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BIOFUEL: REPLACING THE FOSSIL FUEL AS ENERGY SOURCE

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1. Introduction: The major source of the energy being used in today's world comes mainly from the fossil fuels. All these fuels contain materials such as metal, sulfur, and nitrogen compounds in addition to carbon, hydrogen, and oxygen. Different harmful pollutants are generated such as fly ash, sulfur oxides, nitrogen oxides, and other volatile compounds during the process of combustion. Moreover, fossil fuels have non-renewable energy sources which are derived from pre-historic fossils. These are primarily formed from the remains of the decayed plants and animals of the carboniferous era. The main types of fuel sources that are being used to meet the energy and electricity demands of today's world are coal, natural gas, and oil/petroleum help. The source of these fuels is limited and are depleting at a faster rate (1). Particulate matter produced by the burning of fossil fuel can not only pollute the air, it also contaminates the water and soil leading to deterioration and degradation of the same. Wet and dry inorganic pollutant gets deposited leading to acidification of the environment. The obvious consequences are increased corrosion, deterioration of cultivated soil, forest etc. Besides, plant and wildlife is also susceptible such pollution. It is reported that wildlife has been extensively harmed in Europe and North America. Most of the food plants, crops, and other coniferous trees are not also resistant to oxides and thus leading to withered and falling leaves. Biofuels are energy-rich compounds alternative to conventional fossil fuels. Biofuels are produced from the biomass namely microalgae, plants, and bacteria. Other sources with a high value of the heat of combustion are also used as the source of biofuels such as biohydrogen, biodiesel, bioethanol, and biomethanol. Biofuel poses several advantages over fossils fuels. The sources used in the production of biofuel are renewable and releases less toxic compounds in the environment during combustion. Moreover, there is no scope for emitting CO_2 in the whole process saving the environment to some extent (2).

2. Evolution of biofuel production: Depending on the type of biomass usage, biofuels can be divided into the primary and the secondary ones. The primary biofuels are the natural biofuels directly produced from firewood, plants, forest, animal waste, and crop residue. This is the main fuel used in the Third World countries for heating, cooking and agricultural needs. They are also called as traditional Biomass. The secondary biofuel is produced from biomass usually from the primary biofuel. This particular category can be further classified into three more generations: first generation, second generation, and third generation biofuels depending on the various parameters such as:

- Use of general feedstock for fuel production,
- The processing methods, and
- Historical sequence of the fuel's appearance on the world energy market.

First generation biofuels are produced from biomass of food crops which are enriched with sugars, starch, and oils such as soybeans, sunflower seeds, and rapeseeds. Bioalcohols and biodiesel are two of the first generation biofuels that have been widely used. second generation biofuels are devised to overcome the setback of the first generations biofuels. They are produced from lignocellulosic biomass. The third generation of biofuel is produced from algal biomass and is a relatively new direction of bioenergetics production (3).

3. Sources of biofuel

Biomass used in biofuel production

Wood: this is the commonly used biomass that has been used for cooking and heating. Even in the present day, this is the main source of energy in developing countries.

Algae: main biomass used for the production of third generations of biofuels. Main sources of algae come from the stagnant ponds in the natural world, and more recently in algae farms. Recently algae have been used experimentally as a new form of green jet fuel designed for commercial travel (4).

Carbohydrate (sugars) rich biomaterial: the main source for this biomaterial is derived from products like wheat, beets, corn, sugar cane, and other existing food crops (1).

Oils rich biomaterial: this is used to produce the biodiesel for automobiles, and home heating, the Main source for this material is various food crops such as rapeseed, sunflower, corn, and others. The main advantage of this type of biomass is that it is not susceptible to microbial degradation, and can be re-used. It is being experimentally used in the production of green jet fuel (1).

Biorefinery: The biorefinery is a facility where the biomass is used to produce a spectrum of marketable products and energy. This biorefinery concept is somewhat similar to the petroleum refinery (5).

4. Mechanism of biofuel production

Thermochemical conversion: This method involves several processes such as gasification, liquefication, pyrolysis, and hydrogenation and proved to be an efficient method of biofuel production from algal biomass. (6)

1. Gasification: in this process biomass is treated for temperatures above 1000 K and a gas mixture is formed including CO_2, CO, H_2, CH_4, N_2 and other such compounds.
2. Liquefication: in this process catalytic thermal decomposition of biomass produces unstable small components, which are then combined to form bio-oils.
3. Pyrolysis: this is an anaerobic decomposition of biomass (temperatures range from 650 to 800 K). The substance proceeds in a vapor phase and then condenses into the mixture, called bio-oil.
4. Hydrogenation: This is a simple reduction process involving the addition of hydrogen to the unsaturated organic compound. Generally, algal hydrogenation is performed in presence of the solvent and a catalyst in an autoclave.
   (:10.1016/j.enconman.2009.03.001)

Biochemical conversion

1. Fermentation: The fermentation reactions are caused by microorganisms, which feed on sugar-enriched feedstock. The process of fermentation requires less consumption of energy. Moreover, CO2 produced as a by-product during this process can be used as carbon sources for microalgae in cultivation process and therefore reduce the emission of greenhouse gases (2).
2. Transesterification: Transesterification of vegetable oils and animal fats with methanol or ethanol is used for biodiesel production (2).

5. Economic and environmental impact: Biofuel has various advantages over fossil fuel. The main advantage is that it produces lesser amount of greenhouse gas (GHG) emissions with no net increase in atmospheric carbon dioxide (CO_2). Another environmental benefit of biofuels is the fact that it is made from renewable resources (7). In addition to the environmental impact, biofuels tend to be cheapest when compared to the fossil fuels. One of the main reason behind the biofuel research was the high petroleum price. The cost of biofuel production can be further reduced by the use of inedible oils and used oils, instead of using edible vegetable oil (7).

6. Conclusion and future perspective: With the ever-increasing global energy demand, fossil energy has the continuing weaknesses with the significant risk to the environment. The amount of fossil fuel consumed globally is increasing with time and consequently depleting fast in an alarming manner. In addition, burning of fossil fuel creates several harmful impacts on the environment. Therefore, an increased use of biomass-derived fuels has the potential to meet the future demand for energy in an eco-friendly and cost-effective manner.

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मराठी नाटकांचे चित्रपटातील रूपांतर!

डॉ.प्रा.शशिकांत चौधरी, *'सुमित्रा', ६३०/१—ए, बी वॉर्ड, जवाहरनगर, कोल्हापूर.*

महाराष्ट्र नाट्य वेडा आहे. मराठी माणसाचे नाट्यप्रेमच मुळात अफलातून असल्यामुळे मराठी रंग• ूमीचा हा चालता, बोलता वसा आणि वारसा काळानुरूप बदलत आला आहे. बदल हे परिवर्तनाचे पहिले लक्षण आहे. मग तो बदल आचारात असेल, विचारात असेल, कलेतला असेल वा साहित्यातला असेल. पण तो डोळसपणे समजून घेणे महत्त्वाचे आहे. विष्णुदास • ावे, अण्णासाहेब किर्लोस्कर, कृ.प्र.खाडिलकर या मंडळींनी मराठी नाट्यसृष्टीचा पाया बळकट केला. संगीत नाटकाच्या माध्यमातून मराठी माणसाचे मन आणि कान तयार करण्यात ही मंडळी यशस्वी ठरली. त्यांच्या लेखणीने मराठी नाटक गतीमान झाले. पण ते गतिमान करण्यात जे कलावंत पुढे आले, त्यांचे योगदान खूपच मोठे आहे. विशेषत बाल गंधर्व यांच्या सौंदर्याने, अ• नयाने, तत्कालीन मराठी रसिक घायाळ तर झालेच, पण फॅशनच्या क्षेत्रातले इंडियन आयडॉल म्हणूनच आजही त्यांच्या वेश• ुषेमुळे, केश • ुषेमुळे, अ• नय आणि त्यांच्या दर्द• री गायनाकडे पाहिले जाते. नाटकाच्या दृष्टीकोनातून ज्यांनी त्यांना जवळून पाहिले, ती पीढी तर • ाग्यवान होतीच पण आपली पिढी त्या लौकिक इतिहासाकडे आजही डोळसपणाने पाहते आहे, हे त्यांच्या व्यक्तिमत्त्वाचे मोठेपण आहे.

नाटक हा लाईव्ह परफॉर्मन्स आहे. हजारो प्रेक्षकांच्या साक्षीने ते घडते. अ• नयाचे, गायनाचे बारकावे आपल्याला पाहता येतात. पण चित्रपट माध्यमाचे तसे नाही. मराठी रंग• ूमीवरच्या नाटकाचे पुढचे रूप, रूपांतर म्हणजे चित्रपट आहे. तसे म्हणाल तर चित्रपट हे पडद्यावरच्या नाटकाचे पुढचे स्वरूप आहे असे म्हटले तर वावगे ठरणार नाही. कारण प्रारं• ीचे चित्रपट हे तत्कालीन सर्वसामान्य प्रेक्षकांना पडद्यावरचे नाटकच वाटत होते.

१९१२ ते १९३१ हा मराठी चित्रपट सृष्टीतल दोन दशकांचा काळ म्हणजे मुकपटाचा जमाना होता. एकीकडे मराठी नाट्यप्रेमी प्रेक्षक तन्मयतेने नाटक पाहण्यात रंगला होता. तर दुसरीकडे दादासाहेब फाळके सारखा माणूस मराठी रंग• ूमीवरच्या प्रेक्षकांना खेचून घेऊन, त्यांना चित्रपटाच्या माध्यमाकडे आकर्षित करण्यासाठी प्रयत्न करीत होता. तसे म्हणाल तर पाश्चिमात्यांच्याकडून स्वीकारलेली. ही कला, मराठीत रूजविण्याचा पहिला प्रयत्न जर कोणी केला असेल तर तो त्यांनी. हे आवर्जुन सांगावे लागेल. जसं कानडी नाटक पाहून विष्णुदास • ावे यांना हा प्रयोग मराठी करता येईल. याची जाणीव झाली. नेमकी ती आणि तशीच जाणीव दादासाहेब फाळके यांनाही झाली होती, हे आवर्जुन मान्यच करावे लागेल. त्यांना हात• ार, पुढे प्र• ातने आणि व्ही.शांताराम, • ालजी पेंढारकर, मा.विनायक, अनंत माने, दिनकर द. पाटील, अशा असंख्य दिग्दर्शकांनी लावला आहे.

तसे म्हणाल तर शब्द हे कथा, कादंबरी, नाटकाचे माध्यम आहे. शब्द हे कादंबरी वाङ्मयात सर्वे सर्वा असतात. पण हेच शब्द नाटकाच्या माध्यमात, संवादाच्या जोडीने उ• ा राहतात, तर चित्रपट माध्यमात दृशांच्या • ूमिकेतून हा बदल समजून घेणे इथे महत्त्वाचे आहे. कारण तत्कालीन प्रेक्षकांना नाटकाने आणि मुकपटाने रंग• ूमीवर आणि पडद्यावर जे जे दिसते, ते ते

पाहण्याची आणि कानावर जे जे पडते ते ऐकण्याची सवय लावली हे या दोन्ही माध्यमातले साम्य आहे.

नाटक हे प्रेक्षकांच्या समोर घडते. म्हणजे लाईव्ह परफॉर्मन्सच असे म्हणता येईल. तिथे एखादा संवाद वा गाणे वन्समोअर घेऊ शकता. रसिकांच्या टाळ्यांची दाद तो कलाकार वसूलही करतो.

पण चित्रपट माध्यमात ते शक्य नाही. कारण चित्रपट हा कॅमेऱ्याच्या माध्यमातून चित्रीत केला जातो. त्यामुळे नाटकातला जिवंतपणा चित्रपटात येत नाही. कारण प्रतिमा, प्रतिकांच्या माध्यमातून चित्रपट बोलतो. सशक्त प्रतिमा हे चित्रपटांचे तर सशक्त संवाद हे नाटकाचे माध्यम आहे. हे अभ्यासकांनी समजून घेणे महत्त्वाचे आहे.

लेखकाचे लेखनाचे काम जिथे संपते. तिथे दिग्दर्शकाचे काम सुरू होते. कुशल दिग्दर्शक नटांना सोबत घेवून, तालमतीच्या माध्यमातून, पाठांतरातून तो ते नाटक बसवून घेतो. त्यामुळे दिग्दर्शकाचे काम जिथे संपते, तिथे नटाचे काम सुरू होते. आणि मग नट प्रेक्षक यांच्यात जो खेळ सुरू होतो, तो अभिनयाच्या माध्यमातून होतो. कारण नाटकातला अभिनय हा हजारो प्रेक्षकांच्या साक्षीने घडत असतो. नटाला आपल्या भूमिकेला न्याय देताना प्रेक्षकांच्या मनावर अधिराज्य गाजवता येते. भूमिका आवडल्याची पावती त्याला त्याच्या नजरेतून पहायला मिळते. मग ते नाटक शोकांतिक असो वा सुखांतिक. पण एका क्षणात त्याला त्याची पावती मिळते. अर्थात नाटकात हे शक्य आहे. चित्रपटात नाही. कारण कॅमेऱ्याच्या माध्यमातून टिपला जाणारा अभिनय हा मर्यादीत मंडळींच्या साक्षीने टीपला जात असतो. तिथे टेक, रिटेक वारंवार होतात. तुकड्या, तुकड्यांनी तो चित्रित केला जातो. त्यामुळे त्यात वारंवार बदल करता येतात. पण ही खेळी नाटक या माध्यमात चालत नाही. नाटक, चित्रपट ही दोन्ही माध्यमे दिग्दर्शकाचीच आहे. हे मात्र निर्विवादपणे सांगावे लागेल. चित्रपट माध्यम हे वास्तवतेच्या जवळ अधिक जाते. मूर्तिमंत वास्तव प्रेक्षकांसमोर उभा करू शकते. पण नाटक हे माध्यम हे शक्य होत नाही. नव्हे नाविण्यपूर्ण तंत्राची जोड दिली तरीही हे साध्य करता येत नाही. कारण नाटक माध्यमाला इथे मर्यादा असतात. पण चित्रपट माध्यम मात्र कौशल्यपूर्ण छायाचित्रण, प्रकाश योजना, दिग्दर्शक, प्रतिमा—प्रतिमांचा वापर करून एखादी निर्जीव वस्तूदेखील पडद्यावर सजीव करून दाखवण्यात यशस्वी होतो. यात तंत्रज्ञानाची जोड असते. हे लक्षात घेणे इथे महत्त्वाचे आहे.

नाटकावरून चित्रपट निर्मिती करणे किंवा चित्रपटावरून नाटक निर्माण करणे यात गैर कांही नाही. परिणामकारक आशय व्यक्त करण्यासाठी प्राप्त माध्यमांचा वापर आपण किती हुशारीने करतो, यावर त्याचे महत्त्व अवलंबून असते. चित्रपट हे प्रगत तांत्रिकतेतून जन्माला आलेले माध्यम आहे. दृकश्राव्यतेला ते प्राध्यान्य देणारे माध्यम आहे. पण नाटक माध्यम हे दीर्घ काळाच्या परंपरेतून, साहित्यिकांच्या पालन—पोषणातून विकसित झालेले माध्यम आहे. स्थल, कालाचे वेळेचे बंधन हे माध्यम तोडू शकत नाही. कारण रंगमंच हेच या माध्यमाचे घटना स्थळ आहे. आणि दोन—अडीच तास हाच त्यातला घटना काळ आहे. त्यामुळे वेळ काळाच्या बंधनामुळे नाटककार प्रेक्षकांच्या कल्पना शक्तीला आव्हान देत असतो. हे आव्हान चित्रपटाच्या माध्यमातून कुशल दिग्दर्शक, लोकेशन, छायाचित्रण, या माध्यमातून चित्रीत करीत असतो. ध्वनी—प्रकाशाचा वापर सहजतेने करीत असतो. त्यामुळे टेक, रिटेकचा वापर करीत हे माध्यम सलग निर्माण केलेली, तुकड्या तुकड्यांनी जोडलेली सलग प्रिंट प्रेक्षकांना खेळवून ठेवण्यात यशस्वी होते. तर नाटक लाईव्ह परफॉर्मन्स देण्यात यशस्वी होते. दोन्हीही माध्यमांत दृकश्राव्याचा

वापर केला असला तरी प्रेक्षकांच्या समोर घडणारे नाटक आणि नाटकाचे पडद्यावरचे रूप जाणून घेणारे प्रेक्षक यात फरक हा राहतोच. कारण चित्रपट हे पडद्यावरच्या नाटकाचे पुढचे रूप आहे. स्वरूप आहे. रूपांतर आहे. या दृष्टीने विचार करता, एका शतकाच्या इतिहासात नाटकावरून जे चित्रपट निर्माण, रूपांतरीत झाले, त्यांची यादी मी सोबत देत आहे. त्यावर नव्या संशोधकांनी संशोधन करणे गरजेचे आहे, हे आवर्जुन सांगावेसे वाटते. १९१२ ते १९३१ हा मुकपटांचा जमाना होता. त्या कालखंडात १२ मराठी नाटकांचा आधार घेवून चित्रपट निर्मिती झाली आहे. त्यात दोन संस्कृत नाटकांचा समावेश आहे. एक इंग्रजी नाटक आहे. आणि तीन मराठी कादंबरींचा आणि दोन खंड काव्यांचा आधार घेवून चित्रपट निर्मिती झाली आहे. त्यामुळे एकूण पंधरा नाटके, तीन कादंबऱ्या, आणि दोन खंड काव्यांचा आधार घेवून चित्रपट निर्मिती, मुकपटाच्या जमान्यात झाली. अर्थात हा काल खंड २१ वर्षांचा आहे. त्यामुळे नाटक माध्यमाचा आधार घेवून चित्रपट निर्मिती होणे हेच या कालखंडाचे फलीत होते, असे म्हटले तर वावगे ठरू नये. ७४ वर्षांच्या कालखंडात मराठी चित्रपटात तांत्रिक बदल होत राहिले. हे जरी खरे असले तरी या कालखंडात ही मराठी चित्रपट दिग्दर्शकांनी २३ मराठी नाटकांचा, शेक्सपियरच्या ३ इंग्रजी नाटकांचा, २ संस्कृ त नाटकांचा, १ बंगाली नाटकाचा आणि १ रशियन कथेचा आधार घेवून चित्रपट निर्मिती केली आहे. त्यामुळे एकूण २९ नाटके आणि १ रशियन कथा यांचा आधार मराठी चित्रपट सृष्टीने घेवून आपली चित्रपट निर्मिती केल्याचे दिसून येते. तर याच कालखंडात २७ कादंबऱ्या, ३ आत्मकथा, आणि ३ चरित्रांचा आधार घेवून चरित्रात्मक चित्रपटांची निर्मिती केली आहे. अर्थात हा आढावा देण्या पाठीमागचा माझा हेतू प्रांजळ आहे. नव्या पिढीने नविन विषय घेवून संशोधन करावे. ही या मागची माझी प्रांजळ धारणा आहे. विषयाच्या अनुषंगाने चित्रपटांची यादी मी दिली आहे. त्याचा नव्या संशोधकांनी जरूर विचार करावा. आणि आपले संशोधन करावे. आणि त्यांना मार्गदर्शन करणाऱ्या गाईडनीही आपली दृष्टी व्यापक ठेवून त्यांना सहकार्य केले तर नवे संशोधनही तितकेच सखोल आणि व्यापक होईल, याची खात्री वाटते.

मुक पट — नाटक

सन	चित्रपट	दिग्दर्शक	नाटक—लेखक
१९१२	• क्त पुंडलीक	दि.दादासोा तोरणे	पुंडलीक ले—रामराव बाळकृ ष्ण किर्तीकर
१९१५	नारायण पेशव्यांचा वध	श्री.ना.पाटणकर	श्रीमान नारायणराव पेशवे ले—हरिपंत पंडीत
१९१९	कच देवयानी	श्री.ना.पाटणकर	सं.विद्याहरण काकासोा खाडीलकर
१९२०	सिता स्वयंवर	श्री.ना.पाटणकर	सिता स्वयंवर विष्णूदास • ावे
१९२२	द्रौपदी स्वयंवर	विष्णुपंत दिवेकर	स्वयंवर कृ.प्र. खाडीलकर
	महाश्वेता	श्री.ना.पाटणकर	कादंबरी—बाळ• ट्ट — संस्कृत नाटक
१९२३	शारदा अर्थात कन्या विक्रय	मामा निरंतर	शारदा — गो.ब.देवल
१९२६	ताई तेलीण ऐतिहासिक	नानासोा सरपोतदार	ताई तेलीण अच्यूत बळवंत कोल्हटकर
	तोतयाचे बंड	नानासोा सरपोतदार	तोतयाचे बंड —न.चि.केळकर
१९२८	जगद्गुरू श्रीमद शंकराचार्य	पार्श्वनाथ आळतेकर	शंकर दिग्वीजय अण्णासोा किर्लोस्कर
१९२९	राज संन्यास	पांडुरंग तलेगिरी	राजसंन्यास— रा.ग. गडकरी
	वसंत सेना	दादासाहेब फाळके	मृच्छ कटीक — शुद्रक —

			संस्कृत
१९३०	रक्ताचा मुकुट — खुनीताज	पांडुरंग तलेगिरी	मॅक्बेथ — शेक्सपिअर — इंग्रजी
	शिवसं• व	के.पी.• ावे	
१९३०	चंद्रसेना	व्ही.शांताराम	चंद्रसेना—पु.• ा. डोंगरे
१९३२	माया मच्छिंद्र	व्ही.शांताराम	मणी शंकर गुजराती नाटकाचा सिध्द संसार, मराठी रूपांतर
१९३४	शककर्ता शिवाजी	नागेंद्र मुझुमदार	आमचे इर्मान
१९३५	चंद्रसेना	व्ही.शांताराम	चंद्रसेना—पु.• ा. डोंगरे
१९३७	साध्वी मीराबाई	बाबुराव पेंटर	अमृत सिध्दी — वसंत शांताराम देसाई
१९३८	ज्वाला	मा.विनायक	मॅकबेथ — शेक्सपिअर — इंग्रजी
१९४१	पैसा	जी.पी.पवार	पैसाच पैसा माधव जोशी
	म्युनिसिपालीटी — स्थानिक स्वराज्य	बाबूराव आपटे	म्युनिसिपालीटी — माधव जोशी
१९४२	वसंत सेना	गजानन जागीरदार	मृच्छ कटीक — शुद्रक — संस्कृत
१९४८	मोरूची मावशी	आचार्य अत्रे	चार्लीज आँट— इंग्रजी
१९४९	ब्रह्म घोटाळा	आचार्य अत्रे	लग्नाची बेडी — आ.अत्रे
१९६४	या मालक	नंदू खोटे	निशिकांताची नवरी — आनंत काणेकर
१९७१	शांतता कार्ट चालू आहे	सं.सत्यदेव दुबे	शांतता कार्ट चालू आहे— विजय तेंडूलकर
१९७७	घाशीराम कोतवाल	कृष्णन हरिहरण इतर तीन	घाशीराम कोतवाल — विजय तेंडूलकर
१९८६	पुढचं पाऊल	राजदत्त	पर्याय— जयवंत दळवी
	माझ घर माझा संसार	राजदत्त	माझ घर माझा संसार — रत्नाकर मतकरी
१९९०	घाबरायचं नाही	व्ही.के.नाईक	टायमींग ऑफ शिरू — शेक्सपीअर — इंग्रजी
१९९१	चौकट राजा	संजय सुरकर	बॉनसाय
१९९२	हाच सूनबाईचा • ाऊ	पुरू षोत्तम बेर्डे	लहान पण देगा देवा — बाळ कोल्हटकर
१९९३	वजीर	संजय रावल	वजीर— उज्वला ठेंगडी
२००६	मातीच्या चुली	सुरेश मांजरेकर	महेशमा जावेकराच्या नाटकावर आधारीत
२००८	गाढवाचं लग्न	राजू फुलकर	गाढवाचं लग्न — हरि• ाऊ वडगांवकर
२०१३	श्रीमंत दामोदर पंत	केदार शिंदे	श्रीमंत दामोदर पंत — केदार शिंदे
	कुमारी गंगुबाई नॉन मॅट्रीक	राजेश देशपांडे	कु.गंगुबाई नॉन मॅट्रीक— राजेश देशपांडे
	नारबाची वाडी	आदित्य सरपोतदार	मनोज मित्रांच्या बंगाली नाटकावर आधारीत
	कट्यर काळजात घुसली	सुहास • ावे	कट्यर काळजात घुसली— पुरूषोत्तम दारव्हेकर
	नटसम्राट	महेश मांजरेकर	नटसम्राट — वि. वा.

			शिरवाडकर

मुक पट — कादंबरी

सन	चित्रपट	दिग्दर्शक	नाटक—लेखक
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QUALITY ASSESSMENT OF KHARAMBOLI DAM WATER BY STUDYING PHYSICO-CHEMICAL CHARACTERISTICS, MURUD, DIST-RAIGAD (M. S.)

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Abstract
The water sample from Kharamboli dam of Murud Taluka was analyzed for their physicochemical characteristics. Laboratory tests were performed for the analysis of samples for Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity were analyzed in the month of November 2017. By observing the result it can be concluded that the parameters which were taken to study the water quality are below the pollution level for ground water which satisfies the requirement for the use of various purposes like domestic, agricultural, industrial etc. The usefulness of these parameters in predicting dam water quality characteristics were discussed
Keywords: *Kharamboli Dam water, water quality standard, Physico-chemical Parameter*

INTRODUCTION: Water is one of the most important and abundant compounds of the ecosystem. All living organisms on the earth need water for their survival and growth. As of now only earth is the planet having about 70 % of water. But due to increased human population, industrialization, the use of fertilizers in the agriculture and man-made activity, it is highly polluted with different harmful contaminants. Therefore, it is necessary that the quality of drinking water should be checked at regular time interval, because due to use of contaminated drinking water, human population suffers from varying of water borne diseases. It is difficult to understand the biological phenomenon fully because the chemistry of water revels much about the metabolism of the ecosystem and explain the general hydro – biological relationship [1]. Water pollution is a serious problem in India as almost 70 per cent of its surface water resources and a growing percentage of its groundwater reserves are contaminated by biological, toxic, organic, and inorganic pollutants. In many cases, these sources have been rendered unsafe for human consumption as well as for other activities, such as irrigation and industrial needs. This shows that degraded water quality can contribute to water scarcity as it limits its availability for both human use and for the ecosystem. Due to growth of population, agriculture, and industries, demand for domestic water has increased many times during the last few years. Improper waste disposal and over exploitation of resources has affected the quality, not only of tap water, but also of ground water [2]. Prabhakar R. Pawar and Balasaheb G. Kulkarni [3] has studied assessment of water quality in the karanja creek (Raigad). Budharatna Bhavare, Miguel A. Rodriguez, Anil Kurthe [4] has studied different physic chemical parameter and nutrients in water of Bhatye estuary, Ratnagiri central, West coast of India. Francis Andrade, H.B. Arvinda, and E.T. Puttaiah [5] have studied Manglore coastal water



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pollution by analysis of physical, chemical parameter. Ramalingam manikannan, Subramanian asokan and A.H.M.S. Ali [6] have studied Seasonal variation of physicochemical properties of the great vedaranyam swamp point calimere wildlife Sanctuary, South east coast of India. Sujata Sen, Dr. Minal Kanti Paul, and Madhab Borah [7] have studied the some physico chemical parameter of pond and river water with reference to correlation study. G.Velsamy, N. Manoharan, S.Ganesan [8] has studied analysis of physicochemical variations in sea water sample Uppanarestuary, Cuddalore, Tamilnadu (India). Amboli is a Village in Murud Taluka in Raigad District of Maharashtra State, India. It belongs to Konkan region. It belongs to Konkan Division. It is located 49 Km towards South from District head quarters Alibag. 11 Km from Murud. The dam is situated amidst lush greenery which makes it an amazing picturesque location. The sound of nature - water and birds - makes this location a more appealing one.

The water sample was collected from the dam early in the morning between 8.00 am to 10.00 am and was analyzed to compare the differences occurred in Physico-chemical parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Ca-hardness, Magnesium hardness and Salinity.

The research work is carried out, keeping in mind the following objectives.

- To study the chemical composition and water quality parameters of dam.
- To investigate the possible sources and Cause of pollution in the dam if any.

To study if these effects can be attributed to the change in the chemical composition of the dam water



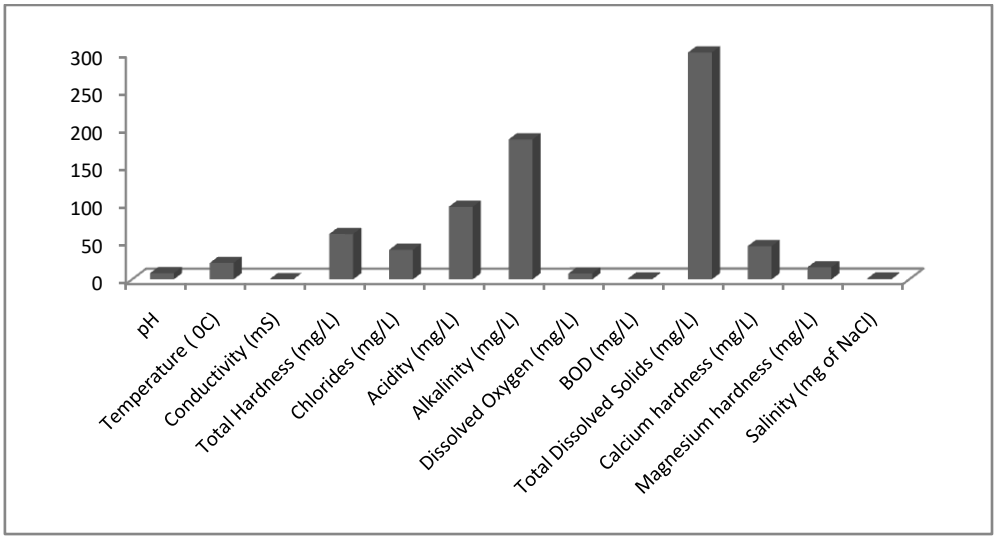
MATERIAL & METHOD:- Sample of water was collected in sterile plastic bottle of 2 litre capacity from the dam. At the same time the temperature & pH were noted. The physico-chemical analysis was carried out within 24 hours of collection in a laboratory as per APHA (1989), (1992), AWWA & WPFA, Trivedy & Goel (1986) [9-10]. The chemicals were used of A. R. grade and are standardized as per Inorganic quantitative analysis by Vogel (1964) & (2006) [11-12]. The result is statistically analyzed by calculating mean & standard deviation.

RESULTS & DISCUSSION:-

Parameters	**Garambi Dam Mean±S.D**
pH	8.10± 0.02
Temperature (^{0}C)	21.7 ± 0.3
Conductivity (mS)	0.109 ± 0.002
Total Hardness (mg/L)	60 ± 1.0
Chlorides (mg/L)	39.05 ± 0.18

Acidity (mg/L)	96 ± 0.3
Alkalinity (mg/L)	185 ± 0.3
Dissolved Oxygen (mg/L)	7.716 ± 0.015
BOD (mg/L)	1.281 ± 0.03
Total Dissolved Solids (mg/L)	300 ± 1.0
Calcium hardness (mg/L)	44± 0.3
Magnesium hardness (mg/L)	16± 0.3
Salinity (mg of NaCl)	1.172 ± 0.003

Table-1:- Values of different parameters of water sample of Kharamboli dam. (Mean and Standard deviation is calculated)



Graph showing concentration range of various parameters at Kharamboli dam.

1. Temperature: Temperature is the most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimize temperature change. The Water temperature depends on the depth of the water column, climatic and topographic changes [13]. A rise in temperature of water leads to the speeding up of chemical reactions in water, reduces the solubility of gases and amplifies the tastes and odour. At higher temperature with less dissolved gases the water becomes tasteless and even does not quench the thirst and decreases the solubility of oxygen. Temperature also determines various other factors such as pH, Conductivity, saturation level of gases and various forms of alkalinity. The temperature of Garambi dam water is $21.7 \pm 0.3\ ^{0}C$.

2. pH: pH, one of the most common analyses in soil and water testing, is the standard measure of how acidic or alkaline a solution is. pH has no direct adverse effect on health. pH governs the distribution, transport and fate of heavy metals in aquatic ecosystem. It is measured a scale from 0 - 14. pH of 7 is neutral, pH is less than 7 is acidic and pH greater than 7 is basic. Aquatic organisms need the pH of their water body to be a certain range optimal growth and survival. pH of water sample collected is 8.10 ± 0.02.

3. Electrical Conductance: Conductivity is the measure of a substance or solution to conduct electric current. Presence of salts and contamination with wastewater increases conductivity of water. It is a indication of pollution. Electrical conductivity used to quickly estimate the ionic or soluble salt concentration in soils, water supplies, fertilizer solution and chemical solution. It is highly depended upon temperature Conductivity however is an important criterion in determining the suitability of

water for irrigation. The conductance of water sample is 0.109± 0.002 mS. The observed value of electrical conductance is quite low and less electrolyte

4. Total Hardness: Total hardness is defined as the sum of calcium and magnesium hardness in mg/L as $CaCO_3$.Total hardness of water an important factor that indicates toxic effect and poisonous elements [14]. There is no adverse effect of hardness on health. Hard water is also not suitable for domestic and irrigation purposes. Total hardness of water collected is 60±1.0 mg/L. The degree of hardness of drinking water has been classified in terms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/L, Medium - 60-120 mg/L, Hard - 120-180 mg/L, Very hard - >180 mg/L. The observed value was quiet less than the acceptable limit of 300 mg/L

5. Chlorides: Chloride is mainly obtained from the dissolution of salts of hydrochloric acid as table salt (NaCl), NaCO2 and added through industrial waste, sewage, sea water etc. Surface water bodies often have low concentration of chlorides as compare to ground water. It has key importance for metabolism activity in human body and other main physiological processes. High chloride concentration damage metallic pipes and structure as well as harms growing plants. According to WHO standards concentration of chloride should not exceed 250 mg/L

The chloride content of the water sample is found to be 39.05±0.18 mg/L

6. Acidity: Acidity of water is its capacity to neutralize a strong base and is mostly due to the presence of strong mineral acids, weak acids and the salt of strong acids and weak bases. Addition of wastewater having acidity producing substances increases the acidity of water. The observed acidity of water sample is 96± 0.3 mg/L of $CaCO_3$. The value is much less than threshold value i. e. 200 mg/L of $CaCO_3$. This indicates that sample of water are in safe range

7. Alkalinity: Alkalinity is a chemical measurement of water's ability to neutralize acid. Alkalinity is also a measure of water buffering capacity or its ability to resist changes in pH upon the addition of acids or bases. Alkalinity of natural water is due to primarily to the presence of weak acid salts, although strong bases may also contribute (i.e. OH^-) in the extreme environment. Bicarbonate represents the major form of alkalinity in natural water, so its source being the partitioning of CO2 from the atmosphere and the weathering of carbonate minerals in rocks and soil. Other salts of weak acids, such as borate, silicates, ammonia, phosphate, and organic bases from natural organic matter may be present in small amounts The observed alkalinity of water sample is 185 ± 0.3 mg/L of $CaCO_3$. The observed value of alkalinity of sample is within the permissible range i.e. below 200 mg/L.

8. Dissolved Oxygen: The amount of oxygen dissolved in water, such as a lake, river or stream. Dissolved oxygen is the most important indicator of the health of water bodies and its capacity to support a balanced aquatic ecosystem of plants and animals. Warm water released from industrial outlets, flowages or storm sewers can also reduce dissolved oxygen levels. Dissolved oxygen may play a large role in the survival of aquatic life in temperature lakes and reservoirs during summer months. Dissolved oxygen of water sample collected is 7.716 ± 0.015mg/L. It may be due to high temperature and inorganic reluctance such as hydrogen sulfide, ammonia, nitrites, ferrous ions and other oxidizable substances also tend to decrease dissolved oxygen in water

9. Biochemical Oxygen Demand (BOD): Biochemical oxygen measures the amount of oxygen that microorganisms consume while decomposing organic matter, it also measures the chemical oxidation of inorganic matter. BOD is a measure of organic material contamination in water, specified in mg/L. BOD is the amount of dissolved oxygen required for the biochemical decomposition of organic compounds and the oxidation of certain inorganic materials (e.g., iron, sulphites). The observed value of BOD is 1.281 ± 0.03 mg/L which is within the permissible range i. e. 0.75-1.5 mg/L.

10. Total Dissolved Solids (TDS): Total dissolved solids are the total amount of mobile charged ions, including minerals, salts or metal dissolved in a given volume of water in mg/L. TDS is directly related to the purity of water and the quality of water purification system and affects everything that consumes, lives in, or uses water, whether organic or inorganic, whether for better or for worse. Common inorganic salts that can be found in water include calcium, magnesium, potassium and sodium, which are cations and carbonates, nitrates, bicarbonates, chlorides and sulphates which are anions. They give a particular taste to water at higher concentration and also reduce its palatability
The total solid present in water sample collected is 300±1.0 mg/L which is lower than threshold value of total solid content i.e. 500 mg/L.

11. Calcium hardness: Calcium is naturally present in water. Calcium is a determinant of water hardness, because it can be found in water as Ca^{2+} ions. As per Indian Standards the calcium content of water should not be more than 75 mg/L. This has been specified in the IS 10500:- Drinking Water –Specifications. In the study the calcium content in water sample has been found to be 44± 0.3 mg/L which is within the limit as per Specification

12. Magnesium hardness: Magnesium is naturally present in water. Magnesium is a determinant of water hardness, because it can be found in water as Mg^{2+} ions. As per ISI the magnesium content of water should not be more than 50 mg/L. In the study the magnesium content in water sample has been found to be 16± 0.3 mg/L which is within the limit as per Specification

13. Salinity:- Salinity which is defined as the total concentration of electrically charged ions in the water. These ions are the four major cations-calcium, magnesium, potassium and sodium, and the four common anions carbonates (CO_3), sulphates (SO_4), chlorides (Cl) and bicarbonates (HCO). Other components of salinity are charged nitrogenous compounds such as nitrates (NO_3), ammonium ions (NH_4) and phosphates (PO_4) **[**15]. In general the salinity of surface waters depends on the drainage area, the nature of its rock, precipitation, human activity in the area and its proximity to marine water [16]. Waters with salinity below 1% are fresh and waters with salinity higher than 1% are brackish/marine [17]. The observed value of salinity for water sample is 1.172 ± 0.003 mg of NaCl.

CONCLUSION: The study assessed the evolution of water quality in dam water of Kharamboli, Murud taluka which was carried out by taking certain important parameters like Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity. The data of physico-chemical and biological parameters clearly shows that the water of Kharamboli dam is within the permissible range as per APHA (1989), (1992), Trivedi and Goel (1986). Such water is suitable for drinking purpose and can be used for domestic as well as irrigation purpose.

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ANALYTICAL STUDY OF PREEMINENT COINAGE OF THE MARATHA EMPIRE (SHIVKAL)

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Abstract
Founder of The Maratha Empire is Chhatrapati Shivaji Maharaj and Maratha warrior group establishing Hindavi Swarajya.There were several coins in circulation like Vijaynagar, Nizamshahi, Adilshahi, Mughal, France, England etc. Maharaj Shivaji aware of the importance of currency. He minted coins during his coronation in 1674. He minted coins like Hon which is gold coin and today these coins are very rare with only few known specimens, another coin is Shivarai coins which are minted at various mints even post-humously and circulated till the middle of the eighteenth century.Hon as a gold coin and shivarai was copper coin.Was Maharaj shivaji casted silver coins or not ? we have different opinians for this question , but there were some silver coins presented in the auction that shows the relation with shivaji maharaj or the time of shivaji coinage. Maharaj samhaji and Maharaj rajaram continued these coins even after the death of shivaji maharaj and also both of them casted coins of their own names. These all coins shows power of Maratha Empire.
Keywords : *Hon , Shivrai, gujas, Phanams, lari.*

Introduction : The history of India is full of the stories of countless heroes and gallants.Their deeds of bravery,gallantry,and heroism have left indelible marks.Maharaj shvaji is one of those Indian heroes who have been acknowledged as the most worthy and remarkable personalities.He was the first king who establish hindavi swarajya in 17th century . On 6 June,1674 coronation ceremony of shivaji Maharaj was performed.He assume the title of king and become fist chhatrapati of Maratha empire.After establishing his rule, Maharaj Shivaji implemented a competent and progressive administration with the help of a disciplined military and well-established administrative set-up. He was the first Maratha ruler to start the Raj Shaka (royal era). He aware of the importance of currency. He minted coins like hon and shivari during his coronation. Maharaj Shivaji did not allow the coins of british East India Company[1]. Hon as a gold coin and shivarai was copper coin. Was Maharaj shivaji casted silver coins or not ? we have different opinians for this question , but there were some silver coins presented in the auction that shows the relation with shivaji maharaj or the time of shivaji coinage.But some references shows He did not strike silver coins[2].Coins of Maharaj Shivaji shows one of the most independent and well established kingdom. Hon which is gold coin and today these coins are very rare, and copper coin is Shivarai circulated till the middle of the eighteenth century.

Coinage: At the time of shivaji maharaj land was cultivated by the farmers and farming was one of the main occupation,and money paid very little role in there economic life.Maharaj Shivaji aware of the importance of currency. He minted coins during his coronation in 1674.These coins improves the economic system with their correctiveness. The Metals used in these coins were equal to the price of the day plus the minting charges.At the raigad fort raje shivaji had their own mint.In addition to his own mints, Maharaj Shivaji allowed private mint-owners to run the mints in his Kingdom. It was a profitable business of the time to produce coins out of royal metals. There were free and open mints.This also entailed the danger of counterfeit private coins.

1.Hon: Maharaj Shivaji used 'Hon' as a gold coin.According to Sabhassd there were twenty six gold coins (hons) in circulation (3) .Hon is also known as Hon Varahi or Varah.According to Sabhasad the hons were Gutti-hon, Adoni Hon, Dharwad Hon, Vellor Hon, Tanjor Hon and Ramnathpuri Hon (4).Maharaj Shivaji's hons bear only the Devnagari legend giving his name and titles. He never acknowledged the supremacy of any other power (5). Shivrai Hon was round, weighing two mashas and seven Gunjas(Gunja seeds – Abrus precatorius is a poisonous herb used in Ayurvedic medicines

after detoxifying process) i.e. 42.12 grains or 2.7.128 Grams in diameter, 1/32 C. meter and touch 32.45(6). The rate of Gold was approximately sixteen rupees per Tola. It means, Shivrai Hons were of Rupees three and thirteen annas .This coin was in circulation for more than one hundred and fifty years. At the time of Maharaj Shivaji's death, in the State treasury, there were 79 lakhs gold coins including Shivrai Hons, and in his personal treasury, there were four lakhs 'Shivrai Hons', Gambar Mohars, Putlis, Patshahi Hons and Sangrai Hons etc. Phanams like Aphraji, Venkatrai,Ulaphkari, Devanhalli,Trishuli etc. were also in his treasury, in which Patshahi hons were more than 13 lakhs .Maharaj Sambhaji and Maharaj Rajaram followed his father's policy but he also minted some new coins.



(Fig:1)

Hon (Fig:1) in collection of chhatrapati shivaji maharaj vastu sangrahalaya.
This coin bear the title ‘Chhatrapati’ on the obverse and the legend ‘Shri Raja Shiva’ on the reverse of the coin.
The text is in Nagari script.
Material: Gold .
Dimensions: Size: 1.1 cms.
Weight: 2.9 gms.
Shivarai: Shivrai is a copper coin of Chhatrapati Shivaji Maharaj . Shivarai (approx 10 to 13 gms.). This coin bear the title ‘Chhatrapati’ on the obverse and the legend ‘Shri Raja Shiv’ or ‘Shri Raja Siv’ on the reverse of the coin and having dotted border on it.There were 150 and above type of copper Shivarai coin.Rev Abat found in his research there were 8 types of specimens.According to Die Studies Model there was approximately 4,50,000 shivarai coin produced at that time.Abat wrote in his Bombay gaziyeter “old copper coins called chhatraptis also called shivarais,as the coin of Raja Shivaji,worth about a quarter of an anna are also current.The Chhatrapati contains 136 grains troy (three forth tola) of pure copper,or 45 grains troy (one forth tola) more than the current quarter anna piece.Peshwa’s were casted same type of copper coin known as Dudandi but the main difference between Dudandi coins and Shivarai coins is Peshwa’s removed dotted border which was printed at the edge of coin. (Fig:2) and (Fig:3) shows copper shivari coin in collection of coin collector.



(Fig:2)



(Fig:3)

Material: Copper.
Weight: 10-13 gms

SHIVARAI SILVER COINS: At the time of maharaj shivaji was he casted silver coins or not? for this question we have different opinians from different scholars . At that time Adilshahi and Nijamshahi saltanat had their own silver coin named as Lari. Amiteshwar jha mentioned in his bharatiy sikke book that there were some silver coins casted by Mahara j Shivaji and on which Raja Shiv Chhatrapati' inscribed on one side and other side Jagdamb prasanna inscribed. Mahadev govinda ranade mentioned in his Currencies and Mints under Maharashtra Rule' article ,As regards the silver rupee coined at Raigad,it is impossible to say what inscription it bore ,as no specimens of Shivaji's rupee coin are now available. according to numismatics circle, there are less than 10 coins minted in celebration of Mahraj shivaji's coronation. From these one of the silver coin selled for 15lakhrupees in 2016 (TOI) and in the same year but in another auction this coin was selled for 10.5 lakh rupees(the hindu newspaper) the coin was undated with 'jagdamba prasanna' inscribed on one side and 'Raja Shiv Chhatrapati' on other side.Jagdamba is one of the goddess and avatar of goddess bhavani.And bhavani devi is family deity of Maharaj Shivji .These coins are extremely rare coin. (Fig:4) and (Fig:5) shows silver shivari coin in collection of coin collector.



(Fig:4) (Fig:5)

Material: silver.

SHAMBHU CHHATRAPATI'S SHIVARAI : Maharaj Sambhaji (May 14, 1657 – March 11, 1689) was the second ruler of the Maratha kingdom. He was the eldest son of Maharaj Shivaji, and his first wife Saibai. He was successor of the realm after his father's death, and ruled it for nine years. Sambhaji's rule was largely shaped by the ongoing wars between the Maratha kingdom and Mughal Empire as well as other neighbouring powers such as the Siddis, Mysore and the Portuguese in Goa. His coronation was held on 20 july 1680 at the fort panhala and on 16 january 1681 at the fort raigad after the death of shivaji maharaj and sambhaji maharajfollowed his father's policy but he also minted some new coins.sambhaji maharaj continued the shivarai coin in his currency. he also minted the new copper coin and now collectors or scholars called it as shambhurai.It was also copper coin .This coin is approx 12 gms. This coin bear the title 'Chhatrapati' on the obverse and the legend 'Shri Raja Shambhu' or 'Shri Raja Sambhu' on the reverse of the coin and having dotted border on it.The text is in Nagari script. These coins are very rare. (Fig:6) and (Fig:7) shows copper shivari coin of Maharaj Sambhaji in collection of coin collector.



(Fig:6) (Fig:7)

Material: Copper.

Weight: Approx 10-12 gms.

MAHARAJ RAJARAM'S SHIVARAI: Rajaram Raje Bhosale (24 February 1670 – 3 March 1700.) was the younger son of Maratha ruler Chhatrapati Shivaji Maharaj, and half-brother of Maharaj Sambhaji. He took over the Maratha Empire as its third Chhatrapati after Sambhaji Maharaj's death in 1689.Rajaram followed his father's policy but he also minted some new coins.This coin known as Maharaj Rajaram's Shivarai. This coin bear the title 'Chhatrapati' on the obverse and the legend 'Shri Raja Ram' on the reverse of the coin and having dotted border on it.The text is in Nagari script. This coin is having weight approx 9 gms.Mostly we get these coins in square shape,but some coins also found in rounded shape.These coins are also very rare. (Fig:8), (Fig:9), (Fig:10) and (Fig:11) shows copper shivarai coin of Maharaj Rajaram in collection of coin collector.



(Fig:8)



(Fig:9)



(Fig:10)



(Fig:11)

Material: Copper.

Weight: Approx 9-10 gms.

CONCLUSION: Ancient coins are the mediators , which tells us the history of todays currency . these coins throws light on the life , culture and economic conditions of any empire. in the whole history of maharashtra maratha empire was one and the only empire which was established by maharashtrian man, and maharashtra was ruled by maharashrian person maharaja shivaji.not only the maharashtra but he aquired some parts of gujarat and karnatak also . after the coronation shivaji maharaj casted his own coins because he was aware about the power of currency . a normal shivaji became a great king due to his deeds and that's why the name of shivaji maharaj has written by golden words in the history of Maharashtra . shivarai was one of the important part of his currency . this coin was used by common people and rich people also . to aquaire more knowledge about the economic development, cultural development of maratha empire it is important to do study of these coins.It is important to conserve these archaeological coins, but at the same time analytical study of these coins is also important to reveal the more correct and pure history . Because future is always reflection of past.

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ESTIMATION OF WATER QUALITY PHYSICO-CHEMICAL PARAMETERS OF DRINKING WATER SOURCES OF USROLI VILLAGE OF MURUD TEHSIL DISTRICT- RAIGAD, MAHARASHTRA, INDIA

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Abstract
Quality of water is an important criterion for determining the suitability of water for human consumption. Keeping in view the significance of good quality water for a healthy society, the physic-chemical analysis of the water sources of the Usroli village was carried out to evaluate their suitability for drinking purpose. The present study focused an acute awareness among the people about the quality of drinking water by taking water samples from different sources for analysis. The experiment analyses its various Physico-chemical and biological parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity were analyzed in the month of December 2017. The results are compared with standards of WHO. From the obtained result it can be predicted that the parameters which were taken to study the water quality are below the pollution level for water which satisfies the requirement for the use of various purposes like domestic, agricultural etc.
Keywords: *Drinking water resources, water quality standard, Physico-chemical Parameter.*

INTRODUCTION: Rural India depends mainly on groundwater for drinking and agriculture. Villages once depend on sources like wells, lakes, ponds and streams for their water needs. Contamination of most surface water sources has rendered them unfit for consumption. And also increase in water demand by an increasing population has necessitated resource to tapping groundwater. Unsustainable withdrawal of groundwater has led to the spectra of depleting the problem of water scarcity. Every human society, be it rural or urban, industrially or technologically advanced, disposal of waste exceeds the limit of natural scavenging or removal process, they are bound to effect the normal functioning of the ecosystems and consequently they bear an adverse effect on the biota [1]. Water is one of the most important parameter to the ecosystem. The sustainable development will not be possible without adequate quantity and quality of fresh water [2]. Fresh water resource are becoming deteriorate day-by-day at the very faster rate. Now water quality is a global problem [2]. The healthy aquatic ecosystem is depended on the biological diversity and Physico-chemical characteristics [3]. Better quality of water is described by its physical, chemical and biological characteristics. But some correlation was possible among these parameters and the significant one would be useful to indicate quality of water. Water supply systems are important, but at the same time wastewater treatment systems are also equally important. Approximately 80% of water turns to waste water after its utilization. Water quality provides current information about the concentration of various solutes at a given place and time. Its quality parameters provide the basis for judging the suitability of water for its designated uses and to improve existing conditions [4].There is no single or simple measure for water quality. Water may be tested for a few characteristics or numerous natural substances and contaminants depending on their needs. The nature and extent of water pollution is characterized by several physical, chemical and biological parameters. The

increased anthropogenic activities due to industrialization have contributed to decline in water quality including climate and precipitation, soil type, vegetation, groundwater and flow conditions. The water quality of rivers and lakes changes with the seasons and geographic areas, even when there is no pollution presents [5]. The deterioration of water quality has led to the destruction of ecosystem balance, contamination and pollution of ground and surface water resources. Water quality degradation world-wide is due to many anthropogenic activities which release pollutants into the environment thereby having an adverse effect upon aquatic ecosystems. Quality of water can be regarded as a network of variables such as pH, oxygen concentration, temperature, etc. and any changes in these physical and chemical variables can affect aquatic biota in a variety of ways [6]. Since the quality water is directly related to health and is important for determination of water utility, it is very essential and important to test the quality of the water before it is used for drinking, domestic, agricultural or industrial purposes. The utility of river water for various purposes is governed by physicochemical and biological quality of the water [7]. It is well known that no straight forward reasons can be advanced for the deterioration of water quality, as it is dependent on several water quality parameters [8]. Ground water quality in the industrial areas is determined by measuring the concentration of some physico-chemical parameters and comparing them with drinking water standards [9]. Chandanshive Navnath Eknath [10] studied "The Seasonal Fluctuation of Physico-Chemical parameters of River Mula- Mutha at Pune, India and their Impact on Fish Biodiversity". MVS Vaishnavi et al [11] studied "Study of levels of heavy metals in the river waters of regions in and around Pune City, Maharashtra, India". Pali Sahu et al [12] studied "Physicochemical Analysis of Mula Mutha River Pune". Nidhi Jain et al [13] studied "Comparative Review of Physicochemical Assessment of Pavana River". Patil. P.N et al [14] studied "Physico-chemical parameters for testing of water". According to Census 2011 information the location code or village code of Usroli village is 554241. Usroli village is located in Murud Tehsil of Raigarh district in Maharashtra, India. It is situated 10km away from sub-district headquarter Murud and 42km away from district headquarter Alibag. As per 2009 stats, Usroli village is also a gram panchayat. The total geographical area of village is 653.11 hectares. Usroli has a total population of 1,099 peoples. There are about 239 houses in Usroli village. Murud is nearest town to Usroli which is approximately 10km away.The water sample such as Pipe water, bore well water and well water was collected early in the morning between 8.00 am to 10.00 am and was analyzed to compare the differences occurred in Physico-chemical parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Ca-hardness, Magnesium hardness and Salinity.

The research work is carried out, keeping in mind the following objectives.

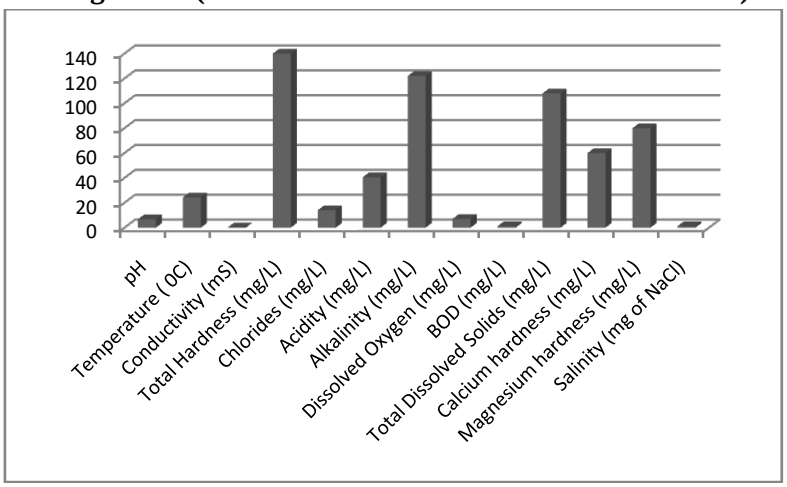
- To study the chemical composition and water quality parameters of different sources.
- To investigate the possible sources and Cause of pollution in the water if any.
- To study if these effects can be attributed to the change in the chemical composition of the different water sources.

MATERIAL & METHOD:- Sample of water was collected in sterile plastic bottle of 2 litre capacity from the dam. At the same time the temperature & pH were noted. The physico-chemical analysis was carried out within 24 hours of collection in a laboratory as per APHA (1989), (1992), AWWA & WPFA, Trivedy & Goel (1986) [15-16]. The chemicals were used of A. R. grade and are standardized as per Inorganic quantitative analysis by Vogel (1964) & (2006) [17-18]. The result is statistically analyzed by calculating mean & standard deviation.

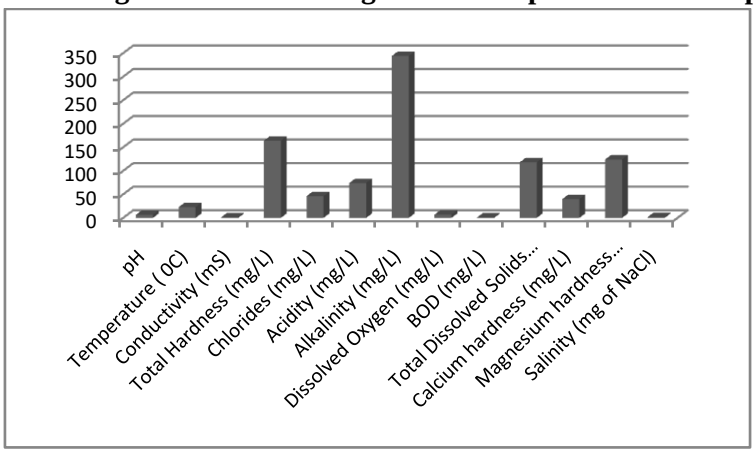
RESULTS & DISCUSSION:-

Parameters	Tap water Mean±S.D	Bore well water Mean±S.D	Well water Mean±S.D
pH	6.78 ± 0.02	6.53 ± 0.02	6.75 ± 0.02
Temperature (^{0}C)	24.3 ± 0.3	22.8 ± 0.3	24.7 ± 0.3
Conductivity (mS)	0.245 ± 0.002	1.344 ± 0.002	0.302 ± 0.002
Total Hardness (mg/L)	140 ± 1.0	164 ± 1.0	140 ± 1.0
Chlorides (mg/L)	14.05 ± 0.18	46.15 ± 0.18	27.13 ± 0.18
Acidity (mg/L)	40.6 ± 0.3	73.9 ± 0.3	46.3 ± 0.3
Alkalinity (mg/L)	122 ± 0.3	344 ± 0.3	140 ± 0.3
Dissolved Oxygen (mg/L)	7.126 ± 0.015	6.896 ± 0.015	7.266 ± 0.015
BOD (mg/L)	1.231 ± 0.03	0.993 ± 0.03	1.127 ± 0.03
Total Dissolved Solids (mg/L)	108 ± 1.0	118 ± 1.0	235 ± 1.0
Calcium hardness (mg/L)	60 ± 0.3	40 ± 0.3	68 ± 0.3
Magnesium hardness (mg/L)	80 ± 0.3	124 ± 0.3	72 ± 0.3
Salinity (mg of NaCl)	1.172 ± 0.003	1.758 ± 0.003	1.172 ± 0.003

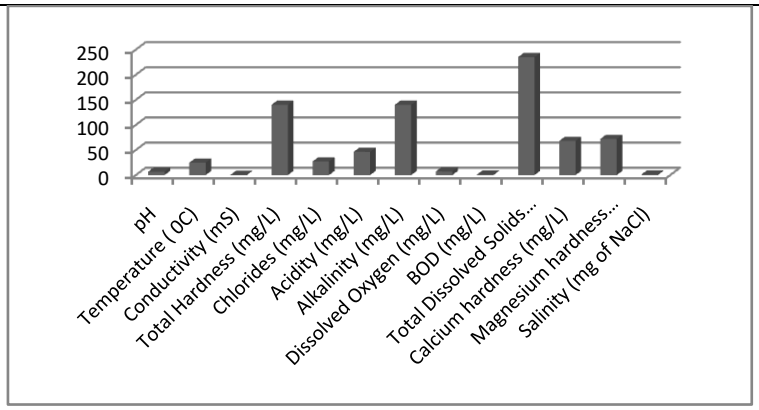
Table-1:- Values of different parameters of water sample of different drinking sources in Usroli village area. (Mean and Standard deviation is calculated)



a. Graph showing concentration range of various parameters of Tap water.



b. Graph showing concentration range of various parameters of bore well water.



c. Graph showing concentration range of various parameters of well water.

1. Temperature: Temperature is the most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimize temperature change. The Water temperature depends on the depth of the water column, climatic and topographic changes [19]. A rise in temperature of water leads to the speeding up of chemical reactions in water, reduces the solubility of gases and amplifies the tastes and odour. At higher temperature with less dissolved gases the water becomes tasteless and even does not quench the thirst and decreases the solubility of oxygen. Temperature also determines various other factors such as pH, Conductivity, saturation level of gases and various forms of alkalinity. The temperature of Tap water is 24.3$\pm$0.3 ^{0}C, bore well water temperature is 22.8$\pm$0.3 ^{0}C and temperature of well water is found to be 24.7$\pm$0.3 ^{0}C.

2. pH: pH, one of the most common analyses in soil and water testing, is the standard measure of how acidic or alkaline a solution is. pH has no direct adverse effect on health. pH governs the distribution, transport and fate of heavy metals in aquatic ecosystem. It is measured a scale from 0 -14. pH of 7 is neutral, pH is less than 7 is acidic and pH greater than 7 is basic. Aquatic organisms need the pH of their water body to be a certain range optimal growth and survival. The pH of Tap water is 6.78 $\pm$ 0.02, bore well water pH is 6.53 $\pm$ 0.02 and pH of well water is found to be 6.75 $\pm$ 0.02. Amongst these three samples, water is comparatively acidic in nature.

3. Electrical Conductance: Conductivity is the measure of a substance or solution to conduct electric current. Presence of salts and contamination with wastewater increases conductivity of water. It is a indication of pollution. Electrical conductivity used to quickly estimate the ionic or soluble salt concentration in soils, water supplies, fertilizer solution and chemical solution. It is highly depended upon temperature. Conductivity however is an important criterion in determining the suitability of water for irrigation. The conductance of Tap water is 0.245 $\pm$ 0.002 mS, bore well water conductance is 1.344 $\pm$ 0.002 mS and conductance of well water is found to be 0.302 $\pm$ 0.002 mS. Amongst these three samples, bore well water is comparatively high electrical conductance. The observed values of electrical conductance for others are quite low and less electrolyte.

4. Total Hardness: Total hardness is defined as the sum of calcium and magnesium hardness in mg/L as $CaCO_3$.Total hardness of water an important factor that indicates toxic effect and poisonous elements [20]. There is no adverse effect of hardness on health. Hard water is also not suitable for domestic and irrigation purposes. Total hardness of Tap water is 140 $\pm$1.0 mg/L, bore well water is 164 $\pm$1.0 mg/L and the well water is 140 $\pm$1.0 mg/L. he degree of hardness of drinking water has been classified in terms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/L, Medium - 60-120 mg/L, Hard - 120-180 mg/L, Very hard - >180 mg/L. The observed values were quiet less than the acceptable limit of 300 mg/L for all water samples. It shows that water is hard.

5. Chlorides: Chloride is mainly obtained from the dissolution of salts of hydrochloric acid as table salt (NaCl), $NaCO_2$ and added through industrial waste, sewage, sea water etc. Surface water bodies

often have low concentration of chlorides as compare to ground water. It has key importance for metabolism activity in human body and other main physiological processes. High chloride concentration damage metallic pipes and structure as well as harms growing plants. According to WHO standards concentration of chloride should not exceed 250 mg/L. The chloride content of the tap water sample is 14.05 ±0.02 mg/L, bore well water is 46.15±0.18 mg/L and Chlorides in well water sample is 27.13 ±0.05 mg/L.

6. Acidity: Acidity of water is its capacity to neutralize a strong base and is mostly due to the presence of strong mineral acids, weak acids and the salt of strong acids and weak bases. Addition of wastewater having acidity producing substances increases the acidity of water. The observed acidity of tap water sample is 40.6± 0.015 mg/L of $CaCO_3$, bore well water sample is 73.9 ± 0.3 mg/L. of $CaCO_3$. While acidity of well water samples is 46.3± 0.3 mg/L of $CaCO_3$. The value is much less than threshold value i. e. 200 mg/L of $CaCO_3$. This indicates that sample of water are in safe range.

7. Alkalinity: Alkalinity is a chemical measurement of water's ability to neutralize acid. Alkalinity is also a measure of water buffering capacity or its ability to resist changes in pH upon the addition of acids or bases. Alkalinity of natural water is due to primarily to the presence of weak acid salts, although strong bases may also contribute (i.e. OH^-) in the extreme environment. Bicarbonate represents the major form of alkalinity in natural water, so its source being the partitioning of CO2 from the atmosphere and the weathering of carbonate minerals in rocks and soil. Other salts of weak acids, such as borate, silicates, ammonia, phosphate, and organic bases from natural organic matter may be present in small amounts. The observed alkalinity of tap water sample is 122 ±0.3 mg/L of $CaCO_3$, bore well water sample is 344 ± 0.3 mg/L. of $CaCO_3$ while alkalinity of well water sample is 140 ± 0.3 mg/L of $CaCO_3$. The observed values of alkalinity of tap water and well water are within permissible range i. e. below 200 mg/L of $CaCO_3$. The bore well water is not in safe range i.e. higher than permissible range of 200 mg/L of $CaCO_3$.

8. Dissolved Oxygen: The amount of oxygen dissolved in water, such as a lake, river or stream. Dissolved oxygen is the most important indicator of the health of water bodies and its capacity to support a balanced aquatic ecosystem of plants and animals. Warm water released from industrial outlets, flowages or storm sewers can also reduce dissolved oxygen levels. Dissolved oxygen may play a large role in the survival of aquatic life in temperature lakes and reservoirs during summer months. Dissolved oxygen of tap water sample collected is 7.126 ± 0.015mg/L, bore well water sample is 6.896 ± 0.015mg/L, whereas well water sample is 7.266 ± 0.015mg/L . It may be due to high temperature and inorganic reluctance such as hydrogen sulfide, ammonia, nitrites, ferrous ions and other oxidizable substances also tend to decrease dissolved oxygen in water.

9. Biochemical Oxygen Demand (BOD): Biochemical oxygen measures the amount of oxygen that microorganisms consume while decomposing organic matter, it also measures the chemical oxidation of inorganic matter. BOD is a measure of organic material contamination in water, specified in mg/L. BOD is the amount of dissolved oxygen required for the biochemical decomposition of organic compounds and the oxidation of certain inorganic materials (e.g., iron, sulphites). The observed value of BOD for tap water is 1.231 ± 0.03 mg/L, for bore well water is 0.993 ± 0.03 mg/L and for well water sample is 1.127 ± 0.03 mg/L which is within the permissible range i. e. 0.75-1.5 mg/L.

10. Total Dissolved Solids (TDS): Total dissolved solids are the total amount of mobile charged ions, including minerals, salts or metal dissolved in a given volume of water in mg/L. TDS is directly related to the purity of water and the quality of water purification system and affects everything that consumes, lives in, or uses water, whether organic or inorganic, whether for better or for worse. Common inorganic salts that can be found in water include calcium, magnesium, potassium and sodium, which are cations and carbonates, nitrates, bicarbonates, chlorides and sulphates which are

anions. They give a particular taste to water at higher concentration and also reduce its palatability. The total solid present in tap water sample collected is 108 ± 1.0 mg/L, for bore well water is 118 ± 1.0 mg/L, while that of for well water sample is 235 ± 1.0 mg/L which is lower than threshold value of total solid content i.e. 500 mg/L.

11. Calcium hardness: Calcium is naturally present in water. Calcium is a determinant of water hardness, because it can be found in water as Ca^{2+} ions. As per Indian Standards the calcium content of water should not be more than 75 mg/L. This has been specified in the IS 10500:- Drinking Water –Specifications. In the study the calcium content in water sample has been found to be for tap water sample is 60 ± 0.3 mg/L, for bore well water is 40 ± 0.3 mg/L and for well water is 68±0.3 mg/L. Tap water, bore well water and well water possess values calcium hardness which is within the limit as per Specification. The observed values for all water samples are within permissible range of concentration of calcium.

12. Magnesium hardness: Magnesium is naturally present in water. Magnesium is a determinant of water hardness, because it can be found in water as Mg^{2+} ions. As per ISI the magnesium content of water should not be more than 50 mg/L. In the study the magnesium content in water sample has been found to be for tap water sample is 80 ± 0.3 mg/L, for bore well water is 124 ± 0.3 mg/L and for well water is 72 ± 0.3 mg/L. The observed values for tap water, bore well water and well water shows higher concentration of magnesium as per Specification.

13. Salinity:- Salinity which is defined as the total concentration of electrically charged ions in the water. These ions are the four major cations-calcium, magnesium, potassium and sodium, and the four common anions carbonates (CO_3), sulphates (SO_4), chlorides (Cl) and bicarbonates (HCO). Other components of salinity are charged nitrogenous compounds such as nitrates (NO_3), ammonium ions (NH_4) and phosphates (PO_4) **[**21]. In general the salinity of surface waters depends on the drainage area, the nature of its rock, precipitation, human activity in the area and its proximity to marine water [22]. Waters with salinity below 1% are fresh and waters with salinity higher than 1% are brackish/marine [23]. The observed value of salinity for tap water sample is 1.172 ± 0.003 mg of NaCl, for bore well water sample is 1.758 ± 0.003 mg of NaCl and for well water sample is 1.172 ± 0.003 mg of NaCl .

CONCLUSION: The present paper deals with analysis of water quality in different drinking water resources available in Usroli village region which was carried out by taking certain important parameters like Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity. The data of physico-chemical and biological parameters clearly shows that the drinking water of Usroli village region is within the permissible range as per APHA (1989), (1992), Trivedi and Goel (1986) except few limitations in one or two parameters. Such water is suitable for drinking purpose and can be used for domestic as well as irrigation purpose.

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DEVELOPMENT OF AN EXTRACTIVE SPECTROPHOTOMETRIC METHOD FOR DETERMINATION OF TI (IV) USING 2, 4-DIMETHYL -3H- 1, 5 BENZODIAZEPINE

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Abstract

A new analytical reagent 2, 4-dimethyl -3H- 1, 5 benzodiazepine (DBA) is proposed for the extraction and spectrophotometric determination of Ti (IV). The Reagent was synthesized and characterized by IR, NMR, elemental analysis as well as Mass spectrometry. DBA reacts with Titanium to give red colored complex which can be quantitatively extracted into n-butanol at pH 8.6. The organic extract shows maximum absorption at 435nm where absorption due to similarly prepared reagent blank is negligible. The beer's law is followed in the concentration range 1-10 µg/ml of Ti (IV). The molar absorptivity and sandell's sensitivity of Ti (IV) -DBA complex is 7320 Lit mol^{-1}cm^{-2} and 0.012427 mg/cm^2 respectively. The proposed method is rapid, sensitive, reproducible, and accurate and has been satisfactory applied for determination and separation of Titanium (IV) in commercial mixtures, pharmaceutical samples and alloys.

Keywords: *Titanium (IV), Spectrophotometric determination, DBA reagent*

1. Introduction: The symbol of Titanium is **Ti** and atomic number **22**. Metallic titanium is well known for its excellent corrosion resistance, having ability to withstand attack by dilute Sulphuric acid and hydrochloric acid or even moist chlorine. Titanium is highly resistant to the usual kinds of metal fatigue. Approximately 95% of titanium production is consumed in the form of titanium dioxide. Titanium alloys are principally used for aircrafts and missiles, where light weight strength and ability to withstand extremes of temperature are important. Its capacity for joining with bone and other tissue-Osseo integration makes it suitable for medical applications, such as total replacement of arthritis hips, knee joints, facial treatment and dental implants. Titanium exists in nature in its most stable and common oxidation state as titanium (IV). Titanium dioxide is extensively used as a white pigment in printing ink, ceramics and cosmetics. Ferro titanium is used as scavenger to remove oxygen, hydrogen and nitrogen in steel industry. The pure titanium resembles stainless steel. Many organic compounds of titanium such as phthalates, oxalates, tetraethylate and butyltitanate are widely synthesized and used extensively. A thorough literary survey has revealed that a few number of hydrazones are available for the spectrophotometric and extractive spectrophotometric determination of titanium (IV)[1-6] For the determination of titanium(IV) in micro levels, there are several frequently adopted methods using analytical techniques, such as AAS, ICP-AES, ICP-MS, x-ray fluorescence spectroscop [7-15] spectrophotometry and such other techniques. Among these, spectrophotometric methods are preferred because they are cheaper and easier to handle, with comparable sensitivity.

2. Experimental

2.1 Instruments: A Shimadzu 2450 UV-Visible spectrophotometer with 1.0 cm quartz cell was used for absorbance studies. An Elico LI-120 digital pH-meter was used for pH adjustments. The experimental conditions are maintained as presented in Table 1.

Condition	Results
Absorption Maxima	435 nm
Solvent	n- butanol
pH range	8.6
Equilibration time	1.0 min
Stability of Chromium- reagent	72 hours
Beer's range	1 to 10 mg/cm3
Molar absortivity	7320 Lit mol^{-1}cm^{-2}
Sandell's sensitivity	0.01427 mg/ cm^2
Mole ratio of Cr :reagent	1:1

Table 1 Experimental conditions

2.2 Synthesis of Reagent: The reagent was synthesized by mixing 1 mole of O phenylenediamine and 2 moles of Acetyl acetone in Ethanol. The above mixture is refluxed for 2 Hours in round bottom flask. The solution thus obtained is poured in ice. Solid is formed, which is purified with ethanol. It is then characterized and used for extractive spectrophotometric determination of Ti (IV). A stock solution of reagent with concentration 0.05% was prepared in methanol. The scheme of reaction is as shown in Fig.1.

Reaction

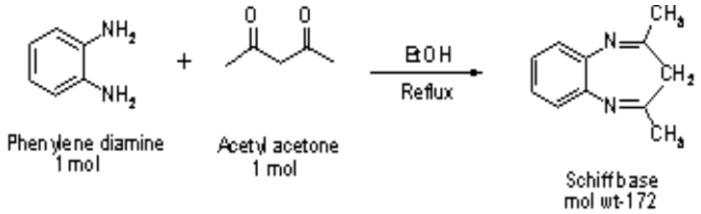


Fig.1 Synthesis of Reagent 2, 4-DIMETHYL -3H- 1,5 BENZODIAZEPINE (DBA)

2.3 Preparation of stock solution: A weighed quantity titanium tetrachloride was dissolved in double distilled water then diluted to desired volume by double distilled water.

2.4 Extraction as a function of pH: The extraction of Titanium was carried out at various pH conditions ranging from the pH 1to pH11 using various buffer solutions. The ratio of organic phase to aqueous phase was kept 1:1. The present extraction was observed to be quantitave at pH 7.2. Therefore pH 7.2 was selected for further studies and presented in Fig.2.

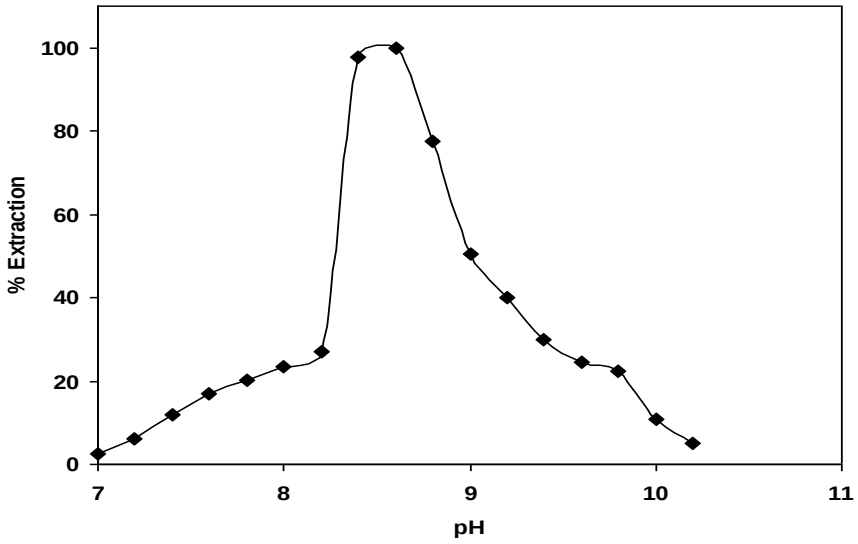


Fig.2. Extraction as a function of pH.

2.5 Effect of solvent: The suitability of extraction was studied using various organic solvents such as n-butanol, toluene, cyclohexanone, cyclohexanol, chloroform, ethyl acetate, carbon tetrachloride, xylene, diethyl ether and hexane. The extraction of chromium was observed to be quantitave in the organic solvent n-butanol. Therefore n-butanol is used for extraction of Titanium.Fig.3. indicate that n-butanol is observed to be an appropriate solvent.

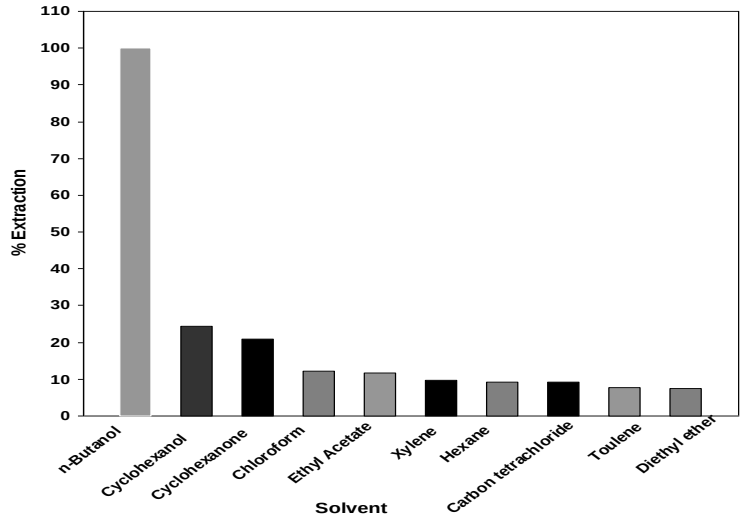


Fig.3. Effect of solvent

2.5 Absorption spectrum: Fig.4 depicted that the absorption spectrum in n-butanol observed to be maximum absorption at 445nm and the absorption due to reagent was found to be negligible at this wavelength. Hence 445nm was selected as wavelength for the absorbance measure in the spectrophotometric determination of Titanium against reagent blank.

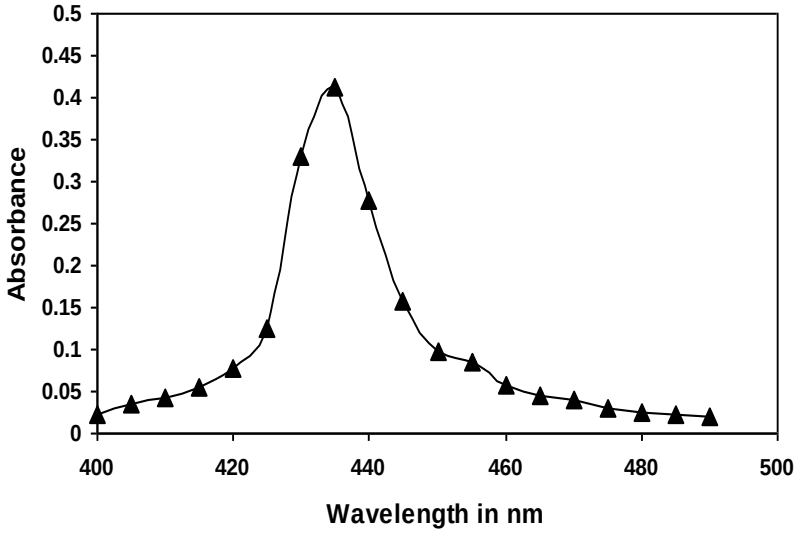


Fig.4. Wavelength of absorption

3. Recommended procedure: Mix 1 cm^3 aqueous solution containing 1-100mg of Titanium and 1cm^3 of 0.05% methanolic solution of reagent in 25 cm^3 beaker. Adjust the pH of the solution to required value with buffer solution Make the final volume 10 cm^3. Transfer the solution into 125 cm^3 separating funnel and equilibrate for 1min with 10 cm^3 n- butanol. Allow the two phases to separate and measure the absorbance of organic phase containing the complex at 445 nm against reagent blank.

3.1 Preparation of calibration plot: The calibration curve was prepared by taking known amount of Titanium which was treated as described in the procedure. A graph of absorbance against concentration was prepared (Fig.2). The concentration of the unknown Titanium solutions is determined from the calibration plot as presented in Fig.5.

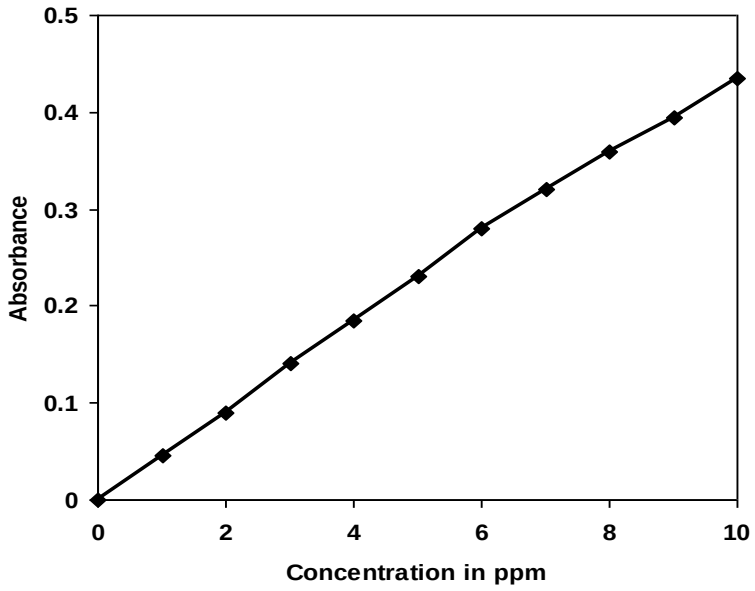


Fig.5. Calibration Plot of Ti (IV) in mg/ml against Absorbance

3.2 Composition of the extracted species: The composition of the extracted species was determined by using the Job's continuous variation method and verified by mole ratio method and slope ratio method. These methods show that the composition of Ti (IV): DBA regent is 1: 1 and above results are confirmed from Fig.6.

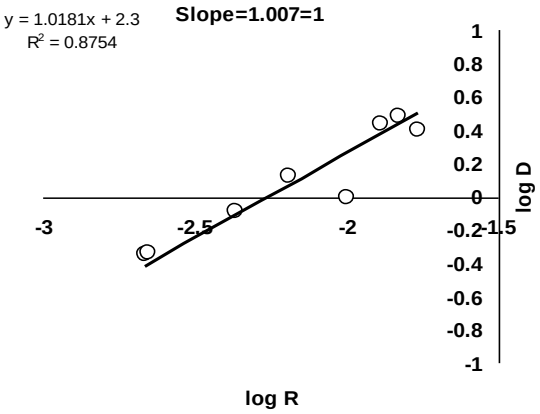


Fig.6. Slope Ratio method

3.3 Effect of foreign ions: The effect of diverse ions on the Titanium (IV) determination was studied, in presence of a definite amount of a foreign ion. Various cations and anions were investigated in order to find the tolerance limit of these foreign ions in the extraction of Titanium (IV) as presented in **Table 2**. The tolerance limit of the foreign ion was taken as the amount required causing an error of not more than 2% in recovery of Titanium (IV). The ions which interfere in the spectrophotometric determination of Titanium were masked by using appropriate masking agents as presented in **Table 3**.

S. No.	Interfering ions	Tolerance limit
1	Acetate, Oxlate, CN-, I-, Br-, NO3-, BrO-3, ClO3-, IO3-, NO2-, SO4-,SO3-	18
2	Tartarate	16
3	phosphate	14
4	Mg(II), Zn(II), Mo(VI), Ce(IV), Bi(III), Ca(II), As(III), Pb(II), Al(III),	14
5	V((V), Cd(II)	10
6	Na+, Ag+	18
7	Fe(II), Ni(II), Mn(II), Zr(II), Co(II), Fe(II),Cu(II), EDTA	Interfere strongly

Table 2 Effect of foreign ions

Interfering Ion	Masking agent added	Interfering Ion	Masking agent added
Cd (II)	Potassium Iodide	EDTA	Boiled with concentrated HNO_3
Fe (II)	Sodium flouride	CN-	Boiled with concentrated HNO_3
Ce (IV)	Sodium flouride	Ni (II)	Thiourea
Cr (VI)	Ammonium acetate	Zr (IV)	Sodium flouride
Mn (II)	Sodium flouride	Tartate	Sodium molybdate
Ag +	Potassium Iodide	V (V)	Thiourea

Table 3 Masking agents

3.4 Comparison between reagents: Various reagents were investigated by the earlier researchers for removal of Titanium (IV). The proposed reagent 2, 4-dimethyl -3H- 1, 5benzodiazepine (DBA) is found more superior as that of reported regents and are presented in **Table 4.**

Name of the Reagent	Limitations
Pyridoxal salicylal hydrazone	Low Molar absorbtivity
2,4-dihydroxyacetophenone	More ions interfere
Diphenylglyoxalbis	Unstable complex
Salicylhydroxamic acid	Unstable complex
2-hydroxy-1-acetonapthoneoxime	Low Molar absorbtivity

Table 4 Comparison between regents

4. Applications: The present method was applied for determination of amount of Titanium (IV) in various samples of alloys, commercial mixtures; water samples etc. are in well agreement with standard methods as shown in **Table 5**. Every result is average of independent determinations.

S. No.	Sample	Amount of Ti(IV) in standard method	Amount of Ti(IV) in present method
1	Ferro-titanium	55%	55.05%
2	Titanium oxide	30%	30.5%
3	Ti (IV) + V(VI)	4.97 ppm	4.96 ppm

Table 5 Applications

5. Conclusion: The results obtained show that the newly developed method in which the reagent 2,4-DIMETHYL -3H- 1,5 BENZODIAZEPINE (DBA) was synthesized, can be used for quantitative estimation of Ti(IV). The proposed novel reagent is found to be more effective over reported reagent from earlier investigators. The proposed method is simple, rapid and requires less volume of organic

solvent. The method is also precise, less time consuming and easily employed anywhere as does not require sophisticated instruments.

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NEED AND IMPORTANCE OF LIBRARY AUTOMATION

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Abstract
Automation of libraries leads to the increasing speed of all library operations. We can easily handle all the data of the library. It maintains all the statistics and records of library in a proper way and we can retrieve it easily with high speed. Cataloguing of library material is very easy as compared to manually cataloguing and we can easily search the holdings of the library with the help OPAC in a short period. This article states that historical background of library automation, growth of library automation, library automation meaning and definition, need, objectives and advantages of library.
Keywords: *Library automation, needs and objectives*

Introduction: Libraries are known for using Information and Communication Technology (ICT) both for automation of its routine activities as well as for providing search services to the users. Computers are increasing used in libraries both for internal operations as well as for accessing information that is available four walls of the library. The application of computers avoid repetitive jobs and save labor and time both for users as well as outside the library staff. Computers are not only used as a data processing tool, but also for information storage, access and retrieval. The use of computers for information storage and retrieval began with the production of computer-generated and printed indices for scientific and technical literature in 1960s. Subsequently, several organizations started using computers not only for generation and printing of indices but also for creation of computer readable databases, By early 1970s, several published indexing and abstracting journals, such as Biological Abstracts, Chemical Abstracts, Index Medicus, etc. were not only produced by computer, they were also made available as computer-readable databases on magnetic tapes and several organizations started subscribing to them on magnetic media to organize local information storage and retrieval services.

Historical Background of Library Automation: A process of great change has been taking place today in libraries due the impact of information technology and application of computers in library work. We hear a lot about library automation in libraries and library automation is nothing but application of machines viz. computers to the routine library housekeeping operations such as acquisition, serial control cataloguing and circulation. Before proceeding into the depth of library automation, it is necessary to know the historical background of automation. Automation of library has passed through several of development, which can be divided into 3 phases:

1 Experimental Phase (1930-1960)
2 Local systems Phase (1960-1970)
3 Co-operative Systems Phase (1970)

1. EXPERIMENTAL PHASE (1930-1960)

The first application of automatic data processing equipments in libraries can be traced back to 1936 when the University of Texas adapted a mechanical system for its circulation function. In the first half of the 20th century, i.e. in the early 1960s library automation began especially in the U.S.A. after the World War II. During this period, many libraries in North America and in the U.K began to experiment processing of information by using computers. Many techniques were introduced in the universities and national libraries. Several of these systems were like tabulators, sorters; punched cards were used for circulation i.e. for providing books on loan,
serial control, acquisition, cataloguing etc. (Laxminarayan, 1986).

In the U.K. the Public Libraries of Camden and West Sussex and the University libraries of Newcastle and Southampton were involved in the Experimental phase. Many systems such as edge-notched cards, optical coincidence, punched cards, and early computers developed during this phase failed due to the following reasons:

1 Computer technology at that time was inadequate.

2 Librarians were not sufficiently definitive in their requirements of the computer based system.

3 Computer people thought that they knew the librarians' requirements of the computer based system.

4 It was thought that all the individual systems in a library should be simultaneously converted to computer based. (Tedd, 1977).

2. LOCAL SYSTEMS PHASE (1960-1970)

This period applied general purpose digital computer for retrieval of information. In this era, the computers were applied offline. During this period, many librarians made use of the computer as a tool in the organization of many of the library's procedures. Most of these systems were developed locally, either in an academic library, special library or public library. In this phase focus was mostly on acquisition, cataloguing and circulation process. During this phase, OPAC i.e. Online Public Access Catalogue was in an experimental stage in the U.S.A. During this phase, Machine Readable Catalogue i.e. MARC came into existence in year 1963 at the Library of Congress, U.S.A for providing standardization in automation. In 1967, the Ohio College Library Centre (OCLC) was set up which is an online system which marked the beginning of cooperative systems and union catalogue. In 1969, the Library of Congress started distribution of records in the new MARC II format.

(Tedd, 1977).

3. COOPERATIVE SYSTEMS PHASE (1970-)

In the 1970s there has been an increase in library cooperation and resource sharing by libraries developing computer based systems. In this phase, designing of online systems and conversion of batch systems into online mode was done and also the growth of library network and databases were seen in these Phase. Here magnetic tapes and floppy disks were used for storing information. In the 1980s there was in intensive use of online systems networks, optical disks, CD-ROMs etc. In this period, microcomputers came to be used in libraries. Late on through Internet and library networks, all processes of libraries were integrated. (Rajagopalan, 1986).

Kaul (1999) has given the growth of library automation can be better understood from the following table:

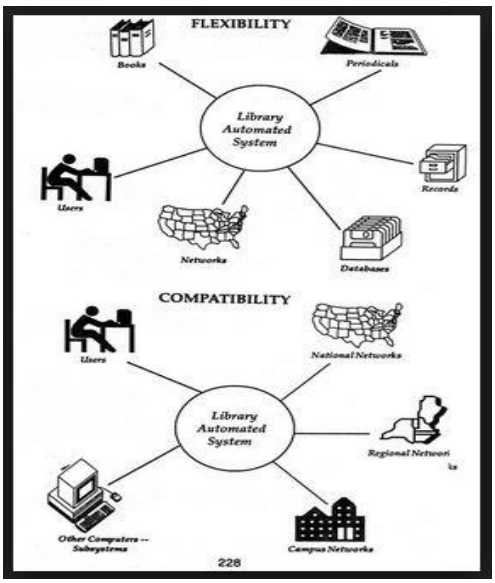
GROWTH OF LIBRARY AUTOMATION

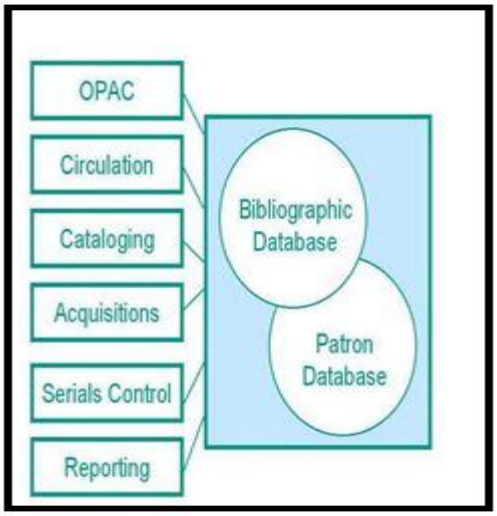
Year	Developments
1940-1949	Semi-mechanical applications including edge-notched cards, optical coincidence, peek-a-boo cards.
1950-1959	Use of punched cards, data processing equipments, early computers and micro image searching systems.
1960-1969	Application of general purpose digital computers, feasibility studies of online interactive and advance micro image systems, experiments in library networking.
1970-1979	Design of online systems and conversion of batch systems into online mode, growth of library network and databases.
1980-1989	Intensive use of online systems, networks, mini and microcomputers, optical disks, CD-ROMs, FAX etc.
1990s	Use of internet and library networks aims towards higher levels of computer application such as recording through electronic media, artificial intelligence etc

Library Automation: The word "automation" has been derived from Greek word "automose" means something, which has power of spontaneous motion or self-movement. The term "automation" was first introduced by D.S. Harder in 1936, who was then with General Motor Company in the U.S. He used the term automation to mean automatic handling of parts between progressive production processes.

Definition: According to Encyclopedia of Library and Information Science, "automation is the technology concerned with the design and development of process and system that minimize the necessity of human intervention in operation" (Kent, 1977). According to McGraw Hill Encyclopedia of Science and Technology automation as "a coined word having no precise generally accepted technical meaning but widely used to imply the concept, development, or use of highly automatic machinery or control systems" (McGraw, 1982). Webster's Third new International Dictionary of English Language Automation is defined as "automatically controlled operation of an apparatus, process or system by mechanical or electronic device that takes place of human organs of observation, effort and decision". (Gove, 1966) According to the Oxford English Dictionary automation as "application of automatic control to any branch of industry or science by extension, the use of electronic or mechanical devices to replace human labor". (Simpson & Weiner, 1989). Library automation, stated in single term, is the application of computers and utilization of computer based product and services in the performance of different library operations and functions in provision of various services and production of output products. Library automation may be defined as the application of automatic and semiautomatic data processing machines (computers) to perform traditional library housekeeping activities such as acquisition, circulation, cataloguing and reference and serials control. Today "Library Automation" is by far the most commonly used terms to describe the mechanization of library activities using the computer. (Uddin, 2009).

Following are the images to describe concept of Library Automation.





Need And Objectives Of Library Automation: Information explosion has resulted in the production of a large amount of literatures in every field of knowledge. Accordingly the print documents are coming to the library in huge numbers which is not possible for a library to manage the collection

manually. Now a day no user has time to search the required and relevant information from the dense heap of information collection .They have no time to go shelve by shelve to pick up a book . So it necessitated for library automation. In most of libraries are yet to be automated.

Objectives of Library automation

- To improve over the library collection.
- To have an effective control over the entire operations.
- To share effectively the resources among various libraries at a local, regional, national and international level.
- To avoid duplication and repetitive work/tasks.
- To obtain various services of the existing staff effectively.

Need and Importance of Library Automation

- Information explosion.
- Availability of information in various formats (print, non-print, graphical, audio-visual etc.)
- Different approaches and needs of the user.
- Limitation of library (time, space and human power)
- Increasing no of users.
- Speedup of searching for users.
- Better access to the collection.
- Allows easy sharing of resources with other libraries.
- More interface with the library users with other information resources.
- Better facilities for the users as other libraries are also automated.
- Enhances consistency in the collection, streamlines circulation.
- Time saving of clerical and repetitive tasks.
- Ease of maintenances of statistics and overdues.
- Immediate report to the management.

Basic Requirements for Library Automation

- Adequate collection
- Financial assistance
- Hardware
- Software
- Trained staff
- User training
- Maintenance & development

Advantages of Library Automation

- Provides users with timely access to various library materials.
- Eliminates routine and repetitive tasks or performs them more quickly and effectively.
- Reduces the amount of time spent on material acquisition, serials, etc.
- Management, budget administration and record keeping.
- Supports new means of information retrieval system.
- Allows library users to use search strategies that exceed those that can be used with card catalogue.
- Also allows library users to search library's collection from anywhere locating beyond the boundaries.
- It motivates users equip them with problem solving and information retrieval skills and provides them with the lifelong learning experience.
- It increases productivity in terms of both work as well as in service.

- Professional staff need not spend much time to the routine work.
- Eliminates human errors while performing routine library work.
- Cataloguing is faster.
- Excellent control over circulation.

Conclusion: Automation of libraries leads to the increasing speed of all library operations. We can easily handle all the data of the library. It maintains all the statistics and records of library in a proper way and we can retrieve it easily with high speed. Cataloguing of library material is very easy as compared to manually cataloguing and we can easily search the holdings of the library with the help OPAC in a short period. It serves the fourth law of library science "Save the time of the user". Because Library Automation saves the time of the user as well as library staff.

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PHARMACOGNOSTIC STUDY OF NATURAL CAT REPELLANT PLANT

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Abstract
The present study deals with the Phytochemical and Pharmacognostic studies of leaves and stem of Plectranthus canninus Roth (Synonym Plectranthus spicatus). It is a perennial herb belonging to family Lamiaceae . As the essential oil present in the leaves of this plant it possess a strong odour. This plant is used as natural cat repellent due to its strong odour. Pharmacognostic study of this plant leaf drug is carried out and it contains the dermal character like stomata, trichomes and anatomical features etc. The preliminary Phytochemical studies indicate the presence of volatile oils, alkaloid, fixed oils and glycosides and tannins. The present study is helpful or standardization for evaluation of drugs.

Figure: References: 16 Tables:02
***Keywords** – Plectranthus canninus, Pharmacognostic studies, volatile oils, tannin*

Introduction - Lamiaecae is an important medicinal plant family popular as mint family due to the aromatic fragrance emitted by the herbs and shrubs of its members. Popular plants in this family are Coleus, Ocimum ,mint,lavendula etc. The family Lamiaceae consists of of approximatly 300 species. Plectranthus are aromatic plants of this family are perennial but most of them are annual herbs with approximately 1meter in height. *Plectranthus canninus* Roth is belonging to family Lamiaceae is an important plant in Indian system of medicine. It is a perennial fleshy herb, in arid places on rocky ground among bushes found in Coimbator district of Tamil Nadu India and in Pune, Maharashtra. It grows upto 1meter in height with branchlets hispid in nature. Traditionally this plant is used as a stimulant treatment of cough, diuretic,and cytotoxic. Literature reveals that *Plectranthus canninus* is used in the treatment of teeth and gum disorders. *Plectranthus canninus* is one of the plant species which are presently being tasted for their suitability to be grown as Green Roof plants in the Durban region that have initially shown good results. They also occur naturally within a radius of 50km of the Durban city centre.

Plectranthus canninus (Roth)

Genus –*Plectranthus*

Species-*canninus*

Nomenclature Authority: Roth

Vernacular name's

English : Scary cat plant, Piss-off plant, Dog gone

This plant has been fabled to e scaring the canina fauna especially cats hence the name caninus(Eggli and Newton, 2004). The scary cat plant, or Plectrnthus cannina does have a distinctive skunk smell which is worse when someone brushes up against the plant or bruises it. They are native to Southern Asia and eastern Africa and they attract butterflies and bees. These plants root easily from cuttings or just touching the ground. Both the leaves and flowers of the plant are sticky to the touch, and have a mild odour not unlike a marijuana.

Material and Methods

1. **Plant Material** - Plant was collected from the different study areas near Pashan lake Pune and hilly regions of Coimbator district Tamilnadu. The collected plant was identified with the help of floras and expert opinions. Herbarium were made and authenticated in the Botanical Survey of India, Western region, Pune. The voucher specimen was deposited in the Herbarium, BSI, Pune (BSI/WRC/2016/509) and BSI, Coimbator .

2. Pharmacognostic studies-

i) Macroscopic study: The macroscopy and microscopy of the plant were studied according to the method developed by Esau. The transverse sections were prepared and stained for the microscopical study as per the standard procedure described.

ii) **Powder analysis:** The powder was characterized by its morphological characters like green colour of powder, presence of specific aromatic odour and bitter taste.

Table : 1 Preliminary test of *Plectranthus canninus*

Sr. No.	Test	Observation	Inference
1	Colour	Green	Leaves of Plectranthus
2	Odour	Specific	Aromatic crude drug
3	Taste	Bitter	Drug contain tannin

3.Preparation of Extract – The plant material were brought to the laboratory washed in the tap water and shed dried for a week then made into powdered and stored in clean plastic container till further use. Powdered material extracted in 5 different solvents like Water ,Ethanol, Acetone, Chloroform and Petroleum ether by soxhlet apparatus and dried material stored and use for further experiment.

4. Preliminary Phytochemical screening - The Preliminary Phytchemical screening of crude extract were subjected using different solvents of Petroleum Ether, Chloroform, Acetone,Ethanol and Water for different test for identification of phytochemicals as alkaloid,
carbohydrates,tannins,resins,flavonoids protein, amino acids,saponins and coumarin.

Observations

1) T.S. OF STEM – The transverse section of the is circular in shape. The epidermis is outermost protective layer of stem. It is single layered and present in both upper and lower surface. The outer cell wall is greatly thickened and heavily cutinized. Epidermis is followed by hypodermis. Periderm, cortex, vascular cylinder and pith are seen from periphery to center. Periderm is superficial and uniform in thickness all throught the stem. The phloem cells are thin wall and tabular in shape and suberized. The covering and glandular trichomes found in periderm

2) T.S. OF LEAF – It is dicotyledonous leaf. The epidermis is outermost protective layer and upper epidermis is single layered and rectangular cells. The outer cell surface of the epidermis is covered with cuticle. Leaves have upper and lower epidermis with numerous stomata flanked by guard cells. Stomata are present on both the upper and lower epidermis. The mesophyll tissues are differentiated into Palisade cells and spongy tissues.Palisade cells are double layered,compact with radially elongated cells. Spongy parenchyma is 4- 6 layered. Lower epidermis is similar to upper epidermis and has many stomata and many trichome. Covering trichomes are uniseriate and multicellular (3-5 celled), mostly not straight and warty with blunt tips. Upper epidermal trichomes are less in number as compared to lower epidermis. Each vascular bundle is conjoint, collateral and closed. Xylem is present towards upper epidermis and phloem is towards lower epidermis

3) TRICHOME – The trichomes are present on both the upper and lower leaf surface. The trichomes of upper surface are uniseriate, multicelluar . The foot is embedded in the epidermal cell and tip of trichome is slightly bent. The trichomes of lower surface are more in number as compared to upper surface and uniseriate and multicellular. The foot is embedded in the epidermal cell and tip is pointed and slightly bent.

4) STOMATA– Leaf is simple and succulent type. The leaf surface is smooth. Stomata are present on the both upper and lower surface of leaf. on upper surface of leaf number of stomata are more in number as compared to lower surface.

Phytochemical constituent – The Preliminary Phytochemical analysis of leaf powder shows the presence of Alkaloid, Tannins, Flavonoids, Glycosides and Saponins while quinone is absent. (Table no.2)

Table 2 - Preliminary Phytochemical screening of leaf powder

Phytochemical	Test	WE	EE	AE	CE
Alkaloid	Dragendroff's reagent	++	++	-	-
Phenol	Ferric Chloride test	++	++	-	-
Tannin	Ferric chloride test	++	+	-	-
Sterols	Salkowski test	++	-	-	-
Flavonoid	Lead acetate	++	++	+	-
Glycosides	Keller killani test	+	+	-	-
Carbohydrate	Fehling's test	+	+	-	-
Quinone	Quinone	--	--	-	-
Saponin	Frothing test	++	++	+	-
Resin	Turbidity	++	-	-	-
Coumarin	Coumarin	++	_	-	-

WE- water extract, EE-Ethanol extract AE –Acetone extract,
CE – Chloroform extract
++ indicates strongly present, + indicates and – indicates absent

Table 3 - Preliminary Phytochemical screening of stem powder

Phytochemicals	Test	WE	EE	AE	CE
Alkaloid	Dragendorff's reagent	++	++	-	-
Phenol	Ferric Chloride test	++	++	-	-
Tannin	Ferric chloride test	++	+	-	-
Sterols	Salkowski test	++	-	-	-
Flavonoid	Lead acetate	++	++	+	-
Glycosoides	Keller killani test	+	+	-	-
Carbohydrate	Fehling's test	+	+	-	-
Quinone	Quinone	--	--	-	-
Saponin	Frothing test	++	++	+	-
Resin	Turbidity	++	-	-	-
Coumarin	Coumarin	++	_	-	-

Result and Discussion: Macroscopic characteristics: The herb grows upto 1meter in height. The branchlets are hispid by nature. The leaves are ovate in shape and they are succulent, pubescent with cordate –truncate base and crenate margin.Floral bracts are closely imbricate, ovate and acute. Calyx resemble like tube villows within and tomentose. The 5 unequal lobes are present whereas upper lip is ovate,flat and lower lip is obtuse and 4-toothed while mid lobe is shorter. In India, Plectranthus is a popular traditional plant and found in all the habitats. Various Phytochemicals have been known to possess medicinal properties and hence widely used to Indian systems of traditional medicine. This plant is rich in phenolic compounds. In the present study various Phytochemical constituents like alkaloid, tannins, Saponins, phenols, flavonoids,Glycosides etc. were present. All phytoconstituents are present in water extract whereas only quinone, sterol,coumarin and resin is absent in ethanolic

extract. Flavonoid and saponins only present in acetone extract and all Phytochemical are absent in chloroform extract. Microscopic characteristics: Leaf: The leaf is thick fleshy and soft. It is isobilateral and apparently less differentiated into midrib and lamina. The lamina of the leaf shows three distinct regions viz., upper epidermis, lower epidermis and mesophyll. Abundant covering and glandular trichomes emerged from the both epidermal layer. The trachoma's are multi-cellular, uniseriate and unbranched (2-7 cell) mostly straight and sometime warty with acute tips. Stomata are occasionally present which is more in numbers in upper epidermis and less in number in lower epidermis.

Conclusion: The Phytochemical qualitative analysis of *Plectranthus canninus* plant showed a positive reaction towards an aqueous extract as most of the phytochemicals was present in it. It is a good source of tannin and phenol, carbohydrates,alkaloid. The plant used for ethno-botanical uses like wound healing and itches. Thus all these properties can be observed due to various types of Phytochemical present in it. The Phytochemical characterization of the extract and identification of bioactive compounds and quality standards are necessary for future study.

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SOLAR POWER SYSTEM AND INDIA

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Abstract
As per the fastest growing technologies and developing countries like India,renewable energy sources is needed.Energy is considered a prime agent in the generation of wealth and a significant factor in economic development. Energy is also essential for improving the quality of life. Renewable energy sources and technologies have potential to provide solutions to the longstanding energy problems being faced by the developing countries like India.Solar energy is the most important alternative resource of the world and has a large potential of green energy. Solar energy can be an important part of India's plan not only to add new capacity but also to increase energy security, address environmental concerns, and lead the massive market for renewable energy.This report examines various ways in which solar power is precisely such an opportunity.

Introduction: Energy is considered a prime agent in the generation of wealth and a significant factor in economic development. The increase in energy consumption, particularly in the past several decades has raised fears of exhausting the globes reserves of petroleum andother resources in the future. The huge consumption of fossil fuels has caused visible damage to the environment in various forms. The most challenging thing in front of the world is how fulfill the requirement of energy. Due to the limitation of the conventional resources, the world has to think about the alternate source of energy. To fulfill the requirement of energy resources that cannot be hazardous to environment, most of the countries are emphasizing on the development of renewable energy resources.In the renewable energy resources, solar energy plays important role.Solar power is a clean, environmental friendly source of energy [2]. There are no toxic byproducts or emissions. Solar power is the generation of electricity from sunlight. This can be direct as with photovoltaic's (PV), or indirect as with concentrating solar power (CSP), where the sun's energy is focused to boil water which is then used to provide power. The solar photovoltaic is a very important power source for meeting rural electricity demand in this region of the country. Thermal energy is required to fulfill several purposes in the domestic,agricultural, industrial, and commercial sectors of the economy.India is growing towards huge solar energy day by day.

Thermal Power Plant: Concentrated solar power (also called **concentrating solar power**, **concentrated solar thermal**, and **CSP**) systems generate solar power by using mirrors or lenses to concentrate a large area of sunlight, or solar thermal energy, onto a small area. Electricity is generated when the concentrated light is converted to heat, which drives a heat engine (usually a steam turbine) connected to an electrical power generator [3][4][5]or powers a thermochemical reaction (experimental as of 2013[6][7][8].CSP technology utilizes focused sunlight. The plants consist of two parts: one that collects solar energy and converts it to heat, and another that converts the heat energy to electricity. Within the United States, CSP plants have been operating reliably for more than 15 years. All CSP technological approaches require large areas for solar radiation collection when used to produce electricity at commercial scale [9]. Solar thermal power plant can be distinguished according to the arrangement of their concentrated mirror.The best known technologies are the parabolic trough, the compact linear Fresnel reflector, the Stirling dish and the solar power tower. A parabolic trough consists of a linear parabolic reflector that concentrates light onto a receiver positioned along the reflector's focal line. The receiver is a tube positioned along the focal points of the linear parabolic mirror and is filled with a working fluid. The reflector is made to follow the sun during daylight hours by tracking along a single axis. Parabolic

trough systems provide the best land-use factor of any solar technology[16]. Compact Linear Fresnel Reflectors are CSP-plants which use many thin mirror strips instead of parabolic mirrors to concentrate sunlight onto two tubes with working fluid. This has the advantage that flat mirrors can be used which are much cheaper than parabolic mirrors[17][18]. The Stirling solar dish combines a parabolic concentrating dish with a Stirling engine which normally drives an electric generator. The advantages of Stirling solar over photovoltaic cells are higher efficiency of converting sunlight into electricity and longer lifetime. Parabolic dish systems give the highest efficiency among CSP technologies[19]The 50 kW Big Dish in Canberra, Australia is an example of this technology[20] A solar power tower uses an array of tracking reflectors (heliostats) to concentrate light on a central receiver atop a tower. Power towers can achieve higher (thermal-to-electricity conversion) efficiency than linear tracking CSP schemes and better energy storage capability than dish stirling technologies[20].The PS10 Solar Power Plant and PS20 solar power plant are examples of this technology. STE plants are considered to have a minimum life of 20 years. According to some estimates, India can have a STE installed base of 4–5 GW by 2020. A large amount of Indian STE outputis consumed in Delhi, Haryana, and Punjab, drawing upon supply sites in both Rajasthan and Jammu and Kashmir. Population centers in Gujarat are also well positioned to extract power from Rajasthan [10].

Concentrating Photovoltaic system: Concentrator photovoltaics (CPV) (also known as Concentration Photovoltaics) is a photovoltaic technology that generates electricity from sunlight. it uses lenses and curved mirrors to focus sunlight onto small, but highly efficient, multi-junction (MJ) solar cells. In addition, CPV systems often use solar trackers and sometimes a cooling system to further increase their efficiency[11].



Concentrator photovoltaics (CPV) modules on dua
l axis solar trackers in Golmud, China.

Concentrator Photovoltaic (CPV) technology has entered the market as a utility scale option for the generation of solar electricity with 370 MWp in cumulative installations, including several sites with more 30 MWp. This report explores the current status of the CPV market, industry, research, and technology. CPV is of most interest for power generation in sun-rich regions with Direct Normal Irradiance (DNI) values of more than 2000 kWh/(m²a). The systems are differentiated according to the concentration factor of the technology configuration (see Table 1). More than 90 % of the CPV capacity that has been publicly documented to be installed through the end of 2016 is in the form of high concentration PV (HCPV) with two-axis tracking. Concentrating the sunlight by a factor of between 300x to 1000x onto a small cell area enables the use of highly efficient but comparatively expensive multi-junction solar cells based on III-V semiconductors (e.g. triple-junction solar cells made of GaInP/GaInAs/Ge). Low concentration designs – those with concentration ratios below 100x

– are also being deployed. These systems primarily use crystalline silicon (c-Si) solar cells and single-axis tracking, although dual axis tracking can also be used[12][13][14].

Concentratedphotovoltaic technology willpave the way tomeet the goals of the Indian Government's Solar Mission that promotes sustainable growth while addressing India's energy security. It is an integral part of the initiative to respond to the global challenge of climate change. The first phase of the Mission aims to commission 1000 MW of grid-connected solar power projects by 2013. In addition to helping meetthese targets in the most efficient manner, concentrated photovoltaic solar power will introduce a new solar technology to India [15].

Solar Power in India: power projects in Tamil Nadu, Rajasthan,Gujarat and Maharashtra. These states are also the top five states in India with highest wind electricity generation[21] The country's solar installed capacity reached 20 GW in February 2018[22]. India expanded its solar-generation capacity 8 times from 2,650 MW on 26 May 2014 to over 20 GW as on 31 January 2018[23][24]. The 20 GW capacity was initially targeted for 2022 but the government achieved the target four years ahead of schedule[23][24] The country added 3 GW of solar capacity in 2015-2016 and over 5 GW in 2016-2017, the highest of any year, with the average current price of solar electricity dropping to 18% below the average price of its coal-fired counterpart[25][26][27]. In January 2015 the Indian government expanded its solar plans, targeting US$100 billion in investment and 100 GW of solar capacity (including 40 GW from rooftop solar) by 2022[30][31][31][32][33][34]. India's initiative of 100 GW of solar energy by 2022 is an ambitious target, since the world's installed solar-power capacity in 2017 is expected to be 303 GW[35][36]. The improvements in solar thermal storage power technology in recent years has made this task achievable as the cheaper solar power need not depend on costly and polluting coal/gas/nuclear based power generation for ensuring stable grid operation[37][38][39].

Advantages of solar power:

Renewable Energy Source

Among all the benefits of solar panels, the most important thing is that solar energy is a truly renewable energy source. It can be harnessed in all areas of the world and is available every day. Reduces Electricity Bills: Since you will be meeting some of your energy needs with the electricity your solar system has generated, your energy bills will drop. How much you save on your bill will be dependent on the size of the solar system and your electricity or heat usage. Moreover, not only will you be saving on the electricity bill, but if you generate more electricity than you use, the surplus will be exported back to the grid and you will receive bonus payments for that amount (considering that your solar panel system is connected to the grid). Savings can further grow if you sell excess electricity at high rates during the day and then buy electricity from the grid during the evening when the rates are lower. Low Maintenance Costs: Solar energy systems generally don't require a lot of maintenance. You only need to keep them relatively clean, so cleaning them a couple of times per year will do the job. Technology Development: Technology in the solar power industry is constantly advancing and improvements will intensify in the future. Innovations in quantum physics and nanotechnology can potentially increase the effectiveness of solar panels and double, or even triple, the electrical input of the solar power systems [28] It's eco-friendly: Solar energy is an alternative for fossil fuels as it is non-polluting, clean, reliable and renewable source of energy. It does not pollute the air by releasing harmful gases like carbon dioxide, nitrogen oxide or sulphur oxide. So, the risk of damage to the environment is reduced. Solar energy also does not require any fuel to produce electricity and thus avoids the problem of transportation of fuel or storage of radioactive waste [29].

Conclusion: In this paper, we have discussed how solar power work and also how India is taking the benefits of such system to fulfill the growing need of energy.Solar energy development in India can also be an important tool for spurring regional economic development, particularly for many underdeveloped states, which have the greatest potential for developing solar power systems which is unlimited and clean source of energy. It can provide secure electricity supply to foster domestic industrial development. So it can be concluded that photovoltaic power systems will have an important share in the electricity of the future not only in India, but all over world.The step of Indian government to increases the target is a very good to become India as one of the most solar powered countries in the world. Such types of steps will be required in the future

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आंतरशास्त्रीय संशोधनात जैवविविधता

डॉ. सुनिलदत्त एस. गवरे, *शिवळे महाविद्यालय, शिवळे.*

प्रस्तावना : जैवविविधता म्हणजे सजीवांमधील एखाद्या जाति, परिसंस्था, बायोम किंवा पूर्ण पृथ्वीवरील विविधता. परिसंस्थेमधील विविधता हे परिसंस्थेच्या निकोप पणाचे एकक आहे. जैवविविधता बऱ्याच प्रमाणात भूभागाच्या हवामानावर अवलंबून असते. उदा. उष्णप्रदेशीय भागामध्ये जैवविविधता अधिक तर ध्रुवीय भागामध्ये विविधता कमी असते. झापाट्याने होणाऱ्या परिसरातील बदलांमुळे सजीव सामूहिकरित्या लुप्त होतात. एका अंदाजानुसार पृथ्वीवर असलेल्या एकूण सजीवांपैकी एक टक्का सजीव लुप्त झाले आहेत. सजीवांची पृथ्वीवर निर्मिती झाल्यापासून आजपर्यंत पाच वेळा मोठ्या प्रमाणात आणि अनेक वेळा लहान प्रमाणात जैवविविधतेचा नाश झाला आहे. फेनेरोझोइक महाकल्पामध्ये (54 कोटी वर्षापूर्वी) जैवविविधतेचा महाविकास 'कॅम्बियनकल्पामधील विविधतेचा स्फोट' या नावाने ओळखला जातो. बहुपेशीय सजीवांमधील सर्व संघांची निर्मिती झालेली होती. त्यापुढील 40 कोटी वर्षामध्ये जैवविविधतेचा पुन्हा पुन्हा नाश झालेला होता. 'कार्बोनिफेरस' युगामध्ये सदारहित वनांमधील वनस्पती व प्राण्यांचा नाश झाला. 'पर्मियन ट्रायासिक' युगामध्ये 25 कोटी वर्षापूर्वी झालेला जैवविविधतेचा नाश सर्वात मोठा होता. तीन कोटी वर्षापूर्वी पृष्ठवंशी सजीवांनी पुन्हा एकदा आपला जम बसवला. साडेसहा कोटी वर्षापूर्वी झालेला 'क्रिटेशियस – टर्शरी विनाश' हा नजीकच्या काळातील जैवविविधतेचा नाश होय. याच काळात डायनासॉर नाश झाले. जैवविवितेमध्ये माणसाचा प्रवेश झाल्यानंतर जैवविविणता जनुकीय विविधता हळूहळू नाहीशी होत आहे. यास 'हॉलोसिन विनाश' म्हटले जाते. मानवी हस्तक्षेपामुळे अधिवास नष्ट झाल्याने जैवविविधतेचा हा नाश होत आहे. संयुक्त राष्ट्र संघाने जैव विविधतेच्या नाशाकडे लक्ष देण्यासाठी इसवी सनाचे 2011–2020 हे दशक जैवविविधता दशक म्हणून जाहीर केले आहे. पूर्वी घराच्या आजूबाजूला वेगवेगळी फळांची व फुलांची झाडे लावली जायची जेणेकरून त्यावर पक्षी फुलपाखर बागडावीत पण आताच्या सध्याच्या स्तिथीत पाहिल तर सगळीकडे कोन्क्रीटीकरण वाढलेले आहे. त्यामुळे आजूबाजूला जास्त परिसरच नाहीये व जेवढा आी तेव्हढ्यात वेगवेगळी शो ची झाडे लावली जात आहेत.

व्याख्या : जैवक विविधता किंवा जैवविविधता व्याख्याचे अनेक अर्थ निघतात. सामान्य व्याख्याप्रमाणे जैवविविधिता म्हणजे जाति विविधता आणि जातिमधील संपन्नता (जीवशास्त्रीय). जीवशास्त्रज्ञांच्या व्याख्याप्रमाणे ''जैवविविधता म्हणजे जनुकांची व्यक्तता, जातीमधील विविधता आणि परिसंस्थेमधील विविधता''. 2004 मध्ये कार्डिफ विद्यापीठाने आणि पेंबुकशायर मधील डार्विन सेंटरच्या प्राध्यापक ॲन्थनी कॅंपबेल यांनी या व्याख्याते रेण्वीय विविधतेची भर घातली.

जैवविविधता समृद्ध क्षेत्र : जैवविविधता समृद्ध क्षेत्र अशा अनेक ठिकाणांना हॉट स्पॉट म्हणावे ही कल्पना डॉ. सबिना विर्क यांनी 1988मध्ये मांडली आहे. म्हणजे ज्या ठिकाणी मोठ्या संख्येने स्थानिक जातींचे वसतिस्थान आहे त्यास जैवविविधता समृद्ध क्षेत्र म्हणता येते. बहुतेक समृद्धी क्षेत्रे ही मानवी वस्त्यांजवळ आहेत. समृद्धक्षेत्रे जगभर विखुरलेली असली तरी उष्ण कटिबंधातील वनांत आणि सदाहरित जंगलात त्यांची संख्या सर्वाधिक आहे. ब्राझीलमधील अटलांटिका पर्जन्यवन हे त्यापैकी एक आहे. या वनामध्ये 20,000 प्रकारच्या वनस्पति, 1350 पृष्ठवंशी आणि लक्षावधी कीटक आहेत. यातील निम्याहून अधिक असे आहेत की की, ते इतरत्र कोठेही आढळत नाहीत. मादागास्कर बेटावर एकमेव अरण्य, मादागास्कर शुष्क वन आणि सपाठटीवरील पर्जन्यवन आहे. मादागास्कर मूळ आफ्रिकन भूमीपासून साडेसहा कोटी वर्षापूर्वी वेगळे झाल्याने या वनातील सजीवांमध्ये प्रदेशनिष्ठा दिसते. मादागास्करच्या भूमीवर अनेक जाती आणि परिसंस्था स्वतंत्रपणे विकसीत झालेल्या आहेत. इंडोनेशियामधील 17000 बेटांनी 19,04,560 चौरस

किलोमीटर क्षेत्र व्यापलेले आहे. या प्रदेशामध्ये जगातील 10 टक्के सपुष्प वनस्पति, 12 टक्के पृष्ठवंशी प्राणी, 17 टक्के सरपटणारे प्राणी, पक्षी आणि उभयचर प्राणी असे 24 कोटी माणसांच्या वस्त्यांच्या सहवासात आहेत. समृद्ध जैवविविधता असलेले काही भाग वैशिष्ट्यपूर्ण प्रदेशनिष्ठ भागापासून उगम पावलेले असल्याने त्यांच्यामध्ये नेहमीच्या बदलाहून वेगळे बदल घडून आलेले आहेत.

जैवविविधता उत्क्रांति (विकास) : आज अस्तित्वात असलेल्या जैवविविधतेमागे 350 कोटी वर्षाचा इतिहास आहे. सजीवांची नक्की निर्मिती केव्हा झाली हे जरी वैज्ञानिकांना सांगता आले नाही तरी पृथ्वीच्या उत्पत्तीनंतर वीस ते तीस कोटी वर्षानंतर प्राथमिक रचना असलेले सजीव अस्तित्वात आले यावर वैज्ञानिक ठाम आहेत. चोपन्न कोटी वर्षापूर्वी फॅनरोझोक कल्पामध्ये झालेल्या कँब्रियन युगामध्ये जैवविधतेमध्ये प्रचंड वाढ झाली. कँब्रियन युगामध्ये बहुपेशीय सजीवांची निर्मिती झाली. पुढील 40 कोटी वर्षामध्ये विविधतेमध्ये बहुतांशी अपृष्ठवंशी सजीव अधिक संख्येने होते. या वाढीबरोबर अनेक पर्यावरणीय कारणाने जैवविविधितेचा नाश होत होता. समूह विलोपन क्रियेमुळे जैवविविधतेमध्ये घट आणि वृद्धी हे प्रकार सजीवांच्या निर्मितीपासून चाललेले आहेत. कार्बनिफेरस युगामध्ये झालेल्या विलोपनामध्ये पर्जन्यवने भूपृष्ठाखाली गाडली गेली. या काळात गाडल्या गेलेल्या जीवाश्मांवर उच्च दाब आणि कार्बन वेगळा होण्याच्या प्रक्रियेतून निर्माण झालेले दगडी कोळसा आणि क्रूड ऑइल आजच्या आपल्या इंधनाची 90 टक्के गरज भगवत आहे. गेल्या दोन तीन कोटी वर्षाच्या जीवाश्मांच्या अभ्यासावरून असे आढळून आले आहे की, आजच्या एवढी जैवविविधता कधीही अस्तित्वात नव्हती. सर्व वैज्ञानिकांना हे महणणे पूर्णपणे मान्य नाही. जीवाश्मीकरण सर्व सजीवांचे कधीही प्रतिनिधित्व करू शकत नाही हा त्यांचा आक्षेप. काही वैज्ञानिकांच्या म्हणण्यानुसार तीस कोटी वर्षापूर्वी आणि आजच्या जैवविविधतेमध्ये फारसा फरक नसावा. सध्याच्या सजीव जातींची संख्या 2 दशलक्ष ते 100 दशलक्ष एवढी असावी. सर्व पर्यायांचा विचार करून सजीवांची संख्या 130 ते 140 लाखांपर्यत पोहोचते. यांमधीलसंधिपाद प्राण्यांची संख्या सर्वाधिक आहे. ज्या ठिकाणी सजीवांमध्ये संघर्ष कमी आहे म्हणजे निसर्ग निवडीला सामोरे जावे लागत नाही अशा ठिकाणी जैवविविधता वृद्धिंगत होते.

जैवविविधतेचा मानवास उपयोग : जैवविविधता परिसंस्था टिकवून ठेवण्यास मदत करते. त्यामुळे कार्बन डाय ऑक्साइड चक्र सुरळीत राहते. हवेचे घटक संतुलित राहतात. जलचव सुरळीतपणे सुरू राहते. जलचक्रामुळे पाणी शुद्ध होते. जमिनीची धूप थांबते. अश्मयुगापासून मानवी हस्तक्षेपामुळे सजीव जातींचा विनाश व्हायला प्रारंभ झाला आहे. याआधी नैसर्गिक आपत्ति हेच फक्त जातिविनाशाचे एकमेव कारण होते. जीवाश्मांच्या अभ्यासावरून अश्मयुगापासून जातिविनाशाचा वेग शंभर ते दहा हजार पटीनी वाढल्याचे सिद्ध झाले आहे.

अ) कृषि : पिकांमधील विविधतेमुळे नेहमीचे पीक रोग किंवा किडीमुळे नष्ट झाल्यास पिकामध्ये हवे ते बदल घडवून आणण्यासाठी वन्य जातींकडून इनग्रीडिंग करता येते. शेतीमध्ये अधिक उत्पादन मिळावे यासाठी उकच पीक विस्तृत क्षेत्रावर घेण्याची पद्धत आहे. कृषि व्यवसायातील बहुतेक अरिष्टे एकाच वाणची निपज विस्तृत क्षेत्रावर केल्याने झालेले आहेत. यातील प्रमुख म्हणजे युरोपमध्ये 19व्या शतकात मद्य उद्योगावरील संकट आणि अमेरिकेतील मक्यावरील रोगामुळे पडलेला दुष्काळ. मानवी वापरासाठी असलेले 80 टक्के अन्न फक्त वीस प्रकारच्या वनस्पतीपासून मिळविण्यात येते. त्याच्या 40 हजार जाती प्रत्यक्ष मानवी वापरात आहेत. यामध्ये निवारा, अन्न, फळे, औषधे आणि वस्त्रप्रावरणे यांचा समावेश होतो. पृथ्वीवरील जैवविविधता वाढत्या लोकसंख्येची गरज अजून भागवत आहे यात शंका नाही पण मानवी वापराच्या जातीमधील विविधता झपाट्याने कमी होत आहे. याचा विचार करण्याची वेळ आली आहे.

ब) मानवी आरोग्य : जैवविविधता आणि तानवी आरोग्य हे सध्या आंतरराष्ट्रीय राजकारणाचे कारण होत आहे. जैवविविधतेच्या नाशामुळे पृथ्वीच्या आरोग्यावर परिणाम होत आहे, यावर शास्त्रीय संशोधन झाले आहे. जागतिक हवामन बदलाचे कारण हे मानवी आरोग्यावर परिणाम करणाऱ्या अनेक कारणापैकी एक

रोगाचे वाहक आणि कारक असणाऱ्या सजीवांचा प्रसार, गोड्या पाण्याची कमतरता, कृषि उत्पादनातील घट, कृषि उत्पादनामधील तोच तोच पणा इत्यादी. एखादी जाती नष्ट झाल्यानंतर निसर्गतः त्यास पर्याय उपलब्ध असायचा. आता असे पर्याय कमी उपलब्ध आहेत. ज्या जाती टिकून रहात आहेत त्या नवीन पोषितामध्ये सवंमित होत आहेत. जुनेच आजार नव्या दाद न देणाऱ्या आजारात बदलले जात आहेत. बर्ड फ्लू, स्वाइन फ्लू आणि इन्फ्लुएंझा हे एकाच विषाणूचे बदललेले स्वरूप आहे. वेस्ट नाइल व्हायरस, लाइम आजार, हांटाव्हायरस असे नवीन विषाणू माणसामध्ये येण्यामध्ये त्यांच्या मूळ पोषितामध्ये झालेले परिवर्तन कारणीभूत आहे. पाण्याची वाढती मागणी आणि पिण्यायोग्य पाणी उपलब्ध नसणे हा मानवी आरोग्याशी निगडीत प्रश्न बनलेला आहे. स्वच्छ पाण्याचे वितरण वाढले असले तरी अनेक देशात पाण्याचे स्त्रोत नाहीसे होत आहेत. 2008च्या जागतिक लोकसंख्येचा अभ्यासावरून निघालेल्या माहितीनुसार अविकसीत राष्ट्रामधील फक्त 62 टक्के व्यक्तींना स्वच्छ पिण्यायोग्य पाणी उपलब्ध आहे. जैवविविधतेशी संबंधित आणखी काही प्रश्न म्हणजे अन्न सुरक्षा आणि सकस अन्नाची उपलब्धता, संसर्गजन्य आजार, अरोग्य विज्ञान, औषधांची उपलब्धता, सामाजिक आणि मानसिक आरोग्य, जैवविविधतेमधून औषध निर्मिती आणि नव्या औषधांचा स्त्रोत इत्यादी. जगातील 80 टक्के लोकसंख्या प्राथमिक आरोग्यसेवेसाठी नैसर्गिक उपचारपद्धति किंवा नैसर्गिक औषधांवर अवलंबून आहे. आजपर्यंत थोड्या जातींचा त्यांच्या औषधी गुणधर्मांचा अभ्यास झाला आहे. जैवविविधतेच्या नव्या इलेक्ट्रॅनिक्स आणि बायालॉजी यांच्यापासून निघालेली संयुक्त शाखा 'बायॉनिक्स' मध्ये झपाट्याने वापर सुरू आहे. 1980 नंतर औषध उद्योगामध्ये नव्या औषधांची निर्मिती कमी झाल्यासारखे वाटत आहे. जनुकीय शास्त्र आणि मानवी जनुक प्रकल्प पूर्ण झाल्यानंतर नव्या रासायनिक औषधांच्या निर्मितीवर भर पडत आहे. सागरी जैवविविधतेवर आधारित औषध निर्मिती नव्याने तपासून पाहाण्याची गरज उत्पन्नझाली आहे.

क) औद्योगिक वापर : अनेक उद्योगांमध्ये सजीवापासून मोठ्या प्रमाणात मिळवलेल्या वस्तूंवा वापर होतो. घरे, कपडा, रंग, रबर आणि इंधन सर्वस्वी सजीवांपासून मिळवले जातात. जैवविविधता पाणी, इमारती, लाकूड, कागद, तंतू आणि अन्न यांच्या पुनः पुनः निर्मितीसाठी अत्यंत महत्त्वाची आहे. जैवविविधतेचा ऱ्हास म्हणजे आर्थिक नुकसान होय.

ड) छंद, संस्कृती आणि सौंदर्यदुष्टी : जैवविविधतेमुळे अनेक संगीतकार, चित्रकार, शिल्पी, लेखक आणि कलावंतामध्ये सौंदर्यदृष्टी आलेली आहे. अनेक संस्कृतीमध्ये जैवविविधता टिकवून राहणे म्हणजेच संस्कृति असा दृष्टिकोन उत्पन्न झाला आहे. महाराष्ट्र, गोवा, कर्नाटक आणि केरळमधील अनेक देवस्थानांच्या आश्रयाने वाढलेल्या देवरायामध्ये झाडाचे पानसुद्धा तोडायचे नाही अशा अलिखित नियमामुळे अनेक प्रजाति टिकून राहिलेल्या आहेत. बागामध्ये शोभेच्या वनस्पति लावणे, वाढवणे, औषधी वनस्पति उद्यान, घरगुती मत्स्यपालन, प्राणिसंग्रहालये, मत्सयालये अशा अनेक व्यवसायांचा उगम जैवविविधतेमध्ये आहे. सर्वसामान्य व्यक्ती अशा छंदाना मनापासून प्रतिसाद देते. व्यावसायिकपणे दुर्मीळ प्राणी जोपासणे, त्यांना वाढवण, दुर्मीळ पक्षी सांभाळणे त्यांना परत निसर्गामध्ये सोडणे, त्यांचे संवर्धन अशा छंदांचे नेमके मूल्यमापन करणे हे कठीण काम आहे. पण केवळ निसर्गाच्या प्रेमापोटी काही संस्था हे काम पदरमोड करून करत आहेत. राजकीय दृष्ट्या ग्रीन पार्टी नावाचा पक्ष 1970 पासून जर्मनी, बेल्जियम, स्वीडन यांमध्ये पर्यावरणरक्षण या अजेंड्यावर काम करतो आहे. आज ही लाट युरोप आणि उत्तर अमेरिकामध्ये एक प्रभावी पक्ष बनली आहे.

सजीव जातींची संख्या : जागतिक सजीव वर्गीकरण विभागाने आणि युरोपियन डिस्ट्रिब्यूटेड इंस्टिट्यूट ऑफ ॲक्सॉनॉमी या संस्थानी सजीवांच्या प्रत्येक वर्गातील एकूण जातींचा 2010 मधील केलेल्या अंदाज प्रत्यक्षात असलेल्या जातीहून कितीतरी कमी असावा असे म्हटले आहे.

1. 1 ते 1 कोटी कीटक
2. अर्धा ते 1 कोटी जिवाणू
3. 15 लाख कवके
4. 10 लाख अष्टपाद

5. सूक्ष्म जीवांची संख्या किती याचा अजून अंदाज आला नाही.

जैवविविधता ऱ्हासाची कारणे : अधिवास नाहीसा होणे, अतिशिकार, नव्या अधिवासात नव्या जातींचा प्रवेश आणि विलोपन यामुळे जैवविविधतेस धोका उत्पन्न होतो असे जेअर्ड डायमंड या निसर्गतज्ञाने सांगितले आहे.

1. एखादी जात हळूहळू नष्ट होणे हे नैसर्गिक असले तरी गेल्या काही दशकता जाती नष्ट होण्याच्या प्रमाणात चिंताजनक वाढ झाली आहे. गेल्या 25 वर्षात जगातील जैवविविधतेचे 15 अक्के नुकसान झाले आहे व अशा जाती नष्टप्राय होण्याच्या मार्गावर आहेत.
2. जती नष्ट होण्यामागील महत्त्वाचे कारण म्हणजे जातींच्या नैसर्गिक अधिवासात झालेली घट. विशेषतः पश्चिम घाटात शहरीकरणामुळे जंगलाचे प्रमाण 50 टक्क्यापेक्षा जास्त नष्ट झाले आहे. त्यामुळेच माणसे आणि वन्यप्राणी यातील संघर्ष वाढीला लागला आहे. जुन्नरजवळ बिबट्या, भीमाशंकर जवळ रानडुकरे, सिधूदुर्गात हत्ती मनुष्यवस्तीत, बागायतीत धुडगूस घालीत आहेत.
3. मनवाने आपल्या प्रगतीसाठी इमारती, रस्ते, धरणे, खनिजसंपत्तीसाठी पर्यावरणाचा अमर्याद वापर केला आहे. त्यामुळे त्या त्या भागात असणाऱ्या वनस्पती, कीटक, पशू, पक्षी यांचा अधिवास उद्ध्वस्त झाला आहे.
4. जैवविविधतेच्या ऱ्हासाचे महत्त्वाचे कारण म्हणजे आर्थिक फायदा नुकसानींच्या हिशोगाशी असणारे सरळ नाते दाखविण्यात आलेले अपयश.
5. मानवाची उदासीनता व निसर्गातील प्रत्येक घटकाकडे पाहण्याचा बदलत चालेला दृष्टिकोन याला कारणीभूत आहे. त्यासह प्रदूषण, गोंगाट, बदलते निसर्गचक्र हे घटकही जैवविविधता नष्ट होण्यास कारणीभूत आहेत.
6. मोठ्या प्रमाणावर वृक्षतोड झाल्यानंतर पुनवैनीकरणामध्ये अस्तित्वात असलेल्या सर्व नवस्पति परत कधीच लावता येणार नाहीत. एकाच प्रकारच्या वृक्षांचे पट्टे लावण्याने त्या परिसरामध्ये असलेली विविधता नष्ट होते.

कदाचित म्हणूनच की काय, यातून धडा घेऊन कर्नाटकातल्या 'अधनाशिनी' नदीच्या भोवताली वसलेल्या स्थानिक लोकांनी व मच्छीमारांनी जीवशास्त्राच्या शिक्षकांना नदीतील कालवे, तिसरे, शिंपले, मासे, झिंगे इत्यादींच्या अभ्यासा मदत केली. त्यातून असे लक्षात आले की, यांच्या विक्रीतून होणारी आर्थिक उलाढाल वर्षाकाठी सुमारे पाच कोटी रूपये इतकी आहे. त्यामुळे नदी परिसरातील जैवसंपदेचे नुसतेच संरक्षण व संवर्धनच साध्य झाले नाही तर प्रदूषणकारी कारखाने तेथून हटवावे लागले. भारतातील सर्व जीवसंपदा काही थोड्या राष्ट्रीय उद्याने व अभयारण्यातच फक्त सुरक्षित ठेवता येणार नाही. त्यासाठी संरक्षित केंद्रांचे विकेंद्रीकरण करणे आवश्यक आहे. देवराया, शेती, नद्यातील डोह, पाणवठे ऐवढेच नव्हे तर शहरांमधूनही जीवसंपदा आहे आणि त्याच्याही संरक्षणाची आवश्यकता आहे. खाजगी हितसंबंधाची जपवणूक, लोकांपर्यंत चळवळ नेणे यांसारख्या गोष्टींमधून जीवसंपदेचे रक्षण होणार आहे. जैवविविधता जपणे हे प्रत्येक नागरिकाचे कर्तव्य आहे आणि यात फक्त सुशिक्षित लोचक योगदान देऊ शकतात असे नाही तर डोंगराळ भागातील अडाणी व्यक्तीसुद्धा फार मोठे काम करू शकते. परंतु त्यांना आपल्या आसपास जे आहे त्याबद्दल माहिती नाही. त्यामुळे पहिल्यांदा जैवविविधतेचे महत्त्व पटवून द्यावे लागणार आहे. मग तो आजऱ्याचा घनसाळ असो वा अन्य बियाणे त्यांच महत्त्व लोकांना सांगावे लागेल. त्यासह आपल्या आसपास असणारे प्राणी, कीटक हे निसर्गचक्रासाठी फार महत्त्वपूर्ण आहेत. मग त्यात उपद्रवी कीटकांचेही महत्त्व त्यांना समजावून द्यावे लागणार आहे. त्यासाठी स्थानिक पातळीवर समितीमाँत प्रबोधन करण्यात येणार आहे. ग्रामपंचायत पातळीवर त्यासाठी राखीव निधी ठेवावा लागणार आहे. सध्याच्या तरूणाईकडे तंत्रज्ञान आहे. त्याचा वापर करून ती लवकर प्रबोधन करू शकते. एखाद्या वेळेस जंगलात वणवा पेटल्यास मित्र, ओळखीच्यांना एकत्र करून तो विझविण्यास मदत करू शकेल. त्यामुळे हजारो

एकरांमधील जैवविविधता आगीपासून वाचू शकेल. पर्यटनस्थळी तिथल्या जैवविविधतेचं महत्त्व पटवून तरूणाईच्या विचारांना दिशा दिल्यास ते यामध्ये नक्कीच योगदान देऊ शकतील, यासाठी प्रयत्न करायला हवेत. त्यासह शेतकऱ्यांनीही मिश्रशेतीचा अवलंब केल्यास व शेताच्या बांधावर उंबर, वड, पिंपळ, आंबा, कडूनिंब अशी विविध वृक्षलागवड केल्यास प्रत्येक ऋतूत तिथे जैवविविधतेला पोषक वातावरण निर्माण होऊन अनावश्यक कीटकनाशकांवर केला जाणार खर्चही वाचू शकेल. जैवविविधतेचे रक्षण व संवर्धन हे प्रत्येक नागरिकाचे कर्तव्य आहे. उन्हाळ्याच्या दिवसात घराबाहेर पक्ष्यांसाठी पाणी व धान्य ठेवणे हे देखील जैवविविधता संवर्धनातील मोठे पाऊलच असणार आहे.

संदर्भ :

पर्यावरणीय अर्थशास्त्र सिद्धांत आणि उपयोजना : कटार सिंह, शिशोदिया.
http://www.lokmat.com/kolhapur
https://mr.wikipedia.org/wiki
https://www.google.co.in/search जैवविविधिता
https://www.google.co.in/search जैव, विविधिता, संवर्धन व उपाय
https://www.google.co.in/search जैवविविधितेचे प्रकार
https://www.google.co.in/search जैवविविधितेचे महत्त्व

TO STUDY SEED VIABILITY, GERMINATION AND SEEDING GROWTH OF VIGNA UNGUICULATA UNDER INFLUENCE OF BORIC ACID AS CHEMICAL MUTAGEN

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Abstract

To study the influence of Boric acid as a chemical mutagen on seeds of Vigna unguiculata are treated with 0.01%, 0.1%, 1% and 2% concentration w/v solution of Boric acid. The seed viability, germination percentage, plumule length, radicle length, number of rootlets per radicle, fresh weight of seeding and dry weight of seeding are parameters to study the influence of Boric acid. It is observed that –

1) *There is adverse effect of Boric acid treatment on seed viability, germination percentage plumule length, radicle length, number of rootlets per radicle, fresh weight of seeding.*
2) *There is insignificant, negative influence of Boric acid treatment on seed viability, germination percentage, plumule length, radicle length, number of rootlets per radicle, fresh weight of seeding in general.*
3) *The adverse, insignificant, negative effect is directly proportional to the concentration of Boric acid solution. More the concentrated Boric acid treatment, more the adverse effect on seed viability, germination percentage plumule length, radicle length, number of rootlets per radicle, fresh weight of seeding in Vigna unguiculata.*
4) *It means the Boric acid influence as chemical mutagen, it creates mutants however in adverse, insignificant, negative form.*

INTRODUCTION – There are chemical mutagens such as Diethyl Sulphates, Colchicine, EMS, NMU, ENU etc, (Medrano et al 1986; Szarejko and Forster, 2007). These are proven chemical mutagens to induce the mutation. Variability is raw material for plant breeding. More the variability, greater is the chance of plant breeding. For better variety/ varieties to develop, variability is to create. Mutation is one of the means to develop the variability for plant breeding. Szarejko and Forster in 2007 stated that mutation induction is an effective tool to enhance the genetic variation available to plant breeders, particularly for traits with a very low level of genetic variation. Much of our knowledge of genetics of higher organisms in based upon works utilizing induced mutations for analyzing gene function (Mc Callum et at. 2000). There are several examples of successful applications of mutation breeding to crops have been reported in literature, such as, Ahmad et. al. (1991); Bacells, (2001); Bhatia et al. 1999; Ferrie et al. 2008; Flower and Stefansson, 1972; Parry, et al. 2008. Mutation techniques have been applied to improve to characters like disease resistance, high yielding, better quality, drought resistance etc, especially by Parry, et al. 2009; Schnurbush et al. 2000. FAO/ IAEA, 2011 states that there are over 4000 mutant varieties have been develop by induced mutation.

Vigna unguiculata commonly known as cowpea, black eye pea, southern pea, yardlong bean, catjang and crowder pea (Timko et. al 2007). Unguiculata is Latin word, its meaning is 'with small claw', which reflects the small stalks on the flower petal, as per Small (2009).

Vigna unguiculata are grown mostly as edible food, especially for beans, although the leaves, green peas and green pods can also be consumed. Usually by boiling, the Vigna unguiculata are made edible (Hamid, et. al. 2016). These beans can be prepared in stews, soups, purees and caseroles- as per Cowpeas Recipe, 2017. They can also be processed into paste or flour (Gonkalves, et al. 2016). They further added that seeds of Vigna. unguiculata provide rich source of proteins and calories, as well as minerals and vitamins. As per Rangel et al 2003, a seed of Vigna unguiculata consists of 25% protein

and has very low fat contenet. Hamid. et. al, 2016, said that Vigna unguiculata seeds are often referred as ' poor man's meat due to the high levels of protein found in the seeds and leaves. It arrives conclusion that Vigna unguiculata is important food yielding plant having great importance as food plant, medicinal valued plant and complete diet plant.

The objective of present study is to screen the mutants of Vigna unguiculata by treatment of Boric acid as chemical mutagen. Boric acid is not a proven chemical mutagen. In present experiment an attempts is made to find the mutagenic property of Boric acid at various concentration. To study the influence of Boric acid as chemical mutagen, the germination, viability, and seeding dimensions are used as the parameters.

MATERIAL AND METHODS - Control treatment is of distilled water. The Boric acid solution is prepared of 0.1%,1 % and 2% by using distilled water. Ten dried seeds are sown in garden soil containing pot. Such five pots were prepared. Each pot is sown with 10 seeds of Boric acid. Control treated pot is watered with adequate amount of distilled water. The remaining pots with ten seeds of Boric acid were daily treated individually with 0.01%, 0.1%, 1.0% and 2.0% (W/v) Boric acid solution in required quantity respectively. The seeds of control pot and Boric acid treated pots were kept in dark for next ten days. The observations were recorded daily. The parameters considered to note the effect of Boric acid during sprouting phase upto the first ten days. The observations under study were recorded as, germination, percentage of sprouting, plumule length, radicle length number of rootlets per radicle and fresh weight of seedlings on tenth day of experiment. The same experiment is repeated simultaneously so as finding mean of observations. It helps to minimize the experimental errors. The results shown are the arithmetic mean of two replicas of experiments.

RESULTS AND DISCUSSION –

Table I. Influence of Boric acid chemical as mutagen on seed viability in Vigna unguiculata.

Observation	**Treatment of Boric acid (w/v) solution**				
	Control	**0.01%**	**0.1%**	**1%**	**2%**
Viability at 3rd day of sowing	10	10	05	04	04
Viability of 6th day of sowing	10	10	07	03	04
Viability at 10th day of sowing	10	10	07	05	04

Table I shows that all seeds are viable since the third day of germination. Boric acid treated seeds shows less viability as compared to control. The viability is least in 2% Boric acid treated seeds. It means there is adverse influence of Boric acid solution on the viability of seeds of Vigna unguiculata the adverse effect intensifies as the concentration of Boric acid chemical goes on increasing.

Table II- Influence of Boric acid chemical as mutagen on seed germination percentage in Vigna unguiculata.

Observation	**Treatment of Boric acid (w/v) solution**				
	Control	**0.01%**	**0.1%**	**1%**	**2%**
Germination Percentage on 3rd day of sowing	100%	100%	50%	40%	40%
Germination percentage in 6th day of sowing	100%	100%	70%	50%	40%
Germination percentage on 10th day of sowing	100%	100%	70%	50%	40%

From the Table II, it is clear that 100% seed germination shown by control condition in Vigna unguiculata since the 3rd day of germination. Same vigour, same germination percentage also observe in 0.01% Boric acid treated seeds. However as the concentration of Boric acid solution goes on increasing, then the germination percentage of seeds of Vigna unguiculata goes on decreasing. The minimum germination percentage of seeds is observed at highest concentration of Boric acid (2%). Thus, it can be concluded that the negative influence of Boric acid is there on germination percentage of seeds of Vigna unguiculata.

Table III- Influence of Boric acid as a chemical mutagen on average length of plumule on 10th day of treatment in Vigna unguiculata.

Observation	Treatment of Boric acid (w/v) solution				
	Control	0.01%	0.1%	1%	2%
Plumule length on 10th day of treatment	8.8cm	7.0cm	502cm	4.5cm	4.1cm

Table III depicts that the plumule length of seedlings of vigna unguiculata. On the 10th day of sowing. There is maximum growth of plumule length. The intensity of adversity goes on increasing as the concentration of Boric acid solution increases in treatment.

Table IV- influence of Boric acid as a chemical mutagen on average length of radical and number rootlets / radical on 10th day of treatment in Vigna unguiculata.

Observation	Treatment of Boric acid (w/v) solution				
	Control	0.01%	0.1%	1%	2%
Radicle length	8.3 cm	6.5cm	4.8cm	5.0 cm	3.9 cm
Rootlets / radicle	24	13	10	07	04

To find out effectivity of Boric acid solution as an chemical mutagen, its effect was observed on length of radical and number of rootlets per radical were stadied. Table IV shows the influence of Boric acid as chemical mutagen on average radical length. The observations were taken on 10thdy of treatment. It is seen from Table. IV that the root length as well as rootlets per radicle is decreasing due to Boric acid treatment. The decrease in radicle length and rootlets per radical goes on decreasing as the concentration of Boric acid treatment goes on increasing.

Table V- Influence of Boric acid as a chemical mutagen on average fresh weight and dry weight of seedlings on 10th day of treatment in Vigna uguiculata.

Observation	Treatment of Boric acid (w/v) solution				
	Control	0.01%	0.1%	1%	2%
Fresh Weight	13.32 gm	10.42 gm	9.88 gm	9.52 gm	7.04 gm
Dry weight	4.15 gm	3.11 gm	3.25 gm	2.8 gm	2.35 gm

Table V shows the observations of fresh weight (in gm) and dry weight (gm) of seedlings of Vigna unguiculata after treatment of Boric acid as a chemical mutagen at various concentrations. On the 10th day, the control as well as treated seedlings were uprooted and average fresh weight as well as dry weight maximum in control condition, When the Boric acid treatment is provided then the fresh weight and dry weight get affects. It effects directly proportional to the concentration of Boric acid chemical solution.

Concentrations exceeding 1.5% Fe and 1% B in the priming solutions affected germination negatively. Ajouri et al. (2004), similarly studying the effect of seed priming on germination, showed that concentrations exceeding 0.04 M boric acid significantly reduced the germination rate in barley. A reduced germination percentage was also registered for treatment of sweet pepper (*Capsicum annum* L.) when higher dosages of micronutrients were used for seed priming (Diniz et al. 2009).

The importance of seedling vigor on the rapid stand establishment and early growth of medicinal plants to compete for water, light, and nutrients has been stressed by Tabrizian and Osareh (2007).

The results of the laboratory experiments carried by Mirshekari, 2012 indicated that the effect of the chemical (Boron) treatments on the final germination percentage was significant. The seedling vigor index of dill was restricted when the Fe and B concentrations increased beyond 1.5% and 1%, respectively. The highest seed yield was recorded for the concentration of 1.5% Fe + 1% B in solution, which produced nearly 20% greater yield than the control. The essential oil concentration of the seeds ranged from 2.60% for 0.5% Fe to 2.81% for 1.5% B for the priming solutions. There was a positive response to seed priming with Fe and B regarding the essential oil yield. Priming dill seeds in the 1.5% Fe + 1% B solution resulted in a further increase in dill yield.

Emrani et al.)2011) carried out the experiment to study the effect of chemical mutagens on seed viability, seed germination and seedling growth of Brassica napus. Their result revealed the significant effects of chemical dosages and treatment periods on seed viability and seed germination as well as on seedling characteristics for all the Chemical mutagens tested. Additionally, it was found that increased dosage and period of in each treatment led to significant reductions in seed viability for the tested mutagens.

Inverse relations were found between chemical mutagen concentration and both rate and percentage of seed germination in various plants as recorded by Afsar, et al.1980: Ahmed etal, 1991; Flower and Stefansson,1972: Padavai and Dhanavel, 2004; Singh and Kole 2005. Flower and Stefansson (1972) reported that increasing of EMS chemical concentration from 0 to 1% adversely affected germination percentage.

Carton et.al.1968 Das and Haque, 1997; Gustafson, 1989; Hu and Rutger, 1992: Snusted and Simmons, 2006; Jabeen and Mirza 2004; Padma and Reddy. 1977 are some of researchers who carried out effect of chemical mutagens on the seed germination. According to Emrani et. al.(2011) the average germination percentage from 92.7% in the control to 7.9% in the treatment with 1.6% EMS chemical. Seedling height and radical length also decreased with increasing chemical EMS concentration and treatment period.

CONCLUSION: To study the influence of Boric acid as a chemical mutagen on seeds of Vigna unguiculata are treated with 0.01%, 0.1%, 1% and 2% concentration w/v solution of Boric acid. The seed viability, germination percentage, plumule length, radicle length, number of rootlets per radicle, fresh weight of seedling and dry weight of seedling are parameters to study the influence of Boric acid. It is observed that –

1) There is adverse effect of Boric acid treatment on seed viability, germination percentage plumule length, radicle length, number of rootlets per radicle, fresh weight of seeding.
2) There is insignificant, negative influence of Boric acid treatment in seed seed viability, germination percentage, plumule length, radicle length, number of rootlets per radicle, fresh weight of seeding in general.
3) The adverse, insignificant, negative effect is directly proportional to the concentration of Boric acid solution. More the concentrated Boric acid treatment more the adverse effect on seed viability, germination percentage, plumule length, radicle length, number of rootlets per radicle, fresh weight of seeding in Vigna unguiculata.
4) It means the Boric acid influence as mutagen, it creates mutants however, in adverse, insignificant, negative form.

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DIVERSITY OF LADYBIRD BEETLES (COCCINELIDAE) IN THE MALSHIRAS TEHSIL MAHARASHTRA, INDIA

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Abstract
The Ladybird bettles are best known as predators of family Coccinellidae, superfamily Cucujoidea and suborder Polyphaga. Order Coleoptera is largest order confining beetles. The ladybird beetles are characterized by round to elliptical, dome-shaped body and elytron morphology. The lady bird beetles having important biocontrol agent against hemipteran species and some are pests. During January 2015 to December 2017 surveyed thoroughly diversity of coccinellids (Coleoptera: Coccinellidae) from Malshiras tehsil and enlisted 7 different species belonging to 7 different genera and 2 subfamilies viz. Coccinellatrans versalis (Fabricius), Menochelus sexmaculata (Fabricius), Propylea japonica (Thunberg), Micraspis discolor (Fabricius), Illeis cincta (Fabricius), Brumoid saturalis (Fabricius) and Epilachna viginitoctopunctata (Fabricius) are reported in present study.
Keywards: *Lady bird beetle, Malshiras, Coccinellidae, Biocontrol agent, Diversity.*

Introduction: Ladybird beetles also known as Ladybugs. The lady bugs belonging to the class Insecta, order Coleoptera, superfamily Cucujoidea and family Coccinellidae (Gordon 1985; Majerus, 1996). The worldwide known distribution of Coccinelidae is about 6000 species (Vandenberg, 2000) which comprises under seven subfamilies worldwide viz. Coocidulinae, Coccinellinae, Scymninae,Chilochorinae,Ortalinae, Sticholotidinae and Epilachninae.

All coccinellids except mycophagous Coccinellinae (Hylyziini and Tythaspis) and herbivorus Epilachnianae, feeds voraciously on hemipteran insect species(scales, psyllids, white fly and aphids), Mites and sometimes on other insect larvae (Dixon, 2000). Due to predatory characteristics of these beetles, they known by biocontrol agent and beneficial insects but some species were phytophagus, act as pest. Their size varies (1 mm to 15 mm) species to species and depending upon the species their pray species should be different, therefore exploration of these biocontrol agents also give an idea about pest composition of given area(Obrycki and Kring 1998; Hodek and Honek 2009; Ali and Agrawal, 2014).

Present study is carried out within the Malshiras tehsil of Solapur district from southeast Maharashtra. Study area is selected for the present study based on diverse and unique habitat. At the northern boundary made by Nira river basin, this region was well irrigated and provides habitat and shelter to the diverse insect species including ladybird beetles. Entire area comes under rain shadow and always draught condition but irrigation made some green patches. Most of the area dry and available irrigated area covers by mostly Sugarcane along with other vegetable crops, fruit crops and in hilly region some plantation of various native as well as exotic species by government departments. The study area situated between 17° 86' N latitude and 74° 90' E longitude which covers 1522.2 sq/km area under 112 villages. Average rainfall is 422.8mm. Soil type is black, coarse gray and reddish and it is derived from Deccan trap.

Material and Methods: The coccinellids collection were made by net sweeping and hand picking method during active seasons of ladybug. 10 collection localities were selected from Malshiras tehsil

for collection and diversity study. The samplings were focused in cucurbitaceous and solanacious vegetable fields and other vegetation also traced.

Sampling was done by visiting each locality by one-month interval. Collected specimen picked and killed in killing bottles with the help of ethyl acetate. After killing the specimen were pinned with entomological pins. The small sized beetles were preserved by cardning method. After proper drying specimen properly stored in collection box. Identification done with the help of Kapur (1958) and Rafi *et al*. (2005)

During present study the lady beetle diversity of Malshiras tehsil represented by 7 species distributed over 7 different genera.

1. *Coccinella transversalis* (Fabricius) (Image: 1)

Material Examined*:* 6♂, 10. 11. 2016. Yashwantnagar. coll. A. M. Hegade.

Distribution**:** India: Maharashtra, Karnataka, Kerala, Haryana, Tamilnadu, Haryana, Goa and Andhra Pradesh (Bielawski 1961, Poorani 2002).

Worlwide : Myanmar, Chagos, Sri Lanka, Nepal, Indonesia, Pakistan, Archipelago, Madagascar, South-East Asia, China, East Africa, Ghana, Togo, Seychelles, Tanzania, Mauritius, Reunion, Kenya (Kapur 1962, Booth and Pope1989).

Remark: Colour variation observed in this species, brick red, pale yellow, dark yellow and creamy orange. Blackish head having yellow spot, mouth part also shows color variation black to darkbrown ; antennae, eyes and scutellum are darkbrown and black respectively. Elytra hving color varition with black markings and ventral side and legs entierly black (Abhishek *et al* .2014). Body shape oval and dorsally dome shape with 5.86mm long and 4.54 mm width. This species habitats in bushes, hide underside leaves and stem and observed feeding on aphids. Distribution occurs through out India but more abundant in penisular region of India.

2. *Cheilomenes (Menochilus) sexmaculata* (Fabricius)

Material examined: 25♂, 10. 11. 2016. Khudus. coll. A. M. Hegade.

Distribution: It is widely distributed in orient specially Afghanistan, Indonesia and Bangladesh (Manippan, 2012).

India- Kerala, Uttar Pradesh, Assam and Kashmir (Khan *et al*. 2012).

Remark: Body shape is rounded and convex at some proportion. Wide range of colour morphs were observed viz. orange, faint red, yellow or pinkish. Anterior pronotum having T- shaped band at medium line and attached to brought black on posterirarly. Elytra having six markings having two zig zag black line with black spot posteriorly. This species identified by having three specific shapes on each elytron i.e. inverted V shaped, complete w shaped and roundish. At the junction of elytra having brownish black strip. It is highly predacious on aphid found on maize, Rui and Sugarcane.

3. *Brumoid suturalis* (Fabricius)

Material examined: 1♂, 06. 02. 2018. Malinagar. coll. A. M. Hegade.

Distribution: Worldwide: Nepal, Myanmar, Malaysia, Kenya, East Africa, South Africa, Sri Lanka, Indonesia, Pakistan, Tanzania, Seychelles, Nepal, Reunion, Madagascar, Togo (Camways et al. 1999). India: Highly distributed in Uttar Pradesh, Tamil Nadu, Panjab, Orissa, Maharashtra, Kerala, Goa, Assam, Andhra Pradesh, and Karnataka (Bielawski 1961).

Remark: Oval body shape having 2.8to 3.8 mm length and 2.2 to 2.4 mm width. On elytra 3 brownish black bonds found longitudinally. One on each elytron and one on mid dorsal line on elytron. Brownish head & eyes with nine segmental antennae. At terminal tarsal joint, a pair of simple claws is present on the legs. It is found in natural and agro ecosystem. Predacious on mealy bug and pyrills (Chakraborty *et al.* 2013). Psyllids and Aphid (Ullah *et al.* 2012). Collected from okra plants.

4. *Propylea japonica* (Thunberg)

***Material examined*:**1♂, 20. 12. 2016. Falwani. coll. A. M. Hegade

***Distribution*:** Worldwide: North America, Southeast Asia, Tanzania, Kenya, Togo, Indonesia, Reunion, Pakistan, Nepal, Malaysia, South Africa, Brazil, North Africa, Chagos, East Africa and China.

India: Uttar Pradesh, Kerala, Maharashtra, Haryana, Himachal Pradesh, Karnataka, Tamil Nadu, Andaman and Nicobar Island, Bihar, Punjab, Delhi, Rajasthan, North East and West Bengal (Bielawski 1961, Poorani 2002).

***Remark*:** Oval shaped body having reddish yellow antennae and head. Mouth parts are yellowish brown, with black scutellum and shining black elytra with reddish yellow apices. Ventral side ranges from yellowish brown to dark brown in color with pale tarsi.

5. *Micraspis discolor* (Fabricius)

Material examined: 2♂, 23. 11. 2015. Malkhambi. coll. A. M. Hegade

Distribution: Worldwide: Tanzania, Sri Lanka, Brazil, South East Asia, China, Myanmar, Madagascar, Pakistan, Malaysia, Brazil, Togo, Archipelago, Reunion, North America, North Africa, Tanzania, South Africa, Seychelles.

India: West Bengal, North east, Rajasthan, Andaman and Nicobar Island, Bihar, Kerala, Maharashtra, Uttar Pradesh, Delhi, Haryana, Himachal Pradesh and Karnataka. (Bielawski 1961, Poorani 2002).

Remark: Adult species length is 4.5 to 3.00 mm elytra is yellowish red with small, rounded black spots on each elytron. One at proximal end and another at distal end. forelegs and hind legs are brownish yellow and dark brown respectively. Body shape is oval with pair of compound eyes and it segmented antennae. It is found on maize crop.

6. *Illieis cincta* (Fabricius)

Material examined: 6♂, 05. 11. 2016. Malkhambi. coll. A. M. Hegade

Distribution: Worldwide: South Africa, Brazil, Myanmar, Nepal, Archipelago, North America, North Africa, Chagos, South East Asia, China, Chagos.(Kapur 1962, Booth and Pope 1989, Canepari 2003)

India: Maharashtra, Karnataka, Kerala, Haryana, Rajasthan, West Bengal, North East Himachal Pradesh, Delhi, Bihar, Punjab, Tamil Nadu, Andhra Pradesh, Tamilnadu, Uttar Pradesh, Andaman and Nicobar Island.

Remark: Yellowish head having a pair of black eyes .Shiny yellowish coloured elytra and thorax. Body length and width is 5.2 mm and 4.00 mm respectively. At the posterior margin of the thorax two spots were situated.

7. *Epilachna vigintioctopunctata* (Fabricius)

Material examined: 6♂, 05. 11. 2016. Malkhambi. coll. A. M. Hegade

Distribution*:* Worldwide: South Africa, Brazil, Myanmar, Nepal, Archipelago, North America, North Africa, Chagos, South East Asia, China, Chagos.(Kapur 1962, Booth and Pope 1989, Canepari 2003)

Remark: Larvae are stout with spiny dorsal and lateral processes and their feeding causes the characteristic skeletonized pattern on leaves resulting in drying and dropping of leaves.

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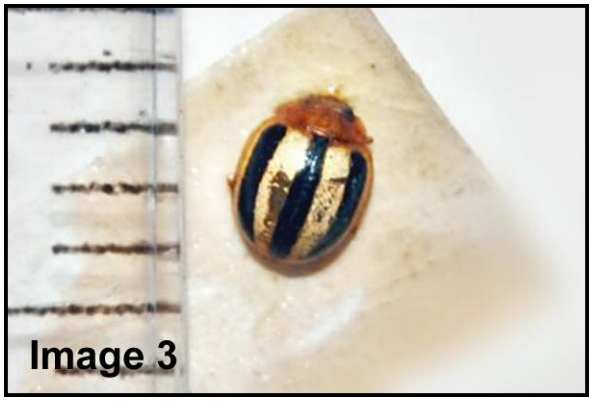
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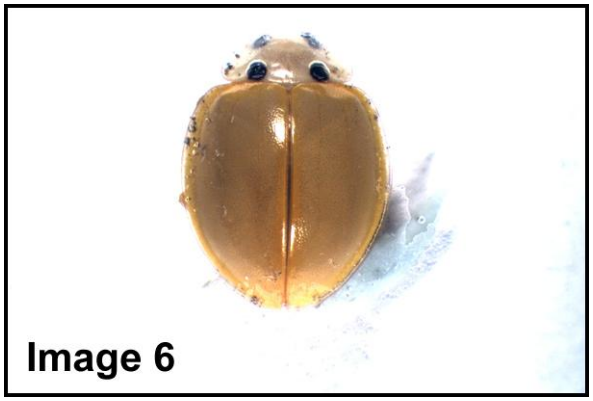


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SCREEN LESS DISPLAY TECHNOLOGY

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Abstract
This paper discusses advent of the Screen less display which is an developing new technology , has become a good vision in the near future for a wide range of applications. This paper includes a review about the Screenless Display technology. It describes the system that enables the transmission of video data without using display screen with/without light display.As the name implies it deals with the display of several things without the use of screens using projector. It involves three different working principles. First is The Visual image, second is Virtual retinal display and third is Synaptic interface. This paper mainly illustrates and demonstrates how the screen less displays works and its uses in various fields of science.

Introduction

Screenless video describes systems for transmitting visual information from a video source without the use of a screen. Screen -less computing systems can be divided into three groups: Visual Image, Retinal Direct, and Synaptic Interface.

Visual Image screenless display includes any image that the eye can perceive. The most common example of Visual Image screenless display is a hologram. Holograms were used mostly in telecommunications as an another to screens. Holograms could be transferred directly, or they could be stored in various storage devices (such as holodiscs) the storage device can be hooked up with a holo projector in order for the stored image to be accessed Virtual retinal display systems are a class of screen less displays in which images are projected directly onto the retina.They are distinguished from visual image systems because light is not reflected fromsome intermediate object onto the retina; it is instead projected directly onto the retina.

Retinal Direct systems, once marketed, hold out the promise of extreme privacy when computing work is done in public places because most inquiring relies on viewing the same light as the person who is legitimately viewing the screen, and retinal direct systems send light only into the pupils of their intended viewer

Synaptic Interface screenless video does not use light at all. Visual information completely bypasses the eye and is transmitted directly to the brain. While such systems have only been applied in humans in rudimentary form - for example, displaying single Braille characters to blind people - success has been achieved in sampling usable video signals from the biological.

Working principle

There are several new emerging ways for the technological development of the working principle of the screen less displays. Several software's are merging for the GEN-X wonder view. Any computer system that can run the mudoc software can present text that has been set in interactive movable type. Most of the mudocs that are consumed in the next few years will be consumed with conservative personal computers, e-book readers, and other kinds of display and projection devices that are now in use. Very soon it appears to be a new kind of input/output system will facilitate communication and interaction between the computer and the computer user. This new human/computer interface is the telereader terminal. Visual Image is a bitmap manipulation and composition product. Bitmaps can be manipulated independently, in the Image Mode or multiple bitmaps can be composited Together in

the Object Mode to create a "collage". Visual Image can create and Manipulate images of any size: the only limitation is the amount of memory resources your system has.

Applications of the Screenless display

The main use of the screen less displays are used for the development of the mobile phones which are mainly used by the old and blind people . This type of the invention of the screen less displays was first done on the mobile phone named OWASYS 2CC.



useful for the old, blind, and even for the people with less vision power.

Application applied to mobile Technology Screen less displays technology is also implemented for the development of the screen less laptops. A laptop without an LCD can be a very useful portable solution when connected to CRT or fixed LCD monitors.

Laptops without screens would also be a green solution, giving value to donated CRT monitors that would otherwise be heading for landfills. Portability means that volunteers, who don't always have the time to travel to people's homes, can more easily maintain this computer. Screenless displays are also widely applicable in the field of the holograms projection.

Hologram projection is a result of a technological innovation that truly helps in touch less holographic interfaces. In fact, hologram projection projects 3D images of so high quality that it feels as if one can touch them. However, holographic projection is still to achieve mass acceptance as until now, conventional holograms, which offer 3D images.

Latest laser technology are also implementing the special technique of the
screen less display through the presence of the several 3D scope animation or the screen provides the advantage of being combined with the Laser Valve Video Projector that helps in projecting video images by the use of the laser light instead of the Xenon Arc lamps as depicted in figure 8. Laser technologies have given an edge over the other technologies as the LVP gives the projector an excellent depth in the focus.

Advantages of Screenless Display.

- It Displays the information directly into the retina of eye rather than displaying through screen like LCD monitor, touch screen display etc.
- It is one of the top 10 emerging technologies in IT field.
- We will be using screenless display technology during 2020s.
- 3D images are possible.
- Ability to present far point images.
- High quality and large angle of view are the other vital
- Light weight and hence greater portability.
- Lower power requirement.

Disadvantages of Screenless Display

- VRD is not yet available in the significant number.
- Prototypes and special experimental models are now being built, but their cost per unit is high.
- The VRD technology is still under progress and development.

Conclusion : The paper has elaborately discussed screenless displays which is one of the most emerging computer technologies and has become a new exciting rage for the up coming generations as a field of the futuristic technology. Due to the ability of having several advantages which are involved in the making, designing, coding of the screenless , this needs plenty of knowledge and process for the development is still under the improvement. May be in the future the world may be dominated with the screen less display technologies and this enriches the world of technological empowerment in the field of the computer technology. Screenless displays promises the cost effective aspect and also brighter future in the computer technology

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PRESSURE SWITCH REACTION OF METHANE: A TECHNIQUE OF TAPPING BIOMETHANE FOR COMMERCIAL USE

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Abstract
Biomethane is a green house gas on one side but very useful fuel on other side. So for commercial exploitation have been trying by many scientists and energy associations. Mostly they are using separation of impurities and use refined methane gas. This will increase the cost of purification as well as transportation. Therefore we are trying to explore biomethane by liquefaction of biomethane using pressure switch reactions. This aims towards easy liquefaction using differential pressure condition and easy transportation for commercial exploitation.
***Key words**: biomethane, pressure switch*

Introduction: The most needed but rapidly reducing resource is energy. Though endeavors are being made to trap energy in different forms such solar, tidal, wind energy, but are not meeting the present ever increasing need. Others sources of energy such as fossil fuels are also rapidly decreasing due to its exorbitant exploitation. So there is always need to search new renewable sources. Renewable gases such as biogas and biomethane are considered as key energy carrier when the society is replacing fossil fuels with renewable alternatives. On other hand methane is more potential green house gas than CO_2, which are increasing global warming. Upgraded biomethane can cover a great number of applications as well as it reduces global warming. Nowadays biomethane is already used in public transportation and in power generation, while different projects are being run around the world to expand its use even in private sector as main fuel in boilers or biomethane powered cars. The economic analysis demonstrates that biomethane can be produced at a cost which is competitive with liquid biofuels and fossil fuels. The main hurdle is in the use of biomethane on large scale for commercial purpose is transportation from site of its formation to the site of its actual application.

The raw biogas produced consists primarily of CH4 (55-70%) and CO2 (25-40%) but trace components are often present (H2O, H2S (3-5%), Siloxanes, Hydrocarbons, NH3, O2, CO and N2). It's pH value ranges from 6.5 to 7.5 and due point is < -800C. Biogas consumption for household, power generation can be done at its site of production without purification. Upgrading processes are required to fit the heating value into the standard specifications. The main parameter used for the assessment of energy efficiency of biogas production processes is the Primary Energy Input to Output (PEIO). The results obtained show that PEIO value range from 10.5 to 64.0 %. But this use does not lead to commercial application specially at distant place. So as to explore it's commercial scale application at distant place, it should be transported through grid or bottles in pure form (upgraded biomethane). But it has seen that both the purification and its transport remained a challenge for it's commercial application. India's human population is 120 crores. Majority lives in villages and this rural population – directly or indirectly - is associated with agriculture. In 1961 the population of live stock was 335.4 million of which 51 million were buffaloes. The numbers went up to 510.2 million in 2007 of which 102.4 million were buffaloes. There is a 100% increase in the number of buffaloes in 46 years. The milk production went up by 100% from 51.4 million tons in 1989-90 to 112.5 million tons in 2009-10. [1] Taking this challenge into consideration, many techniques and studies have been reported. Usually these techniques are physical modification of biogas. To improve the quality of biogas, some used scrubbing CO2 and drying for further transport of enriched biomethane [2]. Partial oxidation of

methane to form carbon monoxide and hydrogen, followed by Fischer–Tropsch chemistry, the direct oxidation of methane to methanol and formaldehyde, oxidative coupling of methane to ethylene have been studied.[3] [4] Ionic liquids (ILs) have emerged in the last few years as promising new acid gas absorbents, and thus, this remarkable interest, in both industry and academia, has led to a large collection of experimental and theoretical studies in which the most important aspects of the absorption process are analyzed. The viability of ILs as an alternative to the available amine based absorption processes, and showing the possible future directions of research.[5] A known host-guest assembly, organized only by means of relatively weak dispersive forces, exhibits hitherto unappreciated thermal stability. The hexagonal close-packed arrangement of calix-[4]-arene contains lattice voids that can occlude small, highly volatile molecules. This host-guest system can be exploited to retain a range of freons, as well as methane, not only well above their normal boiling points, but also at relatively high temperatures and low pressures. The usually overlooked van der Waals interactions in organic crystals can indeed be used in a highly stable supramolecular system for gas storage. [6] An experiments using Ni2(dhtp) and gas mixtures of CO2–N2 and CO2– CH4 demonstrate the ability of the material to separate these gases. It is shown that CO2 is preferentially adsorbed over methane or nitrogen. In the case of CO2–N2, the retention is quantitative within the precision of the detection system. The performance in respect to CO2–N2 separation was better than for CO2–CH4 separation. Biogas upgrading is beneficial but its market is still relatively very small. In European region there are at present around 200 biomethane plants that employ five main technologies: water scrubbing (WATS), pressure swing adsorption (PSA), chemical scrubbing (CHEMS), physical scrubbing (PHYS) and membrane separation (MEMS). The most preferable technology is WATS with almost 40 % share, followed by PSA and CHEMS (both around 25 % share). The lowest share has MEMS with around 4 %. All five technologies are able to produce biomethane with required purity.[7] Dual nitrogen expander liquefaction process can be boosted using power from a nitrogen expander, with all power input via the main cycle compressor, improving efficiency and increasing LNG production. [8] Solubility of methane in various solvents such as hexane, cyclohexane, acetone, benzene, ethanol, methanol and water have been studied. It is concluded using Bunsen absorption coefficient that solubility decreases from hexane to water with decreasing polarity. But this solubility is not sufficient to use this concept for commercial transportation. [9] All ethylene glycol ethers (including the mixture PEGDME 250, NMP, and sulfolane) were liquid at ambient temperature. These liquids are used for studying solubility of methane and ethane using Henry's constant at ambient temperature [10].

Property	Liquid below T_c	Gas below T_c	Fluid above T_c	Critical region
		Methane		
Pressure%	2	0.3	0.3	0.3
Density %	0.2	0.3	0.1	5.0
Temperature %	0.1	0.1	0.1	1
Enthalpy (J/mol)	2	1	1	10
Entropy (J/mol)	1	1	1	2
Specific heat, C_p %	5	5	2	10
Specific heat, C_v %	5	5	2	10
Speed of sound %	2	0.5	0.5	2
Thermal conductivity %	5	4	3	8
Viscosity %	2	2	2	5
Dielectric constant %	0.05	0.05	0.05	0.3

Experiments, result and discussion: From all above techniques are mostly dedicated to purification of biogas to biomethane up to standard specification. This has also been done using physical techniques only. So need is to improve purification of biogas using chemical methods and using certain chemical methods to bring cost effective transportation of upgraded biomethane for commercial application. Our aim is to explore chemical methods to make transportation of biomethane a cost effective mean for commercial scale up. The techniques we are proposing are using chemical reactions of methane which are pressure driven. This study is based on physical and chemical properties of methane. Methane is the first hydrocarbon. A one-carbon compound in which the carbon is attached by single bonds to four hydrogen atoms. It is a colourless, odourless, non-toxic but flammable gas (b.p. −161°C). It is comparatively lesser reactive than impurities present in biogas. So we are aiming to develop a system in which increase pressure will make

methane soluble in suitable solvent. This liquid solution of methane will have volume almost same as that of the solvent. This makes transportation of the methane very easy. Array of different solvents such as nonpolar, polar and room temperature ionic liquids (RTIL) will be used to assess the reversible solubility of methane at different temperatures. This will provide data which solvent is more suitable for transportation of methane at different temperature.

Conclusion: Very few studies are done of solubility of methane especially for transportation of methane. Therefore this study will open a new avenue in solubility of methane, transportation and commercial application of methane. This also will reduce global warming and boost the rural economy in India.

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CRYPTOGRAPHY ENCRYPTION

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Abstract
Data is any type of stored digital information. Security is about the protection of assets. Data security refers to protective digital privacy measures that are applied to prevent unauthorized access to computers, personal databases and websites. Cryptography is evergreen and developments. Cryptography protects users by providing functionality for the encryption of data and authentication of other users. Compression is the process of reducing the number of bits or bytes needed to represent a given set of data. It allows saving more data. Cryptography is a popular ways of sending vital information in a secret way. There are many cryptographic techniques available and among them AES is one of the most powerful techniques. The scenario of present day of information security system includes confidentiality, authenticity, integrity, non-repudiation. The security of communication is a crucial issue on World Wide Web. It is about confidentiality, integrity, authentication during access or editing of confidential internal documents

Introduction: To secure the data, compression is used because it use less disk space (saves money), more data can be transfer via internet. It increase speed of data transfer from disk to memory. Security goals for data security are Confidential, Authentication, Integrity, and Non-repudiation. Data security delivers data protection across enterprise. Information security is a growing issue among IT organizations of all sizes. To tackle this growing concern, more and more IT firms are moving towards cryptography to protect their valuable information. In addition to above concerns over securing stored data, IT organizations are also facing challenges with everincreasing costs of storage required to make sure that there is enough storage capacity to meet the organization's current and future demands. Data compression is known for reducing storage and communication costs. It involves transforming data of a given format, called source message to data of a smaller sized format called code word. Data encryption is known for protecting information from eavesdropping. It transforms data of a given format, called plaintext, to another format, called cipher text, using an encryption key. Currently compression and encryption methods are done separately. Cryptography prior to the modern age was effectively synonymous with encryption, the conversion of information from a readable state to apparent nonsense. Modern cryptography is heavily based on mathematical theory and computer science practice; cryptographic algorithms are designed around computational hardnessassumptions, making such algorithms hard to break in practice by any adversary. It is theoretically possible to break such a system, but it is infeasible to do so by any known practical means. The growth of cryptographic technology has raised a number of legal issues in the information age. Cryptography's potential for use as a tool for espionage and sedition has led many governments to classify it as a weapon and to limit or even prohibit its use and export

CRYPTOGRAPHY: The art of cryptography is considered to be born along with the art of writing. As civilizations evolved, human beings got organized in tribes, groups, and kingdoms. This led to the emergence of ideas such as power, battles, supremacy, and politics. These ideas further fueled the natural need of people to communicate secretly with selective recipient which in turn ensured the continuous evolution of cryptography as well. The roots of cryptography are found in Roman and Egyptian civilizations.

The importance of information and communication systems for society and the global economy is intensifying with the increasing value and quantity of data that is transmitted and stored on those

systems. At the same time those systems and data are also increasingly vulnerable to a variety of threats, such as unauthorized access and use, misappropriation, alteration, and destruction.

The hiding of information is called encryption, and when the information is unhidden, it is called decryption. A cipher is used to accomplish the encryption and decryption. Merriam-Webster's Collegiate Dictionary defines cipher as ―a method of transforming a text in order to conceal its meaning.‖ The information that is being hidden is called plaintext; once it has been encrypted, it is called ciphertext

To hide any data two techniques are mainly used one is Cryptography other is Steganography. In this paper we use Cryptography. Cryptography is the science of protecting data, which provides methods of converting data into unreadable form, so that Valid User can access Information at the Destination. Cryptography is the science of using mathematics to encrypt and decrypt data

Basic Terminology of Cryptography: Computers are used by millions of people for many purposes. such as banking, shopping, military, student records, etc.. Privacy is a critical issue in many of these applications, how are we need to make sure that an unauthorized parties cannot read or modify messages

Cryptography is the transformation of readable and understandable data into a form which cannot be understood inorder to secure data. cryptography refers exactly to the methodology of concealing the content of messages, the word cryptography comes from the Greek word "Kryptos", that means hidden, and "graphikos" which means writing.

The information that we need to hide, is called plaintext , It's the original text, It could be in a form of characters, numerical data, executable programs, pictures, or any other kind of information, The plaintext for example is the sending of a message in the sender before encryption, or it is the text at the receiver after decryption

The data that will be transmitted is called cipher text , it's a term refers to the string of "meaningless" data, or unclear text that nobody must understand, except the recipients. it is the data that will be transmitted Exactly through network, Many algorithms are used to transform plaintext into cipher text

Cipher is the algorithm that is used to transform plaintext to cipher text, This method is called encryption, in otherwords, it's a mechanism of converting readable and understandable data into "meaningless" data.

The Key is an input to the encryption algorithm, and this value must be independent of the plaintext, This input is used to transform the plaintext into cipher text, so different keys will yield different cipher text, In the decipher side, the inverse of the key will be used inside the algorithm instead of the key.

Computer security it's a generic term for a collection of tools designed to protect any data from hackers, theft,corruption, or natural disaster while allowing these data to be available to the users at the same time. The example of these tools is the antivirus program.

Network security refers to any activity designed to protect the usability, integrity, reliability, and safety of dataduring their transmission on a network, Network security deals with hardware and software. The activity can be one of the following anti-virus and anti-spyware, firewall, Intrusion prevention systems, and Virtual Private Networks.

Cryptography Goals

By using cryptography many goals can be achieved, These goals can be either all achieved at the same time in one application, or only one of them.

These goals are:

1. Confidentiality: it is the most important goal, that ensures that nobody can understand the received message exceptthe one who has the decipher key.

2. Authentication: it is the process of proving the identity, that assures the communicating entity is the one that itclaimed to be. This means that the user or the system can prove their own identities to other parties who don't have personal knowledge of their identities.

3. Data Integrity: its ensures that the received message has not been changed in any way from its original form. Thedata may get modified by an unauthorized entity intentionally or accidently. Integrity service confirms that whether data is intact or not since it was last created, transmitted, or stored by an authorized user. This can be achieved by using hashing at both sides the sender and the recipient in order to create a unique message digest and compare it with the one that received.

4. Non-Repudiation: it is mechanism used to prove that the sender really sent this message, and the message wasreceived by the specified party, so the recipient cannot claim that the message was not sent. For example, once an order is placed electronically, a purchaser cannot deny the purchase order, if non-repudiation service was enabled in this transaction.

5. Access Control: it is the process of preventing an unauthorized use of resources. This goal controls who can haveaccess to the resources, If one can access, under which restrictions and conditions the access can be occurred, and what is the permission level of a given access.

Data Encryption: A data encryption is a random string of bits created explicitly for scrambling and unscrambling data. Data encryption is designed with algorithms intended to ensure that every key is unpredictable and unique. Cryptography uses two types of keys: symmetric and asymmetric. Symmetric keys have been around the longest; they utilize a single key for both the encryption and decryption of the ciphertext. This type of key is called a secret key. Secret-key ciphers generally fall into one of two categories: stream ciphers or block ciphers. A block cipher applies a private key and algorithm to a block of data simultaneously, whereas a stream cipher applies the key and algorithm one bit at a time.

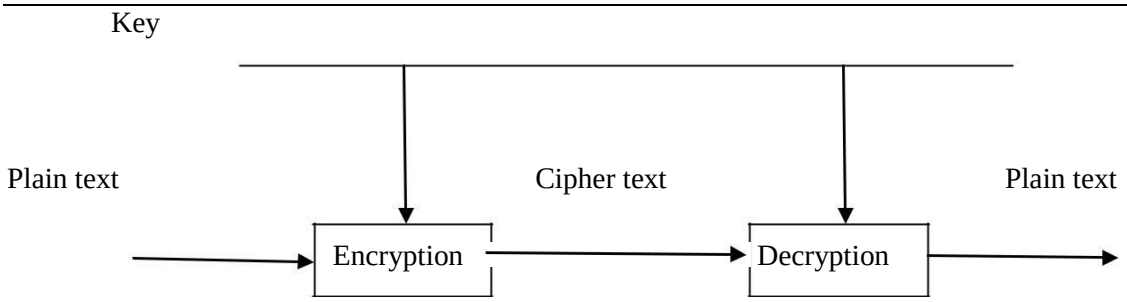
Most cryptographic processes use symmetric encryption to encrypt data transmissions but use asymmetric encryption to encrypt and exchange the secret key. Symmetric encryption, also known as private key encryption, uses the same private key for both encryption and decryption. The risk in this system is that if either party loses the key or the key is intercepted, the system is broken and messages cannot be exchanged securely.

Data Decryption

One of the foremost reasons for implementing an encryption-decryption system is privacy. As information travels over the World Wide Web, it becomes subject to access from unauthorized individuals or organizations. Decryption is the process of taking encoded or encrypted text or other data and converting it back into text that you or the computer can read and understand. This term could be used to describe a method of un-encrypting the data manually or with un-encrypting the data using the proper codes or keys. Encryption is the process of translating plain text data (*plaintext*) into something that appears to be random and meaningless (*ciphertext*). Decryption is the process of converting ciphertext back to plaintext

Symmetric Key Cryptography

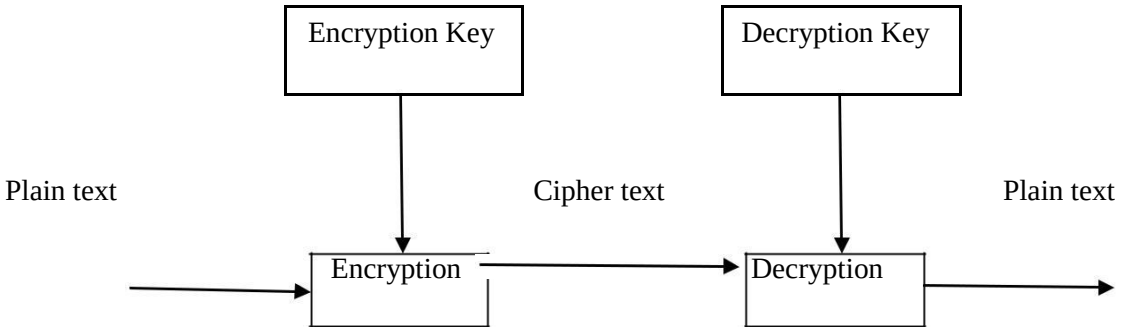
In symmetric key cryptography is also known as private-key cryptography, a secret key may be held by one person or exchanged between the sender and the receiver of a message. If private key cryptography is used to send secret messages between two parties, both the sender and receiver must have a copy of the secret key.



Symmetric Cryptosystem

Asymmetric Key Cryptography: In the two-key system is also known as the public key system, one key encrypts the information and another, mathematically related key decrypts it. The computer sending an encrypted message uses a chosen private key that is never shared and so is known only to the sender. If a sending computer first encrypts the message with the intended receiver's public key and again with the sender's secret, private key, then the receiving computer may decrypt the message, first using its secret key and then the sender's public key.

Using this public-key cryptographic method, the sender and receiver are able to authenticate one another as well as protect the secrecy of the message



Asymmetric Cryptosystem

COMPRESSION: Data compression offers an attractive approach for reducing communication costs by using available bandwidth effectively. Compression algorithms reduce the redundancy in data representation to decrease the storage required for that data. Over the last decade there has been an unprecedented explosion in the amount of digital data transmitted via the Internet, representing text, images, video, sound, computer programs etc

Data compression implies sending or storing a smaller number of bits. Compression is the reduction in size of data in order to save space or transmission time. Many methods are used for this purpose, in general these methods can be divided into two broad categories: Lossy and Lossless methods. Lossy Compression generally used for compress an images. In this original data is not identical to compressed data that means there is some loss e.g. Block Truncation Coding, Transform Coding, etc... Lossless Compression used for compress any textual data

CONCLUSION: Cryptography is used to ensure that the contents of a message are confidentiality transmitted and would not be altered. this paper describes compression techniques. Confidentiality means nobody can understand the received message except the one that has the decipher key, and "data cannot be changed" means the original information would not be changed or modified

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नटसम्राट एक नाटक आकलन – वि.वा. शिरवाडकर

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आप्पा (गणपत बेलवलकर) – मराठी साहित्याला ज्ञानपीठ पारितोषिकाचा बहुमान मिळवून देणाऱ्या वि. वा. षिरवाडकर या महान प्रतिभावंत कलावंताची नटसम्राट ही तितकीच श्रेष्ठ सुंदर नाटय कलाकृती आहे. नटसम्राट हे नाटक गणपतराव बेलवलकर या आप्पा म्हणजेच गणपतराव बेलवलकर आणि गणपतराव बेलवलकर म्हणजेच नटसम्राट म्हणुन नटसम्राट हे अप्पांचे नाटक आहे. ''नटसम्राट समिक्षा'' ग्रंथात स्वतः नाटककार षिरवाडकरच म्हणतात. ''हे नाटक मूलतः गणपतराव बेलवलकरांचे असल्यामुळे बाकीची पात्रे त्याच्याषी असलेल्या संबंधापूरती मर्यादित महत्वाची आहेत.'' म्हणजेच अप्पा ही या नाटकातील मध्यवर्ती व्यक्तिरेखा आहे. आणि या केंद्रस्थानाभोवती नाटकातील इतर पात्रे धरून उभे आहेत.

1) दोन भिन्न जगाचा रहिवासी – नटसम्राट मधील अप्पा हा नाटयकलेचा जीवन मानणारा एक महान कलावंत यष किर्तीची षिखरे सर करीत करीत अखेर नटसम्राट या गौरव षिखरावर पोहोचला. नाटयकलेचे जग हेच त्याचे वास्तव जग होते आणि वास्तव जग हेच त्याचे अवास्तव जग होते त्याची संपूर्ण जीवन निष्ठा, श्रध्दा आणि प्रेम रंगभूमिला बांधलेली होती. नटसम्राट पृष्ठ क्रमांक 20 पण खऱ्या पृथ्वीवर मी राहिलोच नाही माझी पृथ्वी वेगळी होती..... थेटर मधील अंतराळयान तोलून धरलेली चंद्र सूर्य नव्हे तर रंगमंचावरील दिव्याने प्रकाषित केलेले रूपया आण्याचे जमा खर्च या माझ्या जगात फारसे पोहोचलेच नाहीत हे आप्पांचे उद्‌गार त्यांच्या नाटकाला वाहिलेल्या जीवनाचे दर्षन घडवितात. परंतु वार्धक्य आल्यानंतर त्यांना आजवर अवास्तव वाटलेल्या लौकिक जगात प्रवेष करावा लागतो. तरूण भारत दिवाळी अंक 1978 मध्ये षिरवाडकर म्हणतात, नटसम्राट हा सर्वाधिकार संप्पन मुकूट मस्तकावरून आप्पा उतरवितात आणि वडिलधाऱ्या माणसाची काळी टोपी डोक्यावर चढवितात. कलात्मक जीवनाचे संदर्भ तुटून जातात या नव्या संसरात सगळे जवळचे (मुलगा,मुलगी,सुन,जावई) असूनही ते परकेच ठरतात. '' चौकोनी खुंटी गोल छिद्रात बसत नाही.'' येथेच त्यांच्या वास्तव जीवनातील षोकांतिकेला सुरूवात होते. कलावंताचे जीवन त्याला विसरता येत नाही आणि नव्या वास्तव जगाषी जुळवून घेणे अवघड होत रहाते. येथेच संधर्षाचे बीज पडते आणि षोकांतिकेची नांदी सुरू होते.

2) आप्पा संस्कार संपन्न नट – नटसम्राट नाटकाची सुरवात आप्पांच्या प्रदिर्घ स्वागताने होते. त्यांच्या कला जीवनात इतिहास त्यातून उलगडत जातो. या निवेदनात जाणवणारे आप्पा एक संस्कार संपन्न व समृध्द व्यक्तिमत्व असलेला नाटय कलेवर श्रध्दा असलेला रंगदेवतेचा पुजारी असे त्याचे व्यक्तिमत्व कलावंत म्हटले की लहरी, व्यसनी, अहंकारी, कलंदर वृत्तीचा असतो. असा एक समज आहे परंतु आप्पा तसे नाही. एक साक्षात्कारी नट असे त्यांचे व्यक्तिमत्व आहे. कवी मनाचा तत्वचिंतन आणि सभ्य असा हा माणूस जणू पारदर्षी पाण्याचा नितळ निर्मळ डोह ऋषीच्या अल्पतेने तो जगाकडे बघतो आहे असे वाटते हा कोणाच्या ही प्रेमात पडणारा नाही त्याच वेळी त्यांचे हे असामान्य व्यक्तिमत्व पाहून आपण पात्र त्यांच्या प्रेमात पडतो. '' नटसम्राट समिक्षा'' या ग्रंथात तारा – भवाळकर म्हणतात, ''आप्पा बेलवलकरांनी उभ्या आयुष्यात नाटकाषिवाय काहीही पाहीलं नाही, नाटकाषिवाय काहिही अनुभवले नाही.'' नोटा आणि नाण्यासाठी रोज रात्री तोंडाला रंग फसणारा तो पोटार्थी नट नाही तो तो सर्वार्थाने नटसम्राट व नट श्रेष्ठ कलावंत आहे.

3) जीवन हे खडतर तपष्चर्या – नटसम्राट हा सर्वश्रेष्ठ बहूमान मिळविण्यासाठी गणपतरावांना खडतर तपष्चर्या करावी लागली. वयाच्या 15 व्या वर्षी घराच्या चारी भिंती चार बाजुना कुजून पडल्या. डोक्यावर आकाषाचे छप्पर दिसायला लागले. सराई नसलेल्या वाळवंटातून वाटचाल करायला लावून पायाला

जाळीत होते. जमिन आणि मस्तकाला जाळीत होते आकाष पहिल्या अंकातील आप्पांच्या या स्वागतात त्याच्या रंगभूमी पूर्व जीवनातील दु:ख, यातनांचे प्रतिबिंब उमटले आहे. परंतु आप्पा चालत राहिले अदृष्यातून गुराख्यासारखे कोणीतरी मला हाकारीत होता.या जळत्या प्रकाषातच केव्हातर साक्षात्कार झाला. की आपल्याला जगायचे आहे ते रंगमंचावर प्रवेष केला. जीवनाचे देह आप्पांना सापडले. कलावंताच्या जीवनाचे दार उघउले.

4) कला साधन – नटसम्राट हा बहुमान मिळविण्यासाठी आप्पांना उग्र तपष्चर्या करावी लागली. नाटकाच्या जगात त्याने सर्वस्व अर्पण केले. नाटककार अभिनव कला आणि प्रेक्षक यातच देवता मानून श्रध्दा भावाने त्याची पूजा केली या मुळेच आप्पा मधला कलावंत घडत गेला. आप्पा सांगतात पुण्यातील प्रेक्षकांसमोर कांचन गडची मोहिना नाटकाची प्रतापरावांची भूमिका मी जीव ओतून केली आणि कलावंत या पदवीला पात्र झालो पुढे वेगवेगळया नाटकातून 40 वर्षे सतत रोज रात्री प्राण पणाला लावून त्याची विविध भूमिका जीवंतपणे साकार केल्या. नाटय रसीकाची मने जिंकली गणपतराव जोषी सारख्या नट सम्राटाचे श्रेष्ठत्व व षाबासकी मिळाली. लोकमान्यांचे आषिर्वाद मिळविले. कृ.पा. खडिलकर राम गणेष गडकरी या दैवतांने पाठीवर हात ठेवला. आप्पांचे कलावंत म्हणून जीवन असे कृतार्थ झाले. या सारे यष वैभवाचे गमक आहे. आप्पांची रंगभूमीवरची नितांत निष्ठा आणि अलैकिक अभिनय. तिसऱ्या अंकात एक प्रेक्षक दुसऱ्या प्रेक्षकाला म्हणतो. ॲथोल्लोची भूमिका गणपतराव बेलवलकरांनी केलेली तु पाहिली नाहीस! त्याच स्टेजवर पाउल टाकलें की, आफ्रिकेचे घनघोर जंगल मनामध्ये षिरत असे तो संताप उसळला की, वाटायचं स्टेजवर पेट्रोलची वारंवार धडाडून पेटली आहे. काय ती तीन्ही सप्कातून चित्यासारख्या धावणारा स्वर आहे. असे प्रेक्षकांना वाटायचं उगाच नाही. महाराष्ट्रानं नटसम्राट म्हणून त्यांना डोक्यावर घेतलं कोठे ते गौरी षंकर आणि कुठे ते वारूळ!(आजचे नट) पृष्ठ कमांक 80 – या प्रेक्षकांच्या संवादातून आप्पांच्या असामान्य अभिनयाचे आणि भूमिकेषी तन्मय होण्याचे हे दोन्ही गुण व्यक्त होतात. म्हणूनच आप्पांच्या भूमिका आणि त्यांचा अभिनय महाराष्ट्रातील नाटय रसिकांनी हृदयात कायमचा जपून ठेवला. पुढे रंगभूमिलच्या पडत्या काळात आप्पा आपल्या गावी गेले. पण नाटकाचे जग ते विसरले नाहीत. पुन्हा रंगभुमीला चांगले दिवस आले आणि नाटय रसिकांनी या नटश्रेष्ठाचा नटसम्राट म्हणून गौरव केला. त्यांची जीवनयात्रा कृतार्थ सफल आणि पूर्णतः झाली. भावी श्रध्दाळू आणि रसिक नटसम्राट नाटकातील प्रसंगीच्या आप्पांच्या संवादाचे निरिक्षण करतांना काही गोष्टी चटकन ध्यानात येतात. नमस्कार, ताईत, दंडे, दोरे, पूजा, अर्चा इ. कर्म कांडावर विश्वास ठेवणारे आप्पा भाविक वाटतात. तर ''कांचनगडची मोहिना'' या नाटकाच्या प्रयोगापूर्वी घाबरलेल्या आप्पांनी काकासाहेब खाडीलकरांच्या पायाला मिठी मारली व त्यांनी ओठातल्या ओठात आषिर्वाद दिला. त्यात आप्पांना भास असा झाला. दिषादिषांतून सदाषिवाच्या डमरूसारख तो आवाज मला ऐकू आला. सगळया भितीचा निचरा झाला. अंतरबाहय प्रकाषाने निथळून गेलो. हे आप्पांचे उद्‌गार त्यांच्या मनाचा श्रध्दाळूपणा दाखवतात तर बालगंधर्व विषय बोलतात आप्पा म्हणतात, '' बालगंधर्व म्हणजे फुटलाईटच्या प्रकाषात उगवलेले इंद्रधनुष्या'' हे आप्पांचे उद्‌गार त्यांच्या रसिक कृतीची साक्ष देते. विनोदी वृत्तीचा वत्सल पिता आप्पा नाटाकांच्या जगात भाग्यवान ठरले. नट म्हणून उदंड यष, मान, सन्मान, किर्ती, गौरव रसिकांचे अफाट प्रेम सारे सारे मिळाले. पण आप्पांच्या वास्तव जगात कुटुंब संसारात आप्पांचा पुर्णतः पराभव झाले वत्सल कृतीचा पिता नटश्रेष्ठाचा राजमुकुट उतरवुन कुटूंब किर्तीची काळी टोपी चढवितो आणि पहिल्याच अंकात आपल्या जवळ होते नव्हते ते सगळे मुलगा आणि मुलगी यांना देवून टाकले. नंदू आणि नलू या आपत्यांवर आप्पांचे जीवापाड प्रेम आहे म्हणून सत्कार प्रसंगी मिळालेली थैली ते मुलांना देवून टाकतात. आपल्या मुलाचा आणि मुलीचा आप्पा परिचर करून देतात तेव्हा त्यांच्या षब्दांमध्ये कौतुक षिगोषिग भरलेले असते. नेहमीच्या बोलण्यात सुध्दा आप्पा ब़ऱ्याच वेळ विनोदी उक्तीचे दिसतात. उदा. नलूकडे

गेल्यावर स्टेषनवर नोकर उषीराने येतो तेव्हा आप्पा म्हणतात, ''आम्हाला ताटकळत ठेवून नावाला जागलास बाबा!''

5) गोल छिद्रात न बसलेली चौकोनी खुंटी – कुटूंब कर्ता म्हणून आप्पांच्या जिवनास सुरवात होते. कुटूंब विषयाचे कौतुकाने प्रेम व्यक्त करतात. मुलाला प्लॉट घ्यायला पैसेही देतात. या पुढील म्हातारपण सुखात जाणर असे भविष्याचे सुंदर स्वप्न आप्पा पाहतात. '' म्हातारपण म्हणजे गुलाबकावलीचे फुल'' या त्यांच्या उद्‌गारात त्यांची भविष्याकालाविषयाची अपेक्षा स्पष्ट होते. नंदुच्या प्लॉटवर रहायला जातात. हळूहळू त्यांच्या स्वप्नांना तडे जावू लागतात. प्लॉट संस्कृतीषी जुळते घेण्याचा खुप प्रयत्न आप्पा करतात. परंतु त्यांना ते जमत नाही. हळुंहळु लाचारी , अपमान,अनादर,तिरस्कार त्यांना सहन करावा लागतो. कारण रंगभूमिवरील जगाचे आणि व्यवहारी जगाचे कायदे निराळे असतात.व्यवहारी जगाचे कायदे अप्पांना नाडीत असतात. आयुष्याला कडवटपण येत जातो. रंगभूमिवरचा हा सम्राट मूलाच्या घरात अडगळ होतो. '' महाबळेश्वरी मधाची बुदली'' असा आप्पांनी जीचा गौरव केला तीच सून असा मुलाने अपमानकारक ताडताड बोलू लागते. जर उंच आवाजात चहा मागितला तर ते ओरडणे होते. ठमीला ढालगज भवानी असे संबोधणारे आप्पा. आप्पांच्या मनातील ठमी विषयाचे प्रेम कोणालाच कळले नाही. ठमीषिवाय परंतू त्या प्लॉट संस्कृतीत ढालगज भवानी हे असंस्कृतपणाचे ग्राम्यतेचे लक्षण समजले गेले. एवढेच नव्हे प्रेमळ नातीला सून आप्पांपासून ओढून घेते. नोकराकडून सुध्दा अपमान सहन करण्याची पाळी या रंगभूमीच्या राजवर येते. मनाला भेगाच भेगा पडतात आणि अखेर मुलगा स्पष्ट षब्दात सांगतो. ''मी माझ्या पत्नीचा आणि संसाराचा बळी तुमच्या पायावर देणर नाही.'' इतका कडवट अपमान आघात सहन करावा लागतो. परंतू नवऱ्याचा अपमान कावेरी सहन करू षकत नाही. आप्पा मुलाचे घर सोडतात आणि मुलीकडे जातात. आता सत्तरी ओलांडलेली असते नव्हे थोडा भ्रमीष्टपणा आलेला असतो. आप्पांच्या भावविश्वात खळबळ उडालेली असते. ठमीला ते विसरू षकत नाहीत. म्हणुन तर रेल्वे स्टेषनवर गाडीच्या खिडकीषी उभी असलेली मुलगी पाहून आप्पा तीला ठमी समजतात. गाडी सुरू होते. आप्पा त्या भ्रमात गाडीकडे धावत राहतात. आप्पांच्या भविष्यातील हे खळबळजनक काव्या वाचकाचे अंतःकरण हालवते. ज्याच्या पासून प्रेम मिळायचे त्याच माणसांनी पाठ फिरवली. अपेक्षा भंगाचा जबरदस्त तडाखा आप्पांच्या मनाला हादरून टाकतो. मुलीकडेही यापेक्षा वेगळ वाटयाला येत नाही. नियतीच कुर झालेली असते की काय? कळवणकरांच्या भेटीचा प्रसंग घडतो. आणि आप्पांचे दैवत असलेल्या गणपतराव जोषीची कळवणकर टवाळी करतात. आप्पा सारे काही सोसतील परंतु त्यांच्या श्रध्दास्थानावर झालेला आघात ते कदापी सहन करणार नाही. कारण गणपतराव जोषी, खाडीलकर,गडकरी या दैवतांच्या आषिर्वादानेच आप्पांना नटसम्राट हा बहुमान मिळाला. इंद्राचे भाग्य लाभते. म्हणून संतापलेले आश्रयाला आपण रहात आहोत त्या आश्रयदात्याचा कळवणकर हस वरिष्ठ अधिकारी. आप्पा दीन होतात. लाचार होतात. पष्चात्तापाने पोळून निघतात. परिणमतः आप्पांची खजगी आउट हाऊस मध्ये खाजगी होते. मायेचे व स्नेहाचे संबंध दुरावतात. हा दुःखाचा दंष आप्पांना सहन करण्याची पाळी येते. पण काल कुटाचा जहरीपणा पुढेच असतो. आप्पांवर त्यांच्य प्राणप्रिय मुलीकडून चोरीचा आळ घेतला जातो. आणि आप्पा पुरते उध्वस्त होतात. कावेरी हा आघात सहन करू षकत नाही. या प्रसंगीही जिवनातील मोठे सत्य आप्पांच्या लक्षात येते. ''कोणी कुणचं नसतं एवढेच खरे '' अंतराळातील आप्ते आमच्या वासनेच्या जीण्यातून खाली येतात. आणि आम्ही बाप झालो पण कोणीच कुणाचं नसतं हे सत्य लक्षात येते आणि याच वेळी दुदैवाचा दहा अवतारही पूर्ण होतो. आप्पांना समजून घेणारी आणि सतत सावरणारी त्यांच्या जीवनातील तुळषी वृंदावन असणारी कावेरी मृत्युमुखी पडते. आप्पांच्या वाटयाला मात्र रामासारखा वनवासच आला. पण हा वनवास रामापेक्षा ही भयानक होता. रामाला वनवास भोगावा लागला तो तरूण पणी, वनवासात साथ मिळाली ती लक्ष्मणाची अन सीतेची. आप्पांना मात्र कावेरी षिवाय कोणाचीच साथ मिळाली नाही. अन वनवास आला तो वृध्दपणी सारी षक्ती संपल्यानंतर राम वनवास संपल्यानंतर परत

घरी येतो. पण आप्पांचा वनवास त्यांच्या मृत्युनंतरच संपतो. असा विदारक वनवास ज्याच्या वाटयाला आला त्या आप्पांची मागणी तर काय होती? त्यांच्याच भाषेत सांगायचं म्हणजे.

सुर म्हणतो साथ दे
दिवा म्हणतो वात दे
उन्हामधल्या म्हाताऱ्याला
फक्त तुझा हात दे

येथून पुढच्या आयुष्याचा विचार म्हणजे आप्पांच्या चिंधडया झालेल्या आयुष्याचा तपषील एक प्रचंड माणूस उध्वस्त झाला आणि हे गणपतराव नावाचे तुफान घराबाहेर उसळले. खऱ्या घराच्या षोधात ''कुणी घर देता का घर.'' म्हणीत अखेर आयुष्याची बरीच फरपट होते आणि आप्पा मुंबईत येतात. तिथे त्यांना भेटतो राजा खरा माणूस काळजाच्या कराराने आप्पांषी जोडलेला '' माणसे तगविली पाहीजेत''इतकी माणूसकी विषयाचे निष्ठा जपणारा. षेवटी मुलगा, मुलगी, जावई आप्पांना षोधून काढतात. आम्हाला क्षमा करा म्हणून आर्जव करतात. परंतु रस्त्यावर बरे वाईट होवू नये ही या प्रतिष्ठित माणसाला माहीत आहे भिती वाटते. अर्थात अखेर आप्पा आपल्याच षरीरातील महा पुरूषांना आवाहन करतात. असे आप्पांचे नाटक आणि जगण्याचे ही नाटक संपते.

आभाळ म्हणतं सावली दे
जमीन म्हणते पाणी दे
माळावरच्या म्हाताऱ्याला
फक्त तुझी गाणी दे
कावळा म्हणतो पंख दे
चिमणी म्हणते खोपा दे
माझ्यासारख्या आजोबाला
फक्त तुझा पापा दे

पण आप्पांना यातलं कधीच काही मिळालं नाही. ज्या एका नातीचं थोडे बहूत देण्याचा प्रयत्न केला तिचेही पंख छाटून टाकले जातात. कावळे, चिमण्या सुध्दा घरटे बांधतात. आपल्या पिल्लांसहीत सुखा समाधानांने त्यात राहतात. पण आप्पांना हे साध सुख सुध्दा मिळत नाही. पोराच्या जीवावर रिटायर झालेल्या आप्पांना षेवटी पोरांनीच रिटायर केलं..... पार या जगातून ना त्यांना कुणी हात दिला..... ना कुणी त्यांना पाणी दिलं..... मग सावली तर खुपचं दूर राहीली. म्हणूनच नटसम्राट ही जषी एक नटाची षोकांतीका आहे तषी ती एक वृध्दाची षोकांतीका आहे. असा हा नाटसम्राट गणपतराव बेलवलकर म्हणजे षोकांतीकेचे प्राणतत्व आहे. डॉ. व. दी. कुळकर्णी म्हणतात. आप्पा म्हणजे जे षुध्द सुंदर आहे त्यासाठी आत्मसमर्पण करणाऱ्या नायकाचा आत्मा घेवून उभा राहिलेला माणूस ते कुणाचेच नसतात ते असतात फक्त एक Living Sprit (जागृत आत्मा) प्रखर आणि लखलखीत असेल जे त्याच्या मुला मुलीच्या थिटया आकलना पलीकडच्या असतात. म्हणुनच आप्पांची षोकांतिका होते.

संदर्थ :–

1. *नाटक एक चिंतन – वसंत कानेटकर*
2. *षेक्सपिअरची षोकनाटये – परषूराम देषपांडे*
3. *नटसम्राट एक अभ्यास – प्रा. मो.द. ब्रम्हो*
4. *षोककारण मराठीत षोकांतिका – मनोहर माधव अळतेकर*

RESEARCH ON WIRELESS SENSOR NETWORK TECHNOLOGY

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Abstract
As wireless sensor technology improves; an increasing number of organizations are using it for a wide range of purposes. Zig Bee technology is a new standard in wireless personal area after Bluetooth. After an introduction to this technology, a new wireless meter-reading system based on Zig Bee protocol has evolved. This system, which is comprised of Zig Bee network and database management system, has many important advantages such as low cost, low power consumption, and low date rate. Wireless Sensor Network based on Zig Bee technology is a wireless network which is composed of many nodes of Zig Bee RF chip, sensor and MCU, especially suitable for application of the remote monitoring system in flammable and explosive environment.Fusion of RFID and Zig bee is also possible which turn out to be boon for wireless sensor network technology. A complete overview of wireless sensor network technology is given in this paper. Wireless sensor network technology has become one of technological basic needs of us.

INTRODUCTION: With the development of network and communication technology, the inconvenience of wiring is solved with WSN into people's life; especially it has wide perspective and practicability in the area of remote sensing, industrial automation control, and domestic appliance and so on.WSN has good functions of data collection, transmission ,and processing. It has many advantages compared to traditional wired network, for example, convenient organizing network, small influence to environment, low power dissipation, low cost, etc. At present, near field wireless communication technology has been used widely ,especially Bluetooth, wireless local area network(WLAN),infrared, etc. But, they have a number of disadvantages, for example, complexity, large power dissipation, short distance ,networking in small scale. In order to satisfy the demand of low power dissipation and low speed among wireless communication devices, a new type of wireless net technology-Zig bee emerges as the times require. In this paper, we will introduce the networking technology and application of Zig bee. How Zig bee & RFID combination can be used in applications. In this paper first Zig bee is explained, then its advantages application and finally its fusion with RFID along with applications is discussed.

ZIGBEE TECHNOLOGY: Zig Bee is new wireless communication technology with short distance, low complexity, low energy consumption ,slow data rate and low cost, and it is based on IEEE 802.15.4 Standard with the capacity of coordinating mutual communication among thousands of tiny sensors. Through the radio waves, these sensors can transmit the data from one sensor to another with small energy cost and high efficiency. Compared with various existing wireless communication technology, Zig Bee technology has the lowest energy consumption and cost. Because of the slow data rate and the small range of communication, Zig Bee technology is extremely suitable for agricultural field which has small amount of data flows. The technical features of this technology also make it the best choice for wireless sensor networks.

Zig Bee has the following features. Zig Bee uses a variety of power-saving modes to guarantee that it could be used for at least six months to two years powered by two AA batteries. Zig Bee uses the avoidance collision mechanism in CSMACA and pre-set a prior particular time slot for a fixed bandwidth communications service in order to avoid competition and conflict when sending data.

Zig bee has self-organizing features that one node can sense other ones without any human interventions, and connect with each other automatically to create a completed network. It also

obtains self-recovery function that the network can repair itself when a node is added or deleted, the position of a node is changed, or a breakdown occurred. It also can adjust the topology structure to ensure that the whole system can work normally without any human interventions.

III. BASIC NETWORK STRUCTURES: Zig bee supports multiple network structures, which mainly include star, tree, and mesh network, shown in Fig .They are composed of the Coordinator, the uter, and trend device.The Coordinator and the router need full function (FFD), but the end device could select either full function device (FFD) or reduced function device (RFD).RFD is only used to acquire data information and transmit the information to its parent node; it is not used to finish the work such as data transmission, route discovery, and route maintenance. The responsibility of RFD is used for building a new network, transmitting network beacon managing nodes in the network, and storing network information, etc. Star network is composed of a Coordinator and an end device or multiple end devices, the end device could only communicate with Coordinator, it cannot communicate with end device, so star network is called single-hop network. The tree network and mesh network have routing function, so they are called multi-hop network. Following Fig. The architecture of Zig bee network.

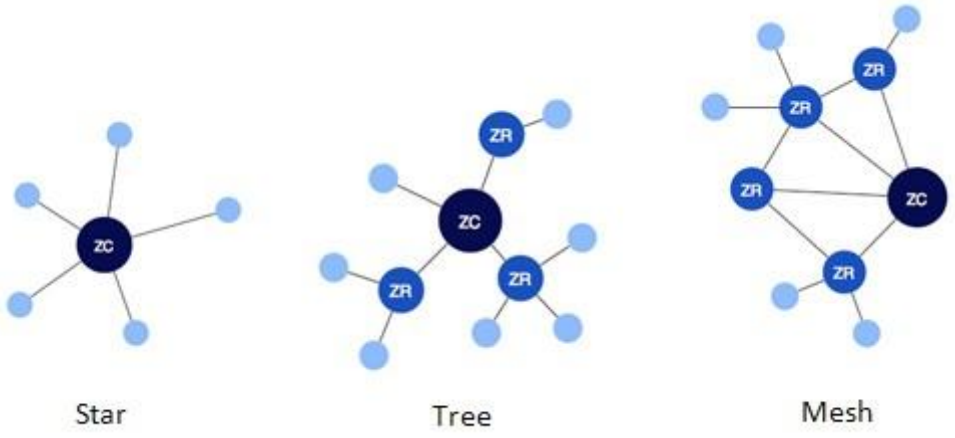


Fig.1.The architecture of zigbee network

THE FUSION OF RFID AND ZIGBEE

RFID is a non-contact automatic identification technology that uses radio frequency signals automatic recognizes target and access to relevant data. The identification work does not require human interference and can work in variety of harsh environments. But if there is no network to transmit data, it will be difficult to play its advantage. Under the influence of environmental conditions, the traditional wired network may not be a better way to achieve. The feature of wireless sensor network is no center and self-organize, it is a powerful complement of RFID, and

can solve the drawback of poor anti- interference, the effective transmission distance short. Based on the Zig Bee technology and the RFID technology of information-fusion technology: the former used to monitor the target environment conditions, the latter used to identify target objects. Complementary and interdependent of the technology can effectively solve the problem of RFID data transmit in the mine and can also better perceive the safety hazard exists in coal mine Fig. 2 The fusion technology of wsn and RFID *Base on the Integration of WSN and RFID Technology to Solve the Problem of Mine Safe* The combination of Zig Bee wireless sensor networks and RFID technology, make up for the drawback of short transmission distance of the RFID which can also solve some of the following problems.

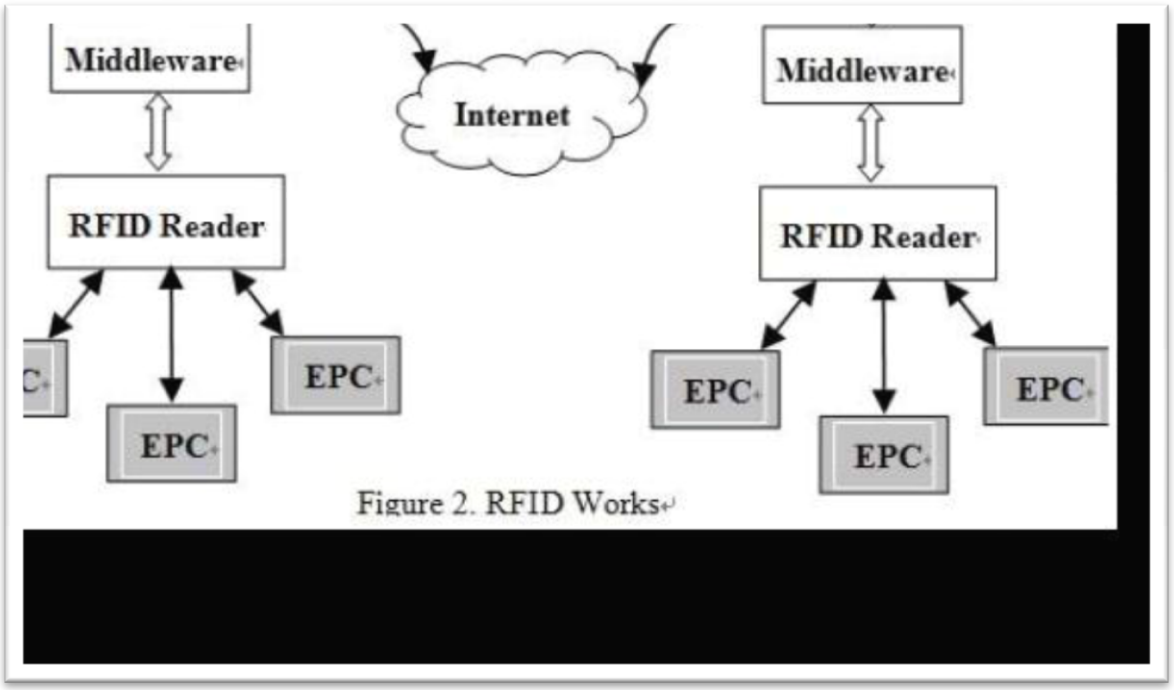


Figure 2. RFID Works

APPLICATIONS OF WSN

Zig bee wireless communication technology has wide perspective, Zig bee will be used in a couple of years in the area of industry control, industrial wireless location, home network, building automation, medical equipment control, mine safety, etc, especially home automation and industry control will be the main application fields. Zig bee wireless communication is applied in families. With the development of people's life, the concept of smart home and home automation is well known, but it must relate to the transmission of information and signal if it comes true, so it is troublesome to wire cables. Zig bee is a new short-range technology for wireless communication, it is specially designed for applications of wireless communication of low speed and low power dissipation, and it is ideally suited for establishing family wireless net. It is effortless to realize home temperature regulation, remote control of interior lighting systems,and automatic adjustment of certain. Zig bee wireless communication technology is applied in meter reading system in the monitoring center just needs to analyze and calculate data acquired from users and obtain electricity consumption of users. After that, electric charge of the month is deducted from electricity account of users, the workers who is obliged to read the meter in user's home,the thing that users are not at home when workers are to read the meter is avoided.Compared to working real-time human-machine interface can be provided for worker.

CONCLUSION: Zig bee designed for sensor and controls network. Used for application that require low power consumption,low data rate and network security. It is high density nodes per network,it has low cost and low data rate. As a new wireless protocol in personal area, Zig Bee has its unique characteristics including low cost, low data rate, and low power consumption which corresponds to a large market. This paper provides an application in the field of building automation.

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TO STUDY IMPACT OF PRESENCE OF VEGETABLE EXTRACT AND NON VEGETABLE EXTRACT DURING GERMINATIONN PROCESS ON GREEN MONG

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Abstract
To study the seed germination of Green mong under the aqueous extract of plant and animal origin of 1%, 5%, 10% and 20% concentration are used. The germination of seeds per day percentage of germination, average radical length and average plumule length in cm are parameters under study. The germination is more in control than treated seeds. Either plant extract or animal extract treatment is non stimulating and harmful to germination process in general. The effect of animal extract is very harmful than the plant extract treatment. Seed germination percentage is more in control than treatment. The seed germination percentage is more affected in aqueous extract of animal origin than plant origin. In both the treatment as the concentration increases, the maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin average radical length is affected due to the treatment. The treatment of aqueous extract of prawn is more is destructive than the aqueous extract of spinach. There is adverse effect of aqueous extract of plant origin (spinach) and prawn on average plumule growth of Green mong seeds. Amongst the both treatment, aqueous extract of plant origin (spinach) shows less harmful

Introduction- Green mong belongs to family fabaceae. It is annual plant with yellow flowers and fuzzy brown pods. Seed are having great nutritional values. According to USDA database, Green moong contain high fibers, Proteins, Carbohydrates, Vitamins A, vit B6, Vit C, Vitamin k, Phosphorous, Magnesium, Copper, Iron and Zinc. Importantly Mung beans are composed of about 20%–24% protein. Globulin and Albumin are the main storage proteins found in Mung bean seeds and make up over 60% and 25% of the total mung bean protein, respectively[1,2]. Mung beans are a good source of protein for the vegetarian's Mung bean protein is rich in essential amino acids, such as total aromatic amino acids, leucine, isoleucine, and valine, [3]. Green mong seeds are having great medicinal values the mung bean was recorded to be beneficial in the regulation of gastrointestinal upset and to moisturize the skin [4] The seeds and sprouts of mung beans are also widely used as a fresh salad vegetable or common food in India [5]. Mung beans can also be made into products like soups, porridge, confections, curries, and alcoholic beverages. In western cultures, mung bean sprouts are popularly used as a fresh salad vegetable [6]. As a food, mung beans contain balanced nutrients, including protein and dietary fiber, and significant amounts of bioactive phytochemicals. High levels of proteins, amino acids, oligosaccharides, and polyphenols in mung beans are thought to be the main contributors to the antioxidant, antimicrobial, anti-inflammatory, and antitumor activities of this food and are involved in the regulation of lipid metabolism [7, 8, 9, and 10] Germination is thought to improve the nutritional and medicinal qualities of mung beans [11]. Mung beans are a diabetic friendly food as they have a low GI. The energy offered by mung beans and sprouts is lower than that of other cereals, which is beneficial for individuals with obesity and diabetes [12,26]. Extracts of Moong beans improve glucose tolerance and increased insulin immunoreactive levels [13]. Trypsin inhibitors, hemagglutinin, tannins, and phytic acid found in the mung bean have also been reported to have biological functions, promoting digestion and eliminating toxins [14]. Mung and other beans

have protease inhibitors in them. These protease inhibitors are known to prevent cancer. They block and prevent the formation of cancerous cells and tumor cells Mung beans have been shown to exert antitumor effects through several different mechanisms [15].

Mung beans have zero cholesterol and are rich in soluble dietary fiber. Foods that are rich in soluble fibre are known to be helpful in lowering the "bad" LDL cholesterol. In order to reduce the amount of LDL cholesterol in the body it is advised to consume 10 to 25 g of soluble dietary fiber each day. Enzymes, peptides, and polyphenols extracted from mung beans have been shown to possess both antimicrobial and antifungal activities [16]. However, there are no scientific studies on the influence of aqueous extract of plant origine and animal origin of varying concentration on seed germination in Green mong. Miransari and Smith(2014) said that seed germination is an important process affecting crop production , and is influence by range of factors, including enzymes and hormones[17]. Seed germination is simple and non destructive technique for measuring plant biochemical growth and development. Therefore seed germination, germination percentage, radical length and plumule length are considered for understudy. The number of seed germinates per day, germination percentage of seed; radical length and plumule length on 10^{th} day are the parameters consider to study. The treated petri dishs (6^{th}, 7^{th} , 8^{th} and 9^{th}) with 10 seeds of Green mong each treated with adequate amount of aqueous extract of prawn of 1% , 5% ,10% and 20% for 10 days to study the seed germination of Green mong the germinate per day, germination percentage of seed and plumule length on 10^{th} day of treatment are parameters consider for study. The entire process repeated for next 10 days. The observation are taken as an average of both the replicas.

MATERIAL AND METHOD

Green Mong are collected, placed ten each set of 9 Petri dishes. Each Petri dish is placed with normal blotting paper at bottom. First Petri dish is treated as control. It is poured with adequate distill water daily. Next four petri dish are treated with adequate amount of aqueous extract of plant (spinach leaves) remaining four petri dish are poured and treated with adequate amount of aqueous extract of animal origin (dried prawn). The control and treated petri dishes with 10 each Gram seed are under 10 day's observation. It was to study the seed germination of Green mong under the aqueous extract of plant and animal origin.

For aqueous extract of plant origin preparation weight to volume ratio is consider for 1% aqueous extract of plant origin , 1 gm fresh spinach leaves homogenized with 100 ml distill water. The content is filter through the normal filter paper. The filtrate is used as 1% aqueous extract of plant origin, similarly 5% , 10% and 20% aqueous extract of plant origin is prepared daily freshly . Thus 1%, 5%, 10% and (w/v) concentrated aqueous extract of plant origin is prepared.

For aqueous extract of animal origin preparation, weight to volume ratio is considered for 1% aqueous extract of animal origin, 1 gm of dried prawn homogenized with 100 ml distill water. The content is filter through normal filter paper. The filtrate is used as 1% aqueous extract of animal origin. Similarly 5%, 10% and 20% aqueous extract of animal origin prepared daily freshly. Thus 1%, 5%, 10% and 20% (w/v) concentrated aqueous extract of plant origin is prepared.

The treated petri dish of Green mong treaed with aqueous extract of plant origin and animal origin of 1%, 5%, 10% and 20% for 10 days to observe seed germination of Green mong.

RESULT AND DISCUSSION:-

Table 1. Number of seed germination 1 day of Green mong due to treatment of aqueous extract of plant and animal origin.

Petri dish Number	Treatment		Number of seed germination/ day.									
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
1	Control	1	0	5	7	7	8	10	8	6	6	6
2.	Spinach Extract	1%	0	0	8	10	10	10	9	9	8	8
3.		5%	0	0	8	8	8	9	9	9	7	7
4.		10%	0	0	9	9	9	10	10	10	9	9
5		20%	0	0	2	2	3	3	3	3	2	2
6.	Control	2	0	5	9	10	10	10	7	7	6	6
7.	Prawn Extract	1%	0	0	10	10	10	10	8	8	5	5
8.		5%	0	0	9	9	9	8	8	8	5	5
9.		10%	0	0	9	9	8	8	6	6	6	6
10.		20%	0	0	0	1	3	3	3	3	2	2

From Table-1, it is clear that the germination of seeds of Green mong starts on second day in control. There is no germination in 1% of plant extract and there is germination on animal extract. Germination of seed increases on day to 10^{th} day. Maximum germination of nine seeds on 10^{th} day in control as well as 1%, 5% and 10% respectively the 20% animal extract (prawn extract) treated seeds shows less germination even on 10^{th} day. In 5%, 10%, 20% plant extract treated seed germination is more as compare to the control after fifth day. In 5%, 10% prawn extract treated seeds the germination of seeds is less. It is almost non-significance.

From Table-1 it is clear that the number of seeds germination third to nine days in control and 1% plant extract treated seeds that 1% plant extract shows more germination than control seed. It may conclude that 1% plant extract stimulates the germination in Green mong.

The overall conclusion from discussion is to draw as the germination of seed of Green mong is somewhat more or less in control than treated seed. It means either plant extract treatment or animal extract treatment is non stimulating and harmful to germination process, except the 1%, 5%, 10% plant extract. The effect of animal extract is harmful than the plant extract treatment.

Table-2. Seed germination percentage of Green mong after treatment of

Petri dish Number	Treatment		Number of seed germination/ day.									
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
1	Control	1	00	50	70	70	80	100	80	60	60	60
2.	Spinach Extract	1%	00	00	80	100	100	100	90	90	80	80
3.		5%	00	00	80	80	80	90	90	90	70	70
4.		10%	00	00	90	90	90	100	100	100	90	90
5		20%	00	00	20	20	30	30	30	30	20	20
6.	Control	2	00	50	90	100	100	100	70	70	60	60
7.	Prawn Extract	1%	00	00	100	100	100	100	80	80	50	50
8.		5%	00	00	90	90	90	80	80	80	50	50
9.		10%	00	00	90	90	80	80	60	60	60	60
10.		20%	00	00	00	10	30	30	30	30	20	20

Seed germination percentage of Green mong after treatment of aqueous extract of plant and animal source origin is seen in Table 2.It shows the seed germination percentage per day up to ten days of

experiment for control and treated conditions from the table. It is clear that seed germination percentage maximum on 10th day of treatment in control aqueous plant extract treated as well as animal extract treated seed in control. The seed germination percentage is 50 on 2nd day in control. However it is interested to note that it is zero percentage in both treatment .It 70% in control while 80% and 80% in 1% and 5% plant extract treatment seeds. It seems to stimulating effect of plant extract on germination percentage. The seed germination percentage is 90% and 20% each on 10th day in 10% and 20% respectively plant extract treatment. In aqueous extract of plant origin it is hardly 100, 90%, 90% and 0% in 1%, 5%, 10% and 20% treatment respectively. It is to conclude that seed germination percentage is somewhat more or less control than treatment amongst the treatment unclear study; the seed germination percentage is more effect in aqueous extract of animal origin than plant origin. In both the treatments the concentration increases somewhat or less the adverse effect on seed germination increases. The maximum adverse effect is seen at 20% concentration of aq extract of animal origin.

Table- 3. Average radical length on 10th day of treatment in Green mong, after treatment of aqueous extract of plant and animal origin.

Treatment	Concentration	Average radical length on 10th day of treatment
Control	-	0.3
Aqueous extract of plant Origin (spinach extract control)	1% 5% 10% 20%	0.2 0.2 0.1 00
Control	-	0.3
Aqueous extract of Prawn	1% 5% 10% 20%	0.1 0.1 0.1 0.0

From Table 3, it is clear that control seeds of green mong shows average radical length which is maximum (0.3 cm) than 0.2, 0.1, 0.1, 0 cm of aqueous extract of plant origin treated seeds with 1%, 5%, 10% and 20% concentration respectively. It means the average radical length is more in plant extracts treated seeds. It is decreasing as the concentration of spinach extract goes on increasing similarly from the table. It is also seen that the average radical length 0.1 cm at 1% aqueous extract of animal origin (prawn) treated seeds. It is 0.1 cm for 5% and 10%, and it is 0cm for 20% treated seeds. Above observation are arrived at conclusion that the average radical length is affected due to the treatment with aqueous extract of spinach and prawn. The treatment of aqueous extract of animal origin is more destructive than aqueous extract of spinach.

Table-4- Average plumule length on 10th day of treatment of aqueous extract of spinach and prawn.

Treatment	Concentration	Average plumule length on 10th day of treatment(cm)
Control	-	0.2
Aqueous extract of spinach	1% 5% 10% 20%	0.1 0.0 0.0 0.0
Control	-	0.2
Aqueous extract of Prawn	1% 5% 10% 20%	0.1 0.1 0.0 0.0

Table-4. Depicts the average plumule length on 10th day of treatment in control and treated seeds of Green mong. It is noted that 0.2 cm is maximum average plumule length seen in control seed . 0.1 cm,0 cm, 0 cm,0 cm is average growth of plumule in aqueous extract of spinach treated seeds at 1 %, 5%, 10% and 20% concentration respectively. The aqueous extract of prawn treated seeds of Green mong are showing the average plumule length as 0.1cm, 0.1cm, 0cm and 0cm for 1%, 5%, 10% and 20%. Means no plumule growth at all for 10% and 20% concentration of aqueous extract of prawn. This discussion conclude that there is adverse effect of aqueous extract of animal (prawn) on plumule growth of Green mong seeds. Amongst the both treatment, aqueous extract of plant origin shows less harmful than prawn extract [17,18,19]

C. Beasse (2000) studied effect of epidemics of mycophaerella pinocles on crop growth radiation interception efficiency (PIE) and radiation use efficiency by dispersion on ground of pea. Which decrease the photosynthesis in leaves [20].

Dry seeds do not germinate. Water is an essential factor to trigger off the process of seed germination. Shortage of water at any stage of plant growth usually results in a reduction in vegetative growth but many annual crop plants are sensitive changes in soil moisture condition during the period from flower initiation to the development of full flower [21-23].

Heat cultivation and micronutrient coupling are two relatively unknown methods that are used to increase the yield and size of the seed. Recent research has indicated that a combination of heat treatment along with the two vital micronutrients, phosphorus and nitrogen, are the most critical components to increasing the overall yield of Cicer arietinum[21]. Unlike other food crops, the perennial seed shows a remarkable capacity to change its nutritional content in response to heat cultivation. Treating the seed with a constant heat source increases its protein content almost threefold [21]. Consequently, the impact of heat cultivation not only affects the protein content of the seed itself, but the ecosystem that it supports as well. Increasing the height and size of seed plants involves using micronutrient fertilization with varying doses of inorganic phosphorus and nitrogen [22].

Temperature affects cellular metabolic and growth rates. Seeds from different species and even seeds from the same plant germinate over a wide range of temperatures. Seeds often have a temperature range within which they will germinate, and they will not do so above or below this range. Baskin, Carol C and Jerry M (2014) shows that variation in Seed Dormancy and Germination within and between Individuals and Populations of a Species [23].

Light or darkness can be an environmental trigger for germination and is a type of physiological dormancy. Most seeds are not affected by light or darkness, but many seeds, including species found in forest settings, will not germinate until an opening in the canopy allows sufficient light for growth of the seedling.

When the seed imbibes water, hydrolytic enzymes are activated which break down these stored food resources into metabolically useful chemicals.[24]. Oxygen is required by the germinating seed for metabolism.[25]. Oxygen is used in aerobic respiration, the main source of the seedling's energy until it grows leaves [24]. Oxygen is an atmospheric gas that is found in soil pore spaces, if a seed is buried too deeply within the soil or the soil is waterlogged, the seed can be oxygen starved.

CONCLUSION: To study the seed germination of Green mong under the aqueous extract of plant and animal origin of 1%, 5%, 10% 20% Concentration are used. The germination of seeds per day percentage of germination, average radical length and average plumule length in cm are parameters under study. The germination is more in control than treated seeds. Either plant extract or animal extract treatment is non stimulating and harmful to germination process in general. The effect of animal extract is very harmful than the plant extract treatment. Seed germination percentage is more in control than treatment. The seed germination percentage is more affected in aqueous extract of animal origin than plant origin. In both the treatment as the concentration increases the maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin average radical length is affected due to the treatment. The treatment of aqueous extract of prawn is more is destructive than the aqueous extract of spinach. There is adverse effect of aqueous extract of plant origin (spinach) and prawn on average plumule growth of Green mong seeds. Amongst the both treatment, aqueous extract of plant origin (spinach) shows less harmful.

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INDIAN LIFE INSURANCE INDUSTRY OVERVIEW & IT'S HUMANITIES

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Introduction: - India has adopted the policy of liberalization, privatization, & globalization (LPG) in 1990's and transferred the traditional market mechanism to the threshold of a free market philosophy. Naturally, the Insurance sector is also not a exception to this change. Insurance sector in India was liberalized in March 2000 with the passage of the Insurance Regulations & Development Authority (IRDA). This has lifted the entry restrictions for private players and allowing foreign players to enter the market with some limits on direct foreign ownership. The potentials for growth of insurance industry in India is immense as nearly 80% Indian population is without life insurance cover while health insurance and non-life insurance continues to be well below international standard.

OBJECTIVES OF THE STUDY

The person Research study is carried out with the following objectives in view

1) To study the Indian Life Insurance Industry Overview & It's Social Responsibility 2) To study the spread Life Insurance widely and in particular to the rural areas and to the socially and economically backward classes.

RESEARCH METHODOLOGY

Secondary data also collected from various websites are as follows.

The said Research study is based on the secondary data. For this propose the researcher studied the various reference books on commerce, Economics, management & Insurance. The researcher also studied the various reports published by the LIC as well as other financial institutions

Reform of Insurance Sector:- The first step towards insurance sector reforms was taken in 1993 with the formation of Malhotra Committee, under the Chairmanship of former Finance Secretary & RBI Governor Mr. R.N.Malhotra. The Committee was formed with an object to evaluate the Indian insurance industry & recommend its future direction in the free market economy. This committee has made the important recommendations on Structure, Competition, Regulation Investments, Customers Services, etc. Some of the very important recommendations have focused below:-

1) An Insurance regulatory body should be set up.
2) Controller of insurance should be made independent.
3) Govt. stake in the insurance companies to be brought down to 50%.
4) All the insurance companies should be given greater freedom to operate.
5) Private Companies with minimum paid up capital of Rs. 1 billion should be allowed to enter the industry.
6) Foreign company may be allowed to enter the industry in collaboration with the domestic companies.
7) No Company should deal in both life & General Insurance through single entity.
8) Mandatory Investments of LIC Life Fund in Govt. securities to be reduced from 75% to 50%.
9) Insurance Company must be encouraged to set up Unit Linked Pension Plans.
10) Computerization of operation & updating of technology to be carried out.

Opening up of Insurance Sector to Private & Foreign Players:-

LIC had a monopoly from 1956 to 200; that is for 44 years. The Insurance industry has been thrown open to competition. A number of big companies of the world have entered the Indian insurance market in joint venture with one or other domestic business group as shown below:-

Life Insurers in Private Sector

1. SBI Life Insurance
2. Metlife India Life Insurance
3. ICICI Prudential Life Insurance
4. Bajaj Allianz Life
5. Max Life Insurance
6. Sahara Life Insurance
7. Tata AIG Life
8. HDFC Standard Life
9. Birla Sunlife
10. Kotak Life Insurance
11. Aviva Life Insurance
12. Reliance Life Insurance Company Limited - Formerly known as AMP Sanmar LIC
13. ING Vysya Life Insurance
14. Shriram Life Insurance
15. Bharti AXA Life Insurance Co Ltd
16. Future Generali Life Insurance Co Ltd
17. IDBI Fedaral Life Insurance
18. AEGON Religare Life Insurance
19. DLF Pramerica Life Insurance
20. CANARA HSBC Oriental Bank of Commerce LIFE INSURANCE
21. IndiaFirst Life Insurance Company
22. Star Union Dia-ichi Life Insurance Co. Ltd

Present Scenario in Insurance Sector:-

The Indian economy has been growing rapidly and the growth is continued during 2005-06. There has been sustained manufacturing activity and impressive performance of the service sector. The industrial sector increased by 7.6 percent and the service sector maintained a higher growth of 10.3 percent. The agricultural and allied activities registered a growth of 3.9 percent. Thus, the growth in real GDP was 8.4n percent during 2005-06 as against 7.5 percent in 2004-05. Within service sector, finance, insurance real estate has shown improved performance. The opening up of the insurance sector has contributed favorably to industrial growth. GDP from insurance sector is increased to 19.3 percent in 2004-05 from 12 perce3nt in 200-01.

The premiums underwritten in India & abroad by life insurers in 2005 - 06 increased by 27.78 percent which was higher than the growth in 2004-05 i.e. 24 .31 percent. It has shown an increase in the non-life insurance also from 11.57 percent to 15.61 percent for corresponding period. First year premiums including single premiums recorded a growth of 47.94 percent because of significant performance in the unit- linked business.

Social Responsibility of Life Insurance Corporation of India(LIC)

The present study covers in depth approach towards behavior of stakeholders regarding Social Responsibility policies adopted and implemented by Life Insurance Corporation of India It is a case study of Life Insurance Corporation of India's Social Responsibility approach. The current governance in Life Insurance Corporation of India is the result of privatization of the sector. Therefore, there is a need to have the complete analysis of the corporation from social point of view.

As a country we face several problems and complexities. Several villages lack primary education, health care, drinking water and transport facility. Corers of people live below poverty line. In such a scenario it is necessary for our corporate to act responsibility and contribute towards social upliftment and well-being.

Conclusion:-There is a need of greater efforts in extending the benefits of insurance to the rural areas in the coming years. The public sector insurer has to take a lead in this regard because of their market share and geographically spread up net work. The private companies also requires to intensify their efforts in extending the benefits of insurance in rural areas. IRDA has notified Micro Insurance regulation facilitating insurer to tap the potentials of rural markets. As per these regulations, Non-Government Organizations (NGO) Micro Finance Institutions (MFI) and Self Help Group (SGP) have been recognized as micro insurance agents. It would facilitate penetration of insurance to rural & remote areas. In nutshell, Insurance sector in India has tremendous potentials for expansion. It is found that, in India out of every 100 peoples only 22 to 23 have been insured, which means that at least 77 people are not insured. With a large population & untapped market, insurance happens to be a big opportunity in India. Though, the premiums volume is increasing, the insurance penetration in the country is low. Insurance penetration or premium volume as a share of country's GDP for the year 2005 stood at 2.53percent for life insurance and 0.62 percent for non-life insurance. Rising middle class households is a potential for insurance industry in India. The penetration ratios of health and other non-life insurance in India is also very low as compared to international standards. These facts indicate immense growth potentials of the insurance sector. In brief, the opening up of the insurance sector has led to rapid growth of the sector. The potentials for growth of insurance industry in India is very high because of large population & untapped market along with increasing per capita income and saving habits of the people.

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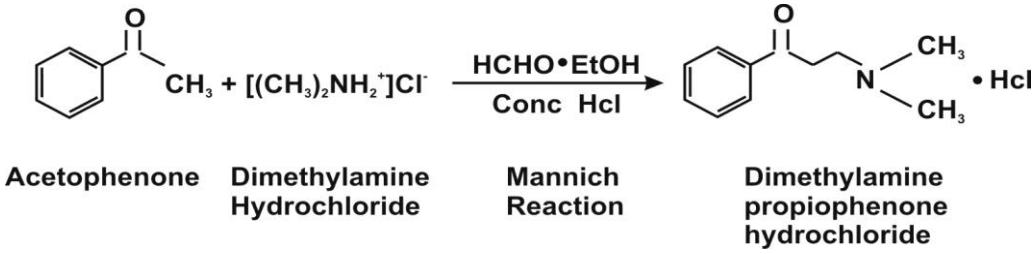
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AMINE EXCHANGE REACTIONS OF MANNICH BASES WITH AROMATIC AMINES IN IONIC LIQUIDS

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Abstract
Mannich reaction has found to have wide range of applications in synthetic and pharmaceutical fields. The efficiency of a chemical synthesis can be nowadays measured, not only by parameters like selectivity and overall yield, but also by its raw material, time, human resources and energy requirements, as well as the toxicity and hazard of the chemicals and the protocols involved. The use of Ionic liquids as a medium for organic reactions instead hazardous chemicals contribute to the development of environmentally friendly processes.In the present study, amine exchange reactions of Mannich bases with aromatic amines in room temperature ionic liquids were carried out to form aromatic amine Mannich bases with high yields.
Keywords*:MannichBase, Ionic liquids, Amine Exchange*

INTRODUCTION: The condensation of compound containing active hydrogen and ammonia or primary or secondary amines usually as their hydrochlorides (HCl being used as catalyst) to form amino methyl or substituted amino methyl derivatives is known as Mannich reaction. The base called Mannichbase, is usually isolated as its hydrochloride. Aryl amines do not normally respond to this reaction.



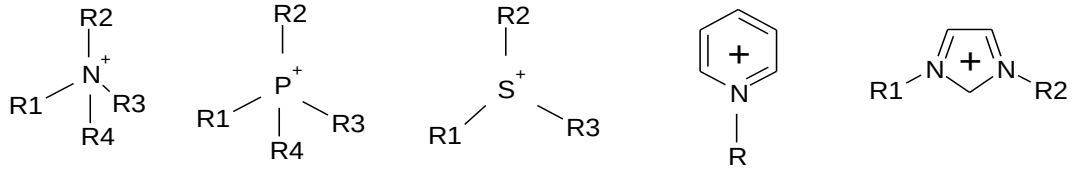
Many important natural products, especially alkaloids have been synthesized by this reaction. A classical example is Robinson's synthesis of tropinone by a double Mannich condensation and subsequent synthesis of atropine. Tuctacaine, a commercially useful anesthetic is prepared by this reaction.The amino acid, tryptophan is synthesized from the quaternary salt of gramine and acetamidomalonic ester.

Besides the common alkyl amines employed ever since the early work of Carl Mannich, more recent research in the synthesis of Mannich bases has proved that less common alkyl amines (mainly used with a view to creating pharmacologically active products), amino acids or phthalimide can be successfully used as amine components in direct amino methylation reactions. The amine exchange reaction between an alkyl amine Mannich bases and aryl amines also offers easy access to aryl amine Mannich bases in high yield under mild reaction conditions. This method, firstly introduced by Singh and later improved by Cymerman- Craig still is in spite of recent progress, a valuable preparative way for obtaining aryl amine Mannich bases.

Despite the impressive progress achieved in the amine exchange reactions there is still room for improvement, especially towards developing a novel green procedure with the rapid development in the field of synthetic chemistry, the researchers have started to pay more attention to detrimental effect on non-green processes to the environment. Carrying out organic reactions in green solvents has become highly desirable due to detrimental effect of toxic solvents to the environment.

The use of Ionic liquids as a medium for organic reactions would greatly contribute to the development of environmentally friendly processes.

Ionic liquids are basically liquids at room temperature; they composed entirely of ions and can be represented as [Cation] $^{+}$ [Anion]$^{-}$. Various cations can be tetraalkylammonium, tetraalkylphosphonium, trialkylsulfonium, N-alkylpyridinium, 1-3-dialkylimidazolium cations.



Various anions can be NO_3^-, Cl^- Br^-, I^- $AlCl_4^-$, BF_4^-, PF_6^-, $CHCOO^-$, F_3CCOO^-, $CF_3SO_3^-$ and $(CFSO)_2N^-$. The ionic liquids are organic salts with melting points under 100^0C, often even below room temperature. The common ionic liquids are imidazolium pyridinium derivatives.

They have very good dissolution properties for most organic and inorganic compounds, high thermal stability, non -flammable. Ionic liquids can be used as a solvent for synthetic and catalytic purposes, as biphasic system in combination with an organic solvent or water in extraction and separation technologies, as electrolytes in electrochemistry. Ionic liquids has advantages like optimization of compound characteristics through a broad choice of anion and cation combination, reaction rate enhancement, higher selectivity as well as higher yields and can be used as replacement for volatile organic compounds in chemical processes or extraction procedures.

Mannich reaction of 2-(1-cyclopentyl)-2-alkylcyclopentanone and amine exchange of aryl amines for the Mannich bases. In the discovery for new anti-inflammatory agents, a series of 2-(E)-(4-hydroxy- 3 - methoxybenzilidine) - 5 - (N-Substituted aminomethyl) cyclopentanones was synthesized via stock reaction, Mannich reaction and amine exchange reaction by Dong J. et al. A series of fifteen compounds were synthesized and all these compounds were characterized by spectral and elemental analysis. Mannich bases of o-hydroxyacetophenones gives amine exchange reaction with pyrazole and methyl or halogen substituted pyrazoles.

Roman G. et. al. (2003) derived Mannich bases from o-hydroxyacetophenones with N,N-dialkyldithiocarbamic acid salts result in the formation of the corresponding dithiocarbamic acid esters via an amine moiety replacement. They conducted this process in cold water; the synthesis was carried out in refluxing ethanol-water mixture led to the insertion of Carbon sulphide at the C-N bond of Mannich base.

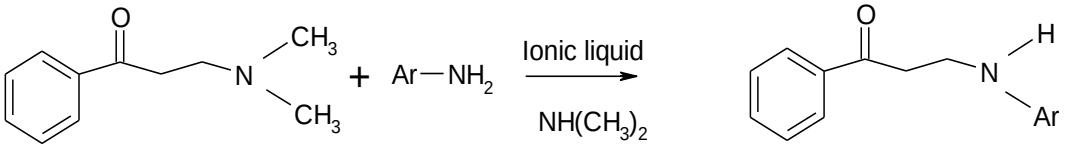
A series of seven Mannich bases were derived by Roman G. et. al. (2004) from cis trance 2-5-dimethyl piperazine and (Hetero) aryl methyl ketones were prepared both through direct aminomethylation and via amine exchange reaction. Roman G. et. al. (2002) derived Mannich bases from ortho-hydroxyacetophenone in amine exchange reactions with pyrazole and one or methyl substituted pyrazoles.

Dong J. et. al. (1998) synthesized nineteen kinds of 2-(E)-bezelidine-5-(N-substituted amino methyl) cyclopentanones via Mannich reaction or Amine exchange reaction and identified spectrometrically.

J. Cyperman Craig et. al. (1963) has performed variety of amine exchange reactions between Mannich bases and primary alkyl amines.

MATERIAL AND METHODS

In the present work, we have carried Amine exchange reactions of Mannich bases with aromatic amines in room temperature ionic liquids. The Mannich base (β-dimethyl amino propiophenone) derived by reaction of Acetophenone with Dimethyl amine HCl and Paraformaldehyde was taken as key compound and treated with a series of aromatic amines in the presence of room temperature ionic liquid $[Bmim]^+[PF_6]^-$.



Mannich base **Aryl amine** **Aryl amine Mannich base**

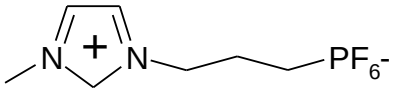
Experimental work involves following steps:

Scheme 1: Synthesis of Ionic liquid

Scheme 2: Synthesis of β-amino propiophenone

Scheme 3:The β -amino propiophenone treated with various aromatic amines such asAniline, m-Aminotoluene, p-Aminotoluene, p-Chloroaniline, p-Anisidine, 2-Amino pyridine, 2-Amino thiozole, Naphthylamine, p-Aminoazobenzene, p-Aminobenzoic acid to form various aromatic amine Mannich bases.

Scheme 1:**Synthesis of Ionic liquid [1-butyl-3methyl immidazoliumhexaflurophosphate]**



10 ml N-methyl immidazole, 22 ml butyl bromide and Toluene 12.5 ml were placed in 100 ml round bottom flask attached with reflux condenser with guard tube and mixture was refluxed on oil bath for 48 hours at 80^0C.

After reflux the mixture was kept in refrigerator for two days for getting solid then the solvent (Toluene) was thrown away. Solid was washed with ether and tried to break in it. Then 100 ml Distilled water was added and the whole solution was transferred in 250 ml round bottom flask. Mixture was cooled in ice bath for 1 hour and 5ml HPF_6 + 5ml Distilled water was added 5 times in solution which was prepared in plastic measuring cylinder. Then whole solution was stirred for 2 hours. $[Bmim]^+PF_6^-$separated then 80 ml Dichloromethane added in the solution and stirred two layers of Dichloromethane and water were obtained, water layer was thrown away and Dichloromethane was washed with 100 ml distilled water till the water showed neutral Ph. Then Dichloromethane layer was passed through Cotton + silica gel + Na_2SO_4 bed in funnel and Dichloromethane was evaporated under vaccum to get Ionic liquid.

Scheme 2:**Synthesis of 3-N-N Dimethyl Amino Propiophenone Salt**

5.3 gm (0.326 mol) Dimethylamine hydrochloride, 2 gm (0.33 mol) of paraformaldehyde and 6 gm (0.25 mol) of acetophenone were placed in 250 ml round botton flask attached with reflux condenser. 8 ml of ethanol and 0.5 ml concentrated HCl were introduced in reaction mixture and mixture was refluxed on water bath for 3 hours. The reaction mixture was almost clear and homogeneous. While still warm 50 ml of acetone was added and cooled at room temperature and was left in refrigerator overnight. The crystals were filtered at pump and dried for 6 hours at 40-50^0C.



Acetophenone **Dimethylamine Hydrochloride** **Mannich Reaction** **Dimethylamine propiophenone hydrochloride**

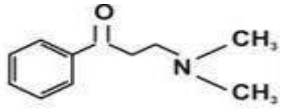
Theoretical yield = 10.5 gm

Practical yield = 7.2 gm

Practical % yield = 68.57%

Melting Point of Dimethylamine propiophenone Hydrochloride =156^{0}C

Preparation of free base from 3-N,N Dimethyl Amino Propiophenone Salt

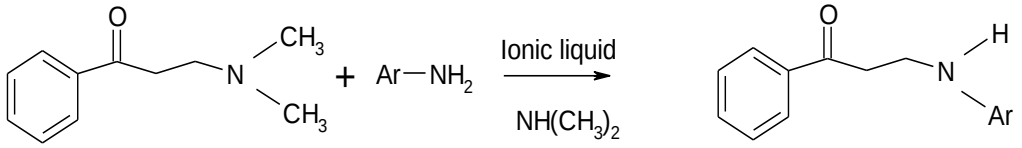


Dimethylamine propiophenone

Whole quantity of Mannich salt was dissolved in minimum amount of water and the solution was kept in ice bath for 30 min, 50% NaOH was added in the solution till pH of the solution comes at 11 and then whole solution was extracted by using ether in separating funnel. Ether layer was collected and evaporated to get Mannich free base.

Scheme 3:

The β-amino propiophinone treated with various aromatic amines to form Aromatic amine Mannich bases by following procedure.

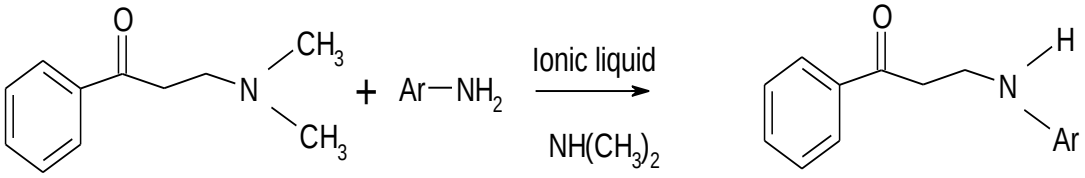


1 mili mole of Mannich free base (0.177gm), 1 mili mole of Ar amine and 2 ml of ionic liquid was taken in 5 ml round bottom flask and the mixture was stirred on magnetic stirrer. The reaction was monitored by using thin layer chromatography and reaction mixture was extracted by ether extraction to get product. The obtained compounds were then purified by column chromatography and analyzed by IR spectra.

The reaction of B-amino propiophenone (Mannich free base) with Aromatic amines leads to elimination of Dimethyl amine to give B-phenyl amino propiophenone in presence of ionic liquid. There is a exchange of dimethyl amine by aryl amine in presence of ionic liquid.

RESULTS AND DISCUSSION

The replacement of the dimethylamine moiety in the Mannich free bases derived from acetophenone by arylamineMannich bases is illustrated in the figure.



1 2

2a: Ar= Benzene 2b: Ar= 3-methyl phenyl 2c: Ar= 4-methyl phenyl
2d: Ar- 4-chlorophenyl 2e: Ar- 4-methoxy phenyl 2f: Ar- pyridine
2g: Ar- Thiozole 2h: Ar- Naphthalene 2i: Ar- Azobenzene
2j: Ar- benzoic acid

As a trial case 1 mili mole of Mannich base, 1 mili mole of Aniline and 2 ml of Ionic liquid were added in 5 ml round bottom flask and stirred at room temperature. The reaction proceeds smoother. Besides favoring the elimination of the easily leaving dimethylamino group, the mixture assures the

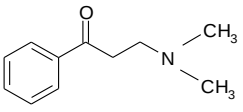
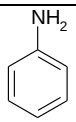
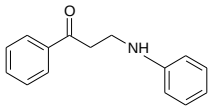
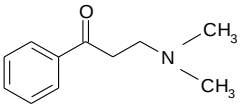
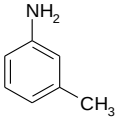
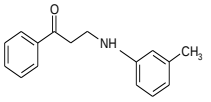
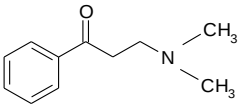
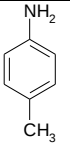
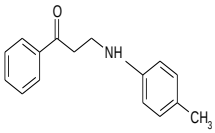
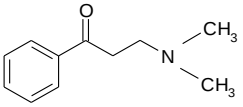
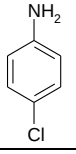
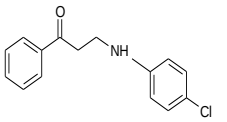
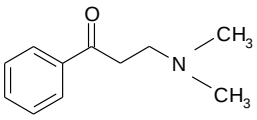
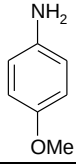
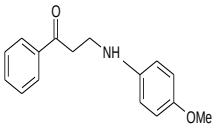
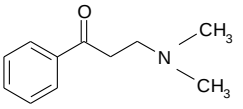
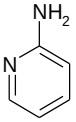
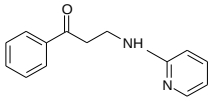
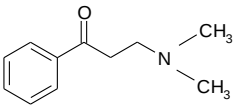
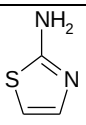
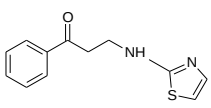
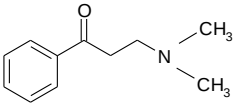
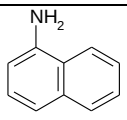
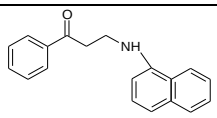
complete dissolution of both reactants and the comfortable separation of the resulting arylamineMannich bases.

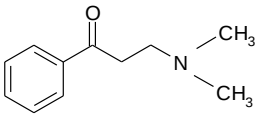
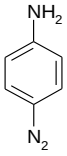
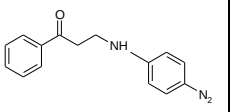
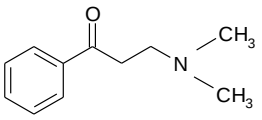
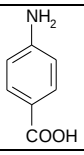
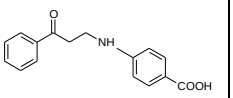
Inspired by these results, the reactions were carried out using different arylamines. In all cases reaction precedes smoothly giving moderate good yields. The results obtained are summarized in the **Table no. 1.**

The amine exchange products separated from the reaction mixture by ether extraction. The arylamineMannich bases are purified by using coloumn chromatography, that are soluble in acetone, chloroform, diethyl ether and insoluble in water.

In the products IR spectra, the carbonyl group in the arylamine Mannich bases gave an intense sharp absorption band at about 1650 cm^{-}, the formation of a hydrogen bonding between this group and the adjacent phenolic one being responsible for the low absorption frequency. A single medium to intense sharp absorption band, attributed to N-H band vibration, was identified in the 3350-3450 cm^{-1}.

Table: 1Data of the products obtained

Sr. No.	Reactant	Aryl amine	Product	Yield %	Melting Point ^{o}C	Melting Point (lit.)	IR range. cm^{-1} (N-H strech)
1				36	110	113-114	3450 cm^{-1}
2				63	105	-	3441 cm^{-1}
3				42	112	114-115	3450 cm^{-1}
4				50.94	130	134-135	3450 cm^{-1}
5				39.60	105	111-112	3450 cm^{-1}
6				50	85	88-89	3436 cm^{-1}
7				38.40	78	-	3410 cm^{-1}
8				46.20	147	150-151	3400 cm^{-1}

9				39	135	-	3400 cm^{-1}
10				35.50	208	210-212	3400 cm^{-1}

CONCLUSION

The method for synthesis of B-aryl amino propiophenones using room temperature ionic liquids has found to have following advantages-

1. It is ecofriendly.
2. High yields of product.
3. No side reactions.
4. Ionic liquids can be used repeatedly.

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CONTAMINATION OF SOIL AND WATER WITH ARSENIC, ITS EFFECT ON LIFE AND REMEDIAL STRATEGIES

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Introduction

With a rapid urbanization and uncontrolled growth of human population, the deterioration of environment is also taking place in an alarming way. Human population is being exposed to numerous pollutants and toxic chemicals in everyday walks of life. The food, drinking water, air every indispensable component of life is contaminated with toxic chemicals and metals making them exposed to several disease and disabilities. Contamination of heavy metals in water and crops is one of those major environmental concerns of present days.

Arsenic (As) is a naturally occurring metalloid abundantly found in earth's crust. It has potential hazardous effects on both environment and health. Presence of high concentration of arsenic in soil and water (to some extent in air) can exert miserable effects on human health and environment. Owing to it severe toxic effect, its presence in drinking and groundwater has become a global menace in several countries worldwide including different parts of India and our subcontinent (1).

The world is putting a great effort to understand the environmental source of arsenic and researches have been directed towards the remediation of this pollutant. In spite of this effort, the environmental route of exposure of arsenic in general population is yet to be fully understood. Till date, the major source of arsenic toxicity in human is thought to be through the routes of drinking water, food components, smoking, and cosmetics. In remediation aspect, the target is to keep a safe level of arsenic (0.01 mg/L) in drinking water in arsenic prone areas (2).

This review focus on the environmental sources of arsenic, potential health hazard imparted by arsenic and its possible remediation strategies.

Sources of arsenic in the environments

Arsenic (As) is already present as a natural element and in mineral form in earth's crust which is subsequently leached into soil and groundwater during natural weathering of rocks. The anthropogenic source of arsenic also contributes to the contamination of groundwater and soil. The major sources are mining activities, industrial wastes from metal processing, administration of pesticides and fertilizers in agriculture etc(3) .

The effect of arsenic contamination is not limited to affected regions but is far-reaching in terms of its hazardous consequences to widespread ecological niche. The ingestion of arsenic through food chain may impact the socioeconomic pattern as it is largely related to exploitation of groundwater. In addition, the food crops grown with the arsenic contaminated groundwater accumulates the toxic metal in high concentration. These crops are sold to far-off places and consumed by people. Thus, it may also exert arsenic toxicity in the geographical region where the soil and groundwater are not contaminated with the toxic metal.

The permissible level of arsenic concentration in soil generally ranges from 1 mg/kg to 40 mg/kg with an average of 5 mg/kg. Any perturbation to this value is only possible due to a variation in the local composition of rocks and during other biogeochemical processes. Mining activity is one of the human activities that is proven to increase the soil arsenic content above the permissible level. A high arsenic

content in some part of the countries like England, China, Thailand, Ghana, Zimbabwe, Mexico, Canada, U.S.A., and Brazil have been found to be associated with mining activities (4).

Health hazards The toxic effect of any hazardous substance can be broadly categorized into acute and chronic toxicity. The toxic dose of arsenic for an adult human being is found to be 1-3 mg/kg (Hughes, 2002). The common acute toxicity arising from arsenic poisoning includes the following presentations

- Nausea
- Vomiting
- Severe abdominal pain
- Profuse watery diarrhea (often bloody)
- Excessive salivation

Chronic toxicity

The chronic clinical manifestation of arsenic poisoning in human is commonly known as arsenicosis. Arsenicosis includes myriads of disorders such as typical skin lesions characteristic of arsenic toxicity. Moreover, arsenic is known to affect both the respiratory system and nervous system to a great extent. Above all, chronic arsenic poisoning ultimately leads to different types of carcinomas of lung, skin, liver, prostate and urinary bladder (5). International Agency for Research on Cancer (IARC) has recognized arsenic as a potent carcinogen and probably the only one that can cause cancer through respiratory or gastrointestinal exposure. However, the exact mechanism of carcinogenesis by arsenic is yet to be fully understood and needs further investigations (6).

The chronic effect of arsenic is strongly correlated with the following factors:

- Exposure amount
- Length of exposure
- Frequency of exposure
- The biological species
- Age
- Sex
- Individual sensitivity and immunity
- Genetics
- Nutritional factors

The mechanism of arsenic toxicity in human is complex and involves impairment of several biological functions. Recent studies have shown that arsenic causes DNA impairment, inhibition of enzymatic activities produces harmful reactive oxygen species (ROS) and promotes tumor formation by inactivating the tumor-suppressor genes by DNA hypermethylation. Moreover, the extent of toxicity is highly dependent on the oxidation state and solubility of arsenic and also influenced by several other chemical and biological factors (7). Neurobehavioral abnormalities in puberty and adulthood due to arsenic poisoning can result from the exposure of arsenic in early childhood. Similarly, Arsenic accumulated in the body during childhood may induce neurobehavioral abnormalities during puberty, and neurobehavioral changes as an adult. Neuritis, the loss of sensory functions of the peripheral nerves, does also arise from arsenic toxicity (5).

Removal of arsenic contamination Arsenic can be removed from the contaminated soil or water by both physicochemical and biological processes. Considering the cost and associated hazards of physicochemical treatment, scientists have also come up with different biological tools to remediate excess arsenic from the environment (8). The biological methods include:

- Phytoremediation
- Biological filtration

- Microbial remediation, etc.

Summary of few physic chemical remediation techniques is given below.

1. Coagulation-precipitation and filtration

This process involves the transformation of soluble arsenic forms into insoluble solids by coagulants. Thus, the suspended and or colloidal arsenic are made to be precipitated by the action of coagulants and flocculants. Subsequently, the precipitate is filtered out by some suitable filtration technique to obtain arsenic-free water. Lime softening, precipitation using lime [Ca(OH)2], is a common technique to precipitate out arsenic from water (9).

2. Adsorption

The technique exploits the property of arsenic to bind different solid or liquid adsorbent material by Van der Waals force. The adsorption process is strongly influenced by factors such as initial arsenic concentration, adsorbent dose, exposure time or contact time, the solubility of arsenic in water, acting pH, temperature, and presence of other chemical species (10).

3. Membrane filtration

A specialized membrane that can block undesired chemical except for the feed water, is used to filter arsenic from water (11).

4. Ion exchange

This physicochemical technique involves the exchange of ions of a solid phase bound to column with the equivalent number of ions from water fed to the column. Synthetic resins capable of exchanging arsenic ions from water are used for the decontamination of drinking water.

In addition, reverse osmosis (RO) is also used to remove arsenic from drinking water (4).

Conclusion

A continuous effort should be made to improve the remediation techniques of arsenic-polluted water to maintain the agricultural sustainability and food safety. Moreover, a better environment-friendly, cost-effective remediation technique should be innovated to easily implement in the rural regions.

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जंजिरा संस्थानातील पोलिस व तुरुंग व्यवस्था

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प्रस्तावना :-

भारतीय इतिहासात दक्षिण महाराष्ट्राती संस्थांना अनन्य साधारण महत्व आहे. इ.सन १८१८ मध्ये पेशवाईच्या आस्तानंतर मराठी साम्राज्यात ब्रिटांशांचा अंमल सुरू झाला. मात्र पेशवाईच्या आस्तानंतर काही जागिरदार अस्तित्वात होते. त्यांने इंग्रजी सत्तेची तह करून आपले जाहगीरीचे अस्तित्व टिकवून ठेवले होते. १९ व्या व २० व्या शतकात या जाहगीरदारांना संस्थांनीक असे संबोधण्यात येवू लागले. तत्कालीन मुंबई इलाख्यात कोल्हापुर, औंद, भोर, जत, फल्टन, मिरज, सांगली, कुरंद वाड इ. संस्थाने आस्तित्वात होती. या संस्थानाप्रमाणे कोकणच्या किनारपट्टीवर जंजिऱ्याचे स्वातंत्र संस्थान अस्तित्वात होते.

सन १८७० मध्ये ब्रिटिशांबरोबर केलेल्या करारानुसार संस्थानात पोलिस दलांची निर्मिती करण्यात आली होती. सुरवातीला ६० राज्य पोलिस व ३२ जेल पोलिस अशी रचना होती. सन १८८० मध्ये या दोन विभागांचे एकत्रिकरण करण्यात आले.[१] त्यानंतर पोलिसदलांत वाढ करण्यात आलेली होती. मान्यता प्राप्त पोलिस दलांची संख्या १५० होती.

१ इन्स्पेक्टर
४ चीफ कॉन्स्टेबल
२८ हेड कॉन्स्टेबल
११६ कॉन्स्टेबल
१ ड्रिल प्रिशिक्षक (हेड कॉन्स्टेबलचा दर्जा असलेला)

मुंबई पोलिस दलाच्या धर्तीवर या पोलिस दलाची क्षमता व अनुशासन योग्य ठेवण्याची संपूर्ण काळजी घेण्यात आलेली होती.संपुर्ण पोलिस दलापैकी १/३ पोलिस लिहिता व वाचता येणारे होते. ज्यांना लिहिता व वाचता येत नव्हते त्यांच्या शिक्षणाची व्यवस्था करण्यात येत असे.

सर्व पोलिसांना कवायतीचे निर्देश, पोलिस कार्यासंबंधी व डयुटी संबंधी निर्देश ड्रिल शिक्षकाकडून दिले जात होते. संस्थानाचे सर्व पोलिसदल केंद्रिय पोलिस ट्रेनिंग स्कूल नाशिक या संस्थेच्या आधिकाऱ्याच्या देखरेखीखाली होते. पोलिस दलाचा एकूण खर्च २४,२६०/- रू. एवढा होता.[२]

जाफराबादमध्ये देखिल नियमित पोलिसदल होते. जाफराबादचे २९ पोलिस होते.

१ चीफ कॉन्स्टेबल
४ हेड कॉन्स्टेबल
२४ कॉन्स्टेबल

जाफराबादमध्ये दरोडेखोरांपासुन संरक्षणासाठी विशेष पोलिस दलाची भरती करण्यात आली होती. त्यात २ हेड कॉन्स्टेबल आणि ५ कॉन्स्टेबल तालुक्यात वर्षभर तैनात होते. यामध्ये काही पोलिस जंजिऱ्याहून पाठविण्यात आले होते.

१९२२ च्या अहवालातील आकडेवारीनुसार संस्थानात चोरी झालेली मालमत्ता ८७०/- रू. होती तर जाफराबादमध्ये २२४७/- रू एवढी होती. जाफराबादमध्ये चोरीचे प्रमाण जास्त होते. दरोडेखोरांच्या टोळया खेडयांवर आक्रमण करून खेडी लुटत असत. वधेरा आणि बाबरकोट खेडयात १९२२ मध्ये दोन दरोडे पडले होते. एका धाडीत कॉन्स्टेबल दादा घाची एकटाच दरोडेखोरांशी प्रतिकार करत होता. त्या झटापटीत त्याने एका दरोडेखोराला जखमी केले होते. परंतू दादा घाचीला सर्व बाजूंनी घेरून गोळीबार केला. त्यात त्याचा मृत्यू झाला. त्या अगोदर दरोडखोरांनी त्याला शस्त्र ठेवून शरण येण्यास सांगितले होते. पण त्याने त्यास नकार दिला. त्याने

शरण जाण्यापेक्षा मरण पत्करले. वधेरा गावासाठी त्यानी आपले प्राण अर्पण केले होते. त्याच्या मागे त्याची आई होती. तिच्या देखभालीची व्यवस्था संस्थानाने केली होती. दरोडेखोरांनी कॉन्स्टेबलची बंदुक आणि फेटा पळवुन नेला होता. त्याची किंमत २६ रू. होती. ज्या गावाच्या वेशीवर ही झटापट झाली होती. त्या गावावर दरोडेखोरांनी हल्ला केला नव्हता. तर त्या गावातील श्रीमंत व्यक्ती देवत गिगा मकवाना यांचा खुन करून ५९९/- रू. ची चोरी केली होती.

पुर्वी झालेल्या दरोडयांचा शोध घेतला तर, असे दरोडेखोर परत दरोडे टाकतील म्हणुन पोलिसांनी त्यांचा शोध घेण्याचे कार्य सुरू केले होते. भगवान खिमा सोनी आणि लेखा बिचीया हे दोन अट्टल दरोडेखोर होते. या दोघांना अटक करण्यात आली होती. त्यामुळे काठेवाड मधील वातावरण शांत होते. लोधापुर भागात दरोडेखोरांचा शोध चालू असताना जिवा रामा याला जुनागढ येथे अटक करण्यात आली होती. त्याच्यावर इतर प्रांतात देखिल गुन्हे नोंदविलेले होते. जंजिरा संस्थानाने त्याला आपल्या ताब्यात घेण्यासाठी प्रक्रिया सुरू केली होती. आणखी एक कैदी होता ज्याची जुनागढ संस्थानाकडुन मागणी केली होती. त्याचे नांव गिगा सुसेसर धकाडा. त्याने शरणागती पत्करली होती. त्याला जाफराबाद संस्थानाच्या ताब्यात देण्यात आले होते. त्याला दोषी ठरवुन शिक्षा दिली गेली.[३]

जाफराबाद मध्ये वारंवार दरोडे परत असल्यामुळे तेथे पोलिस दलाला सक्षमक रण्याचे प्रयत्न करण्यात आले होते. जुन १९२१ मध्ये संस्थानाचे पोलिस इन्स्पेक्टर स्वत: तिथे जाऊन दोन महिने मुक्कामी राहिले होते. सोबत जादा पोलिसही तैनात केले होत. तेथे रात्री गस्त घालण्याची पध्दती अवलंबिण्यात आली होती. त्यामुळे दरोडेखोरांना काही दिवस दूर ठेवण्यास मदत झाली. एप्रिल १९२२ मध्ये राज्य पोलिस इन्स्पेक्टर पुन्हा जाफराबादमध्ये जाऊन पाहणी करून आले. तोपर्यंत दरोडेखोरीच्या घटना घडल्या नव्हत्या.

लोक संख्येच्या मानाने पोलिस व जनता यांचे प्रमाण १:५८३ आणि १:२.१ चौ.मैल तर जाफराबादमध्ये १:३७९ आणि १:१.८ चौ.मैल असे होते. संस्थानात गाव पोलिस अशी भरती केली जात नव्हती.

संस्थानातील पोलिस कार्यक्षम होते. जनतेचे संरक्षण करणे हे त्यांचे प्रमुख उद्दीष्ट होते. सेवा करत असताना एखादया पोलिसास मृत्यू आला तर त्याच्या कुटूंबाची जबाबदारी संस्थान घेत असे. तसेच पोलिसांकडुन गुन्हेगारांना सहकार्य मिळत आहे असे आढळून आल्यास त्या पोलिसाला सेवेतुन बडतर्फ करून त्याच्यावर खटला चालविण्यात येत असे.

कारागृह (जेल)

१९७६ पर्यंत मुरूड येथे तुरूंग होते. यात तीन खोल्या होत्या. प्रत्येक खोलीत सहा कैदी ठेवण्याची व्यवस्था होती. तुरूंग लहान असल्यामुळे तीन महिन्यांपेक्षा जास्त सजा झालेल्यांची रवानगी ठाणे किंवा येरवडा तुरूंगात होत असे. १८७६ नंतर मुरूड शहराच्या बाहेर समुद्र किनाऱ्या जवळ तुरूंगाची नवी इमारत बांधण्यात आली. त्यात एकुण १४ खोल्या आणि स्त्री कैदयांसाठी दोन खोल्यांची व्यवस्था करण्यात आली होती. वरचा मजला कार्यालय म्हणून वापरण्यात येत असे. त्या शिवाय बोर्ली, मांडले, नांदगांव, मुरूड, म्हसळा, बोर्ली पंचतन व श्रीवर्धन येथे अटक कोठडया होत्या.[४] कैदयांकडून कारागृहातील बागेचे काम तसेच सार्वजनिक कामे करवून घेतली जात होती.

जाफराबादला एक कारागृह होते. स्थानिक वैद्यकीय अधिकारी त्याचे नियंत्रण करीत असे. जशी कैदयांची संख्या वाढु लागली तशी तुरूंगाची इमारत अपुरी पडु लागली. म्हणून १९२२ नंतर जाफराबादमध्ये नवीन इमारत बांधण्यात आली होती. या इमारतीत ट्रेझरी ऑफीस, तालुका ऑफीस आणि तुरूंग यांचा समावेश करण्यात आला होता.

सारांश :-

जंजिरा संस्थानात पोलिस प्रशासन व्यवस्था उत्तम होती १८८० ते १९४८ या काळातील जंजिरा संस्थानात पोलिस व्यवस्था इतर संस्थांनाच्या मनाने चांगली होती. गुन्हेगारांना पकडण्यात पोलिस जिवाची बाजी लावून काम करत होते. तसेच संस्थानात तुरुंग व्यवस्था चांगल्याप्रकारे होती.

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REVIEW ON APPLICATION OF ALOE VERA IN MEDICINAL FIELD AND ITS CHEMICAL COMPOSITION

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Abstract
Aloe vera is a perennial, drought-resisting and succulent plant belonging to the Liliaceal family, which historically has been used for a variety of medicinal purposes. Scientific investigations on Aloe vera have gained more attention the last several decades due to its reputable medicinal properties. After describing Aloe in a botanical point of view, the papers relating with the chemical composition of skin and gel of Aloe, particularly describes the gel of Aloe. The chemical analysis reveals that Aloe vera contains various carbohydrate polymers, notably glucomannans, along with a range of other organic and inorganic components. This paper reviews history, its chemical composition, medical usage and agronomy of Aloe vera.

INTRODUCTION:-The plant of Aloe vera and its usage as drug dates back to 6000 years B.C. Cleopatra said that her beauty is due to use of Aloe vera plant. One prescription that belongs to 1550 BC shows Aloe vera plant used for different illness. Jelatin that is extracted from this plant is continuously used to treat burns, cuts and inflamed scars since many years. It is also used in cosmetics sector, medical sector and beverage sectors. Because of high concentration of water and oil in this plant, it helps to protect skin from drieness and so the skin that is burnt or cut heals very quickly.



High concentration of glucose in gelatin, results in high osmotic pressure that protect skin from live bacteria. Aloe vera includes "Antrokinon" chemicals that are known as antivirus, anti bacteria and anti cancer. Researchers show that plant is very helpful for treatment of Psoriyazis. Aloe vera is very similar to Cactus but belongs to Lily family of Aloe barbadensis groups. Aloe vera has 400 species but just 2 species; *A.barbadensis* and *A.aborescens* are used for trade in the world.

Ancient Egyptian papyrus and Mesopotamian clay tablets describe aloe as useful in curing infections, treating skin problems and as a laxative [1]. Cleopatra was said to include aloe cream in her beauty regimen [2]. Aloe was used by Hippocrates and Arab physicians, and was carried to the Western Hemisphere by Spanish explorers. Legend has it that Alexander the Great captured the island of Socotra in the Indian Ocean to secure its aloe supplies to treat his wounded soldiers [3]. Aloe is also popular in both traditional Chinese and Ayurvedic medicine (India). The Chinese describe aloe's

skin and the inner lining of its leaves as a cold, bitter remedy which is downward draining and used to clear constipation due to accumulation of heat [4]; the gel is considered cool and moist. In Ayurvedic medicine, the traditional medicine of India, aloe is used internally as a laxative, antihelminthic, hemorrhoid remedy, and uterine stimulant (menstrual regulator); it is used topically, often in combination with licorice root, to treat eczema or psoriasis. In Arabian medicine, the fresh gel is rubbed on the forehead as a headache remedy or rubbed on the body to cool it in case of fever, as well as being used for wound healing, conjunctivitis, and as a disinfectant and laxative [5].

Today aloe vera gel is an active ingredient in hundreds of skin lotions, sun blocks and cosmetics [6]. The gel's use in cosmetics has been boosted by claims that it has similar anti-aging effects to vitamin A derivatives [7]. Aloe first gained popularity in the United States in the 1930's with reports of its success in treating X-ray burns [8,9,10]. Recently, aloe extracts have been used to treat canker sores, stomach ulcers and even AIDS. Some natural health enthusiasts promote aloe gel as a cleansing juice [11]. Some naturopaths promote aloe juice as a way to prevent and treat renal stones [12]. Many mothers keep a plant handy in the kitchen where it readily thrives in bright sunlight with little care [13]. When faced with a minor burn, a fresh leaf can be cut and the gel of the inner leaf applied directly to the burn immediately after the injury [14]. The inner leaf lining of the plant is used as a potent natural laxative. In a 1990 survey of members of a health maintenance organization, aloe vera was used by 64%; of these, 91% believed it had been helpful [15]. Aloe is also an ingredient in Compound Benzoin tincture [16]. This paper reviews history, its chemical composition, medical usage and agronomy of Aloe vera.

2. ABOUT ALOE VERA SPECIES :-

2.1 MEDICINAL SPECIES:

Aloe vera, A. barbadensis (Barbados aloe), *A. vulgaris, A.arborescens,* A. ferox (Cape aloe), *A. perryi* (Socotrine or Zanzibar aloe). There are over300 species of aloe, most of which are native to South Africa, Madagascar and Arabia [5]. The different species have somewhat different concentrations of active ingredients [17,18].

2.2 PLANT DESCRIPTION:

The botanical name of Aloe vera is A*loe barbadensis* miller. It belongs to Asphodelaceae (Liliaceae) family, and is a shrubby or arborescent, perennial, xerophytic, succulent, pea-green color plant. The aloe plant has long (up to 20 inches long and 5 inches wide), triangular, fleshy leaves that have spikes along the edges. The fresh parenchymal gel from the center of the leaf is clear; this part is sometimes dried to form aloe vera concentrate or diluted with water to create aloe juice products. The sticky latex liquid is derived from the yellowish green pericyclic tubules that line the leaf (rind); this is the part that yields laxative anthraquinones [21]. The flowers (not used medicinally) are yellow.

2.3 WHERE IT'S GROWN:

Aloes are indigenous to South Africa and South America, but are now cultivated worldwide except in tundra, deserts and rain forests. In the US aloe is commercially cultivated in southern Texas [22]. It takes approximately four years to reach maturity and has a life span of about 12 years.

3. ALOEVERA: POTENTIALLY ACTIVE CHEMICAL CONSTITUENTS:

3.1. FROM THE GEL:

1. Polysaccharides: glucomannan and acemannan
2. Other: carboxypeptidase, magnesium, zinc, calcium, glucose, cholesterol, salicylic acid,prostaglandin precursors (gammalinolenic acid [GLA]), vitamins A, C, E, lignins, saponins, plant sterols and amino acids [3].

3.2. FROM THE LATEX LEAF LINING:

1. Anthraquinone glycosides: aloin, aloe-emodin, barbaloin

Table 1: Summary of the chemicals composition of A. Vera [23, 24, 25, 26, 27, 28, 29].

Class	Compounds	Properties
Anthraquinones/ anthrones	Aloe-emodin, aloetic-acid, anthranol, barbaloin, isobarbaloin , emodin, ester of cinnamic acid.	Aloin and emodin acts as analgesics, antibacterials and antivirals.
Carbohydrates	Pure mannan, acetylated mannan, acetylated glucomannan, glucogalactomannan, galactan, galactogalacturan, arabinogalactan, galactoglucoarabinomannan, pectic substance, xylan, cellulose	A glycoprotein with antiallergic properties, called alprogen and novel anti-inflammatory compound.
Chromones	8-C-glusoly-(2'-O-cinnamoly) -7-O-methlyaloediol A, 8-C-glucosyl-(S)-aloesol, 8-C-glucosyl-7-O-methylaloediol A, 8-C-glucosyl-7-0-methylaloediol, 8-C-glucosyl-noreugenin, isoaloeresin D, isorabaichromone, neoalosin A	The novel anti-inflammatory commands .
Enzymes	Alkaline phosphatese, amylase,bradykinase, carboxypeptidase, catalase,cyclooxidase, cyclooxygenase,lipase, oxidase, phosphoenolpyruvate, carboxylase, superoxide dismutase	Bradykinase helps to reduce excessive inflammation when applied to the skin topically, while others help in the breakdown of sugars and fats.
Inoraganic compounds	Calsium,chlorine, chromium, copper,iron,magnesium, manganese,potassium,phosphorous, sodium,Zinc	They are essential for the proper functioning of various enzymes systems in different metabolic pathways and few are antioxidants
Miscellaneous including organic comounds and lipids	Arachidonic acid, Y-linolenic acid, steroids(campestrol, cholesterol, Bsitosterol), triglycerides, triterpenoid, gibberillin, lignins,potassium sorbate,salicylic acid, uric acid	
Proteins	Lectins, lectin-like substance	It also contains salicylic acid that possesses anti-inflammatory and antibacterial properties. Lignin, an inert substance, when included in topical preparations, enhances penetrative effect of the other ingredients into skin. Saponins that are the soapy substances from about 3% of the gel and have cleansing and antiseptic properties.
Saccharides	Mannose, glucose, L-rhamnose, aldopentose	

Vitamins	Vitamin A, B12,C, E,choline and folic acid	Vitamin A, C and E are antioxidants and antioxidant neutralizes free radicals.
Hormones	Auxins and gibberellins	That helps in wound healing and have antiinflammatiory action.

4. REVIEW ON APPLICATION OF ALOE VERA IN MEDICINAL APPLICATION:-

4.1 Healing properties:

Various researchers reported that the effective components for wound healing may be tannic acid [37] and a type of polysaccharide [38]. Other researchers have also reported that glucomannan, a mannose-rich polysaccharide and gibberellin a growth hormone interacts with growth factor receptors on the fibroblast thereby stimulating its activity and proliferation which in turn significantly increase collagen synthesis after topical and oral Alov vera [39]. Aloe gel not only increased collagen content of the wound but also changed collagen composition and increased the degree of collagen cross linking. Due to this, it accelerated wound contrcation and incresed the breaking strength of resulting scar tissue [40]. An increased synthesis of hyaluronic acid and dermatan sulfate in the granulation tissue of a healing wound following oral or topical teratment has been reported [41].

4.2 Immune modulation:

Immune stimulant and anti-inflammatory (gel), in a case studies of 14 HIV-1+ patients who were prescribed 800 mg/day of acemannan, there was a significant increase in the number of circulating monocyte and macrophages which mirrored clinical improvements [42]. In a pilot study in HIV-infected persons acemannan increased the number of white blood cells and improved symptoms [43]. Aloe extracts also increased phagocytosis in asthmatic adults [44]. Alprogen inhibit calcium influx into mast cells, thereby inhibiting the antigen-antibody-mediated release of histamine and leukotriene from mast cells [45].In a study on mice that had previously been implanted with murine sarcoma cells, acemannan stimulates the synthesis and release of interleukin -1(IL-1) and tumor necrosis factor from macrophages in mice, which in turn inhitiated an immune attack that resulted in necrosis and regression of the cancerous cells [46]. Several low-molecular weight compounds are also capable of inhibiting the release of reactive oxygen free radicals from activated human neutrophils [47].

4.3 Antimicrobial:

Aloe vera contains 6 antiseptic agents: Lupeol, salicyclic acid, urea nitrogen, cinnamonic acid, phenols and sulfur. They all have inhibitory action on fungi, bacteria and viruses. Acemannan acts alone and synergistically with azidothymidine (AZT)and acyclovir to block reproduction of Herpes and the AIDS virus [48], AntifungalAloe extract treatment of guinea pig feet that had been infected with Trichophyton mentagrophytes resulted in a 70% growth inhibition compared with untreated animals [49]. In recent, studies, a polysaccharide fraction has shown to inhibit the binding of benzopyrene to primary rat hepatocytes, thereby preventing the formation of potentially cancer-initiating benzopyrene-DNAadducts. An induction of glutathione Stransferase and an inhibition of the tumorproting effects of phorbol myristic acetae has also been reported which suggest a possible benefit of using aloe gel in cancer chemoprevention [50,51,52].

4.4 Skin and mucus membranes:

In humans, aloe has been reported to accelerate healing from deep scrapes, frostbite, flash burns of the conjunctiva, and even canker sores [53, 54,55]. Only one study has had an opposite effect; that is, aloe-treated surgical wounds healing by secondary intention took longer to heal than

comparison wounds [56]. Despite the conflicting research, some dentists and otolaryngologists use aloe gel to promote healing in injured tissues in the mouth, nose, sinuses and ear [57]. Aloe gel has most often been used as a topical treatment for burn wounds [58]. In a study of 27 adults with partial thickness burns, those treated with aloe healed an average of six days faster than those treated with Vaseline gauze [59]. Psoriasis remedy In a 1995 double-blind, placebo controlled study of aloe's effect on 60 patients with psoriasis vulgaris, an aloe vera extract (0.5%) in a hydrophilic cream resulted in a significant clearing of the psoriatic plaques in 83.3% of the aloe-treated patients versus 6.6% of the placebo group [60]. The aloe treatment was well tolerated with no adverse drug-related side effects. Its moisturizing effects has also been studies in teratment of dry skin associated with occupational exposure where aloe vera gel gloves improved the skin integrity, decreases appearance of fine wrinkle and decreases erythema [61] .It has also anti-acne effect.

4.5 Effects on skin exposure to UV and gamma radiation:

Aloe vera gel has been reported to have a protective effect against damage to skin [62, 63]. Exact role is not known , but following the administration of alove vera gel, an antioxidant protein, metallothionein, is generated in the skin which scavenges hydroxyl radicals and prevents suppression of superoxide dismutase and glutathione peroxidase in the skin. It reduces the production and release of skin keratinocyte-derived immunosuppresive cytokines such as interlukin -10 and hence prevents UV-induced suppression of delayed type hypersensitivity [64].

4.6 Anti-diabetic effects:

Several pre-clinical (in animal) and clinical (in human) trials showed a blood glucose lowering effects for Aloe vera gel preparations in different forms (e.g. juice or as constituents in bread etc.). In a study on streptozotocin- induced diabetic rats oral administration of Aloe vera gel (alcohol insoluble residue extract) significantly reduced the fasting blood glucose, herpatic transminases, plasma and tissue cholesterol, triglycerides, free fatty acids and phospholipids and in addition also significantly increased plasma insulin levels. The decreased plasma levels of high density lipoprotein cholesterol and increased levels of low density lipoprotin cholestrol in the sterptozotocin-induces rats were restored to normal after teratment with gel extract [65]. From the findings of another study on streptozotocin-induced diabetic rats, it was suggested that the mechanism of action of Aloe vera extracts to reduced blood glucose levels is by enhancing glucose metabolism. It was further proposed that the glucose lowering effect could be explained by an antioxidant mechanism because it attenuated oxidative damage in the brains of sterptozotocin-induced mice and reduced peroxidation levels in the kidneys of streptozotocin-induced diabetic rats [66].

5. Conclusions:

Aloe vera bulk and its extracts are widely used in cosmetic, healthcare, skincare and medical industry as active ingredients for extra therapeutic, hygienical, rejuvenating, health enhance effectives. Food and Drug Administration of USA has already approved the developmental study of Aloe vera in the treatment of Cancer and AIDS. In future, controlled studies are requied to prove the effectiveness of Alove vera under the various conditions.

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COMPONENTS AND SEARCH TECHNIQUES OF SELECTED WEB SEARCH ENGINES

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Abstract

Recent research showed that specifying search terms, search results, deciding source and information. Web that are design to help people find information stored on other sites.Present study of major World Wide Web search engine,. Each search engine was evaluated in terms of their search capabilities (e.g., Boolean logic, truncation, field search, word and phrase search) using sample queries drawn from real reference questions. The purpose of this paper is to discuss information search strategies, techniques and principles which today have increasing importance particularly in the context of e-learning.

Introduction:

During this study, Five Search Engines and ten keywords were studied base on Library & Information Science & Communication Technology. The data analysis for the present research was done with the help of types of searches allowed by Search Engine. In the last decade search engines have improved their performance to the point of becoming a tool of everyday use for most Internet users. Generally, search engines common goal is to make people of different background have easy access to information, which is far from their normal reach. Through the years from the days of Archie till this present time of Google, Yahoo and others, search engine have improve to a better standard as the technology improves globally.

The Components of Search Engines:

1. **Robot**

2. Database

3 .Agent

As search engines is a program that search through the internet data from primarily locating the information in the web and is most often used in association with searching through databases of HTML documents. The components of a search engine are :

The Robot: Robots are program that transverse the WWW looking for the information specified and move from one web document to the other by referring to the hyperlinks that are embedded in the web pages. Robots are also called as " Web Wanderers", "Web Crawlers" or "Spider".

The Database: The search engine database is that component which records all the indexed information include web addresses, titles, headers, words, first lines, abstracts and sometime even full text in its lists. Databases can store anywhere from a thousand to millions of web pages.

The agent: The agent is software program that accepts queries from users and search them through the database consisting of index of millions of pages. It is that program which represents the user to search database and displays a sorted list of "hits" after user makes a search request. The results consisting of web links and brief descriptions are arranged in order of relevance and are presented to the users.

Objective of Study:

- This lesson is designed to impart knowledge Web search engines.
- Components of a search engine;
- Search techniques;
- To suggest some measures to develop search engines.

Research Methodology:

Selection of Search Engines

General purpose of search engines use crawler mechanisms in order to scan as many web documents as possible. Usually, they focus on the general population of internet search engine users and they cover all types of information needs. For this study 5 Search Engines were selected.

Selection of queries

The queries from Library & Information Science are used in search engines. Evaluations were done from the database of each search engine in order to ensure the fact that the content of each query existed in the website's database. Thus, 5 queries were inserted in each website's search engine.

Boolean Search

Database searching is based on principles of Boolean logic. Boolean logic refers to the logical relationship among search terms and is named for the British-born Irish mathematician George Boole. On internet search engine, the option for constructing logical relationships among search terms extend beyond the traditional practice of Boolean searching. Boolean logic consist of three logical operators :

1) OR
2) AND
3) NOT
4) +
5) –

Advanced Search

Advanced searching is the use of techniques that help to define the information that is being searched. In advance searching, some filtering is done to reduce the amount of items retrieved. Filtering refines the search for relevancy. In advanced searching the user is able to apply multiple search fields that can help to broaden or narrow the search depending on the topic and the search strategy.

Search Capability:

A component Web search engine must include the fundamental search facilities that internet users are familiar with, which include Boolean logic, phrase searching, truncation, and limiting facilities (e.g. limit by field). Because the searching capabilities of a web search engine ultimately determine its performance, absence of these basic functions will severely handicap the search tool, as we have seen in the case of Excite and Lycos which do not support phrase searching.

Table No. 1 Types of Searches allowed by Search Engines

Sr. No.	Search Engine	Boolean Search	Advanced Search	Preferences Search	Expert Search
1	Google	Yes	Yes	Yes	No
2	Yahoo	Yes	Yes	No	No
3	Lycos	Yes	Yes	No	No
4	Aol	Yes	No	No	No
5	Excite	Yes	Yes	Yes	No

Table No.2 Percentages of Types of Searches

Sr. No.	Type of Search	No. of Search Engines having the Facility	Percentages
1	Boolean Search	5	100%
2	Advanced Search	4	40.00%
3	Preferences Search	2	20.00%
4	Expert Search	0	00%

Conclusion & findings : We are currently conducting Library Science quires using five major Web search engines, including Google Search, to determine additional dimensions of the Search coverage and Search allowted. Further studies are also needed that examine retrieved results beyond 20 First Hits. It is observed from table that advanced search, Boolean Search & preference search is common feature of search engines. Boolean searches are allowed in Highest 100.00% search engines & advanced searches are allowed by 40.00% search engines. 20.00% search engines allow preferences searches. Expert search facility is not allowed by all the search engines.

Area of Further Research:

- Evaluative study of Web Search Engines.
- Usage study of Web Search Engines.
- Effectiveness of Web Search Engines.
- Quires may be formed on different facet of various domain and study

can be taken for further research.

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DOES THE DRINKING WATER SOURCES AVAILABLE SATISFIES MINIMUM REQUIRED STANDARDS IN NANDGAON VILLAGE OF MURUD TEHSIL DISTRICT- RAIGAD, MAHARASHTRA, INDIA

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Abstract
Water is one of the abundantly available substances in nature. It is regarded as a very vital necessity of life and is a part of every living cell. Water is vital for living processes. Animals and plants need it for survival. Villages and towns can only be constructed if there is enough water for their use. Apart from cooking and drinking, water is used for cleansing. Drinking water must be pure and not polluted. The present study deals with an acute awareness among the people about the quality of drinking water by taking water samples from different sources for analysis. The experiment analyses its various Physico-chemical and biological parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity were analyzed in the month of December 2017. The results are compared with standards of WHO. From the obtained result it can be predicted that the parameters which were taken to study the water quality are below the pollution level for water which satisfies the requirement for the use of various purposes like domestic, agricultural etc.
Keywords: *Drinking water resources, water quality standard, Physico-chemical Parameter.*

INTRODUCTION: The quality of water used for drinking or any domestic purpose is an important factor in public health. Poor quality water can cause a disease outbreak and according to world health organization about 40% of the diseases in the world are due to consumption of polluted groundwater [1] and in developing countries about 75% of diseases are induced by polluted water WHO [2]. Water is most abundant occupying about 75% of the earth's surface, but access to potable water that is safe for drinking and sanitation is a global issue [3]. According to [4] about 1 billion people lacked access to adequate supply of potable water across the world and [5] observed that in most developing countries access to good quality water is lacking. Water quality provides current information about the concentration of various solutes at a given place and time. Its quality parameters provide the basis for judging the suitability of water for its designated uses and to improve existing conditions [6].There is no single or simple measure for water quality. Water may be tested for a few characteristics or numerous natural substances and contaminants depending on their needs. The nature and extent of water pollution is characterized by several physical, chemical and biological parameters. The increased anthropogenic activities due to industrialization have contributed to decline in water quality including climate and precipitation, soil type, vegetation, groundwater and flow conditions. The water quality of rivers and lakes changes with the seasons and geographic areas, even when there is no pollution presents [7]. Manjusha Bohr, Prakash Kadave, Sheetal Bhor, Manisha Bhosale [8] has studied Water quality assessment of the River Godavari, at Ramkunda Nashik. Pratiksha Tambekar, pravin P. Morey, R.J. Batra and R.G. Weiginnwar [9] have studied physico-chemical parameter evaluation of water quality around Chandrapur (Maharashtra). Vijaya Kumar K.M. and Vijaya Kumara [10] has studied physico-chemical analysis water quality of Kundapurs Mangrove forest (Karnataka). J.G. Koliyar and N.S. Rokade [11] have studied in order to understand the water quality

in pond lake, Mumbai. Prabhakar R. Pawar and Balasaheb G. Kulkarni [12] has studied assessment of water quality in the karanja creek (Raigad). Budharatna Bhavare, Miguel A. Rodriguez, Anil Kurthe [13] has studied different physic chemical parameter and nutrients in water of Bhatye estuary, Ratnagiri central, West coast of India. Nidhi Jain et al [14] studied "Comparative Review of Physicochemical Assessment of Pavana River". According to Census 2011 information the location code or village code of Usroli village is 554241. Usroli village is located in Murud Tehsil of Raigarh district in Maharashtra, India. It is situated 10km away from sub-district headquarter Murud and 42km away from district headquarter Alibag. As per 2009 stats, Usroli village is also a gram panchayat. The total geographical area of village is 653.11 hectares. Usroli has a total population of 1,099 peoples. There are about 239 houses in Usroli village. Murud is nearest town to Usroli which is approximately 10km away.The water sample such as Pipe water, bore well water and well water was collected early in the morning between 8.00 am to 10.00 am and was analyzed to compare the differences occurred in Physico-chemical parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Ca-hardness, Magnesium hardness and Salinity.

The research work is carried out, keeping in mind the following objectives.

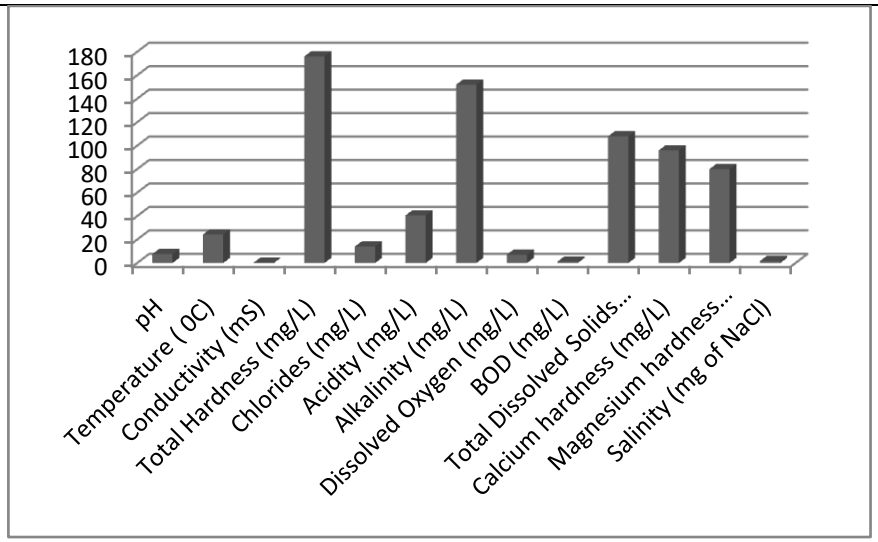
- To study the chemical composition and water quality parameters of different sources.
- To investigate the possible sources and Cause of pollution in the water if any.
- To study if these effects can be attributed to the change in the chemical composition of the different water sources.

MATERIAL & METHOD:- Sample of water was collected in sterile plastic bottle of 2 litre capacity from the dam. At the same time the temperature & pH were noted. The physico-chemical analysis was carried out within 24 hours of collection in a laboratory as per APHA (1989), (1992), AWWA & WPFA, Trivedy & Goel (1986) [15-16]. The chemicals were used of A. R. grade and are standardized as per Inorganic quantitative analysis by Vogel (1964) & (2006) [17-18]. The result is statistically analyzed by calculating mean & standard deviation.

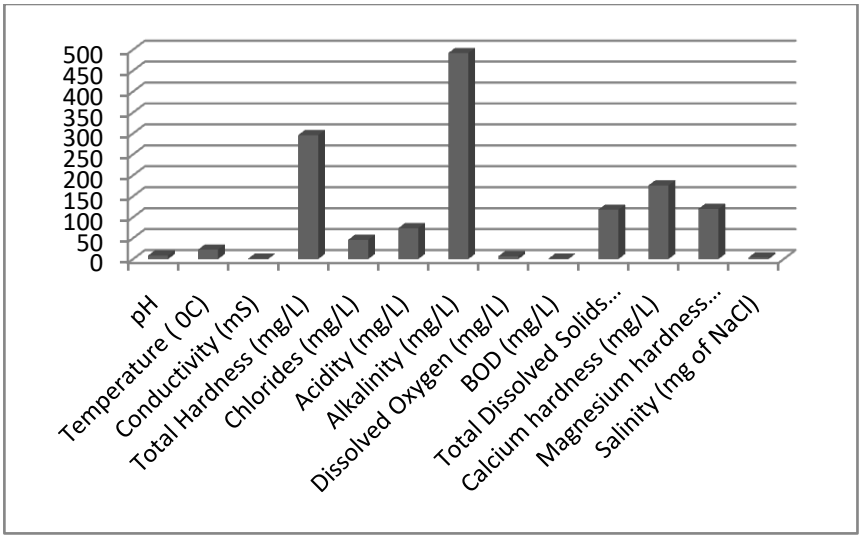
RESULTS & DISCUSSION:-

Table-1:- Values of different parameters of water sample of different drinking sources in Nandgaon village area. (Mean and Standard deviation is calculated)

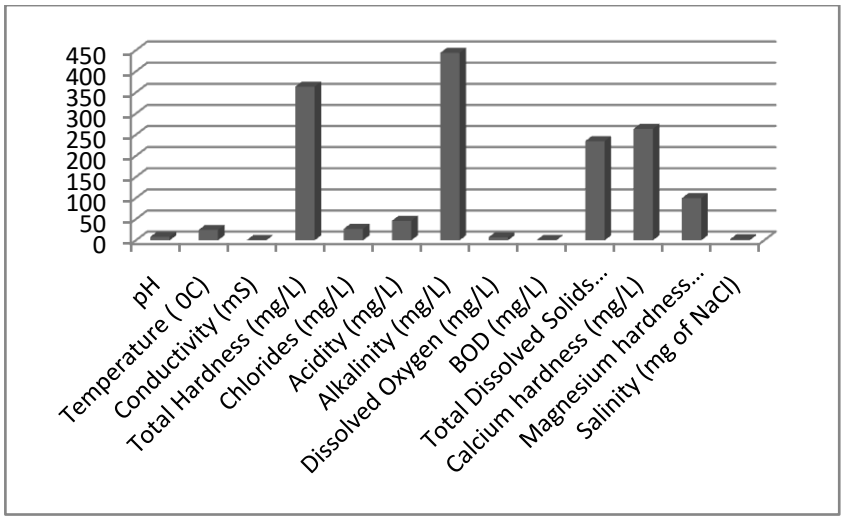
Parameters	Tap water Mean±S.D	Bore well water Mean±S.D	Well water Mean±S.D
pH	7.64 ± 0.02	8.52 ± 0.02	8.32 ± 0.02
Temperature (^{0}C)	24.3 ± 0.3	22.8 ± 0.3	24.7 ± 0.3
Conductivity (mS)	0.314 ± 0.002	1.174 ± 0.002	0.904 ± 0.002
Total Hardness (mg/L)	176 ± 1.0	296 ± 1.0	364 ± 1.0
Chlorides (mg/L)	14.05 ± 0.18	46.15 ± 0.18	27.13 ± 0.18
Acidity (mg/L)	40.6 ± 0.3	73.9 ± 0.3	46.3 ± 0.3
Alkalinity (mg/L)	152 ± 0.3	492 ± 0.3	444 ± 0.3
Dissolved Oxygen (mg/L)	7.126 ± 0.015	6.896 ± 0.015	7.266 ± 0.015
BOD (mg/L)	1.231 ± 0.03	0.993 ± 0.03	1.127 ± 0.03
Total Dissolved Solids (mg/L)	108 ± 1.0	118 ± 1.0	235 ± 1.0
Calcium hardness (mg/L)	96 ± 0.3	176 ± 0.3	264 ± 0.3
Magnesium hardness (mg/L)	80 ± 0.3	120 ± 0.3	100 ± 0.3
Salinity (mg of NaCl)	1.758 ± 0.003	4.102 ± 0.003	2.930 ± 0.003



a. Graph showing concentration range of various parameters of Tap water.



b. Graph showing concentration range of various parameters of bore well water.



c. Graph showing concentration range of various parameters of well water.

1. Temperature: Temperature is the most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimize temperature

change. The Water temperature depends on the depth of the water column, climatic and topographic changes [19].

A rise in temperature of water leads to the speeding up of chemical reactions in water, reduces the solubility of gases and amplifies the tastes and odour. At higher temperature with less dissolved gases the water becomes tasteless and even does not quench the thirst and decreases the solubility of oxygen. Temperature also determines various other factors such as pH, Conductivity, saturation level of gases and various forms of alkalinity. The temperature of Tap water is 24.3±0.3 ^{0}C, bore well water temperature is 22.8±0.3 ^{0}C and temperature of well water is found to be 24.7±0.3 ^{0}C.

2. pH: pH, one of the most common analyses in soil and water testing, is the standard measure of how acidic or alkaline a solution is. pH has no direct adverse effect on health. pH governs the distribution, transport and fate of heavy metals in aquatic ecosystem. It is measured a scale from 0 -14. pH of 7 is neutral, pH is less than 7 is acidic and pH greater than 7 is basic. Aquatic organisms need the pH of their water body to be a certain range optimal growth and survival. The pH of Tap water is 7.64 ± 0.02, bore well water pH is 8.52 ± 0.02 and pH of well water is found to be 8.32 ± 0.02. Amongst these three samples, water is comparatively alkaline in nature.

3. Electrical Conductance: Conductivity is the measure of a substance or solution to conduct electric current. Presence of salts and contamination with wastewater increases conductivity of water. It is a indication of pollution. Electrical conductivity used to quickly estimate the ionic or soluble salt concentration in soils, water supplies, fertilizer solution and chemical solution. It is highly depended upon temperature. Conductivity however is an important criterion in determining the suitability of water for irrigation. The conductance of Tap water is 0.314 ± 0.002 mS, bore well water conductance is 1.174 ± 0.002 mS and conductance of well water is found to be 0.904 ± 0.002 mS. Amongst these three samples, bore well water is comparatively high electrical conductance. The observed values of electrical conductance for others are quite low and less electrolyte.

4. Total Hardness: Total hardness is defined as the sum of calcium and magnesium hardness in mg/L as $CaCO_3$.Total hardness of water an important factor that indicates toxic effect and poisonous elements [20]. There is no adverse effect of hardness on health. Hard water is also not suitable for domestic and irrigation purposes. Total hardness of Tap water is 176 ±1.0 mg/L, bore well water is 196 ±1.0 mg/L and the well water is 364 ±1.0 mg/L. The degree of hardness of drinking water has been classified in terms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/L, Medium - 60-120 mg/L, Hard - 120-180 mg/L, Very hard - >180 mg/L. The observed values were quiet less than the acceptable limit of 300 mg/L for tap water and bore well water samples. But for well water sample, total hardness values are high and near about less and more than 300 mg/L. It shows that water is very hard.

5. Chlorides: Chloride is mainly obtained from the dissolution of salts of hydrochloric acid as table salt (NaCl), NaCO2 and added through industrial waste, sewage, sea water etc. Surface water bodies often have low concentration of chlorides as compare to ground water. It has key importance for metabolism activity in human body and other main physiological processes. High chloride concentration damage metallic pipes and structure as well as harms growing plants. According to WHO standards concentration of chloride should not exceed 250 mg/L.

The chloride content of the tap water sample is 14.05 ±0.02 mg/L, bore well water is 46.15±0.18 mg/L and Chlorides in well water sample is 27.13 ±0.05 mg/L.

6. Acidity: Acidity of water is its capacity to neutralize a strong base and is mostly due to the presence of strong mineral acids, weak acids and the salt of strong acids and weak bases. Addition of wastewater having acidity producing substances increases the acidity of water. The observed acidity of tap water sample is 40.6± 0.015 mg/L of $CaCO_3$, bore well water sample is 73.9 ± 0.3 mg/L. of

$CaCO_3$. While acidity of well water samples is 46.3± 0.3 mg/L of $CaCO_3$. The value is much less than threshold value i. e. 200 mg/L of $CaCO_3$. This indicates that sample of water are in safe range.

7. Alkalinity: Alkalinity is a chemical measurement of water's ability to neutralize acid. Alkalinity is also a measure of water buffering capacity or its ability to resist changes in pH upon the addition of acids or bases. Alkalinity of natural water is due to primarily to the presence of weak acid salts, although strong bases may also contribute (i.e. OH^-) in the extreme environment. Bicarbonate represents the major form of alkalinity in natural water, so its source being the partitioning of CO2 from the atmosphere and the weathering of carbonate minerals in rocks and soil. Other salts of weak acids, such as borate, silicates, ammonia, phosphate, and organic bases from natural organic matter may be present in small amounts.

The observed alkalinity of tap water sample is 152 ±0.3 mg/L of $CaCO_3$, bore well water sample is 492 ± 0.3 mg/L. of $CaCO_3$ while alkalinity of well water sample is 444 ± 0.3 mg/L of $CaCO_3$. The observed value of alkalinity of tap water is within permissible range i. e. below 200 mg/L of $CaCO_3$. The bore well water and well water is not in safe range i.e. higher than permissible range of 200 mg/L of $CaCO_3$.

8. Dissolved Oxygen: The amount of oxygen dissolved in water, such as a lake, river or stream. Dissolved oxygen is the most important indicator of the health of water bodies and its capacity to support a balanced aquatic ecosystem of plants and animals. Warm water released from industrial outlets, flowages or storm sewers can also reduce dissolved oxygen levels. Dissolved oxygen may play a large role in the survival of aquatic life in temperature lakes and reservoirs during summer months. Dissolved oxygen of tap water sample collected is 7.126 ± 0.015mg/L, bore well water sample is 6.896 ± 0.015mg/L, whereas well water sample is 7.266 ± 0.015mg/L. It may be due to high temperature and inorganic reluctance such as hydrogen sulfide, ammonia, nitrites, ferrous ions and other oxidizable substances also tend to decrease dissolved oxygen in water.

9. Biochemical Oxygen Demand (BOD): Biochemical oxygen measures the amount of oxygen that microorganisms consume while decomposing organic matter, it also measures the chemical oxidation of inorganic matter. BOD is a measure of organic material contamination in water, specified in mg/L. BOD is the amount of dissolved oxygen required for the biochemical decomposition of organic compounds and the oxidation of certain inorganic materials (e.g., iron, sulphites). The observed value of BOD for tap water is 1.231 ± 0.03 mg/L, for bore well water is 0.993 ± 0.03 mg/L and for well water sample is 1.127 ± 0.03 mg/L which is within the permissible range i. e. 0.75-1.5 mg/L.

10. Total Dissolved Solids (TDS): Total dissolved solids are the total amount of mobile charged ions, including minerals, salts or metal dissolved in a given volume of water in mg/L. TDS is directly related to the purity of water and the quality of water purification system and affects everything that consumes, lives in, or uses water, whether organic or inorganic, whether for better or for worse. Common inorganic salts that can be found in water include calcium, magnesium, potassium and sodium, which are cations and carbonates, nitrates, bicarbonates, chlorides and sulphates which are anions. They give a particular taste to water at higher concentration and also reduce its palatability. The total solid present in tap water sample collected is 108 ± 1.0 mg/L, for bore well water is 118 ± 1.0 mg/L, while that of for well water sample is 235 ± 1.0 mg/L which is lower than threshold value of total solid content i.e. 500 mg/L.

11. Calcium hardness: Calcium is naturally present in water. Calcium is a determinant of water hardness, because it can be found in water as Ca^{2+} ions. As per Indian Standards the calcium content of water should not be more than 75 mg/L. This has been specified in the IS 10500:- Drinking Water – Specifications. In the study the calcium content in water sample has been found to be for tap water sample is 96 ± 0.3 mg/L, for bore well water is 176 ± 0.3 mg/L and for well water is 264 ±0.3 mg/L. The observed values for all water samples such as Tap water, bore well water and well water possess

values calcium hardness which is higher than the limit as per Specification. They have higher range of concentration of calcium.

12. Magnesium hardness: Magnesium is naturally present in water. Magnesium is a determinant of water hardness, because it can be found in water as Mg^{2+} ions. As per ISI the magnesium content of water should not be more than 50 mg/L. In the study the magnesium content in water sample has been found to be for tap water sample is 80 $\pm$ 0.3 mg/L, for bore well water is 120 $\pm$ 0.3 mg/L and for well water is 100 $\pm$ 0.3 mg/L. The observed values for Tap water, bore well water and well water shows higher concentration of magnesium as per Specification.

13. Salinity:-

Salinity which is defined as the total concentration of electrically charged ions in the water. These ions are the four major cations-calcium, magnesium, potassium and sodium, and the four common anions carbonates (CO_3), sulphates (SO_4), chlorides (Cl) and bicarbonates (HCO). Other components of salinity are charged nitrogenous compounds such as nitrates (NO_3), ammonium ions (NH_4) and phosphates (PO_4) **[**21]. In general the salinity of surface waters depends on the drainage area, the nature of its rock, precipitation, human activity in the area and its proximity to marine water [22]. Waters with salinity below 1% are fresh and waters with salinity higher than 1% are brackish/marine [23]. The observed value of salinity for tap water sample is 1.758 $\pm$ 0.003 mg of NaCl, for bore well water sample is 4.102 $\pm$ 0.003 mg of NaCl and for well water sample is 2.930 $\pm$ 0.003 mg of NaCl .

CONCLUSION: The present paper deals with analysis of water quality in different drinking water resources available in Nandgaon village region which was carried out by taking certain important parameters like Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity. The data of physico-chemical and biological parameters clearly shows that the drinking water of Nandgaon village region is within the permissible range as per APHA (1989), (1992), Trivedi and Goel (1986) except few limitations in one or two parameters. Such water is suitable for drinking purpose and can be used for domestic as well as irrigation purpose.

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तुम्हारी रोशनी में' सुवर्णा, एक स्वतन्त्र नारी की अन्तःसंघर्ष

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प्रस्तावना : 'तुम्हारी रो''ानी में' गोविन्द मिश्र जी का पॉचवा उपन्यास है। समकालीन उपन्यासकारो में मिश्र जी एक महत्वपूर्ण हस्ताक्षर है। 1965 से लेकर आज तक लगातार लेखन कार्य करते जा रहे है। इस उपन्यास की महत्वपूर्ण महिला पात्र सुवर्णा है। वह इस उपन्यास की कथानायिका भी है। इस उपन्यास की रचना 1985 ई. में की गई थी। आधुनिकता और परम्परा के बीच झूलती भारतीय नारी का एक ऐसा चित्र शायद पहली बार हिन्दी उपन्यास में आया है। इतना सं''लष्ट की कहना मु''कल की सुवर्णा यह है–अपनी तरफ से साफ या सपाट करने की जरा भी को''ा''ा न करते हुए चरित्र को उसके उलझावो के साथ वैसे का वैसा रख देना कि वह साहित्य का कम जीवन का ज्यादा लगे। मुक्ति और बंधन के बीच अपनी पहचान खोजती आधुनिक भारतीय नारी का संघर्ष है। मूल्यहीनता की संस्कृति के खोखलेपन को उजागर करते हुए उसे प्रेम तक वापस ले जाने का आग्रह है।

गोविन्द मिश्र के सभी उपन्यासो में सुवर्णा का चरित्र बेजोड़ है। सुवर्णा के रंग रूप का चित्रण करते हुये लेखक लिखता है कि सुवर्णा गोरे रंग की थी, कन्धे तक कटेबाल रहते थे। उसका पुरूष मित्र अनंत उसके व्यक्तित्व से आतंकित रहता था। आधुनिक नाक–नक्''ा–थोड़ा पैनापन लिये हुए ऑखे – चंचल और गहरी। सबके ऊपर पंखा–सा झूलती हुई उम्र की ताजगी। यह वह खूबसुरती थी, जो आस–पास को धुँधलाती नही, बल्कि उसे एक नयी चमक में खड़ा करती है। उसका पूरा नाम श्रीमती सुवर्णा चौधरी थी। सुवर्णा के पति का नाम रमे''ा था। जो पहले एक ही कालेज में पढ़ते थे। दोनो का स्वभाव अलग–अलग था। जहॉ सुवर्णा एक तरफ खुलेपन में जीती थी, तो रमे''ा घुटा–घुटा जीता था। घर की पूरी जिम्मेदारी सुवर्णा के कंधो पर थी। रमे''ा एकदम तटस्थ रहता था। सुवर्णा सभी जिम्मेदारी को अकेले पूरा करती थी। वह खूब गहने भी पहनती थी। उसके अंगुलियो में मोती हीरे जड़े अगूंठियॉ होती थी। वह जैसे खुद सजती थी, वैसे ही घर के एक–एक कोने को सजाती थी। जबकि पति को इससे कुछ मतलब नही था। इसीलिए लेखक सुवर्णा को एक सुघर महिला कहता था। उसके घर में गर्मी ठंडी हर मौसम का खयाल रखा जाता था। जैसा सारा कुछ नाप–तौल और सोच–समझकर जमा किया गया हो। जो चीज जहॉ थी उसकी वह जगह थी, इसीतरह जो चीज जिस अनुपात या मात्राा में होना चाहिए उसी में था। हर तरफ अनुपात, सन्तुलन, सुरूचि उसके घर में देखने को मिलता था। सुवर्णा को गृहस्थिन होना गर्व की बात थी। उसे घर का काम करने में उतना ही अच्छा लगता था, जितना की दफ्तर के काम में। वह जैसे दफ्तर में सफल होना चाहती थी, वैसे ही घर में। उसके पुरूष दोस्त ज्यादा थे, इसलिए को''ा''ा करती रहती थी कि उसके पति रमे''ा अपने को उपेक्षित महसूस न करे।

सुवर्णा अपने पति को अक्सर महत्वपूर्ण बाते बता देती थी। वह कोई काम पति से छिपकर नही करती थी। जैसे उसके दोस्त कौन–कौन है, वह कहॉ जा रही है, किसे बुलाया है इत्यादि। लेकिन उसका पति दिखाने के लिये आधुनिक है परन्तु अंदर से पुराने विचारो से भरा हुआ है। वह चाहता है कि सुवर्णा उसके इ''ाारो पर नाचे, उससे पूछकर किसी से मिले। लेकिन सुवर्णा आधुनिक महिला होने के कारण यह स्वीकार नही कर सकती। वह पत्नी के फर्ज तो निभा सकती है लेकिन पति की गुलामी नही कर सकती। उसे तो मर्दे का घूरकर देखना बहुत नापसन्द है। उसे यह बदतमीजी लगती है, जबकि लोग है कि उसे देखते रहते है। वह दफ्तर में सबसे घुल मिलकर रहती है। वह किसी से गॉठ नही

बॉधती कि वह औरत है। अगर आदमी खुलकर बाते कर सकता है तो सुवर्णा क्यो नही। कोई गलत समझता है तो समझा करे, वह किसी की परवाह नही करती है। वह रमे''ा के प्रति ईमानदार रहती है। सुवर्णा अपने मॉ बाप की इकलौती बेटी थी। उसके घर में किसी चीज की कोई कमी नही थी। वह बचपन से ही राजकुमारी की तरह जीती थी। वह दिमाग में तेज तर्रार थी तभी तो विज्ञान की पढाई की। वह अक्ल से सब कुछ हासिल करना चाहती थी। उसकी नजर में रोना बेवकूफी है। वह खूब पढ़ी–लिखी खूबसूरत महिला थी। वह आर्थिक दृष्टि से हमे''ा से आत्मनिर्भर रही है। कालेज के दिनो में भी उसे चाहने वालो की कमी नही थी। लेकिन वह किसको कितना समय दे, पास रखे, दूर रखे इसका इस्तेमाल बड़ी कु''ालतापूर्वक करती थी। जो बहकने लगता उसे उसकी सीमा तुरन्त बता देती। उसे एक सीमा तक सब कुछ जायद था। सीमा से आगे बढ़ने पर रि''ता तोड़ देने पर हिचकती नही थी। सभी उसके पैरो पर लोटने के लिए आतुर है तो, वह भी सभी को अपने ढंग से इस्तेमाल करती है।

सुवर्णा का स्वभाव सबसे अलग किस्म का था। कभी वह लड़कियों की तरह भावुक बन जाती और कभी आइसक्रिम खाने कि जिद करने लगती थी, तो कभी छोटे बच्चो की तरह दौड़ना पसन्द करती थी। कभी एकदम समझदार महिला बन जाती थी। वह जानती है कि जिस बात पर रमे''ा का हक है उसे वह कभी बॉट नही सकती। इस बात से उसके चरित्र की महानता, दृढ़ता, सिध्द होती है। उसकी भावुकता कभी कमजोरी नही बनती। वह प्रकृति प्रेमी है, प्रकृति के रंगो से उसका जी नही भरता। वह जिसे प्यार करती है तो दिल खोलकर प्यार करती है। उसके स्वभाव में छिपाव नही है। वह पति रमे''ा को कह देती है कि उसे अनंत अच्छा लगता है। उससे बाते करना, साथ बिताना, घूमना अच्छा लगता है। जो रमे''ा के साथ नही कर सकती तो अनंत के साथ करने में क्या बुराई है।

सुवर्णा के जीवन में कई पुरूष मित्र आये और गये। उसे एक स्वभाव के पुरूषों के साथ दोस्ती पसंद नही थी। वह अपने पुरूष मित्र अनंत को बताती है कि उसे सोम का पागलपन पसंद है। सोम की मदहो''ाी उसे पागल कर देती है। लेकिन अपने आप पर नियन्त्रण रखी, कभी मर्यादा भंग होने नही दिया। सुवर्णा को दिपक की कविता, त्याग और इंतजार करने की आदत पसंद है। दीपक का जुनून उसे पसंद है। सुर्वणा को अनंत इसलिए पसंद था क्योकि वह सोचती थी कि अनंत के साथ रहने से उसके जीवन में रो''ानी आयेगी। कोई कमी नही रह जायेगी, बाहर की किसी चीज की जरूरत नही होगी। अनंत के पास होने से उसके अंदर वि''वास भरता है। सुर्वणा को श्याममोहन भी पसंद था। सुवर्णा को जिस किसीके अंदर कोई अच्छी आदत पसंद आ गयी, तो सुवर्णा उससे दोस्ती कर लेती है। सुवर्णा को वि''वास है कि इससे जीवन का उद्दे''य पूरा हो जाता है। हालाकि यह सब दोस्ती करते हुए भी वह अपने पति के प्रति ईमानदार रहती है जो उसके चरित्र को महान बनाती है। ऐसे ही उसके चारो दोस्त अलग–अलग क्षेत्र के है जैसे कोई पत्रकार है, कोई खिलाड़ी है तो कोई कलाकार। लेकिन उसके पति कों यह पसंद नही, वह घुट–घुटकर जीता है। रमे''ा चाहता था कि, सुवर्णा ऑफिस से सीधे घर आये, लेकिन सुवर्णा रमे''ा की गुलामी नही कर सकती। रमे''ा के मन में यह वि''वास भरा है कि औरत का मतलब घर की चहारदीवारी में रहनेवाली लेकिन उसे यह नही मालुम कि सुवर्णा एक ऑफिसर महिला है जिसे मर्दो से कैसे काम लेना है बखूबी से मालुम है। उसे पुरूष के झूठे दंभ संस्कार सब मालुम है। मित्र अनंत अक्सर उसके पुरूष मित्र के बारे में ज्यादा पूछता है तो वह इस बात को पसंद नही करती। वह अनंत से भी दूरी बना लेती है। वह नही चाहती कि कोई उसके पुरूष मित्र या दुसरे मित्र के बारे में ज्यादा पूछे या बोले। अनंत के माफी मांगने पर ही वह फिर उससे दोस्ती करती है। हालाकि अनंत उसका सबसे पंसदीदा दोस्त था। वह नही चाहती की कोई उसका पीछा

करे। सुवर्णा अपने दिल की हर बात अनंत को बताती है। उसके जीवन में विनय, श्याम मोहन, सोम, दिपक से ज्यादा महत्व अनंत का है। सुनंदा अपनी तरफ से चाहती है कि सब सुखी रहे, उसके कारण कोई दुःखीत न रहे।

सुनंदा देने वाली महिला है, वह लेना कम, देना ज्यादा चाहती है। वह नही चाहती की उसके कारण कोई दुःखीत हो। अगर किसी को उसके कुछ पल से, बात से, सुख मिल रहा है तो क्यो वह वंचित रखे। इसी वजह से उसे कई बार दुःख भी मिलता है, मुसीबत भी झेलना पड़ता है। पति भी नाराज हो जाता है। जबकि वह अनंत से कहती है– ''मै रमे''ा या अपने घर की कीमत पर कुछ नही करती।'' पेज 79 (तुम्हारी रो''ानी में) सुवर्णा को कभी–कभी अनंत से डर भी लगता है। क्योकि अनंत किसी छोटे–से फूल की तरह मासूम है। बहुत ईमानदार है। अनंत के साथ सुवर्णा को महसूस होता है कि अनंत एक वीणा है जिसमें अनंत तरह का संगीत निकलता है। सुवर्णा का पुरूष मित्र अनंत भी सोचता है। कि वह एक स्वतन्त्र किस्म की महिला है। जमाने से चला आ रहा पुरूषो का दम्भ की, वही स्त्री का जीवन चलाये, इसके खिलाफ आज की पढ़ी–लिखी औरत का विद्रोह है।

सुवर्णा सोचती है कि उसके पास देने को इतना कुछ है कि वह अकेले रमे''ा को नही दिया जा सकता इसीलिए वह अनेक लोगो से दोस्ती की है। लेकिन अनंत उसे बताता है कि यह तुम्हारा भ्रम है। तुम एक को देती हो तो दुसरा रिक्त हो जाता है। इस देने के चक्कर में तुम्हे मैनेज करना पड़ता है। कब कौन आ सकता है, कब कौन नही। इस पर सुवर्णा कहती है कि आज की दुनिया में ऐसा कोई संम्बंध नही है, जिसे आप सब कुछ सौप सकते है। उसे कभी श्याम मोहन चाहिए तो कभी रमे''ा, तो कभी अनंत। सुवर्णा अनंत से कहती है –''मेरी रो''ानी तुम्हारे भीतर तभीतक होती है जब मै तुम्हारे पास होती हूँ –– थोडा उसके कुछ देर बाद तक, लेकिन तुम्हारी रो''ानी मेरे भीतर लगातार होती रहती है।'' पेज 89 (तुम्हारी रो''ानी में)

सुवर्णा को किसी सुपर मैन की तला''ा है जिसके अंदर सब की आदते अच्छाइया भरी हो, जिसके अंदर हर तरह का भाव हो। जो सुवर्णा को हर स्थिति में सुख दे सके। उसे अपने पति रमे''ा का सरल व्यक्तित्व भी अच्छा लगता है लेकिन सुवर्णा के लिए प्यार ही सब कुछ नही है। उसे किसी पर ज्यादा निर्भर रहना भी अच्छा नही लगता। उसे जब लगता है कि आजकल अनंत पर ज्यादा दिल आ गया है तो अनंत से कह बैठी – ''ज्यादा मिले तो फिर और कही मन नही लगता सब कुछ बेकार लगने लगता है। यह नही होना चाहिए – किसी एक चीज पर उतना निर्भर हो जाना, हम खतरे के नि''ाान पर आ गये है। पेज 93 (तुम्हारी रो''ानी में)

सुवर्णा को अपने पति तथा नौकरी से भी कभी–कभी नफरत हो जाती है, क्योकि इससै वह खुलकर जी नही पाती है। वह सोचती है कि नाचने का एक स्कूल खोल ले, क्योंकि उसे नाचने की बड़ी शौक है। सुवर्णा अपने बच्चे को भी बहुत प्यार करती है। अक्सर वह बच्चो के सामने पति से उलझने से बचती है। वह नही चाहती कि उसके झगड़ो पर बच्चो के मन मे असुरक्षा का भाव जन्म ले। बच्चे भी मम्मी के चेहरे पर तनाव देखकर मासूम हो जाते है। छोटा बच्चा तो मम्मी के ऑचल या पेट से ही चिपका रहता है। छोटे बेटे को बहुत प्यार करती है। सुवर्णा कितना ही आधुनिक क्यों न बन जाये बच्चो के बगैर नही जी सकती। सुवर्णा जानती है कि दो लोगो के अहं की लड़ाई में सबसे ज्यादा नुकसान बच्चो को उठाना पड़ता है। पति रमे''ा बच्चो को ढाल बनाकर सुवर्णा को ब्लॅकमेल करना चाहता है। श्याम के बर्थडे में पति रमे''ा सबके सामने अपमानित करके लेकर चला जाता है, तो वह नि''चत कर लेती है कि अब पति के साथ जिंदगी नही कट सकेगी। सुवर्णा को रमे''ा सरेआम जलील किया था। रमे''ा उसे अपने ढंग से रखना चाहता है जो सुवर्णा को मंजुर नही है। सुवर्णा पति रमे''ा का घर हमे''ाा के लिए

छोड़कर पिताजी के घर चली जाती है। सुवर्णा का ख्याल है कि जिन्दगी चहचहाने के लिए है, दुनिया की खूबसूरती अपने भीतर लो और उसे खु''ी–खु''ी दूसरों मे बॉटो। सुवर्णा अनंत को सीधे–सीधे कह देती है कि वह गन्दी लड़की है लेकिन उसे छोड़ना मत। अनंत के साथ उसके वे संबंध है जिनका ख्वाब वह देखा करती थी। सुवर्णा यह भी जानती है कि वह कोई जायदाद भी नही है। अब उसे अपने ढंग से जीना है। वह रमे''ा से कभी बेवफाई नही कि लेकिन जैसे ही उसे पता चल जाता है कि रमे''ा का उर्व''ी से अवैध संबंध है तो वह हमे''ाा के लिए रमे''ा को छोड देती है। वह रमे''ा की पत्नी बनकर जी सकती है, लेकिन लौंडी बनकर नही जी सकती है। सुवर्णा स्वाभिमानी औरत है वह जीवन अपने ढंग से जीना चाहती है। वह किसी से मदत भी नही चाहती है। वह रमे''ा से अपनी लड़ाई खुद लड़ेगी। उसे उन औरतो से नफरत है जिन्हे अपने आप पर या पति पर भरोसा नही है। जब एक बार ऑफिस में श्याममोहन की पत्नी गिफ्ट वापस करती है तो सुवर्णा उसे खूब डॉटी, और कही – ''कैसी कमजोर औरते है आप लोग... एक आदमी.... आपका पति समझता है कि मेरा और उसका संम्बंध है क्योकि एक–दुसरे आदमी– मेरे पति– को कोई आपत्ति नही है.....और आप मान लेती है।'' पेज 145 (तुम्हारी रो''ानी में) पति से सम्बंध तोड़कर वह आगे यह भी जानती है कि एक खूबसुरत औरत को जंगल में घूमना मेमना जैसा होता है। उसे किसी–न–किसी का साथ चाहिए इसीलिए वह फैसला कर लेती है कि वह अपने अकेलेपन का नया साथी अनंत को बनायेगी। और पति का साथ हमे''ाा के लिए छोड़ देती है।

निष्कर्ष : 'तुम्हारी रो''ानी में ' उपन्यास में सुवर्णा शुरू से लेकर अंत तक छायी हुई है। वह पुरूष के दंभ के खिलाफ अकेली लड़ती है। एक साथ कई कोनो से उसके ऊपर आक्रमण होते रहे, वह सब को झेलती प्रत्युत्तर देती आगे बढ़ जाती है। सुवर्णा पुरूषवादी मनोवृत्ति से लड़ती है भारतीय नारी के अज्ञान से लड़ती है। जिन्दगी कैसे जिये उसका एक नया तरीका सिखाती है। डॉ. चन्द्रकान्त वांडिवडेकर लिखते है– ''उसकी जरूरत है पुरूषो के साथ समान स्तर पर मैत्री या उसमें प्राप्त होने वाली अपने व्यक्तित्व के प्रभाव की गौरवगाथा।'' सुवर्णा भारतीय नारी को एक नयी दि''ाा दिखाने का काम करती है। वह इ''ाारा आज के समाज को करती है कि क्या औरत पुरूषो से दोस्ती नही कर सकती, पति के अधिकार से ज्यादा कर्त्तव्य, वि''वास को कीमत देती है। इस उपन्यास में जिस समस्या को ध्यान में रखकर गोविन्द मिश्र जी ने लिखा क्या वह आज के समाज की सबसे बड़ी आबादी की समस्या नही है। गोविन्द मिश्र जी इस उपन्यास में सुनन्दा के चरित्र को बड़े ही नायाब तरीके से प्रस्तुत कर आज सबको सोचने की बाध्य कर दिया है कि रो''ानी किसमे है, सुनंदा में या फिर रमे''ा में। बे''ाक सुवर्णा को रो''ानी अनंत में जाकर समाप्त होती है बाकी सुवर्णाओ की क्या होती है, ये किसी को मालुम नही है।

सन्दर्भ :

1. *तुम्हारी रो''ानी में – गोविन्द मिश्र*
2. *मेरे साक्षात्कार – गोविन्द मिश्र*
3. *आकलन गोविन्द मिश्र – सं. रामजी तिवारी*
4. *गोविन्द मिश्रः सृजन के आयाम – डा. चन्द्रकान्त बांडिवडेकर*
5. *गोविन्द मिश्रा का औपन्यासिक संसार – डा. चन्द्रकान्त बांडिवडेकर*
6. *बयाबां में बहार, गोविन्द मिश्र की जीवनी – डा. उर्मिला f''ारीष*

RESOURCE SHARING CONCEPT IN LIBRARY INFORMATION SCIENCE

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Abstract
Since libraries are non-profit institutions, there is lack of funds to purchase all the resources in the library, so resource sharing became essential. Because there is tremendous growth in published literature in the world, the cost of books, periodicals, E-books and Databases are reached at a high level, the demands of users are multi dimensional, to satisfy all the demands of the users is impossible to a single library, to overcome with all these cases resource sharing is very useful. This article states that what is resource sharing?, why resource sharing?, ways, means and methods, definition, objectives, advantages, disadvantages and types of resource sharing.
Keywords: *Resource sharing, inter library loan, library networking*

Introduction

Resource sharing basically Resource sharing is basically sharing of resources of participating libraries on the basis of the agreement of cooperation for the purpose of sharing the resources of each other's materials. This entails not only to share the document resources but also facilitates services, equipments and even the manpower among the participating libraries. The Libraries have started using the computers in large number and have automated their functions and services. After the introduction of internet in Libraries, the concept of on-line resources was introduced and the libraries started subscribing e-journals regularly. The traditional sources of information i.e. books, journals, magazines are supplemented by electronic forms of documents e-books, e-journals, e- newspaper etc. The automated libraries get connected to one or the other networks. A computer network allows the user of one computer to use the resources of another computer which may be space, database, programs or printer. The traditional libraries were facing barriers for interlibrary loan such as indifferences of lending library, conservative attitude, distance, language, cost time etc. The recent developments in Information science, Computer and Telecommunication technologies have changed these perceptions on account of multidimensional growth of published documents. The modern libraries with the advanced technology are forming library consortium for sharing electronic resources.

What is Resource Sharing

Resource sharing denotes "**a mode of operation whereby the functions are shared in common by a number of libraries".**

The term **"Resource"** is used to designate any or all of the materials, functions, services and the expertise of the professional and non-professional staff.

Kent & Galwin (1977) defines a resource as a thing/ person/ action to which one turns for and in time of need.

"Sharing" on the other hand implies apportioning, allotting or contributing something that is owned to benefit others.

In short, resource sharing in the context of library is sharing of;

- Information
- All kinds of information
- Available in any format
- Personnel & Equipment
- Expertise & Services

Why Resource Sharing?

Allen Kent has suggested that "**the success and survival of big libraries will depend on how much and to what extent libraries co-operative with each other in future"**

- Increasing cost of document & Tremendous growth of literature
- Declining library budget & Reduce the operational cost of libraries
- Technological solutions & Users need satisfaction
- Optimum utilization of existing records

The goal of resource sharing is to provide convenient access to information, in whatever form and manner and wherever they located, at possible minimum cost. Resource sharing via network is planned to achieve these basic goals; they are,

- Computerized union service & Maximize user satisfaction
- Shared catalogue service & Shared circulation and interlibrary loan services
- Minimizing cost and time in reaching destination
- Links with other automated library systems and services
- Shared database services such as abstracting, indexing and full text services

Ways, Means & Methods:

- Inter library loan & Co-operative cataloguing
- Co-Operative storage & Reference, Reprographic service
- Documentation centre
- Union list of serials & Bibliographies

Definition of Resource Sharing:

- The activities that result from an agreement, formal or informal, among a group of libraries (usually a consortium or network) to share collections, data, facilities, personnel, etc., for the benefit of their users and to reduce the expense of collection development
- **"**A mode of operation whereby the functions are shared in common by a number of libraries".

Objectives of the Resource Sharing:

Allen Kent, Bhargava (1986) stated the objectives of resource sharing networks as: "Library user should have access to more materials or services providing level service at less cost, increased service at level cost, or much more service at less cost."

- Sharing of the burden of purchasingmaterials & processing the materials
- Sharing of services & Human expertise.
- To extend the accessibility of resources
- To diminish costs & To promote exploitation of resources
- To avoid duplication and save the finances
- Increase availability ofresources & Promote full utilization of resources

Needs for Resource Sharing:

- Information Explosion & No library is self-sufficient
- Language barrier & Limitation in fund
- Diversity in users need
- Increase in user population & Quality of libraryservice
- Inflation & Acquisition, Universal bibliographic control
- Growth of Knowledge in different subjects
- Rapid increase of literature and growth of publication, cost of publications
- Increasing trend of new born subjects and specialization
- Increase in the number of members of user community teachers, scholars and students in universities.

 Lack of environment to make use of available computer and communication technology for efficient and production use in libraries.

ADVANTAGES OF RESOURCE SHARING

Following are the benefits and advantages of resources sharing network;

_ Satisfies the large number of users
_ Very cost effective and saves lot of library space
_ Will set a standard among the pool library members in classification of resources
_ Provides greater level of information's for research students
_ Avoids duplication
_ Ensures the quality of resources available among the libraries
_ It resolve the end users' needs searching across bundle of libraries
_ More professional approach to the resources

DISADVANTAGES/DRAW BACKS OF RESOURCE SHARING

There might be some possible disadvantages from resource sharing which are as follows;

• The dependency on other libraries may impact on the main purpose of collection development.
• The bigger libraries may have to share more and get less from small libraries.
• Possibility of Copyright violation
• Some libraries may not willing to share some resources
• Lack of technological tools/awareness to access resources
• Cost evolved in setting up the computer network for faster communication

1. Inter-Library Loan (ILL)

Inter-library loan is the one kind of resource sharing, **Interlibrary loan** is a service whereby a patron of one library can borrow books, DVDs, music, etc. and/or receive photocopies of documents that are owned by another library. The user makes a request with their home library, which acting as an intermediary, identifies libraries with the desired item, places the request, receives the item, makes it available to the user, as well as arranges for its return. The lending library usually sets a due date and overdue fees of the material borrowed. Although books and journal articles are the most frequently requested items, some libraries will lend audio recordings, video recordings, maps, sheet music, and microforms of all kinds. In some cases, nominal fees accompany the interlibrary loan services.

2. Library consortia: present concept for resource sharing

The concept of consortia is based on the basic principle of cooperation as it is a "cooperative arrangement among group or institutions". The consortia enable libraries to meet the spiraling costs of printed journals and of online resources. The concept of sharing of resources was started with Inter Library Loan(ILL), Document Delivery system (DDS), Library Networking (via, LAN, WAN), etc. At present the more accepted system of resource sharing is Library consortia.

A library consortia can be considered as a formal association of libraries, not under the same institutional control, but usually restricted to a geographical area, number of libraries, types of materials, or subject interests, which is established to develop and implement resource sharing among members. The objective of Library consortia is:

 To control and reduce information costs,
 To improve resource sharing, to develop a network information environment (via campus systems, campus networks, and the Internet.
 To share licensing issues with each other.

The basic premise of consortia is that its members can collectively achieve more than what they can achieve as individual institutions. It is an association of group of Libraries having formally agreed norms to coordinate cooperate or consolidate certain functions to achieve, mutually, the common objective.

In Indian scenario the concept of establishing digital libraries is coming up. The modern computerized libraries where all library operations are being carried out by the specialized library application software and suitable hardware for creating and using library databases. These libraries are also having traditional collections but they are procuring digital resources in the form of e-journal subscriptions, bibliographical and Full Text Databases in CD-ROM/ DVD-ROM format, Online databases of specialized subjects. Theses e-resources can be accessed over the Internet on IP based identification of users.

Due to the financial crunch and the rising cost of the journals, many Indian University and college libraries cannot subscribe to all the required journals and databases. To overcome this problem, libraries are forming consortia. The consortia phenomenon is based on the concept of buying e-information together which has become very important in these days. The purpose is to share the resources in better manner, to reduce the information costs, speedy delivery of documents, to keep abreast of new developments.

3. Library Networking:

Accessibility to information has crossed all the geographical boundaries. The access to the library resources has also transformed from "physical access", to "online access". Networking has integrated all the library activities e-mail, support reference service through search of databases, exploiting the catalogue of other institutions, participation in inter-library loan(ILL), ordering of books and journals, services by establishing home page, etc. Under these circumstances resource sharing and cooperative functioning of the libraries through internet has become vital. Utilization of these facilities depend largely on availability of internet connection and exploiting its services and resources for better access to global information. Therefore this present chapter focuses on the Networking related services provided by Management Libraries in University of Pune as well as IIM Libraries.

The National commission on Libraries and Information Science"s National Program for the year 1975 defines a Network as "Two or more libraries or other organizations engaged in a common pattern of information exchange through communication for some functional purpose. A network usually consists of a formal arrangement whereby materials, information and services provided by a variety of libraries and other organizations are available to all potential users. Libraries may be different jurisdictions but must agree to serve one another on the same basis as each serves its own constituents. Computers and telecommunication may be among tools for facilitating communication among them."

Purpose of library network:

The purpose of library network is to promote resource sharing among member libraries by coordinate efforts for suitable collection development and reduce unnecessary duplication wherever possible. The purpose of the library network is to provide network based services to Users, document Delivery Services, bibliographic Information Services, and human Resource Development.

Major Library Networks in India

INFLIBNET Centre

Information and Library Network (INFLIBNET) 1 Centre is an Autonomous Inter-University Centre (IUC) of University Grants Commission (UGC) involved in creating infrastructure for sharing of library and information resources and services among Academic and Research Institutions. INFLIBNET works collaboratively with University Libraries in India to shape the future of the academic libraries in the evolving information environment. It promotes automation of libraries, develops standards, creates union catalogue of serials, thesis, books, monographs, and non book materials, provides access to bibliographic information sources, creates database of projects, institutions, specialists

DELNET

DELNET (Delhi Library Network) was started as a project of the India International centre in 1988 with initial financial support of National Information System in Science and Technology(NISSAT) and later officially registered as a society in June 19922. presently the DELNET activities are supported by the National Informatics centre (NIC) of the Planning commission, Government of India. The main objective of DELNET is to promote sharing of resources among the libraries located in Delhi and beyond. This is done by developing a network of libraries, by storing and disseminating information, offering computerized information services to users and by coordinating efforts for suitable collection development and reducing unnecessary duplication wherever possible. DELNET gives membership to various libraries including universities, colleges, government departments and provides technical assistance to them for creating and maintaining the bibliographic databases, serials control, union catalogue preparations, abstracting services, inter library loan, document transfer/ copying facilities and for accessing local, national and international databases. It has also created library software such as DELSEARCH, DEL-DOS etc for library networking database creation and database access using different platforms.

MANLIBNET

To promote, nurture and enhance the profession of management librarianship in the country through networking, conferences, workshops, seminars, research, consulting, mentoring and publishing- Management Libraries Network (MANLIBNET) was born in the year 2000 which is in operation for the past four years as a registered Society in Delhi under Societies Regulation Act of 1860. The network is not an on-line network like DELNET, INFLIBNET and so on. Its basic objective of the network is to provide a forum for all the management libraries to share information and ideas for development of libraries and business librarianship. The network organizes annual conventions and publication of a quarterly newsletter.

It is indeed a matter of great pride and satisfaction for the researcher to personally witness (since 1998, the year its establishment) and be part of Management Libraries Network's (MANLIBNET) as a life member of the network.

ADINET

ADINET is a network of libraries in and around Ahmedabad. ADINET was registered as a Society in October 1994. It was initially sponsored by National Information System for Science and Technology (NISSAT), Department of Scientific and Industrial Research, Government of India.

ADINET aims to bring about cooperative mode of working amongst the libraries and information centers in and around Ahmedabad. The main objective of ADINET is to promote sharing of resources and disseminate information among member libraries by networking them and creating a centralized Union catalogue of their holdings. It plans to coordinate efforts for suitable collection development and reduce unnecessary duplication wherever possible. ADINET will not only help library users but will be of help to individuals who practice different professions in getting specialized information of their interest.

Conclusion: Since libraries are non-profit institutions, there is lack of funds to purchase all the resources in the library, so resource sharing became essential. Because there is tremendous growth in published literature in the world, the cost of books, periodicals, E-books and Databases are reached at a high level, the demands of users are multi dimensional, to satisfy all the demands of the users is impossible to a single library, to overcome with all these cases resource sharing is very useful. This concept is very helpful for small and poor libraries, with resource sharing one library can satisfy their user's need at a optimum level.

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वैश्वीकरण और मीडिया

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वैश्वीकरण अर्थात राष्ट्र की अर्थव्यवस्था को वि''व की अर्थव्यवस्था के साथ जोडना है। वै''वीकरण यह एक प्रक्रिया है, जिसके द्वारा संपूर्ण वि''व को एक महकाय बाजार मे परिवर्तीत किया जाता है। वै''वीकरण के चलते आज दे''ा में विदे''ाी फर्मे बहुत कुछ स्वतंत्र रूप से काम करने लगी है, लोग विदे''ाी वस्तये खरीदने लगे है और स्थानीय बचत का काफी हिस्सा दे''ा के बाहर निवे''ा किया जाने लगा है। इसका आ''ाय यह नही है कि वै''वीकरण राजनैतिक अथवा सामाजिक एवं सांस्कृतिक प्रक्रिया होते हुये भी मूल रूप से एक आर्थिक प्रक्रिया है। एक आर्थिक प्रक्रिया के रूप में वै''वीकरण दे''ाों के बीच श्रम, पूॅजी, माल तथा ज्ञान एवं तकनीक के निर्बाध प्रवाह पर जोर देती है। इसकी आधारभूत मान्यता है कि आर्थिक गतिविधिंयॉ स्वातंत्र बाजारद्वारा संचालित कि जाये। जिससे भविष्य मे एक वि''व अर्थव्यवस्था के विकास का मार्ग सुगम हो जाता है।

वै''वीकरण भौतिक व्यक्तिवाद का सामूहिक नाम है। इसकी वि''िाष्टता मनुष्य को समाज निरपेक्ष बनाना है। इसकी आधारभूत मान्यता है कि संप्रदाय, दे''ा, संस्कृति और यहां तक कि इतिहांस से कटकर ही मनुष्य वि''व मानव बनेगा । वह स्थायी रूप से न किसी से जुडा रहेगा और नही किसी के प्रति वफादार रहेगा। वै''वीकरण धर्म एवं संस्कृति संबंधी संकुचित परंपराओ संबंधी प्रतिबंधो से व्यक्ति और व समाज को मुक्त करने हुये उन्हें विकास के बेहतर अवसर एवं व्यापक आयाम भी प्रदान करती है। वै''वीकरण वस्तुतः एक बहुआयामी प्रक्रिया है, जिसमे बिभिन्न आयामो में बहुत कुछ परिवर्तन घटित होते है, जो बहुत कुछ एक–दुसरे के सहगामी होते है।

मीडिया एक व्यापक क्षेत्र, जो एक प्रदे''ा, दे''ा या संपूर्ण वि''व हो सकता है, रह रहे लगोंतक बहुत कुछ एक साथ और एक समय पर सूचना संप्रेषित किये जाने का माध्यम है। दरसल मीडिया जनता की सोच, इच्छा, विचार एवं व्यवहार की अभिव्यक्ती का माध्यम है। इसकी अंतर्वस्तू की सूची बहुत विस्तृत है। यह जहां व्यक्ति को व्यक्तित्व के सर्वोन्मुखी विकास एवं प्रगति के लिए स्वास्थ, ि''ाक्षा, ज्ञान, मनोरंजन तथा रोजगार, व्यापार एवं व्यवसाय आदि से संबंधित जानकारी उपलब्ध कराता है वही सामाजिक जीवन के विविध पक्षों को उजागर करता है जिससे यदि समाज का कोई भाग कमजोर हो गया हो तो वह लोगों की जानकारी मे आये और उसके उपचार के लिए आव''यक फहल किंया जाना संभव हो सकें। इसप्रकार मीडिया वै''वीकरण के दौर में आज समाज, राजनीति, आर्थिकी, संस्कृति एवं पर्यावरण सहित मानव जीवन के प्रायः सभी पक्षों को अच्छादित करता है। वै''वीकरण को बढावा देने में मीडिया एक उपयुक्त माध्यम है। कुलमिलाकर कहे तो आज समाज से जुडा हर क्षेत्र वै''वीकरण से प्रभावित हो रहा है और उसे गति देने का कार्य मीडिया कर रहा है। अतः आधुनिक जगत मे वै''वीकरण और मीडिया एक दूसरे के लिए पुरक सिध्द हो रहे है तथा मानव जीवन के महत्वपुर्ण एवं स''ाक्त अंग बनते जा रहे है।

वै''वीकरण और मीडिया का मूल स्त्रोत व्यक्ति है। इसीलिए दोनो अपने उद्भव से वर्तमान तक विकास कि सतत प्रक्रिया के दौरान एक–दूसरे के अभिन्न रूप मे संबध रहे है। जहांतक वै''वीकरण का प्र''न है मीडिया और संचार के अभाव मे इसका प्रभावी हो पाना असंभव है। मीडिया और वै''वीकरण दोनों के उद्गम का स्त्रोत एक होने के लावा एक अन्य उल्लेखनीय बात यह है कि दोनों का उद्भव

बहुत कुछ एक साथ हुआ है और दोनों ही विकास की लगातार प्रक्रिया से गुजरते हुये अपनी वर्तमान स्थिति तक पहुंचे है। साथ ही विकास के इस दौर मे वे एक–दूसरे के साथ अभिन्न रूप से जुडे हुये है। संक्षेप, में हम कह सकते है कि वै''वीकरण सूक्ष्म रूप से समाज के बीच सुचना, ज्ञान, अनुभव एवं तकनीकी कौ''ाल का संप्रेषण एवं प्रसार है तथा मीडिया वह साधन है जिससे संचार एवं प्रसार संपन्न होता है। इस प्रकार वै''वीकरण और मीडिया दोनों एक–दुसरे से प्रभावित होते है और एक–दूसरे को प्रभावित करते है। वै''वीकरण में हमारी दिनचर्या, साहित्य और समाज नयी उपभोक्तावादी बाजार संस्कृति में बदल रहा है। पत्र–पत्रिकाह, समाचार पत्रों, सायित्यिक रचनाओं के साथ सूचनाओं का भंडार खुल गया है। वै''वीकरण के इस दौर में विज्ञापनो के द्वारा हिंदी अंग्रेजी मिश्रित नयी भाषा का प्रचार प्रसार तेजी से हो रहा है।

वै''वीकरण और मीडिया का संबंध इकतरफा नही है। वै''वीकरण मीडिया संप्रेषण एवं विस्तार में महत्वपूर्ण भूमिका अदा करता है तो मीडिया वै''वीकरण वो तेज करता है। मीडिया वित्तीय लेन–देन तथा व्यापारिक सूचनाओं जानकारियों व संदे''ाों का तत्काल संप्रेषण संभव कर आर्थिक वै''वीकरण को मजबूत करता है। यह स्थानीय समाजों व संस्कृतियों को एक–दुसरे के निकट लाता है, जिससे उनमे एकरूपता का विकास होता है और सामाजिक, सांस्कृतिक वै''वीकरण के प्रक्रिया धनीभूत होती है। मीडिया कर्मियों के वै''वीक वर्ग के रूप में विकास के माध्यम से भी यह सामाजिक–सांस्कृतिक वै''वीकरण को मजबूत करता है। इस तथ्य से इंकार नही किया जा सकता है की आज मीडिया कर्मी अपनी भिन्न राष्ट्रीय पहचानो से परे एक वै''वीक मीडिया कर्मी वर्ग के सदस्य के रूप में अपनी एक नयी वै''वीक पहचान कायम कर रहे है। अपना स्वतंत्र अस्तित्व कायम रखने मे वै''वीकरण बाजार के माध्यम से मीडिया को अपनी आर्थिक आव''यकताओंकी संपूर्ति की व्यवस्था करने में मदद भी करता है। निष्कर्षतः कहा जा सकता है कि आज मीडिया एक नई वि''वक्रांति के रूप में उभर रहा है तथा उसने अपने प्रचार प्रसार के माध्यम से आज मनुष्य के सामाजिक परिवर्तन का एक क्रांतिकारी हत्यियार बन चुका है।

संदर्भ :–

1. *वै?वीकरण, मीडिया और समाज–रामगोपाल सिंह*
2. *वै?वीकरण के परिप्रेक्ष्य में भाषा और सहित्य –संपादक, डॉ. माधव सोनटक्के, डॉ. अंबादास दे''ामुख*

COMPARATIVE STUDY ON ENERGY SAVING LAMP

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Abstract
Electric lighting is a major energy consumer. Enormous energy savings are possible using energy efficient equipment, effective controls, and careful design. Nowadays, lighting represents 20% of the global electricity consumption. Light can be produced using different technologies but three basic light bulb namely incandescent ,compact fluorescent and LEDs are more efficient technologies nowadays used. The paper presents a life cycle assessment of different lighting technologies like incandescent lamps, compact fluorescent lamps (CFL) and Light Emitting Diode (LED) luminaries for the general lighting of the office or homes. More than 100 years after invention of light bulb, the incandescent bulb is still the most sold and one of the more used light sources. Compact Fluorescent Lamps use a different, more advanced technology than incandescent light bulbs and come in a range of styles and sizes based on brand and purpose. A new lighting technology has been evolved as light emitting diodes (LEDs) that can be over 10 times more efficient than conventional-old incandescent .

Introduction:

The Household lighting cost typically accounts for 10% of the electric bill.Changing the light bulbs effectively can reduce the long-term energy costs significantly. Thus, in the present energy scenario, in developing countries like India, an efficient lighting with proper techniques is used, major energy saving is possible. Also it has to be take comparison between light bulbs to get to know efficient and better lighting technology.

More than 100 years after invention of light bulb ,incandescent bulb the most sold and one of the more used light sources but Compact Fluorescent Lamps use a different, more advanced technology than incandescent light bulbs and come in a range of styles and sizes based on brand and purpose. LEDs has several advantages such as low heat output,small size, long lamp life, , energy savings and durability. Compact fluorescent lights (CFLs) and light emitting diodes (LEDs), convert most of their energy into light. Both CFLs and LEDs are designed to last longer than the average incandescent bulb, reducing both energy and replacement costs and increasing longevity.

This paper presents the design, working, operation,advantages and future use of the above technologies. It also compares the LED system with other technologies (Compact Flourescent and incandescent lamps).

Incandescent light bulbs:

An incandescent light bulb, incandescent lamp or incandescent light globe is an electric light with a wire filament heated to such a high temperature that it glows with visible light (incandescence). Incandescent bulbs are manufactured in a wide range of sizes, light output, and voltage ratings, from 1.5 volts to about 300 volts. Robert Friedel and Paul Israel list 22 inventors of incandescent lamps prior to Joseph Swan and Thomas Edison.[2]

Incandescent lamps generate light by passing an electric current through a thin filament wire until the wire is white-hot. They are used mainly in residential applications because they emit a warmer light that contains less red and blue [3].

1-Construction:

Incandescent light bulbs consist of an air-tight glass enclosure (the envelope, or bulb) with a filament of tungsten wire inside the bulb, through which an electric current is passed. Contact wires and a base with two (or more) conductors provide electrical connections to the filament.

Base of the bulb has metal contacts and they are connected to the ends of the circuit. Metal contacts in turn are connected to wires attached to the filament. The tungsten filament lies in the center of the incandescent bulb with the help of a glass mount. Bulb of quartz or glass encloses the filaments, wires and inert gases like argon and nitrogen. When the incandescent bulb is given a power supply, current flows through the filaments and wires from contact to contact and the bulb glows. This is because of the excitation of atoms inside and zip of the tiny particles through the filament causing atoms to give energy in the form of heat and light

2-Working Principle:

Light bulbs work on a very simple principle. When metal is heated, it glows.Electricity comes into a light bulb via a hot wire connected to a tab on the base of the bulb. Inside the bulb the electricity goes through a wire leading to a piece of tungsten. The tungsten is very thin and coiled to maximize resistance in the wire .When electricity meets resistance, it heats up the resistor.The tungsten gets to a temperature of about 4500° Fahrenheit (2482° Celsius). This causes it to get white hot.It glows, and glows quite brightly.



3-Efficiency and Environmental impact:

Of the power consumed by typical incandescent light bulbs, 95% or more is converted into heat rather than visible light [6] This is becouse incandescent light bulb to work, electrical energy has to pass through a filament for it to be converted to heat. It is when the filament becomes hot enough that light is produced. Since this process generates more heat—about 90 percent of its output—than light, a great deal of electrical energy is actually wasted. This makes incandescent light bulbs less efficient compared to compact fluorescent lamps and other devices, which require less electricity to give off the same (if not more) amount of light.

incandescent light bulbs as harmful not only because of the electricity they waste in producing heat, but also because of the substantial amounts of carbon dioxide they emit. In addition, the heat they generate pushes cooling systems like air conditioners to work harder, especially during summer. These cooling systems are dependent on coal power plants, which are known for the greenhouse gases they emit [7]

4-The Future of Incandescent lamp:

The future of the incandescent light bulb is uncertain. While heating a filament until it glows is certainly a satisfactory way to produce light, it is extremely inefficient: about 95 percent of the electricity supplied to a typical light bulb is converted to heat, not light. In a world with dwindling

resources, where energy conservation is increasingly vital, this inefficiency may eventually make the incandescent light bulb impractical [8]

Compact Flourescent Light Bulb:

A compact fluorescent lamp , is a fluorescent lamp designed to replace an incandescent light bulb.CFLs use one-fifth to one-third the electric power, and last eight to fifteen times longer. A CFL has a higher purchase price than an incandescent lamp, but can save over five times its purchase price in electricity costs over the lamp's lifetime [9]

CFLs radiate a spectral power distribution that is different from that of incandescent lamps but CFLs as subjectively similar in color to standard incandescent lamps.[10]

1-Construction:

Compact fluorescent lights (CFLs) are created by taking a traditional fluorescent tube and bending it into a compact design that fits easily into ordinary incandescent fixtures.There are two types of CFLs: integrated and non-integrated lamps. Integrated lamps combine the tube and ballast in a single unit. These lamps allow consumers to replace incandescent lamps easily with CFLs. Non-integrated CFLs have the ballast permanently installed in the luminaire, and usually only the fluorescent tube is changed at its end of life. Since the ballasts are placed in the light fixture, they are larger and last longer compared to the integrated ones. CFLs have two main components: a magnetic or electronic ballast and a gas-filled tube (also called bulb or burner). Replacement of magnetic ballasts with electronic ballasts has removed most of the flickering and slow starting traditionally associated with fluorescent lighting, and has allowed the development of smaller lamps directly interchangeable with more sizes of incandescent light bulb.

Electronic ballasts contain a small circuit board with a bridge rectifier, a filter capacitor and usually two switching transistors, which are often insulated-gate bipolar transistors. The incoming AC current is first rectified to DC, then converted to high frequency AC by the transistors, connected as a resonant series DC to AC inverter. The resulting high frequency is applied to the lamp tube.

2-Working Principle:

In fluorescent lamps, light is generated using a very different method without the need to heat anything. It consists of a sealed tube with a coating of fluorescent material on the insides and an electrode at each end. The tube contains mercury vapor.

When a voltage is applied across the electrodes, the gas inside the tube gets ionized, conducts electricity and in the process generates ultraviolet (UV) light. When the UV light hits the phosphor coating on the inside of the tube, the material glows to produce visible light.

When the lamp is switched on, a component called the ballast produces a high voltage between the electrodes, which is necessary for the initial ionization of the gas in the tube. Once the lamp starts operating, the current and light output can be maintained using a much lower voltage. Unlike incandescent lamps, the little heat produced in a fluorescent lamp is just a byproduct and most of the energy is converted into light.[14]

3-Efficiency and Environmental impact:

The luminous efficacy of lamps is the number of lumens produced for each watt of electrical power used [15]. The luminous efficacy of a typical CFL is 50–70 lumens per watt (lm/W). CFL lamps have lighting efficiency ranges of 7–10% [16]. Because of their higher efficacy, CFLs use between one-seventh and one-third of the power of equivalent incandescent lamps.[15]. Replacing all inefficient lighting with CFLs would save 409 terawatt-hours (1.47 exajoules) per year, 2.5% of the world's electricity consumption.

CFLs, like all fluorescent lamps, contain mercury.[18][19].The mercury released from powering an incandescent bulb over five years is 10 milligrams; however, only 2.4 milligrams of mercury is released over the same period of time to power a comparably luminous CFL. Thus, by using up to

75% less energy than incandescent lamps, CFLs decrease the amount of greenhouse gas emissions in our atmosphere and help off-set global warming [20].

CFLs may pose an added health risk due to the ultraviolet and blue light emitted. This radiation could aggravate symptoms in people who already suffer skin conditions that make them exceptionally sensitive to light.

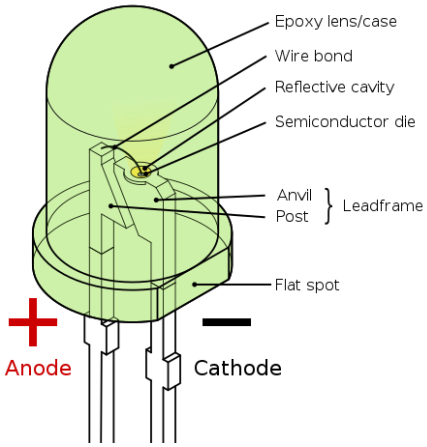
Light emitting Diode:

A LED lamp or LED light bulb is an electric light for use in light fixtures that produces light using light-emitting diode (LED). LED lamps have a lifespan and electrical efficiency which are several times greater than incandescent lamps, and are significantly more efficient than most fluorescent lamps [21][22][23]. LEDs, as their name suggests operate as diodes, run on direct current (DC), whereas mains current is alternating current (AC) and usually at much higher voltage than the LED can accept. An LED is made like electronics. It's a chip of semiconducting material. LED bulbs are more efficient and last much longer than either incandescent or fluorescent bulbs. Unlike fluorescent bulbs, LEDs do not use mercury, which is toxic.

It is a type of diode that makes one color of light when electricity is sent through it in the expected direction .This effect is a kind of electroluminescence [24].The color of the light depends on the chemical composition of the semiconducting material used [25]. The color affects how much electricity is used by the LED [26].

1-Working principle:

It is a two-lead semiconductor light source. It is a p–n junction diode that emits light when activated [27].When a suitable current is applied to the leads,[6][7] electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence [28][29][30] .



Electroluminescence (EL) is an optical phenomenon and electrical phenomenon in which a material emits light in response to the passage of an electric current or to a strong electric field. Electroluminescence is the result of radiative recombination of electrons & holes in a material, usually a semiconductor. The excited electrons release their energy as photons – light [31].

2-Efficiency and Environmental impact:

LED light bulbs use only 2-17 watts of electricity (1/3rd to 1/30th of Incandescent or CFL). Typical indicator LEDs are designed to operate with no more than 30–60 milliwatts (mW) of electrical power. Use of LED bulbs causes less damage to the environment than CFL and incandescent bulb. A 6-to-8-watt LED bulb, with a light output of 800 lumens, will last for 50,000 hours. In comparison, incandescent bulbs last 1,200 hours and consume 60 watts, while CFLs last for 8,000 hours and use

13-15 watts.LED bulbs consume less power per unit (lumen) of light emitted. This reduces greenhouse emissions from power plants. Carbon dioxide emissions for LEDs are also low. Roughly, one LED bulb will minimize greenhouse gas emissions by almost half a ton [32].

Conclusion:

Artificial lighting systems are transitioning from incandescent to compact fluorescent lamp (CFL) and light-emitting diode (LED) leads to energy savings and reduced greenhouse gas emissions. Although CFLs and LEDs are more energy-efficient than incandescent bulbs, they require more metal-containing components. Therefore, the objective of this study is to analyze the resource depletion and toxicity potentials from the metals in incandescent, CFL, and LED bulbs to complement the development of sustainable energy policy.

The comparative study of various parameters of light sources explains that incandescent lamps are the most inefficient with maximum power consumption and maximum life cycle cost. CFLs are good alternative for incandescent lamps with somewhat lesser power consumption and very less life cycle cost.LED lamps have very low life cycle cost as compared to other. advantage with LEDs is that they have maximum burning hours. It means once the LED lamps are installed, they do not need to be replaced again and again for years. The objective of this study is to analyze the resource depletion and toxicity potentials from the metals in incandescent, CFL, and LED bulbs to complement the development of sustainable energy policy.

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आगरी बोली: इतिहास आणि उच्चारप्रक्रिया

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१. प्रस्तावना :–

भा ा ही मानवी समुहाने परस्पर विचारविनिमयासाठी संपर्कासाठी व अभिव्यक्तीसाठी हेतूपूर्वक निर्माण केलेली प्रक्रिया आहे. ध्वनीयुक्त संकेत हे त्याचे साधन असते. उच्चार व श्रवण ह माध्यम असते. समाजातील व्यक्तीचे व्यवहार भा ोच्या साहय्याने चाललेले असतात. म्हणून त्या त्या समाजातील भा ा भिन्न भिन्न असली तरी ती व्यवहाराचे साधन असते.

भा ा ही परिर्वतनशील असते. त्यात बोली हे दैनंदिन व्यवहाराचे साधन आहे. बोली या मौखिक पध्दतीने आलेली असल्यामुळे तिच्या अंगी एक जिवंतपणा असतो. तिची स्वाभाविकता हेच तिचे वैशि टये असते. बोलींना योग्य तो सन्मान मिळणे म्हणजे त्या समाजाचा, त्या भा ा बोली बोलणाऱ्या व्यक्ती, त्या राहत असलेल्या समाजाचा अन् संस्कृतीचाच तो सन्मान असतो. विविध बोली समजून घेणे म्हणजे विविध संस्कृतीत जगणाऱ्या वावरणाऱ्या माणसाला समजून घेणे आहे. बोलीमध्ये एक अंगभूत गोडवा असतो. तिला एक स्वाभाविक लय असते.

सहयाद्रीपासून अरबी समुद्रापर्यंतचा पश्चिमेकडील प्रदेश म्हणजे पूर्वीचा अपरान्त होय. कोकण त्याचे प्राकृत नांव आहे. ठाणे, मुंबई, कुलाबा, रत्नागिरी हे जिल्हे व गोवा हा पूर्वीचा प्रदेश कोकणामध्ये येत असे. आज ठाणे, मुंबई, नवी मुंबई, रायगड,रत्नागिरी व सिंधुदूर्ग हे जिल्हे हा कोकणंचा भाग मानला जातो. या कोकणची पूर्वीची मानवी वसाहत भौगोलिकदृ टया पाहिली तर दर्यावर दर्यावदी कोळी, त्यानंतर पूर्वेकडे गेल्यावर आगरातला आगरी, माळावरचा माळी आणि वनातला म्हणजेच आदिवासी. या दरम्यान होती. हे सर्व मानवी समुह अनार्य म्हणजे द्रविड संस्कृतीमधील आहेत.[१] यातील दर्यावरचा कोळी आणि माळावरचा माळी या दोन्ही मधील आगर (नारळी, पोकळी, भाजीपाला, मीठ, मासे, भात वगैरे पिकविण्याचे ठिकाण) पिकविणारा तो आगरी समाज होय. आगरी समाज हा मुळत: कुणबी म्हणजे ोतीप्रधान आहे. व त्याला मदत करून बलुतेदार व इतर समाज जगत होते. हे सारे आगरातील समाज आगरी प्रमुख लोकांबरोबर त्याची आगरी बोली बोलत होते व बोलतात. म्हणून या बोलीस केवळ आगरी बोली जातीवाचक न म्हणता 'आगर बोली' आगरातील लोकांची म्हणणे संयुक्तिक ठरेल.[२]

२. भौगोलिक वापरक्षेत्रे.

आगरी समाजाची मूळ वस्ती ठाणे, मुंबई, रायगड (पूर्वीचा कुलाबा) हया भागामध्ये मोठया प्रमाणात होती. आज ती ठाणे, मुंबई नवी मुंबई, रायगड व नाशिक या जिल्हयात बऱ्यापैकी आहे. त्यामुळे ठाणे जिल्हयातील पालघर ते मुंबई, नवी मुंबई, रायगड जिल्हयाचे दक्षिणेचे ोवटचे टोक, नासिक जिल्हाचा काही भाग, धुळे, जळगांव जिल्हयाचा थोडासा भाग यात आहे. तिथे आगरी बोली बोलली जाते.

आज अलिबाग कडील आगर बोली मुळस्वरूपात आहे. नवी मुंबईत ती कोळी बोली व आगर बोली अशी मिश्र स्वरूपाची दिसते. ठाणे जिल्हातील वसई, पालघर, विरार या भागात ती तेथील वाडवळ वगैरे बोलीत मिसळून गेली आहे. अलिबाग तालुक्यात 'अक्षी' या गावी मराठीतील पहिला शिलालेख सन १०१२ मध्ये सापडला आहे. परंतु या शिलालेखाची लिपी शिलाहारकालीन आहे. त्याची भा ा संस्कृत मराठी मिश्रीत अशी आहे. त्या शिलालेखात आगर बोलीतील ाब्द दिसत नाहीत. यावरून ही भा ा राजघराण्यातील असावी असे वाटते तर बहुजन कृ ी घराण्यातील या आगर बोलीला १९६० नंतरच लिखित स्वरूप मिळाले. ही बोली १९७० नंतर ांकर सखाराम, परेन जांभळे, यांच्या लेखनातून मोठया प्रमाणात मराठीत आली. रूळली आणि ओळखीची झाली. या आगर बोलीत किती तरी लोककथा व लोकगीते आहेत. दृ टांतपाठात ोभाव्यात अशा कितीतरी आगर बोलीत लोककथा आहेत. तसेच अनेक ाब्द आहेत. उदा. चिंबोऱ्याची गो ट, काळया नि बाळयाची गो ट. अका न मकाची गो ट इ. आगर बोलीत विवाह प्रसंगी धवळे

गाण्याची प्राचीन परंपरा आहे. ही परंपरा आजही तशीच टिकून आहे. याशिवाय एकवीरा देवीची लोकगीते, नागपंचमीची लोकगीते, गणपतीची लोकगीते, गौरीची लोकगीते, होळीची लोकगीते, अंगाईगीते, गोकूळअ टमीची लोकगीते,

३. आगर बोलीतील उच्चार प्रक्रिया स्वरूप वैशि टये–

१. 'ळ' बद्दल 'ल' येतो उदा. कंटाळा = कंटाला, नळ = नल, धुळ = धुल
२. 'ण' बद्दल न येतो उदा. आठवण – आठवन, पण – पन, गोण – गोन
३. ाब्दात प्रथम येणारा 'ड' तसाच राहतो मात्र नंतरचा 'ड' चा 'र' होतो. उदा. कडू–करू, वेडा – यरा, डबडे – डबरा, तडांग – तरांग.
४. ाब्दांती येणारा ओकार 'ऊ' कार होतो. उदा. गेलो – गेलु, आलो–आलु
५. ओकारान्त ाब्द अकारान्त होऊन पुढे 'स' येतो. उदा. मारतो – मारतस, घेतो – घेतस, करतो – करतस, जातो – जातस
६. ाब्दांती 'त' ऐवजी व येतो. उदा. घेतलास – घेतलाव, बघितलेत – बघितलाव, केलात – केलाव, खात – खाताव, तोललेत – तोलाव इ.
७. एकारान्त ाब्द अनुखाना होतो. उदा. कुठे – कुठं, तिथे – तिथं
८. एकारान्त अनेकवचनात आकारान्त होते. उदा. झाडे – झारा, पोरे – पोरा
९. अनुस्वाराचा स्प ट उच्चार होत नाही. उदा. पिंपळ – पिपल, चिंच – चिच, खुंट – खुट
१०. छ चा सर्रास स होतो. उदा. छत्री – सत्री, छोटा – सोटा, छोकरा – सोकरा, छगन – सगन, छडी – सरी.
११. आगरी बोलीत व चा लोप होऊन पुढे महाप्राण येतो. उदा. जेवढा – जव्हरा, तेवढा – तेव्हरा, केवढा–कव्हरा, इत्यादी.
१२. ाब्दाला सुरूवातीच्या र चा कधी कधी ल होतो. उदा. रडतोय – लरतय, रबर – लबर, राखडी – लाखरी
१३. जोडशब्दातील र चा वेगळा उच्चार होतो. उदा. प्रत्येक–परतेक, प्रकाश –परकाश, कात्री–कातरी, श्रीमंत – ीरीमंत
१४. ा चा स होतो. उदा. ारद – सरद, ाप–सराप, ोध–सोद
१५. सुरूवातीचा 'वि' जाऊन त्या जागी इ येतो. उदा. विमान– इमान, विरजण–इरजन, विमल–इमल, वि ाय–इ ाय
१६. पण ऐवजी पन किंवा 'बी' येतो. उदा. मीपण–मीपन–मीबी, तूपण–तूपन–तूबी, आम्हीपण– आम्हीपन–आमीबी,
१७. उन,हुन प्रत्यया ऐवजी 'शी' येतो. उदा. गर्दीतून – गर्दीशी, गावातून–गावाशी, लांबून–लांबशी, गावाहून–गावशी
१८. ला प्रत्यया ठिकाणी 'ल' महाप्राण होतो. उदा. तुला – तुल्हा, तिला – तिल्हा, कधी 'ला' चे ना होते उदा. मला – मना
१९. 'त' ऐवजी न येतो. उदा. फुलात – फुलान, रानात–रानान, मनात–मनान
२०. नो या संबोधना ऐवजी नू किंवा हू येतो. उदा. पोरानो–पोरान्–पोराहू, गाववाल्यानो – गाववाल्यांन्, गाववाल्यांहू
२१. होता, नव्हता ऐवजी व्हता, नता येते.
२२. आता चे ऐवजी आथा येते.
२३. अ चा सर्रास आ होतो. उदा. अंग – आंग, अभ्यास – आभ्यास, अंतर–आंतर, असा–आसा
२४. वे ऐवजी य येतो. उदा. वेडा – येडा, वेस–येस, वेगळा–यगळा
२५. 'म' चा म्ह होतो. उदा. महादेव – म्हादेव, मारोती–म्हारोती, महाराज–म्हाराज
२६. 'ढ' ऐवजी ऱ्ह येतो. उदा. गाढव–गाऱ्हव, पेढा–पेऱ्हा, कढी–कऱ्ही
२७. सुरूवातीच्या 'ओ' ऐवजी व येतो. उदा. ओटी–वटी, ओवा–वोवा
२८. ए येवजी 'य' येतो. उदा. एक –यक, एकदा–यकदा,
२९. ोवटच्या 'ई' ऐवजी य येतो उदा. सुई–सुय

३०. सुरवातीच्या 'ऐ' कार जाऊन मूळ अक्षरापुढे 'ई'कार येतो. उदा. बैल–बईल, म्हैस–म्हईस, वैद्य–वईद, मैल–मईल

३१. सुरूवातीच्या 'औ' कार जाऊन मुळाक्षरापुढे 'ऊ' येतो. उदा. मौज–मऊज, गौरव–गऊरव, फौज–फऊज, हौद–हऊद, कौल–कऊल

३२. आगरी बोलीत ढ,ड,ण,ळ, हे ध्वनी फारसे वापरले जात नाहीत. सोंपे उच्चार करून भा ाा सहज, सुलभ करण्याकडे कल असतो तसेच त्र, ा,छ,ण,ळ ही व्यंजने बोलीत नाहीत.

संदर्भ ग्रंथ

1. *भारतीय भा ााचे लोक सर्वेक्षण – संपा अरूण जाखडे पृ. ८२ पदमगंधा प्रकाशन पुणे*
2. *भारतीय भा ााचे लोक सर्वेक्षण – संपा अरूण जाखडे पृ. ८२ पदमगंधा प्रकाशन पुणे*

ROADMAP FOR WEB DEVELOPMENT

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Abstract
Building a website requires that we obtain the right tools and resources. Standardization is one factor. When we use the right tools, we are assured that our pages would be standard and acceptable to every visitor. This research paper (ROADMAP FOR WEB DEVELOPMENT) discusses the various tools and techniques used in the development of website. We have mostly focused on the use of HTML and CSS in developing process of website and the phases that need to be accomplished while developing a website.
Keywords*: Navigation, Impressive, Effective, HTML, Development, Standardization.*

INTRODUCTION

Website Development is like house building, before house building process, we ask to an architect about plan, building permit, oversee a survey of geological and license from city. All things must have to see in the website development requirement, designing, documentation, appropriate server and programming language etc. Most necessary things for a website is selecting a programming language. Mostly web designers use HTML and CSS. For web designing, it is not necessary to have high level knowledge of HTML. We can say features like as webpage formatting, designing, page layout techniques, graphics, multimedia, images and functions of multipage website should be including. After programming language to see the layout of webpage one should use a test server. The reason behind this, developer is using programming language, either will be the expert of language but still running often these mistakes cannot be found, there is a need to execute server side codding to see the preview by a test server.

The Web Site Design and Development Process

There are numerous steps in the web site design and development process. From gathering initial information, to the creation of web site, and finally to maintenance to keep the web site up to date and current.

The exact process will vary slightly from designer to designer, but the basics are the same.

1. Information Gathering
2. Planning
3. Design
4. Development
5. Testing and Delivery
6. Maintenance

Phase One: Information Gathering



The first step in designing a successful web site is to gather information. Many things need to be taken into consideration when the look and feel of the site is created.

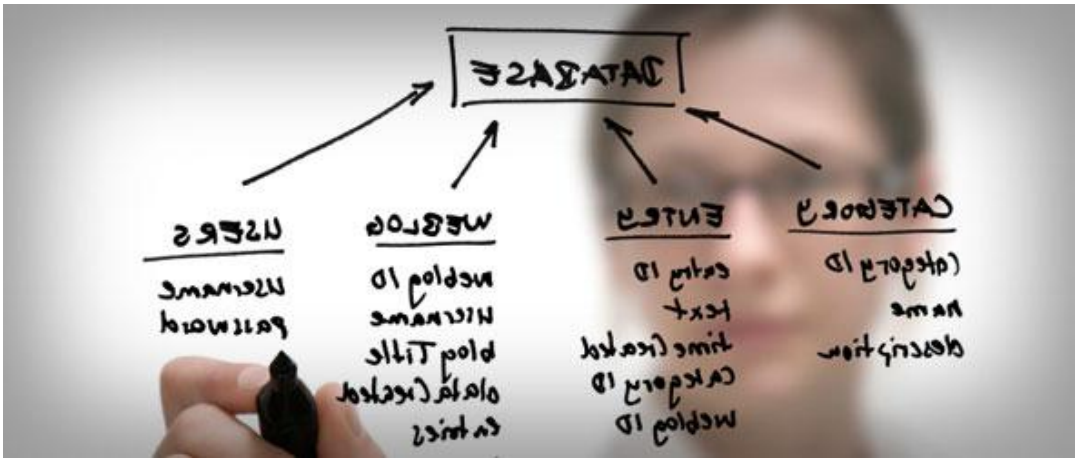
This first step is actually the most important one, as it involves a solid understanding of the company it is created for. It involves a good understanding of *the company* – what business goals and dreams are, and how the web can be utilized to help the company achieve those goals.

It is important that the web designer start off by asking a lot of questions to take help so as to understand the company business and the needs in a web site.

Certain things to consider are:

- **Purpose**
  What is the purpose of the site? Do you want to provide information, promote a service, sell a product… ?
- **Goals**
  What do you hope to accomplish by building this web site? Two of the more common goals are either to make money or share information.
- **Target Audience**
  Is there a specific group of people that will help you reach your goals? It is helpful to picture the "ideal" person you want to visit your web site. Consider their age, sex or interests – this will later help determine the best design style for your site.
- **Content**
  What kind of information will the target audience be looking for on your site? Are they looking for specific information, a particular product or service, online ordering..?

Phase Two: Planning



Using the information gathered from phase one, it is time to put together a plan for the web site. This is the point where a site map is developed.

The site map is a list of all main topic areas of the site, as well as sub-topics, if applicable. This serves as a guide as to what content will be on the site, and is essential to developing a consistent, easy to understand navigational system. The end-user of the web site – your website visitor – must be kept in mind when designing the site. These are, after all, the people who will be learning about the service or will be using the website. A good user interface creates an easy to navigate web site, and is the basis for this.

During the planning phase, web designer also helps to decide what technologies should be implemented. Elements such as what CMS (content management system) such as WordPress to incorporate, will any contact forms be needed, etc. are discussed when planning the web site.

Phase Three: Design



Drawing from the information gathered up to this point, it's time to determine the look and feel of your site. Target audience is one of the key factors taken into consideration. A site aimed at teenagers, for example, will look much different than one meant for a financial institution. As part of the design phase, it is also important to incorporate elements such as the company logo or colors to help strengthen the identity of the company on the web site.

The web designercreate one or more prototype designs for the web site. This is typically a .jpg image of what the final design will look like. Often times clients will be sent an email with the mock-ups for the web site, while other designers take it a step further by giving the clients access to a secure area of their web site meant for customers to view work in progress.

Either way, designer should allow their clients to view the project throughout the design and development stages. The most important reason for this is that it gives client the opportunity to express your likes and dislikes on the site design.

In this phase, communication between both client and the designer is crucial to ensure that the final web site will match clients needs and taste. It is important that client should work closely with the designer, exchanging ideas, until the final design for the web site.

Then development can begin…

Phase Four: Development



The developmental stage is the point where the web site itself is created. At this time, web designer will take all of the individual graphic elements from the prototype and use them to create the actual, functional site.

This is typically done by first developing the home page, followed by a "shell" for the interior pages. The shell serves as a template for the content pages of the site, as it contains the main navigational structure for the web site. Once the shell has been created, the designer will take the content and distribute it throughout the site, in the appropriate areas.

Elements such as the CMS (content management system) like WordPress, interactive contact forms, or ecommerce shopping carts are implemented and made functional during this phase, as well.

This entire time, designer should continue to make in-progress web site available for viewing, so that client can suggest any additional changes or corrections he/she would like to have done.

On the technical front, a successful web site requires an understanding of front-end web development. This involves writing valid HTML / CSScode that complies to current web standards, maximizing functionality, as well as accessibility for as large an audience as possible.

This is tested in the next phase…

Phase Five: Testing and Delivery



At this point, the web designer will attend to the final details and test the web site. They will test things such as the complete functionality of forms or other scripts, as well last testing for last minute compatibility issues (viewing differences between different web browsers), ensuring that the web site is optimized to be viewed properly in the most recent browser versions.

A good web designer is one who is well versed in current standards for web site design and development. The basic technologies currently used are HTML and CSS (Cascading Style Sheets). As part of testing, the designer should check to be sure that all of the code written for the web site validates. Valid code means that your site meets the current web development standards – this is helpful when checking for issues such as cross-browser compatibility as mentioned above.

Once the client give web designer the final approval, it is time to deliver the site. An FTP (File Transfer Protocol) program is used to upload the web site files to your server. Some web designers offer domain name registration and web hosting services as well, or have recommendations as to where the client can host their site. Once these accounts have been setup, and the web site is uploaded to the server, the site should be put on one last run-through. This is just precautionary, to confirm that allfiles have been uploaded correctly, and that the site continues to be fully functional.

Other final details include plugin installation (for WordPress or other CMS driven web sites and SEO (Search Engine Optimization). SEO is the optimization of the web site with elements such as title, description and keyword tags which helps the web site achieve higher rankings in the search engines. The previously mentioned code validation is somethingthat plays a vital role in SEO, as well. There are many WordPress plugins available that further enhance the default WordPress functionality – many of which directly relate to improving SEO, as well.

There are a lot of details involved in optimizing the web site for the search engines – enough to warrant its own post. This is a very important step, because even though web site now have been uploaded, one need to make sure that people can find it!

Phase Six: Maintenance



The development of web site is not necessarily over, though. One way to bring repeat visitors to the site is to offer new content or products on a regular basis. Most web designers will be more than happy to continue working together with their clients, to update the information on web site. Many designers offer maintenance packages at reduced rates, based on how often the client anticipate making changes or additions to web site.

If the client prefer to be more hands on, and update their own content, there is something called a CMS (Content Management System) such as WordPress can be implemented to the web site. This is something that would be decided upon during the Planning stage. With a CMS, the designer will utilize online software to develop a database driven site for the client.

A web site driven by a CMS gives the ability to edit the content areas of the web site. Clients are given access to a back-end administrative area, where he/she can use an online text editor (similar to a mini version of Microsoft Word). Client will be able to edit existing content this way, or if he/she feeling is more adventurous, the client can even add new pages and content itself. The possibilities are endless!

It's really up to you as far as how comfortable you feel with updating your own web site. Some people prefer to have all the control so that they can make updates to their own web site the minute they decide to do so.Others prefer to hand off the web site entirely, as they have enough tasks on-hand that are more important for them to handle directly.

That's where the help of your web designer comes in, once again, as they can take over the web site maintenance for you – one less thing for you to do is always a good thing in these busy times!

Other maintenance type items include regular site backups, WordPress upgrades, additional plugin installation, etc.

Are You Ready to Design (or Re-Design) Your Web Site?



Your web designer should work closely with you on a very similar process to this one. A good working relationship with your designer, including an open line of communication, is important to ensure they are creating a successful web site that will help your business grow.

I follow this same process myself – a process I've been using and refining over the last 15 years, through the web sites I've designed and developed for my own clients. If you are in the market of a new or updated web site, and like my design style, please don't hesitate to contact me – I would love to hear from you!

ARTICLES

Traditional professions will be the next to see significant change – and competition – as digital technology introduces new ways of working

The work of doctors, lawyers, professors and accountants has been only moderately affected by IT so far. But the digital innovations of the 2020s – deep learning, expert systems, software agents, speech and image processing, algorithmic operations, shared ledgers, smart contracts, digital cash, neuro-imaging and the internet of things (IoT) – are aimed directly at knowledge, learning and trust, the very traits that have defined the professions for centuries.

One thing all four professions have in common is the growing need for change. Whether we are looking at healthcare, law, education or high-end accounting/auditing services, the pattern is the same – high costs, limited citizen access, often crushing workloads, the inability to keep up with their fields, and a priesthood-like culture that often leaves professionals blind to their biases and prone to error. In this sense, professional should be seen primarily as an important form of societal progress.

Traditionalists bemoan the declining finances of newspapers, but those old sources of revenue aren't coming back – technology has changed everything

Economists tend to misunderstand quite how wrenching technological change is on the people subject to it. Those of us doing the technological change itself also often rather miss this point. For it isn't only true that our new and whizzy way of doing something is better, fancier or more lovely. It's also true that the old way is now going to die and all the people working in that old manner are going to find lives changed irretrievably.

A useful example of this is the closing down of the *Gothamist* and *DNAinfo* news sites. There is, of course, a certain irony here. The staff voted to unionise to get better benefits, higher pay and job security, and the next week they found there were no jobs at all. But it would be unkind to dwell upon that.

Rather, the important thing to understand is that this internet thing has entirely changed the business of newspapers and news. And it has changed the US world very much more than the UK in an interesting manner and tending to change India as well.

What We've learned

There's been a lot to discuss on the subject of a web design and development project! I hope we have learned things that will help us both be successful and to help find and evaluate the web design and development agency that will be the best fit for you and your organization.

From the initial planning to what it takes to maintain a launched site, we hope we've gained some insights that will help us as to undertake some important next steps in the website

CONCLUSION

There are many reasons building a website requires that we obtain the right tools and resources. When we use the right tools, we are assured that our pages would be standard and acceptable to every visitor. By using standard resources and tools, our visitors are able to view our web pages no matter what browser they use. Our pages would load faster and we would also be able to maintain the pages we have created with ease.

Using the right resources for our web design jobs will make our websites contemporary. They can easily integrate into current technologies and software. Our users would derive added value from our websites and contribute to its growth.

The right resources also make it easy for surfers to use our site. The standard tools used for creating the website will ensure that things such as navigation, menus and layout conform to current practices with which every web user is familiar with.

Our pages become attractive if we use the right tools. They can display correctly in the browser and your visitors would be glad to visit again because you appealed to then.

Search engines would index your website if the pages conform to their rules. Standard tools like blogs will produce pages that understand how search engines index pages so you will have the added advantage of increase visibility o the web.

Web tools make your web design job easy. The WYSIWYG interface makes you work with icons and not raw code. Coding can take away a lot of time and produce fatal errors if you are not proficient. GUI interfaces take away all the incidences of errors and labor, and give you something manageable.

Speed of implementation comes with the right tools. You can create a website and launch it in an hour with the right resources. You save on time, effort and never miss important deadlines.

Now that you are equipped with the right knowledge you can go about your web design with the assurance that you are going to produce something appealing and acceptable to most browsers.

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इंटरडिसीप्लिनिक संशोधनात एसएसएच एम्बेड

डॉ. प्रकाश के. धुमाळ, शिवळे महाविद्यालय, शिवळे.

प्रस्तावना :

जीवनातील जटिल समस्यांचे निराकरण करणे आणि अनेक शिस्तभंगांमधील अंतदृष्टीस एकत्र करणे आवश्यक आहे. परस्परविरोधी घोषणेच्या पार्श्वभूमीवर पदानुक्रम आणि विषमता देखील कायम रहातात. पुढील विभागात, मी सध्याच्या धोरणात्मक आराखड्यात एसएसएच अंतःविषयशास्त्रीय सहकार्याने प्रमुख धोरणात्मक विचार करणार आहे. इंटरडिसीप्लीनरी प्रोजेक्टमध्ये एसएसएच संशोधनासाठी मुख्य आग्युमेंटस सादर केल्यानंतर, लेख अंतःविषयशैली संशोधनातील काही प्रमुख अडचणींवर विचार करण्यासाठी पुढे जातो. विविध मोड अंतःविषयशास्त्रीय सहकार्याबद्दल विशेष जोर देऊन केवळ एक विशिष्ट प्रकारचे संशोधन करण्याऐवजी इंटरडिसीप्लनिरायटी एक सर्वसामान्य आणि व्यापक आकाराची संकल्पना आहे. जी विविध वैज्ञानिक पद्धती आणि दृष्टिकोणामध्ये विस्तृत आहे. ज्यामुळे एकाच फ्रेमवर्कमध्ये मूल्यांकन करणे कठीण होते. अंतःविषय संशोधनासाठी एसएसएच समाविष्ट करणे आवश्यक आहे. परंतु विविध वैज्ञानिक क्षेत्रात संरचना, हेतू आणि अंतःविषय संशोधनाचा प्रभाव समजण्यासाठी अधिक प्रयत्न आवश्यक आहेत.

''सॉफ्ट सायन्स अँड ॲप्लिकेशन'' अंतःस्थापित करणे गेल्या दशकात विज्ञान धोरणामध्ये एक प्रमुख अग्रक्रम बनले आहे. संशोधन आणि नूतनीकरणाच्या वर्तमान युरोपियन फ्रेमवर्क प्रोग्रामच्या राजकीय वाटाघाटी आणि त्यानंतरच्या अंमलबजावणी ''होरायझन 2020'' मुख्य आंतरशास्त्रीय कार्यक्रमात एसएसएचचे समावेशन करण्याच्या संदर्भात चर्चा व वाद–विवादांचे एक उपकारक उदाहरण सादर करते. युरोपियन कमिशनने होरायझन 2020 च्या प्रस्तवावर सहमती देण्यापूर्वी, बहु–अरब शोध कार्यक्रम साठी समर्थन सुनिश्चित करण्यासाठी यूरोपमधील भागधारक गटांनी अनेक धोरणात्मक अहवाल, व्हाईट पेपर आणि घोषणा प्रकाशित केल्या. होरायझन 2020 चे मुख्य ट्रस्ट ''ग्रँड चुनॅगेज'' या शब्दाच्या शहानिशाद्वारे याचे उदाहरण आहे. भव्य आव्हान पद्धतीच्या अनुसार, संशोधनासाठी आणि नवोपक्रमांसाठी निधीतून त्यांनी भूतपूर्व आणि नोकरशाही संरचनेचा त्याग केला पाहिजे आणि त्याऐवजी समाजातील सर्वात आव्हानात्मक समस्यांचे निराकरण करण्यासाठी संसाधनांवर लक्ष केंद्रित करणे आवश्यक आहे.

इंटरडिसीप्लीनरी इंटिग्रेशन :

मोठ्या प्रमाणावरील आंतरशाखीय प्रकल्पांमध्ये सामाजिक विज्ञान व मानवतेची प्रभावी अंमलबजावणी रोखता येणारी राजकीय संरचना आणि नोकरशाही अवलंबन याबाबत चिंता व्यक्त करण्याची आवश्यकता आहे. हे क्षितिज 2020 आणि आशिया आणि अमेरिका यामधील इतर आंतरशास्त्रीय निधी कार्यक्रमांवर आधारित आहे. मूलभूतपणे, समस्या किंवा मिशन देणारे दृष्टिकोन ज्या अंतःविषय संशोधनासाठी बहुतेक कॉलवर अभिमान ठेवतात ते ज्ञानाच्या उत्पादनासाठी अनुकूल असतात जे एसएसएच च्या शोध शैलीशी जुळत नाहीत. विज्ञान आणि तत्रज्ञानाच्या अभ्यासाचे बहुतेक विद्वान सहमत आहेत की अंतःविषय संशोधनामध्ये काही प्रकारचे एकीकरण, संश्लेषण यासारख्या फरकांचा समावेश आहे. सामान्यतः एकेक विषयांच्या पलीकडे जाऊन नवीन दृष्टिकोन, सिद्धांत, संकल्पना आणि पद्धतीमंधील संशोधनात्मक विषयांवर आधारित पारंपारिक अनुशासनात्मक सीमांपेक्षा ज्ञानाची संस्था तयार करण्याची क्षमता यावर जोर दिला जातो.

विषयांद्वारे घेतलेल्या दृष्टिकोनातून शास्त्रज्ञ त्यांचा दृष्टिकोन कसा अचूकपणे लावतात यामागील मुख्य कारण म्हणजे भिन्न शिस्त असलेल्या विविध सैद्धांतिक भाषांबरोबर काम करणारी वेगवेगळी तत्त्वे आणि धोरणे. साधारपणे बोलता, विविध शिस्त वेगवेगळ्या स्पष्टीकरण शोधण्याच्या प्रश्नांची मागणी करतात आणि म्हणून वेगवेगळ्या अवतारनाची अंमलबजावणी करतात. दोन किंवा त्यापेक्षा जास्त शिस्तभंगांमधील विभाजनास पुल करण्यासाठी संशोधन प्रश्नांची आणि पद्धतींची रचना आणि

समन्वयासाठी सावधपणे लक्ष देणे आवश्यक आहे. एसएसएच समाविष्ट करताना हे विशेषतः समर्पक आहे. ज्यामध्ये नैसर्गिक व आरोग्यविज्ञान या परंपरा यांच्याशी तुलना करता येत नाही.

एसएसएच संशोधक सहसा संयुक्त प्रकल्पाची व्याख्या करणाऱ्या संशोधन समस्येच्या सुरूवातीच्या सूचनेमध्ये सहभाग घेत नाहीत. उलट त्यांना विशिष्ट कामाच्या पॅकेजेसमध्ये बोलाविले जाते. जसे की विज्ञान संवाद, सार्वजनिक भागीदारी किंवा बायोएथिक्स. या असंमत संबंधामुळे आंतरशास्त्रीय निधी कार्यक्रमात सतत धोका निर्माण होतो की सामाजिक विज्ञान आणि मानविकी केवळ टेक्नो–वैज्ञानिक विषयांचा परिशिष्ट बनतात. इंटरडिसीप्लीनरी इंटिग्रेशन अंतर्भूत असलेल्या राजकीय मर्यादांमुळे हा काही भाग दिसून येत आहे. जर एसएसएच संशोधकांना सुरूवातीच्या नियोजनात किंवा संशोधन डिझाईनमध्ये समाविष्ट केले गेले नाही तर सामान्य शोध समस्या ओळखणे अधिक अवघड जाईल आणि त्यामुळे एकीकरण कमी होईल.

अंतःविषय संशोधनाशी संबंधित अनेक आव्हाने, इतर गोष्टींबरोबर एक सामान्य सिद्धांत भाषा आणि पद्धतीचा विकास यांच्यासह विषयांच्या संज्ञानात्मक अंतराने वाढ. उदा विसाव्या शतकाच्या दुसऱ्या सहामाहीत वातारणातील विज्ञान क्षेत्रातील वातावरणातील कार्बन डायॉक्साईड, नायट्रोजन व फॉस्फोरस चक्र, जैवविविधता, पाणी आणि जमिनीच्या वापराचे निरीक्षण यांमध्ये असलेल्या नैसर्गिक विज्ञानांमधील विविध विषयांचे संश्लेषण म्हणून उदयास आले. महासागर ऍसिडिनाइझेशन आणि ओझोन कमी होणे इत्यादी. या अनुषंगाने एकत्रितपणे व्यक्त केलेल्या गोष्टींची संख्या आणि पर्यावरणाशी संबंधित संख्यनांच्या संख्येचा अर्थ सांगण्याची वचनबद्धता आणि या स्वरूपात, विविध तज्ञ संस्कृतींना एक संख्यात्मक बदल घडवून आणून सांगण्यात आले आहे. नंतर अर्थशास्त्र एकत्रीकरण आणि संसाधने आणि प्रक्रिया आर्थिक 'मूल्य' किंवा 'सेवा' गणना विशेष असाईनमेंट की, पर्यावरणातील पुरवठा होते. गेल्या दशकातील सर्वात प्रभावी एकत्रित ज्ञान समुदायांपैकी हे एक यशस्वी पाऊल आहे ते म्हणजे पर्यावरणीय अभ्यास होय.

Sorline द्वारा प्रत्यक्षरित्या विश्लेषित केल्याप्रमाणे परिणामवादात बदल करून घेतलेल्या धमक्यांच्या अंदाजपत्रक अधिकारानुसार नैसर्गिक विज्ञान आणि अर्थशास्त्र या क्षेत्रातील पर्यावरणीय बदलांचे उत्पादन आणि अर्थ हे विशेषतः राहिले. त्याचबरोबर वातावरणाशी संबंधीत असलेल्या माण्सांचे गुणत्मक अन्वयार्थ आणि वातावरणातील बदल घडवून आणणे हे खूपच कठीण आहे. पारंपारिक पर्यावरणीय शिस्तभंगाांमधील संज्ञानात्मक निकटता धोरण संबंधीत हवामानाच्या मॉडेलवर एक मजबूत सार्वभौम समानता निर्माण करत होती आणि म्हणूनच हवामान बदलांच्या प्रभावशाली सामाजिक व्याप्तीची रचना केली गेली. परंतु एसएसएच सारख्या दूरगामी शाखांमध्ये मोठ्या प्रमाणात अनुपस्थित होते. परिणामस्वरूप मूल्य–आधारित प्रणली आणि पर्यावरणविषयक बदलांच्या सामाजिक व मानवी पैलूंवर जास्तीत जास्त अंतर ठेवले गेले आहे. केवळ गेल्या दशकातच या गटांच्या शाखांमधील दरी भरून काढण्यासाठी आणि वातावरणातील विाानाच्या क्षेत्रातील एसएसएच कौशल्याला एकत्रित करण्यासाठी गंभीर पावले उचलली गेली आहेत. पर्यावरणविषयक मानवीय संस्थांची स्थापना तांत्रिक–वैज्ञानिक कौशल्याचा निःसंशयपणे वापर करणे आवश्यक आहे. परंतु समाजाच्या आणि अर्थव्यवस्थांच्या अंतर्गत संचालक यंत्रणेतील मूलभूत बदलांविषयी ज्ञान वाढते आहे. यात पर्यावरणीय गोष्टींवर लोक, नागरीक आणि कंपन्या कशी प्रतिक्रिया देतात याचा अभ्यास करतात.

पर्यावरणात्मक अभ्यासाच्या उदाहरणावरून हे स्पष्ट होते की एका एकीकृत ज्ञान क्षेत्राची स्थापना करण्यासाठी किती वेळ लागतो. अर्धशतकांपूर्वी अंतःविषय संशोधन केंद्रे, संशोधन करिअर आणि अंतःविषयकवषयक नियतकालिकांची स्थापना झाली. आंतरशास्त्रीय सहयोगास अडथळ्यांवर मात करणे, जसे की विशेष क्षेत्रांमधील संज्ञानात्मक अंतर किंवा स्पष्ट प्रकाशनाची योजना निवडणे कठिण, संशोधकांच्या वेळी – वेळ आणि संससाधनांची लक्षणीय गुंतवणूक करणे आवश्यक आहे. त्याचबरोबर त्यास विविध प्रोत्साहन रचनांचे काळजीपूर्वक लक्ष देणे आवश्यक आहे आणि सहयोगी शिस्त. संशोधकांना केवळ एकमेंकांशी सहयोग करण्याचीच गरज नाही तर बाह्य भागधारकांशी संवाद साधण्याचीही गरज आहे. शेवटी, अंतःविषयशास्त्रीय सहकार्य जटिल वैज्ञानिक समस्यांचे निराकरण करण्यासाठी विविध वैज्ञानिक विषयातील दृष्टिकोण, पद्धती, आणि सिद्धांकाला समाकलित करण्यासाठी विचारात घेतले जाते.

ज्यामुळे जैवरासायन, न्यरोसायन्स किंवा पर्यावरणीय मानविकीसारख्या नवीन वैज्ञानिक क्षेत्रांची निर्मिती होण्यास वेळ लागतो.

चांगले, काय चांगले किंवा यशस्वी आंतरक्रियाशीलतेचे गणित हे कशा प्रकारचे सहकार्य एक विशेषाधिकारांवर अवलंबून असते. अनेक शैक्षणिक दृष्टिकोन एकत्रित करण्याच्या प्रयत्नांसह, शैक्षणिक आणि गैर–शैक्षणिक भागधारकांना समाकलित करण्याचा प्रयत्न किंवा विविध विषयात नवीन वैज्ञानिक मॉडेल विकसित करण्याचा प्रयत्न करणे आवश्यक आहे. पुन्हा एकदा असे सांगितले आहे की आंतरशास्त्रीय एकीकरण आणि समन्वय या आचारसंहितांना अनुसरण्यात अपयश हे अधिक खोल असलेले आर्थिक आणि राजकीय स्वभाव यांचे परिणाम होण्याची शक्यता आहे. उदाहरणादाखल, संशोधनाचे जास्तीत जास्त ध्येय म्हणजे ज्ञान निर्माण करणे हे आहे. जे शिक्षण क्षेत्राबाहेरील कलावंतांना लागू आहे, संयुक्त प्रकल्पांमध्ये एसएसएच संशोधन समाविष्ट करण्यासाठी धोरणातील आणि भागधारकांनाकडून एक स्पष्ट पूल असणे आवश्यक आहे.

एकीकृत वातावरण :

आंतरशास्त्रीय सहकार्यासाठी संशोधन धोरण डिझाइन करण्यासाठी दीर्घकालीन दृष्टीकोनाची आवश्यकता आहे. एकात्मतेचा व्यापक विचार सहसा स्वीकारला जातो. तांत्रिक आणि आरोग्य विज्ञानाच्या आधारे अस्तित्वातील संशोधन आणि नवोपक्रम दृष्टीने मानक धोरणे परिभाषित आणि अभ्यासल्या जातात.

आजच्या समस्येचे जटिल स्वरूप, विशेषतः मानवी पर्यावरणाशी संवाद साधणारे, ज्या पद्धतीने विज्ञानाने पाठपुरावा केला जातो त्यात अनेक आव्हाने उभी आहेत. यातील सर्वात प्रमुख आव्हान म्हणजे एकट्या शिस्तीचा मार्ग. फक्त जटिल समस्या समजून घेण्याच्या सर्वात मूलभूत गरजेचे आहे. अनेक अनुशासनात्मक दृष्टीकोनातून एकत्रितपणे स्पष्टीकरण मिळवण्यापासून मिळवलेली अंतर्दृष्टी देखील पूरक असणे आवश्यक आहे.

जगाच्या एका पैलूवर लक्ष केंद्रीत करण्याऐवजी अंतःविषयविषयक प्रोजेक्ट समस्येचा अनेक स्तरांवर संशोधनासाठी अनुकूल अनुपालनाचा संच तयार करणे आवश्यक आहे. या घटकांना एकसंध पद्धतीने समजावून सांगणे, तथापि एक सामान्य मेटा–सैद्धांतिक भाषा विकसीत करण्याची शक्यता जरूरी आहे. ज्यामध्ये कृत्रिम दृश्य निर्माण करण्यासाठी विविध संस्था, डेटा, पद्धती, साधने आणि संकल्पना समाकलित होतात. हे काही अंतःविषय उपक्रमांचे ध्येय असू शकते, परंतु एकत्रिकरणाची ही कल्पना संशोधनात्मक सहभागाच्या वास्तविक प्रखरतेला पुरेसे संवेदनशील नाही. याउलट, एकत्रिकरणाची मजबूत कल्पना, संस्थात्मक संसाधने, वेळ आणि बांधिलकी दीर्घकालीन आंतरविभागीय समुदायांच्या विकासासाठी आवश्यक असलेली लक्षणे दर्शविण्याचा धोका आहे.

आंतरशास्त्रीय कार्यक्रमात मानवीय आणि सामाजिक विज्ञान एकत्रित करण्याचा आणखी एक आव्हान म्हणजे हे कार्यक्रम विषम नसलेले आहेत. Viseu म्हणून एसएसएच – सहसा एक सामाजिक शास्त्रज्ञ किंवा मानवतावादी विशेषतः प्रकल्प रचना आणि प्रमुख संशोधन प्रश्न ओळखले गेले आहेत नंतर आणले जाते आहे. ही असमतोलता एकात्मतेच्या वेगवेगळ्या टप्प्यांवर आहे. नेतृत्व ते निधी, ज्ञान निर्मिती आणि प्रसार आणि अखेरीस शोध मूल्यमापन आणि मूल्यांकन. तरीही हा संबंध बऱ्याचशा संशोधन निधी कार्यक्रमात लपलेला किंवा अबाधित असतो.

आंतरशास्त्रीय प्रकल्पांत सामाजिक विज्ञान आणि मानवता एकत्रित करण्याच्या अधिक उपयुक्त पद्धती असू शकतात Viseu नुसार काही उपाय सहजपणे लागू करता येऊ शकतातः ''एकात्मतेसाठी लक्ष्य देण्याकरता एक किंवा दोन व्यक्तींच्या जागी सामाजिक शास्त्रज्ञांचे गट असणे आवश्यक आहेत. या संघांना परिभाषित आणि अंमलात आणण्यासाठी आर्थिक आणि कार्यरत स्वायत्तता द्यावी. त्यांच्या क्रियाकलाप'' शिवाय एसएसएचने अर्थपूर्ण योगदाने करण्यासाठी योग्य प्रोत्सहनांना स्थान दिले पाहिजे. इतर गोष्टींबरोबरच यामध्ये प्रकल्प निधीसाठी धडपडणे समाविष्ट आहे. नंतर प्रकल्पामध्ये एसएसएच

संशोधकांमधील ब्रिनंग करण्याऐवजी एसएसएच घटकांसाठी प्रारंभ–वाटप संसाधने. संशोधन प्रश्नांचे मूल्यमापन करणे आणि सर्व सहभागींच्या पुरवलेल्या माहितीसह निश्चित करणे आवश्यक आहे.

एकत्रिकरण (म्हणजेच, समस्येच्या निराकरणीची क्षमता) म्हणजे एकात्मता वातावरणात (म्हणजे, समस्येच्या समस्येचे अभिप्राय निर्माण करण्याची क्षमतेस निर्माण करण्याची) एक पूर्णपणे इंस्ट्रमेंटल कल्पना पासून लक्ष ठेवणे आवश्यक आहे. केवळ समस्या निर्दिष्ट करून आणि निदान विकसित करून केवळ समाधान मिळवणे शक्य नाही. अंत'विषयविषयक समस्या जसे की हवामानातील बदल, अन्नसुरक्षा किंवा स्थलांतर हे ओपन एंडेड आहेत आणि समस्या कशा प्रकारचा आहे आणि कशा प्रकारे त्यावर उपाययोजना करावयाची हे कोणत्याही अंतःविषयविषयक प्रयत्नांचा अविभाज्य भाग असणे आवश्यक आहे. फलदायी होण्याचे एकत्रीकरण करण्यासाइी आपण त्याचा अर्थ अल्टर–टर्म प्रोजेक्ट निधीपासून दीर्घकालीन सहयोग आणि आंतरशास्त्रीय पर्यावरणीय रचनांचे बांधिलकीवर बदलावा. असे केल्याने वैज्ञानिक अभ्यासांमध्ये बदल करणे आवश्यक आहे. तसेच निधी एजन्सीज, विद्यापीठे आणि शैक्षणिक समुदायांमधील संरेखन.

संरेखन आणि दीर्घकालीन सहकार्य प्रयत्नांचे हे महत्त्वाकांक्षी उद्दीष्टे असेल तर शिक्षण, संशोधन आणि सार्वजनीक आवाक्यांसह आंतरशास्त्रीय वातावरणास चालना देण्यासाठी अधिक लक्ष द्यावे. एकत्रित संशोधन कशा प्रकारे आयोजित केले जावे किंवा उत्तेजित केले जावे या प्रश्नााचे एकही साधे उत्तर नसून एकत्रित पर्यावरणाची स्थापना करणाऱ्या विद्यापीठ आणि समुदायांचे अनेक उदाहरण अस्तित्वात आहेत. ज्या वेळी अंतःविषय संशोधनासाठी आर्थिक मदत वाढते आहे त्या वेळी धोरणकर्त्यांना आणि निधी संस्था सध्याच्या शैक्षणिक विषमता पुनरूत्पादीत करण्याची शक्यता असलेल्या अल्पकालीन प्रकल्पासाठी निधी उपलब्ध करून देण्याऐवजी शाश्वत आंतरसंस्कृतीत्मक वातावरण तयार करण्यासाठी कटिबद्ध आहे. आंतरशास्त्रीय प्रकल्पाच्या विविधतेमुळे, एकत्रित संशोधन एक अधिक प्रगत, संदर्भ आणि बहुआयामी प्रतिकृती स्वीकारणे आवश्यक आहे. ज्यात एसएसएच मधील योगदानांचा समावेश आहे. विविध अनुशासनास पार्श्वभूमीतून संशोधकांना एकत्र आणणे किंवा नवीन अत्यावश्यक उपक्षेत्रे तयार करणे, अपरिहार्यपणे ज्ञान निर्माण आणि प्रसारीत करण्याच्या विद्यमान संस्कृतींच्या पलीकडे आहे.

अंतःविषय संशोधनासाठी धोरणात्मक निधीसाठी धोरणकर्त्यांना आणि वैज्ञानिक समुदायातील सदस्यांना आंतरशास्त्रीय सहकार्याच्या साध्या शब्दांच्या संकल्पनांपेक्षा पुढे जाण्याची आवश्यकता आहे. प्रायोगिक समृद्धी आणि भिन्न तराजू समजून घेण्याच्या आणि अंतःविषय संशोधनाची असमर्थता समजून घेण्यामुळे अग्रगण्य वित्त पुरवठा संस्थांनी अवलंबलेल्या एकापेक्षा एकत्रित पर्यावरणास उत्तेजन देणारे अधिक मॉडेल तयार केले जाईल. वेगवेगळ्या समुदायांमध्ये परस्पर संघटन कसे कार्य करते हे शिकणे, विविध आंतरविषयक संटिंग्जमध्ये संशोधनाचा परिणाम कसा साध्य केला जातो हे समजून घेण्यास मदत करेल. चांगले किंवा सत्य अंतःविषयविषयक संशोधन संदर्भ आणि दृष्टीकोनानुसार वेगळे असण्याची शक्यता असलेल्या मानवीय विद्धानांच्या डॅनिश सर्वेक्षणाचे सर्वेकषण करणे आवश्यक आहे.

DATA MINING AND WAREHOUSING

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Abstract
Data warehouse provides an effective way for analysis and statistic to the mass data, and helps to do the decision-making. The paper introduces the data warehouse and the online analysis process. According to the power management information system, the paper analyzes the power-oriented multidimensional database modeling and the presentation of multidimensional views. The system also builds power-oriented data warehouse using DB2 database, Warehouse Manager, Cube View and Alphablox of IBM. Then, this paper discusses the concrete applications of data warehouse in completing the extract, transform and load (ETL) of power data. The discussion includes the optimization of the system after creating the MQT tables using Cube View and the presentation of the analysis system. The system can help the power corporations to do decision-making.

INTRODUCTION

The huge data is created by integrating current and historical data from different sources and store them centrally in a special repository called Data Warehousing(DW). Have you ever think about the recommendations you get when you shop online. If you purchase for example a TV online, the website recommends you another products that you really need to get. Also have ever think about the alerts you get from your bank when you do a sudden use of your credit card in a different city. Actually these are examples of data mining which is the process of discovering useful patterns in a huge data set.

DW is a very important repository especially for the historical data and non-every-day transactions

For example, the old data about the purchase transactions made by customers at a modern supermarkets. Keeping this kind of data in a regular database will make it very huge and then slower performance. For those reasons the historical data and nonevery-day transactions should be archived in a data warehouse for data mining purposes.

The ways of designing data warehousing and regular databases are different. Data warehousing design depends on a dimensional modeling techniques and a regular database design depends on an Entity Relationship model. Data Mining (DM) is a combination of Database and Artificial Intelligent used to provide useful information to both technical and non-technical users which will help them to make better decisions. It is usually used as a decision support system.

Data Mining (DM) is not an easy process. It has several feedback and sometimes the whole process needs to be repeated. For that reason the data mining process is considered as an iterative process.

It involves six phases:

1) problem definition, 2) data preparation, 3) data exploration 4) modeling

5) evaluation 6) deployment

DATA, INFORMATION AND KNOWLEDGE

• Data: facts or description. Numbers and texts are considered data. Computers take data as an input. There are different formats of data which can be processed by computers: operational, non-operational and Meta data.

- Information: It can be provided by having relationship or association among data. Computers process data into information

- Knowledge: useful patterns or relationship between historical and future information. For example, historical sales information with information about customers can provide knowledge of customer's buying behavior.

DATA WAREHOUSING

To get accurate results from data mining process, current and historical data should be available for the process but keeping the historical data in a regular database would cause a negative effect on the database itself. Usually old data is not used for everyday transactions but it is used for the data mining and reporting issues. Storing historical data in everyday database will cause a huge increase of its size which leads to a slower performance. A good practice is to move the old data from different sources and integrate the whole in another repository called data warehouse [12]. Moving the data from operational databases to a data warehouse involves three steps: 1) cleaning, 2) transformation, and 3) integration.

Data warehouse has more than one definitions. The most common one is defined by Bill Inmon who defined it as the following : "A data warehouse is a subject-oriented, integrated, time-variant and non-volatile collection of data in support of management's decision making process" [1]. As defined , any data warehouse (DW) should have the following characteristics

•subject-oriented: DW can be used to analyze any subject.

• integrated: DW integrates current and historical data from different sources.

• time-variant: DW keeps historical data of different time.

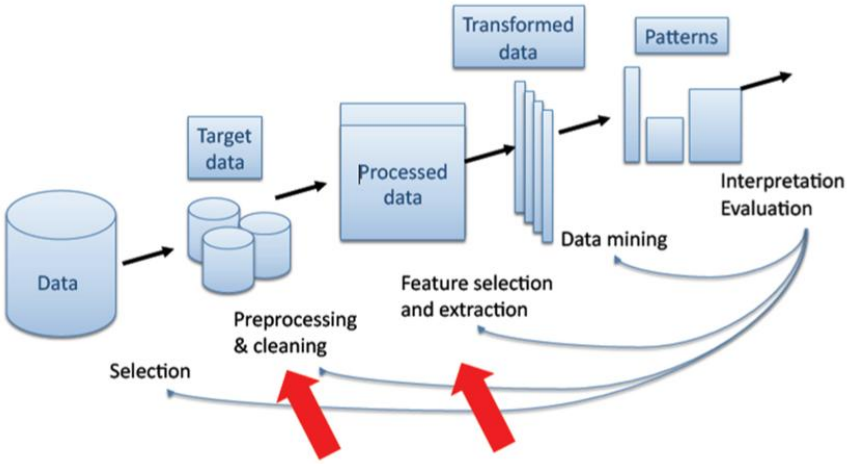
• non-volatile collection of data: content of DW should not be changed. It is historical data.

DATA MINING

Data Mining (DM) is a combination of Database and Artificial Intelligent used to extract useful information from huge amount of datasets to help the users to make better decisions. It is usually used as a decision support system.

A. Data Mining Usage Having enormous volume of data, makes it very difficult for human to analyze and get useful information. This causes the importance of using Data Mining techniques. DM is used in different areas to help to extract useful information then make better decisions. For example, DM can be used for marketing purposes. It can help by giving useful information about the best media and time to publish an advertisement which would help to increase the sales of a product. DM techniques (e.g. association analysis) check all the historical related marketing data and compare the sales to provide informative reports to be used by the decision makers then increase the future sales [The most common use of data mining is the web mining As terabytes of data added every day in the internet , makes it necessary to find a better way to analyze the web sites and to extract useful information.

B. Data Mining Process Data mining process is not an easy process. It is complicated and has feedback loops which make it an iterative process. Figure 1 [7] shows the steps of data mining process. It also shows that the steps might be repeated and sometimes it is possible to restart the entire process from the beginning. Actually , the data mining process involves six steps: (1) Problem definition, (2) Data Preparation, (3) Data Exploration, (4) Modeling, (5) Evaluation, and (6) Deployment.



C) Explanation/Discussion of Model

1) Data Mining Process - Goal "The Data Mining process is not a simple function, as it often involves a variety of feedback loops since while applying a particular technique, the user may determine that the selected data is of poor quality or that the applied techniques did not produce the results of the expected quality. In such cases, the user has to repeat and refine earlier steps, possibly even restarting the entire process from the beginning.

2) Problem Definition "A data-mining project starts with the understanding of the business problem. Data mining experts, business experts, and domain experts work closely together to define the project objectives and the requirements from a business perspective. The project objective is then translated into a data mining problem definition. In the problem definition phase, data mining tools are not yet required

3) Data Exploration "Domain experts understand the meaning of the metadata. They collect, describe, and explore the data. They also identify quality problems of the data. A frequent exchange with the data mining experts and the business experts from the problem definition phase is vital. In the data exploration phase, traditional data analysis tools, for example, statistics are used to explore the data.

4) Data Preparation "Domain experts build the data model for the modeling process. They collect, cleanse, and format the data because some of the mining functions accept data only in a certain format. They also create new derived attributes, for example, an average value. In the data preparation phase, data is tweaked multiple times in no prescribed order.

5) Modeling "Data mining experts select and apply various mining functions because you can use different mining functions for the same type of data mining problem. Some of the mining functions require specific data types. The data mining experts must assess each model. In the modeling phase, a frequent exchange with the domain experts from the data preparation phase is required. [7] p. 3" After completing the data exploration and preparation phases, data mining experts can start the modeling phase by selecting modeling techniques and defining the columns of data needed to build a mining structure and then the mining models [10]. The developed model should meet the expectation.

6) Deployment "Deployment : Data mining experts use the mining results by exporting the results into database tables or into other applications, for example, spreadsheets. The Intelligent

Miner™ products assist you to follow this process. You can apply the functions of the Intelligent Miner products independently, iteratively, or in combination.

A. Operational Database

1)Functions of the System

The main functions that are done by this system are :

• Students can make requests in order to get their items repaired.
• The requests given by the students will go to an employee who is responsible to receive the requests
• Student can know the price for the repair work done and the status of his/her repair request.
• Employees can list all the new requests .
• Employees can show the status of the repairing process.
• Employees can update the repairing information.

2)Brief

As the data of a university housing has to be maintained in a finite order, it is better to take a help provided by a database, due to which the dealing with the information becomes very simple. Also having a database for the Housing Department helps to make the work more efficient. One of the most important things that the Housing Department should provide in a timely manner is to fix any problem or damage that may happen. So, having the database can speed up the process. Students can make requests by filling an electronic form with some necessary information to store in the database. Then the employee who is responsible to receive the repairing requests from the students will receive the requested information. When the workers are done from the work, the database should be updated by providing all the information which is related to repairing process.

CONCLUSION Nowadays we have enormous volume of data which lead to the necessity of using data warehousing and data mining. Data warehouse is used as a central store of a subjectoriented, integrated, time-variant and non-volatile collection of data from different sources (operational databases) . For faster performance, data warehousing organizes data in a different architecture – fact table and dimension tables For that reason modeling the data warehouse is unlike modeling the operational database. A dimensional modeling is used to model the data warehouse (star schema, snowflake schema, or galaxy schema) but the operational database uses entity relationships diagram Data mining has became an important tool which can extract useful information from the huge amount of data we have nowadays. It also may help to extract information from the Internet which becomes part of our life. It is a complicated process. It involves six phases:

(1) Problem definition,
(2) Data Preparation,
(3) Data Exploration,
(4)Modeling,
(5)Evaluation,
(6)Deployment

It is an iterative process which includes feedbacks between the phases and sometimes needs to repeat the entire process from the beginning. The iterations are needed in the mining process in order to provide better answers which will be used by the users to make better decisions.

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SYNTHESIS AND CHARACTERIZATION OF GaInSb SUBSTRATES FOR FABRICATION OF BORON IMPLANTED P-N JUNCTION DIODE: GROWTH BY VERTICAL DIRECTIONAL SOLIDIFICATION TECHNIQUE

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Abstract
A bulk semiconductor crystal of Gallium Indium Antimonide ($Ga_{0.7}In_{0.3}Sb$) have grown using vertical directional solidification (VDS) technique and polished wafer was characterized by X ray analysis, EDAX, FTIR and Hall effect measurements. The substrate was found n-type with career concentration of 6.8x 10 ^{16} cm^{-3}, mobility of 4410 cm^2/Volt sec, and band gap of 0.539 eV at 27 ^oC. The p-n junction has formed on this substrate by implanting boron ions with energy of 100 KeV and dose of 10^{17} cm^{-3}. The dark I-V characteristics of p-n junction at 273^oK, and 173^oK have been presented in this paper. The diodes fabricated on Ga $_{0.7}$ In $_{03}$ Sb substrate exhibits large leakage current and low reverse breakdown voltage.
Keywords: *GaInSb, Bulk crystal growth, Indium segregation, Boron implantation,VDS technique.*

Introduction:

GaInSb is well known III-V ternary semiconductor material useful for thermo photovoltaic (TPV) device, infrared laser and sensors in infrared region, since the band gap can be varied from wide range by varying Indium content [1]. However, the growth of GaInSb bulk single crystal using conventional growth techniques is more difficult due to large separation of liquids and solidus lines in phase diagram, which leads to segregation and constitutional supercooling. The continuous segregation Indium results in multi phasing and micro cracks in crystals [2, 3]. The bulk crystal growth of binary and ternary substrate using vertical directional solidification (VDS) technique and fabrication of p-n junction diode using different techniques have been reported in literature [4,6,7]. For p-n junction diode fabricated on GaInSb ternary semiconductor substrate exhibits large leakage current and low reverse breakdown voltage.

Experimental:

Synthesis of $Ga_{0.7}In_{0.3}Sb$ substrate:

The bulk crystals of $Ga_{00.7}In_{0.3}Sb$ have been grown using indigently designed vertical directional solidification (VDS) technique [5]. The granules of 4N grade Gallium (Ga) Indium (In) and Antimony (Sb) were taken in stoichiometric proportion and sealed in a quartz ampoule, with cone angle 30^o, under Argon atmosphere at pressure of 150 Torr. To achieve homogenous mixing, sealed ampoule was kept at 850^{0}C for 15 hours. To avoid the segregation and constitutional super cooling, coupled mechanical vibrations with frequency from50 Hz and amplitude of 0.05 mm were applied during the growth. The ampoule lowering rate was kept 5mm/hour. The as grown ingot (Fig.1) was sliced by using low speed diamond coated cutter and wafers of thickness 0.5 mm were formed. For the characterization purpose, wafers were mirror polished by Alumina powder of size 0.05 µm and diamond paste. Before implantation, the polished wafers were etched by selective CP_4 chemical etchant and cleaned by deionized water.



Fig.1. As grown Ingot of $Ga_{0.7}$ In_{03} Sb

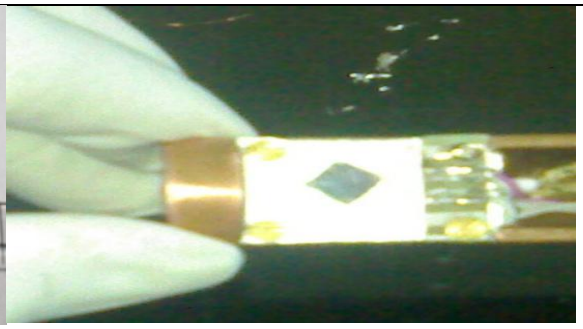


Fig.2 Substrate mounted on cold tip for low temperature Hall measurement

Fabrication of diode and ohmic contacts: The p-n junction was formed on etched wafer by implanting boron ions with energy of 100 KeV , dose of 10^{17} $cm^{-3}$and beam diameter of 3 mm. The ion implantation was carried out at the IUAC New Delhi, India. The ohmic contacts were made by depositing thin film of aluminum on implanted and non-implanted area of substrate. The deposition of aluminum is done using HINDHIVAC BC-300 vacuum evaporation system at 10^{-5} Torr pressure. The diameter of aluminum film was 1mm and thickness of 2µm. To remove the mechanical stresses at aluminum contact and implanted region, sample was annealed at 200 ^{O}C for 20 minutes under Argon atmosphere. For connection purpose, copper wires of 10 µm diameter were soldered on aluminum layer on p and n region of substrate using indium. The schematic diagram of substrate and ohlmic contact is shown in fig.3.

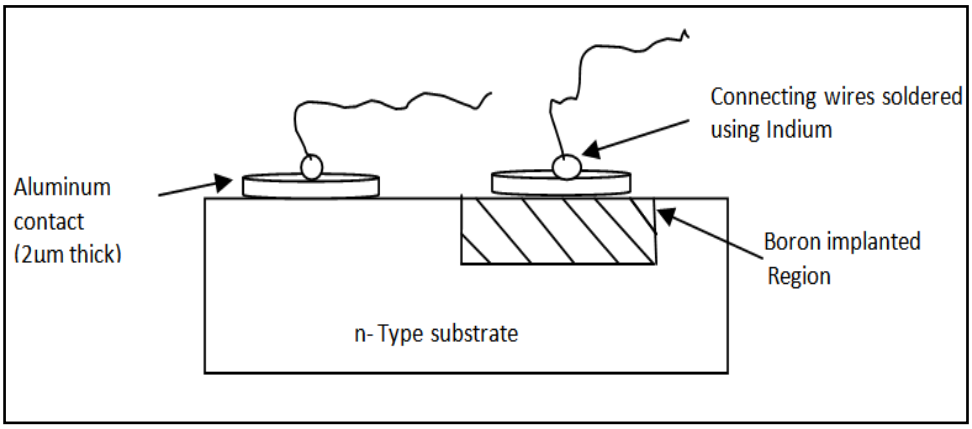


Fig.3. Schematic diagram of substrate and ohlmic contact.

Results and discussion:

The composition analysis of substrate using EDAX (Model: FEI Quanta 200 ESEM system) confirmed relative atomic percentage of $Ga_{0.7}$ $In_{0.3}Sb$. The powder X-ray spectra (fig.4) revealed cubic zinc blende structure with lattice constant of 6.213A^{0}. The FTIR study using Perkin Elmer Spectrum-2 model showed the band edge with band gap of 0.549 eV (fig. 5) .

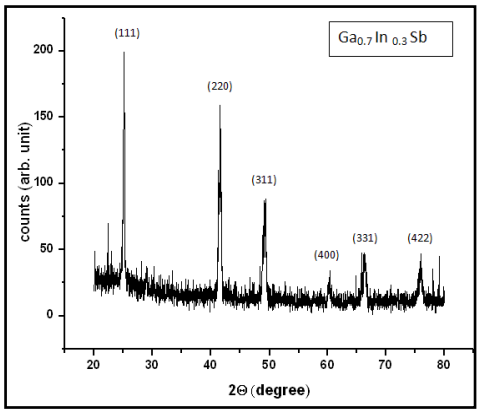


Fig.4. Powder X-Ray of Ga $_{0.7}$In $_{0.3}$ Sb

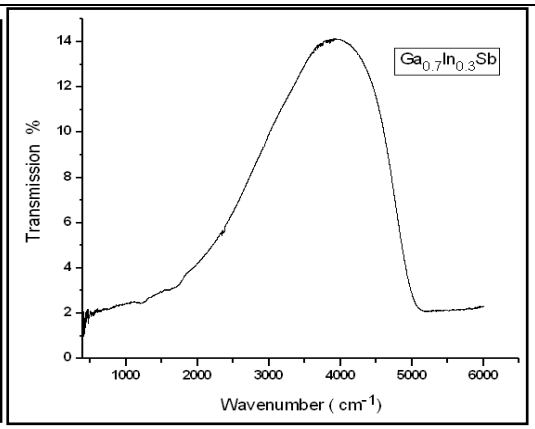


Fig.5 FTIR spectra of Ga $_{0.7}$In $_{0.3}$Sb

The electric measurements of Ga $_{0.7}$ In $_{03}$ Sb substrate using Hall and four probe measurement at 27 ^{o}C shown n -type conductivity with career concentration of 6.8x10 ^{17} cm^{-3}, sheet resistivity of 0.0026 ohm- cm and mobility of 4410 cm^{2}/V sec. The measurement of I-V characteristics (fig.6) of p-n junction at 273^{o}K, and 173^{o}K was carried out in dark conduction. The current and voltage was measured using Testronix -8 digital meter. The low temperature measurements were carried out using indigenously designed liquid nitrogen immersed cold tip (fig.2). From forward bias I-V measurement at 273 ^{o}K, it is found that turn–on voltage is around 0.24 V and breakdown voltage of junction is around 3.5 volts with large reverse leakage current. This large reverse current might be due to large defect levels present in band gap. From forward bias I-V measurement at 173 ^{o}K, the forward turn–on voltage increases to 0.35V and reverse break down voltage of increases to 4.5 V with significant decrease in reverse leakage current. The increase in reverse saturation current with temperature shows the generation of thermally exited carriers in depletion region. The low value of reverse break down voltage is due to low resistivity and high doping concentration of n and p regions, which may lead to tunneling of carriers across the junction.

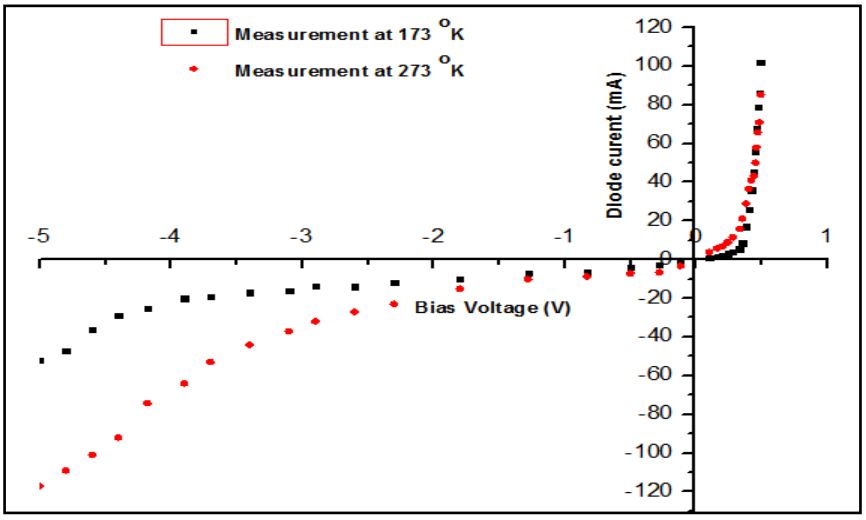


Fig.6. I-V characteristics of p-n junction under dark condition.

Conclusions:

In conclusion, we have demonstrated the applicability of VDS technique for crystal growth of ternary Ga $_{0.7}$ In $_{03}$ Sb semiconductor substrates. The diodes fabricated on $Ga_{0.7}In_{0.3}Sb$ substrate exhibits large value of reverse leakage current and low reverse breakdown voltage in the range of 3 to 4.5 volt. The synthesis of defect free substrate of GaInSb material having high resistivity and low doping

concentration essential for high value of reverse break down voltage with less leakage current at room temperature is still remains technological challenge.

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TO STUDY THE IMPACT OF CERTAIN EXTERNAL CONDITIONS ON SEED GERMINATION IN CICER ARIETINUM. (CHICKPEAS SEEDS)

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Abstract
Aqueous extract of spinach leaves and prawns of 1%, 5%, 10% and 20% (w/v) was treated to Cicer arietinum seeds was studied. Treated seeds show late germination, decreased rate of germination percentage, less redicle length and no plumule formation. Beginning of germination delayed more by prawn extract treatment than spinach leaves extract treatment. Prawn extract treatment is more adverse in terms of redicle growth during germination than spinach leaves extract treatment to seeds of Cicer arietinum. There is no plumule formation takes place in both treated seeds during germination. The adverse effect of spinach leaves extract treatment and prawn extract goes on increasing with the concentration extracts.

INTRODUCTION-

Cicer arietinum (Chickpeas) of family fabaceae commonly called as chickpea, gram, Bengal gram, garbanzo, chana, Herbjar, Egyptian pea.

Cited from http:// en.wikipedia.org/wiki/Cicer arietinum, Chick pea is originated in south-East Asia. It is widely utilized in Indian cuisine. Chickpeas are also popular in the Iberian Peninsula. It serves as an energy and protein source as animal feed. Chickpeas are a nutrient-dense food, providing rich content of protein, dietary fiber, folate and certain dietary minerals such as iron and phosphorus.

It has higher protein Digestibility corrected Amino acid score than many other legume and cereals.

Compared to reference levels established by the United Nations food and Agricultural organization and world Health organization, proteins in cooked and germinated chickpeas are rich in essential amino acids such as lysine, isoleucine, tryptophan and total aromatic amino acid. Therefore, the Cicer arietinum is selected for present study.

The germination is one of vital process in plant physiology. According to Raven et.al (2005), seed germination depends upon internal and external conditions. In present study an attempt is made to study the impact of certain external conditions on seed germination in Cicer arietinum (chickpea). Vegetable extract of spinach leaves and non vegetable extract of prawn extract are used as external factors to observe effect on seed germination of Cicer arietinum.

MATERIAL AND METHODS-

Cicer arietinum (Chick pea) seeds are selected for present study. Two sets of petri plates with blotting filter paper at base are taken. 10 seeds of Cicer arietinum are placed in each petridish. Adequate distilled water is applied to first petridish as control. Treated petridishes are applied quantity of 1% (wt/volume) 5%, 10%, and 20% aqueous extract of spinach leaves. The experiment is repeated as it is for second time. The observations of both experiments are considered as average.

Similarly, apply 1%, 5%, 10% and 20% aqueous extract of dried prawns to 2 replicas of 4 petridishes with 10 seeds of Chick peas each. The control reference kept common.

The germination of seeds is treated as one of the important criteria to study the impact of vegetable extract and non vegetable extract on black gram. From day one of experiment up to 10th day, the number of seeds (out of 10) underwent germination were observed. Similarly the redicle length is also treated as another parameter for study of treated and control seeds germination. Average plumule length formation on 10th day of germination is considered as another mean to find impact of vegetable extract and non-vegetable extract on seed germination process in Chickpeas.

RESULTS AND CONCLUSION-

Table I-A Effect of spinach leaves extract on emergence of seeds of Cicer arietinum.

Treatment (spinach leaves extract)	Number of seed Germination Per day/s.									
	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day
Control	0	1	3	3	3	4	4	6	6	8
1%	0	0	5	5	6	7	7	7	7	7
5%	0	0	5	5	5	5	5	6	6	6
10%	0	0	2	3	4	5	5	5	5	5
20%	0	0	2	3	3	3	3	3	3	3

Table I-B-Effect of spinach leaves (vegetable) extract on germination percentage in seeds of Cicer arietinum.

Treatment (spinach leaves extract)	Germination percentage Per day/s.									
	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day
Control	0	10	30	30	30	40	40	60	60	80
1%	0	0	50	50	60	70	70	70	70	70
5%	0	0	50	50	50	50	50	60	60	60
10%	0	0	20	30	40	50	50	50	50	50
20%	0	0	20	30	30	30	30	30	30	30

Table I-C Effect of spinach leaves extract on redicle (root) length in Cicer aritinum.

Treatment (Spinach Leaves Extract)	Average radicle length in cm on 10th day of treatment.
Control	1.20 cm
1%	0.80 cm
5%	0.3 cm
10%	0.1 cm
20%	0 cm

Table I-D Effect of vegetable extract (Spinach leaves extract) on plumule (shoot) length during seed germination of Cicer arietinum.

Treatment (spinach Leaves Extract)	Average plumule (shoot) length in cm on 10th day of germination
Control	1.10
1%	-
5%	-
10%	-
20%	-

Table I-A, I-B, I-C and I-D shows germination of Chickpea seeds from day one to day 10 in control and spinach extract treated seed germination at 1%, 5%, 10%, and 20% concentration, average redicle length and average plumul;e length on 10th day of experiment.

From table I-A it is clear that the germination started on second day in control and in 1%, 5%, 10% and 20% spinach extract treatment, the germination started on third day. It means the spinach extract treatment shows late germination. It delays the seed germination in Cicer arietinum.

The seed germination percentage from first day to tenth day is also seen in Table I-B in Chickpea seeds under controlled and treated conditions. It is observed that seed germination is 60% in control eight day of germination. In 1% spinach treatment, it is 70% of germination while in 5% spinach treatment and 10% spinach treatment and in 20% spinach treatment it is 60%, 50%, and 30% percent in eight day of germination. The 20% spinach treated seed of Cicer arietinum shows very less percentage of germination. It shows the rate of germination is more in control while rate of germination % is less in spinach leaves extract treated seeds in Cicer arietinum. The rate of germination percentage goes on decreasing as the concentration of spinach leaves extract treatment goes on increasing.

The Table I-B shows the 80% seed germination in control seeds of chickpeas on tenth day while 70%, 60%, 50% and 30% seed germination rate in 1%, 5%, 10% and 20% spinach leaves extract treated seeds respectively. It means the rate of seed germination is less in spinach leaves extract treated leaves as compared to control.

From the Table I-C it is clear that average redicle length is 1.20 cm in 1% spinach leaves treated seeds it is 0.80 cm, and it is 0.3 cm, 0.1 cm and 0 cm in 5%, 10% and 20% spinach leaves extract treated seeds of Cicer arietnum respectively. It is clear from these observations that average redicle length is affected due to spinach leaves extract treatment. The effect goes on increasing as the concentration of spinach leaves extract also goes on increasing.

The shoot length i.e. plumule length of control and treated seeds during germination on 10th day of treatment is shown in Table I-D. It is observed that the plumule formation is only seen in control seeds of Cicer arienitum as compared to Spinach leaves extract treated seeds. It means the treatment of spinach leaves extract shows adverse effect on the plumule formation during germination in Cicer arietinum.

Table II-A Effect of prawn extract on emergence of seeds of Cicer arietinum.

Treatment (Prawn Extract)	**Number of seed/s Germination Per day.**									
	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day
Control	0	3	5	6	6	7	8	10	10	10
1%	0	0	2	2	3	3	4	4	5	5
5%	0	0	2	2	2	3	3	3	3	3
10%	0	0	0	0	1	1	1	1	1	1
20%	0	0	0	0	0	0	1	1	1	1

The Table II-A shows the effect of prawn extract on seed germination in Cicer arietinum. It is seen from observation that the seed germination started in control seeds on second day of experiment. The seed germination started on 3rd day of treatment in 1% prawn extract treatment. In 5% extract treated seeds, the seed germination started on 5th day of treatment. In 20% prawn extract treated seeds, the seed germination is affected due to the treatment of prawn extract and it is delayed and started on 7th day of treatment. It means the beginning of seed germination is affected due to the treatment of prawn extract. It is further added that the delay in beginning of seed goes on decreasing as the

concentration of prawn extract treatment goes on decreasing as the concentration of prawn extract treatment goes increasing.

Table II-B Effect of prawn Extract on germination percentage of seeds of Cicer arienitum.

Treatment (Prawn Extract)	Number of seed/s Germination Per day.									
	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day
Control	0	30	50	60	60	70	80	10	100	100
1%	0	0	20	20	30	30	40	40	50	50
5%	0	0	20	20	20	30	30	30	30	30
10%	0	0	0	0	10	10	10	10	10	10
20%	0	0	0	0	0	0	10	10	10	10

Table II-B Shows the effect of percentage of concentration of prawn extract on seed germination in Cicer arietinum. From these observations, it is clear that the seed germination percentage goes on increasing from 1st to 10th day of germination in control seeds. It is 100% rate of germination on 8th day of treatment. The rate of germination only 50% in 1% prawn extract treated seeds on 10th day. It is 30%, 10% and 10% rate of seeds germination in 5%, 10% and 20% prawn extract treated seeds on 10th day of treatment. 20% prawn extract treatment shows very less percentage of germination. It means the rate of seed germination is affected by prawn extract treatment in Cicer arietinum. The effect goes on adverse as the concentration of prawn extract goes on increasing.

Table II-C Effect of prawn extract on redicle (root) length in Cicer arietinum.

Treatment (Prawn Extract)	Average redicle (root) length in cm on 10th day of treatment.
Control	1.10 cm
1%	0.8 cm
5%	0.5 cm
10%	0.3 cm
20%	-

Table-II-C shows the average radicle length of seeds in Cicer anrietinum on 10th day of germination in control and prawn extract treated seeds. It is clear from Table II-C that the average root length (redicle) is 1.10 cm in control seeds as on 10th day of germination. It is 0.8 cm, 0.5cm and 0.3 cm in 1%, 5%, 10% prawn extract treated seeds while there is no redicle formation in 20% prawn extract seeds. It indicates the prawn extract treatment has adverse effect on redicle length in seeds of Cicer arietinum. The adverse effect of prawn extract treatment goes on increasing as the concentration of prawn extract treatment goes on increasing from 1% to 20%.

Table II-D Effect of prawn extract on plumule (shoot) length during seed germination of Cicer arietinum.

Treatment (Prawn Extract)	Average redicle (shoot) length in cm on 10th day of treatment.
Control	1.09 cm
1%	-
5%	-
10%	-
20%	-

Table II-D Shows effect of prawn extract treatment on plumule (shoot) formation in seeds of Cicer arietinum. It is clear from Table II-D that the length of plumuleis 1.09 cm in control seeds. There is no plumule formation in 1%, 5%, 10% and 20% prawn extract treated seeds. It means there is inhibiting effect of prawn extract treatment on plumule formation in Cicer arietinum. When observation of Table I-A and Table II-A are compared, it is found that seed germination begin on 2nd

day in control of Cicer arietinum. The 1% spinach leaves extract treated seed shows beginning of germination on 2nd day while 1% prawn extract treated seeds shows beginning of germination on 3rd day of treatment. However in 1%, 5%, 10% and 20% prawn extract treated seeds of Cicer arietinum show beginning of germination on 3rd, 3rd, 5th and 7th day respectively. It means beginning of germination delayed more by prawn extract treatment than the spinach leaves extract treatment on seeds of Cicer arietinum.

Comparative account of Table I-B and Table II-B Shows that germination percentage of control seeds of Cicer arietinum is about 100% on 10th day of treatment. While it is 70%, 60%, 50% and 30% in 1%, 5%, 10% and 20% spinach extract treated seeds. It is 100% in control seeds of Cicer arietinum and 50%, 30%, 10% and 10% in prawn extract treated seeds. It means seed germination percentage is more affected by prawn extract treatment than spinach leaves extract treatment.

From Table I-C and Table II-C, it is observed that the radicle length is maximum i.e. 1.20 cm in control seeds of Cicer arietinum. The length of redicle is 0.80cm, 0.3cm, 0.1 cm and zero cm in 1%, 5%, 10% and 20% Spinach leaves extract treated seeds during germination on 10th day of treatment. The length of redicle is 0.8cm, 0.5cm, 0.3cm and zero cm in 1%, 5%, 10%, 20% prawn extract treatment. It means prawn extract treatment is more adverse in terms of redicle growth during germination than spinach leaves extract in seeds of Cicer arietinum.

Table I-D and Table II-D comparative account shows that shoot formation in control, however, there is no shoot (plumule) formation in either spinach leaves extract treatment affect the plumule (shoot) formation.

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An experiment was conducted to determine the effect of some indigenous plant extracts on the germination of wheat seeds. This study showed that the seeds treated with plant materials did not adversely affect the seed germination.

Asian Journal of plant Sciences

E.A.Grant, W.G.Sallans

In this paper the effect of aqueous extracts of different herbal plant leaves on the germination of selected vegetables are studied. A significant effect of aqueous extracts was found on the germination of vegetables throughout the growing period. In Turnip and Ladies finger it found to be maximum.

In this paper the effect of Banana plant extracts revealed a significant inhibition on seed germination and seedling growth of lettuce and the degree of inhibition increases with the increase of extract concentration.

In this research, the percent reduction in seed borne infection of target pathogenic fungi recorded in mungbean seeds were treated with five different treatments. All treatments were found to significantly reduce theoccurences of seed borne fungi but did not completely control them. Plant extracts have played a significant role in the inhibition of seed borne pathogens such as fusarium oxysporum and in the improvement of seed quality and emergence of seed embryo.

Izzet Kadioglu and Yusuf Yanar

June 1964, contribution No.129, Reaserch station Canada

Rhizome extract strongly delayed and inhibited the germination of lettuce.

Rishi P. Singh, K. Raja Reddy, in Advances in Agronomy, 2015.

Seeds of four legumes and four grasses were germinated in the presence of aqueous extracts of the same species, using distilled water as a check. Based on the number of significant reaction to the extracts, the species may be classified in the following order of decreasing inhibition-Alfalfa and timothy were the species least affected by the extracts while reed canary grass was the most susceptible.

The effect of vermicompost of Salvinia, Eichhornia, Chromolaena and Parthenium on percentage of seed germination, shoot and root length and wet and dry weight of wheat are measured. Regarding that it has concluded that, the lower concentration of vermicompost extract enhances the root length, shoot length, number of roots and wet and dry weights of seedlings in all the wheat seeds tested.

The paper gives an overview of approaches that have been taken to utilize the non-chemical methods for control of important seed borne pathogens of vegetables and small grain cereals. The treated plants include bacterial fungal diseases and viral diseases, which can be controlled in seeds.

The result of the present investigation showed that, seed treatment with different physical, chemicals, biological and botanical agents especially Biofungicide, allamonda leaf extracts, neem leaf extracts and Chitosan solution is useful to prevent germination failure to produce healthy, disease free and morphologically strong seedling and to promote production of vigorous seedling

This research shows the treatment technology in which it revealed that by using specific products and specific techniques can improve the growth environment for the seed, seedling and young plant. The seed is dressed with either a dry formulation of the seed treatment chemicals

Volume 3(4):472-475, 2004

With the exception of alfalfa, extracts of aerial portions of the plants had greater inhibitory effects than root extracts.

Similarly, an attempt is made to study the impact of certain external conditions on seed germination of Cicer arietinum

CONCLUSION-

Aqueous extract of spinach leaves and prawns of 1%,5%,10% and 20%(w/v) was treated to Cicer arietinum seeds was studied. Treated seeds show late germination, decreased rate of germination percentage, less radicle length and no plumule formation. Beginning of germination delayed more by prawn extract treatment than spinach leaves extract treatment. Seed germination percentage is more affected by prawn extract treatment than spinach leaves extract treatment. Prawn extract treatment is more adverse in terms of radicle growth during germination than spinach leaves extract treatment to seeds of Cicer arietinum. There is no plumule formation takes place in both treated seeds during germination. The adverse effect of spinach leaves extract treatment and prawn extract goes on increasing with increasing the concentration extracts.

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TO STUDY VEGETABLE EXTRACT TREATMENT AND NON VEGETABLE EXTRACT TREATMENT ON INITIAL LIVING PROCESS OF PISUM SATIVUM (GREEN SEEDS)

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Abstract
To study the seed germination of pisum sativum (green pea) under the aqueous extract of plant and animal origin of 1%, 5%, 10% 20% Concentration are used. The germination of seeds per day percentage of germination, average radical length and average plumule length in cm are parameters under study. The germination is more in control than treated seeds. Either plant extract or animal extract treatment is non stimulating and harmful to germination process in general. The effect of animal extract is very harmful than the plant extract treatment. Seed germination percentage is more in control than treatment. The seed germination percentage is more affected in aqueous extract of animal origin than plant origin. In both the treatment as the concentration increases, the maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin average radical length is affected due to the treatment. The treatment of aqueous extract of prawn is more is destructive than the aqueous extract of spinach. There is adverse effect of aqueous extract of plant origin (spinach) and prawn on average plumule growth of pisum sativum seeds. Amongst the both treatment, aqueous extract of plant origin (spinach) shows less harmful.

INTRODUCTION-

Pisum sativam belongs to family fabaceae. It is annual plant. It is most common vegetable plant. It bears seed pods. The seeds are either yellow or green.

Pisum sativum seed are having great nutritional values. According to Jegtvig (2007), peas contain high fibers, proteins, vitamins A, vit B_6, Vit C, Vitamin k; Phosphorous, Magnesium, Copper, Iron, Zinc and Pea dry weight contain about one quarter Protein and one quarter sugar.

Pisum sativam seeds are having great medicinal values according to pownall et. Al (2010) amino acid composition and antioxidants properties of pea seed are nateworthy[2]. Pea seed peptide fractions have less ability to acavenge free radicals than glutathione. But greater ability to chelate metals and inhibits Linoleic acid oxidation. Slanc et.al (2009) screamed selected food and medicinal plant extracts for pancreatic Lipase inhibition. They observed the vital role of pea for pancreatic lipase inhibition [3].

Pisum sativum seeds are having role in overcoming certain allergy. Sanchez et.al (2004) found that Visilin and Convicilin are potentially major allergens extracted from pea [4].

Pisum savitum plant has root nodules of Rhizobium Nitrogen fixing bacteria. Postage (1998), mentioned significant role of pea plants in biological nitrogen fixation[5]. Oelke(1991), Kalka (2005)[10] and sonil (2000)[6] also Learmed the significance role of pulses, especially Pisum Sativum plant in systebiotic nitrogen fixation as well, as in nutritional vegetable.

Pisum sativum seed can be preserved for longer duration to make it available at any season. The froozen seeds of Pisum sativum are great source of vegetable in any corner of life. Er.el as learned and proviten with scientific methodology by Sivasankar(2002)[7].

Being nutrition source as vegetable, major part as food, better nutritional Values in seeds, medicinal Values and better preservation sheflife of pea i.e Pisum sativum leads to study the seeds

germination of Pisum Sativum under the aqueous solution of plant and animal origin.

The extracts of Pisum sativum have been investigated and found to be pharmacologically active inducing anticancer activity. Clemente et al.[25,33] compared the effect of Bowman-Birk trypsin-chymotrypsin inhibitor, a potential cancer chemopreventive agent.

Peas, like many legumes contain symbiotic bacteria called Rhizobium within 2001 nodules of their root system. Bacteria have special ability of fixing nitrogen from atmospheric molecular nitrogen (Biological Science [26]).

According to Marinangeli et. Al in pea's high content of sugat present due to this it may mediate the glycuemic response and affects diabetic patients Dr advise not to use [27]. The effect of pea intake human gastointestinal function symptom studied show that it increase the bowel movement frequency [28].

However, there are no scientific studies on the influence of aqueous extract of plant origine and animal origin of varying concentration on seed germination in Gram seed. Miransari and Smith (2014) said that seed germination is an important process affecting crop production, and is influence by range of factors, including enzymes and hormones [13]. Seed germination is simple and non destructive technique for measuring plant biochemical growth and development (Wood and Roper 2000) .Therefore seed germination, germination percentage, radical length and plumul length are consider for understudy .

In Green pea the number of seed germinate per day, germination percentage of seed, radical length and plumule length on 10^{th} day are the parameters consider to study

The treated petri dishs (6^{th}, 7^{th}, 8^{th} and 9^{th}) with 10 seeds of Pea each treated with adequate amount of aqueous extract of prawn of 1%, 5%, 10% and 20% for 10 days to study the seed germination of Green pea .The germinate per day, germination percentage of seed and plumule length on 10^{th} day of treatment are parameters consider for study.

The entire process repeated for next 10 days. The observation is taken as an average of both the replicas.

MATERIAL AND METHOD

Green pea are collected, place ten each set of 9 Petri dishes. Each Petri dish is placed with normal blotting paper at bottom. First Petri dish is treated as control. It is poured with adequate distill water daily. Next four petri dish are treated with adequate amount of aqueous extract of plant (spinach leaves) remaining four petri dish are poured and treated with adequate amount of aqueous extract of animal origin (dried prawn). The control and treated petri dishes with 10 each Gram seed are under 10 day's observation. It was to study the seed germination of Gram seed under the aqueous extract of plant and animal origin.

For aqueous extract of plant origin preparation weight to volume ratio is consider for 1% aqueous extract of plant origin, 1gm fresh spinach leaves homogenized with 100 ml distill water. The content is filter through the normal filter paper. The filtrate is used as 1% aqueous extract of plant origin, similarly 5%, 10% and 20% aqueous extract of plant origin is prepared daily freshly. Thus 1%, 5%, 10% and (w/v) concentrated aqueous extract of plant origin is prepared.

For aqueous extract of animal origin preparation, weight to volume ratio is considered for 1% aqueous extract of animal origin, 1 gm of dried prawn homogenized with 100 ml distill water. The content is filter through normal filter paper. The filtrate is used as 1% aqueous extract of animal origin. Similarly 5%, 10% and 20% aqueous extract of animal origin prepared daily freshly. Thus 1%, 5%, 10% and 20% (w/v) concentrated aqueous extract of plant origin is prepared

The treated petri dish of Green pea treaded with aqueous extract plant origin and of 1%, 5%, 10% and 20% for 10 days to observe seed germination of Gram seed.

RESULT AND DISCUSSION:

Table 1. Number of seed germination 1 day of Pisum sativum (green seeds) due to treatment of aqueous extract of plant and animal origin.

Petri dish Number	Treatment		Number of seed germination/ day.									
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
1	Control	1	0	0	3	3	5	6	6	7	6	6
2.	Spinach Extract	1%	0	0	0	3	3	5	4	4	5	5
3.		5%	0	0	0	0	2	3	3	2	2	2
4.		10%	0	0	0	0	0	0	0	0	0	0
5		20%	0	0	0	0	0	0	0	0	0	0
6.	Control	2	0	0	1	1	2	5	4	5	4	4
7.	Prawn Extract	1%	0	1	1	2	2	0	0	0	0	0
8.		5%	0	0	1	1	1	1	0	0	0	0
9.		10%	0	2	1	1	1	1	0	0	0	0
10.		20%	0	2	1	1	1	1	0	0	0	0

From Table-1, it is clear that the germination of seeds of P. sativum (green seeds) starts on second day in control. There is no germination in 1% of plant extract and there is germination on animal extract. Germination of seed increases on day to 10^{th} day. Maximum germination of nine seeds on 10^{th} day in control as well as 1%, 15% and 10% respectively the 20% animal extract (prawn extract) treated seeds not shows any germination even on 10^{th} day. In 5%, 10%, 20% plant extract treated seed germination is less as compare to the control. Similarly in 5%, 10% prawn extract treated seeds the germination of seeds is very less. It is almost non-significance.

From Table-1 it is clear that the number of seeds germination third to nine days in control and 1% plant extract treated seeds that 1% plant extract shows more germination than control seed. it may conclude that 1% plant extract stimulates the germination in Pisum Sativum seed.

The overall conclusion from discussion is to draw as the germination of seed of Pisum sativum (green pea) is more in control than treated seed. It means either plant extract treatment or animal extract treatment is non stimulating and harmful to germination process, except the 1% plant extract. The effect of animal extract is very harmful than the plant extract treatment.

Table-2. Seed germination percentage of Pisum sativum after treatment of.

	Treatment		**No of seed germination percentage/day**									
Petridish no			**Day 1**	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**	**Day 7**	**Day 8**	**Day 9**	**Day 10**
1	Control	1	0	0	30	30	50	60	60	70	60	60
2	Spinach Extract	1%	0	0	0	30	30	50	40	40	50	50
3		5%	0	0	0	0	20	30	30	20	20	20
4		1%	0	0	0	0	0	0	0	0	0	0
5		20 %	0	0	0	0	0	0	0	0	0	0
6	Control	2	0	0	10	10	20	50	40	50	40	40
7	Prawn Extract	1%	0	10	10	20	20	0	0	0	0	0
8		5%	0	0	10	10	10	10	0	0	0	0
9		10 %	0	20	10	10	10	10	0	0	0	0
10		20 %	0	20	20	20	20	10	0	0	0	0

Seed germination percentage of P. sativum (green) after treatment of aqueous extract of plant and animal source origin is seen in Table 2.It shows the seed germination percentage per day up to ten days of experiment for control and treated conditions from the table. It is clear that seed germination percentage maximum on 10^{th} day of treatment in control aq plant extract treated as well as animal extract treated seed in control. The seed germination percentage is 20 on 2^{nd} day. However it is interested to note that it is zero percentage in both treatment. It 50% in control while 90% and 80% in 1% and 5% plant extract treatment seeds. It seems to stimulating effect of plant extract on germination percentage. The seed germination percentage is 60%each on 10^{th} day in 10% and 20% plant extract treatment. In aqueous extract of plant origin it is hardly 40%, 30%, 10% and 0% in 1%,5%,10% and 20% treatment respectively. It is to conclude that seed germination percentage is more in control than treatment amongst the treatment unclear study; the seed germination percentage is more effect in aqueous extract of animal origin than plant origin. In both the treatments the concentration increases the adverse effect on seed germination increases. The maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin.

Table- 3. Average radical length on 10^{th} day of treatment in Pisum sativum after treatment of aqueous extract of plant and animal origin.

Treatment	Concentration	Average radical length on 10^{th} day of treatment
Control	-	1.37
Aqueous extract of plant Origin (spinach extract control)	1% 5% 10% 20%	0.58 0.95 0 0
Control	-	1.35
Aqueous extract of Prawn	1% 5% 10% 20%	0.0 0 0 0

From Table 3, it is clear that control seeds of P. sativum show average radical length which is maximum (1.35 cm) than 0.58, 0.95cm of aqueous extract of plant origin treated seeds with 1%, 5%, 10% and 20% concentration. It means the average radical length is less in plant extracts treated seeds. It is decreasing as the concentration of spinach extract goes on increasing similarly from the table. It is also seen that the average radical length 0cm at 1% aqueous extract of animal origin (prawn) treated seeds. It is 0cm for 5%, 10%, and 20% treated seeds. Above observation are arrived at conclusion that the average radical length is affected due to the treatment with aqueous extract of spinach and prawn. The treatment of aqueous extract of animal origin is more destructive than aqueous extract of spinach.

Table-4- Average plumule length on 10^{th} day of treatment of aqueous extract of spinach and prawn.

Treatment	concentration	Average plumule length on 10^{th} day of treatment(cm)
Control	-	1.22
Aqueous extract of spinach	1% 5% 10% 20%	0.5 0 0 0
Control	-	0.85
Aqueous extract of Prawn	1% 5% 10% 20%	0 0 0 0

Table-4. Depicts the average plumule length on 10th day of treatment in control and treated seeds of Pisum Sativum. It is noted that 1.22 cm is maximum average plumule length seen in control seed . 0.58 cm,0 cm, 0 cm,0 cm is average growth of plumule in aqueous extract of spinach treated seeds at 1 %, 5%, 10% and 20% concentration respectively. The aqueous extract of prawn treated seeds of Pisum Sativum are showing the average plumule length as zero for 1%, 5%, 10% and 20% means no plumule growth at all for 1%, 5%, 10% and 20% concentration of aqueous extract of prawn.This discussion conclude that there is adverse effect of aqueous extract of plant (spinach) on plumule growth of Pisum Sativum seeds. Amongst the both treatment, aqueous extract of plant origin shows less harmful than prawn extract [11,12,13].

C. Beasse (2000) studied effect of epidermics of mycophaerella pinocles on crop growth radiation interception efficiency (PIE) and radiation use efficiency by dispersion on ground of pea. Which decrease the photosynthesis in leaves [29].

Shortage of water at any stage of plant growth usually results in a reduction in vegetative growth but many annual crop plants are sensitive changes in soil moisture condition during the period from flower initiation to the development of full flower [30-33].

CONCLUSION:

To study the seed germination of pisum sativum.(green pea) under the aqueous extract of plant and animal origin of 1%, 5%, 10% 20% Concentration are used. The germination of seeds per day percentage of germination, average radical length and average plumule length in cm are parameters under study. The germination is more in control than treated seeds. Either plant extract or animal extract treatment is non stimulating and harmful to germination process in general. The effect of animal extract is very harmful than the plant extract treatment. Seed germination percentage is more in control than treatment. The seed germination percentage is more affected in aqueous extract of animal origin than plant origin. In both the treatment as the concentration increases the maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin average radical length is affected due to the treatment. The treatment of aqueous extract of prawn is more is destructive than the aqueous extract of spinach. There is adverse effect of aqueous extract of plant origin (spinach) and prawn on average plumule growth of Pisum sativum seeds. Amongst the both treatment, aqueous extract of plant origin (spinach) shows less harmful.

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DUST MONITORING IN ALIBAG USING CALOPTROPIS GIGANTEA

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Abstract
*That plants can be used to monitor dust is a well-known fact .The current work is aimed at understanding the level of dust pollution in Alibag using **Calotropis gigantea**. Ten sites were selected and foliar dust was monitored throughout the dry season of 2017. The dust fall showed seasonal variations at different sites and co- related well with the ecological urban condiations prevalent at the site. The work throws light on the levels of dust pollution in the region and that **Calotropis gigantea** can effectively be used to monitor dust. High values of dust fall was observed in the summer months.*

INTRODUCTION :

Atmospheric particulate matter consists of a mixture of dust soot ,various elements, etc. Dust may affect the rate of photosynthesis , chlorophyll content , stomata , transpiration.

The use of vegetation to filter out dust , soot and particulates from atmosphere has been extensively used as a common practice by many developed countries. The dust interception capacity of plants depends upon its surface geometry , phyllotaxy and external characteristics such as hair cuticle , length of petioles , height and the weather conditions such as speed of wind. (Prajapati and Tripathi 2008)

Plant leaves has been regarded as biofilter as they absorb large quantities of particles from the environment (CPCB 2007). In order to ensure the conditions of local surroundings , monitoring with the help of biological indicators is simple , economical and convenient method (Wagh et al. 2006)

Some leaves have greater surface roughness than other leaves. Sticky leaves have more dust capture. Leaves with trichoms and hair also prove beneficial.

The current work aims at understanding the dust holding capacity a roadside plants in Alibag. Alibag is the most favourite travel destination for people near Mumbai and Pune.

MATERIAL AND METHODS :

Calotropis gigantea is a common weed frequenting the region of alibag . It has opposite and decussate phylotaxy and the foliar surface is dense with hairs . leaves form this plant were selected from 10 sites and dustfall estimated.

ESTIMATION OF DUST FALL

Ten dustiest sites were selected and 7 days washing analysis was carried out for ***Calotropis gigantea.*** The foliar surface of plant was cleared of dust spraying with water on initial day and dust was collected on 7^{th} day as shown by soha and padhy (2011).The leaves were washed with water and filter through whatmann paper no.1.once washed leaves were traced on graph paper to determine leaf area in m2

Dust fall was calculated in gms/m2 by method given by chaphekar et al (1980).

$$\text{Dust fall(gm/m2)} = \frac{\text{foliar dust (gms)}}{\text{Total leaf area.}}$$

DESCRIPTION OF SITE:-

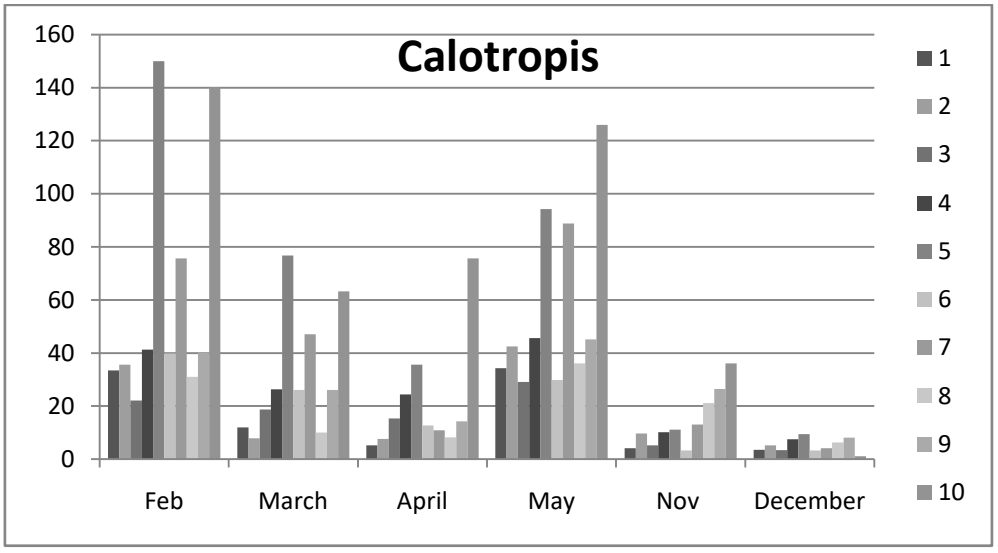
Table 1.1 :-

SR NO	NAME OF THE SITE	SITE DESSCRIPTION
1	Anand nagar	Residential area with moderate traffic.
2	Revas Road	Very heavy traffic
3	Rautwadi Road	Heavy traffic
4	Versoli Road	Moderate traffic
5	Revdanda Bypass Road	Heavy vehicular traffic consisting of all types of vehicles.
6	Gondhalpada road	Near residential area so less traffic.
7	Pimpalbhat Road	Heavy continuous traffic.
8	Khandala Road	Moderate traffic with heavy vehicles
9	Chendhre bypass Road	Connecting road to highway,less traffic.
10	Karle Khind Road	Heavy traffic with all types of vehicles.

Dust fall in gm/m^2 on 7^{th} day on the leaves

Table 1.2

Plant	Site	Dust fall in gm/m^2					
		Feb	March	April	May	Nov	December
Calotropis	1	33.38	11.96	5.212	34.28	4.129	3.5
	2	35.57	7.808	7.581	42.52	9.604	5.14
	3	22.11	18.695	15.296	29.10	5.239	3.33
	4	41.28	26.25	24.41	45.60	10.116	7.51
	5	150.0	76.80	35.581	94.24	11.101	9.4
	6	39.86	26.007	12.681	29.85	3.286	3.2
	7	75.68	47.08	10.921	88.76	12.98	4.12
	8	31.034	10.010	8.235	36.11	21.128	6.23
	9	40.16	26.007	14.285	45.10	26.401	8.04
	10	140.20	63.20	75.681	126.00	36.112	1.11



Dustfall on the leaves of *calotropis gigantea in dry season*

Results and Discussions :

The dust fall at ten sites in the dry season is shown in table 1.2

SITE 1: From the table it can be seen that maximum dust was observed 34.28 gms/m2 in the month of May and minimum3.5gm/m2 in December.

SITE 2The maximum dust was observed 42.52gms/m2in the month of May and minimum5.14gms/m2 in December

SITE 3: The maximum dust was observed29.10gms/m2 in the month of May and minimum3.33gms/m2 in December

SITE 4: The maximum dust was observed45.60gms/m2 in the month of May and minimum7.51gms/m2 in December

SITE 5: The maximum dust was observed 150.00gms/m2 in the month of February and minimum9.4gms/m2 in December

SITE 6: The maximum dust was observed39.86gms/m2 in the month of February and minimum3.2gms/m2 in December

SITE 7: The maximum dust was observed88.76gms/m2 in the month of February and minimum 4.12gms/m2in December

SITE 8The maximum dust was observed36.11gms/m2 in the month of May and minimum6.23gms/m2 in December

SITE 9: The dust was observed 45.10gms/m2in the month of May and minimum8.04gms/m2 in December

SITE 10: The maximum dust was observed 140.20gms/m2in the month of February and minimum 1.11gms/m2 in December.

Conclusion:

This study conclude that ***Calotropis gigantea*** recorded maximum dust fall at site 5 in the month of February with the value being 150 gms as well as in site 10 in same month with dust fall being fall 140.20gms/m2.Minimum dust fall is in month of December at site 10 is 1.11gms/m

The plant species has opposite phyllotaxy and with dense hairs which proves effective ass a dust capturer.

Using plants as monitors of dust has advantage over highly expensive and sophisticated instruments as they easily available have low maintenance can be cost effective substituent can be placed at specific sites and also do not risk pilferage.

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POLITICAL CONDITION OF THE CARNATIC ON THE EVE OF ANGLO-FRENCH CONFLICT

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The disintegration of the Mughal empire started from the early pent of the 18th century after the death of the last great Mughal emperor. Aurangzeb in 1707 A.D. The Mughal empire began to totter and fall into ruin. Taking advantage of this situation, Nizam-ul-mulk. The viceroy of Deccan, declared independence, defying the suzerainty of the Mughal power. But his supremacy in the Deccan was challenged by the marathas under Baji Rao, and a long duel ensued between the two powers. The Carnatic (coromanal coast) was province under the subedar (viceroy) of the Deccan and was ruled by a qouernar called the Nawab, with his capital at Arcot. He was nominally subordinate to the Nizam of Hyderabad but really excersised sovereign powers. But the internal condition of Carnatic qradually deteriorated due to internal feuds and external – aggression of the marathas. According to Tara Chand," the placid back waters of carnatic, and admist the petty intraques of the princess, the sudden appearance of the Maratha army led by Raghuji Bhonsale and his lieutenant Narain Rao was a Bombshel, Dost Ali, who tried to stop them, fell in battle. Safdar Ali his heir and chanda sahib (son-in-law of Dost Ali) took their families to Pondicherry for safety. Raghuji besieged Trichinopoly. Captured the fort and took chanda sahib prisoner sufder Ali the son of Dost Ali had saved his life and kingdom by promising to pay the marathas a crore of Rupees. But he was soon murdered and his young son was proclaimed the new Nawab a Created feeling of panic and uncertainty in the Carnatic Nizam now got an opportune moment to revive his lost power in the cornatic. But the appointment of the new Nawab made things worse as he was sure to be regarded as an intruder and rived Nawab Dost Ali's relative who still held many forts and enjoyed extensive power. Thus the cornatic region was embroiled in fratricidal wars of succession. This conditions gave the foreigners an opportunity to expand their political influence and control over the affairs of the south Indian states.[1]

At this time that Austrian win the war and broke out Europe and ranged the England and france in India on opposite side. The outbreak of the worry between England and france also placed the two mercantile companies in India Technically in a state of war during the period madras and Pondicherry in the Carnatic coast were the commercial bases of the English and India, at first tried hard to maintain neutrality. Even Dupleix, the Governor of Pondicherry opened direct negotiations with English Authorities in India. But it was failure and hostilities broke out between the two companies. The English set the ball rolling by capturing some French ships. As the French had no fleet in Indian waters, Dupleix sent an urgent appeal to La Bourbonnais, the Governor of Mauritius to come to his rescue. The latter reached the English troops faced each others for some time. The English squadron failed to resist the French attack and left for Ceylon. The French be signed madras which fell into the French hands. Dupleix now prepared to besiege the second English settlement of fort st. David.

2) Role of the Nawab :

The English appealed to Anwar-vd-din the Nawab of Carnatic for protection and assistance and the latter requested Dupleix. The French Governor to raise the siege of madras. But the French were in no mood to accede to the request, just as the English had ignored him in the past, since the Nawab had no naval fleet, he was not in a position to intervene effectively. It was quite different in the case of warfare on land. As here the Nawab was willing and seemed able to back up his demand by force. Dupleix new this and sought to pacify him by diplomacy. But the Nawab got terribly angry at this behavior of Dupleix and sent a huge army to snatch away madras from the French Bust most

surprisingly a handful of French troops inflicted a crushing defeat upon a huge army of the Nawab in the battle of Adyar st. Thomas (near) madras. It is otherwise known's as the battle of Adyar, as melleson has appointed out with pride "It may well be asserted that of all the decisive actions that have been fought in India. There is not one more memorable than this. The circumstances which stamps this action as so memorable is that it was the very first of it's kind, that it proved to the surprise of Both parties, the absolute and over whelming superiority of the disciplined European soldier to this Asiastic rival Duplex occupied madras and draw the English from almost the entire coromandal coast.

In spite French didn't gain much in the end. La Bourbonnais had promised to restore madras to the English for a large ransom. But Dupleix opposed the move and this led to a quarrel between the two French captain after a prolonged quarrel, Dupleix seemed ready to submit, when a hurricane caused serve damage to the French fleet and forced La Bourbonnais to retire with his ships from the Indian seas. Dupleix was now free to assume the initiative vis-à-vis the English he made a fresh attack on madras which surrendered as early as in the first instance.

Dupleix couldn't rest contented with his present victory. He turned his covetous attention to fort St. David which was some twelve miles south of Pondicherry However, the English succeeded in repelling the French attack through their brave officer, Boscawen. Thereafter the English laid siege of Pondicherry but were not successful because of the fierce resistance of the French. In the mean time the Austrian war of succession came to a close in Europe in 1748 with signing of the Treaty of Aix-La-chapelle between france and England. Under the terms of the treaty. Madras was restored to the English and Boscawen sailed back to Europe. Thus the first Carnatic war was drawn games yet it proved to be a significant event in the history of the growth of European power in India. According to malleson, " It brought into view silently but surely the possibility of the conquest of India by one or other of the two European powers on the coromandal coast."

3) Important Role of Dupleix :

Dupleix valiant efforts to relieve the French position were not much appreciated by Home government. The French government was tried of this unauthorized war Dupleix was now recalled by the authorities of the French company in paris. Who couldn't appreciate his ambitious schemes on 1st August 1754 Godeheu succeeded Dupleix as Governor General in India. In a complete reversal of Dupleix's policy. He reopened negotiations with the British and concluded a treaty. Both the English and French agreed not to interfere in the quarrels of the native princess. And each ponty was left in possession of the territories that it actually occupied at the time of this treaty. The peace was provisional and was to be implemented only after it's ratification by both the companies in Europe. It may be mentioned that the ratification never come and mean while there broke out in Europe a long war known as "Seven years war" any how

4) An Estimate Dupleix:

Dupleix was the first European stateman. Who took advantage of the weakness of the mughal empire for the advancement of the french-cawe-the French- supremacy leading to the building of an empire. According to Michel Edward' Because of Dupleix there was nearly a French empire in India and certainly because of him there was an English one," He was the first European politician who quitted the ports on the sea coast and marched into the continent for establishing imperial power. He formed a Brilliant project of a French dominion in India. His political conception were during and imaginative. According to Rubert, He raised the prestige of France in the East for some years to an amazing height he won a reputation among Indian princess and leaders that has never been surprised, and he arowsed a deud in his English contemporaries which is at once a tribute to his personal power and a testimony to their sagacity" one can Admit that he was one of the most striking personalities in Indian History. But According to R.C. majumdar" He was engaged in are of those risky undertakings

where success elevates a man to the rank of a Hero but failure denounces. Him as an abstinate and perverse advanture" According to Lowerence "Like all able men, he loved power both from policy' and in clination was not averse to a certain the optical pomp and display- He neither values men nor money, nor anything but what can gratify his own ambition" But he was a great administrator and diplomat with a wonderful capacity for organization and great persistence and tenacity of purpose.

Alfred Lyall has aptly remarked "Dupleix was a man of original and energetic political instincts. An imperious and morally in repid disposition who embarked upon wide and some what audacious schemes of oriental dominion.

5) Dupleix as an appointed as Governor of Pondicherry:

Dupleix was an appointed as Governor of Pondicherry finally He was be came Director General of all French possession in India. As director of Chandra nagar factory. He developed in to a most flourishing European settlement. As his mother country was not in good relation with England. He excepted war at any time. So he constructed a strong fort in Pondicherry. He tried to maintain neutrality in India insteul of a war between England and france in Europe. He made friendship with the Nawab of Carnatic and checked the ambition of the English during the first Carnatic war he captured madras the very much soul of the English made in Carnatic, to the surprise of all he also defeated Nawab's huge army with help of a handful of well disciplined French troops at st. Thome hateron, he supported chanda sahib to the throne of Carnatic. The combined armies of Dupleix and chanda sahib defeated and killed Nawab Anwar-u-din in the battle of Ambur' He supported muzaffer Jung to the Throne of the Nizam of Hyderabad But soon the new Nizam was murdered and in 1751 salabat Jang the Third son of Nizam-w-mulk, was raised to the throne by the French from then onwards the ride turned against Dupleix. The French siege of Trichiopoly didn't yield results. Arcot was cuptured by clive and mahamad Ali, the English nominee became the Nawab of carnutic mean while Dupleix was recalled and thus the grand design of Dupleix ended abruptly[5], According to Roberts, "The plain truth is that the schemes of Dupleix, both ingenious and for-reaching as they were, had broken down. It was Godeheus (the French Governor-General in India) task to save what he could from the wreck. He succeeded to a greater extent than might have been expected and afforded his countrymen an opportunity which they were unable to avail themselves to the full because a European war occurred before they had consolidated their strength. Besides the French Government was too anxious to keep peace in India as the conflict broken out between the French and the English in America seemed more reasonable than hypothetical conguest in india. The Ambition of the French Government to build a colonial empire in America was more unreal than Dupleix's design in India. He was always motivated by desire to build a French empire in India.

6) Dupleix as a great Diplomat:

Dupleix was only a diplomat and not a commander. He had to depend upon his subordinate Generals and none of them had the wisdom to understand his strategy and put it into operation. Dupleix way also over confident and his schemes of conquest were misunderstood by home Government. He was not enthusiastically supported by the home Government. The home Government also showed an indifferent attitude to the Company in the management of Indian settlements[7].

Dupleix vanity hot temper and love for intrigues made him unpopular. He treated the home government in a cavalier fashion. Intimating victories but not defeats Dupleix was over confident. He did not give proper estimate of the struggle to the home Government Ultimately, the personal factor also went against the plan of Dupleix. In the words of R.C. Mujumdar, "It is idle to deny the fact that the subsequent ourself events in the Carnatic war. Determined to a large extent by personalities rather than circunstances. The Brilliant genius and bold dosh of clive on the one hand and Lally and his colleagues on the other hands determined the issues[8].

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COMPUTER NETWORKING

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Abstract: Computernetworksareasystemofinterconnectedcomputersforthepurposeofsharingdigitalinformation.Theconceptofanetworkbeganin1962whenaserverattheMassachusettsInstituteofTechnologywasconnectedtoaserverinSantaMonica,California.Sincethattimetheproliferationofcomputersandcomputernetworkshasincreasedsignificantly.Oneofthemostsignificantchallengestonetworksisattacksontheirresourcescausedbyinadequatenetworksecurity.Inthisresearchpaperwehighlightandoverviewconceptofcomputernetworks**.**

I.INTRODUCTION

Acomputernetworkordatanetworkisatelecommunicationsnetworkthatallowscomputerstoexchangedata.Incomputernetworks,networkedcomputingdevicespassdatatoeachotheralongdataconnections.Theconnections(networklinks)betweennodesareestablishedusingeithercablemediaorwirelessmedia.Thebest-knowncomputernetworkistheInternet.Networkcomputerdevicesthatoriginate,routeandterminatethedataarecallednetworknodes.Nodescanincludehostssuchaspersonalcomputers,phones,serversaswellasnetworkinghardware.Twosuchdevicesaresaidtobenetworkedtogetherwhenonedeviceisabletoexchangeinformationwiththeotherdevice,whetherornottheyhaveadirectconnectiontoeachother.Computernetworkssupportapplicationssuchasaccesstothe World Wide Web,sharedu seofapplicationandstorageservers,printers,andfaxmachines,anduseofemailandinstantmessagingapplications.Computernetworksdifferinthephysicalmediausedtotransmittheirsignals,thecommunicationsprotocolstoorganizenetworktraffic,thenetwork's size,topologyandorganizationalintent.

II.HISTORY

Makingdevicestalktoeachotherforthepurposesofcommunicationisnothingnew.Earlyforaysintotelephonysuchasthetelegraphandtelephonehavesinceevolvedintomorecomplicateddevices,andnowacomputercanbenetworkedtothe Internet,another PC,orevenahomestereo.Intheearly1960s,individualcomputershadtobephysicallyshared,makingthesharingofdataandotherinformationdifficult.Seeingthiswasimpractical,researchersdevelopedawayto“connect”thecomputerssotheycouldsharetheirresourcesmoreefficiently.Hence,theearlycomputernetworkwasborn.

Throughthethen-newcommunicationprotocolknownaspacketswitching,anumberofapplications,suchassecurevoicetransmissioninmilitarychannelsbecamepossible.Thesenewcircuitsprovidedthebasisforthecommunicationtechnologiesoftherestofthe 20th century,andwithfurtherrefinementthesewereappliedtocomputernetworks.ThesenetworksprovidedthebasisfortheearlyARPANET,whichwastheforerunneroftheModernInternet.TheAdvancedResearchProjectsAgency(ARPA)submittedtheproposalfortheprojectonJune3,1968whichwasapprovedafewweekslater.Thisproposalentitled“ResourceSharingComputerNetworks”wouldallowARPAnotonlythefurthersharingoftheirdata,butwouldallowthemtofurthertheirresearchinawidevarietyofmilitaryandscientificfields.Afterbeingtestedinfourlocations,thenetworkspreadandthenewprotocolscreatedforitsuseevolvedintotoday’sWorldWideNetwork.

In1977,earlyPCbasedLocalAreaNetworks,orLANs(LocalAreaNetworks)werespreading,andwhileinitiallyrestrictedtoacademicsandhobbyists,theyeventuallyfoundtheirwayintotheworkplaceandinhomes,althoughtheexplosionintothelattertwoarenasisarelativelyrecentphenomenon.LANvariantsalsodeveloped,includingMetropolitanAreaNetworks(MANs)tocoverlargeareassuchasacollegecampus,andWideAreaNetworks(WANs)foruniversity-to

universitycommunication.Withthewidespreaduseofcomputersinthecorporateworld,thespeedandconvenienceofusingthemtocommunicateandtransferdatahasforeveralteredthelandscapeofhowpeopleconductbusiness.Networkshavebecomeanintegralpartofthecorporateworld.UbiquitouscomputingandInternet-
capablecellularphoneshaveallowedpeopletoremainconnected,eveniftheindividualisawayfromafullywiredofficeenvironment.

III.PROPERTIESOFCOMPUTERNETWORKS

Facilitatecommunications: Usinganetwork,peoplecancommunicateefficientlyandeasilyviaemail,instantmessaging,chatrooms,telephone,videotelephonecalls,andvideoconferencing.Permitsharingoffiles,data,andothertypesofinformationInanetworkenvironment,authorizedusersmayaccessdataandinformationstoredonothercomputersonthenetwork.

Facilitatesinterpersonalcommunications

Peoplecancommunicateefficientlyandeasilyviaemail,instantmessaging,chatrooms,telephone,videotelephonecalls,andvideoconferencing.

Allowssharingoffiles,data,andothertypesofinformation

Authorizedusersmayaccessinformationstoredonothercomputersonthenetwork.Providingaccesstoinformationonsharedstoragedevicesisanimportantfeatureofmanynetworks.

Allowssharingofnetworkandcomputingresources

Usersmayaccessanduseresourcesprovidedbydevicesonthenetwork,suchasprintingadocumentonasharednetworkprinter.Distributedcomputingusescomputingresourcesacrossanetworktoaccomplishtasks.

Maybeinsecure

AcomputernetworkmaybeusedbycomputerCrackerstodeploycomputervirusesorcomputerwormsondevicesconnectedtothenetwork,ortopreventthesedevicesfromaccessingthenetwork(denialofservice).

Mayinterferewithothertechnologies

Powerlinecommunicationstronglydisturbscertainformsofradiocommunication,e.g.,amateurradio.Itmayalsointerferewithlastmileaccesstechnologiessuchas ADSLandVDSL.Acomplexcomputernetworkmaybedifficulttosetup.Itmaybecostlytosetupaneffectivecomputernetworkinalargeorganization.

IV.PROTOCOLSINNETWORKING

Ethernet: TheEthernetprotocolisbyfarthemostwidelyusedone.Ethernetusesanaccessmethodcalled CSMA/CD(CarrierSenseMultipleAccess/CollisionDetection).Thisisasystemwhereeachcomputerlistenstothecablebeforesendinganythingthroughthenetwork.Ifthenetworkisclear,thecomputerwilltransmit.Ifsomeothernodeshavealreadytransmittedonthecable,thecomputerwillwaitandtryagainwhenthelineisclear.Sometimes,twocomputersattempttotransmitatthesameinstant.

FastEthernet: Toallowforanincreasedspeedoftransmission,theEthernetprotocolhasdevelopedanewstandardthatsupports100Mbps.

LocalTalk: LocalTalkisanetworkprotocolthatwasdevelopedbyAppleComputer,Inc.forMacintoshcomputers.ThemethodusedbyLocalTalkiscalledCSMA/CA(CarrierSenseMultipleAccesswithCollisionAvoid

ance).ItissimilartoCSMA/CDexceptthatacomputersignalsitsintenttotransmitbeforeitactuallydoesso.LocalTalkadaptersandspecialtwistedpaircablecanbeusedtoconnectaseriesofcomputersthroughtheserialport.

TokenRing: TheTokenRingprotocolwasdevelopedbyIBMinthemid-1980s.Theaccessmethodusedinvolvestoken-passing.InTokenRing,thecomputersareconnectedsothatthesignaltravelsaroundthenetworkfromonecomputertoanotherinalogicalring.Asingleelectronictokenmovesaroundtheringfromonecomputertothenext.

FDDI: FiberDistributedDataInterface(FDDI)isanetworkprotocolthatisusedprimarilytointerconnecttwoormorelocalareanetworks,oftenoverlargedistances.TheaccessmethodusedbyFDDIinvolvestoken-passing.FDDIusesadualringphysicaltopology.

ATM: AsynchronousTransferMode(ATM)isanetworkprotocolthattransmitsdataataspeedof155Mbpsandhigher.ATMworksbytransmittingalldatainsmallpacketsofafixedsize;whereas,otherprotocolstransfervariablelengthpackets.ATMsupportsavarietyofmediasuchasvideo,CD-qualityaudio,andimaging.ATMemploysastartopology,whichcanworkwithfiberopticaswellastwistedpaircable.

GigabitEthernet: ThemostlatestdevelopmentintheEthernetstandardisaprotocolthathasatransmissionspeedof1Gbps.GigabitEthernetisprimarilyusedforbackbonesonanetworkatthistime.Inthefuture,itwillprobablyalsobeusedforworkstationandserverconnections.

V.APPLICATIONS

Applicationsofwirelesstechnology:

Mobiletelephones

Oneofthebest-knownexamplesofwirelesstechnologyisthemobilephone,alsoknownasacellularphone,withmorethan4.6billionmobilecellularsubscriptionsworldwideasoftheendof2010.

Wirelessdatacommunications

Wirelessdatacommunicationsareanessentialcomponentofmobilecomputing.Thevariousavailabletechnologiesdifferinlocalavailability,coveragerangeandperformance,andinsomecircumstances,usersmustbeabletoemploymultipleconnectiontypesandswitchbetweenthem.

Wi-Fiisawirelesslocalareanetworkthatenablesportablecomputingdevicestoconnecteasilytothe Internet.StandardizedasIEEE802.11a,b,g,n,Wi-Fiapproachesspeedsofsometypesofwired Ethernet.Wi-Fihasbecomethedefactostandardforaccessinprivatehomes.

Cellulardataserviceofferscoveragewithinarangeof10-15milesfromthenearestcellsite.Speedshaveincreasedastechnologieshaveevolved,fromearliertechnologiessuchasGSM,CDMAandGPRS,to3Gnetworkssuchas W-CDMA,EDGEorCDMA2000.

MobileSatelliteCommunicationsmaybeusedwhereotherwirelessconnectionsareunavailable,suchasinlargelyruralareasorremotelocations.Satellitecommunicationsareespeciallyimportantfortransportation,aviation,maritimeandmilitaryuse.

WirelessSensorNetworksareresponsibleforsensingnoise,interference,andactivityindatacollectionnetworks.Thisallowsustodetectrelevantquantities,monitorandcollectdata,formulatemeaningfuluserdisplays,andtoperformdecision-makingfunctions

Wirelessenergytransfer

Wirelessenergytransferisaprocesswherebyelectricalenergyistransmittedfromapowersourcetoanelectricalloadthatdoesnothaveabuilt-inpowersource,withouttheuseofinterconnectingwires.Therearetwodifferentfundamentalmethodsforwirelessenergytransfer.Theycanbetransferredusingeitherfar-fieldmethodsthatinvolvebeampower/lasers,radioormicrowavetransmissionsornear-fieldusinginduction.Bothmethodsutilizeelectromagnetismandmagneticfields

WirelessMedicalTechnologies

Newtechnologiessuchasmobilebodyareanetworks(MBAN)thecapabilitytomonitorbloodpressure,heartrate,oxygenlevelandbodytemperature,allwithwirelesstechnologies.TheMBANworksbysendinglowpoweredwirelesssignalstoreceiversthatfeedintonursingstationsormonitoringsites.Thistechnologyhelpswiththeintentionalandunintentionalriskofinfectionordisconnectionthatarisefromwiredconnections.

Computerinterfacedevices

Answeringthecallofcustomersfrustratedwithcordclutter,manymanufacturersofcomputerperipheralsturnedtowirelesstechnologytosatisfytheirconsumerbaseOriginallytheseunitsusedbulky,highlylimitedtransceiverstomediatebetweenacomputerandakeyboardandmouse;however,morerecentgenerationshaveusedsmall,high-qualitydevices,someevenincorporatingBluetooth.Thesesystemshavebecomesoubiquitousthatsomeusershavebeguncomplainingaboutalackofwiredperipherals.Wirelessdevicestendtohaveaslightlyslowerresponsetimethantheirwiredcounterparts;however,thegapisdecreasing.

ComputerinterfacedevicessuchasakeyboardormousearepoweredbyabatteryandsendsignalstoareceiverthroughaUSBportbywayofaradiofrequency(RF)receiver.TheRFdesignmakesitpossibleforsignalstobetransmittedwirelesslyandexpandstherangeofeffectiveuse,usuallyupto10feet.Distance,physicalobstacles,competingsignals,andevenhumanbodiescanalldegradethesignalquality.Concernsaboutthesecurityofwirelesskeyboardsaroseattheendof2007,whenitwasrevealedthatMicrosoft'simplementationofencryptioninsomeofits27MHzmodelswashighlyinsecure.

V.NETWORKSECURITY

WhatIsNetworkSecurity?

Networksecurityreferstoanyactivitiesdesignedtoprotectyournetwork.Specifically,theseactivitiesprotecttheusability,reliability,integrity,andsafetyofyournetworkanddata.Effectivenetworksecuritytargetsavarietyofthreatsandstopsthemfromenteringorspreadingonyournetwork.WhatIsNetworkSecurityandHowDoesItProtectYournetwork?Manynetworksecuritythreatstodayarespreadovertheinternet.Themostcommoninclude:

1. Viruses,worms,andTrojanhorses
2. Spywareandadware
3. Zero-dayattacks,alsocalledzero-hourattacks
4. Hackerattacks
5. Denialofserviceattacks
6. Datainterceptionandtheft
7. Identitytheft

V.CONCLUSION

Whiletheoldconceptofthenetworkisfoundationalinvirtuallyallareasofsociety,ComputerNetworks andProtocolshaveforeverchangedthewayhumanswillwork,play,andcommunicate.Forgingpowerfullyint oareasofourlivesthatnoonehadexpected,digitalnetworkingisfurtherempoweringusforthefuture.Newprot ocolsandstandardswillemerge,newapplicationswillbeconceived,andourliveswillbefurtherchangedanden hanced.Whilethenewwillonlybebetter,themajorityofdigitalnetworking'scurrenttechnologiesarenotcuttin g-
edge,butratherareprotocolsandstandardsconceivedatthedawnofthedigitalnetworkingagethathavestoods olidforoverthirtyyears.

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جواب نہیں ہندوستان کے ساحل کا

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زمین کے ۷۰/فیصد حصے پر سمندر ہے جس میں سے ۱۴/فیصد پر بحر ہند واقع ہے۔ ہندوستان ۳/طرف سے سمندر سے گھرا ہوا ہے اور اس کے ۱۳/ریاستوں کی سرحدیں سمندر سے ملی ہوئی ہیں۔ مندرجہ ذیل اہم ساحلوں سے سمندر کا نظارہ کرنا بڑا ہی دلچسپ تجربہ ہوتا ہے۔ یہ ریاست درجہ ذیل ہیں۔(۱) آندھرا پردیش (۲) مغربی بنگال (۳) کیرالا (۴) کرناٹک (۵) اڑیسہ (۶) تمل ناڈو (۷) مہاراشٹر (۸) گوا (۹) گجرات (۱۰) پانڈیچری (۱۱) دمن دیو (۱۲) لکش دیپ (۱۳) انڈومان نکوبار

(۱) آندھرا پردیش : آندھرا پردیش جنوبی ہند کی ایک ریاست ہے جس کا دارالخلافہ حیدرآباد ہے۔ اس ریاست کی سرکاری زبان تیلگو اور دوسری سرکاری زبان اردو ہے۔ آندھرا پردیش جغرافیائی اعتبار سے ۳/حصوں (۱) ساحلی آندھرا (۲) رامل سیما اور (۳) تلنگانہ پر مشتمل ہے۔ یہاں تاریخی مقامات کی کمی نہیں جو سیاحوں کو راغب کرتے ہیں۔ یہاں کے ساحلوں کی مناسبت سے ۳/مقامات خاص طور پر مشہور ہے جن کے نام ہیں (۱) بھیمونی پٹنم (۲) رام کرشا مشن اور (۳) سوریہ لنکا۔

مغربی بنگال : ہندوستان کے صوبہ بنگال کی تقسیم کے بعد ایک تو بنا بنگلہ دیش اور دوسرا حصہ جو چلا گیا جو ہندوستان میں رہا اس کا نام پڑا مغربی بنگال۔ بنگال کا زیادہ تر سمندری علاقہ بنگلہ دیش میں چلا گیا۔ مغربی بنگال میں اب ۲/اہم مقامات سے سمندر کو دیکھا جاسکتا ہے۔ جنوبی ۲۴/پرگند میں واقع لکاتہ کے پاس (۱) گنگا ساگر ڈیلٹائی کا علاقہ (۲) سندر بن کا علاقہ۔ گنگا ساگر کو سمندری جزیرہ یا گنگا ساگر سنگم بھی کہتے ہیں۔ گنگا ساگر خلیج بنگال کا 'کانٹینینٹل شلف' میں کولکاتا سے ۱۵۰/کلومیٹر (۸۰ میل) جنوب میں ایک جزیرہ ہے۔ مغربی بنگال کے بکھالی، مندارمنی اور تاج پور ساحل مشہور ہیں۔

(۳) کیرالا : کیرالا ہندوستان کے علاقے دکن کے جنوبی حصہ میں واقع ایک ریاست ہے۔ اس کا دارالحکومت تریویندرم ہے۔ اس ریاست کی زبان ملیالم ہے۔ یہاں کے باشندوں کو ملیالی کہتے ہیں۔ اس ریاست کے مسلم آبادی میں بیشتر موپلا قوم کے لوگ ہیں۔ کیرالا کا بحرہ عرب سے متصل ساحلی علاقہ ۵۵۰/کلومیٹر پھیلا ہوا ہے۔ یہ ہندوستان کا جنوب مغربی کنارہ ہے۔ جہاں کے مشہور ساحلوں کے نام ہیں۔ الاپوزا، کوچی کا قلعہ، کبڑہ کپا، کڑاؤ، کوہ لم، مرائی، مرافیلنکر، پیم بلم، موگھوم، ورکالا اور ویلی۔

(۴) کرناٹک کے ساحل : کرناٹک کے جنوبی ہند کی اہم ریاست ہے۔اسے ہندوستان میں 'آئی ٹی' ٹیکنالوجی کے دارالخلافہ کا خطاب بھی حاصل ہیں۔شہر بنگلور کرناٹک کا دارالخلافہ ہے۔اسے ''عروس البلاد'' اور گارڈن سٹی آف انڈیا کے نام سے بھی جانا جاتا ہیں۔''آئی ٹی سیکٹر'' میں یہ ریاست ''سلیکون آف انڈیا'' کے نام سے مشہور ہے۔اپنے وسیع جغرافیائی قدرتی حسن اور قدیم تاریخ کی وجہ سے یہ ریاست کرناٹک سیاحوں کی دلکشی کا مرکز رہی ہے۔ریاست میں جہاں ایک طرف قدیم تاریخی عمارتیں ہیں وہی جدید شہر بھی ہیں۔تاریخی عمارتوں سے اور سنہرے ریتلے اور پرسکون ساحلوں کے سبب کرناٹک کو ملک میں سیاحوں کے سبب کرناٹک کو ملک میں سیاحوں کے لیے چوتھی سب سے مقبول ریاست کا شرف حاصل ہے۔یہاں کے مشہور ساحلوں کے نام ہیں۔گوکرنا، کاروا، کوپ، کنڈلے، کروم گڑھ، مرودیشور، سومینشور، سورتھگل، تنیر باوی الا ساحل وغیرہ۔

(۵) اڑیسہ : اڑیسہ کے ریاست ہندوستان کے مشرقی سمندری ساحلی پر واقع ہے۔جہاں سے خلیج بنگال نظر آتی ہیں۔تقریباً ۵ر سو کلومیٹر کی اس ساحلی پٹی پر کئی خوبصورت ساحل ہیں۔اس ریاست کا دارالحکومت بھونیشور ہے۔جنوبی ہند کی اس غریب ریاست میں عیسائیوں کی منسریوں کی جانب سے تبدیلی مذہب کے مشن اور نکھلی سرگرمیوں کی وجہ اب بھی یہاں کے کندھمال ضلع میں کشیدگی رہتی ہیں۔اڑیسہ کے جنگلوں میں جانوروں اور پرندوں کی نایاب قسمیں دیکھنے کو ملتی ہیں۔یہاں کے اہم ساحل میں پوری گوپال پور، کومارک، باگیشور، آریہ پلی اور پارادیپ وغیرہ کو کافی شہرت حاصل ہے۔

(۶) تمل ناڈو : ہند کی اہم ریاست تمل ناڈو کا دارالحکومت چنئی ہے۔جسے پہلے مدراس کے نام سے جانا جاتا تھا۔یہاں کی اہم ندی کاویری ہے۔اس ریاست میں ہندوؤں کے بڑے ۴ر مٹھوں سے ایک مٹھی ہے۔کانچی پورم میں واقع کانچی کام کوئی پیٹھ، تمل ناڈو کی ایک ساحلی پٹی ہے۔جو تقریباً ایک ہزار کلومیٹر تک پھیلی ہوئی ہے۔جہاں سیکڑوں دلکش ساحلی مقامات ہیں۔اس کے کنارے پر جہاں ایک طرف رامیشورم ہے تو دوسری طرف کنیا کماری۔تمل ناڈو کی تاریخ بیت ہی پرانی ہے۔تمل ناڈو کے ساحلوں کے نام ہیں۔الیویٹ، مہابلی پورم، کنیا کماری، پومیویر اور رامیشورم۔

(۷) مہاراشٹر : مہاراشٹر کے ساحلی رقبہ کے لحاظ سے ملک کی تیسری اور آبادی کے لحاظ سے دوسری بڑی ریاست ہے۔اس کی سرحدیں مدھیہ پردیش، چھتیس گڑھ، آندھرا پردیش، کرناٹک اور گوا سے ملتی ہیں۔ریاست کے مغربی ساحلی بحرہ عرب واقع ہے۔ہندوستان کا گنجان ترین شہر ممبئی ریاست کا دارالحکومت ہے۔مہاراشٹر کے مشہور ساحل ہیں-لیسیما، دھانو، بورڈی، گنپتی، بھلے، پرنائی، حولبو، مانڈوا، میرنین ڈرائیو، ماروے منوری گورائی، مروڈ جنجیرہ، شری وردھن، ویگورلا مالون، وجے دوگ، سندھودرگ وغیرہ۔

(۸) گجرات کے ساحل : مغربی ہندوستان کی اس ریاست کی اس ریاست کی سرحد میں الاقوامی سرحد بھی ہے، پاکستان سے لگی ہوئی ہے۔اس ریاست کا دارالحکومت گاندھی نگر ہے جو ریاست کے اہم تجارتی مرکز احمد آباد کے قریب واقع ہے۔بڑے سمندر کے کنارے والی ریاست میں تاریخ کے دور کے شروع ہونے سے پہلے ہی متعدد غیر ملکی اقوام بری اور بحری راستے سے آکر ملتے ہیں اور یہ

مستقل طور سے بسی ہوئی ہیں۔ ریاست گجرات کے ۵/ساحل بہت مشہور ہیں جن کے نام ہیں-احمد پور مانڈوی ساحل، کیتھال، گوینا تھا اور عمر گاؤں۔

(۹) گوا : ہندوستان کی قدیم تاریخ میں گوا کا ذکر ملتا ہے۔ گوا تقریباً ۵/سو سال تک پرتگالیوں کے تسلط میں رہا۔ دنیا بھر کے سیاح یہاں چھٹیاں گزارنے آتے ہیں۔ گوا پہنچنے کے لیے دو اہم راستے ہیں۔ ممبئی سے گوا کا راستہ اور کرناٹک کے بیلگام کا راستہ۔ گوا کا دارالحکومت پنجی ہے۔ گوا کے اہم ساحل ہیں-مسیرامار، سکرین، ورکا، کولوا، بینا ولم، بوگمولو، پالولیم، ہرمل دریائے فانڈوی وغیرہ۔

۱۰) پانڈیچری : ہندوستان کی مرکز کی حکمرانی والی اس ریاست کا نام پانڈوچری یا پانڈیچری ہے۔ پانڈیچری کے مغرب طویل ساحل سمندر ہے۔ پانڈیچری پر فرانسیسیوں اور انگریزوں کا قبضہ تھا۔ پانڈیچری کی متحدہ ریاست ۴/دستوار گزار علاقہ (۱) پڈوچیری (۲) کرائیکال (۳) مالپے (۴) ینم سے مل کر بنی ہے۔ چنئی سے پانڈیچری کی دوری ۱۶۰/کلومیٹر ہے۔ یہاں کے مشہور ساحل ہیں-کرائیکل پرومینڈ مالپے، پلیگ پیرادائز اور ودے ورسیر بینئی۔

۱۱) انڈومان اور نکوبار : تقریباً ۳/سو چھوٹے بڑے جزیروں سے مل کر بنے انڈومان اور نکوبار جزائر مراکز کے زیر انتظام علاقے ہیں جو خلیج بنگال کے جنوب میں بحر ہند میں واقع ہیں۔ یہاں کا دارالحکومت پورٹ بلیئر ہے۔ انڈومان ملائی زبان کے لفظ 'ہاندومن' سے آیا ہے۔ جو ہندو دیوتا ہنومان کے نام کا متبادل ہے۔ نکوبار لفظ بھی اسی زبان سے لیا گیا ہے۔ یہاں کے بڑے ساحل کورین کو اور چرایا جزیرہ پر مندرے، کرمتانگ، رادھا اور وجے نگر، رام نگر اور اس کے علاوہ ایک سمندری پارک بھی ہے جس کا نام انڈر نیشنل پارک۔

۱۲) دمن دیو : دمن دیو اور گجرات کے جوناگڑھ اور مہاراشٹر کے ممبئی کے قریب بحیرہ عرب میں واقع جزائر ہیں۔ یہ علاقہ مرکزی حکمران کے تحت آتا ہے۔ یہاں کا دارالحکومت 'سلواسا' ہے۔ یہاں سیاحوں کے لیے سہانے موسم کے ساتھ خوبصورت اور محفوظ تفریحی پارک ہے اور ایک وسیع 'دمن گنگا' ندی بھی ہے۔ یہ ندی دمن کو ۲/حصوں میں تقسیم کرتی ہے۔ ایک 'نانی دمن' اور دوسرا 'موتی دمن'۔ یہاں پر ۲/اہم ساحل ہیں ایک کا نام 'دیو کا ساحل' اور دوسرے کا نام 'جیم پورے ساحل' ہے۔

۱۳) لکش دیپ : لکش دیپ کی زمین ۳۲/کلومیٹر طویل اور ۳۹ چھوٹے چھوٹے جزیروں میں بنی ہوئی ہے۔ یہ دنیا کے سب سے زیادہ پرسکون جزیروں میں سے ایک ہے۔ یہاں کے سمندر کا پانی انتہائی شفاف ہے۔ ان تمام جزیروں پر مونگے کے ریف، ریتیلے کنارے اور خوبصورت قدرتی املاک دیکھنے کے قابل ہیں۔ یہ آلودگی سے پاک ہوا۔ صاف پانی اور اور مہمان نوازی اور آسانی سہولیات کے لیے مشہور جگہ ہے۔ یہاں آپ 'سی ڈرائیونگ' کر سکتے ہیں یا چاہیں تو قدرتی لطف اندوز ہو سکتے ہیں۔ یہاں کے اہم ساحل ہیں-کاورتی، کلپتی، قدامت، اگاتی اور بنگارام وغیرہ۔

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ENVIRONMENTAL IMPACT OF PLASTIC POLLUTION

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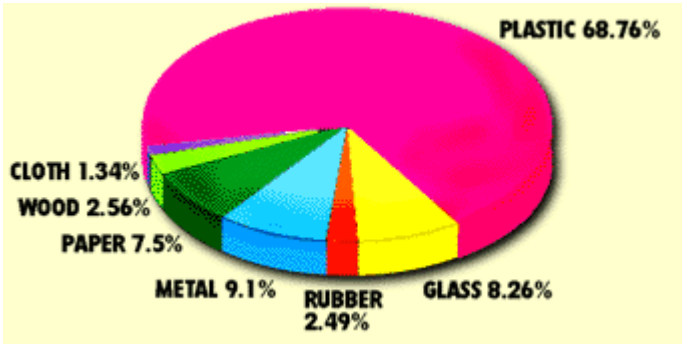
INTRODUCTION

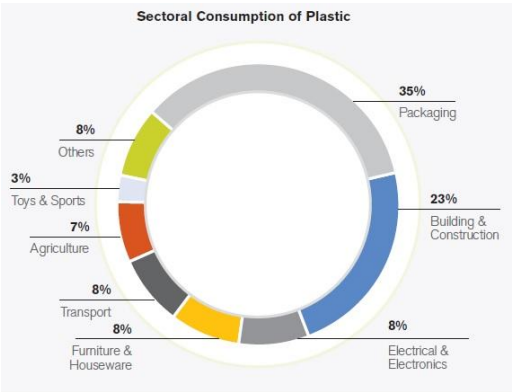
The word 'plastic' comes from the Greek word 'plasticos', which means to be able to be shaped or moulded by heat. 'Polymers' is the generic term for all plastic materials, referring to organic, carbon based compounds whose molecules are linked together in long-chain patterns.

Plastic pollution is a global problem. The majority of plastic winds up in landfills where it remains indefinitely. No one exactly knows how long plastic takes to break down, but it is believed to take hundreds or even thousands of years. It is not just the accumulation of plastics that harms the environment—it is also the fragments and toxins released during photo-decomposition that pollute our soil and water.

The very properties that have made plastic such a necessity for modern living pose problems once its useful life is over. Plastic is used in paints, cable coverings and window frames to prevent rotting, but this also makes degradation that much more diffi cult. Plastic food packaging increases the shelf life of foods, and provides a cheap, hygienic and versatile range of wrappings. Although it has obvious advantages for the food industry, the huge increase in plastic packaging has greatly increased plastic waste and, consequently, litter.

Plastic pollution has the potential to poison animals, which can then adversely affect human food supplies. Plastic pollution has been described as being highly detrimental to large marine mammals. Some marine species, such as sea turtles, have been found to contain large proportions of plastics in their stomach. When this occurs, the animal typically starves, because the plastic blocks the animal's digestive tract. Marine mammals sometimes become entangled in plastic products such as nets, which can harm or kill them.





The world population is living, working, vacationing, increasingly conglomerating along the coasts, and standing on the front row of the greatest, most unprecedented, plastic waste tide ever faced. The amount of plastic manufactured in the first ten years of this century will approach the total produced in the entire last century. The plastic pollution involves the accumulation of plastic products in the environment that adversely affects wildlife habitat, or humans. We absorb many types and forms of plastic pollution exist. The plastic pollution can adversely affect lands, waterways and oceans. The prominence of plastic pollution is correlated with plastics being inexpensive and durable, which lends to high levels of plastics used by humans. Animals can be

significantly harmed or killed by plastic pollution. The environmental tools of plastics, i.e. cell phones and computers to bicycle helmets and hospital IV bags, plastic has molded society in many ways that make life both easier and safer. Plastic are very long lived products that could potentially have service over decades and yet our main use of these lightweight, inexpensive materials are as single-use items that will go to the garbage dump within a year.

A simple walk on any beach, anywhere, and the plastic waste spectacle is present. All over the world the statistics are ever growing, staggeringly. Tons and tons of plastic debris (which by definition are waste that can vary in size from large containers, fishing nets to microscopic plastic pellets or even particles) is discarded every year, everywhere, polluting lands, rivers, coasts, beaches, and oceans.

Types of plastics

Accumulation of plastic products in the Environment that adversely affects wildlife, wildlife habitat, or humans is a major concern for the governments now. Plastic Pollution occurs in many forms, including but not limited to littering, marine debris (man-made waste that has released in a lake, sea, ocean, or water way), plastic particle water pollution, plastic netting and friendly Floaters. A large percentage of plastic produced each year is used to make single-use, disposable packaging items or products which will get permanently thrown out within one year. Often, consumers of the various types of plastics mainly use them for one purpose and then discard or recycle them.

Chlorinated plastics can release harmful chemicals into the surrounding soil, which can then seep into ground water or other surrounding water sources. This can cause serious harm to the species that drink this water. Nurdles are plastic pellets that are shipper in this form, often in cargo ships, to be used for the creation of plastics products. A significant amount of hurdles are spilled into oceans, and it has been estimated that globally, around 10% of beach litter is nurdles. Plastics in oceans typically polystyrene can leach into waters from some plastics. Polystyrene pieces and nurdles are the most common types of oceanic debris.

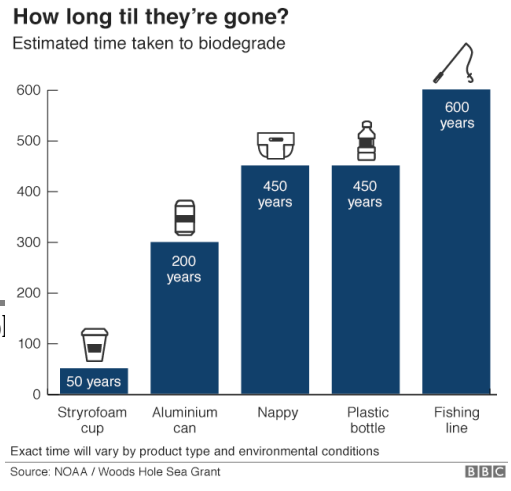
Animals can be significantly harmed or killed by plastic pollution. Plastic pollution has potential to poison animals, which can then affect human food supplies. Plastic pollution has been described as being highly detrimental to large marine mammals Plastics contains many different types of chemicals, depending on the type of plastics. The addition of chemicals is the main reason why these plastics have become so Multipurpose, however this has problems associated with it. Some of the chemicals used in plastic production have the potential to be absorbed by human beings through skin absorption.

Some plastics are designed to degrade quickly, such as Oxo-Degradable and while they may become less noticeable, they are still present in the environment. For example, in ocean environments, plastic fragments are taken in by filter-feeding organisms. When tiny plankton ingest plastic, animals up the food chain can bioaccumulate larger quantities.

So while some plastic may be designed to degrade quickly, it is still present in the environment. Floating plastic waste that can survive thousands of years in water can serve as a transportation device for invasive species that disrupt habitats.

Wrong disposal of plastic

Plastic bags are known to clog drains and thus hit urban sewage systems. Choked drains provide excellent breeding grounds for mosquitoes, besides causing floods during the monsoon. Due to indiscriminate dumping of plastic bags on land, toxic metals such as lead and cadmium pigments leach into underground water. Garbage mixed with plastic bags interferes in waste



processing facilities and causes problems in landfill operations. Since plastic bags do not undergo bacterial decomposition, land filling using plastic bags would mean preserving the poison forever. Buried in landfill sites, plastic takes hundreds of years to degrade.

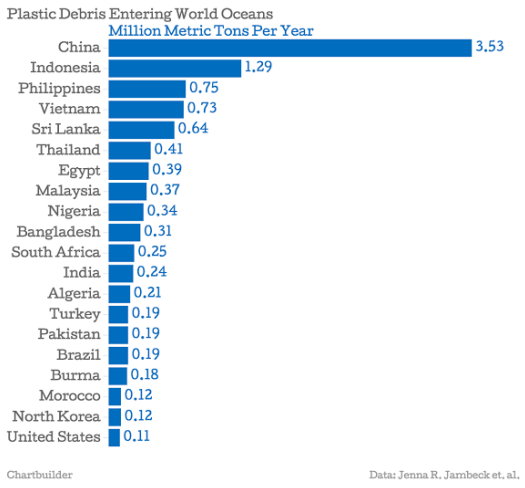
Plastic is meant to last, it is nearly impossible to break down. Burning plastic is incredibly toxic, and can lead to harmful atmospheric conditions and deadly illness. Therefore, if it is in a landfill, it will never stop releasing toxins in that area.

Even recycling doesn't cut down on plastic, as it essentially uses the existing plastic, albeit in a new form. The process of recycling plastic can also lead to plastic irritants being released in a number of ways.

ENVIRONMENTAL POLLUTION ASSOCIATED WITH PLASTIC WASTE

1. Land: Chlorinated plastics can release harmful chemicals into the surrounding soil, which can then seep into groundwater or other surrounding water sources. This can cause serious harm to the species that drink this water. Landfill areas are constantly piled high with many different types of plastics. In these landfills, there are many microorganisms which speed up the biodegradation of plastics. Degradation of plastics leads to the release of methane which is a major contributor greenhouse effect. Some landfills are taking initiative by installing devices to capture the methane and use it for energy, but most have not incorporated such technology. Release of methane does not only occur in landfills, biodegradable plastics also degrade if left on the ground, in which case degradation takes longer to occur.

2. Ocean: Nurdles are plastic pellets (a type of microplastic) that are shipped in this form, often in cargo ships, to be used for the creation of plastic products. A significant amount of nurdles are spilled into oceans, and it has been estimated that globally, around 10% of beach litter is nurdles. Plastics in oceans typically degrade within a year, but not entirely, and in the process toxic chemicals such as bisphenol A and polystyrene can leach into waters from some plastics. Polystyrene pieces and nurdles are the most common types of plastic pollution in oceans, and combined with plastic bags and food containers make up the majority of oceanic debris. In 2012, it was estimated that there was approximately 165 million tons of plastic pollution in the world's oceans.



Plastic pollution has the potential to poison animals, which can then adversely affect human food supplies. Plastic pollution has been described as being highly detrimental to large marine mammals. Some marine species, such as sea turtles, have been found to contain large proportions of plastics in their stomach. When this occurs, the animal typically starves, because the plastic blocks the animal's digestive tract. Marine mammals sometimes become entangled in plastic products such as nets, which can harm or kill them.

3. Air: Air pollution is another issue for humans and animals. When plastic is burned in the open air, it releases large amounts of toxins, which pollutes the air. If the toxins are inhaled for a long period of time, it can lead to respiratory problems.

Plastics contain many different types of chemicals, depending on the type of plastic. The addition of chemicals is the main reason why these plastics have become so multipurpose; however this has problems associated with it. Some of the chemicals used in plastic production have the potential to be absorbed by human beings through skin absorption. A lot is unknown on how severely humans are

physically affected by these chemicals. Some of the chemicals used in plastic production can cause dermatitis upon contact with human skin. In many plastics, these toxic chemicals are only used in trace amounts, but significant testing is often required to ensure that the toxic elements are contained within the plastic by inert material or polymer. Plastic pollution can also affect humans in which it may create an eyesore that interferes with enjoyment of the natural environment.

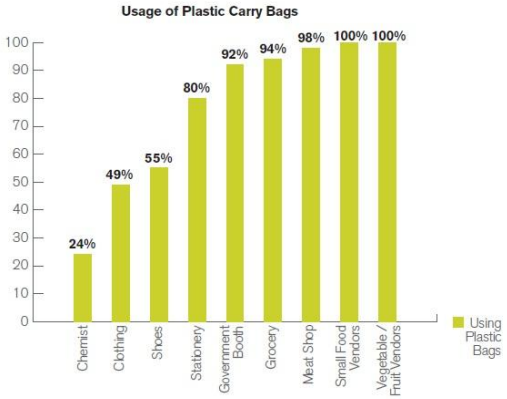
The amount of garbage in the world increases as the population grows, and disposable plastic products, like water bottles and soda cans, accumulate over time. Plastic pollution occurs when enough plastic has gathered in an area that it affects the natural environment and harms plants, animals, or humans.

Plastic has toxic pollutants that damage the environment and cause land, water, and air pollution. It can take hundreds or even thousands of years for plastic to break down, so the damage to the environment is long-lasting.

EXISTING METHODS OF REMEDIATION

Reduce, reuse and recycle

A great way to reduce waste is to use reusable bags when you grocery shop. People often leave stores with dozens of plastic bags that just get thrown away.

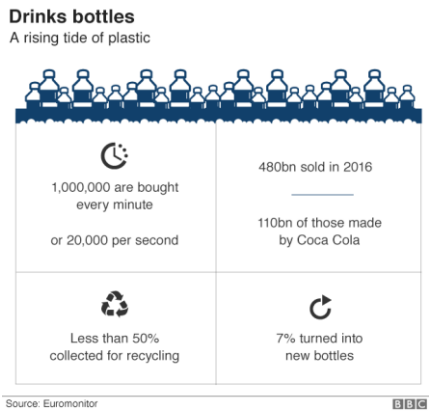


Drinking from a reusable water bottle instead of a disposable one can also be very helpful. If everyone drank the recommended amount of water per day from disposable bottles, it would create an unbelievable amount of plastic waste.

You can also avoid to-go containers like cups from coffee shops and styrofoam containers for leftovers from restaurants. Instead, purchase reusable containers to cut down on waste.

Avoid using plastic straws, even in restaurants. If you like using straws, you can purchase a reusable glass or stainless steel straw. Try to buy household products like laundry detergent in cardboard boxes instead of plastic bottles. If you use plastic lighters frequently, consider investing in a metal refillable lighter instead. Even small changes in your day-to-day life can add up and greatly reduce the amount of plastic waste in the environment.

Bioremediation



Plastic is an incredibly useful material, but it is also made from toxic compounds known to cause illness, and because it is meant for durability, it is not biodegradable.

The following are some of the feasible alternatives: This is an alternative to single-use paper or plastic bags, which can be reused many times for shopping. These come in canvas, woven plastic fibre, hemp, cotton and even leather.

Bio-plastics or organic plastics are a form of plastic derived from renewable organic sources, such as vegetable oil, corn starch and pea starch. The basic characteristic of these plastics is that they are capable of being decomposed by bacteria or other living organisms.

The reality is that the only way this problem can be addressed is by individuals and companies around the world agreeing to implement practices that reduce waste on every level. The top tips for reducing plastic waste are:Plastic bags were once a modern convenience but can be efficiently replaced by

reusable bags, many of which fold up compactly in order to be portable. Just think about how many bags you typically carry out of a grocery store, and multiply that by the number of times you grocery shop. That's a lot of plastic! Carry a bag and always reuse plastic bags as much as possible if you have them.

People are meant to drink lots of water each day, and plastic water bottles have become a great way to stay hydrated throughout the day. However, most of these are only recommended for single use, and that means that every time someone finishes a bottle it goes into the trash. Many companies now sell reusable water bottles as a substitute, reducing plastic waste and exposure to leaking bottles.

You would be surprised at how much plastic is involved in the making and packaging of food containers. Think the coffee shop's drink cup is paper? It's likely lined with plastic for insulation (pour a cup of coffee on some cardboard and see what happens).

Plastic food containers, lids, and utensils are all easily replaced by reusable containers, which will cut down significantly on even a single meal's waste.

Speak to local restaurants and businesses about options that they can switch to for packaging, storing, and bagging items. Many companies are starting to come up with excellent low-cost replacements, such as bamboo utensils in place of plastic ones.

Speak to lawmakers and get involved with government on any level, and you'll see how many special interest groups have made it so that we are dependent on plastic without needing to be. Encourage development of items, and propose alternatives when applicable.

Try and select items that come in non-plastic recycled and recyclable packaging, to do your best to properly handle items that can't be reused. Check everything before you put it in the trash, as more and more items are able to be recycled these days.

Remember that because plastic doesn't break down easily (if ever), recycling plastic means that it is still plastic, just being used for a different purpose. Therefore, you're not actually reducing plastic amounts or exposure, even in the recycling process.

CONCLUSION

Social awareness

Efforts to reduce the use of plastics and to promote plastic recycling have occurred. Some supermarkets charge their customers for plastic bags, and in some places more efficient reusable or biodegradable materials are being used in place of plastics. Some communities and businesses have put a ban on some commonly used plastic items, such as bottled water and plastic bags.

The plastic pollution can adversely affect lands, waterways and oceans. The prominence of plastic pollution is correlated with plastics being inexpensive and durable, which lends to high levels of plastics used by humans. Animals can be significantly harmed or killed by plastic pollution. The environmental tools of plastics, i.e. cell phones and computers to bicycle helmets and hospital IV bags, plastic has molded society in many ways that make life both easier and safer. A large percentage of plastic produced each year is used to make single-use, disposable packaging items or products which will get permanently thrown out within one year. A significant amount of nurdles are spilled into oceans, and it has been estimated that globally, around 10% of beach litter is nurdles. Some of the chemicals used in plastic production have the potential to be absorbed by human beings through skin absorption. Efforts to reduce the use of plastics and to promote plastic recycling have occurred.

Future perspective

Plastic bags are so intrinsic to our everyday lives that it is hard to imagine life without them. However, more eco-friendly alternatives are now available and are being considered. In recent times, the central and state governments have taken measures to cut down the usage of plastic bags. Apart

from government initiatives, many non-governmental organisations (NGOs) are spreading awareness on the impact of plastic bags on the environment. These initiatives have generated the demand for alternatives to plastic bags.

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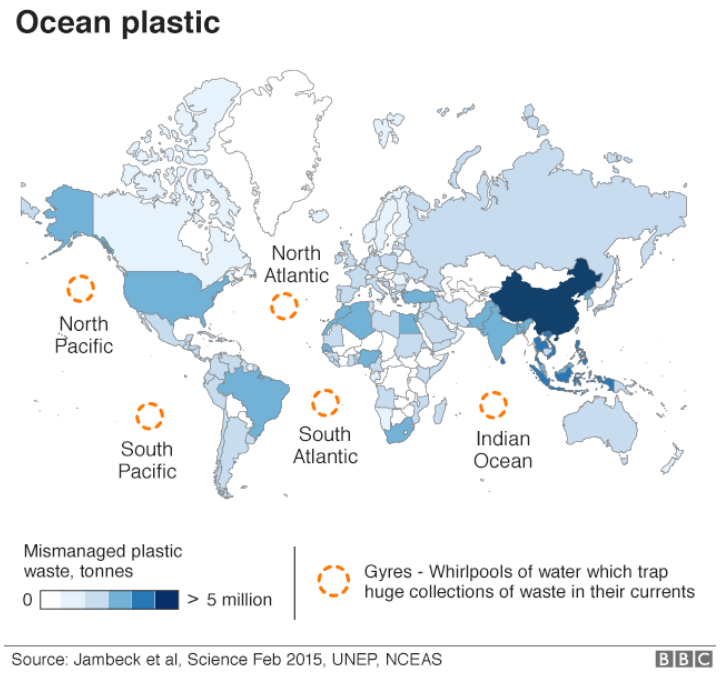
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Avoid plastic, save nature to save earth…..

भारतीय दारिद्र्यव्यवस्थेचे चिकित्सक अध्ययन

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प्रस्तावना :–

भारतीय अर्थव्यवस्था जगातील एक सर्वात मोठी लोकशाही व शेतीवर आधारित अर्थव्यवस्था आहे. 2011 चा जनगणनेनुसार देशाची अर्थव्यवस्था 121.01 कोटी आहे. भारतीय अर्थव्यवस्था वेगाने पुढे जात असली तरीही भारतात वाढणारी लोकसंख्या, भ्रष्टाचार, आर्थिक विषमता, बेकारी अशा अनेक समस्यांबरोबरच दारिद्र्याची एक गंभीर समस्या आजही कायम आहे. भारतीय स्वातंत्र्यांच्या वेळी (इ.स. 1947) भारताची एकुण लोकसंख्या 34 कोटी होती. व त्यापैकी अर्धे आधिक लोक दारिद्र्यरेषेखालील जीवन जगत होते. तेंडुलकर समितीच्या निकषानुसार सन 2009–10 ला 29.8 टक्के व नियोजन आयोगानुसार सन 2011–12 ला 21.9 टक्के तर सी.रंगराजन समितीच्या अहवालानुसार सन 2011–12 मध्ये 29.5 टक्के लोकसंख्या म्हणजेच 36.30 कोटी लोक दारिद्र्यरेषेखाली जीवन जगत होते. म्हणजेच भारतातील प्रति 10 पैकी 3 लोक दारिद्र्यरेषेखालील जीवन जगत आहेत.

भारतात स्वातंत्र्यपूर्व काळापासून दारिद्र्याची समस्या गंभीर असून ब्रिटीशांच्या काळात 80 टक्कांपेक्षा जास्त लोक दारिद्र्यरेषेखाली जीवन जगत होते. दादाभाई नौरोजी यांच्यामते, वसाहत वादाच्या धोरणातून पध्दतशीरपणे भारतातून आर्थिक वाढावा, आर्थिक शोषणाच्या स्वरूपात ब्रिटनमध्ये हस्तांतरीत केला. भारतीय दारिद्र्याची सर्वप्रथम मांडणी दादाभाई नौरोजी यांनी 1876 मध्ये Poverty and Unbritish Rule In India या ग्रंथात चित्र स्पष्ट केले. दादाभाई नौरोजी यांनी ब्रिटीश राजवटीने प्रसिध्द आकडेवाढीच्या आधारे भारतीयांचे दरडोई उत्पन्न 20 रूपये होते तर किमान निकृष्ट जीवनाकरिता त्यावेळेस (1870) 34 रूपये आवश्यक असल्याचे निदर्शनास आणून भारतीयांच्या दारिद्र्याची तीव्रता स्पष्ट केली. ब्रिटीश शासनाने दारिद्र्यरेषेखालील कुटूंबाच्या विकासाकडे लक्ष दिले नव्हते त्यामुळे भारतीय जनतेची अत्यंत दीन, हीन, लाचार अशी अवस्था होती. त्यामुळे दारिद्र्याचे प्रमाण मोठया प्रमाणात होते. आपल्या देशामध्ये दारिद्र्याच्या संकल्पनेसंबंधी विचार विनिमय करण्याची प्रक्रिया पहिल्यांदा लोकहितवादी गोपाळ हरी देशमुख आणि दादाभाई नौरोजी यांनी तर 1936 मध्ये सुभाषचंद्र बोस यांनी किमान जीवन जगता यावे यासाठी अन्न व निवारा या संबंधीचे निकष निश्चित करण्याठी पंडीत जवाहरलाल नेहरू यांच्या अध्यक्षेखाली एक समिती स्थापन केली होती. पुढे स्वतंत्र्य भारतामध्ये दारिद्र्यांच्या व्याप्ती संबंधी लोकसभेत प्रथमतः राम मनोहर लोहिया यांनी आपले विचार मांडले होते. स्वातंत्र्यानंतर डॉ.वि.म.दांडेकर, निळकंठ रथ, डॉ.मिन्हास, पी.के. बारधन, गौरव दत्त, मॉटेकसिंग अहलुवालीया, एल.आर.जैन, सुरेश तेंडुलकर व सी. रंगराजन इत्यादींनी भारतीय दारिद्र्यासंबंधी अभ्यास

व लिखाण केले. मुक्त आणि उदारमतवादी अर्थव्यवस्थेच्या धडाकेबाज अंमलबजावणीनंतर गेल्या पंचवीस वर्षात भारताची वाटचाल जागतिक महासत्तेच्या दिशेने सुरू झाल्याचा पिटला जाणारा डांगोरा, वास्तव आणि खरा नसल्याचे संयुक्त राष्ट्रसंघाच्या अन्न आणि कृषी संख्येच्या अहवालाने स्पष्ट झाले आहे. 2014–15 या वर्षाच्या जगातल्या 179 देशातल्या भूकेल्यांच्या लोकसंख्येबाबतच्या या अहवालात भारतात सर्वाधिक लोक भूकेलेच झोपतात असे नमूद केले आहे. जगात एकूण 80 कोटी लोक भुकेले झोपतात त्यात भारतीयांची संख्या 20 कोटी म्हणजे जगात प्रथम क्रमाकांची आहे. त्या पाठोपाठ चीनमध्ये 13 कोटी लोक भुकेले असले तरी गेल्या पंचवीस वर्षात चीनने भुकेल्यांची संख्या निम्माने कमी करण्यात यश मिळवले आहे. आफ्रिकेतल्या अविकसित भागात राष्ट्रांकडून मदतीसाठी धान्याचा पुरवठा केला जात असला तरी तो पुरेसा नसल्यामुळे जनतेला उपासमारीला सामोरे जाण्याशिवाय पर्याय नसतो. इथेपिया आणि अन्य देशात तर गेल्या काही वर्षात वारंवार पडलेल्या दुष्काळामुळे कोटयावधी लोकांचे बळी गेलेले आहेत. संयुक्त राष्ट्रसंघाने भुकेविरूध्दची लढाई यशस्वी व्हावी यासाठी गेली 50 वर्ष विविध उपाययोजना आणि मोहिमा अंमलात आणल्या असल्या तरी अद्यापही भुकेची जागतिक समस्या संपलेली नाही.

121 कोटी लोकसंख्या असलेल्या भारतामध्ये 20 कोटी लोक उपाशी झाोपतात याचा अर्थ दर सहा माणासांमागे एक माणूस उपाशीच आहे. विकसनशील आणि आर्थिक महासत्तेच्या दिशेने जोमाने वाटचाल करणाऱ्या राष्ट्रातली ही सामाजिक स्थिती अत्यंत लाजिरवाणी आहे. भारतामध्ये दारिद्र्याचे सार्वत्रिक अस्तित्व दिसून येते. ग्रामीण भागापासून तर मुंबई, कोलकत्ता, दिल्ली, चेन्नई सारख्या शहरातील झोपडपट्टांमध्ये दारिद्र्य दिसून येते. दारिद्र्यरेषेखालील जीवन जगणाऱ्या लोकांना साधी घरे, कपडे, आरोग्य, शिक्षण व सामाजिक सुविधा पुरेसा प्रमाणात मिळू शकत नाही. मात्र विभिन्न परिस्थितीत व विभिन्न भौगोलिक क्षेत्रामध्ये दारिद्र्याची तीव्रता व स्वरूपामध्ये विभिन्नता दिसून येते. यामुळे दारिद्र्यावस्था नेमकी कशी निश्चित करावी यासंबंधी तज्ञांमध्ये मतभिन्नता दिसून येते. सर्वसाधारणपणे असे म्हटले जाते की, अन्न, वस्त्र, निवारा या मानवाच्या मुलभूत गरजा आहेत. मुलभूत गरजा पूर्ण करणारे जीवनमान म्हणजे किमान जीवनमान होय व किमान जीवनमानही जगण्याची उपलब्धता नसणे म्हणजे दारिद्र्यावस्था होय.

दारिद्र्याची व्याख्या :–

जागतिक बॅकेच्या मते, दारिद्र्य म्हणजे उपासमार, दारिद्र्य म्हणजे निवारा नसणे, आजारी असणे अणि उपचार घेवू न शकणे व शाळेत जावू न शकणे, बेरोजगार असणे, भविष्याचे भय असणे, शुध्द पाणी प्यायला नसणे, दारिद्र्य म्हणाजे स्वातंत्र्याचा अभाव.

गिलीन आणि गिलीन यांच्या मते, दारिद्र्य ही अशी अवस्था आहे की, ज्यात समाजाला ती व्यक्ती राहते तेथील राहणीमानाचा दर्जा गाठू शकत नाही की, जो त्याची शारिरीक व मानसिक कार्यक्षमता वाढवेल.

वर्ल्ड डेव्हलमेंट रिपोर्ट नुसार दारिद्र्य म्हणजे योग्य पध्दतीने अन्न व निवारा यांचा अभाव ही अशी स्थिती आहे की, त्या व्यक्तीस सुयोग्य पध्दतीने राहणीमान, सुव्यवस्थित राहण्याची घरे, आरोग्य, सुविधा, पिण्याच्या पाण्याची सुविधा मिळत नाही अशी दारिद्र्याची व्याख्या केली.

अमर्त्य सेन यांच्यामते, व्यक्तिने जोपासलेल्या मूल्यांप्रमाणे जगता न येणे म्हणजे दारिद्र्य होय.

दारिद्र्यरेषा :–

समाजातील सर्व घटकांना किमान जीवनोपयोगी वस्तूंचा योग्य पुरवठा व्हावा. अन्न, वस्त्र आणि निवारा यांपासुन कुणीही वंचित राहू नये. यासाठी शासन सर्वेक्षण करून गरीब आणि श्रीमंत असे दोन गट ठरविते. एका ठराविक मर्यादेच्या आत उत्पन्न असणाऱ्या व्यक्तींना अत्यावश्यक सेवा रास्त दरात उपलब्ध व्हाव्यात. या उद्देशाने दारिद्र्याचे मोजमाप केले जाते. दारिद्र्यरेषेखालील नागरिकांना केंद्र आणि राज्य सरकारतर्फे राबविल्या जाणाऱ्या स्वस्त धान्य पुरवल्याचा रोजगार सह विविध शासकीय योजनांचा लाभ दारिद्र्यरेषेखालील कुटूंबांना मिळतो हा लाभ कुणाला मिळावा यासाठी सर्वेक्षण करून लाभार्थी ठरविण्यासाठी दारिद्र्यरेषा ठरविली जाते.

स्वातंत्र्योत्तर काळात 1960 पासून शासनाच्या विविध योजनांचे लाभार्थी ठरवित आणि नागरिकांचे उत्पन्न मोजून त्यांचे दारिद्र्यरेषेखालील तसेच वरील उत्पन्नगट ठरवावे यासाठी अनेक तज्ज्ञ व्यक्ती व समित्यांनी आपले अंदाज व्यक्त केलेले आहे. भारतामध्ये सर्वप्रथम इ.स. 1962 मध्ये धनंजयराव गाडगीळ, बी.एन.गांगुली व व्ही.के.आर.व्ही. राव व इतर तज्ञ कार्यगटाने इ.सन 1960–61 च्या किंमतीवर आधारीत प्रतिव्यक्ती प्रतिमाह ग्रामीण भागाकरिता रू.20 व शहरी भागाकरिता रू. 25 दारिद्र्यरेषा निश्चित केली. डॉ. वि.म.दांडेकर व निळकंठ रथ यांनी Poverty In India (1971) या ग्रंथातून भारतीय दारिद्र्याचा प्रश्न व्यापक व शास्त्रीय पध्दतीने चर्चेला आणला. त्यांच्या अभ्यासानुसार इ.स. 1961–62 च्या किंमतीवर आधारित प्रतिव्यक्ती प्रतिवर्ष खर्च ग्रामीण भागात रू.180 पेक्षा कमी व शहरी भागात 270 पेक्षा कमी उपभोग खर्च असणारे दारिद्र्यरेषेखाली मानले गेले. त्यांनी मांडलेल्या संकल्पनेनुसार प्रतिव्यक्ती प्रतिदिन अन्न पदार्थातून ग्रामीण भागात 240 उष्मांक व शहरी भागात 2100 उष्मांक मिळाले पाहिजेत, जर मिळत नसेल तर त्यांना दारिद्र्यरेषेखाली मानले जाईल. कै. सुरेश तेंडुलकर समितीने इ.स. 2009–10 च्या किंमतीवर आधारित प्रतिव्यक्ती प्रतिमाह ग्रामीण भागाकरिता रू. 672.80 व शहरी भागाकरिता रू. 859.60 इतकी निश्चित केली तर नियोजन आयोगाने (नीती आयोग) जून 2014 ला प्रसिध्द केलेल्या अहवालानुसार सन 2011–12 च्या किंमतीवर आधारीत प्रतिव्यक्ती प्रतिमाह ग्रामीण भागाकरिता रू. 972 व शहरी भागाकरीता रू. 1407 किमान उपभोग खर्च दारिद्र्यरेषा म्हणून निश्चित केली.

आंतरराष्ट्रीय दारिद्र्यरेषाः–

सन 2000 पासून जागतिक बॅकेने आंतरराष्ट्रीय दारिद्र्यरेषा ही संकल्पना उदयास आणली. त्यानुसार प्रतिव्यक्ती प्रतिदिन 1.08 डॉलर्सपेक्षा कमी उपभोग खर्च करणारे आंतरराष्ट्रीय दारिद्र्यरेषेखाली मोडत असल्याचे स्पष्ट केले. सन 2008 ला आंतरराष्ट्रीय दारिद्र्यरेषेची पूर्नरचना केली यानुसार ज्या

व्यक्तीचे उत्पन्न दरदिवशी 1.25 डॉलरपेक्षा कमी आहे. ती व्यक्ती दारिद्र्यरेषेखालील होय. या निकषानुसार भारतात दारिद्र्यरेषेखालील जीवन जगणाऱ्यांची संख्या 1981 मध्ये 59.8 टक्के, 1990 मध्ये 51.3 तर 2005 मध्ये 41.6 टक्के असल्याचे स्पष्ट केले तर सन 2015 च्या पुर्नरचनेनुसार प्रतिव्यक्ती, प्रतिदिन 1.90 डॉलर्स किमान उपभोग खर्च निश्चित केला गेला. या निकषानुसार सन 2012 च्या किंमतीनुसार आधारित जागतिक लोकसंख्येच्या 12.7 टक्के लोक व भारतातील 21.3 टक्के लोक आंतरराष्ट्रीय दारिद्र्यरेषेखालील जीवन जगत असल्याचे दिसून आले.

भारतातील दारिद्र्याचे प्रमाण :–

भारतीय अर्थव्यवस्था वेगाने विकसित होणारी जगातील एकमेव विकसनशील अर्थव्यवस्था म्हणून ओळखली जाते. भारताने जागतिक स्तरावर अनेक क्षेत्रात आपला ठसा उमटवला आहे. भारतीय अर्थव्यवथा लोकसंख्येच्या दृष्टिने जगातील दुसऱ्या क्रमांकांची मोठी अर्थव्यवस्था म्हणून ओळखली जाते. भारताचा आर्थिक विकासदर सुध्दा नोंद करण्यायोग्य आहे. असे असले तरी दारिद्र्य हे भारताच्या अर्थव्यवस्थेसमोरील एक मोठे आव्हान आहे. जगातील एकूण दारिद्र्यरेषेखालील जीवन जगणाऱ्या लोकसंख्येच्या एक तृतीयांश लोकसंख्या भारतातील आहे. भारतात स्वातंत्र्यपूर्व काळापासून दारिद्र्याची समस्या गंभीर असून ब्रिटीशांच्या काळात 80 टक्केपेक्षा जास्त लोक दारिद्र्यरेषेखाली रहात असल्याचे दिसून येते. देशाच्या आर्थिक विकासाबरोबर दारिद्र्याचे प्रमाण कमी होत आहे. हे नाकारून चालणार नाही असे असले तरी दारिद्र्याचे प्रमाण घटविण्यात शासनाला म्हणावे तसे यश मिळू शकले नाही. किमान उपभोग पातळी ज्यांना उपभोगता येत नाही अशा व्यक्ती दारिद्र्यात जीवन जगत असतात.

तक्ता क्र. 1

भारतातील दारिद्र्याचे प्रमाण

वर्ष	दारिद्र्यरेषा (रू.)		गरीबांची संख्या (दशलक्ष)			दारिद्र्याचे प्रमाण (%)		
	ग्रामीण	शहरी	ग्रामीण	शहरी	एकुण	ग्रामीण	शहरी	एकुण
2004–05	446.68	578.80	326.3	80.8	407.1	41.8	25.7	37.2
2011–12	816.00	1000.00	216.5	52.8	269.3	25.7	13.7	21.9

Source : Neeti Aayog Estimated by Tendulkar Method Economic Survey – 2014-15, p.140

तक्ता क्रमांक 1 वरून भारतातील दारिद्र्याच्या प्रमाणाचा बाबतीत विचार करता 2004–05 यावर्षी ग्रामीण व शहरी भागात दरडोई दरमहा 446.68 व 578.80 दारिद्र्यरेषा निश्चित करण्यात आली तर 2011–12 यावर्षी वाढ करून ती अनुक्रमे 816 व 1,000 रूप्ये करण्यात आली. 2004–05 मध्ये गरिबांची संख्या ग्रामीण व शहरी 326.3 दशलक्ष व 80.8 दशलक्ष होती. 2011–12 मध्ये ग्रामीण व शहरी गरीबांची संख्या 216.5 व 52.8 दशलक्ष होती. एकूण गरीबांची संख्या 2004–05 या वर्षात दारिद्र्याचे प्रमाण

ग्रामीण व शहरी 41.8 व 25.7 टक्के आणि एकूण टक्केवारी 37.2 टक्के होती. तर 2011–12 यावर्षी दारिद्र्याचे प्रमाण ग्रामीण व शहरी 25.7 व 13.7 आणि एकूण 21.9 टक्के इतके दिसून येते.

तक्ता क्र. 2

सी. रंगराजन व तेंडूलकर तज्ज्ञ गटाचे दारिद्र्याचे अंदाज

वर्ष	तज्ज्ञगट (सी. रंगराजन समिती)			दारिद्र्यरेषेखालील लोकसंख्या (दशलक्ष)		
	शहरी	ग्रामीण	एकुण	ग्रामीण	शहरी	एकुण
2009–10	35.1	39.6	38.2	325.9	128.7	454.6
2011–12	26.4	30.9	29.5	260.5	102.5	363.0
तज्ज्ञगट तेंडुलकर						
2009–10	20.9	33.8	29.8	278.2	76.5	354.7
2011–12	13.7	25.7	21.9	216.7	53.1	269.8

Source: Report of the expert group to review the Methodolgy for Measurement of poverty government of India, planning commission June 2014, p.69.

वरील तक्तावरून भारतातील दारिद्र्याच्या आकडेवारीचे तुलनात्मक विश्लेषण असे की, तेंडुलकर समितीने 2009–10 या वर्षासाठी ग्रामीण व शहरी भागांत दरडोई 673 व 860 रूपये दारिद्र्यरेषा निश्चित केली तर 2011–12 यावर्षी वाढ करून ती अनुक्रमे 816 व 1000 रूपये केली. यावरून 2011–2012 वर्षी दरडोई दर दिवशी ग्रामीण भागात 27 रूपये तर शहरी भागात 33 रूपये उपभोगावर खर्च न करू शकलेला व्यक्ती गरीब समजण्यात यावेत असे समितीचे मत होते. सी.रंगराजन समितीने 2009–10यावर्षी ग्रामीण व शहरी भागासाठी अनुक्रमे 801 व 1198 रूपये तर 2011–2012 या वर्षासाठी 972 व 1407 रूपये दारिद्र्यरेषा निश्चित केली यावरून दरडोई दरदिवशी न्यूनतम उपभोग खर्च ग्रामीण भागात 32 रूपये तर शहरी भागात 47 रूपये करणे या समितीला अपेक्षित होते. सी.रंगराजन समितीने निर्धारित केलेली दारिद्र्यरेषा तेंडूलकर समितीपेक्षा अधिक व्यापक आहे. तेंडूलकर तज्ज्ञ गटाच्या अंदाजानुसार 2009–10 यावर्षी देशात 35.47 कोटी तर 2011–12 मध्ये 26.98 कोटी लोक दारिद्र्यरेषेखाली जीवन जगत होते. तर सी.रंगराजन यांच्या अंदाजानुसार संबंधित वर्षात दारिद्र्यरेषेखालील लोकसंख्या अनुक्रमे 45.46 कोटी व 36.30 कोटी होती. तेंडूलकर तज्ञ गटानुसार 2009–10या वर्षी दारिद्र्याचे प्रमाण 29.8 टक्के होते. त्यात घट होऊन ते 2011–12 यावर्षी 21.9 टक्के झाले तर सी रंगराजन तज्ज्ञ गटानुसार संबंधित वर्षासाठी हेच प्रमाण अनूक्रमे 38.2 व 29.5 टक्के होते. दोन्ही समित्यांनी काढलेले दारिद्र्याच्या प्रमाणाची तूलना समितीने काढलेल्या दारिद्र्याच्या प्रमाणापेक्षा जास्त आहे. देश पातळीवर एकूण दारिद्र्याचा प्रमाणाचा विचार करता सी.रंगराजन समितीने काढलेले देशपातळीवरील दारिद्र्याचे प्रमाण

तेंडूलकर समितीच्या तुलनेत 2009–10 यावर्षी 8.4 टक्कांनी तर 2011–12 यावर्षी 7.6 टक्के अधिक होते. थोडक्यात भारतासारख्या विकसनशील देशात दारिद्र्य हा एक अनुतरित प्रश्न दिसून येतो. कारण इतिहासाचा मागोवा घेतला तर दारिद्र्यरेषेखालील जीवन जगणाऱ्या निरपेक्ष लोकसंख्येत वाढच झालेली दिसून येते. आपण विकासाच्या एक विशिष्ट टप्पा काढलेला असला तरी त्या प्रमाणात दारिद्र्य कमी झाल्याचे दिसून येत नाही.

2016–17 च्या आर्थिक सर्वेक्षणानुसार, भारताने स्वातंत्र्योत्तर काळात जी प्रगती केली आहे. त्यामुळे दारिद्र्याचे प्रमाण 70 टक्कांवरून 22 टक्कांपर्यंत कमी झाल्याचे दिसून येते.दारिद्र्य निर्मूलनाकरीता केंद्रसरकारने ज्या विविध उपाय योजना केल्या त्यात अन्नसुरक्षा कायदा, सर्वशिक्षा अभियान, मध्यान्ह भोजन योजना, प्रधानमंत्री ग्राम सडक योजना, प्रधान मंत्री आवास योजना, स्वच्छ भारत अभियान यासारख्या कल्याणकारी योजनांमुळे दारिद्र्याचे प्रमाण कमी होण्यास मदत होत आहे.

दारिद्र्य निर्मूलनाकरिता शिफारशी :–

1) दारिद्र्य निर्मूलनाकरिता सरकारने रोजगारांच्या संधी उपलब्ध करून देणे आवश्यक आहे.

2) ग्रामीण भागात सरकारने पुरक व्यवसायास मदत करणे.

3) विकास योजनांचे फायदे दारिद्र्यरेषेखालील कुटूंबांनाच मिळतील याकडे लक्ष देणे.

4) ग्रामीण भागातील अंधश्रध्दा तसेच व्यसनाधिनता याचे उच्चाटन केले पाहिजे.

5) लहान कुटूंबांचे महत्व लोकांना पटवून देणे.

6) शेतीची उत्पादनक्षमता वाढल्यास दारिद्र्याचा प्रश्न सुटू शकतो म्हणून शेतीची उत्पादकता वाढीस प्रोत्साहन देणे.

7) दारिद्र्य निर्मूलनासाठी विकासाच्या योजनांची अंमलबजावणी प्रभावीपणे व योग्यप्रकारे होणे आवश्यक आहे.

निष्कर्ष :–

1) विविध अभ्यासगट आणि समित्यांचे दारिद्र्य निर्धारणाच्या निकषांमध्ये विरोधाभास दिसून येतो.

2) श्रीमंत व गरीब यांच्या उत्पन्नात मोठया प्रमाणात तफावत आहे.

3) आर्थिक विकास वेगाने होत असतांना दारिद्र्यरेषेखालील लोकांची संख्या वाढत आहे.

4) विकासाची फळे समाजातील तुलनेने मागास आणि उपेक्षित समाज घटकांपर्यंत जशी पोहोचायला हवी तशी पोहोचत नाहीत.

5) शिधावाटप दुकानात मोठया प्रमाणावर गैरप्रकार होतांना दिसून येतात.

6) भाववाढीने खरेदीशक्तीत घट होते त्यामुळे दारिद्र्यात वाढ होतांना दिसून येते.

7) आपल्या देशाचा आजवर झालेला विकास विशिष्ट वर्गापुरताच मर्यादित राहिल्याचे दिसून येते.

8) दारिद्र्याचे प्रमाण कमी करण्यासाठी शासनाने विविध योजना सुरू केल्या असल्या तरी त्यातील अमंलबजावणीत अनेक अडथळे दिसून येतात.

9) आर्थिक सुधारणेचे लाभ समाजातील दुर्बल घटकांच्या वास्तविक जीवनमानामध्ये अद्यापही प्रतिबिंबित झालेले दिसून येत नाहीत. ही बाब देशाच्या मानवी तसेच समावेशक विकासावर प्रश्नचिन्ह निर्माण करणारी ठरते.

समारोप :–

भारतामध्ये जवळपास 50 टक्के श्रमशक्ती कृषी व्यवसायात कार्यरत आहे. बहुतांश अल्पविकसित राष्ट्रांमध्ये श्रमशक्ती कृषी व्यावसायाशी निगडीत असून कृषी क्षेत्राची उत्पादक्ता कमी असणे ही बाब व्यवसायिक क्षेत्रातील उत्पन्न वितरणातील विसंगतीला स्पष्ट करते. आंतरराष्ट्रीय श्रमिक संघटनेनुसार, अल्पविकसित राष्ट्रांमध्ये एकूण श्रमशक्तीपैकी 28 टक्के श्रमशक्ती प्रतिदिन 2 डॉलरपेक्षा कमी उत्पन्नपातळीवर जीवन व्यतीत करीत आहे. जागतिक अर्थकारणामध्ये भारतीय अर्थव्यवस्था वेगाने विस्तारीत होत असतांना एकूण जागतिक गरीब लोकसंख्येमध्ये 26 टक्के लोकसंख्येचे संकेद्रण भारतामध्ये असणे ही बाब निश्चितच विकासाच्या प्रक्रियेतील विसंगती स्पष्ट करते. नीती आयोगाचे माजी उपाध्यक्ष अरविंद पनगडिया यांच्या नेतृत्वाखालील कृतीदलाने देशातील गरिबांची मोजणी करण्यासाठी गरिबांची नव्याने व्याख्या करण्यात यावी अशी शिफारस केंद्र सरकारला केली आहे. त्यामुळे देशातील आर्थिक चर्चामध्ये गरिबीचा प्रश्न पुन्हा एकदा केंद्रस्थानी येण्याची शक्यता आहे. सन 1950 मध्ये ठरवलेली गरिबीची व्याख्या जी जगण्यासाठीच्या किमान बाबीवर आधारित आहे की, आता बदलावी लागेल. जो जगू शकत नाही त्याला गरीब म्हणायचं, की ज्यांना किमान सुसंपन्न आयुष्य जगणं शक्य नाही. त्यांचाही त्यात समावेश करायचा, हे ठरवण्याची वेळ आता आली आहे. ज्यांना अन्न, वीज, घर, पिण्याचं पाणी, स्वच्छता, आरोग्यरक्षण, शिक्षण आणि सामाजिक सुरक्षा या जगण्यासाठीच्या किमान आठ गोष्टी मिळत नाहीत त्यांना आपण गरीब म्हणून घोषित करायला हवं.

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ROLE OF ALOE VERA EXTRACT IN DIRTY WATER PURIFICATION AND IN HEAVY METAL REMOVAL

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Abstract
During rainy season it is found that there is lot of contamination in the water which is replicated by change in colour as well as lot of turbidity. The drinking water which is contaminated can be purified successively by using natural resource nothing but Aloe Vera Plant. In this paper, the use of Aloe vera extract to purify dirty drinking water was investigated. Analysis of the heavy metals lead and cobalt were performed before and after treatment of water with the Aloe vera extract. The results showed that Aloe vera extract was capable of absorbing the heavy metals from water samples.

1. Introduction



The botanical name of Aloe vera is A*loe barbadensis* miller. It belongs to Asphodelaceae (Liliaceae) family, and is a shrubby or arborescent, perennial, xerophytic, succulent, pea-green color plant. The aloe plant has long (up to 20 inches long and 5 inches wide), triangular, fleshy leaves that have spikes along the edges. The fresh parenchymal gel from the center of the leaf is clear; this part is sometimes dried to form aloe vera concentrate or diluted with water to create aloe juice products. Unsanitary drinking water is a continuing issue in the world [1]. Contaminated water remains an important problem in certain countries, as it is a cause of waterborne diseases. Although some treatments have been found to eliminate certain contaminants, this experiment focused on purifying water from contaminants. It is vital to have access to clean water to meet the basic necessities, to increase the living standard, and to avoid diseases. Fertilizers are used to increase crop production, but the use of these fertilizers has led to contamination of the drinking water [2]. Common contaminants in the water include arsenic, lead, phosphate, copper, cobalt, iron, chlorine, and nitrate [3, 4]. This study identifies aloe vera gel as a purifying agent of water and to remove cobalt and lead metals from water by adsorption. Lead in water arises from a number of industrial and mining sources and is the most widely distributed of all toxic metals [5]. Lead in water causes serious problems such as anaemia, kidney disease and affects the nervous system [5]. Placental transfer of lead in humans affects babies and young children absorb 4–5 times as much lead as adults [6]. The lead toxicant accumulates in the skeleton and causes adverse health effects and interferes with calcium metabolism and with vitamin D metabolism [7]. However, evidence from studies in humans show adverse neurotoxic effects other than cancer occurring at very low concentrations of lead [6]. Therefore, there is need for the removal of lead from all drinking water. This paper evaluates Aloe vera extract as coagulants and reports an economical and environmentally safe method of water purification. This will show the way to improve the quality of drinking water in the rural areas.

2. Experimental section:-

2.1. Application of Aloe Vera in dirty water treatment

2.1.1. Aims and Objectives:

- Purification of dirty/contaminated water using Aloe vera extract.
- Removal of pollutants nothing but metals such as Cobalt and heavy metals such as lead from contaminated water using aloe vera extract.

2.1.2. Materials:

1. Aloe Vera Extract
2. Dirty/Soiled /contaminated Water
3. Beakers
4. Stirring Rod
5. Standard solutions of lead and cobalt salt solution.
6. Conical flask
7. Burette with stand

2.1.3. Method:

Steps involved

1. Put the Dirty/Soiled /contaminated water in the beakers.
2. Added a suitable varying amount of the Aloe extract to the beaker.
3. Stirred the mixture for about 10 minute and leaved it to settle.
4. After that dirt was settled at the bottom of the beaker, the clean water at the top.
5. Clean water decanted into the second empty beaker.
6. Standardization of lead and cobalt salt solution using volumetric analysis by Vogel.
7. Added standard salt solution in water in the beakers.
8. Added a suitable varying amount of the Aloe extract to the beaker.
9. Stirred the mixture for about 10 minute.
10. After 24 hrs and 48 hrs, water sample was pipette out in conical flask.
11. Metal amount estimation carried out using volumetric analysis by Vogel.

3. Results and Discussion:

3.1. Application of Aloe Vera in dirty water treatment

1. The Aloe extract attract the dirt (soil, dust, leaves & other impurities) and separate them from water and finally it will settle at the bottom of the beaker.

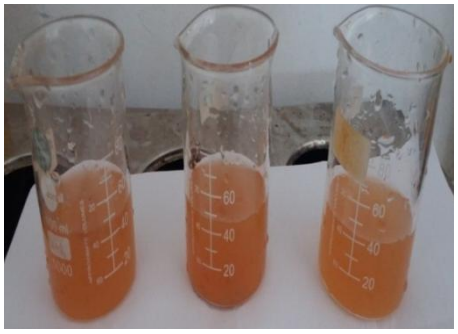


Fig. 1.

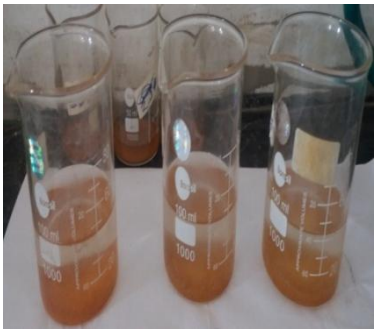


Fig. 2.

Fig.1. Dirty water (rainy season) before addition of aloe vera extract

Fig. 2. After addition of aloe vera extract in dirty water

3.2. Application of Aloe Vera in removal of pollutants

Aloe Vera extract interact with the pollutants and provide surface for adsorption that means it act as an adsorbent. It provides a simpler way to purify contaminated water with natural material.

3. 2.1. (a) Removal of cobalt metal

amount of aloe vera in cm^3	amount of Cobalt in mg		% of cobalt left		% of cobalt loss	
	24 hrs	48 hrs	24 hrs	48 hrs	24 hrs	48 hrs
1	14	13	70	65	30	35
2	12	10	60	50	40	50
3	11	9.4	55	47	45	53
4	10	8.3	50	41.5	50	58.5
5	8.8	6.5	44	32.5	56	67.5
10	2.4	1.2	12	6	88	94

3.2.1. (b) Plot of amount of aloe vera extract against concentration of cobalt

3.2.1. (c) Plot of amount of aloe vera extract against % of Cobalt adsorbed

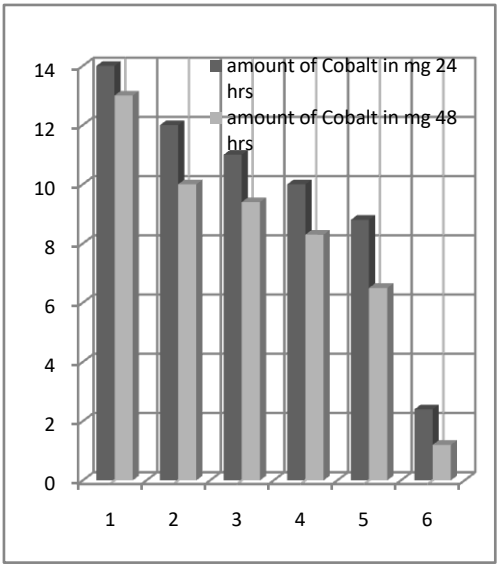


Fig. 3. 3.2.1. (b)

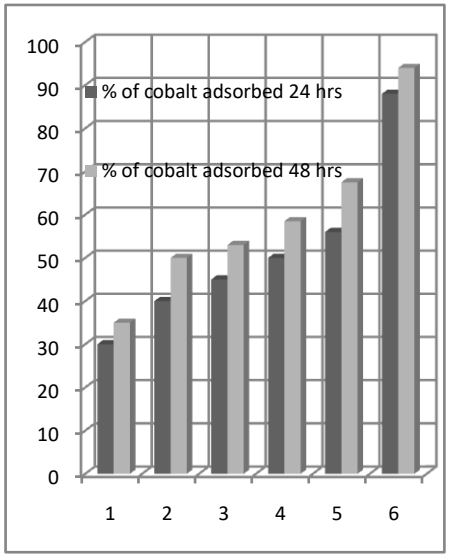


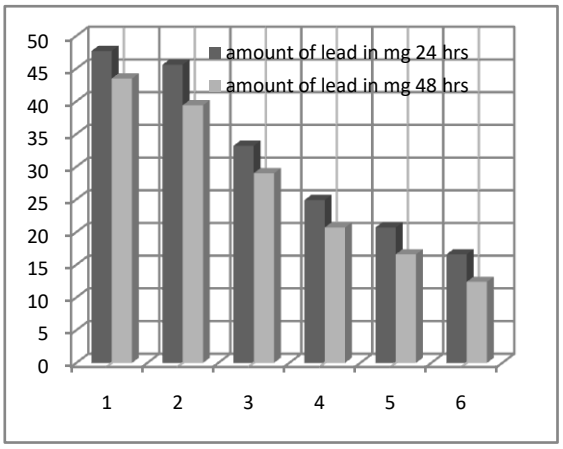
Fig. 4. 3.2.1. (c)

3.2.2. (a) Removal of Lead metal

amount of aloe vera in cm^3	amount of lead in mg		% of lead left		% of lead loss	
	24 hrs	48 hrs	24 hrs	48 hrs	24 hrs	48 hrs
1	47.7	43.5	79.5	72.5	20.5	27.5
2	45.6	39.4	76	65.6	24	34.3
3	33.2	29	55.3	48.3	44.6	51.6
4	24.9	20.7	41.5	34.5	58.5	65.5
5	20.7	16.6	34.5	27.6	65.5	72.3
10	16.6	12.4	27.6	20.6	72.3	79.3

3.2.2. (b) Plot of amount of aloe vera extract against concentration of lead

3.2.2. (c) Plot of amount of aloe vera extract against % of Lead adsorbed



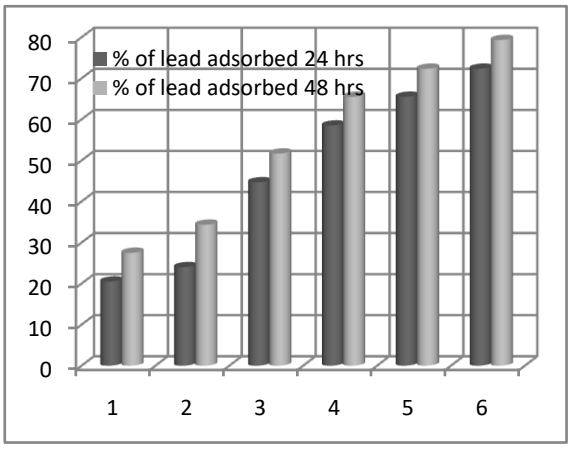


Fig. 5. 3.2.2. (b) **Fig. 6. 3.2.2. (c)**

4. Conclusion

- One can easily treat the dirty/soiled/contaminated water using Aloe Vera.
- Aloe vera is good dirt settling agent.
- Dirt settlement in water is independent of amount of aloe vera extract.
- Aloe vera contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids.
- This method and material is very cheap.
- The benefit of this method of cleaning dirty water is the fact that the Aloe plant grows wells in dry areas where water scarcity is biting.
- One can easily grow Aloe Vera plants in their own land and used it.
- The Aloe Vera gel reduced cobalt and lead concentrations.
- Aloe Vera doesn't consist of a harmful species with respect to human being.
- Aloe Vera has so many uses in medicinal fields also.

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THE EMERGING ROLE OF RRRLF IN PUBLIC LIBRARY DEVELOPMENT: AN MAHARASHTRA PERSPECTIVE

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Abstract
The paper discuss the role of RRRLF in Public library of Maharashtra. The Public Libraries have to play a crucial role in modern society in meeting many of its social needs like information communication, education, recreation and socio-cultural development. Library is a place where the collection of information resources in print or in other forms that is organized and made accessible for reading or study is kept. The purpose of the paper is to discuss about the function, promotion and Achievement of Raja Ram Mohan Rai Library and Public library of Maharashtra.
Keywords: Public Library, RRRLF, DOL, Maharashtra

Introduction :-

Library is the store- house of knowledge for posterior use. Human knowledge can be recorded and preserved in different media. Some years back, documents written or printed in paper were considered as the best medium. But with the development of science and technology today electronic multimedia have been widely used for preservation of knowledge in the libraries of any kind whether it may be public, academic or special library. Since the beginning of civilization human beings have been putting emphasis on storing of information in different ways. However it must be admitted that libraries in ancient times were not like those of the present days. Libraries are dynamic and grow along with human civilization. The urge of social, economic, intellectual and cultural improvement necessitates the development of different kinds of libraries.

Definition of Library :-

International Organization for Standardization has defined library as "irrespective of the title, any organized collection of printed books and periodicals or of any other graphic or audio-visual materials, and the services of a staff to provide and facilitate the use of such materials as are required to meet the informational, research, educational or recreational needs of its users".

Public library :-

"A public library (also called circulating library) is a library which is accessible by the public and is generally funded from public sources (such as tax money) and may be operated by the civil servants. Taxing bodies for public libraries may be at any level from local to national central government level. The public library is an excellent model of government at its best. A locally controlled public good, it serves every individual freely, in as much or as little depth as he or she wants."

Changing role of Public Libraries in Maharashtra:-

- Information and knowledge are commonly recognized as strategic resources in the countries around the world.
- Radical technological, social and economic transformations have provided not only faster access to information and knowledge, but also created new dependencies and complex social practices among people, organizations and even entire nations.
- It is important to create knowledge infrastructure so as to facilitate equitable access to information.
- Citizens should be enabled to know when and what information is needed; where and how to obtain that information.

- Public library is the only institution which provides access to knowledge, information and works of imagination through a range of resources and services without any discrimination.

Public Library In Maharashtra :-

Directorate of the libraries was set up in the state of Maharashtra on 2nd May 1968. Under the directorate upto 31st March 2013 One State Central Library, 6 Divisional Libraries, 35 District Libraries and One Reference Library and 6 Offices of Asstt. Director of Libraries & Head Quarter of Directorate thus 50 offices are established. The Director of Libraries is the Head of the Department and he has been entrusted with certain functions under Superintendence, direction and control of the State Government. He is assisted by the Divisional/Asstt. Directors working at the Divisional Head Quarters. These 6 Asstt. Directors are responsible for supervision, inspection and technical guidance for the recognized public libraries. They have been allotted with the staff viz. Inspectors and Sr. Clerks.

The Director is assisted by one Dy. Director and one Asstt. Director at head office. Dy. Director looks after establishment so also, the work of Book Selection Committee and preparation of bibliographies. He is expected to give technical guidance to the Divisional Libraries. The State Central Library, established at Mumbai and the Divisional Libraries established at Pune and Nagpur, are under the control of Class I Officers.

Functions of DOL :-

Directorate of Libraries comes under administrative control of Higher and Technical Education Department, Govt. of Maharashtra. As per provisions in The Maharashtra Public Libraries, Act 1967.

Sr. No.	**Office**				**Nos.**
A	**Head Quarter of Directorate**				1
1	State Central Library				1
2	Govt. Divisional Libraries				6
3	Dr. Babasheb Ambedkar Memorial Reference Library				1
4	Govt. District Libraries				35
5	Assistant Director Offices				6
	Total Offices				**50**
B	**Public Libraries (As on 31.03.2013)**				
	Grade	District	Taluka	Other	
1	A	35	133	164	332
2	B	-	114	2032	2146
3	C	-	29	4195	4224
4	D	-	-	5955	5955
	Total	**35**	**276**	**12346**	**12657**
C	**Grampanchayat Libraries**				**201**
	Total Libraries				**12858**
D	**Research Institutions**				**35**

The following functions are carried out by Directorate of Libraries for the development of Public Libraries movement in the State.

1) To recognize The Public Library and provide Ad-hoc and Maintenance grants.
2) To prepare schemes for the development of Public library movement.

3) To create network of libraries and library services from state central library to divisional, district, Taluka and village level.
4) To prepare and publish a classified Index of Books published in Marathi language every year.
5) Preserving and promoting collection of rare books and manuscripts.
6) Encourage the development of government and public Libraries.
7) Properly using Funds of The State Public Library grant.
8) Providing financial assistance received under the Scheme of Raja Ram Mohan Roy Library Foundation for Public Libraries.
9) The State Government may recommend names of members to the Library Council.
10) Organizing of The State Library Council
11) To guide Workers for establishment of Public Library
12) To develop reading culture and Library movement in society State

Government gives following Awards annually-

- Dr. Babasaheb Ambedkar Excellent urban-rural Library each category of award
- Dr. S.. R.. Ranganathan Granthamitra Excellent field worker and worker award

Raja Ram Mohan Roy Library Foundation:-

In 1972 was a significant year in the history of the library movement in India. Silver Jubilee celebration of the independence of his country from British administration in 1972. Sudden he's reading habits among the masses to emphasize that an international year of the proclamation of the book promotion "all books". Not only that, it was a good occasion of the Bicentennial of the birth anniversary of Indian social reformer, who stressed the need for the development of modern education in the nation. This year in August the king Ram Mohan Roy Library (RRRLF) was in May 1972 (; 1997; 1 RRRLF) . The public library service and support system and is the nodal agency of the Government of India to promote the country's public library movement. King Ram Mohan Roy Library Foundation is sponsored by the Department of Culture to establish an autonomous institution and the Government of India. But the West Bengal Societies Registration Act, 1961, is registered under. Has its headquarters in Kolkata. Northern Regional Office at New Delhi; In view of the large programs, the Foundation has opened regional offices Foundation under grant presented by the impact of the implementation of the monitoring Assistant East Regional Office and regional authorities, such as the Southern Regional Office at Calcutta , Mumbai, Chennai and Western regional office.

Main Objectives of RRRLF:-

- to enunciate a national library policy and to help build up a national library system;
- to provide financial and technical assistance to libraries;
- to provide financial assistance to organizations, regional or national engaged in the promotion of library development;
- to promote research on library development;
- to advise the Government on all matters pertaining to the library development in the country;
- to propagate the adoption of library legislation in the country.
- Monitoring and developing public library services in the country.

Functional Procedure of RRRLF :-

For effective implementation of the Matching and Non-Matching Schemes and also to draw development Plans a State Library Committee (SLC) is constituted in each State.SLC Draws the annual implementation plan for library services keeping in view the Budget allocated by the State Government, requirements and thrust area. RRRLF collaborates with Directorate of Library Services in each State. to develop the Public System & Services through implementation of the schemes.

- RRRLF has adopted certain schemes of Matching and Non-Matching assistance.

- State/U.T. has to participate in the Matching programmes of the RRRLF by contributing matching share on a pre-determined basis.
- 50:50, for the states having developed library system
- 60:40 (40% is the state share and 60% is the central share) for the states having moderately developed Library System
- 90:10 for north eastern states (90% is the central share and 10 % is the state share).

Financial Assistance under Matching schemes are provided out of the total fund created with the State Contribution and the corresponding Central Share.

In case of Non-Matching schemes assistances are provided from the Central Government Plan fund only.

Achievements of RRRLF :-

RRRLF has assisted more than 34000 public libraries in India.

- State Central Libraries, District Libraries, Divisional Libraries, Sub-divisional/Taluka/Tehsil/Town and Rural Libraries,
- Nehru Yuva Kendras/Jawahar Bal Bhavan
- Libraries run by voluntary organizations (NGOs),
- Libraries run by Rural Extension Centres of Visva-Bharati, Shantiniketan, Various professional Ogrnanisations and Library Science Departments of Universities.
- Books to about 16,500 libraries,
- Furniture and Equipment to about 5000 libraries,
- About 125 libraries for construction or renovation of library building,
- About 500 libraries for modernization,
- About 160 Training programme, seminars are organized with the assistance of RRRLF,
- About 60 Children corners are established,
- About 10 libraries are provided assistance for creation of facilities for specially abled groups,

Promotional Activities :-

- Preparation of National Policy on Library and Information System.
- Guidelines on Public Library System & Services and Model Public Library Act.
- Report on Loss of Books in Library for the Government of India.
- Raja Rammohun Roy Memorial Lecture by a scholar of eminence.
- RRRLF interacts with national and international professional associations like IFLA, ILA, IASLIC and different state level library associations.
- RRRLF had also started conferring awards in the following fields :
- Award to best State Central Library and Award to best District Libraries (two district libraries in each of the five zones),
- Best article award.
- RRRLF confers the prestigious RRRLF fellowship to selected eminent professionals to honor their outstanding contribution in the field of public library services.
- RRRLF has assisted in Digitization of rare documents of Rabindra Bhavan, Visva-Bharati.

Conclusion :-

- The Foundation has been able to achieve its objective of encouraging the functioning of libraries outside the metropolitan areas with optimum utilisation of the limited resources made available by the Central and State Governments.
- Considerable more work, constantly expanding, has to be done so that all who want access to reading resources can make use of a library services.
- The nature of the tasks ahead is such that greater involvement of state governments and voluntary agencies is inevitable.

- To play their role more efficiently most of the state governments have already taken steps to, and we hope that other states will establish functional state library directorates and state library committees.
- Their endeavor will be to make most effective use of public funds for propagating the vision of "***Knowledge for all at their doorsteps***".

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MAHARASHTRA, INDIA

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Abstract
Access to safe drinking water is key to sustainable development and essential to food production, quality health and poverty reduction. Safe drinking water is essential to life and a satisfactory safe supply must be made available to consumers. Water is thus becoming a crucial factor for development and the quality of life in many countries. Water is vital for living processes. Animals and plants need it for survival. Villages and towns can only be constructed if there is enough water for their use. This paper deals with an acute awareness among the people about the quality of drinking water by taking water samples from different sources for analysis. The experiment analyses its various Physico-chemical and biological parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity were analyzed in the month of December 2017. The results are compared with standards of WHO. From the obtained result it can be predicted that the parameters which were taken to study the water quality are below the pollution level for water which satisfies the requirement for the use of various purposes like domestic, agricultural etc.

Keywords: *Drinking water resources, water quality standard, Physico-chemical Parameter.*

INTRODUCTION:

Almost 70% of the water in India has become polluted due to the discharge of domestic sewage and industrial effluents into natural water source, such as rivers, streams as well as lakes [1]. About 95% of rural population living in India depends on ground water for domestic use [2]. According to WHO estimate about 80% of water pollution in developing country, like India is carried by domestic waste. The improper management of water systems may cause serious problems in availability and quality of water [3]. In our country 70% of the water is seriously polluted and 75% of illness and 80% of the child mortality is attributed to water pollution [4]. The healthy nature of underground water has also altered [5].

Water is thus becoming a crucial factor for development and the quality of life in many countries. In individual arid areas it has even become a survival factor [6]. Therefore, water intended for human consumption must not contain pathogen germs or harmful chemicals; because water contaminated with microorganisms is the cause of epidemics [7]. That is good drinking water is not a luxury but one of the most essential requirements of life itself [8].

Pratiksha Tambekar, pravin P. Morey, R.J. Batra and R.G. Weiginnwar [9] have studied physico-chemical parameter evaluation of water quality around Chandrapur (Maharashtra). Vijaya Kumar K.M. and Vijaya Kumara [10] has studied physico-chemical analysis water quality of Kundapurs Mangrove forest (Karnataka). J.G. Koliyar and N.S. Rokade [11] have studied in order to understand the water quality in pond lake, Mumbai. Prabhakar R. Pawar and Balasaheb G. Kulkarni [12] have studied assessment of water quality in the karanja creek (Raigad). Budharatna Bhavare, Miguel A. Rodriguez, Anil Kurthe [13] has studied different physic chemical parameter and nutrients

in water of Bhatye estuary, Ratnagiri central, West coast of India. Francis Andrade, H.B. Arvinda, and E.T. Puttaiah [14] have studied Manglore coastal water pollution by analysis of physical, chemical parameter.

According to Census 2011 information the location code or village code of Usroli village is 554241. Usroli village is located in Murud Tehsil of Raigarh district in Maharashtra, India. It is situated 10km away from sub-district headquarter Murud and 42km away from district headquarter Alibag. As per 2009 stats, Usroli village is also a gram panchayat.

The total geographical area of village is 653.11 hectares. Usroli has a total population of 1,099 peoples. There are about 239 houses in Usroli village. Murud is nearest town to Usroli which is approximately 10km away.The water sample such as Pipe water, bore well water and well water was collected early in the morning between 8.00 am to 10.00 am and was analyzed to compare the differences occurred in Physico-chemical parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Ca-hardness, Magnesium hardness and Salinity.

The research work is carried out, keeping in mind the following objectives.

- To study the chemical composition and water quality parameters of different sources.
- To investigate the possible sources and Cause of pollution in the water if any.
- To study if these effects can be attributed to the change in the chemical composition of the different water sources.

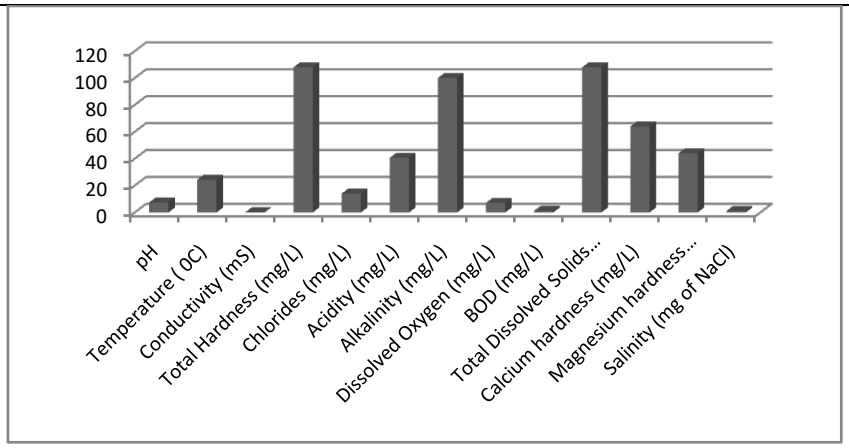
MATERIAL & METHOD:-

Sample of water was collected in sterile plastic bottle of 2 litre capacity from the dam. At the same time the temperature & pH were noted. The physico-chemical analysis was carried out within 24 hours of collection in a laboratory as per APHA (1989), (1992), AWWA & WPFA, Trivedy & Goel (1986) [15-16]. The chemicals were used of A. R. grade and are standardized as per Inorganic quantitative analysis by Vogel (1964) & (2006) [17-18]. The result is statistically analyzed by calculating mean & standard deviation.

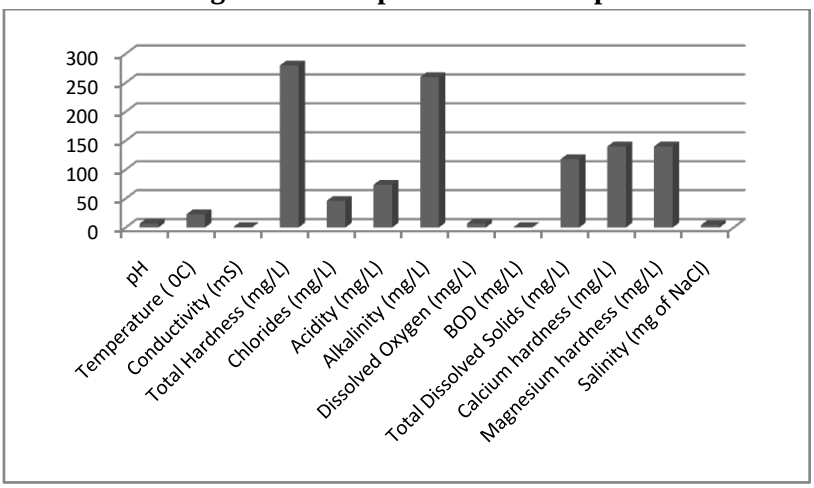
RESULTS & DISCUSSION:-

Parameters	**Tap water Mean+S.D**	**Bore well water Mean+S.D**	**Well water Mean+S.D**
pH	7.43 + 0.02	6.76 + 0.02	6.79 + 0.02
Temperature (^{0}C)	24.3 + 0.3	22.8 + 0.3	24.7 + 0.3
Conductivity (mS)	0.181 + 0.002	0.785 + 0.002	0.294 + 0.002
Total Hardness (mg/L)	108 + 1.0	280 + 1.0	172 + 1.0
Chlorides (mg/L)	14.05 + 0.18	46.15 + 0.18	27.13 + 0.18
Acidity (mg/L)	40.6 + 0.3	73.9 + 0.3	46.3 + 0.3
Alkalinity (mg/L)	100 + 0.3	260 + 0.3	148 + 0.3
Dissolved Oxygen (mg/L)	7.126 + 0.015	6.896 + 0.015	7.266 + 0.015
BOD (mg/L)	1.231 + 0.03	0.993 + 0.03	1.127 + 0.03
Total Dissolved Solids (mg/L)	108 + 1.0	118 + 1.0	235 + 1.0
Calcium hardness (mg/L)	64 + 0.3	140 + 0.3	84 + 0.3
Magnesium hardness (mg/L)	44 + 0.3	140 + 0.3	88 + 0.3
Salinity (mg of NaCl)	1.172 + 0.003	4.102 + 0.003	1.172 + 0.003

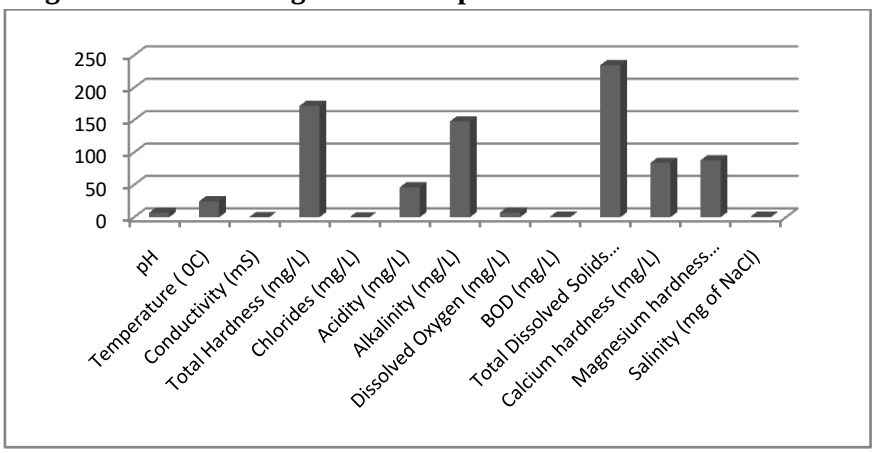
Table-1:- Values of different parameters of water sample of different drinking sources in Majgaon village area. (Mean and Standard deviation is calculated)



a. Graph showing concentration range of various parameters of Tap water.



b. Graph showing concentration range of various parameters of bore well water.



c. Graph showing concentration range of various parameters of well water.

1. Temperature:

Temperature is the most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimize temperature change. The Water temperature depends on the depth of the water column, climatic and topographic changes [19].

A rise in temperature of water leads to the speeding up of chemical reactions in water, reduces the solubility of gases and amplifies the tastes and odour. At higher temperature with less dissolved gases the water becomes tasteless and even does not quench the thirst and decreases the solubility of oxygen.

Temperature also determines various other factors such as pH, Conductivity, saturation level of gases and various forms of alkalinity. The temperature of Tap water is 24.3+0.3 ^{0}C, bore well water temperature is 22.8+0.3 ^{0}C and temperature of well water is found to be 24.7+0.3 ^{0}C.

2. pH:

pH, one of the most common analyses in soil and water testing, is the standard measure of how acidic or alkaline a solution is. pH has no direct adverse effect on health. pH governs the distribution, transport and fate of heavy metals in aquatic ecosystem. It is measured a scale from 0 - 14. pH of 7 is neutral, pH is less than 7 is acidic and pH greater than 7 is basic. Aquatic organisms need the pH of their water body to be a certain range optimal growth and survival.

The pH of Tap water is 7.43 + 0.02, bore well water pH is 6.76 + 0.02 and pH of well water is found to be 6.79 + 0.02. Amongst these three samples, Tap water is comparatively alkaline in nature whereas bore well water and well water is comparatively acidic in nature.

3. Electrical Conductance:

Conductivity is the measure of a substance or solution to conduct electric current. Presence of salts and contamination with wastewater increases conductivity of water. It is a indication of pollution. Electrical conductivity used to quickly estimate the ionic or soluble salt concentration in soils, water supplies, fertilizer solution and chemical solution. It is highly depended upon temperature.

Conductivity however is an important criterion in determining the suitability of water for irrigation. The conductance of Tap water is 0.181 + 0.002 mS, bore well water conductance is 0.785 + 0.002 mS and conductance of well water is found to be 0.294 + 0.002 mS. Amongst these three samples, bore well water is comparatively high electrical conductance. The observed values of electrical conductance for others are quite low and less electrolyte.

4. Total Hardness:

Total hardness is defined as the sum of calcium and magnesium hardness in mg/L as $CaCO_3$.Total hardness of water an important factor that indicates toxic effect and poisonous elements [20].

There is no adverse effect of hardness on health. Hard water is also not suitable for domestic and irrigation purposes. Total hardness of Tap water is 108 +1.0 mg/L, bore well water is 280 +1.0 mg/L and the well water is 172 +1.0 mg/L.

The degree of hardness of drinking water has been classified in terms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/L, Medium - 60-120 mg/L, Hard - 120-180 mg/L, Very hard - >180 mg/L. The observed values were quiet less than the acceptable limit of 300 mg/L for tap water sample and it is medium water. But for bore well water and well water sample, total hardness values are near about less than 300 mg/L. It shows that water is hard to very hard.

5. Chlorides:

Chloride is mainly obtained from the dissolution of salts of hydrochloric acid as table salt (NaCl), NaCO2 and added through industrial waste, sewage, sea water etc. Surface water bodies often have low concentration of chlorides as compare to ground water. It has key importance for metabolism activity in human body and other main physiological processes. High chloride concentration damage metallic pipes and structure as well as harms growing plants. According to WHO standards concentration of chloride should not exceed 250 mg/L.

The chloride content of the tap water sample is 14.05 +0.02 mg/L, bore well water is 46.15+0.18 mg/L and Chlorides in well water sample is 27.13 +0.05 mg/L.

6. Acidity:

Acidity of water is its capacity to neutralize a strong base and is mostly due to the presence of strong mineral acids, weak acids and the salt of strong acids and weak bases. Addition of wastewater

having acidity producing substances increases the acidity of water. The observed acidity of tap water sample is 40.6+ 0.015 mg/L of $CaCO_3$, bore well water sample is 73.9 + 0.3 mg/L. of $CaCO_3$. While acidity of well water samples is 43.3+ 0.3 mg/L of $CaCO_3$. The value is much less than threshold value i. e. 200 mg/L of $CaCO_3$. This indicates that sample of water are in safe range.

7. Alkalinity:

Alkalinity is a chemical measurement of water's ability to neutralize acid. Alkalinity is also a measure of water buffering capacity or its ability to resist changes in pH upon the addition of acids or bases. Alkalinity of natural water is due to primarily to the presence of weak acid salts, although strong bases may also contribute (i.e. OH^-) in the extreme environment. Bicarbonate represents the major form of alkalinity in natural water, so its source being the partitioning of CO2 from the atmosphere and the weathering of carbonate minerals in rocks and soil. Other salts of weak acids, such as borate, silicates, ammonia, phosphate, and organic bases from natural organic matter may be present in small amounts.

The observed alkalinity of tap water sample is 100 +0.3 mg/L of $CaCO_3$, bore well water sample is 260 + 0.3 mg/L. of $CaCO_3$ while alkalinity of well water sample is 148 + 0.3 mg/L of $CaCO_3$. The observed values of alkalinity of tap water and well water are within permissible range i. e. below 200 mg/L of $CaCO_3$. The bore well water is not in safe range i.e. higher than permissible range of 200 mg/L of $CaCO_3$.

8. Dissolved Oxygen:

The amount of oxygen dissolved in water, such as a lake, river or stream. Dissolved oxygen is the most important indicator of the health of water bodies and its capacity to support a balanced aquatic ecosystem of plants and animals. Warm water released from industrial outlets, flowages or storm sewers can also reduce dissolved oxygen levels. Dissolved oxygen may play a large role in the survival of aquatic life in temperature lakes and reservoirs during summer months. Dissolved oxygen of tap water sample collected is 7.126 + 0.015mg/L, bore well water sample is 6.896 + 0.015mg/L, whereas well water sample is 7.226 + 0.015mg/L . It may be due to high temperature and inorganic reluctance such as hydrogen sulfide, ammonia, nitrites, ferrous ions and other oxidizable substances also tend to decrease dissolved oxygen in water.

9. Biochemical Oxygen Demand (BOD):

Biochemical oxygen measures the amount of oxygen that microorganisms consume while decomposing organic matter, it also measures the chemical oxidation of inorganic matter. BOD is a measure of organic material contamination in water, specified in mg/L. BOD is the amount of dissolved oxygen required for the biochemical decomposition of organic compounds and the oxidation of certain inorganic materials (e.g., iron, sulphites).

The observed value of BOD for tap water is 1.231 + 0.03 mg/L, for bore well water is 0.993 + 0.03 mg/L and for well water sample is 1.127 + 0.03 mg/L which is within the permissible range i. e. 0.75-1.5 mg/L.

10. Total Dissolved Solids (TDS):

Total dissolved solids are the total amount of mobile charged ions, including minerals, salts or metal dissolved in a given volume of water in mg/L. TDS is directly related to the purity of water and the quality of water purification system and affects everything that consumes, lives in, or uses water, whether organic or inorganic, whether for better or for worse. Common inorganic salts that can be found in water include calcium, magnesium, potassium and sodium, which are cations and carbonates, nitrates, bicarbonates, chlorides and sulphates which are anions. They give a particular taste to water at higher concentration and also reduce its palatability.

The total solid present in tap water sample collected is 108 + 1.0 mg/L, for bore well water is 118 + 1.0 mg/L, while that of for well water sample is 235 + 1.0 mg/L which is lower than threshold value of total solid content i.e. 500 mg/L.

11. Calcium hardness:

Calcium is naturally present in water. Calcium is a determinant of water hardness, because it can be found in water as Ca^{2+} ions. As per Indian Standards the calcium content of water should not be more than 75 mg/L. This has been specified in the IS 10500:- Drinking Water –Specifications.

In the study the calcium content in water sample has been found to be for tap water sample is 64 + 0.3 mg/L, for bore well water is 140 + 0.3 mg/L and for well water is 84+0.3 mg/L. Tap water possess values calcium hardness which is within the limit as per Specification. The observed values for bore well and well water samples are higher than permissible range of concentration of calcium.

12. Magnesium hardness:

Magnesium is naturally present in water. Magnesium is a determinant of water hardness, because it can be found in water as Mg^{2+} ions. As per ISI the magnesium content of water should not be more than 50 mg/L.

In the study the magnesium content in water sample has been found to be for tap water sample is 44 + 0.3 mg/L, for bore well water is 140 + 0.3 mg/L and for well water is 83 + 0.3 mg/L. Tap water possess value of magnesium hardness which is within the limit as per Specification. The observed values for bore well water and well water shows higher concentration of magnesium.

13. Salinity:-

Salinity which is defined as the total concentration of electrically charged ions in the water. These ions are the four major cations-calcium, magnesium, potassium and sodium, and the four common anions carbonates (CO_3), sulphates (SO_4), chlorides (Cl) and bicarbonates (HCO). Other components of salinity are charged nitrogenous compounds such as nitrates (NO_3), ammonium ions (NH_4) and phosphates (PO_4) **[**21]. In general the salinity of surface waters depends on the drainage area, the nature of its rock, precipitation, human activity in the area and its proximity to marine water [22]. Waters with salinity below 1% are fresh and waters with salinity higher than 1% are brackish/marine [23].

The observed value of salinity for tap water sample is 1.172 + 0.003 mg of NaCl, for bore well water sample is 2.162 + 0.003 mg of NaCl and for well water sample is 2.182 + 0.003 mg of NaCl .

CONCLUSION:

The present paper deals with analysis of water quality in different drinking water resources available in Majgaon village region which was carried out by taking certain important parameters like Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity. The data of physico-chemical and biological parameters clearly shows that the drinking water of Majgaon village region is within the permissible range as per APHA (1989), (1992), Trivedi and Goel (1986) except few limitations in one or two parameters. Such water is suitable for drinking purpose and can be used for domestic as well as irrigation purpose.

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STUDY OF CORRELATION BETWEEN BODY MASS INDEX (BMI) AND BLOOD PRESSURE IN ADOLESCENTS

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Abstract
Body mass index and blood pressure are the great tools of diagnosis of physical fitness in human individuals. Body mass index is the reflection of weight and height proportion while blood pressure reflects the status of cardiac activity. During present investigation, Body mass index and Blood pressure of some selected students were assessed. Results revealed the correlation of body mass index and blood pressure. Maximum percentage of students has shown normal body mass index and blood pressure within the desirable range. Results are discussed with recent literature.
Keywords*: Body Mass Index, Blood Pressure, Correlation*

INTRODUCTION

The very functionality of human physiology relies predominantly on proper functioning of body systems. The United States Department of Health and Human Services (USDHHS) has defined physical fitness as "a set of attributes that people have or achieve that relates to the ability to perform physical activity" (WHO, 2014). Anthropometry is non invasive method of scientific study regarding physical fitness and measurements and proportion of body stating the health status. In the late 50s another approach of anthropometry was initiated which included studies on interrelationship between body weight and cardiovascular diseases. Adolphe Quetelet (1796-1874) have formulated the index indicating ratio of weight in kilograms and square of height in meter. This was called Quetelet Index. Later Ancel Keys termed Quetelet index as Body Mass Index (Eknoyan, 2007).

Body mass index (BMI) is one of the best anthropometric measurements used to determine when extra kilograms in body weight as related to the height of that individual translates into health risks (Ani *et al.*,2014). Reliability of BMI in the assessment of health is depicted by the fact that, BMI presents quantitative base to categorize human individuals into underweight, normal, overweight and obese individuals. Overweight is the condition represented by increased body weight in relation to the height, whereas obesity is the condition of deposition of body fats or adipose tissue in relation to lean body mass. In recent years obesity has been proved to be the alarmingly increasing health problem in all ages all over the world (Klien *et al*., 2002).

As a part of normal physiology, so as to ensure the transport of substances, heart imparts specific pressure on blood which can be felt in arteries and expressed in terms of millimeters of mercury. Measurements of blood pressure is the significant diagnostic tool for the assessment of hypertension and various other cardiovascular diseases. In recent years hypertension has been proved to be a cause of concern in relation to public health and more importantly it is reported that in most cases hypertension has its origin in childhood and adolescents which is believed to track in adulthood (Young *et al*., 1993). Considering the importance of anthropometric studies various workers have carried out significant studies on this issue, some of the notable workers include Alexander *et al.* (1962), Lowder and Brown (1975), Goldstein (1992), Kapil *et al.* (2002), Park (2005), Tandon (2006) , Anil Kumar *et al.* (2008), Nanaware *et al.* (2011), Ani *et al.*(2014) and Kaur (2016). Despite of extensive work in this field of research there is still a lacuna in concern with data collection and assessment. Taking this into consideration we have attempted to assess the BMI and blood pressure of some selected students of belonging to age group 18 to 21 years.

Materials and Methods

During Present investigation a sample of convenience comprising 100 students (50 male and 50 female) from B.Sc. II class of K.B.P. Mahavidyalaya, Pandharpur were selected for observations.

Body mass index of the students under observation was assessed by the standard method prescribed by Bell *et al*. (2012). Observations of weight of students were carried out by properly calibrated high quality manual weighing balance. The subjects were made to stand on the scale taking off their shoes in standing upright position for making observations of weight. Standing height of each subject was taken with the subject standing erect against the height measurement meter rule placed against the wall.

The BMI was calculated by using following formula

$$\text{BMI} = \frac{\text{Body Weight in Kg}}{\text{Height(Meter)}^2}$$

Depending upon the readings obtained regarding the BMI, subjects were categorized into underweight, normal range, overweight and obese individuals by using the BMI chart provided by WHO.

Range	Below 18.5	18.5-25	25-30	Above 30
Type	Underweight	Normal	Overweight	Obese

Blood pressure was measured using Citizen Micro HumanTech digital blood pressure monitor (Model) CH-432, Citizen Systems, Japan Co., Ltd. Japan. Readings were taken after the subjects had sat down and rested for 10 minutes. Correlation between systolic blood pressure and BMI is statistically analyzed by using scatter diagram method. The scatter diagram was plotted by using graphics based on 2007 version of Microsoft Excel.

Results and Discussion

During present investigation Height, Weight, BMI and Blood pressure of the some selected students were recorded by using standard prescribed methods. Results of the investigation are shown in table and correlation between systolic blood pressure and BMI and diastolic blood pressure and BMI is shown in graph 1 and 2 respectively.

During present investigation minimum BMI recorded was 16.01 while maximum BMI recorded was 29.58. While maximum systolic blood pressure recorded was 136 mmHg while minimum systolic blood pressure recorded was 117 mmHg. While maximum diastolic blood pressure was 89 mmHg while minimum diastolic blood pressure was 78 mmHg.

Upon analysis of trend of BMI in male and female it was observed that 7 male students were underweight, 30 male students were having normal BMI while 13 male students were overweight. On the other hand 14 female students were underweight, 32 female students were having normal BMI and 4 female students were overweight.

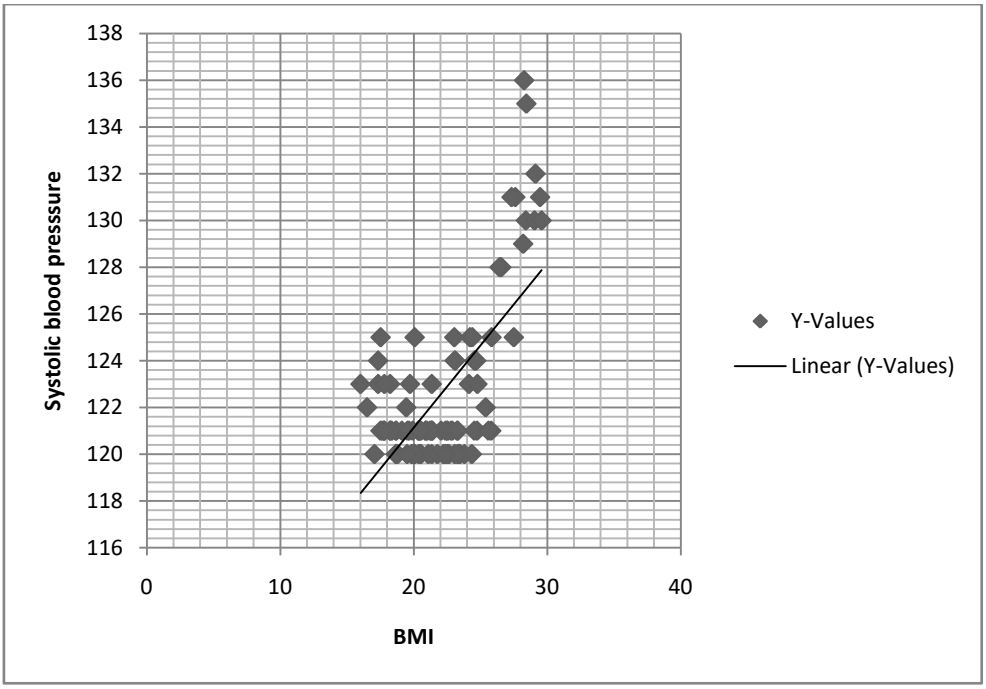
Table 2: Distribution of categories according to BMI

BMI Categories	**No. of Students**			**Percentage (%)**		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Underweight	07	14	21	07	14	21
Normal	30	32	62	30	32	62
Overweight	13	04	17	13	04	17
Obese	0	0	0	0	0	0

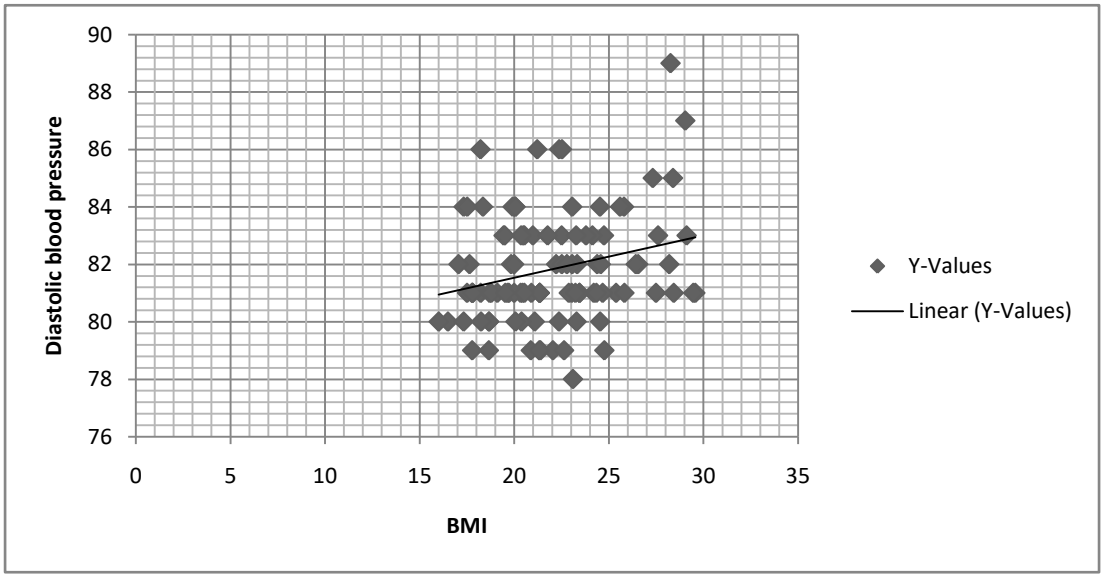
Statistical analysis of BMI and blood pressure revealed that there is correlation in between these two attributes. Both systolic and diastolic blood pressure are positively correlated with the blood

pressure i.e. with increase in BMI, blood pressure may also increase. Our results corroborate with the findings of Aliyu *et al.* (2014), Nanaware *et al.* (2011) and Kaur (2016). The pattern of correlation in between these two is depicted in the form of scatter diagram in graph 1 and graph 2.

Graph 1: Scatter diagram showing correlation between BMI and Systolic blood pressure



Graph 2: Scatter diagram showing correlation between BMI and Diastolic blood pressure



Conclusion

During Present investigation some anthropometric parameters of selected 100 students from class B.Sc. II of K.B.P. Mahavidyalaya, Pandharpur were selected. Height, Weight, and Blood pressure of these students were recorded in accordance with standard prescribed methods. On the basis of height and weight, BMI of students was computed.

The observations reveal that BMI of the 62 % students are in normal range while 21 % students are underweight and 17 % students are overweight. The condition of overweight is found predominantly in female students accounting for about 14% of all students. While overweight condition is more prevalent in male students accounting for 13%.

Blood pressure analysis of students has shown the normal range with maximum systolic blood pressure 136 mmHg and minimum systolic blood pressure is 117 mmHg. Observed range of diastolic blood pressure was in between 78 mmHg to 89 mmHg. Further the trend of change in the BMI and blood pressure also indicated the positive linear correlation in between them. With the increase in BMI, blood pressure also shows hike in values.

It is concluded from present investigation that maintaining BMI in a normal range is a key factor for physical fitness. Routine health monitoring and anthropometric surveillance are needed to maintain good health and to avoid possible adverse consequences of health.

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ROLE OF LIBRARIES IN HIGHER EDUCATION IN INDIA

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Abstract
Libraries are very important for welfare and prosperity of the society. As education and higher education is also essential for the development of the society. This article states that what is library? its types, purpose and objectives of academic library, types of academic libraries, college library, University library and higher education in India.

Keywords: *Library, its types, higher education in India*

What is Library?

A **library** is a service institution. It is a store house of information which is represented in the form of books, periodicals, newspapers, manuscripts, films, maps, prints, documents, microform, CDs, cassettes, videotapes, DVDs, Blue-ray Discs, e-books, audio books, databases, and other formats. These collection of sources of information and similar resources, made accessible to a defined community or parent body for reference or borrowing. It provides access to material which is available in physical or digital form. It is the primary duty of library to organize its resources which is helpful to those who use. It means that the arrangement of library resources should be in easy and convenient.

Types

There are many types of libraries exists in the society which plays an important role in the development of the society. Following are some of the types of libraries.

1. **Early Libraries:** The first libraries consisted of archives of the earliest form of writing the clay tablets in cuneiform script discovered in temple rooms in Sumer, some dating back to 2600 BC. These archives, which mainly consisted of the records of commercial transactions or inventories, mark the end of prehistory and the start of history.
2. **Research Library:** A research library is a collection of materials on one or more subjects. A research library supports scholarly or scientific research and will generally include primary as well as secondary sources; it will maintain permanent collections and attempt to provide access to all necessary materials.

A research library can be either a reference library, which does not lend its holdings, or a lending library, which does lend all or some of its holdings. Some extremely large or traditional research libraries are entirely reference in this sense, lending none of their materials. Many research libraries are attached to a parental organization and serve only members of that organization.

3. Academic Library: An academic body is described like human body, in the higher learning institution though it is a college or university considered as a community where scholars and teachers are the head, students are the body and library its heart. The body cannot perform its proper functions efficiently in case its heart is weak and has not developed fully. The role and image of academic library in an academic institution is advocated by the educationists, education commissions and committees of the government of India from time to time after the independence. They also suggest that the qualitative academic pursuit needs healthy organization of academic library which may transmit the nascent and modem thought for satisfying the intellectual needs and interests of academic community. An academic library organized by an academic institution, with the view of a heart, nerve centre or as a power house may satisfy the intellectual needs and interest of academic community as

well as the five laws of library science, propounded by Dr. S. R. Ranganathan (1892-1972), the father of library and information science in our country. These are -

1. Books are for use
2. Every reader his/her book
3. Every book its reader
4. Save the time of reader and staff
5. Library is a growing organism

Academic libraries are intended to develop human skill, building up of character, generate the self confidence and inculcation of values of young children at their most impressionable age providing them peaceful inviting environment, where they can devote most of their time in enquiring, conforming the facts. The quality of the tasks of teaching, taught and research work based on healthy academic library can easily be differentiated from the non-based academic tasks of an academic institutions. The Calcutta University Commission (1917-1919) recommended that, it is right and proper that the university should provide great libraries and great laboratories of research with great scholar to direct them. It further recommended that, the university librarian ought to be functionary of great importance ranking with university professor, and having a place in the supreme academic body of the university. In this respect, Dr. S. Radhakrishnan University Education Commission (1948-49) observed that the library is the heart of all the university's work; directly so as regarding research work and indirectly as regards its educational works which derives its life from research. Similar view have been expressed by Mehrotra Committee of University Grants Commission of Higher Education (1986) and it has emphasized the role of an academic library for the development of higher education. Indian higher education and academic library have developed considerably during the 1980's and are today very different from what they were in ancient, medieval, pre-independence India. This has been made possible by the progress of higher education, the support to the libraries by the University Grants Commission and guidance of many academic librarians, including Dr. S R Ranganathan.

Purpose and Objective of an Academic Library: The purpose and objective of academic library are very wide which provide support and contribution to education and research activities of their academic institution. These are as follows:

• To increase the image of an academy as a centre for excellence, especially in respect of information sources.

• To improve the quality of education at every level of teaching and learning.

• Increase the quantity of information available for students and others.

• Increase the value of information and help in its maximum use through support service.

• Increase the research output by faculty and research scholars through effective provision of information resources and the support services.

• Develop the role of information resources as an economic investment for obtaining funds for academy and its infrastructure.

• Increase the cooperation in the use of information resources and help in the. development of networking.

• Increase the level of cooperation with other institution, industries, etc with respect of information resources.

• Increase the effective use of expenditure throughout the university in acquiring, producing and using information resources.

• Provide personalized database system for supporting the faculty and students.

• Protect and promote academy's interest with respect of external policies by developing its ability to use information resources in support of its academic responsibilities.

• Develop the means to assert that faculty and students have access to the technical information support needed to use information resources effectively.
• Develop single point access to the full range of information resources in the academy and its neighborhoods.
• Establish personal policies for full range of staff concerned with information research.
• Process information directly to work station and resource utilization points and
• Project the academic's static's at a war front development in term of information resources through educational, professional, technical and technological studies.

In short, the library provides resources to encourage cultivation of curiosity, intuitive thinking, intellectual energy and live-long learning for the education community. Its main role is to provide information to teachers and learners. Academic library is a research, learning support entity in an academic environment. There are various types of information services provided by academic library which have user to identify the topic for research, and the procedure for understanding, the knowledge already known and duly documented.

3.1 College Library: The College library has been given important place in the scheme of higher learning. The standard of teaching and study heavily depends upon the qualitative and quantitative services rendered by the college library. It provides the information as per the academic needs of college students and staff.

3.2 University Library:

University library is the hub and foundation of the university's work. Now a days the university library has changed as information centre. It does great services to research scholars, administrators, teachers and students. It is an integral part
of an institution of higher education. International Encyclopedia of Social Sciences
defines universities as "organization engaged in the advancement of knowledge; they teach, train and examine students in a variety of scholarly, scientific and professional fields". Dr. Radhakrishnan described the role of university library in the following words "the library is the heart of all university's work; directly so, as regards its work, and indirectly as regards its educational works, which derives its life from research work". Thomas Carlyle has rightly stated that "the true university of these days is collection of books". University is an institution where teaching and research are conducted in more than one discipline of universe of knowledge, and which has authority to award degrees, diplomas and certificates in their respective subjects. In the academic sense it is true that no effective work can be developed without a strong library as its heart. S. R. Dongerkery, emphasizing the importance of library in an academic institution in his own words, writes 'a well stocked and up to date library is a sine - qua - non for every modem university. It is the central workshop in the university which provides the students, the teachers, the scholars and the research workers with the tools required for the advancement as well as acquisition of knowledge'. The place of library in the university is partly academic and partly non academic. Rich collection of books attracts good faculty members, and a good faculty in turn attract good students. Thus, the reputation of a university always depends in academic collection of books and other materials. The university libraries have multi-faceted role to play. These libraries provide instructional material, recreational material, research material and textbooks, etc. and they also help in the university's extension and publication program. Emphasis is given to research in the area of thrust. Reference material is available in plenty for consultation.

University library directs its activities towards the fulfillment of the objectives of the university, which are as follows: conservation of knowledge and ideas, teaching, research, publication, extension and service, and interpretation of research.

The library exists not merely to help instructional function at the university, it does also a good deal in aid of research, which is another major function of the university. The library therefore, performs a variety of functions, by way of helping students with textbooks, reference books, and periodicals; by providing a large number of bibliographical tools and upto date literature on every subject for students, teachers and research workers, as well as by maintaining an efficient reference and information service. The university library serves as an important link in the chain between research and practice. It acts as the centre of all academic activities of the universities. It remains more than a library, laboratory and a workshop.

Higher Education in India

Education is a basic need for every human being in the world. The term 'education' has been interpreted by different people in different ways. Some people refer to it as formal schooling or to lifelong learning. Some others refer to it as acquisition of knowledge, skills and attitudes. Some say that education is nothing, but training of people's mind in a particular direction to bring about desired changes.

"Education in the narrow sense does not include self culture and the general influences of one's surroundings, but only those special influences which are consciously and designedly brought to bear upon the youngster by the adult persons of the community whether through the family, the church or the state." — Thomas Raymont (1906)

Higher education comprises all post-secondary education, training and research guidance at education institutions such as universities that are authorized institutions of higher education by state authorities. It includes all the activities a given country deems to be higher education not only those that take place within ordinary universities and graduate schools, but shorter term education and training courses (polytechnics, junior colleges, and various forms of technical specialty schools) that are 2-3 years in length, and even correspondence courses that make use of information technology and are targeted at a broad population of students. Higher education institutions - most prominently universities - have three functions in total. In addition to education, these are research and contributing tosociety.The research and education functions are two sides of a coin; research makes a higher level of education possible and education, in turn, develops the human resources to do research. Recently, contributions to society have increasingly been demanded of higher education institutions. This means the higher education institutions need to have activities to ensure that accumulated knowledge is circulated directly back to society and that they do not become "ivory towers.

Higher education is of vital importance for the country, as it is a powerful tool to build knowledge-based society of the 21st Century. With the growing size and diversity of the higher education sector particularly in terms of courses, management and geographical coverage, it has become necessary to develop a sound database on higher education. Existing data base on higher education is inadequate and out-of-date. Collection and dissemination of data on higher education suffers from incomplete coverage, inordinate time lag etc. Due to this, Gross Enrolment Ratio (GER), which is being calculated on the basis of available data, does not reflect the correct picture of the country's development in respect of Higher Education sector. Government has set a target of increasing the GER from the present level of about 12% to 15% by the end of XI Five Year Plan and to 30% by the year 2020. Various new initiatives have been taken during XI Five Year Plan to increase the GER. Reliable and comprehensive data-base is an immediate requirement to measure the actual GER and efforts taken to improve the GER. A sound database on higher education is also required for planning, policy formulation, fulfilling International Commitments, Research etc.

As per the MHRD ministry, Government of India

Higher Education sector has witnessed a tremendous increase in the number of Universities/University level Institutions & Colleges since Independence. The number of Universities has increased 34 times from 20 in 1950 to 677 in 2014. The sector boasts of 45 Central Universities of which 40 are under the purview of Ministry of Human Resource Development, 318 State Universities, 185 State Private universities, 129 Deemed to be Universities, 51 Institutions of National Importance (established under Acts of Parliament) under MHRD (IITs - 16, NITs – 30 and IISERs – 5) and four Institutions (established under various State legislations). The number of colleges has also registered manifold increase of 74 times with just 500 in 1950 growing to 37,204, as on 31st March, 2013.

The quantum growth in the Higher Education sector is spear-headed by Universities, which are the highest seats of learning.

In India, "University" means a University established or incorporated by or under a Central Act, a Provincial Act or a State Act and includes any such institution as may, in consultation with the University concerned, be recognised by the University Grants Commission (UGC) in accordance with the regulations made in this regard under the UGC Act, 1956. Every year, millions of students from within the country and abroad, enter these portals mainly for their graduate, post graduate studies while millions leave these portals for the world outside.

Higher Education is the shared responsibility of both the Centre and the States. The coordination and determination of standards in Universities & Colleges is entrusted to the UGC and other statutory regulatory bodies.

The Central Government provides grants to the UGC and establishes Central Universities/Institutions of National Importance in the country. The Central Government is also responsible for declaring an educational institution as "Deemed-to-be University" on the recommendations of the UGC.

At present, the main categories of University/University-level Institutions are :- Central Universities, State Universities, Deemed-to-be Universities and University-level institutions. These are described as follows:

Central University:

A university established or incorporated by a Central Act.

State University:

A university established or incorporated by a Provincial Act or by a State Act.

Private University:

A university established through a State/Central Act by a sponsoring body viz. A Society registered under the Societies Registration Act 1860, or any other corresponding law for the time being in force in a State or a Public Trust or a Company registered under Section 25 of the Companies Act, 1956.

Deemed-to-be University:

An Institution Deemed to be University, commonly known as Deemed University, refers to a high-performing institution, which has been so declared by Central Government under Section 3 of the University Grants Commission (UGC) Act, 1956.

Institution of National Importance:

An Institution established by Act of Parliament and declared as Institution of National Importance.

Institution under State Legislature Act:

An Institution established or incorporated by a State Legislature Act.

Following are charts representing how universities and colleges are increasing in India.

Chart 1

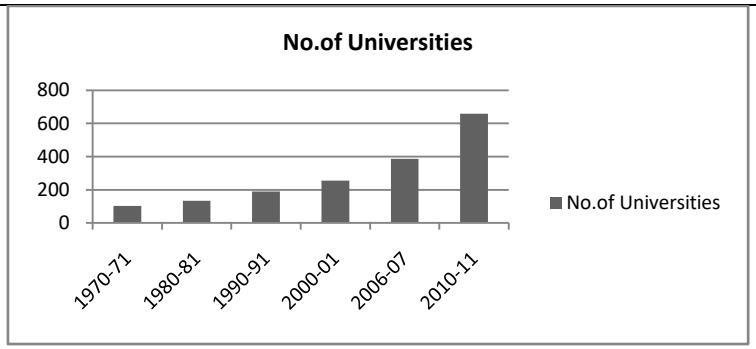
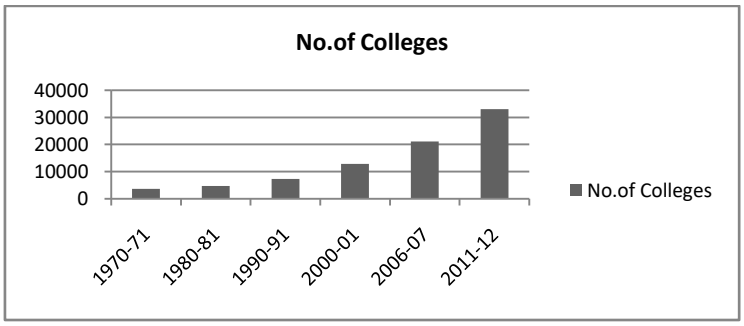


Chart 2



Conclusion:

Libraries are the lifeblood for higher education. It is a backbone of all educational system, because it provides the needed information to their students and staff. A university cannot run without a library. The aim of higher education cannot be achieved without a library. Thus libraries plays vital and important role in higher education.

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EXTRACTION AND SPECTROPHOTOMETRICDETERMINATION OF CR (III) WITH N, N''-BIS (O-HYDROXY-ACETOPHENONE) ETHYLENEDIIMINEDERIVATIVE AS AN ANALYTICALREAGENT

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Abstract

The Spectrophotometric method is coupled with solvent extraction technique and used for the determination of Cr(III) using N,N''-bis(O-hydroxy -acetophenone) ethylene diimine(HAPED) as an analytical reagent. This reagent is synthesised in the laboratory and characterised by NMR, IR, mass and elemental analysis for its purity. The reagent forms a light yellow-coloured stable complex with manganese metal, which can be quantitatively extracted into chloroform at pH 7.6. This Cr(III)-HAPED complex in chloroform exhibit intense absorption peak at 520nm. Beer's law is obeyed in the range of 1-10 ppm of Chromium solution giving linear and reproducible graph. The- stoichiometric ratio of complex studied by Job's continuous variation method, Mole ratio and Slope ratio method. The molar absorptivity and Sandell's sensitivity are also calculated. The molar absorptivity is 1,130.90 L/mol/cm and Sandell sensitivity is 0.0278 µg/cm^2. The proposed method is rapid, sensitive, reproducible, accurate and has been satisfactory applied for determination and separation of Cr(III) in commercial mixtures, pharmaceutical samples and alloys.

Keywords: *HAPED reagent, Chromium(III), Sandell'ssensitivity, Molar absorptivity, Spectrophotometric determination.*

INTRODUCTION

Chromium compounds are essential to life. In the present study, solvent extraction methods are proposed for the metals like Ni(II), Fe(II), Co(II), Cu(II), Mn(II),Cr(III)etc. These metals have proved to be of immense importance in various chemicals, biochemical, pharmaceuticals and industrial applications. It provides good separation and determination methods. Optimum extraction conditions are evaluated to study several experimental parameters like effect of reagent concentration, different diluents, effect of temperature etc. Diverse ion studies are carried out to study the selectivity for the method. This method is used for the analysis of real sample like various alloys, pharmaceutical samples. Extractive methods are highly sensitive but generally lacks in simplicity. Spectrophotometry is essentially a trace- analytical technique and is one of the most powerful tools in chemical analysis. A wide variety of reagents have been proposed for the spectrophotometric determination of Chromium . The extractive spectrophotometric analysis enables to separate desired metal ion, which is to be estimated in presence of other metal from samples. In the present work a novel analytical reagent N,N'bis''(O-hydroxyacetophenone) ethylenediimine (HAPED), was used for the extractive spectrophotometric determination of manganese. The developed method can be employed for efficient determination of Chromium at microgram level. The results of analysis obtained were compared with those obtained by known methods.

EXPERIMENTAL WORK

1. Instruments:- Shimadzu 2100 UV-Visible spectrophotometer with 1.0 cm quartz cell was used for absorbance studies. An Elico LI-120 digital pH-meter was used for pH adjustment.

2. Synthesis of Reagent:-The HAPED reagent was synthesised by O-hydroxyacetophenone and ethylene diamine in methanol in 2:1 molar proportions are mixed in roundbottomflask. Shake the flask for 10 to 15 min. Immediately, light-yellow-colour solid is obtained which is poured in ice-cold water. The solid obtained is separated by filtration and washed with cold water and the product is recrystallised from ethanol. The yield was about 90%. It is then characterised and used for extractive

spectrophotometric determination of Cr(III). A stock solution of HAPED reagent with concentration 0.1% was prepared in methanol. The scheme of reaction is shown in Figure 1.

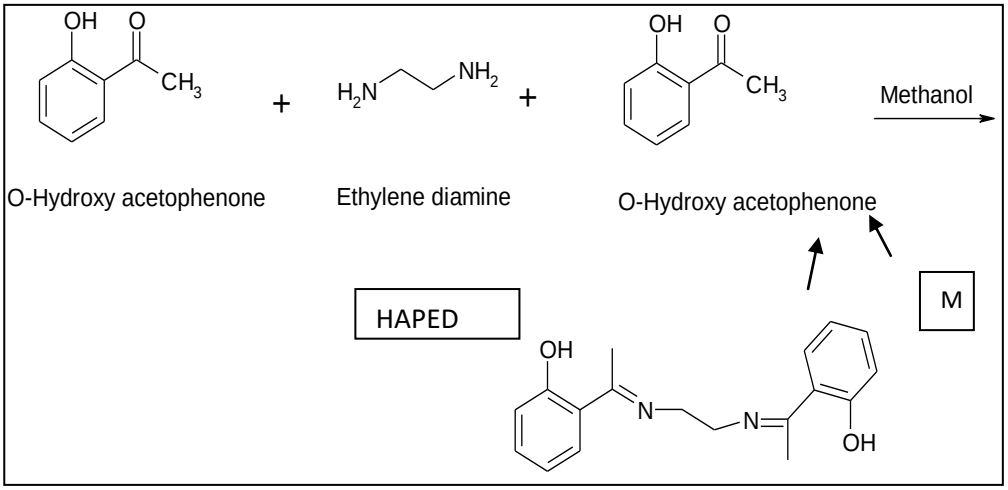
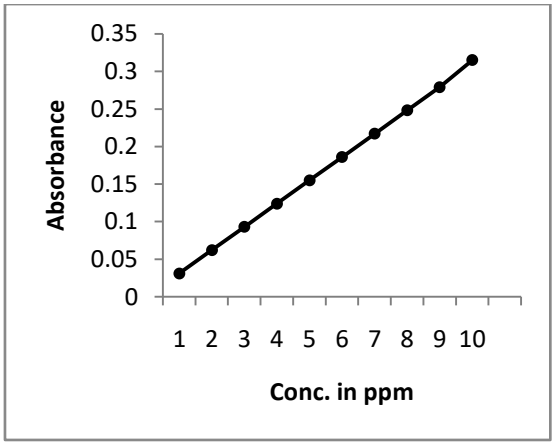


Figure-1:-Synthesis of reagent N,N"-bis (O-hydroxy-acetophenone) ethylene diimine (HAPED)

3. Preparation of stock solution:-A weighed quantity of ChromiumChloride was dissolved in double distilled water containing dilute hydrochloric acid and then diluted to desired volume by double distilled water. The solution was then standardised by titrimetric Method.

4. Recommended procedure:-Mix 1-cm^3 aqueous solution containing 1-100mg of Chromium and 2 cm^3 of 0.1% methanolic solution of HAPED reagent in 25 cm^3 beaker. Adjust the pH of the solution to required value with buffer solution Make the final volume 10cm^3. Transfer the solution into 125 cm^3separate funnel and equilibrate for 1min. with 10cm^3chloroform. Allow the two phases to separate and measure the absorbance of organic phase containing the complex at 520 nm against reagent blank.

5. Preparation of calibration plot:-The calibration curve is prepared by taking known amount of Chromium which is described in the procedure. A graph of absorbance against concentration is shown in Figure 2. The concentration of the unknown Chromium solutions is determined from the calibration plot.

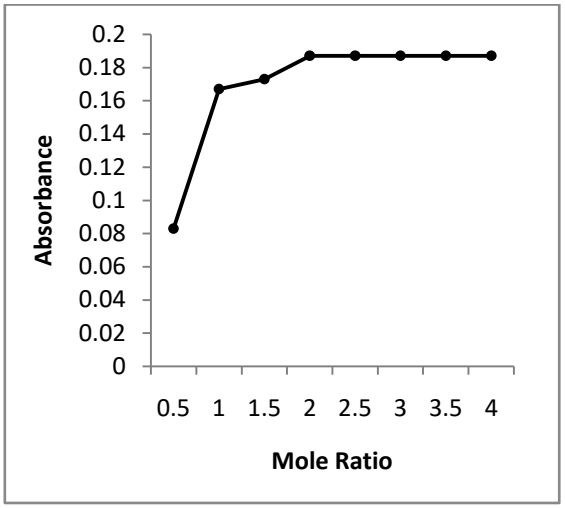


Figure,.2: Calibration plot for extractivespectrophotometric

determination of Cr(III) with chloroform.

6. Composition of the extracted species :-The composition of the extracted species was determined by using the Job's continuous variation method and verified by mole ratio method and slope ratio

method. These methods show that the composition of Cr(III)- HAPED regent is 1: 2 which is represented in Figure 3.



Figure,3: Composition of the Extracted Cr(III) - HAPED species by Mole ratiomethod

7. Effect of foreign ions:-Various cations and anions were investigated to find the tolerance limit of these foreign ions in the extraction of Chromium (III) presented in Table 2. The effect of diverse ions on the Chromium(III) determination was studied, in presence of a definite amount of a foreign ion. The tolerance limit of the foreign ion was taken as the amount required causing an error of not more than 2% in recovery of Cr(III). The ions which interfere in the spectrophotometric determination of Chromium were masked by using appropriate masking agents presented in Table 3.

Table:1

Sr. No.	Different parameters Studied	Observation
1	Solvent	Chloroform
2	pH	7.6
3	Equilibrium time	1 min.
4	Stoichiometry M:L	1:2
5	95% confidence limit	±0.2462
6	Reagent Conc.	0.1%
7	Volume of Rgt.	$2cm^3$
8	Average of7 determination	9.88
9	Stability of thecomplex	33 h.
10	Sandellsensitivity	0.0278-µg/cm^2
11	Molar absorptivity	1,130.90 L/mol/cm

Table :2 Effect of foreign ions

Sr. No.	Interfering ions	Tolerance limit
1	BrO_3^-, Br^-, NO_3^-, IO_3^-, SO_4^-, SO_3^-, CN^-, I^-, Cl^-,ClO_3^-	12
2	Tartrate, acetate	10
3	Oxalate , phosphate,	06
4	Al(III),W(VI),Mg(II),Mo(VI), Cd(II),	09

5	Al(III), Bi(III), Ce(IV),Ca(II),	10
6	Na^+, Ag^+,K^+	05
7	Co(II), Fe(II), Cu(II), Ni(II), Mn(II)	Interferest rongly

Table-3: Effect of masking agent

Sr. No.	Interfering Ions	Masking Agents
1	Pd(II)	Thiourea
2	Fe(III)	Sodium fluoride
3	Co(II)	Sodium fluoride
4	Ni(II)	DMG
5	EDTA	Boiled with conc.HNO_3

8. Comparison between reagents

Various reagents were investigated by the earlier researchers for removal of Cr(III). The proposed reagent (HAPED) is found more superior as that of reported regents and are presented in Table 4.

Table 4: Comparison between regents

Sr./ No.	Reagent	Remark
1	Diantipyryl-(p-chloro)-phenylmethane	Beer's range0-400 µg/25 cm^3
2	Piconaldehyde nicotinoylhydrazone	Beer's Range 0.02-1.5ppm yellow-colouredcomplex with M:L ratio as 1:2
3	N,N'-diethylaniline	Require heating At 100ºC
4	Methylene green	Beer's range0.2-30 cm^3
5	Ethylenebis(triphenyl phosphoniumcation	Mn^{+2i}nterferes

9. Applications

The present method was applied for determination of amount of Cr(III) in various samples of alloys, commercial mixtures, injection vial and tablets. The results obtained were in well agreement with the standard methods shown in Table -5. Every result is the average of independent determinations.

Table 5: Applications

Sr. No.	Sample	Standard method	Present method
1	Ferrochrome	50.10%	50.06%
2	Chromel	10.55%	10.45%
4	Cr(5) + Pd(5)	4.95ppm	4.90ppm
5	Cr(50) + Cd(50) + Ni(50)	50ppm	49.95ppm

RESULT AND DISCUSSION:

The stability of Chromium complex is 33h. Represented as in figure:3. It is observed from this figure that a linear calibration curve was obtained in the range of 1-10 ppm Chromium. In this experiment the results of solvent extraction for removal of Cr(III) by using as (HAPED)organic reagent are presented. Effect of various parameters like pH, absorbance, wavelength and validity of Beer's and Lambert's law. The absorption is observed maximum at wavelength 520 nm. The equilibrium is attained within 1 min. The best results of solvent extraction were obtained in aqueous phase at pH 7.6 whereas organic phase containing chloroform as solvent.

1. Effect of pH and absorbance

Chloroform is found to be the most suitable solvent which is carried maximum extraction which is shown in figure 5. 1 cm^3 aqueous solution contain 100 ppm Cr(III) at different pH shaking with 2 cm^3 of 0.1% HAPED in chloroform, after separated a two layers measure the absorbance of organic phase at wavelength of 520nm and pH of 7.6 respectively which is represented in figure: 6.

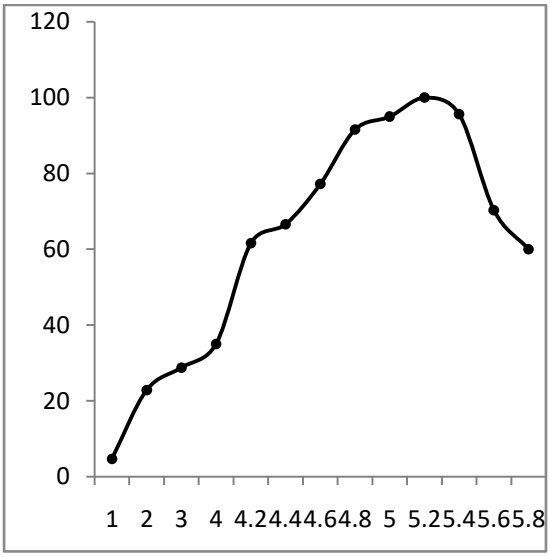


Figure :6- Effect of pH on the extraction of Cr(III):HAPED complex

2 **Selection of the Solvent**

Various solvents were tried to determine the maximum extraction of Chromium. Chloroform was found to be most suitable solvent as it showed the maximum extraction. The extraction of Chromium varied from maximum to minimum for the solvent in the order of chloroform>ethyl Acetate > n-butanol>xylene>cyclohexanone> diethyl ether >toluene>carbon Tetrachloride > n-Hexane >nitrobenzene which is shown in figure:7.

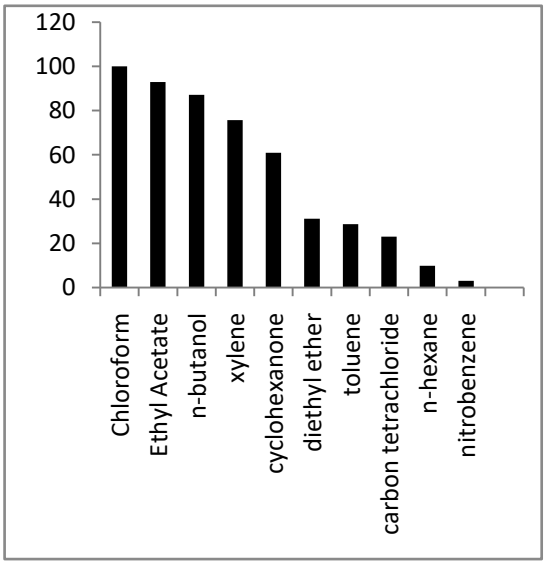


Figure :7 Effect of various solvents on Cr(III) : HAPED complex

3. Shaking time effect

1-cm^3 aqueous solution contain 100 ppm Cr(III) at pH 5.2 after added 2 cm^3 of 0.1%HAPED in chloroform, shaking for different times (0-60) min. after separating the layers, measuring the absorbance of organic phase at wavelength of 520nm.

4 Mole ratio method

Solution of 0.01M HAPED in chloroform used to extract 0.01M Cr(III) from aqueous solution at optimum conditions, also determine absorbance of organic phase at wavelength of 370nm against chloroform, figure : 3 indicates that the ratio of Cr(III) to complex was 1:2[Cr^{+3}:(HAPED)].

4. CONCLUSION

The proposed method is more highly sensitive and selective than the reported methods for the extractive spectrophotometric determination of microgram amounts of Chromium. It has been successfully applied to the determination of Chromium at trace level in synthetic mixtures and alloys .

It offers advantages like reliability and reproducibility in addition to its simplicity, instant colour development and suffers from less interference.

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TO STUDY THE PRE-TREATMENT OF COOLING ON SEED GERMINATION IN PISUM SATIVUM

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Abstract
To study seed germination in Pisum Sativum under cooling pre-treatment at various time duration. The germination of seeds per day, percentage of seed germination, average radical length, average plumule length in cm are parameters under study. The seed germination is more in control than treated seeds. The cooling pre-treatment is non-stimulating and harmful to germination process in general. The seed germination percentage is more in control than treated seeds. In the cooling pre-treatment as the duration of cooling time increases, the adverse effect on seeds increases. The maximum adverse effect is seen in the seeds which are cooled for 80 min. The average radical length is affected due to treatment. There is adverse effect of cooling pre-treatment on average plumule growth of Pisum Sativum seeds. Among the both, treatment and the control, treated seed shows harmful effect on seeds of Pisum Sativum.

INTRODUCTION:-

Pisum Sativum belongs to Fabaceae family. It is most common vegetable plant. It bears seed pods. The seeds are either yellow or green.

Acoording to Jegtving (2007) peas contain high fibres, proteins, vitamin A, vitamin B, vitamin C, vitamin K, Phosphorus, Magnesium, Copper, Iron.

According to Wainwright, Martin (2005) a poll of 2,000 people revealed the pea to be Britain's seventh favourite culinary vegetables. Sodium bicarbonate is sometimes added to soften the peas.

Pisum Sativum seeds are having great medicinal values. According to Pownall et al(2010), amino acid composition and antioxidant properties of seeds are noteworthy. Slane, et al (2009), screened selected food and medicinal plants extracted for pancreatic inhibition. They observe vital role of pea for pancreatic lipace inhibition.

Pisum Sativum plant has root hodules of Rhizobium-Nitrogen fixing bacteria. Postgate (1998), mentioned significant role of pea plant in biological nitrogen fixation. Oelke and Oplinger (1991), Maehlbauer Tullu (1997), Kalka (2005) and Smil (2000) also learned the significant role of pilses, Especially Pisum sativum plants in symbiotic nitrogen fixation as well as in nutritional vegetables.

Being nutritious source as vegetables, major part as food, better nutritional values in seeds, medicinal values and better presentation shelf life of pea. Pisum Sativum seeds are having role in overcoming certain allergy. Sanchez, et, Al (2004) found that vicilin and convicilin are potential major allergens from pea.

Pisum sativum seeds can be preserved for long duration to make it available at any season. The frozen seeds of Pisum sativum is great source of vegetable in any corner of life. It was learned with scientific methodology by Sivsankar (2002).

Materials and Methods:-

Pisum Sativum seeds are collected and placed 10 each in set of petridish. Each petridish is placed with normal blotting paper at bottom. First petridish is treated as control.

5 sets of petridishes are taken for the study of seed germination. Each petridish contains 10 seeds of Pisum Sativum. Here we are taking 2 replicas of 5 sets of petridishes with 10 seeds of Pisum Sativum. The observations of both experiments are considered as average. The germination of seed is treated as one of the important criteria to study the impact of cooling treatment on Pisum Sativum.

Among the 5 petridishes 1st petridish kept common for control reference. Another 4 petridishes are kept in refrigerator at 0^0 C. From the zero time to 20 min 2nd petridish is removed from the refrigerator. After 40 min, 60 min, 80 min from zero time the 3rd, 4th and 5th petridishes are removed from the refrigerator respectively.

The control and the chilled pre-treated petridishes with 10 each Pisum Sativum seeds were under 10 days observation. It was study of seed germination of Pisum Sativum under cooling treatment at various time durations.

The treated petridishes (2nd, 3rd, 4th and 5th) with 10 seeds of Pisum Sativum cooled as pre-treatment at the time duration of 20 min between each petridish. These cooled petridishes and the control petridishes then kept for seed germination for 10 days. To study the seed germination of Pisum Sativum we will observe the number of seed germinated per day, germination percentage of seeds, average radical length, average plumule length within 10 days are the parameters considered to study.

The entire process is repeated for 10 days. The observations are taken as an average of both replicas.

Results and Discussion:-

Table 1:- Effect of Cold pre-treatment at various duration on number of germination in Pisum Sativum.

Cooling Treatment	**Number of seed germination/day**									
	Day One	Day Two	Day Three	Day Four	Day Five	Day Six	Day Seven	Day Eight	Day Nine	Day Ten
Control	0	0	6	7	7	8	8	9	10	10
20 min	0	0	0	4	4	4	4	4	4	4
40 min	0	0	0	2	2	2	2	2	2	2
60 min	0	0	0	0	2	2	2	2	2	2
80 min	0	0	0	0	0	0	0	0	0	0

From Table-1 it is clear that the germination of seeds of Pisum Sativum starts on third day in control. There is no germination starts on third day in seeds which are kept for 20 min in refrigerator at 0^0 C. The germination of seeds increase in 20 min and 40 min on 4th day to 10th day. Maximum germination is 10 seeds on 10th day in control. The germination is 4 seeds on 10th day of seeds which are cooled for 20 min and the germination is 2 seeds on 10th day of seeds which are cooled for 40 min. The germination of seeds increases in 60 min is on 5th day of germination to the 10th day. The germination is 2 seeds on 10th day of seeds which are cooled for 60 min. There is no seed germination even on 10th day in seeds which are kept cooled for 80 min. The overall conclusion from discussion is to draw as, the germination of seeds of Pisum Sativum is more in control than treated seeds. It means cooling treatment is non-stimulating and harmful to germination process.

Table 2:- Effect of Cold pre-treatment at various duration on germination percentage in Pisum Sativum

Cooling Treatment	**Seed germination percentage**									
	Day One	Day Two	Day Three	Day Four	Day Five	Day Six	Day Seven	Day Eight	Day Nine	Day Ten
Control	0	0	60%	70%	70%	70%	80%	90%	100%	100%

20 min	0	0	0	40%	40%	40%	40%	40%	40%	40%
40 min	0	0	0	20%	20%	20%	20%	20%	20%	20%
60 min	0	0	0	0	20%	20%	20%	20%	20%	20%
80 min	0	0	0	0	0	0	0	0	0	0

Table-2 shows the seed germination percentage of Pisum Sativum after pre-treatment of cooling. It shows the seed germination percentage per day up to 10 days of experiments for control and treated conditions from table, it is clear that seed germination percentage is maximum on 9th and 10th day of treatment in control. In control, seed germination percentage is 60 on 3rd day. However it is interested to know that it is zero percentage in another treated seeds in 20 min, 40 min, 60 min and 80 min. The seed germination percentage of seeds of 20 min starts from 4th day on 40% and remains constant up to 10th day on 40%. The seed germination percentage of 40 min and 60 min starts from 4th day and 5th day respectively. The seed germination percentage of both 40 min and 60 min are 20% on 10th day. Seed germination percentage is zero percentage of the seeds which are cooled for 80 min.

It is concluded that seed germination percentage is more in control than cooled pre-treated seeds. As the duration of treatment of cooling increases, the adverse effect of the seed increases. The maximum adverse effect seen at seeds cooled for 80 min.

Table 3:-Effect of Cold pre-treatment at various duration on radical in Pisum Sativum.

Cooling Treatment	**Formation of Radical**		**Formation of Plumule**	
	Initiation	No. of seeds showing radical	Initiation	No. of seeds showing plumule
Control	2nd day	06	8th day	09
20 min	4th day	04	8th day	04
40 min	4th day	02	9th day	02
60 min	5th day	02	9th day	02
80 min	0	00	0	00

From Table-3 here we can see the progress of Pisum Sativum seeds in the form of radical. It is clear that the formation of radical in control starts from 2nd day. It shows 6 numbers of seeds showing radical. The formation of radical in seeds which are cooled for 20 min and 40 min both starts form 4th day. But the numbers of seeds showing radical are different. The numbers of seeds showing radical of 20 min are 4 while 40 min are 2. The formation of seeds of 60 min starts from 5th day. The numbers of seeds showing radical of 60 min is 2. There is no any radical formed in 80 min cooled seeds.Now we will see the progress of Pisum Sativum seeds in the form of plumule. It is clear that the maximum number of seeds showing plumule in control starts from 8th day. It shows the 9 number of seeds showing plumule. The formation of plumule in 20 min cooled seeds starts from 8th day with 4 number of seeds showing plumule. The formation of plumule of 40 min and 60 min cooled seeds starts from 9th day. Both are having same number of seeds showing plumule i.e. 2. There is no formation of plumule in 80 min cooled seeds. The above observation arrives at the conclusion that the number of radical and the number of plumule formed in Pisum Sativum are affected due to cooled pre-treatment.

Table 4:- Effect of Cold pre-treatment at various duration on average of root length in Pisum Sativum

Cooling Treatment	**Average root length on 10th day of seed germination**
Control	2.7 cm
20 min	2.1 cm
40 min	2.0 cm
60 min	1.3 cm

80 min	00 cm

From Table-4 it is clear that control seeds of Pisum Sativum shows average root length is maximum i.e. 2.7 cm. The average root length on 10^{th} day of seed germination is 2.1 cm, 2.0 cm and 1.3 cm of seeds which are cooled for 20 min, 40 min, and 60 min respectively. There is no root formation of seed in 80 min cooled seeds. It is seen that as the duration of cooling of Pisum Sativum seeds increasing the average root length goes on decreasing. The treatment of pre-cooling in Pisum Sativum is more destructive than control seeds.

Table 5:- Effect of Cold pre-treatment at various duration on plumule length in Pisum Sativum.

Cooling Treatment	**Average plumule length on 10^{th} day of seed germination**
Control	1.9 cm
20 min	1.4 cm
40 min	1.0 cm
60 min	0.8 cm
80 min	00 cm

Table-5 depicts the average plumule length on 10^{th} day of treatment in control and treated seeds of Pisum Sativum. It is noted that 1.9 cm is maximum average plumule length seen in control seeds. The average plumule length on 10^{th} day of seed germination is 1.4 cm, 1.0 cm and 0.8 cm of seeds which are cooled for 20 min, 40 min and 60 min respectively. There is no plumule formation of seed in 80 min cooled seeds. It is seen that as the duration of cooling of Pisum Sativum seeds increasing the average plumule length goes on decreasing. This discussion concludes that there is adverse effect of pre-treatment of cooling on plumule growth of Pisum Sativum.

By the refernce of book, "How frozen vegetable is made- production process, making, used, processing, product, industry, machine." In order to freeze and preserve peas, they must first be grown, picked, and shelled. Once the peas have been selected, they are placed in ice water and allowed to cool. The peas are boiled for a few minutes to remove any enzymes that may shorten their shelf life. They are then cooled and removed from the water. The final step is the actual freezing to produce the final product. This step may vary considerably; some companies freeze their peas by air blast freezing, where the vegetables are put through a tunnel at high speeds and frozen by cold air. Finally, the peas are packaged.

Temperature extremes and moisture deficits are major factors influencing the germination, growth, and survival of seedlings on the northern Great Plains (White and Homer 1943, White and Currie 1980, White 1984).

Data from the present study and others (Lawrence and Kilcher 1972, McElgunn 1974, Young and Evans 1982) suggests that low temperatures play a role in the poor germination, growth of seeds.

Conclusion:- To study seed germination in Pisum Sativum under the cooling pre-treatment at various time duration. The germination of seeds per day, percentage of seed germination, average radical length, average plumule length in cm are parameters under study. The seed germination is more in control than treated seeds. The cooling pre-treatment is non-stimulating and harmful to germination process in general. The seed germination percentage is more in control than treated seeds. In the cooling pre-treatment as the duration of time increases, the adverse effect on seeds increases. The maximum adverse effect is seen in the seeds which are cooled for 80 min. The average radical length is affected due to treatment. There is adverse effect of cooling pre-treatment on average plumule growth of Pisum Sativum seeds. Among the both, treatment and the control, treated seeds shows harmful effect on seeds of Pisum Sativum.

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ROLE OF MSMEs IN INDUSTRIAL DEVELOPMENT OF KONKAN REGION

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Abstract

India is the agrarian nation and the second largest population country in the world. As the number of people seeking a job in the country is high, it is not necessary to create a large scale industry, but to create skilled and semi-skilled and inefficient industries, it is necessary to create such industries. In that case the MSMEs industriesshould be given special importance to the development and economic health of the country. The role of MSME in Indian economy is very crucial. It is very important for the national aims of growth with equity and inclusion. It ensures maximum opportunities for both jobs and self or group employment. From 2006 onward when the Micro Small and Medium Enterprises Act was introduced, MSME in India always has shown a progressive and healthy growth. This paper attempts a critical review of industrial development in Konkan region of Maharashtra State, economic growth of this region and need of development of SMEs in this region to improve the economical and industrial growth.

Objectives of research paper:

1) To focus on the development and employment generation of MSMEs in Konkan region.
2) To focus on the development and employment generation of MIDC in Konkan region.
3) To find out challenges of MSME in terms of output generation and employment generation

Introduction:

Industrialization has a major role to play in the economic development of the underdeveloped countries. The primary sector, which includes agriculture, forestry and fishery, has gone down from 55.3% in gross domestic product in 1950-51 to 44.5% in 1970-71 and to a still lower figure at 8.8% in 2007-08. In the Secondary sector includes mining, manufacturing, electricity, gas and water supply has shown a steady increase from 16.1% of G.D.P. in 1950-51 to 20.8% in 2007-08. In the service sector includes construction, trade, transport, communication business, finance, insurance and community services has increased from 28.6% in G.D.P. to 70.4% in 2007-08.Maharashtra is one of the largest, wealthiest and most developed states in India by current economic indicators. Maharashtra is one of the most industrialised states in the country. The State has identified industrial sectors like Auto, Engineering, Electronics, Textile and Defence as focus sectors considering the national and international trends and potential of the resources in the State.

Industrial Development in Maharashtra

According to 2011 census, Maharashtra's population is 11,23,74,333, which is 9.3 percent of the population of the country. Of them, 45.2 percent of the population is urbanized and 54.8 percent of the population lives in rural areas. Maharashtra State is divided into 36 districts and the administration of the state is divided into six sections for smooth running. In these six sections

1) Konkan (Mumbai city and Konkan division)
2) West Maharashtra (Poona Division)
3) Khandesh and North Maharashtra (Nashik Division)
4) Marathwada (Aurangabad Division)
5) Nagpur (Vidarbha Division) and
6) Amravati (Vidarbha Division)

History of konkan

Konkan is the coastal belt of the western state of Maharastra in India. Though a narrow strip, the Konkan region is easily identifiable on a map of India. It is the land between the Western Ghats and the Arabian Sea. The Konkan coast borders Panaji city of Goa to the North and Kasargod of Kerala in the South. It is a 720 kilometres long coastline. It consists of the coastal districts of the western Indian states of Maharashtra, Goa, and Karnataka. and extends throughout the western coasts of Maharashtra, Goa and Karnataka. It is bounded by the Western Ghats mountain range (also known as Sahyadri) in the east, the Arabian Sea in the west, the Mayura River in the north and the Gangavalli River in the south. Its northern bank constitutes the southernmost portion of Konkan. **Area** 30,746 sq km; six districts (Mumbai, Thane, Raigad, Ratnagiri, Sindhudurg and Palghar) **Population** 28.6 million. **Gross Domestic Product** Rs 373,959 crore accounts for 41% of Maharashtra's GSDP. The region's capital, Mumbai – home to India's financial, banking and entertainment industries – is the state's richest district. Neighbouring Thane district has one of India's highest per capita incomes. The region is known for its Alphonso mangoes and costal fisheries. The Konkan region of Maharashtra accounts for the largest number of SEZs (58) in the state, where 122 tax-free zones were approved till October 30, 2007

Table no. 1 Important information regarding the infrastructure and other facilities

Total Area	28,739,397 km^2
No. of Districts	06
No. Of Talukas	50
Gross Domestic Product Rs.	373959 Crore.
Population	2,86,01,441
No. of industrial units	4276
No. of plots developed	12948
SEZ	SEZ 58 and Tax Free Zones 122
MSMEs	47984
No.of MIDC units	19992
Road Transport	NH 66 Mumbai – Goa Highway NH 48 Mumbai – Bangalore Highway SH 4 the Konkan Coastal Road NH-6 NH-7 and NH-69.
Rail Transport	The Konkan Railway is a subsidiary zone of the Indian Railways. It is one of the 17 zones of the Indian Railways with length 736 km

Development in MSME Sector: Small & Medium Enterprises (SMEs) play a major role in global economic growth in terms of their contribution to industrial employment, output and exports. The small and medium enterprises (SMEs) play an important role in the economic and social development of Indian economy. For the economic and social development of the country the geographic distribution of the SMEs is very importance. Micro, Small and Medium Enterprises sector occupies an important position in the State's industrial economy and continues to contribute to industrial production, export, creation of employment opportunities, etc. The Development Commissioner (MSME), Ministry of MSME, Govt. of India, New Delhi formulates the policy governing the MSME in the country and chalk out schemes and programmes for development of the MSME sector as per the provisions in the MSMED Act, 2006. As per the new MSME Development Act, 2006, the current definitions of Micro, Small and Medium Enterprises in manufacturing and service sector are as follows :

Category	Manufacturing	Service sector
	Investment in plant and machinery	Investment in equipment (excluding land building)
Micro	Up to Rs. 25 lakhs	Up to Rs. 10 lakhs
Small	Above Rs 25 lakh up to Rs 5 crore	Above Rs. 10 lakh up to Rs. 2 crores
medium	Above Rs. 5 crores up to Rs 10 crores	Above Rs. 2 crore up to Rs. 5 Crore

Comparison of industries established under the MIDC in Konkan with Maharashtra:

Maharashtra state is an industrially developed state. Industrialization has become a big issue in Maharashtra. A large part of the population depends on the employment opportunities available in the industry. The Maharashtra State Industrial Development Corporation was formed in accordance with Maharashtra State Industrial Development Act 1961.In order to reduce industrial inequalities in six regions in Maharashtra, industrial estates were created in six parts of Maharashtra e.g. Konkan, Pune, Nashik, Aurangabad, Amravati and Nagpur to increase employment generation. From the following table, it will be learned from the details of how many estates were established in the developed and developing areas and the impact of employment generation on it

Table no. 2 Industrial Units in MIDC

Region	Unit no.	Investment (rs. Crore)	Employment (lakh)	No. of plots		Percentage of allotted plot to developed plots
				Developed	allotted	
Mumbai	1012	10135	1.32	7535	7442	98.8
Konkan (Excl. Mumbai)	12306	40842	4.01	5413	5279	97.5
Nashik	7686	6065	0.80	9493	8756	92.2
Pune	11780	61521	4.60	11607	10965	94.5
Aurangabad	7499	8126	0.71	8029	7399	92.2
Amaravti	2067	7182	0.27	4234	3472	82.2
Nagpur	3701	15631	0.82	5455	5100	93.5
Total	46051	149502	12.53	51766	48413	93.5

Source: MIDC, GoI

From the above table shows that in single Mumbai district of Konkan division, 1012 industries have been established in the MIDC, of which the total investment is 10135 crores. 98.8 of the plots developed under the MIDC were distributed. This creates approximately 1.32 lakh jobs. When considering Konkan in Mumbai, the number of industries established under MIDC in the five zones (Thane, Palghar, Raigad, Ratnagiri and Sidhudurg) is 12306 more than the number of industries in the other division. After considering investment, 40842 crores have been found in these five districts of Konkan division. Ans 4.01 lakhs employment have been generated. Of the seats developed under the MIDC, 97.5 percent of the plots is distributed to the industries in MIDC. The percentage of industrial estate in the Konkan division is considered in the industrial estates of Maharashtra State, 28.92% of the total industry in Maharashtra has been set up in the Konkan region. In terms of employment generation, 43.22 percent of the total employment of MIDC in Maharashtra is available in Konkan region. In spite of investment, Rs 50977 crore investment (34% investment) of 14,950 crore investment in the state is found in Konkan.

Region wise information of MSEMs: MSME's role in employment generation is very important. Therefore, the Government of India, established MSME Act, 2006 has found solutions to the development of the incoming industry under this category and to take measures to generate large scale employment throughit. In the MSME industry, there is relatively less investment and more employment generation. Detailed information about this can be described through the following table.

Table no. 2 Region wise information of MSEMs

Region	MSEMs	Percent share	Employment (Lakh)	Percent share
Mumbai	20786	10.2	4.05	13.9
Konkan (Excl. Mumbai)	39269	16.1	6.32	21.7
Nashik	27458	11.3	3.15	10.8
Pune	92233	37.8	10.05	34.4
Aurangabad	18751	7.7	1.93	6.6
Amravati	14510	5.9	1.14	3.9
Nagpur	26714	11.00	2.55	8.7
Total	243721	100	29.19	100

Source: Directorate of Industry, GoI

According to the above figures, there are 243724 MSMEs in Maharashtra, by 2015. In Mumbai alone, 20786 MSME situated and there were 29269 MSMEs in Konkan except Mumbai. In terms of percentage, Mumbai was established at 10.2 percent and in Konkan except Mumbai. In view of employment generation, Maharashtra has generated 29.19 lakh jobs through MSME, out of which 13.9 lakh in Mumbai and 21.7 lakh jobs in five districts of Konkan except Mumbai.

Challenges Faced By Indian SMEs:

SME sector is the strength of present day economy and one of the most important segments for any nation. These SMEs have fostered the Indian economy's competitiveness in an increasingly challenging global economic picture. The survey found that SMEs are more concerned with issues like staff shortages, a lack of orders, sales and government regulation. Some of these hurdles comprise of inefficacy of SMEs to access continued development and success.

- The time needed to transport material from one place to another place is very important in global competition. Lack of all weather paved roads to market centers; lack of availability of railway wagons, damage and theft of goods are the major problems for Indian SME's.
- It has emerged as the most critical barrier for perfect capacity utilization and competing in the market. SMEs are not able to raise adequate funds from banks, especially for high risk projects. A small scale entrepreneur cannot afford to invest huge funds in scientific research to develop process/product or to improve the product quality .
- Small industries are reluctant to change their organizational and financial structure. They try to get work done from the existing workforce rather than recruiting professionals i.e. technicians, engineers, managers etc.
- Small industries are run by family, and it is observed that the younger generations of owners of these industries are less interested in running the business. After witnessing the problems faced by their parents they select easy and comfortable ways of living by doing a job in MNC or settling down in abroad.

Conclusion: In any nation's economy MSMEs sector plays a vital role, they not only give employment to a large number of unskilled and semi-skilled people but also support bigger industries by supplying raw material, basic goods, finished parts and components. SMEs contributed major share in all exports from the country and employ more than 10 crore people which is next only to the agricultural sector. For the economic, social, educational and administrative development of Konkan region development of MSMEs sector is very important. It is proved that the region has unmet potential, its rich resource makes it a prospective destination for manufacturing sectors such as Textiles, Mining, Power, Agro & Food Processing and Pharmaceuticals and Fine Chemicals. At the same time, service sectors such as Logistics, Tourism and IT/ITES also have the potential to flourish

in the region. It is concluded from the above research that for development of this region development of MSME sector is very important.

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RESEARCH PAPER PROGRAMMING TEACHING TOOLS

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Abstract
Research describes preliminary results of research related to programming teaching tools. The study focuses on the key issues being highlighted in this research. Among the research questions of the study are: What are the important issues in programming teaching and learning research? What are the methods of the research? What kind of tools involved in programming teaching and learning? What is the level of programming involved? The study found six issues related to programming teaching tools, and most of the issues concern on the techniques and methods used in teaching, learning and assessment. Regarding the level of programming involved, majority of the research focuses on introductory stage.

1. Introduction:

Various tools have been introduced in education process to enhance teaching and learning activities. These tools play important role for enriching students' learning experience on the learned subject. In programming teaching and learning, various electronic tools are available. These electronic tools are essential since programming software and environment are closely related to and require computer as a platform to implement and test the syntax of programming.

Programming process involves a combination of activities i.e. planning, designing, testing and debugging. To learn on how to develop a program, students need to understand the syntax of programming language. The complexity of programming and difficulty to comprehend program logic often lead to frustration and lack of motivation to learn programming. Learning separation between theory and practical sessions complicate the learning process in this course. Eventually, these factors contribute to the high rate of dropouts in programming courses at most universities and colleges. These problems have stimulated researchers to find ways to help students in learning programming. Among the top three topics in programming teaching and learning are issues related to programming tools.

Various learning strategies such as storytelling, games in learning approaches, simulation and visualization techniques as well as pair-programming approaches are implemented to enhance student engagement and to develop creative thinking as one of the preparation strategy for students to become future producers, not just consumers of technology. Researchers in programming teaching and learning areas also give their attention to related issues for example students' attitudes toward programming and assessment activities in the process. Although programming teaching and learning research has rapidly increased, there is little study to evaluate and synthesize the results of relevant research in this area, specifically within the context of programming tools. Four research questions were raised in this study: what are the current issues related to tools in programming teaching and learning? What are the adopted method in the research?, what kind of tools that were developed or used in programming teaching and learning?, and what are the level of programming involved?

2. Programming Tools:

Programming consists of three main components: program, programming tools and programming language. As one of the key element in programming, programming tools play an important role in programming development and implementation.



Programming tools provide the software or environment that allows programmers to give instructions, test them and implement the program. Ability and skills to use programming tools are considered as important and equivalent to skills in syntax and logic. In teaching and learning of programming, programming tools is one of the main topics that discuss issues related to pedagogy, curriculum and programming languages. Programming tools are supposed to assist novice programmers, students and instructors in developing programming skills. Though many of programming tools are available in market and most of them can be downloaded from the Internet and supported by most platforms, only a small number of them are suitable to be adopted in programming teaching and learning. As a consequent, skills in using programming tools could be gained only through informal learning, trial and error process, using either Internet sources, help functions, or from insertion notes supplied by the software.

Program software developers are generally designed to meet the needs of professional and advance programmers. Usually, the software are equipped with complete set of concepts and complex functions. Due to limited experience and knowledge among novice programmers, it is very difficult for them to understand and use the functions. As a result, this complex functions are perceived as problem rather than solution that help them in producing program. Furthermore, complexity in software interface, difficulty to understand error messages display and warning messages are among the reasons why most programming tools are not suitable for the programming learning environment. These hurdles distract and fade away the initial interest possessed by novice programmers or students. This problem calls for innovative programming tools and environment suitable for teaching and learning purposes. Better learning can be achieved by using a tool that combines communications technology, active learning and visualization display. Jeliot3 is among programming tool architecture and features that support device from cell phones to interactive code that allow mobile users to contribute code and predict its performance.

3. Research questions:



The study focus is to understand the practice of the researchers in programming teaching and learning using teaching equipment. This literature survey aims to obtain answers to the following four research questions:

Research question 1: What are the important issues in programming teaching and learning research?
Research question2: What are the methods used in programming teaching research?
Research question 3: What kind of tools used in programming teaching and learning?
Research question 4: What are the level of programminginvolved?

3.1. Research question 1: Issues in educational programming research.



Research in programming consists of a number of issues. Since the research questions for this study focus on the detail of research discussion, the classification is made based on the research theme. As a result, six issues were identified in this

Table 2. Identified issues

Issues	Number
Techniques of teaching / learning / assessment	18
Techniques of teaching / learning / assessment tools	13
Ability / aptitude / understanding	7
Model andtheory of teaching/learning	3
Research direction	3
Gender issue	1
Total	45

Four important issues were discussed here:

3.1.1 Techniques of teaching, learning, assessment:

Regarding educational programming techniques of teaching, learning and assessment, the focus of this paper is to report the experience and describe teaching and learning methods. The various features and aspects of information technology (IT) are also reviewed to relate the best and pedagogical techniques that produce programming skills and confidence to students, including fragmentation of the programming process using small parts, visualization, constructive and think-aloud approach. Among the formulations in this dimension are to construct clear programming teaching strategy to increase student learning outcomes. The design and testing of programming learning model are considered as important process to identify and understand how students experience certain learning method. This helps to explain the learning process and improve existing methods. The implementation

of active learning should not focus only on language syntax and programming logic in educational programming. Among the suggested activities are trouble shooting and breaking solution into phases.

3.1.2. Teaching, learning and assessment tools:

A large number of studies measure the effectiveness of these tools in helping students to write the program and perform the solution. Similarly, many studies assess the impact and relationship between programming tool usage and performance. The results show that the use of various software tools help student to program. Based on good performance positive response from student, there is evidence that the tools are accepted in the learning process. Besides, tool support from technology and peer-learning are important in helping students to understand programming concept. Programming tools using visualization approach were found to be preferred by students. Meanwhile, game element makes learning programming more interesting to follow. Programming animation and online application were among innovative element in the research.

3.1.3. Ability / aptitude / understanding:

Programming complexity and ambiguity are among the reasons for lack of motivation among programming students. Among the concerns in handling laboratory sessions for this course is the effort to identify and rectify errors that might frustrate and discourage students. In the long run, students' attitude towards programming are at stake and consequently give a negative impact on exam scores, which in turn contributes to drop out in programming subjects. In programming teaching and learning, students require clear and precise instruction and need peer support. Students' understanding in programming can be improved by paying attention to clear instruction activities and peer learning forum, as well as applying concepts and knowledge through games.

3.1.4 Research direction:

Under this issue, this study identifies what researcher perceives as their future research in educational programming, including new issue and proposal. Research in this domain should not be limited to programming introduction level, and more research is required to synthesize the current study in educational programming and to explore educational technology such as distributed line environment and mobile learning.

3.2. Research question 2: Method used in research:



There are nine identified methods used in the research paper, as in table. Survey appears to be the most widely method that measures feedback and responses from instructors and students regarding the effectiveness of programming tools. Several methods were used in evaluating programming tools effectiveness and efficiency. This result implies that instructors are required to be more flexible, to

use combination of traditional teaching approach with other techniques in classroom and laboratory to make the session more interesting.

Table: Research method:

Item	Number
Survey	14
Software design and development	9
Experience report	6
Comparison study	4
Meta-Analysis/ Literature review	4
Program evaluation	2
Empirical study	2
Model andframework development	2
Case study	2
Total	45

3.3. Research question 3: Types of programming tools:

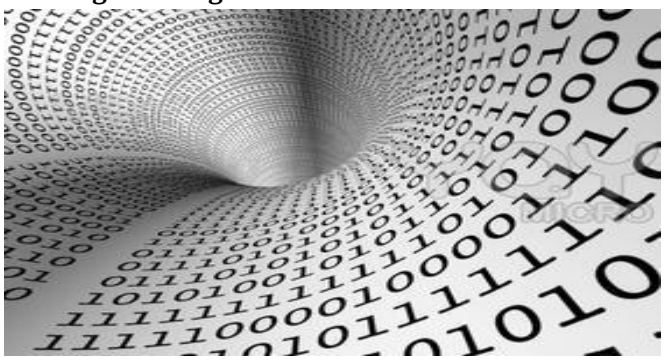


The equipment's used by instructors to help students in programming include visualization, simulation, and physical or online tools. Table present the result. The analysis suggests visualization as the most widely used approach to clarify abstraction in programming. Most studies concern on evaluation of programming tools rather than development of the tools. In addition to programming tool, the use of management or support tool is also important, especially to assess students' work on programming, to record programming activities, and to communicate programming activities. These research paper discuss computing issues related to students' behaviour and attitudes, dropout and failure factors, theory of programming tools, and modelling and analysis of programming teaching and learning.

Table 4. Programming tools type:

Item	Number
Visualisation/ simulation	12
Support and management	6
Onlinetool	2
Physical tool	2
No tools involved	23
Total	45

4.4. Research question 4: Programming Level:



All of the papers are related to education domain, in the context of programming teaching and learning. They cover the basic concepts of programming or introductory programming including programming algorithms, selection,repetition structures, with two exceptions. These two papers discuss programming data structure. This result shows most of the reviewed paper concentrate on the basic level of programming in which novice programmers struggle to develop their understanding and skills.

Table. Programming level:

Item	Number
Introductory programming	43
Data structure	2
Total	45

Conclusion:

One of these is that the computer is a very flexible and powerful tool, and it is a tool that is ours to control. Files and documents, especially those in open standard formats, can be manipulated using a variety of software tools, not just one specific piece of software. A programming language is a tool that allows us to manipulate data stored in files and to manipulate data held in RAM in unlimited ways. Even with a basic knowledge of programming, we can perform a huge variety of data processing tasks.

Writing computer code to process, store, or display data is a task that should be performed with considerable discipline. It is important to develop code in small pieces and in careful stages, and it is important to produce code that is tidy and sensibly structured. This discipline is essential to writing code that will produce the correct result both now and in the future.

By conducting this research, I found a new approach to teaching world study that is beneficial to all the students. I have also expanded my knowledge about how students learn words and the developmental progression they go through. Action research will not only helped students but can also help the teachers to become more reflective practitioner.

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BLUE BRAIN

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Abstract
Human brain is the most valuable creation of God. The man is intelligent because of the brain. "Blue brain" is the name of the world's first virtual brain. That means a machine can function as human brain. Today scientists are in research to create an artificial brain that can think, response, take decision, and keep anything in memory. The main aim is to upload human brain into machine. So that man can think, take decision without any effort. After the death of the body, the virtual brain will act as the man .So, even after the death of a person we will not lose the knowledge, intelligence, personalities, feelings and memories of that man that can be used for the development of the human society.

INTRODUCTION

The Blue Brain System is an attempt to reverse engineer the human brain and recreate it at the cellular level inside a computer simulation. The project was founded in May 2005 by Henry Markram at the EPFL in Lausanne, Switzerland.

Goals of the project are to gain a complete understanding of the brain and to enable better and faster development of brain disease treatments. The research involves studying slices of living brain tissue using microscopes and patch clamp electrodes. Data is collected about all the many different neuron types. This data is used to build biologically realistic models of neurons and networks of neurons in the cerebral cortex. The simulations are carried out on a Blue

Gene supercomputer built by IBM, hence the name "Blue Brain". The simulation software is based on Michael Hines's NEURON, together with other custom-built components.

As of August 2012 the largest simulations are of micro circuits containing around 100 cortical columns such simulations involve approximately 1 million neurons and 1 billion synapses. This is about the same scale as that of a honey bee brain. It is hoped that a rat brain neocortical simulation (~21 million neurons) will be achieved by the end of 2014. A full human brain simulation (86 billion neurons) should be possible by 2023 provided sufficient funding is
received.

WHAT IS BLUE BRAIN?

The IBM is now developing a virtual brain known as the Blue brain. It would be the world's first virtual brain. Within 30 years, we will be able to scan ourselves into the computers. We can say it as Virtual Brain i.e. an artificial brain, which is not actually a natural brain, but can act as a brain. It can think like brain, take decisions based on the past experience, and respond as a natural brain. It is possible by using a super computer, with a huge amount of storage capacity, processing power and an interface between the human brain and artificial one. Through this interface the data stored in the natural brain can be up loaded into the computer. So the brain and the knowledge, intelligence of anyone can be kept and used for ever, even after the death of the person.

NEED OF VIRTUAL BRAIN

Today we are developed because of our intelligence. Intelligence is the inborn quality that cannot be created .Some people have this quality, so that they can think up to such an extent where other cannot

reach. Human society is always in need of such intelligence and such an intelligent brain to have with. But the intelligence is lost along with the body after the death. The virtual brain is a solution to it. The brain and intelligence will be alive even after the death. We often face difficulties in remembering things such as people names, their birthdays, and the spellings of words, proper grammar, important dates, history facts, and etcetera. In the busy life everyone wants to be relaxed.Can't we use any machine to assist for all these? Virtual brain may be a better solution for it. What will happen if we upload ourselves into computer, we were simply aware of a computer, or maybe, what will happen if we lived in a computer as a program?

FUNCTIONING OF HUMAN BRAIN

The human ability to feel, interpret and even see is controlled, in computer like calculations, by the magical nervous system. Yes, the nervous system is quite like magic because we can't see it, but its working through electric impulses through your body. One of the world's most "intricately organized" electron mechanisms is the nervous system. Not even engineers have come close for making circuit boards and computers as delicate and precise as the nervous system.

To understand this system, one has to know the three simple functions that it puts into action: sensory input, integration, motor output.

1. *Sensory input:*

When our eyes see something or our hands touch a warm surface, the sensory cells, also known as Neurons, send a message straight to your brain. This action of getting information from your surrounding environment is called sensory input because we are putting things in your brain by way of your senses.

2. *Integration:*

Integration is best known as the interpretation of things we have felt, tasted, and touched with our sensory cells, also known as neurons, into responses that the body recognizes. This process is all accomplished in the brain where many neurons work together to understand the environment.

3. *Motor Output:*

Once our brain has interpreted all that we have learned, either by touching, tasting, or using any other sense, then our brain sends a message through neurons to effecter cells, muscle or gland cells, which actually work to perform our requests and act upon the environment. How we see, hear, feel, smell, and take decision.

BRAIN SIMULATION

Table 1: Comparison between Natural and Simulated Brain

Natural Brain	**Simulated Brain**
INPUT In the nervous system in our body the neurons are responsible for the message passing. The body receives the input by sensory cells. This sensory cell produces electric impulses which are received by neurons. The neurons transfer these electric impulses to the brain.	INPUT In a similar way the artificial nervous system can be created. The scientist has created artificial neurons by replacing them with the silicon chip. It has also been tested that these neurons can receive the input from the sensory cells. So, the electric impulses from the sensory cells can be received through these artificial neurons.
OUTPUT Based on the states of the neurons the brain sends the electric impulses representing the responses which are further received by sensory cell of our body to respond neurons in the brain at that time.	OUTPUT Similarly based on the states of the register the output signal can be given to the artificial neurons in the body which will be received by the sensory cell.

MEMORY There are certain neurons in our brain which represent certain states permanently. When required, this state is represented by our brain and we can remember the past things. To remember things we force the neurons torepresent certain states of the brain permanently or for any interesting or serious matter this is happened implicitly.	MEMORY It is not impossible to store the data permanently by using the secondary memory. In the similar way the required states of the registers can be stored permanently and when required these information can be received and used.
PROCESSING When we take decision, think about something, or make any computation, logical and arithmetic computations are done in our neural circuitry. The past experience stored and the current inputs received are used and the states of certain neurons are changed to give the output.	PROCESSING In the similar way the decision making can be done by the computer by using some stored states and the received input and the performing some arithmetic and logical calculations.

COMPUTER HARDWARE/ SUPERCOMPUTERS

Blue Gene/P

The primary machine used by the Blue Brain Project is a Blue Gene supercomputer built by IBM. This is where the name "Blue Brain" originates from. IBM agreed in June 2005 to supply EPFL with a Blue Gene/L as a "technology demonstrator". The IBM press release did not disclose the terms of the deal. In June 2010 this machine was upgraded to a Blue Gene/P. The machine is installed on the EPFL campus in Lausanne (Google map) and is managed
by CADMOS (Center for Advanced Modeling Science).

The computer is used by a number of different research groups, not exclusively by the Blue Brain Project. In mid-2012 the BBP was consuming about 20% of the compute time. The brain simulations generally run all day, and one day per week (usually Thursdays). The rest of the week is used to prepare simulations and to analyze the resulting data. The supercomputer usage statistics and job history are publicly available online - look for the jobs labeled as "C-BPP".

- **Blue Gene/P technical specifications**
- 4,096 quad-core nodes
- Each core is aPowerPC 450, 850 MHz
- Total: 56 teraflops, 16 terabytes of memory
- 4 racks, one row, wired as a 16x16x16 3D torus
- 1 PB of disk spaœ, GPFS parallel file system
- Operating system: Linux SuSE SLES 10



Blue brain Storage rack

UPLOADING HUMAN BRAIN

The uploading is possible by the use of small robots known as the Nanobots .These robots are small enough to travel throughout our circulatory system. Traveling into the spine and brain, they will be able to monitor the activity and structure of our central nervous system. They will be able to provide an interface with computers that is as close as our mind can be while we still reside in our biological form. Nanobots could also carefully scan the structure of our brain, providing a complete readout of the connections. This information, when entered into a computer, could then continue to function as us. Thus the data stored in the entire brain will be uploaded into the computer.

Merits and demerits

With the blue brain project the things can be remembered without any effort, decisions can be made without thepresence of a person. Even after the death of a man his intelligence can be used. The activity of different animals can beunderstood. That means by interpretation of the electric impulses from the brain of the animals, their thinking can be understood easily. It would allow the deaf to hear via direct nerve stimulation, and also be helpful for many psychological diseases. Due to blue brain system human beings will become dependent on the computer systems. Technical knowledge may be misused by hackers; Computer viruses will pose an increasingly critical threat. The real threat, however, is the fear that people will have of new technologies. That fear may culminate in a large resistance. Clear evidence of this type of fear is found today with respect to human cloning.

What can we learn from Blue Brain?

Detailed, biologically accurate brain simulations offer the opportunity to answer some fundamental questions about the brain that cannot be addressed with any current experimental or theoretical approaches. Understanding complexity Atpresent, detailed, accurate brain simulations are the only approach that could allow us to explain why the brain needs to

use many different ion channels, neurons and synapses, a spectrum of receptors, and complex dendritic and axonal arborizations.

CONCLUSION In conclusion, we will be able to transfer ourselves into computers at some point. Most arguments against this outcome are seemingly easy to circumvent. They are either simple minded, or simply require further time for technology to increase. The only serious threats raised are also overcome as we note the combination of biological and digital technologies. While the road ahead is long, already researches have been gaining great insights from their model. Using the Blue Gene supercomputers, up to 100 cortical columns, 1 million neurons, and 1 billion synapses can be simulated at once. This is roughly equivalent to the brain power of a honey bee. Humans, by contrast, have about 2 million columns in their cortices. Despite the sheer complexity of such an endeavor, it is predicted that the project will be capable of this by the year 2023.

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GSM BASED DISASTER MANAGEMENT SYSTEM USING ARDUINO

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Abstract
The occurrence of disasters like earthquake, tsunami, and landslide are a big loss for human life and property. Natural causes cannot be stopped but using this technique we can alert people before it occurs. In this design, seven sensors are used for both natural as well as manmade disasters, those are angle or tilt sensor which gives the readings of slope angle if there is any movement due to the landslide and it is also used for tsunami alerting purpose, rain drop sensor is used to collect the depth of water at the mountains, soil drift sensor is used for detection of landslide, earthquake sensor is used for earthquake detection purpose and temperature sensor is used for collecting the temperature. Humidity sensor is used in order to test whether the humidity of the environment is above or below the parameter. In case of gas leakage at home or in a factory, gas sensor is used for this purpose. If any of these disasters occurs, sensor will sense the signal and output of sensor will given to Arduino Uno for further process. The nodes of all these sensors are connected to the Arduino Uno, an advanced microcontroller for the collection of data and the obtained information is then transmitted to the GSM module. An alerting message is displayed on LCD and message is sent as well on the cellular phones in order to alert the people. Thus, this project is very important as it can be used for real time purpose for saving lives and property. In addition, this design combines the GSM wireless communication technology with the advanced microcontroller that causes the project to be cost-effective, reduced efforts on hardware, and has the capability to transmit message to countless people on Earth.
Index terms: *Sensors, Arduino Uno, GSM.*

I. INTRODUCTION

This paper deals with both natural as well as manmade disasters. A natural disaster is a major adverse event resulting from natural process of the Earth. Landslide monitoring is an important topic related at the hill slides. Landslide is downward and outward movement of slope forming materials composed of rocks, soils, artificial fills, or combination of all these materials along surfaces of separation by falling, sliding, and flowing, either slowly or quickly from one place to another [1]. Most of the case happens without of human awareness. Landslides are geological phenomenon causing significant loss of life and properties damages each year in many countries. Many factors contribute to landslides, they are natural factors like Gravity, Geological factors, heavy, and prolonged rainfall, and Earthquakes [2].Earthquakes are a form of wave energy that is transferred through bedrock. Motion is transmitted from the point of sudden energy release, the earthquake focus as spherical seismic waves that travel in all directions outward.The point on the Earth's surface directly above the focus is termed the epicenter. Geologists have described two different types of seismic waves: body waves and surface waves. Body waves are seismic waves that travel through the lithosphere. Two kinds of body waves exist: P-waves and S-waves. Both of these waves produce a sharp jolt or shaking. P-waves or primary waves are formed by the alternate expansion and contraction of bedrock and cause the volume of the material they travel through to change. They travel at a speed of about 5 to 7 kilometers per second through the lithosphere. The speed of sound is about 0.30 kilometers per second. P-waves

also have the ability to travel through solid, liquid, and gaseous materials. When some P-waves move from the ground to the lower atmosphere, the sound wave that is produced can sometimes be heard by humans and animals. S-waves or secondary waves are a second type of body wave. These waves are slower than P-waves and can only move through solid materials. S-waves are produced by shear stresses and move the materials they pass through in a perpendicular (up and down or side to side) direction [3].Tsunami is a series of water waves caused by the displacement of a large volume of a body of water, usually an ocean. A Tsunami is a very long-wavelength wave of water that is generated by earthquakes that causes displacement of the seafloor, but Tsunami can also be generated by volcanic eruptions, landslides and underwater explosions [1].

There is a possibility of an abrupt change in the humidity of the environment.In industries and at our home, there is a possibility of gas leakage.

This design uses seven sensors. The LM35 temperature sensor is used for collecting temperature. Angle or tilt sensor is used to sense slope angle, if there is any movement in landslide and it is used for tsunami purpose. Raindrop sensor is used to collect the depth of water at the mountains. Earthquake sensor is used for earthquake purpose. Soil drift sensor is used for landslide. If any drift or variation occurs, output of sensor will send to the Arduino Uno for further process.

Gas sensor is activated whenever there is gas leakage. If the humidity parameter exceeds, humidity sensor is activated. These all nodes of sensors are connected to the Arduino Uno for collection of data and obtain the information by LCD display as well as by SMS. This system can be used to alert people, save lives and property. Thus, this project is very important as this system can be used in our real time purpose for saving lives and property. This design combines of GSM wireless communication technology and is able to inform very quickly to the user or to the responsible authority if the sensor is activated.

II. HARDWARE DESCRIPTION

In this design a system that can alert before these disasters occur. This design uses seven sensors. The LM35 temperature sensor is used for collecting the temperature. Angle or tilt sensor, which gives the readings of slope angle if there is any movement in landslide and it is used for tsunami purpose. Raindrop sensor is used to collect the depth of water at the mountains. Earthquake sensor is used for earthquake purpose. Soil drift sensor is used for landslide. This circuit will measure the soil resistance. If any drift or variation occurs, output of sensor will send to the Arduino Uno for further process. Gas sensor is activated whenever there is gas leakage. If the humidity parameter exceeds, humidity sensor is activated. These all nodes of sensors are connected to the Arduino Uno for the collection of data. As it obtained the information at the receiver side by LCD display and by SMS, it can alert the people, save lives and property. This project is very important as it is used in real time purpose for saving lives and property. This design combines of GSM wireless communication technology and is able to inform very quickly to the user or to the responsible authority if the sensor is activated.

ARDUINO UNO:

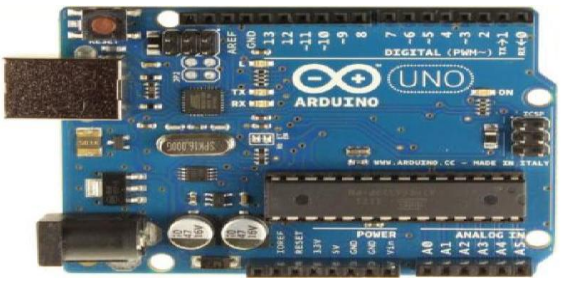


Fig:1

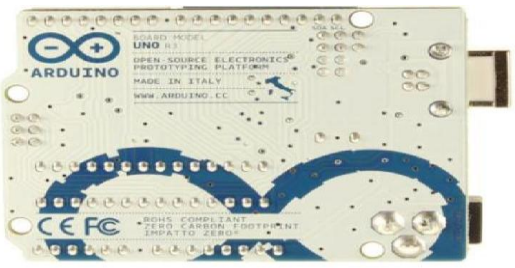


Fig:2

Overview

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

Revision 2 of the Uno board has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode.

Revision 3 of the board has the following new features:

1. 1.0 pinout: added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board. In future, shields will be compatible both with the board that use the AVR, which operate with 5V and with the Arduino Due that operate with 3.3V. The second one is a not connected pin, that is reserved for future purposes.
2. Stronger RESET circuit.
3. Atmega 16U2 replace the 8U2.

"Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the **index of Arduino boards**.

Summary

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328) of which 0.5 KB used by bootloader
SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

GSM SIM 900A:

GSM/GPRS Modem-RS232 is built with Dual Band GSM/GPRS engine- SIM900A, works on frequencies 900/ 1800 MHz. The Modem is coming with RS232 interface, which allows you connect PC as well as microcontroller with RS232 Chip(MAX232).

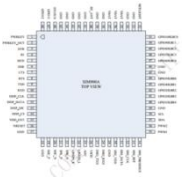


Fig:3

The baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS, Voice as well as DATA transfer application in M2M interface. The onboard Regulated Power supply allows you to connect wide range unregulated power supply . Using this modem, you can make audio calls, SMS, Read SMS, attend the incoming calls and internet through simple AT commands.

III. SOFTWARE DESCRIPTION

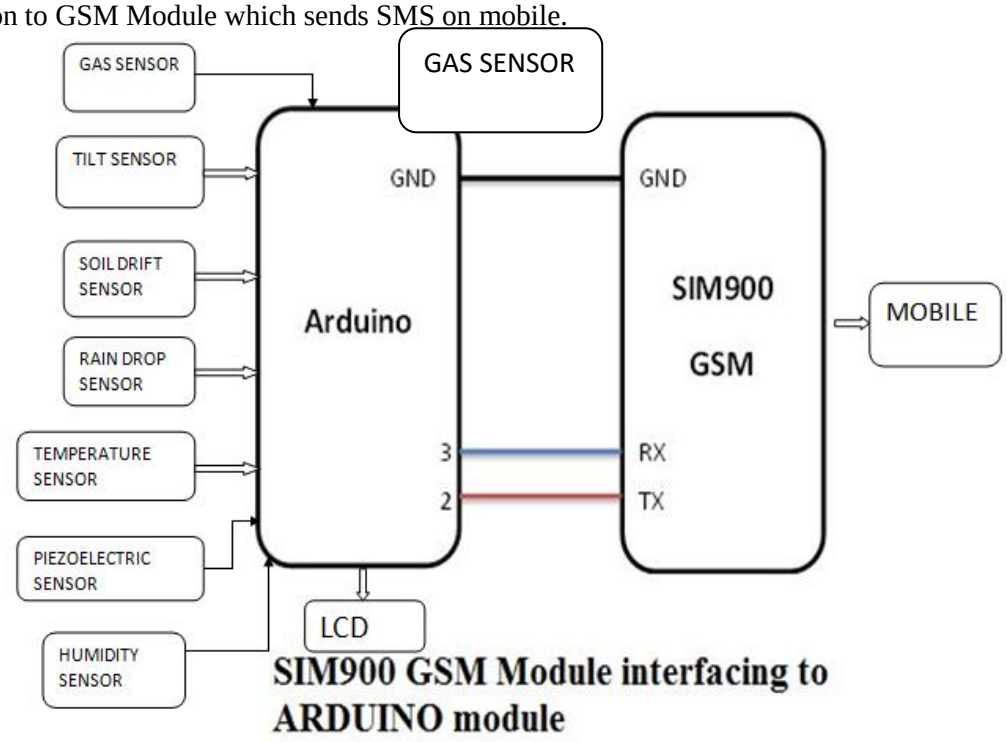
Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into more accessible package.

IV. SYSTEM ARCHITECTURE

Introduction

This design consists of five sensor,*ARDUINO UNO* and GSM module. The sensors used are tilt sensor, soil drift sensor, earthquake sensors, rain gauge sensor ,gas sensor,humidity sensor and temperature sensor. Output of sensor will send to the *ARDUINO UNO* for further process.Then the signal is transmitted to the GSM Module. These all nodes of sensors are connected to the *ARDUINO UNO* for collection of data. It obtains the information from the sensors and then displays it on LCD and gives information to GSM Module which sends SMS on mobile.



SIM900 GSM Module interfacing to ARDUINO module

Fig:4

Tilt Sensor: Tilt sensor which senses slope angle if there is any movement in landslide and it is also used for tsunami purpose. This Tilt sensor acts as a switch, switches employ a mercury bead which connects its terminals whenever it is tilted. Then mercury is being a liquid metal can flow down and establish contact between the leads of the switch in this way sensor is activated.

Soil Drift Sensor: Soil drift sensor is used for landslide. If any drift or variation occurs, output of sensor will send to the *Arduino Uno* for further process.

Earthquake Sensor: Piezoelectric sensor converts mechanical vibrations into electrical variations. Electrical pulses are undergone amplification by transistor amplifier stages.

Rain Drop Sensor: When the sensor comes in contact with the water, the 5V is passes through the water and sensor will be triggered. The sensor current will be 5mA and voltage is 2.5V. This is sufficient to trigger the sensor. In this way the sensor is activated.

Temperature Sensor: LM35 series are precision integration-circuit temperature sensors whose output voltage is linearly proportional to the Celsius temperature. The LM35 does not require any external calibration or trimming to provide typical accuracies. This is three legs IC that directly gives analog output. This unit requires +5VDC for it proper operation

TILT SENSOR:



Fig 5:

TILT SENSOR CONNECTION WITH ARDUINO:

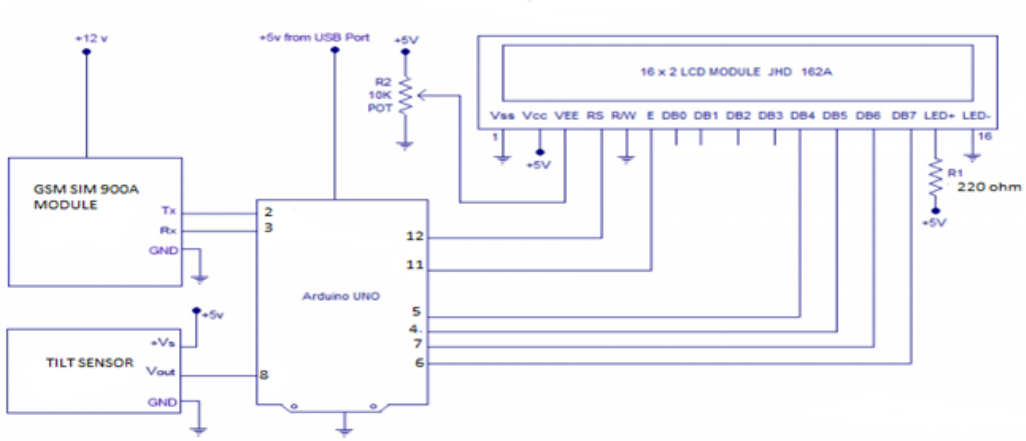


Fig:6

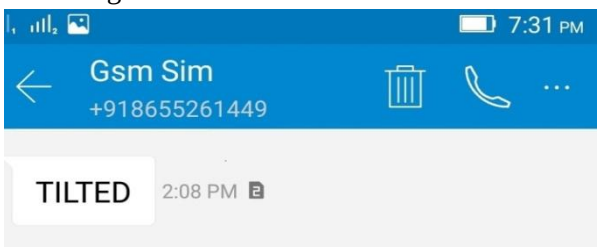
These switches employ a mercury bead which connects its terminals whenever it is tilted. Then mercury is being a liquid metal can flow down and establish contact between the leads of the switch. The blob of mercury is able to provide resistance to vibrations as mercury is a dense liquid metal.Using mercury is discouraged as it is a toxic metal and poses a potential hazard to the user when the glass casing breaks and metal spillage take place. This sensor is connected to digital pin number 8 of the *Arduino Uno.*

Tsunami and Landslide: When the tilt sensor senses any changes in slope angle, it activated and alerting message is displayed in the LCD screen as shown in the figure and it also sends SMS to the authority in the base station as shown below.

Fig 7:



Fig 8:



SOIL DRIFT SENSOR:

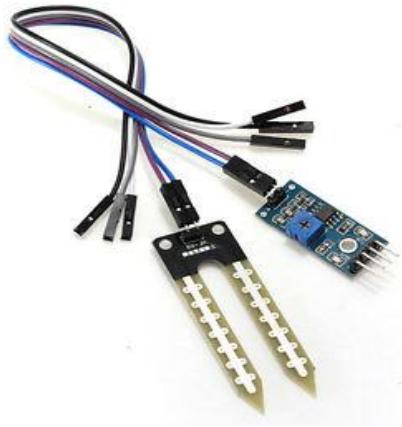


Fig:9

SOIL DRIFT SENSOR CONNECTION WITH ARDUINO:

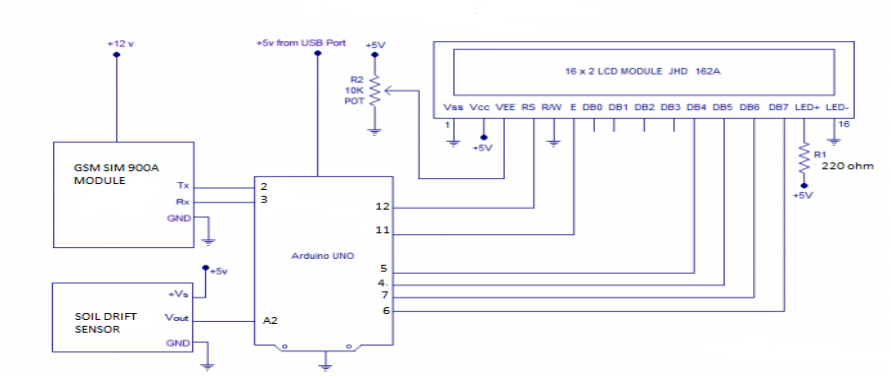


Fig:10

When soil drift sensor comes in contact with the soil, the 5V is passes through the soil and soil drift sensor will be triggered. The triggering current will be 5mA and voltage is 2.5V. This is sufficient to trigger the soil drift sensor. When sensor is triggered, then soil drift sensor gets activated. This will be applied to the *Arduino Uno*. Same circuit can be adapted to the digital and analog mode by altering the program. In analog mode, voltage varies from 0 to 4.7V linearly. Total power consumption of the circuit is 5mA to 6mA. This sensor is connected to analog pin number A2 of the *Arduino Uno*.When

the resistivity changes in the soil level, then soil drift sensor is activated and alerting message is displayed in the LCD screen as shown in the figure and it also sends SMS to the authority in the base station as shown in below figures(11& 12).



Fig 11

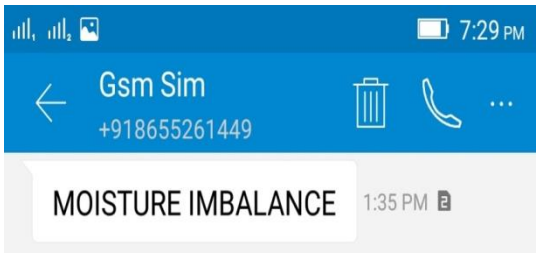


Fig 12

RAIN DROP SENSOR:

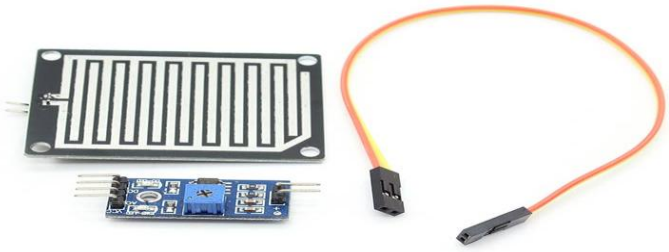


Fig:13

RAIN DROP SENSOR CONNECTION WITH ARDUINO:

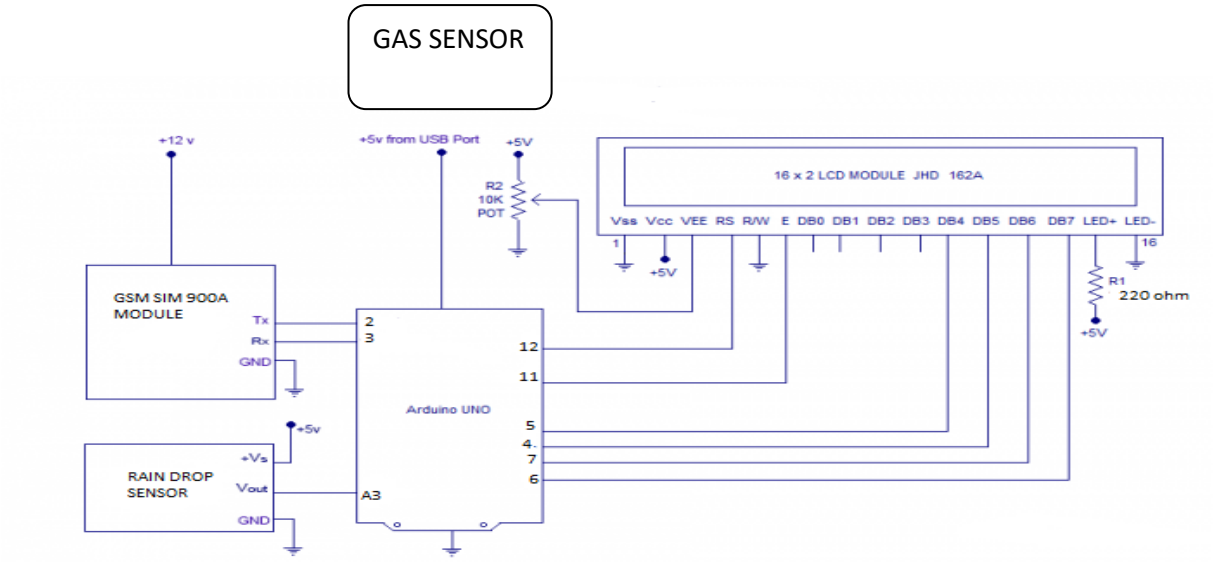


Fig:14

When rain drop sensor comes in contact with the water, the 5V is passes through the water & the sensor will be triggered. The sensor current will be 5mA and voltage is 2.5V. This is sufficient to trigger the sensor. When sensor is triggered,then rain drop sensor gets activated. This will be applied to the *Arduino Uno*. This sensor is operating in analog mode. The power consumption of the circuit is 5mA to 6mA. This sensor is connected to analog pin number A3 of the *Arduino Uno*.

Heavy Rain Fall: Intensity of the rainfall exceeds the normal range, then rain drop sensor is activated, alerting message is displayed in the LCD screen as shown in the figure and it also sends SMS to the authority in the base station as shown below.

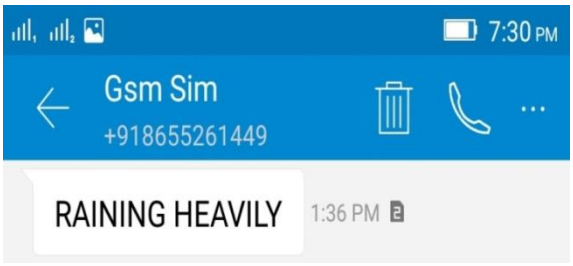


Fig:14



Fig:15

PIEZOELECTRIC (EARTHQUAKE) SENSOR:

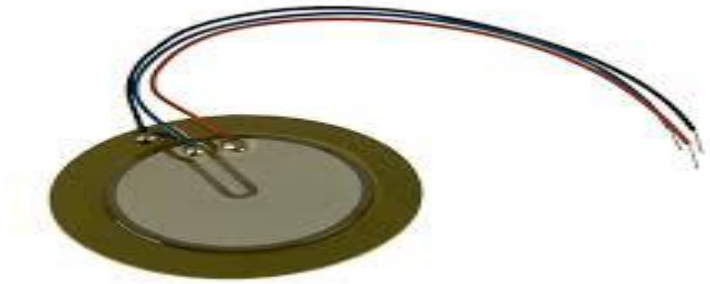


Fig:16

PIEZOELECTRIC SENSOR CONNECTED WITH ARDUINO UNO:

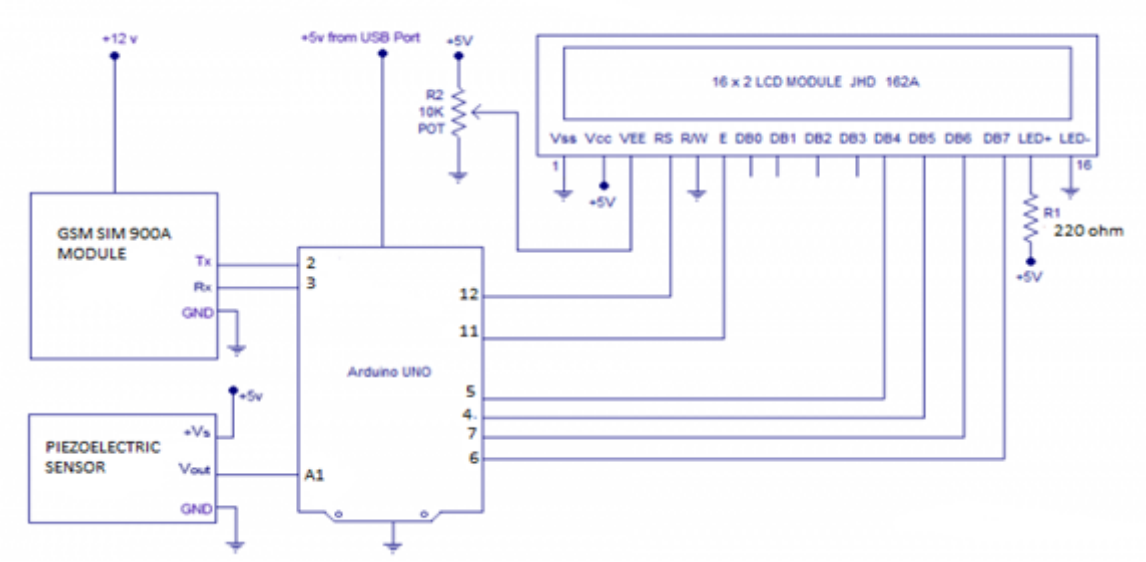


Fig:17

Piezoelectric sensor converts mechanical vibrations into electrical variations. Electrical pulses are undergone amplification by sensor amplifier stages.For demonstration a 9v battery can be used. For continuous use alarm may be powered using 9V or 12V AC adaptor. Simple unregulated supply is enough. This alarm can be used to protect car and other vehicles. Other application of this project is an earthquake warning alarm. This sensor is connected to analog pin number A1 of the *Arduino Uno*.

Earthquake: When any vibrations in the earth, then earthquake sensor is activated and alerting message is displayed in the LCD screen as shown in the figure and it also sends SMS to the authority in the base station as shown below.



Fig:18

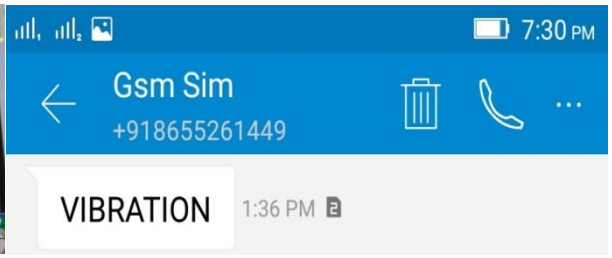


Fig:19

TEMPERATURE SENSOR:

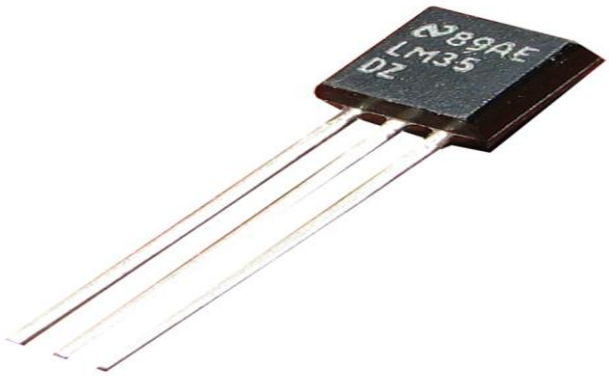


Fig:20

TEMPERATURE SENSOR CONNECTION WITH ARDUINO:

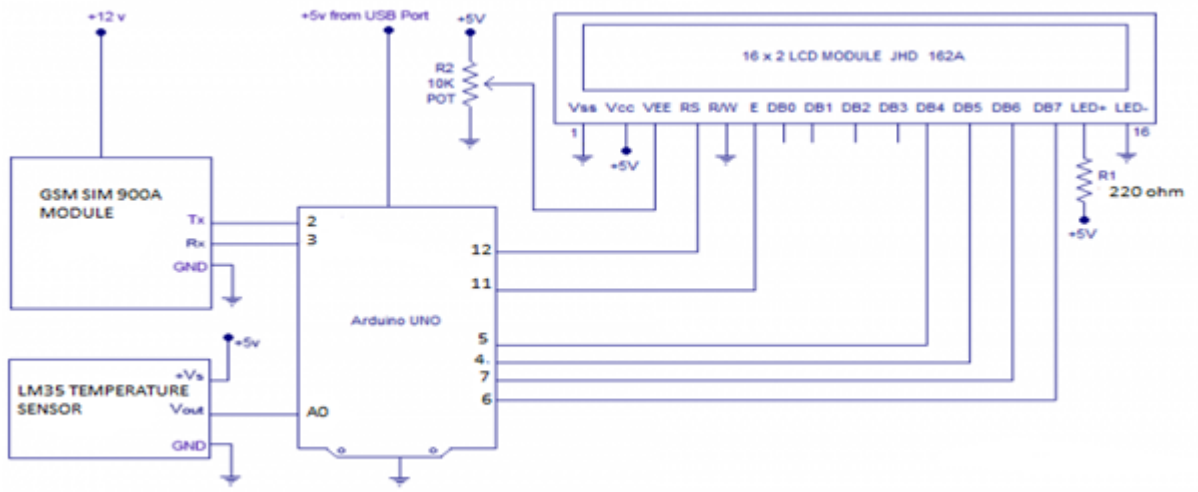


Fig:21

The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling. The LM35 device does not require any external calibration or trimming to provide typical accuracies of ±¼°C at room temperature and ±¾°C over a full −55°C to 150°C temperature range. Lower cost is assured by trimming and

calibration at the wafer level. The LM35 device draws only 60μA from the supply. It has very low self-heating of less than 0.1°C in still air. The LM35 device is rated to operate over a −55°C to 150°C temperature range, while the LM35C device is rated for a −40°C to 110°C range (−10° with improved accuracy). This sensor is connected to analog pin number A0 of the *Arduino Uno*.When the temperature exceeds more than the threshold value, temperature sensor is activated, alerting message is displayed in the LCD screen as shown in the figure and it also sends SMS to the authority in the base station as shown below.

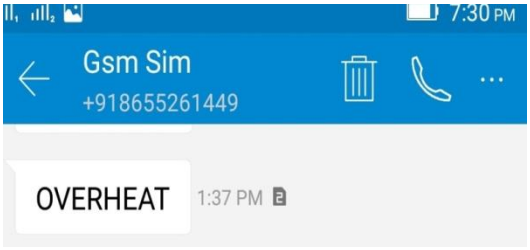


Fig:22

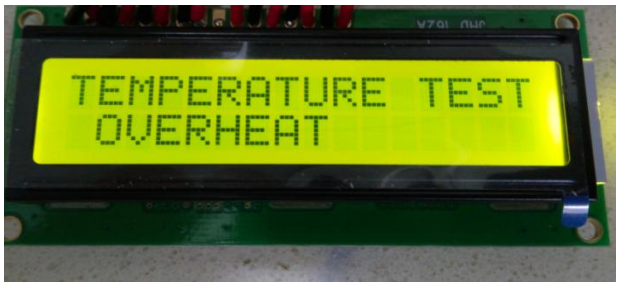


Fig:23

MQ2 GAS SENSOR:



Fig:24

GAS SENSOR CONNECTION WITH ARDUINO:

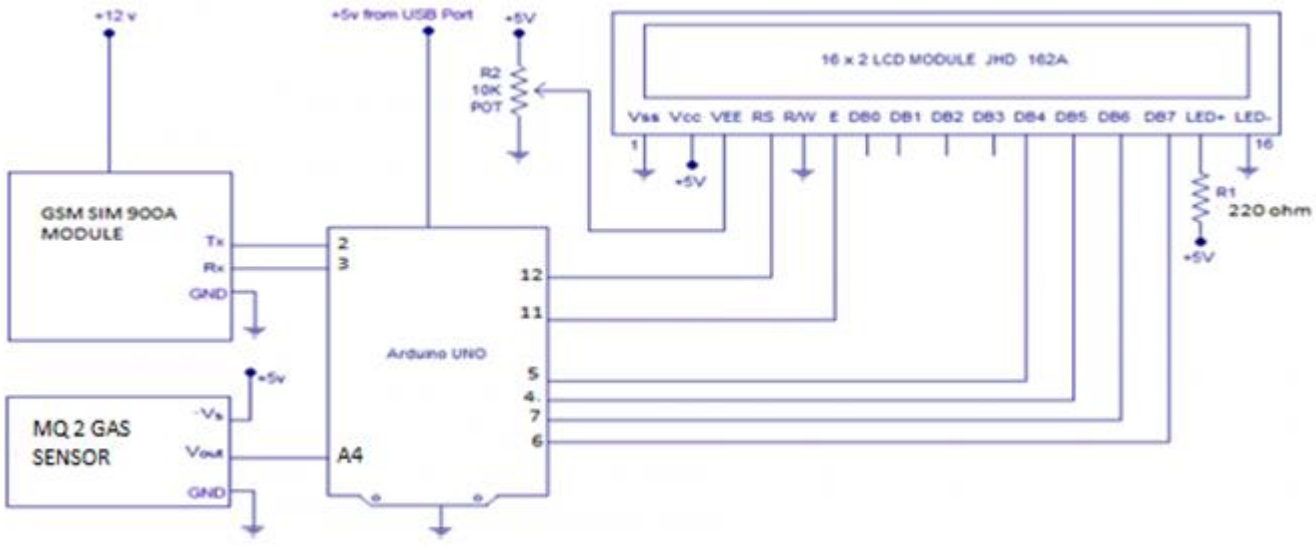


Fig:25

Working: When the target combustible gas exist, The sensor's conductivity is more higher along with the gas concentration rising. Please use simple electro circuit, Convert change of conductivity to correspond output signal of gas concentration. MQ-2 gas sensor has high sensitivity to LPG, Propane and Hydrogen, also could be used to Methane and other combustible steam, it is with low cost and suitable for different application This sensor is connected to analog pin number A4 of the *Arduino Uno*.

Features:

1. Good sensitivity to Combustible gas in wide range.
2. High sensitivity to LPG, Propane, and Hydrogen.
3. Long life and low cost.
4. Simple drive circuit.

Applications:

1. Domestic gas leakage detector.
2. Industrial Combustible gas detector.
3. Portable gas detector.

Specifications:

Parameter	Value
Gas detection	Combustible gas and smoke
Standard encapsulation	Bakelite
Concentration	300-10000ppm

GAS LEAKAGE: When there is gas leakage, then gas sensor is activated and alerting message is displayed in the LCD screen as shown in the figure and it also sends SMS to the authority in the base station as shown below.

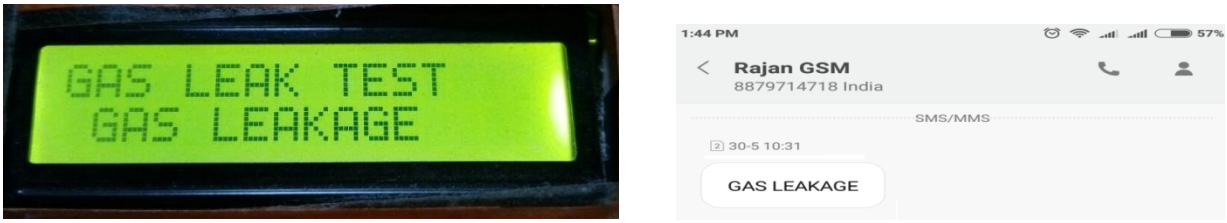


Fig:27

DHT11 HUMIDITY SENSOR:



Fig:28

MQ2 HUMIDITY SENSOR CONNECTION WITH ARDUINO:

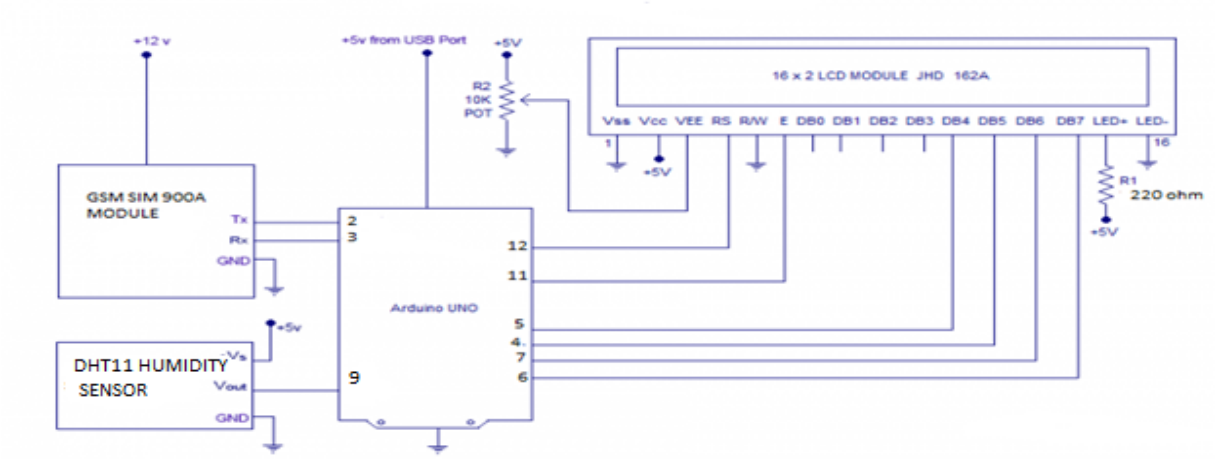


Fig:29

DHT11 Temperature & Humidity Sensor features a temperature & humidity sensor complex with a calibrated digital signal output. By using the exclusive digital-signal-acquisition technique and temperature & humidity sensing technology, it ensures high reliability and excellent long-term stability.

This sensor includes a resistive-type humidity measurement component and an NTC temperature measurement component, and connects to a high performance 8-bit microcontroller, offering excellent quality, fast response, anti-interference ability and cost-effectiveness.

Working :The DHT11 detects water vapor by measuring the electrical resistance between two electrodes. The humidity sensing component is a moisture holding substrate with electrodes applied to the surface. When water vapor is absorbed by the substrate, ions are released by the substrate which increases the conductivity between the electrodes. The change in resistance between the two electrodes is proportional to the relative humidity. Higher relative humidity decreases the resistance between the electrodes, while lower relative humidity increases the resistance between the electrodes. The DHT11 measures temperature with a surface mounted NTC temperature sensor (thermistor) built into the unit..This sensor has been connected to digital pin number 9 of the *Arduino Uno.*

HUMIDITY IMBALANCE: When there is humidity imbalance, then the DHT11 humidity sensor is activated and alerting message is displayed in the LCD screen as shown in the figure and it also sends SMS to the authority in the base station as shown below.



Fig:30

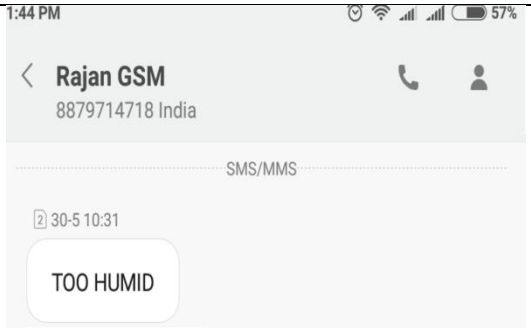


Fig:31

GSM SIM 900A MODULE:

In GSM SIM900A, the baud rate can be configurable from 9600-115200 through AT command. Initially Modem is in Auto baud mode. This GSM -RS232 Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS as well as DATA transfer application in M2M interface. The modem needed only 3 wires (Tx, Rx and GND) except Power supply to interface with microcontroller/Host PC. The built in Low Dropout Linear voltage regulator allows you to connect wide range of unregulated power supply (4.2V -13V) and 5V is in between them. Using this modem, you will be able to send SMS.GSM modem, works on frequencies 850 MHz, 900 MHz, 1800 MHz and 1900MHz. It is very compact in size and easy to use as plug in GSM Modem. The Modem is designed with RS232 Level converter circuitry, which allows you to directly interface PC Serial port.

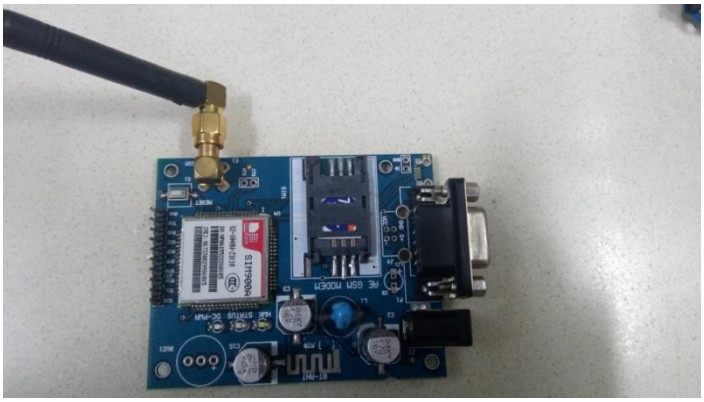


Fig:32

V. APPLICATIONS & ADVANTAGES :

Applications:

1. Landslide monitoring is an important topic related at the hill slides. For example, rocky mountain regions of the Konkan Railways, there is possibility of rock fall due to the landslide using this system.
2. This system is useful for the area where heavy rain fall occur. When sloped areas become completely saturated by heavy rainfall, many times landslides can occur.

3.This system is useful for the earthquake prone areas like Mumbai, Delhi,Kolkata, Chennai and Nepal.

4.It also includes tsunami warning system is used to detect tsunami's in advance and issue warnings to prevent loss of life and damage.

5.This system includes gas sensor which detects hazardous gases leaking from various chemical systems in laboratories or industries or gases leaking in houses.

6.It also includes temperature sensor so when temperature exceeds a certain limit,it alerts the concerned person through this system.

7.It has a humidity sensor which alerts the base station if humidity exceeds a certain value.

Advantages: Multi sensors are used for detecting the different disaster, it is one of the advantage of this system compared to other system that uses multi sensors to detect the single disaster.

Arduino Uno is used for transmitting the signal from sensors to GSM SIM Module if any parameter is exceeded. GSM module is used for sending the alerting message to the base station authority.

THE MOST IMPORTANT ADVANTAGE OF THIS SYSTEM IS THAT IT CAN SEND MESSAGE TO MORE THAN ONE PERSON USING GSM.

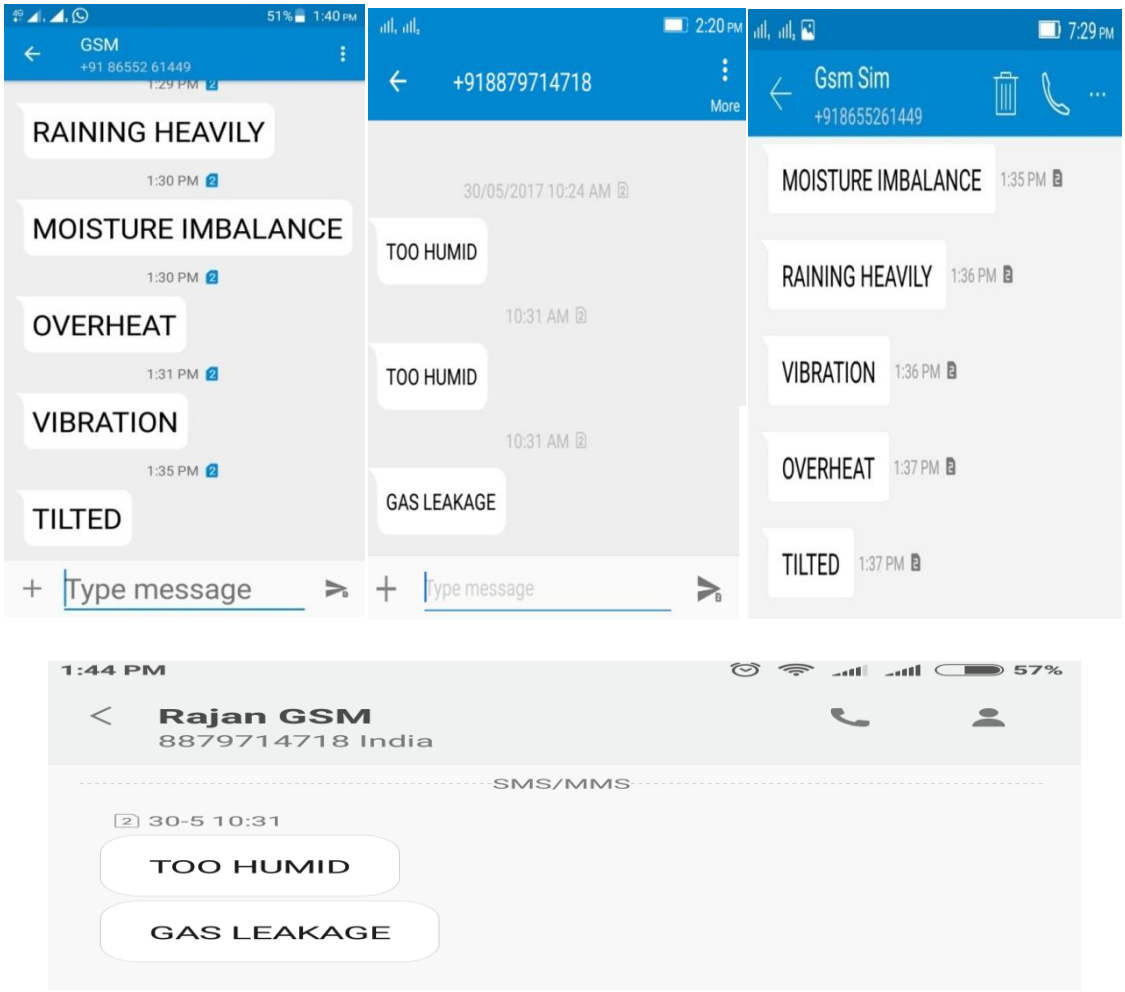


Fig: 32, 33, 34, 35

ALERTING MESSAGES TO MORE THAN ONE PERSON

VI. CONCLUSION AND FUTURE WORK:

The real time system designed for the detection of landslide, tsunami, and earthquake which have been the major hazards. This system is developed using *Arduino Uno*. The main components used in this system are sensors, GSM and *Arduino Uno*. In the proposed project, various types of real time conditions are tested. In the transmitter section, sensors are connected to *Arduino Uno*. If any sensor detected any disturbance *Arduino Uno* transmits the signal to the GSM and it display the alerting message in LCD at receiver using GSM, it can send the message to the authority in the base station. Finally, this project works as per the specification. In future, this project can be modified by sending the alerting video message to the multi users. To increase the performance of this project, the database system can be included to store the real time data.

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VIII. WEBSITES:

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[3] Tilt sensor datasheet, http://www.allsensor.com/download.pdf .
[4] http://www.micropik.com/PDF/dht11.pdf
[5]http://www.robotshop.com/media/files/pdf/dht11.pdf
[6]https://researchdesignlab.com/index.php/sensors/gas-sensor-mq2.pdf
[7]http://arduino.cc
[8]https://researchdesignlab.com/index.php/gsmsim900/gsmsim900.pdf

A MODERN STUDY OF BLUETOOTH WIRELESS TECHNOLOGY

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Abstract
A Bluetooth ad hoc network can be formed by interconnecting piconets into scatternets. The constraints and properties of Bluetooth scatternets present special challenges in forming an ad hoc network efficiently. This paper, the research contributions in this arena are brought together, to give an overview of the state-of-the-art. Simply stated, Bluetooth is a wireless communication protocol. Since it's a communication protocol, you can use Bluetooth to communicate to other Bluetooth-enabled devices. In this sense, Bluetooth is like any other communication protocol that you use every day, such as HTTP, FTP, SMTP, or IMAP. Bluetooth has a client-server architecture; the one that initiates the connection is the client, and the one who receives the connection is the server. Bluetooth is a great protocol for wireless communication because it's capable of transmitting data at nearly 1MB/s, while consuming 1/100th of the power of Wi-Fi. We discuss criteria for different types of scatternets and establish general models of scatternet topologies. Then we review the state-of-the-art approaches with respect to Bluetooth scatternet formation and contrast them.

INTRODUCTION:

Bluetooth is a networking technology aimed at low-powered, short range applications. It was initially developed by Ericsson, but is governed as an open specification by the Bluetooth Special Interest Group . Bluetooth is a recently proposed standard for short range, low power wireless communication. Initially, it is being envisioned simply as a wire replacement technology. Its most commonly described application is that of a "cordless computer "consisting of several devices including a personal computer,possibly a laptop, keyboard, mouse, joystick, printer, scanner,etc., each equipped with a Bluetooth card. There are no cable connections between these devices, and Bluetooth is to enable seamless communication between all them, essentially replacing what is today achieved through a combination of serial and parallel cables, and infrared links.However,Bluetooth has the potential for being much more than a wire replacement technology, and the Bluetooth standard was indeed drafted with such a more ambitious goal in mind. Bluetooth holds the promise of becoming the technology of choice for ad hoc networks of the future.

WHY IT IS CALLED BLUETOOTH?

The heart of the Bluetooth brand identity is the name, which refers to the Danish king Harald "Bluetooth" Blaatand who unified Denmark and Norway. In the beginning of the Bluetooth wireless technology era, Bluetooth was aimed at unifying the telecom and computing industries. Bluetooth can be used to wirelessly synchronize and transfer data among devices.

Bluetooth can be thought of as a cable replacement technology. Typical uses include automatically synchronizing contact and calendar information among desktop, notebook and palmtop computers without connecting cables. Bluetooth can also be used to access a network or the Internet with a notebook computer by connecting wirelessly to a cellular phone.

Connecting two devices via Bluetooth requires phases:

1).inquiry: This process consists of a sender broadcasting inquiry packets, which do not contain the identity of the Inquiry sender or any other information.

- Inquiry Scan: In this state, receiver devices listen for inquiry packets, and upon detection of any such packet, the device broadcasts an inquiry response packet. This contains the identity of the device and its native clock.

2) Page: When paging, a sender device tries to form a connection with a device whose identity and clock are known. Page packets are sent, which contain the sender's device address and clock, for synchronization.

- Page Scan: In this state a receiver device listens for page packets. Receipt is acknowledged and synchronization between the devices is established.

CHALLENGES IN BLUETOOTH DESIGN

The Bluetooth specifications have left several design issues open to implementation, when it comes to its use as a networking technology. The objective is to allow designers flexibility so as to cater to the individual network requirements. However for adapting the technology towards large scale deployment in adhoc networks it is imperative that there be a systematic procedure for attaining some of the most common design objectives.





ARCHITECTURE AND ITS TECHNICAL WORKING:

A simplified view of the bluetooth protocol stack is presented in figure 1.it shows the layers that correspond to the hardware and software components of bluetooth solution. On a PC or PDA the interface between the two is a physical PC bus such as a USB, compact-flash, or PC card bus. The hardware portion of the stack consists of the radio, base band controller, and link manager protocol (LMP). The LMP is used to set up and control the link and implement the bluetooth link-level security.

DESIGN OBJECTIVES :

we describe some of our design objectives in deciding how to best form Bluetooth topologies, and subsequently discuss the challenges involved in satisfying these objectives while exploiting the flexibility offered by the Bluetooth specifications. We are primarily concerned with three major objectives:

1. Connectivity,
2. Distributed operation and low overhead,
3. Throughput maximization.

CONCLUSION : This paper was intended as a brief introduction to the many challenges that the Bluetooth technology faces if it is to succeed as a technology for building adhoc networks and also gives the small description of related work that had been done in this area.. We have described many of the issues that need to be tackled and that have been left unspecified by the current standards. We identified a number of objectives that any solution should aim at meeting, and provided an initial investigation of some of these problems. This is obviously preliminary work, and we are actively

investigating many of the problems outlined in this paper. We hope that the paper will also entice others in exploring what we feel is a promising and rich research area.

ACKNOWLEDGMENTS :

This work was partially supported by Mr. Dipesh Sharma who is Reader of Raipur institute of technology. My special thanks to the Mr. Dipesh sir who have contributed towards development of this work.

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TO STUDY THE IMPACT OF CERTAIN EXTERNAL CONDITION ON SEED GERMINATION IN TRIGONELLA FOENUM- GRAECUM (FENUGREEK)

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Abstract
The Aqueous extract of spinach leaves and prawns of 1%, 5%,10% and 20% (w/v) was treated to Trigonella foenum- graecum Seeds was studied. Treated seeds shows late germination, decreased rate of germination percentage, less radical length and no plumule formation- Beginning of germination delayed more by prawn extract treatment, than Spinach leaves extract treatment. Seed germination percentage is more attested by prawn extract treatment than Spinach leaves extract treatment. Prawn extract treatment is more adverse in terms of radical growth during germination than spinach leaves extract treatment to seeds of Trigonella foenum- graecium. There is no plumle formation takes place in both treatment and prawn extract goes on increasing with increasing the concentration extracts.

Introduction-

Trigonella foenum- graecum is belonging to family fabaceac and and the plant commonly called as Fenugreek, Methi, Menthi,Ventayam, Ullipaya vittanalu, Menthulu, Maila, Methika.

Cited from http://en.wikipediaaa.org/wiki/Trigonella foenum- graecum, Fenugreek is believed to have been brought into cultivation in the Near East, It is originated in Iraq-
The larges producers of fenugreek is India.
It is used as herb, spice and vegetable. It is widely utilized in Indian cuines. Fenugreek seed are rich sources of protein, dietary fiber, Vit B, iron & several other dietary minerals. It promotes digestion,induce labour and reduces blood sugar levels in diabetics.

The germination is one of the Vital process in plant physiology. According to Raven et. Al (2005), seed germination depends study on attempt is made to study the impact of certain external conditions. On seed germination in Trigonella foenum- graecum (Fenugreek) Vegetable extract of dried prawn extract are used as external factors to observe effect on seed germination of Trigonella Foenum-graecum

Matrial and Methods

Trigonella Foenum-graecum(Fenugreek) seeds are selected for present study. Two sets of petri plates with blotting filter paper at base are taken. 10 seeds of Trigonella Foenum-graecum are placed in each petridish. Adequeate distilled waters applied o first petridish as a control. Treated petridishes are applied adequate quantity of 1% (wt/ Volume) 5%, 10% and 20% aqueous extract of Spinach leaves.
The experiment is repeated as it is for second time. The observation of both experiment are considered as average.
Similaty, apply 1%,5%,10%, and 20% aqueous extract of dried prawns to 2 replicas of 4 petridishes with 10 seeds of Fenugreek each.
The control reference kept common.

The germination of seeds is treated as one of the important criteria to study the impact of vegetable extract on Fenugreek. From first day of experiment up to 10th day, the number of seeds (out of 10) undergone germination were observed, Similarly the radical length is also treated as another parameter for study of treated and control seed germination.

Average plumule length formation on 10th day of germination is considered as another mean to find impact of vegetable extract and non vegetable extract on seed germination process in Fenugreek

Results and Discussion-

Table I- A) Effect of Spinach leaves extract on Emergence of seeds of Trigonell foenum - graecum

Treatment (spinach leaves extract)	Number of seeds germination per days									
	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day
Control	0	8	10	10	10	10	10	10	10	10
1%	0	2	8	8	8	8	8	8	8	8
5%	0	3	8	8	8	8	8	8	8	8
10%	0	1	1	1	1	1	1	1	1	1
20%	0	0	0	0	0	0	0	0	0	0

Table I-B effect of spinach leaves (vegetable) extract on germination percentage in seeds of Trigonella Foenum-graecum.

Treatment (spinach Leaves Extract)	Germination Percentage per day /s									
	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day
Control	0%	80	100	100	100	100	100	100	100	100
1%	0%	20	80	80	80	80	80	80	80	80
5%	0%	30	81	80	80	80	80	20	80	80
10%	0%	10	10	10	10	10	10	10	10	10
20%	0%	0	0	0	0	0	0	0	0	0

Table I-C Effect of spinach leaves extract on radical (Root) length in Trigonella foenum graecum.

Treatment Spinach Leaves extract	Average radical length in cm 10th day of treatment
Control	0.5cm
1%	0.2cm
5%	02cm
10%	0.1cm
20%	00 cm

Table I- D) Effect of Vegetable extract (spinach leaves extract) on plumule (shoot) length during seed germination of Trigonella foenum- gracum.

Treatment (spinach Leaves extract)	Average plumule (shoot) length in cm on 10th day of germination.
Control	0.4 cm
1%	0.1 cm
5%	0.1 cm
10%	0. cm
20%	0.

Table I-A, I-B, I-C and I-D shows germination of Fenugreek seeds from day one to day 10 in control and Spinach extract treated seed germination at 1%, 5%,, 10% and 20% concentration, average radical length and average plumule on 10th day of experiment.

From table I-A it is clear that the germination started on second day in control and 1% spinach treatment & 5% spinach treatment. In 10% spinach extract spinach extract treatment, the germination started on second day. While in 20% spinach extract treatment, there is no germination occur. It means the spinach extract treatment shows late germination. It delays the seed germination in Trigonella foenum- graecum.

The seed germination percentage from first day to tenth day is also seen in Table I-B in Fenugreek under controlled and treated conditions. It is observed that seed germination is 100% in control on Third day of germination. In 1% spinach treatment, it is 80% germination while in 5% spinach treatment and it is 10% on third day of germination. The 20% spinach treatd seed of Trigonella foenum graecum not shows any germination percentage even on third day of germination. It shows that rate of germination is more in control while rate of germination percentage is less in spinach leaves extract treated seeds in Trigonella foenum graecum. The rate of germination percentage goes on decreasing as the concentration of Spinach leaves extract treatment goes on increasing.

The table I-B shows the 100% seeds germination in control seeds of Fenugreek on 10th day while 80%, 80%,10% and 0% seed germination rate in 1%,5%, 10% and 20%n Spinach leaves extract treated seeds respectively. It means the rate of seed germinations less in spinach leaves extract treated leaves as compares to control.

From the table- I-C it is clear that average radical length is 1. Cm.In 1% Spinach leaves treated seeds it is 0.2 cm, it is 0.2 cm, 0.1 cm and 0 cm in 5%, 10%,20% Spinach leaves extract treated seeds of Trigonella foenum graecum respectively. It is clear from these observations that average radical length is affected due to spinach leaves extract treatment. The effect goes on increasing as the concentration of spinach leaves extract also goes on increasing.

The shoot length i.e plumule length of control and treated seeds during germination on 10th day of treatment is shown in Table I-D.

It is observed that the plumule formation is only seen control seeds of Trogonella foenium graecum as compared to spinach leaves extract treated

seeds it means the treatment of Spinach leaves extract shows adverse effect on the plumule formation during germination in Trigonella Foenum graecum.

- Table II- A Effect of Prawn extract on emergence of seeds of Trigonella foenum graecum.

Treatment (prawns extract)	**Number of seeds germination per days**									
	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day
Control	0	8	10	10	10	10	10	10	10	10
1%	0	2	3	3	3	3	5	5	6	6
5%	0	0	0	0	0	0	1	1	1	1
10%	0	0	0	2	2	2	2	2	2	2
20%	0	0	0	0	0	0	0	0	0	0

The Table II- A shows the effect of prawns extract on the seed germination in Trigonella foenum graecum. It is seen from observation that the seed germination started in control seeds on second day of experiment. The seed germination started on 2nd day of treatment in 1% prawns extract treated seeds. The seed germination started on 7th day of treatment in 5% prawns extract treated seeds. The seed germination started on 4th day of treatment in 10% prawn extract treated seeds. In 20%

prawn extract treated seeds, the seeds germination does not takes place even on 10th day of germination. It means the beginning of seeds germination is affected due to the treatment of prawn extract. It is further added that the delay in beginning of seed goes on decreasing as the concentration of prawn extract treatment goes on increasing.

Table II- B Effected of prawn Effected on germination percentage of seeds of Trigonella foenum gracum.

Treatment (prawns extract)	**seeds germination percentage per days**									
	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day
Control	0	80	100	100	100	100	100	100	100	100
1%	0	20	30	30	30	30	50	50	60	60
5%	0	0	0	0	0	0	10	10	10	10
10%	0	0	0	20	20	20	20	20	20	20
20%	0	0	0	0	0	0	0	0	0	0

Table II – B shows the effect of percentage on concentration of prawn extract of seed germination Trigonella foenum graecum. From these observations it is clear that the seed germination percentage goes on increasing from first to tenth day of germination in control seeds. It is 100% rate of germination of 3rd day of treatment. The rate of germination is only 60% in 1% prawns extract treated seeds on 10th day. It is 10% and 20% rate of seed germination in 5% and 10% prawns extract treated seeds on 10th day of treatment. However, in 20% prawn extract treatment, the seed germination rate is nil even on 10th day of experiment. It means the rate of seeds germinationis affected by prawn extract treatment in Trigonella foenum graecum. The effect goes on adverse as the concentration of prawn extract goes on increasing .There is no germination percentage at all in Trigonella foenum graecum.

Table II- C. Effect of Prawn Extract on radicle (root) length in Trigonella foenum graecum.

Treatment Prawn Extract	**Average radical (shoot) length in Cm on 10th day of treatment.**
Control	0.5 cm
1%	0.1cm
5%	0.1cm
10%	0.1cm
20%	0 cm

Table II- C shows the average radicle length of seeds in Trigonella foenum graecum on 10th day of germination in control and prawn extract treated seeds. It is clear from table II-C that the average root length (radicle) is 0.5cm in control seeds as on 10th day of germination. It is 0.1 cm, 0.1cm and 0.1cm in 1%, % and 10% prawn extract treated seeds while there was no radical formation in 20% prawn extract treatment goes on increasing as the concentration of prawn extract treatment goes on increasing from 1% to 20%.

Table II- D- Effect of Prawn Extract on Plumule (shoot) length during seed germination of Trigonella foenum graecum.

Treatment Prawn Extract	**Average plumule (shoot) length in Cm on 10th day of treatment.**
Control	0.4 cm
1%	0
5%	0
10%	0
20%	0 cm

Table II-D shows effect of prawn extract treatment on Plumule (shoot) formation in seeds of Trigonella foenum graecum. It is clear that Table II-D shows the length of plumule is 0.4cm in control

seeds. There is no plumule formation in 1%, 5%, 10% & 20% prawn extract treated seeds. It means there is inhibiting effect of prawn extract treatment on plumule formation in seeds of Trogonella foenum graecum. When observation of table I-A and Table II- A are compared, it is found that seed germination begins on 2nd day in control of Trigonella foenum graecum. The 1% spinach leaves extract treated seed show beginning of germination on 2nd day and 1%,5%,10% &20% spinach leaves extract treated seeds shows beginning of germination on 2nd day of treatment. However, in 1%, 5%, 10% and 20% prawn extract treated. Seeds of Trigonella foenum graecum shows beginning of germination on 2nd,7th& 4th day and no germination respectively. It means beginning of germination delayed more by prawn extract treatment than the Spinach leaves extract treatment on seed of Trigonella foenum graecum.

Comparative account of Table I- B and Table-II-B shows that germination percentage of, control seeds of Trigonella foenum graecum is about 100% on 10th day of treatment.While it is 80%, 80%, 10% and 0 in 1%. 5%, 10% and 20% spinach leaves extract treatment seeds. It is 60%, 10%, 20% and zero in 1%, 5%,10% and 20% prawns extract treated seeds. It means seed germination percentage is more affected by prawn extract treatment than spinach leaves extract treatment.

From Table I-C and Table II-C, it is observed that the radical length is maximum (0.5) cm in control seeds of Trigonella foenum graecum. The length of radicle is 0.2cm ,0.2cm and 0.1 and 0 in 1 %, 5%,10% & 20% Spinach leaves extract treated seeds during germination on 10th day of treatment .The length of radical is 0.5 cm, 0.1cm ,0.1cm and zero cm in 1%, 5%, 10% and 20% prawn extract treatment is more adverse in terms of radical growth during germination than Spinach leave extract in seeds of Trigonella foenum graecum.

Table I – D and Table II – D comparative account shows that the shoot formation in control, however there is no shoot (plumule) formation in either spinach leaves extract treated seeds or prawn extract treated seeds of Trigonella foenum graecum. It means either spinach leaves extract treatment or prawns extract treatment affect on the plumule (shoot) formation.

Analia perello, Martin Gruhlke & Slusarenko (2013) published a research paper. In this paper the effect of Garlic extract on seed germination of wheat seeds. This study confirmed that natural mycoflora present in wheat grain was capable of negatively influencing seeding growth. When treatment with garlic juice containing allicin. It results in reduction of infection. Seeds treated with garlic juice had a relatively better germination percentage.

In may 2005 plant ecology Laboratory of the Department of crop Botany, Bangladesh, Investigate the effects of water soluble extracts from different parts of Banana plant on seed germination and seeding growth of some vegetable crops. The test crop were lettuce, radish, cycumber, ribbed gourd, bean & okra.

Among the extracts from different parts of banana plant, extract from rhizome showed strongest inhibition on the seed germination & seedling growth of the test crop. The test plant species responded differently to the rhizome extract and lettuce seedlings were found most sensitive.

***Ziaebrahimi L,et.al. pak J Biol Sci 2007**

In this, research paper showed that effects of water extracts of eucalyptus leaves examined on germination and growth of three wheat cultivar seeds and seedling. Results showed that- germination percentage strongly decreased leaf and root lengths also affected and dry & wet weights of both roots and shoots showed similar change patterns. Activity of polyphenoloxidases increased only in one of three cultivars and again roots showed more activity of this enzyme is response to eucalyptus extract.

Licx, et at. J Environ Sci. (china).2007

The effect of Arsenic (AS) were investigated on seed germination, root & shoot length and their biomass and some other factors to elucidate the toxicity of As, the results indicated **AS** could exert harmfulness in the early development stage of wheat at inappropriate concentration.

An J, et al. Chemosphere.2009

Biochemical responses of wheat (Triticum aestivum) seeding stressed by two typical personal care products- Triclosan (TCS) and gallaxolide (HHCB). The results showed that wheat shoot and root elongation was significantly inhibited by 50-250 mg L(-1) TCS and HHCB. Wheat roots were sensitive to TCS, while shoots were sensitive to HHCB.

Similarly, an attempt is made to study the impact of certain external conditions on seed germination of Trigonella foenum graecum.

E.A Grant, W.G. Sallans

June 1964, contribution No.129, Research station Canada.

Seeds of four legumes and four grasses were germination in the presence of aqueous extracts of the same species, using distilled water as a check. Based on the extract number of significant reactions to the extract, the species may be classified in the following order of decreasing inhibition- alfalfa, bird foot trefoil, ladino clover,, Red clover , reed canary grass, brome grass , timothy and orchard grass . Alfalfa and timothy were the species least affected by thee extracts while reed canary grass was the most susceptible.

With the exception of alfalfa, extracts of aerial partions of the plants had greater inhibilitory effects than root extracts.

Effect of scientist. net Atto. Allelopathic Effects of asian Journal of plant Sciences Volume 3(4):472-475, 2004 Izzet Kadiioglu and Yusuf Yanar

This study examined the effects of extracts of plants, mostly weeds, Also chemical compounds in extract having significant positive or negative allelopathic effects on other plants, should be studies in detail for their specific effects on plant growth.

- S.Roy, M. Asaduzzamn, M.H.R. Pramanik and A.K.M.A Prodhan (2006)

  In this paper, the effect of Banana plant extracts revealed a significant inhibition on seeds germination and seedling growth of lettuce and the degree of Inhibition increases of extract concentration.

  Rhizome extract strongly delayed and inhibited the germination of lettuce.

- M.A.I. Talukdaz. M.Rahman, B.roy & K.C Saha.

  In this paper the effects of aqueous extracts of different herbal plant leaves on he germination of selected vegetables are studied. A significant effect of aqueous extracts was found on the germination of vegetables throughout the growing period. In Trnip and Ladies finger it found to be maximum.

- M.S.A. Mamun and M. Shahjahan (2011) Agri. Res 364):733-739-

  An experiment was conducted to determine the effect of some indigenous plant extracts on the germination of wheat seeds. This study showed that the seeds treated with plant materials did not adversely affect the seeds germination.

- According to chang Naihang (1996), the effect of vermicompost of Salvinia, Eichorinia, chromolaena and Parthenium on percentage of seed germination, shoot and root length and wet and dry weight of wheat are measured Regarding that it has conducted that, the lower concentration of Vermicompost extract enhances the root length, shoot length, number of roots and wet and dry weights of seedlings in all the wheat seeds fasted.

- Eckhard Koch, Steven J, Roberts (2014) JKI, Institute for Biological control, Department Germany.

  The Paper gives an overview of approaches that have been taken to utilize the non-chemical methods for control of important seed born pathogens of vegetables and small grain

cereels. The treated plant include bacterial fungal diseases and viral diseases, which be controlled in seeds.

- Alice D. Rao A.V 1986. Antifungal effects of plant extract on Drechslera oryzac in rice int. Rice Res. Newsl. 12(2):28

  In this research the percent reduction in seed born infection of target pathogenic fungi recorded in mungbean seeds were treated with five different treatments. All treatments were found to significantly reduce the occurrences of seed born fungi but did not completely control them. Plant extract s have played a significant role in the inhibition of seed borne pathogens such as fuzarium oxysporum and in the improvement of seed quality and emergence of seed embryo.

- Rishi P. Singh, K. Raja Reddy, in Advances in Agronomy,2015

  This research shows the seed treatment technology in which it revealed that by using specific products and specific techniques can improve the growth environment for the seed, seedling and young plant. The seed is dressed with either a dry formulation or wet treated with a slurry or liquid formulation of the seed treatment chemicals.

- Md. Zahangir Alam, Islam Hamim, MA Ali, A. Ashratuzzaman, Bangladesh Agricultural University (BAU) (2014)

  The result of the present investigation showed that, seed treatment with different physical, chemicals, biological and botanical agents especially Biofungicide, allamonda leaf extracts neem leaf extracts and Chitosan Solution is useful to prevent germination failure, to produce healthy, disease free and morphologically strong seedling and to promote production of vigorous seedling.

CONCLUSION-

Aqueous extract of Spinach leaves and prawns of 1%, 5%,10% and 20% (w/v) was treated to Trigonella foenum seeds was studied. Treated seed shows late germination, less radical length and no plumule formation. Beginning of germination delayed more by prawn extract treatment than Spinach leaves extract treatment. Seed germination percentage is more affected by prawn extract treatment to seeds of Trigonella foenum graecum. There is no plumule formation takes place in both treated seeds during germination. The adverse effect of Spinach leaves extract treatment and prawn extract goes on increasing with increasing the concentration extracts.

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Effect of personal care product am seeds germination

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EFFECT OF PLANT SOURCE EXTRACT AND ANIMAL SOURCE EXTRACT ON SOME OF VITAL PROCESS IN HORSE GRAM SEED

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Abstract
To study the seed germination of Horse Gram under the aqueous extract of plant and animal origin of 1%, 5%, 10% and 20% concentration are used. The germination of seeds per day percentage of germination, average radical length and average plumule length in cm are parameters under study. The germination is more in control than treated seeds. Either plant extract or animal extract treatment is non stimulating and harmful to germination process in general. The effect of animal extract is very harmful than the plant extract treatment. Seed germination percentage is more in control than treatment. The seed germination percentage is more affected in aqueous extract of animal origin than plant origin. In both the treatment as the concentration increases. The maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin average radical length is affected due to the treatment. The treatment of aqueous extract of prawn is more is destructive than the aqueous extract of spinach. There is adverse effect of aqueous extract of plant origin (spinach) and prawn on average plumule growth of Horse Gram seeds. Amongst the both treatment, aqueous extract of plant origin (spinach) shows less harmful.

INTRODUCTION -

Horse Gram Seed belongs to family fabaceae. It is annual plant are a type of pulse with one seedpod containing two or three peas. It has white flowers with blue, violet, or pink veins. Desi chana has small, darker seeds and a rough coat. Desi means 'country' or 'local' in Hindustani.

Horse Gram seed are having great nutritional values. According to Jukanti AK (2012), Gram seed are a nutrient-dense food, providing rich content (20% or higher of the Daily Value of protein , dietary fibre, folates and certain dietary minerals such as iron and phosphorus [1,2] Thiamin, vitamin B_6, magnesium, and zinc contents are moderate, providing 10–16% of the DV. Horse gram seeds have a Protein Digestibility Corrected Amino Acid Score of about 0.76, [3] which are higher than many other legumes and cereals.

Proteins in cooked and germinated Horse gram seeds are rich in essential amino acids such as lysine, isoleucine, tryptophan, and total aromatic amino acid [4] this reference given by United Nations Food and Agricultural Organization [1]

Horse gram is the most protein-rich lentil found on the planet. The seeds have twice the protein content as of cereal grains. Mean protein value of horse gram seeds is almost equivalent to winged bean (Psophocarpus tetragonolobus), gram (Cicer arietinum) and soybean (Glycine max) [5,6].

Horse gram has the highest calcium content among pulses. As a legume, Horse gram is deficient in methionine and tryptophan, though it is an excellent source of iron and molybdenum [7,8]. Germination of Gram seed improves protein digestibility, although at a lower level than cooking. Germination degrades proteins to simple peptides, so improves crude protein, nonprotein nitrogen, and crude fiber content [1].

Horse Gram seed are having great medicinal values. Its leaves have a significantly higher mineral content than cabbage and spinach [9]. According to Pittaway, JK; Robertson[10]. Preliminary research shows that Gram seed consumption may lower blood cholesterol [11,12]

Horse Gram seed flour (Besan) is used as a batter to coat vegetables before deep frying to make Pakoras. The flour is also used as a batter to coat vegetables and meats before frying, or fried alone such as panelle (little bread), a Horse gram seed fritter from Sicily. Horse gram seed flour is used to make the Mediterranean flatbread socca and called panisse in Provence, southern France. It is made of cooked Horse gram seed flour, poured into saucers, allowed to set, cut in strips, and fried in olive oil, often eaten during Lent. In Tuscany Horse gram seed flour (farina di ceci) is used to make an oven baked pancake: the flour is mixed with water, oil and salt. Horse gram seed flour known as Kadlehittu in Kannada is used for making sweet dish Mysorepak. Horse gram seeds are roasted, spiced, and eaten as a snack, such as leblebi.

Some varieties of Horse gram seeds can be popped and eaten like popcorn. Horse gram seeds and Bengal grams are used to make curries and are one of the most popular vegetarian foods in South Asia and in diaspora communities of many other countries served with variety of breads or steamed rice. Popular dishes in Indian cuisine are made with Gram seed flour, such as Mirchi Bada and mirapakaya bajji. In India, as well as in the Levant, unripe Horse gram seeds are often picked out of the pod and eaten as a raw snack and the leaves are eaten as a leaf vegetable in salads

The scientists made a comparative analysis between horse gram seeds and their sprouts and found that the seeds would have greater beneficial effects on the health of hyperglycemic individuals. Dr. Ashok Kumar Tiwari, Principal Scientist and lead author of the study said increased consumption of highly processed foods was contributing to spiked levels of blood glucose and lipid levels. He said South Asians consume more carbohydrates, and the introduction of polished white rice has contributed to increased levels of blood sugar among them .According to Gupta et al.,[13]

The seeds of M. uniflorum are used to prepare drugs such as Kulatthadi Pralepa (paste), Kulatthadi Gruta (ghee), Kulattha Yusha, Dhanyamla (sour gruel) and Dantimuladi Kwatha [14,15]. Acoording to Kumar, et al. [16] demonstrated that Gram seed extracts have strong activities against hypercholesterolemia and obesity

Powder of baked seed is rubbed over the body to manage excessive perspiration. Poultices of seeds are used to induce sweating. Paste of seeds is applied over the skin to enhance complexion. Paste of seeds is also applied for the goiter and mumps [17].

According to Kawsar, et al. [18], Ram, et al. [19] and Gupta, et al. [20] extracts from Gram seeds had shown significant activity against Bacillus subtilis, Staphylococcus aureus, Escherichia coli and Pseudomonas aeruginosa [18-20].

However, there are no scientific studies on the influence of aqueous extract of plant origin and animal origin of varying concentration on seed germination in Gram seed. Miransari and Smith (2014) said that seed germination is an important process affecting crop production, and is influence by range of factors, including enzymes and hormones [21]. Seed germination is simple and non destructive technique for measuring plant biochemical growth and development (Wood and Roper 2000) .Therefore seed germination, germination percentage, radical length and plumule length are consider for understudy[22] .

The number of Horse Gram seed germinate per day, germination percentage of seed, radical length and plumule length on 10^{th} day are the parameters consider to study.

The treated petri dishes (6^{th}, 7^{th}, 8^{th} and 9^{th}) with 10 seeds of Horse Gram each treated with adequate amount of aqueous extract of prawn of 1%, 5%, 10% and 20% for 10 days to study the seed germination of Green pea .The germinate per day, germination percentage of seed and plumule length on 10^{th} day of treatment are parameters consider for study

The entire process repeated for next 10 days. The observation is taken as an average of both the replicas.

MATERIAL AND METHOD -

Green pea are collected placed ten each set of 9 Petri dishes. Each Petri dish is placed with normal blotting paper at bottom. First Petri dish is treated as control. It is poured with adquate distill water daily. Next four petridish are treated with adequate amount of aqueous extract of plant (spinach leaves) remaining four petridish are poured and treated with adequate amount of aqueous extract of animal origin (dried prawn). The contoll and treated petridishes with 10 each Gram seed are under 10 day's observation. It was to study the seed germinaion of Gram seed under the aqueous extract of plant and animal origin.

For aqueous extract of plant origin preparation weight to volume ratio is consider for 1gm aqueous extract of plant origin , 1 gm fresh spinach leaves homogenised with 100 ml distill water .The conten filter through the normal filter paper . The filterate is used as 1gm aqueous extract of plant origin, similarly 5gm, 10gm and 20gm aqueous extract of plant origin is prepared daily freshly. Thus 1gm, 5gm, 10gm and (w/v) concentrated aqueous extract of plant origin is prepared.

For aqueous extract of animal origin preparation, weight to volume ratio is considered for 1gm aqueous extract of animal origin, 1 gm of dried prawn homogenised with 100 ml distill water. The content is filter through normal filter paper. The filterate is used as 1% aqueous extract of animal origin. Similarly 5gm, 10gm and 20gm aqueous extract of animal origin prepared daily freshly. Thus 1gm, 5gm, 10gm and 20gm (w/v) concentrated aqueous extract of lant origin is prepared .

The petri dish of Green pea tread with aqueous extract plant origin and of 1gm, 5gm, 10gm and 20gm for 10 days to observe seed germination of Gram seed.

RESULT AND DISCUSSION:-

Table 1. Number of seed germination 1 day of Gram seed due to treatment of aqueous extract of plant and animal origin.

Petri dish Number	**Treatment**		**Number of seed germination/ day.**									
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
1	Control	1	2	2	5	6	6	9	10	10	10	10
2.	Spinach Extract (veg)	1%	1	2	2	3	5	7	7	10	10	10
3.		5%	2	2	4	6	6	6	7	7	7	7
4.		10%	2	2	2	3	3	4	5	5	5	5
5		20%	0	0	0	0	0	0	0	0	0	0
6	Prawn Extract (Non-veg)	1%	0	2	2	3	4	6	8	10	10	10
7.		5%	0	0	0	1	1	2	2	3	4	4
8.		10%	0	0	0	0	0	1	1	2	2	2
9.		20%	0	0	0	0	0	0	0	0	0	0

From Table-1, it is clear that the germination of seeds of Gram starts on first day in control. There is germination start on first day in 1% of plant extract and there is no germination on animal extract. Germination of seed increases on day to 10^{th} day. Maximum germination of nine seeds on 10^{th} day in control as well as 1%, 5% and 10% respectively .The 20% animal extract (prawn extract) treated seeds not shows any germination even on 10^{th} day. In 5%, 10%, 20% plant extract treated seed germination is less as compare to the control. Similarly in 5%, 10% prawn extract treated seeds the germination of seeds is very less. In case of 20% it is almost non-significance.

From Table-1 it is clear that the number of seeds germination third to nine days in control and 1% plant extract treated seeds that 1% plant extract shows more germination than control seed. it may conclude that 1% plant extract stimulates the germination in Gram seed.

The overall conclusion from discussion is to draw as the germination of seed of Gram is more in control than treated seed. It means either plant extract treatment or animal extract treatment is non stimulating and harmful to germination process, except the 1% plant extract. The effect of animal extract is very harmful than the plant extract treatment.

Table-2. Seed germination percentage of Horse Gram seed after treatment of.

Petri dish Number	Treatment		Number of seed germination/ day.									
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
1	Control	1	20	20	50	60	60	90	100	100	100	100
2.	Spinach Extract (veg)	1%	10	20	20	30	50	70	70	100	100	100
3.		5%	20	20	40	60	60	60	70	70	70	70
4.		10%	20	20	20	30	30	40	50	50	50	50
5		20%	00	00	00	00	00	00	00	00	00	00
6	Prawn Extract (Non-veg)	1%	00	20	20	30	40	60	80	100	100	100
7.		5%	0	00	00	10	10	20	20	30	40	40
8.		10%	00	00	00	00	00	10	10	20	20	20
9.		20%	00	00	00	00	00	00	00	00	00	00

Seed germination percentage of Gram seed after treatment of aqueous extract of plant and animal origin is seen in Table 2. It shows the seed germination percentage per day up to ten days of experiment for control and treated conditions from the table. It is clear that seed germination percentage maximum on 10^{th} day of treatment in control aqueous plant extract treated as well as animal extract treated seed in control. The seed germination percentage is 20 on 2^{nd} day. However it is interested to note that it is zero percentage in both treatments. It is 50% in control while 90% and 80% in 1% and 5% plant extract treatment seeds. It seems to stimulating effect of plant extract on germination percentage. The seed germination percentage is 50% and 0% on 10^{th} day in 10% and 20% plant extract treatment respectively. In aqueous extract of plant origin it is hardly 70%, 60%, 40% and 0% in 1%, 5%, 10% and 20% treatment respectively. It is to conclude that seed germination percentage is more control than treatment amongst the treatment unclear study; the seed germination percentage is more effect in aqueous extract of animal origin than plant origin. In both the treatments the concentration increases the adverse effect on seed germination increases. The maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin.

Table- 3. Average radical length on 10^{th} day of treatment in Horse Gram seed after treatment of aqueous extract of plant and animal origin.

Treatment	Concentration	Average radical length on 10^{th} day of treatment(cm)
Control	-	0.4
Veg Aqueous extract of plant Origin (spinach extract control)	1% 5% 10% 20%	0.2 0.1 0.5 0.0
Non veg Aqueous extract of Prawn	1% 5% 10% 20%	0.1 0.5 0.05 0.0

From Table 3 it is clear that control seeds of Gram shows average radical length is maximum (1.35 cm) than 0.2cm, 0.1cm of aqueous extract of plant origin treated seeds with 1%, 5%, 10% and 20%

concentration. It means the average radical length is less in plant extracts treated seeds. It is increases and then decreases as the concentration of spinach extract goes on increasing similarly from the table. It is also seen that the average radical length 0.1 cm at 1% aqueous extract of animal origin (prawn) treated seeds. It is 0.5 cm for 5%, 0.05cm for 10%, and 0cm for 20% treated seeds. Above observation are arrived at conclusion that the average radical length is affected due to the treatment with aqueous extract of spinach and prawn. The treatment of aqueous extract of animal origin is destructive than aqueous extract of spinach.

Table-4- Average plumule length on 10^{th} day of treatment of aqueous extract of spinach and prawn.

Treatment	Concentration	Average plumulel length on 10^{th} day of treatment(cm)
Control	-	0.2
Aqueous extract of spinach	1% 5% 10% 20%	0.1 0 0 -
Aqueous extract of Prawn	1% 5% 10% 20%	0 0 0 0

Table-4 Depicts the average plumule length on 10^{th} day of treatment in control and treated seeds of Horse Gram seed. It is noted that 0.2 cm is maximum average plumule length seen in control seed. 0.1 cm for 1% concentration and 0 cm for 5%, 10% and 20% concentration is average growth of plumule in aqueous extract of spinach treated seeds. The aqueous extract of prawn treated seeds of Gram are showing the average plumule length as zero for 1%, 5%, 10% and 20% means no plumule growth at all for 1%, 5%, 10% and 20% concentration of aqueous extract of prawn.This discussion conclude that there is adverse effect of aqueous extract of plant (spinach) on plumule growth of Horse Gram seed. Amongst the both treatment, aqueous extract of plant origin shows less harmful than prawn extract [23,24,25].

C. Beasse (2000) studied effect of epidermics of mycophaerella pinocles on crop growth radiation interception efficiency (PIE) and radiation use efficiency by dispersion on ground of pea. Which decrease the photosynthesis in leaves.[26]

Dry seeds do not germinate. Water is an essential factor to trigger off the process of seed germination. Shortage of water at any stage of plant growth usually results in a reduction in vegetative growth but many annual crop plants are sensitive changes in soil moisture condition during the period from flower initiation to the development of full flower [30-32].

Heat cultivation and micronutrient coupling are two relatively unknown methods that are used to increase the yield and size of the Gram seed. Recent research has indicated that a combination of heat treatment along with the two vital micronutrients, phosphorus and nitrogen, are the most critical components to increasing the overall yield of Cicer arietinum[30]. Unlike other food crops, the perennial Horse gram seed shows a remarkable capacity to change its nutritional content in response to heat cultivation. Treating the Horse gram seed with a constant heat source increases its protein content almost threefold [30]. Consequently, the impact of heat cultivation not only affects the protein content of the Horse gram seed itself, but the ecosystem that it supports as well. Increasing the height and size of Horse Gram seed plants involves using micronutrient fertilization with varying doses of inorganic phosphorus and nitrogen [31].

Temperature affects cellular metabolic and growth rates. Seeds from different species and even seeds from the same plant germinate over a wide range of temperatures. Seeds often have a temperature range within which they will germinate, and they will not do so above or below

this range. Baskin, Carol C and Jerry M (2014) show that variation in Seed Dormancy and Germination within and between Individuals and Populations of a Species [32].

Light or darkness can be an environmental trigger for germination and is a type of physiological dormancy. Most seeds are not affected by light or darkness, but many seeds, including species found in forest settings, will not germinate until an opening in the canopy allows sufficient light for growth of the seedling.

When the seed imbibes water, hydrolytic enzymes are activated which break down these stored food resources into metabolically useful chemicals.[33]. Oxygen is required by the germinating seed for metabolism.[34]. Oxygen is used in aerobic respiration, the main source of the seedling's energy until it grows leaves [33]. Oxygen is an atmospheric gas that is found in soil pore spaces, if a seed is buried too deeply within the soil or the soil is waterlogged, the seed can be oxygen starved.

CONCLUSION:

To study the seed germination of Horse Gram seed under the aqueous extract of plant and animal origin of 1%, 5%, 10% and 20% concentration are used. The germination of seeds per day percentage of germination, average radical length and average plumule length in cm are parameters under study. The germination is more in control than treated seeds. Either plant extract or animal extract treatment is non stimulating and harmful to germination process in general. The effect of animal extract is very harmful than the plant extract treatment. Seed germination percentage is more in control than treatment. The seed germination percentage is more affected in aqueous extract of animal origin than plant origin. In both the treatment as the concentration increases the maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin average radical length is affected due to the treatment. The treatment of aqueous extract of prawn is more is destructive than the aqueous extract of spinach. There is adverse effect of aqueous extract of plant origin (spinach) and prawn on average plumule growth of Horse Gram seeds. Amongst the both treatment, aqueous extract of plant origin (spinach) shows less harmful.

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PRESSURE SWITCH REACTION OF METHANE: A TECHNIQUE OF TAPPING BIOMETHANE FOR COMMERCIAL USE

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Abstract
Biomethane is a green house gas on one side but very useful fuel on other side. So for commercial exploitation have been trying by many scientists and energy associations. Mostly they are using separation of impurities and use refined methane gas. This will increase the cost of purification as well as transportation. Therefore we are trying to explore biomethane by liquefaction of biomethane using pressure switch reactions. This aims towards easy liquefaction using differential pressure condition and easy transportation for commercial exploitation.
Keywords*: biomethane, pressure switch*

Introduction:

The most needed but rapidly reducing resource is energy. Though endeavors are being made to trap energy in different forms such solar, tidal, wind energy, but are not meeting the present ever increasing need. Others sources of energy such as fossil fuels are also rapidly decreasing due to its exorbitant exploitation. So there is always need to search new renewable sources. Renewable gases such as biogas and biomethane are considered as key energy carrier when the society is replacing fossil fuels with renewable alternatives. On other hand methane is more potential green house gas than CO_2, which are increasing global warming. Upgraded biomethane can cover a great number of applications as well as it reduces global warming. Nowadays biomethane is already used in public transportation and in power generation, while different projects are being run around the world to expand its use even in private sector as main fuel in boilers or biomethane powered cars. The economic analysis demonstrates that biomethane can be produced at a cost which is competitive with liquid biofuels and fossil fuels. The main hurdle is in the use of biomethane on large scale for commercial purpose is transportation from site of its formation to the site of its actual application.

The raw biogas produced consists primarily of CH_4 (55-70%) and CO_2 (25-40%) but trace components are often present (H_2O, H_2S (3-5%), Siloxanes, Hydrocarbons, NH_3, O_2, CO and N_2). It's pH value ranges from 6.5 to 7.5 and due point is < -80^0C. Biogas consumption for household, power generation can be done at its site of production without purification. Upgrading processes are required to fit the heating value into the standard specifications. The main parameter used for the assessment of energy efficiency of biogas production processes is the Primary Energy Input to Output (PEIO). The results obtained show that PEIO value range from 10.5 to 64.0 %. But this use does not lead to commercial application specially at distant place. So as to explore it's commercial scale application at distant place, it should be transported through grid or bottles in pure form (upgraded biomethane). But it has seen that both the purification and its transport remained a challenge for it's commercial application. India's human population is 120 crores. Majority lives in villages and this rural population – directly or indirectly - is associated with agriculture. In 1961 the population of live stock was 335.4 million of which 51 million were buffaloes. The numbers went up to 510.2 million in 2007 of which 102.4 million were buffaloes. There is a 100% increase in the

number of buffaloes in 46 years. The milk production went up by 100% from 51.4 million tons in 1989-90 to 112.5 million tons in 2009-10. [1] Taking this challenge into consideration, many techniques and studies have been reported. Usually these techniques are physical modification of biogas. To improve the quality of biogas, some used scrubbing CO_2 and drying for further transport of enriched biomethane [2]. Partial oxidation of methane to form carbon monoxide and hydrogen, followed by Fischer–Tropsch chemistry, the direct oxidation of methane to methanol and formaldehyde, oxidative coupling of methane to ethylene have been studied.[3] [4] Ionic liquids (ILs) have emerged in the last few years as promising new acid gas absorbents, and thus, this remarkable interest, in both industry and academia, has led to a large collection of experimental and theoretical studies in which the most important aspects of the absorption process are analyzed. The viability of ILs as an alternative to the available amine based absorption processes, and showing the possible future directions of research.[5] A known host-guest assembly, organized only by means of relatively weak dispersive forces, exhibits hitherto unappreciated thermal stability. The hexagonal close-packed arrangement of calix-[4]-arene contains lattice voids that can occlude small, highly volatile molecules. This host-guest system can be exploited to retain a range of freons, as well as methane, not only well above their normal boiling points, but also at relatively high temperatures and low pressures. The usually overlooked van der Waals interactions in organic crystals can indeed be used in a highly stable supramolecular system for gas storage. [6] An experiments using Ni_2(dhtp) and gas mixtures of CO_2–N_2 and CO_2– CH_4 demonstrate the ability of the material to separate these gases. It is shown that CO_2 is preferentially adsorbed over methane or nitrogen. In the case of CO_2–N_2, the retention is quantitative within the precision of the detection system. The performance in respect to CO_2–N_2 separation was better than for CO_2–CH_4 separation. Biogas upgrading is beneficial but its market is still relatively very small. In European region there are at present around 200 biomethane plants that employ five main technologies: water scrubbing (WATS), pressure swing adsorption (PSA), chemical scrubbing (CHEMS), physical scrubbing (PHYS) and membrane separation (MEMS). The most preferable technology is WATS with almost 40 % share, followed by PSA and CHEMS (both around 25 % share). The lowest share has MEMS with around 4 %. All five technologies are able to produce biomethane with required purity.[7] Dual nitrogen expander liquefaction process can be boosted using power from a nitrogen expander, with all power input via the main cycle compressor, improving efficiency and increasing LNG production. [8] Solubility of methane in various solvents such as hexane, cyclohexane, acetone, benzene, ethanol, methanol and water have been studied. It is concluded using Bunsen absorption coefficient that solubility decreases from hexane to water with decreasing polarity. But this solubility is not sufficient to use this concept for commercial transportation. [9] All ethylene glycol ethers (including the mixture PEGDME 250, NMP, and sulfolane) were liquid at ambient temperature. These liquids are used for studying solubility of methane and ethane using Henry's constant at ambient temperature [10].

Property	Liquid below T_c	Gas below T_c	Fluid above T_c
			Methane
Pressure%	2	0.3	0.3
Density %	0.2	0.3	0.1
Temperature %	0.1	0.1	0.1
Enthalpy (J/mol)	2	1	1
Entropy (J/mol)	1	1	1
Specific heat, C_p %	5	5	2
Specific heat, C_v %	5	5	2
Speed of sound %	2	0.5	0.5
Thermal conductivity %	5	4	3
Viscosity %	2	2	2
Dielectric constant %	0.05	0.05	0.05

Experiments, result and discussion:

From all above techniques are mostly dedicated to purification of biogas to biomethane up to standard specification. This has also been done using physical techniques only. So need is to improve purification of biogas using chemical methods and using certain chemical methods to bring cost effective transportation of upgraded biomethane for commercial application. Our aim is to explore chemical methods to make transportation of biomethane a cost effective mean for commercial scale up. The techniques we are proposing are using chemical reactions of methane which are pressure driven. This study is based on physical and chemical properties of methane. Methane is the first hydrocarbon. A one-carbon compound in which the carbon is attached by single bonds to four hydrogen atoms. It is a colourless, odourless, non-toxic but flammable gas (b.p. −161°C). It is comparatively lesser reactive than impurities present in biogas. So we are aiming to develop a system in which increase pressure will make methane soluble in suitable solvent. This liquid solution of methane will have volume almost same as that of the solvent. This makes transportation of the methane very easy. Array of different solvents such as nonpolar, polar and room temperature ionic liquids (RTIL) will be used to assess the reversible solubility of methane at different temperatures. This will provide data which solvent is more suitable for transportation of methane at different temperature.

Conclusion:

Very few studies are done of solubility of methane especially for transportation of methane. Therefore this study will open a new avenue in solubility of methane, transportation and commercial application of methane. This also will reduce global warming and boost the rural economy in India.

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NEW TRENDS IN TEACHING IN SECONDARY EDUCATION, ACTIVITY BASED LEARNING AND EFFECTIVE USE OF LEARNING DESIGN

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Abstract

With the advent of new technologies being infused in school curricula, educators and school leaders are being rethink all faces of data in the classroom, new, innovative methods of data collection are continually being developed, which offer new options for ongoing formative, culminating summative and alternative assessments. In Activity based learning, which has drawn upon several resources, we have the possibility of a system which can succeed in keeping children motivated and fully occupied, while they are mastering the fundamentals. Activity based learning or ABL describes a range of pedagogical approaches to teaching. Its core premises include the requirement that learning should be based on doing some hands-on experiments and activities. The idea of ABL is rooted in the common notion that children are active learners rather than passive recipients of information. If child is provided the opportunity to explore, on their own and provided an optimum learning environment then the learning becomes joyful and long-lasting. The key feature of ABL method is that it uses child-ecofriendly educational aids to foster self-learning and allows a child to study according to their aptitude and skill.

A learning design is a reusable version of a specific learning opportunities. It intends to achieve learning outcomes by implementing teaching methods, assessment methods, learning content and learning tools. Learning outcomes are statements of what a learner knows, understands and is able to do on completion of a learning process. Learning outcomes cover knowledge, skills and personal, social and methodological abilities that a learner should have acquired when successfully having finished a learning opportunity. A good tool to use for creating learning designs is the Open Graphical Learning Modellar. This software are allows you to state learning, integrate teaching methods and learning content in your learning design.

LEARNING OUTCOMES

We should be able to

- Create learning designs that are instructionally sound in their learning outcomes and teaching methods.
- Select appropriate teaching methods that help to achieve learning outcome.
- Describes a range of pedagogical approaches to teaching.
- Prepare learning out-comes.

Definitions :

- Learning Design : Is a reusable representation of a concrete learning opportunity. A Learning Design arranges Teaching Methods, Assessments Methods, Learning Content And Learning Tools towards learning outcome attainment.
- Learner: is a role that performs learning activities in a teaching method or learning design to achieve intented learning outcomes.
- Learning Supporter : is a role that supports the Learner role during the activities of teaching methods, or learning design. Teacher, Instructor, Facilitator, External Expert, Moderator are the typical Learning support.
- Activity Based Learning : An activity or activities used in an educational process to make students learn. Learning through and from activities. Activities based learning means that the teacher incorporates activities of some type in teaching to make students learn.

FORMULATING LEARNING OUTCOMES

The following list provides some general guidelines to consider when formulating learning outcomes :

a) Learning outcome statements particularly those relating to skills or competence typically start with "Students are able to……"

The statement then uses an action verb (e.g. identify, describe, enumerate, analyze), so that students are able to demonstrate that they have learned and achieved skills and competences at a specific proficiency level.

A bad example: "There is a mid-term test on software design patterns."

This describes an assessment activity, but doesn't state what the students are supposed to know or be able to do during that test.

A better example would be: "Students are able to apply design patterns for building a software system."

b) Try to focus on learning rather than teaching; specify what the learner can demonstrate, and do not specify what teaching staff do or provide.

A bad example: "Students are taught about software design flaws."

This describes what the teacher does, but ignores what students are about to learn.

A better example would be: "Students are able to identify critical design flaws in a given software system."

c) Try to focus on the outcome, not the process.

A bad example: "Students complete Unit* 1 on the basics of academic writing."

This describes the learning activity but doesn't state the outcome, i.e. what students should know or can do after completing the unit.

A better example would be: "Students are able to explain the basic principles of academic writing."

d) Make sure that it is possible to prove / assess the achievement of each learning outcome. This requires being very specific in formulating each outcome.

A bad example: "Students are able to give a good presentation about their semester project."

There is no way to assess the achievement of this outcome, because "good" is ambiguous.

A better example would be: "Students are able to convey the essential outcomes of their semester project in a five-minute presentation using PowerPoint slides.

LEARNING CONTENT : The topics, themes, beliefs, behaviours, concepts and facts, often grouped within each subject or learning area under knowledge, skills, values and attitudes that are expected to be learned and from the basis of teaching and learning.

LAMS is the learning activity management system, is an open source learning design. System for designins, managing and delivering online collaborative learning activities. LAMS is inspired by the concept and principles of IMS learning design.

PREPARING LEARNING OUTCOMES : Learning outcomes describe what a student is expected to know and to be able to do by the end of the subject or course. Clear learning outcomes should benefit students in a number of ways. Statements of learning outcomes should explain to students what they will learn on successful completion of a subject or course.

ACTIVITY :

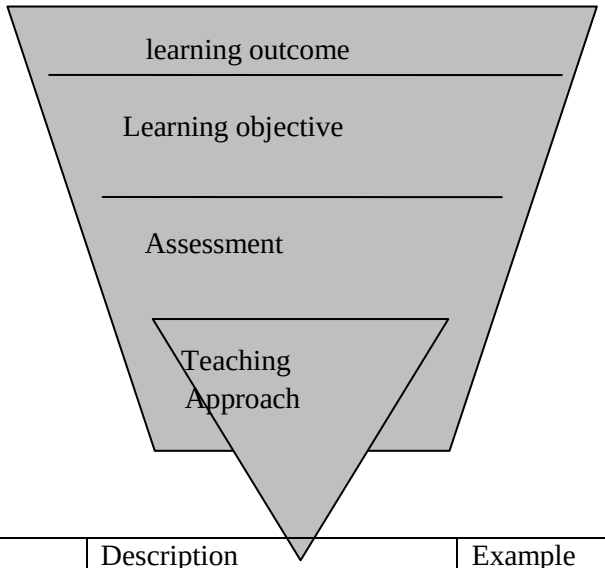
Time : 15 Minutes.

Imagine you are a teacher designing a course. Formulate two intended learning outcomes for an aspect of your subject area using knowledge, skills and competence. Choose your own subject area or one of interest to you.

Check for each learning outcomes whether it can be assessed and whether it contains a verb that clearly shows what the learners are expected to be able to do after completing the learning process.

Learning outcomes and measurable learning objectives.

Broad -



Specific -

Here is an example

	Description	Example
Course Goal Learning Outcome	Describes broad aspects of behavior which incorporates a wide range of knowledge and skill	Upon completion of this course the student will have reliably demonstrated the ability to use the conventions of grammar when creating paragraphs.
Learning objectives	Trend to describe specific, discrete units of knowledge and skill can be accomplished within a short timeframe.	Given a paragraph of ten sentences, the student will be able to identify ten rules of grammar that are used in its construction.

Course goals or learning outcomes are a broad statement of what the students will be able to do when they have completed the course. You may want to think of it as the moral of the story. Generally their learning outcomes connect to the overall goals of the curriculum for a given discipline clarifying these larger ideas and making connection to the curriculum helps students see the purpose and relevance of the course content.

BOPPS MODEL FOR LESSON :

Bridge in	Instructor Learners findout Ideas for bridging	- gains learner attention. - builds motivation - establishes relevance. - What's in it for me? - Why does this matter? - Why should I learn this? - Introduce the topic with a funny video or audio clip or share a relevant story.
Outcomes	Instructor Learners find out Ideas for outcomes	- Clarifies what the learner will "get out of" the lesson. - Streamlines the planning process to focus on the outcomes. - What will be expected of me? - introduce the learning outcome. - identify the ability that will be measured. - specify what knowledge,skill or value will be demonstrated and achieved.

Pre-Assessment	Instructor find out	- What do learners already know? - Do I need to adjust the depth and pace of learning? - What are my students interested in
	Learners Ideas	- recall prior knowledge - gain confidence - assess own strength and areas for improvement. Survey, quiz or poll learners at the beginning of the lesson
Participatory Learning	Instructor Learners Ideas	- Carefully plans a participatory netivity. - Communicates expectations clearly. - Plans level and type of instructor facilitation to minimize student learning - Actively involved in achieving the outcomes of the lesson. - Improve understanding and deeper learning by connecting with, testing, exploring and mentally manipulating ideas. - Pose a question and ask learners to think – pair – share or assign a problem or case study for learners to work enough.
Post Assessment	Instructor's find out Learner's find out Ideas	- What did the learners learn? - Where the desired outcomes accomplished? - Are there any gaps in understanding? - Am I getting it? - What do I need to work? - Ask learners to submit a 1 minute paper in response to questions, such as – What was the most important thing you learned today? - What questions remain unanswered?
Summary	Instructor Learner Ideas	- Concludes and wraps up learning experience. - Provides a sense/closure and completion or sets up learner for future lesson. - Appreciate how the lesson ties in with the course. - Or the bigger picture. - Reflect on whether outcomes were made. - Review material immediately. - Recap main points - Play a clip showing application in the real world.

CONCLUSIONS :

Once you have decided how to proceed towards creating your learning outcomes in relation to your chosen teaching method, you can round up and finalize your learning design with learning content. Using learning content makes the learning design specific to your learing situation when creating assessment for the learning design, you should make sure to vary the content between the learning situation and the assessment situation.

Remember to base your learning designs on intended learning outcomes and ensure that learning outcomes are aligned with the teaching method(s) and the assessments used in your learning design. Approaching learning design this way may help you and others in adopting your learning design for other purposes using other learning content and adjusted learning outcomes.

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COMPARATIVE STUDIES OF NOISE LEVELS ON FESTIVE AND NON FESTIVE DAYS IN ALIBAG REGION

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ABSTRACT
Ganapati festival and Diwali festival are very popular festivals in Maharashtra. Ganapati festival is celebrated at homes and also in public places to worship for a period of 11days. Noise levels, at four different locations in Alibag region were recorded with a sound level meter on a normal non festive day and the day of the festival. Noise pollution indices viz .Leq,, Lmax, Lmin, L10 , L90, LNP(Noise Pollution Levels) and Noise Climate were calculated .Noise levels exceeded the norms set by the central pollution control board on festive days with conspicuous increase in noise levels at all the sites. Chendhare site indicated the category of safe zone on festive and non-festive day. Varsoli site exhibited low to moderate risk zone category for 4pm, 5pm and 6 pm time slot for festive days and for rest all time slots of festive day it showed the category of high risk zone. Koliwada site indicated high risk on festive day. On non-festive day Chendhare, Shribag and Varsoli site indicated safe zone, safe to low risk zone and safe to moderate zone category respectively. Noise levels are not monitored by any agency in this area.

KEY WORDS: Noise pollution, festival, Leq, Noise climate

INTRODUCTION

Alibag is a coastal town in the Konkan region well known for its beaches, clean water and fresh rejuvenating air. Alibag is a subdivision in the Raigad district of Maharashtra and it has many serene and beautiful beaches, known for its calm weather and dense coconut groves. Apart from beaches, there are many historical places and intricate temples. Like other places in Maharashtra Ganapati festival are celebrated with great zeal in Alibag region. In view of rapidly growing population and changed ways of celebrating festivals Alibag is facing the increase in noise levels. An attempt has been made to study noise level fluctuations leading to risk of noise pollution as a consequence of festive celebrations. The major reason of increased noise levels is from transport vehicles, firecrackers, musical instruments like dhol-tasha, banjo etc. These cause significant noise pollution. Considerable amount of increase in noise levels has been recorded on festive days than on non-festivedays.

Noise imparts several effects on mental and physical health and results in disturbances in the daily activities. It affects living as well as non-living things (Pawar, 2005). Noise might affect sleep, conversation, causes hearing loss; in addition to these effects it also affects human judgment and performance (Kumar, 2011). Generally high exposure to noise level can cause annoyance, irritation, damage to auditory system, number of health related effects like physiological, psychological disorders, difficulties in daily activities and performances,

hypertension and heart diseases (Canter, 1996). Along with other types of pollution, noise has become a hazard to quality of life (Davar, 2004). Various studies have revealed that noise levels in some of the Indian cities are higher than the standards prescribed by CPCB, Central Pollution Control Board and MoEF, Ministry of Environment and Forest, Govt. of India (Naik, 1999; Mohan, 2000; Gupta, 2003; CPCB, 2012; Joshi, 2012; Mangalekar, 2012; Kumar, 2001). Several studies have been carried out in India on noise levels, noise climate, Leq, and Lmax (Nikhil Kumar et al, 2013; Chaudhary et.al, 2012; Tandel, 2011).

The CPCB has notified air quality standards for noise which has been included as an air pollutant. Realizing the need to control and regulate noise levels, the Ministry of Environment and Forests, Government of India, have notified Standards and Guidelines for Noise Levels under Environment (Protection) Rules, 1986, known as Noise Pollution (Regulation & Control) Rules, 2000 as shown in Table 1. The objective of the study is to assess the noise pollution levels, noise climate, *Leq*, and Lmax, Noise Pollution Level Index and Noise Climate in this area.

Table 1. Ambient permissible noise levels in India as prescribed by CPCB

Area code	Category	Limits in Dba	
		Day time	Night time
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45

MATERIALS AND METHODS

Study area

Alibag is a coastal town and a municipal council in Raigad district. It is the headquarters of the Raigad district and is located about 120 km south of Mumbai. Current study was carried out at four different sites in Alibag viz. Chendhare, Varsoli, Shribag and Koliwada.

In current study, noise levels on non-festivedays and on festive days were observed. The main objective was to monitor and evaluate the fluctuating noise level at different sites of the study area.

Instrument Used

Sound level meter of Lutron Electronics (Model number: - SL 4012) was used to monitor sound levels at all the sites mentioned above. The readings were measured in dB (A) unit, where A denotes the "A weighting" characteristic which is simulated as "Human Ear Listing" response. The time weighting is adjusted to "Fast" by default. The sound level meter is provided with high sensitivity Bruel and Kjaer Prepolarized Condenser Microphone (Type 4226) at the top and readings are generated on the horizontal display.

Sampling Methodology

While recording the noise levels, the sound level meter was placed at 1 to 1.2m above the ground surface level and one meter away from sound source, then microphone of sound level meter was pointed towards the source of sound and readings were noted down. To minimize the error, readings were taken continuously for 30 minutes at an interval of 2 minutes. The noise levels were recorded on The reading were taken from 5pm to 9pm from 5 to 5.30 pm, 6 to 6.30 pm , 7 to 7.30 pm, 8 to 8.30 pm and 9 to 9.30 pm. Leq was calculated using following formula:

$$\text{Leq, T} = 10 \log[1 \div \sum_{i=1}^{n} 10^{\frac{\text{Li}}{10}}]$$

Where, Leq = noise levels observed in time interval T and n= n^{th} duration of measurement (Saler, 2012).

Leq is the equivalent continuous equal energy level; and can be applied to any fluctuating Noise Level. It is that constant Noise Level that over a given time expends the same amount of energy as the fluctuating level over the same time period. (MPCB, 2005).The readings noted in fractions, were rounded off to nearest integer in the observation tables. To detect the actual rise in the noise level a set of readings was taken on a normal non festive day. To get better understanding of noise range Noise Climate (NC) index (Pathak, 2008) was calculated using following formula:

NC= L10- L90 dB (A).

Total annoyance caused by noise level was estimated using noise pollution level index (NP) (Ehrampoush, 2011):

*LNP= Leq * 2.56d*

Where, *LNP Noise pollution level, Leq= equivalent noise level, d= standard deviation.*

Statistical analysis was carried out to analyse the significant difference between festive and a nonfestive day.

Table 2: Noise levels on festive days

	5:00 PM			6:00 PM			7:00 PM			8:00 PM			9:00 PM		
	Leq	Lmax	Lmin	Leq	Lmax	Lmin	Leq	Lmax	Lmin	Leq	Lmax	Lmin	Leq	Lmax	Lmin
Chendhare	58	62	56	59	62	57	58	63	56	59	64	58	55	57	52
Varsoli	78	84	72	80	87	75	86	90	71	84	88	61	58	59	60
Shribag	81	87	79	85	87	71	87	92	81	86	89	80	84	89	78
Koliwada	81	88	79	81	88	79	81	86	78	84	87	79	86	86	77

Table 3. Noise levels on non-festive day

	5:00 PM			6:00 PM			7:00 PM			8:00 PM			9:00 PM		
	Leq	Lmax	Lmin	Leq	Lmax	Lmin	Leq	Lmax	Lmin	Leq	Lmax	Lmin	Leq	Lmax	Lmin
Chendhare	46	56	46	49	58	45	53	61	52	43	50	38	42	46	38
Varsoli	55	63	52	54	61	51	49	56	46	65	72	58	52	56	44
Shribag	69	75	67	66	77	58	62	71	57	66	77	60	57	64	52
Koliwada	59	67	53	62	72	52	57	67	51	64	73	50	54	59	45

Table 4. Noise risk zone

Intensity of noise in dB (A)	Category of zones
< 66	safe
66.71	tolerable
71-76	low risk
76-81	moderate risk
81-86	high risk
>86	extremely high risk

(Banerjee,2009)

RESULTS AND DISCUSSIONS

Table 2shows the equivalent noise (Leq) maximum noise(Lmax) and minimum noise (Lmin) recorded at all foursites at different time slots on festive and non-festiveday respectively. On festive day fluctuation of noisewas more in comparison to non-festive day. On thefestive day, 9 pm time slot at Chendhare showed adecrease in the noise levels as compared to otherslots in the same area. Sound levels on all other sites

at all the time slots exceeded the permissible limit.On the normal working day i.e. non - festive daysudden depletion in the noise levels was observed.Chendhare site remained noiseless for all the time slots.Shribag site was the noisiest followed by Koliwada andVarsoli87 dB (A) at 7pm and 69 dB (A) at 5pm in Shribagwere the highest Leq, while 53 dB (A) in at 9pm and 42 dB (A) at Chendhare were the lowest Leq recordedon festive and non-festive days respectively. Thecontinuous monitoring showed the broadfluctuating range. Varsoli site showed acutefluctuation followed by Koliwada, Shribag andChendhare.Highest difference in standarddeviation of festive and non-festive day wasrecorded at Varsoli site and least deviation wasseen at Shribag site.

CONCLUSION

On festive days high and comparatively steadynoise levels were recorded and analysed usingnoise pollution level index. Comparativeanalysis of noise using noise pollution level indexindicated that Varsoli is the noisiest site whileChendhare is least noisy site of the study

area. Shribag and Koliwada site show moderate noise pollution andless fluctuation as compared to Varsoli site.Equivalent noise levels of festive days were high ascompared to the non-festive days on all sites butmajority of time slots of all sites showed high noiseclimate (NC) index on non-festive days.Main reason behind this is wide fluctuation range ofnoise on non-festive days. According to differentcategories of noise risk zones (Banerjee, 2009) Leqvalues of all sites were assessed to find out level ofrisk due to high noise levels. Chendhare siteindicated the category of safe zone on festive andnon-festive day. Varsoli site exhibited low to moderate risk zone category for 4pm, 5pm and 6 pmtime slot for festive days and for rest all time slots offestive day it showed the category of high risk zone. For Shribag site festive day time slot of 7pm and 8pm showed extremely high risk while rest all slot showed risk categories between moderate to high. Koliwada sit indicated high risk on festive day. On non-festive day Varsoli, Shribag and Koliwada site indicated safe zone, safe to low risk zone and safe to moderate zone category respectively. The Ganapati festival is celebrated with great enthusiasm in all areas of Alibag regeion. On the day of AnantChaturdashi (Last day of the Ganapati festival), immersion procession involves use of loudspeakers, banjos and firecrackers and continues till hours, this affects theusual sound level. People are often unaware of the consequences of the noise pollution on the human health and environment. Hence it is essential to create awareness amongst the community about the impacts of noise pollution. Restriction from local governments such as defined time limit for procession, limitation on the use of loud musical instruments can also help in controlling the noise pollution.

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ACTINOMYCETES RICH COOKED-FOOD-WASTE COMPOST FOR RECLAMATION OF SALINE AND DROUGHT AFFECTED SOIL

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Abstract

Cooked-food waste generated after common lunch or dinner is thrown on open land or in dustbins, as there are no specific guidelines for its disposal. Its aerobic degradation leads to foul smelling and CO_2 emission. Cooked-food-waste can be a good organic raw material for preparation of compost. Extreme conditions of salt and drought are major hurdles in growth of plants. The soil affected with salinity, or drought can be reclaimed, its fertility can be enhanced by the application of suitable compost. In the present study, we prepared compost of cooked-food waste and used it to reclaim fertility of drought and saline soil.

The growth of test plants (wheat and mustard) in both saline and drought conditions, in the presence of food-waste compost were monitored. Plants grown in the presence of food-waste compost showed significant survival, root growth enhancement (up to 18%) and shoot growth enhancement (up to 54%) in saline and drought conditions. A significant increase in microbial population (268%), nitrogen-fixing bacteria (256%), Phosphate solubilizing bacteria (170%), and actinomycetes (866%) were observed.

Key words: *Drought soil, saline soil, cooked- food waste compost, soil reclamation.*

Introduction:

Composting of waste is the only effective alternative to avoid environmental pollution. It has been proved that composting is not only economical but also improves agriculture quality (Hussien and Sawan 2010). The process of composting is being practiced from ancient time for decomposition and stabilization of biological waste. The stable product of compost has immense potential for improvement of physical, chemical and biological properties of soil (Hong et al., 1999). Stable and mature compost has significant application in agriculture (Mathur *et al.* 1993). pH, electrical conductivity (EC) and the C/N ratio are important parameters of compost, which are affected by the feedstock rather than composting microbes(Mupondi, *et al.*, 2006).

In Indian ceremonies, common lunch and dinners generate cooked food-waste which is disposed improperly. Aerobic degradation of organic content of food waste causes foul smelling and CO_2 evolution. The composting of cooked food waste is an unexplored avenue for its effective management. This type of waste has high concentration of salts, spices and heated fats that affect the survival and growth of composting microbes.

Materials and methods

Preparation of food waste compost:

A pit (2x3Ft) was dug in the botanical garden of C. K. Thakur ACS College, New Panvel. Cooked-food waste sample was collected from a social function. Pit was filled by food waste and covered with garden soil and left for two months for decomposition. Compost sample was collected from pit at the depth of 0.1M. Sample was evaluated for physiological and microbiological parameters.

Microbial analysis of compost and garden soil

Compost soil sample was analyzed for presence of phosphate solubilizes, N-fixing bacteria and Sulfate reducers. 25Gm of compost soil sample was added in 225ml sterile saline with continuous shaking and diluted up to 10^{-5} using sterile saline. Then 0.1ml of diluted sample from last three dilutions were inoculated on sterile nutrient agar plates, sterile Pikovskaya agar plates for isolation of Phosphate solubilizing bacteria, sterile Starkey's agar plates for sulfate reducing bacteria and sterile Ashbey's agar plates for isolation of Nitrogen fixing bacteria. The plates were incubated at 30ºC for 5 days. Isolates were studied for morphology by Gram staining. Garden soil was analyzed similarly as control.

Analysis of physiological parameters

Compost soil sample was analyzed for pH, Oxidizable organic carbon, Phosphate, Potassium, Ammonical - Nitrogen and Nitrate Nitrogen using Soil Testing Kit of Hi media. Simultaneously, garden soil was also analyzed as control.

Analysis of bio-fertilizer efficacy of compost

Bio-fertilizer efficacy of compost in stressed conditions was determined by pot assay using saline soil and drought affected soil. Salinity of soil and compost was determined using its electrical conductivity and adjusted above 4dS/m to create saline environment. Garden soil and compost were dried at 110ºC for 1h to create drought affected environment and used for pot assay.

Six pots were prepared viz; pot with normal compost, saline compost, drought affected compost, normal garden soil, saline garden soil, and drought affected garden soil. Pots were sowed with mustard seeds and wheat seeds. Pots, except the one kept for analysis of effect of drought affected condition, were watered regularly. Pots were observed for germination of seeds and growth with respect to root length and shoot height.

Result and discussions

Microbial analysis of compost and garden soil

Total viable count of normal soil, as observed on nutrient agar, was found to be 3.43×10^6 / ml and that of compost soil sample was found to be 9.22×10^6 / ml. There was 268.8% increase in total viable count of compost soil. Nitrogen fixing bacterial count of normal soil was 4.69×10^4/ ml and that of compost soil was found to be 8.79×10^4/ ml**,** i.e. 256.3% higher than that of normal soil. Phosphate solubilizing bacterial count of compost also exhibited a significant increase (170.8%) from 2.63×10^4 / ml of normal soil to 5.86×10^4 / ml of compost soil. Sulfur reducing bacterial count in compost was 275.2 % higher than that of normal soil.

Morphological analysis of isolates by Gram staining showed significant number of actinomycetes in the compost soil sample. Therefore, actinomycetes count of garden soil and compost soil was determined using Actinomyces agar. Actinomycetes count of normal soil was found to be 3.55×10^3 in normal soil and that in compost soil was found to be 30.75×10^3. There was 866.19% increase in the number of actinomycetes count of compost soil.

Analysis of physiological parameters

Compost soil sample was analyzed for pH, Oxidizable organic carbon, Phosphate, Potassium, Ammonical - Nitrogen and Nitrate Nitrogen using Soil Testing Kit of Hi media. The results were obtained by comparing changes in the color with the standard charts provided with the kit. pH of compost was 7.5, organic carbon in the compost was medium high i.e. 0.75 to 1.00%. The method gives range of percent oxidizable organic carbon by permangnate method. Available phosphate in the compost was low i.e. less than 22 $Kg.hector^{-1}$as P_2O_5. Available potassium as K_2O was also low i.e. below 112 $Kg.hector^{-1}$. Similarly ammonical nitrogen and nitrate nitrogen in the compost soil was also low i.e. about 15 $Kg.hector^{-1}$ and about 10 $Kg.hector^{-1}$.

Effect of compost on growth of test plant in saline and drought stressed soil

Mustard and wheat were used as test plant in pot assay to determine effect of compost on growth in saline and drought stressed soil. Root-length and shoot-height were used as indicators of growth and it was compared with growth of test plants in garden soil under similar stress.

Shoot-height and root length of mustard plant in saline stressed compost soil was found to be 91.42% and 90.90% greater, respectively, than that of plants grown in saline stressed normal soil (fig 1). Similarly the shoot-height and root-length of wheat plant in saline stressed compost soil was found to be 54.58% and 3.7 % greater, respectively, than that of plants grown in saline stressed normal soil. Shoot-height and root-length of mustard plant in drought stressed compost soil was found to be 85.71% and 68.18% greater, respectively, and that of wheat plant was 50.96% and 18.81% greater, respectively, than that of plants grown in drought stressed normal soil.

Since the ammonical nitrogen and nitrate nitrogen as well as organic carbon content, available Phosphate and Potassium of the compost soil was low, microbial population of compost may have played significant role in the plant growth. When difference of Nitrogen fixing bacteria and phosphate solubilizing bacteria in the compost soil and garden soil was determined, it was found to be non-significant (less than 3X). In addition, these bacteria are also sensitive to treatment given to compost and garden soil for making them saline and drought affected. Therefore, the difference in plant growth promotion in stressed condition is not due to nitrogen fixing bacteria or phosphate solubilizing bacteria. Actinomycetes are known for their growth in harsh conditions. Since the rise in actinomycetes content in compost was significantly high than that in garden soil (more than 8X), actinomycetes has played a significant role in plant growth promotion in saline and drought affected soil.

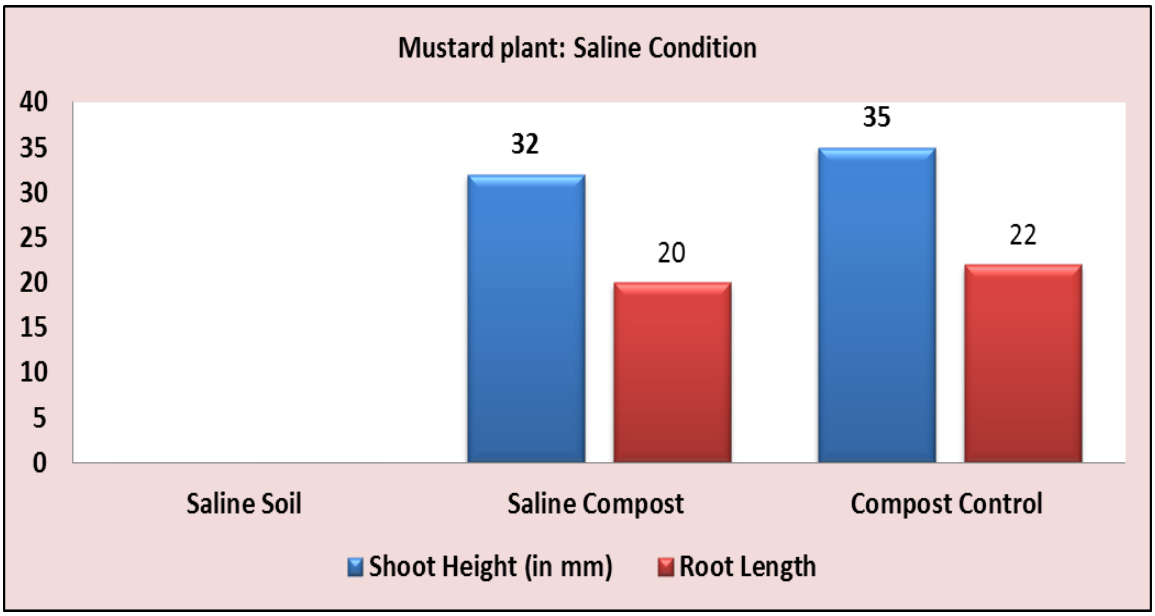


Figure 1: Effect of saline condition on growth of mustard plant. Growth was not observed in the salinized garden soil and significant growth was observed in salinized compost soil.

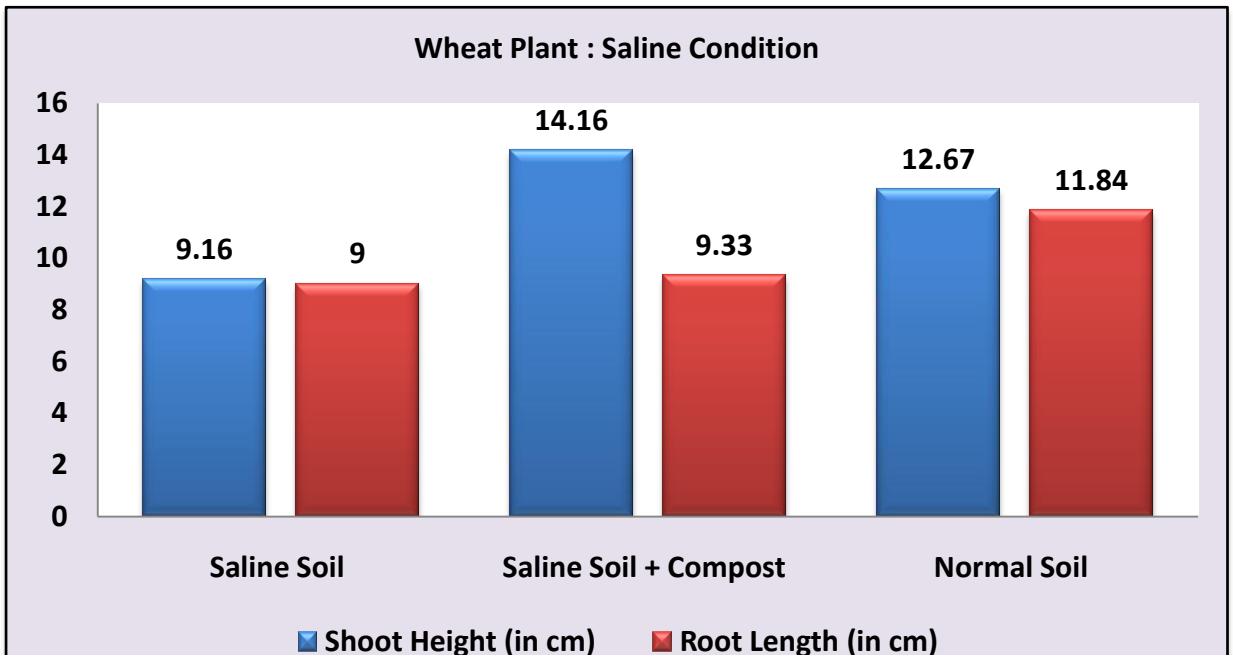


Figure 2: Effect of saline condition on growth of wheat plant. Shoot height and root length of plant grown in saline soil was 9.16 cm and 9 cm and that of plant grown in saline soil + compost was 14.16 cm and 9.33 cm respectively.

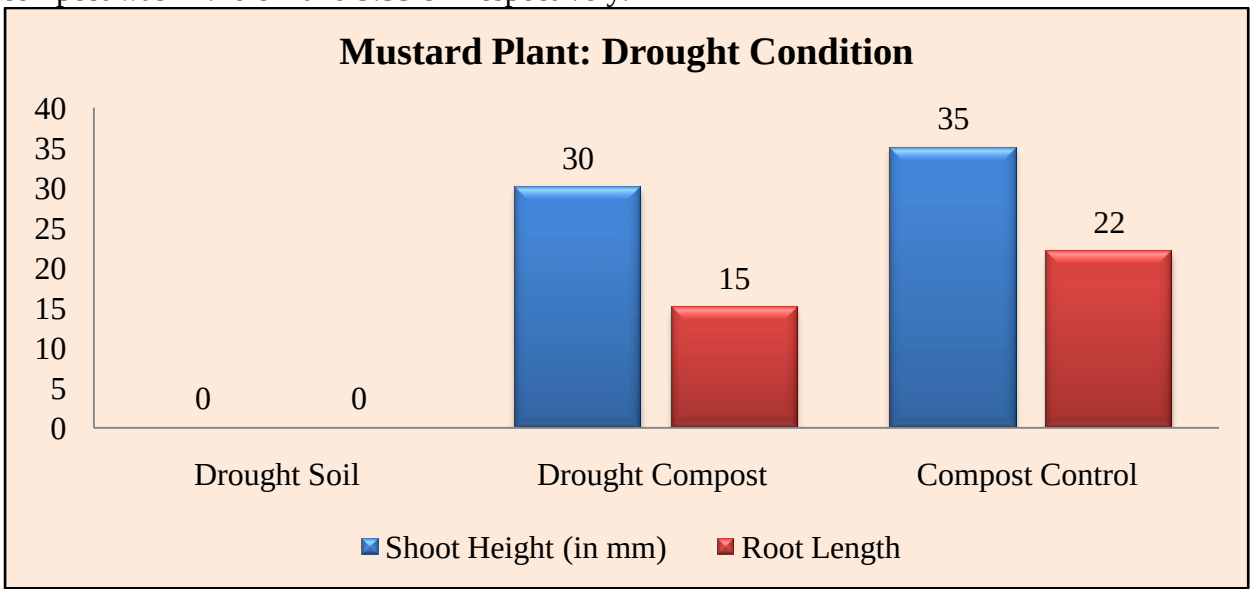


Figure 3: Effect of drought condition on growth of mustard plant. Growth was not observed in the drought affected garden soil and significant growth was observed in drought affected compost soil.

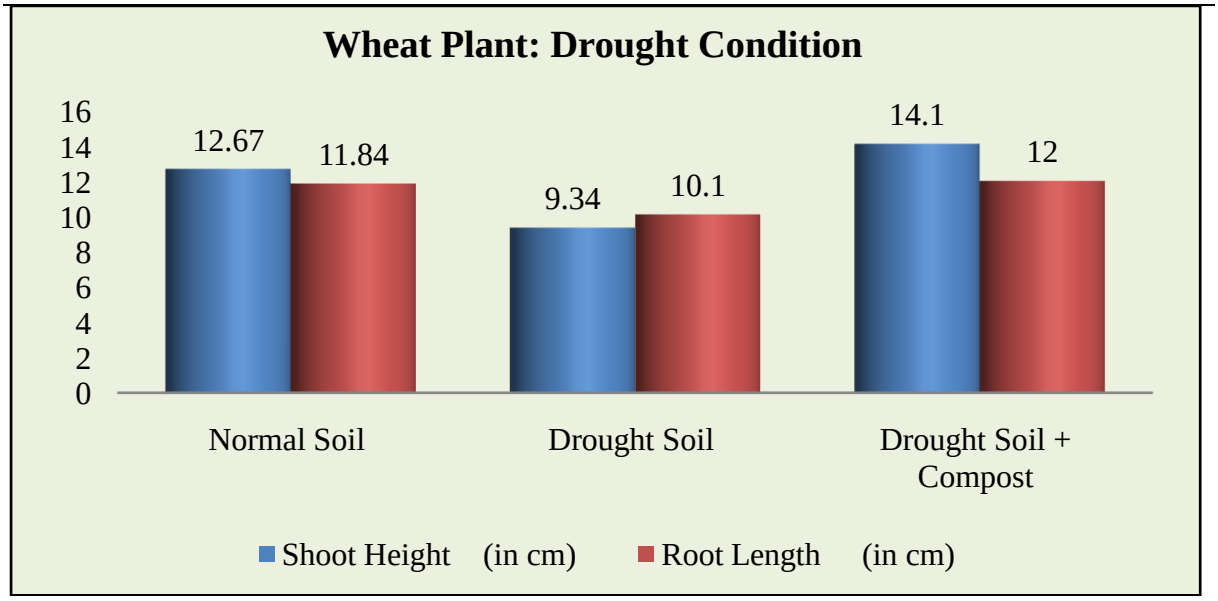


Figure 4: Effect of drought condition on growth of wheat plant. Shoot-height and root-length of plant grown in drought affected soil was 9.34 cm and 10.1 cm and that of plant grown in drought affected soil + compost was 14.1 cm and 12 cm respectively.

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SUSTAINABLE ENERGY AND TECHNOLOGY

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Sustainable energy is the energy required for some considerable purposes, which can be utilised at insignificant rates exclusive of affecting its source and reserve, and without adjudication with the present or the requirements of the future generations. These energy sources include energy from renewable resources such as solar and wind energy, and energy from biomass. The fossil fuels such as coal, oil and gas constitute 80.1% of the total energy supply with 13.6% from renewable sources and 6.3% of the nuclear energy (1). Utilising sustainable energy for the future will replenish the global need energy. Such energy changeover would require essential innovations in a new fleet of dedicated and expert researchers and technologists in the development, optimization and incorporation of the renewable energy sources (2). The production of energy from new sources would also require new storage facilities, such as batteries to suit the storage of energy from sustainable sources. The energy would be required to be integrated into the existing power networking (3).

Access to technology

It is quite challenging to secure the energy for future using the existing technology and even with modernization of the equipments. Securing energy from such sources can be accomplished using innovative technologies, which can be formed as a result of various research projects through chemical processes and use of relevant materials. It will aid in the transfer of energy in between the fuels, light and electricity (4). Such innovative technologies will bring change by extracting energy from the sunlight, carbon-dioxide and water. It will also generate electricity from the wind, water and nuclear plants. This will promote the utilization electricity-driven cars and light motors by using batteries and fuel cells. The technology will function to convert sunlight and wind to high efficiency electricity and enabling its storage in batteries and super-capacitors with more than 10 times the density of that is used at the present day (1).

Operation of coal-fired and nuclear power plants at higher temperature requires atoms with nano-scale structures, where each atom will have a specific function. This has enabled the spontaneous flow of energy from the chemical bonds, light and the electrons. A technology which can produce electricity is capable of producing hydrogen by the means of an electrolyzer (1). Electrolysis can supply energy and hydrogen from the solar and wind energy. The photobiological and the photochemical technology are used for hydrogen production. These technologies produced hydrogen from sunlight and water directly, and also increases the efficiency of solar to hydrogen pathway (4).

Solar power

At the present day with the existing technologies, the solar power is estimated to support about only 5% of the total energy requirements of the US. The first generation solar cells are made of crystalline silicon cells, which are used at the present day. The second generation cells are based on thin film cells and photoactive light-sensitive materials and also cells made of photo-sensitive dyes and low cost oxide semiconductors (4). To combat the power requirements by 2050, a very high conversion efficiency cells in a low cost are required. The third generation solar cells are still under research, which are made up of different semiconductor cells and are about 200 times as expensive as the first generation solar cells. Further research is required for the development of high efficiency and cost-effective solar cells to meet the requirements of the people in the upcoming years (1,5).

Managing carbon from the environment

It is essential to manage the carbon dioxide emitted from various sources, including the burning of the fossil fuels. Reduction of carbon from the atmosphere is a crucial factor to maintain healthy living (2). Trapping and storing the carbon-dioxide by compression to prevent its harmful effects. It can be stored at a geographical location by injecting it into the ground. Although it may be harmful to store the gas under the earth due to the risk of drinking water contamination, conducting research may help in proper utilization of the trapped gases (1,5).

Use of ethanol as a sustainable energy source

Sugarcane ethanol is can be used as motor gasoline after 30 years of its production and is used over the world. The production of ethanol from cellulosic materials will help in reducing the cost of ethanol production and bring forward numerous chances of utilizing biomass and woods for the production of ethanol (2). The use of biogas from the conversion of landfills with solid wastes, industrial wastes, manures and water with the help of microorganisms will help in reducing the expense of fossil fuels for the production of energy. The planted forests can also be utilized for the production of electricity instead of using coal or other fossil fuels, by direct combustion, gasification or the use of gas turbines. Further research is required to confirm the effectiveness of these methods priory of the production phase (6).

Hydrogen production

In the 1930's Rudolf Erren suggested the production of hydrogen by water electrolysis, to be used as transport fuel. The main purpose of production of energy from water is to reduce the emission of harmful gases to the environment and produce hydrogen for energy and transportation to enable energy security for the future generations. Hydrogen can be generated from water, biomass or coal. Coal gasification is considered as the most reliable source due to its low cost and and abundancy. Since, the utilization or depletion rate of coal is high and formation takes hundreds of years, it is necessary to arrange alternative source of energy.

Electrolysis of water, wind, biomass and geothermal energy are considered as sustainable sources of energy. Biomass processing is greatly accepted since years due to its ability to convert liquid and gseous fuels. Although biomass can easily be converted to methanol, ethanol and biodiesel, which can be further processed to form hydrogen, it is not capable of supply in abundance. Water can yield high amount of hydrogen and oxygen on electrolysis. It requires a higher temperature of $<2000^0$C (5). Using sulphuric acid and hydrogen iodide can contribute to generation of hydrogen in multiple steps under the operating conditions. Water and wind can produce electricity in the sufficient quantity due to its suatainability. Sustainable hydrogen can be produced using technologies such as photobiological and photo-electrochemical methods (6). These methods can help in producing hydrogen directly from water and sunlight. It increases the efficiency of solarto hydrogen pathway and reduces the cost of the process. The process requires sufficient amount of land for the collection of sunlight. It may also utilize sea water instead of pure water thereby reducing the total cost (5).

Advancement in nuclear power systems

Nuclear power is considered as a carbon-neutral energy source, which would prevail over the challenges such as management of nuclear wastes, proliferation of nuclear weapons and increased demand of sustainable fuel. It will also confront the demand of safe and improved efficienct of nuclear power (5,1). It will involve the capability of controlling the structure of materials at the nanoscale and enable researchers and engineers to provide the solutions using highly advanced computational toos. The tools incude advanced synchrotron X-ray sources, neutron sources and advanced super computers (1).

Conclusion

There are various techniques of reducing the utilization of the conventional energy. Sustainable energy sources include use of water, wind, fossils and nuclear energy. The innovative methods and chemical

processes involved in bringing the change in the technology. Although the procedures are quite complex, the processes include the conversion of energy from one form to another such as, conversion of water to hydrogen and oxygen, and chemical reactions of the biomass for the production of fuel. It also helps in reducing the cost of energy production and provide access to the required amount of energy to the future generations.

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TOURISM AND TOURIST PERSPECTIVE VIEW OF ALIBAG TEHSIL A GEOGRAPHICAL RESEARCH

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Abstract

Alibag is a small town along the western coast of Maharashtra, Alibag lies in the Konkan region and belongs to the district of Raigad. It is close to the famous metro of Mumbai. Surrounded by water on three of its four sides, Alibag is home to several beautiful beaches. All its beaches are lined with amazing coconut plantations and betel nut trees, giving it a typical tropical beach feel to the entire region. Nature is at its very best here, with the beaches seemingly untouched and virgin. The air that you breathe in is fresh, while the exotic sight that these beaches provide are nothing less than heavenly. While the Alibag Beach pleasantly surprises you with its black sand, the Kihim and Nagaon Beach are replete with silver-white sand. Akshi Beach is another beach that is a must visit. Several ads, serials and movies have been shot on these beaches, here at Alibag. One may also be lucky to bump into one of the many Bollywood celebrities who own farmhouses and bungalows here. Since Alibag is a beach town, all the local delicacies here are fish based. Amongst the pomfret and surmai dishes, sol kadhi is another favourite out here. The beaches in Alibag are the perfect place to spend a quiet, fun-filled weekend with your loved ones, strolling the beach, or playing in the water, or simply watching the evening sun set into the sea at a distance.

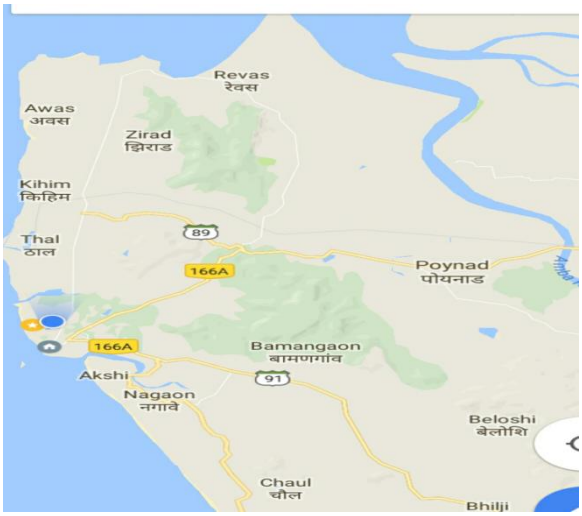
Keywords*:- Tourism, Tourist, Beeches, Forts etc.*

Introduction:- Alibag is a small town located in the Konkan region of Maharashtra. Often considered as a weekend getaway for the tourists, Alibag is equipped with few of the most beautiful picnic spots of Maharashtra. The town is named after a wealthy Israeli who owned several fruit orchards here, hence the name Ali's Bag (garden) or Alibag. Historical forts, continuous web of beaches, untouched aquatic life and lush green gardens are some of the most attractive features of this town. Alibag has developed itself as a major trade centre in the past few years and thus a significant number of businessmen visit this city on a regular basis. This town is often regarded as the island town of Maharashtra as it beautifully meets the waters of Arabian Sea on three of its sides.

Objective:-

1) To study various beautiful places in Alibag
2) To study present situation future scope of coastal tourism the region.
3) To study spatio-temporal changes in Alibag tourism.

Study Area:- The Alibag tehsil has the shape of a triangle with its base in the Konkan region in the western coast in India. It is located about 120 km south of Mumbai, at 18°38′29″N 72°52′20″E. The average elevation is 0 meters.



(The map of the Alibag Tehsil)

Data base and Methdology:-

The present study depend upon the secondary data. It was collected from the Raigad district tourism report, Alibag tourism and Indian tourism report.

Discussion:-

Alibag beach:

This is the main beach. A very flat stretch makes for a long walk. It is reasonably clean and has thin crowds during the week. The sand has a hard texture and is a shade of black. It is not easy to create sand castles. The tide rolls in from all sides You may have to wade through water on the way back.

Siddheshwar Mandir near Khandale:

This is a famous Shiva temple near picturesque hills near village Khandale just 4 km from Alibag-Pen state highway. You can drive your vehicles near to hillocks and with small trek you can reach this beautiful temple. During Shrawan month, hundreds of people throng to worship here during Shrawani Somwars. If you travel further you can see the remains of ancient fort called " Sagargad".

Alibag Fort:

Alibag is the seat of District Administration of Raigad (formerly Kolaba) district since 1852. The name Kolaba is attributed to a sea fort built by Shri Chatrapati Shivaji Maharaj the great in 1680 to fight the mighty naval prowess of the Siddis (Abyssenians) of Janjira and the British of Mumbai. Kolaba fort is famous for many battles, between Siddis and Kanhoji Angre, the British and the Portuguese. It is also famous for lord Ganesh temple and Dargha

Khanderi and Underi Islands :

A few kilometers from the Kihim Beach one can visit Khanderi and Underi islands. They are heavily fortified and built by Shivaji as sea observation posts in 1660 CE to keep a check on the Siddis at Murud-Janjira fort. Later on it lost its importance. Most of the fort is intact. The most prominent structure is a lighthouse built in 1837 which is still in service and used for sea navigation.

Magen Avot Synagogue:

There was once a large Jewish community in Alibag; most of them were oil pressers and sellers. Bet El Synagogue is the only one in Alibag. Viceroy Lord Curzon (1899-1905) visited this synagogue. This place had been place of worship for the Jewish community; it was where community centre, Konkan development programmes and village meetings were held. The synagogue is a heritage property with a unique style and is a well-known Indian Jewish and Konkan tourist point.

Varsoli Beach:

About a mile from the main beach, it is home to a large naval base. It is on the outskirts of Alibag. It is relatively less-visited site. It is a quiet beach with sparkling white sand and cleaner seawater. Varsoli is a small satellite village across Alibag, complete with thick vegetation of coconut and casuarina.

Akshi Beach:

The beach is a favourite spot for advertising, TV serial and film shoots. This beach is well-suited for children and waders as the sea is flat for a long distance. One can walk through to a considerable distance toward the sea.

Nagaon Beach:

This black-sand beach is about 10 km from Alibag and is famous for coconuts and betel nuts. One can walk on the beach from Nagaon beach to Akshi beach in ten minutes. It is more popular for its water sports and most of the tourists coming to Alibag stay near Nagaon beach. It is the cleanest beach among Varsoli beach and Kashid beach too. Below is the image of the Nagaon beach.

Kihim-Navgaon Beach:

Kihim is a secluded place at a distance of approximately 10 km from Alibag. The Kihim beach is famous for dense cover of coconut trees. Another occupation of their people is agriculture for woods that are home to rare butterflies, birds and flowers.

Saswane:

It is about 18 km from Alibag and famous for Karmarkar sculpture and Clean Beach.

Rewas:

It is about 25km from Alibag. From Rewas, there is a ferry boat service to Mumbai (bhaucha Dhakka) and to Uran (Karanja).

Revdanda:

It is situated about 17 km from Alibag. The long sea cost called "REVDANDA BEACH" is tourist attraction place. It is famous weekend tourist spot.

Kanakeshwar Mandir:

It is about 17 km from Alibag to Karlekhind – Chondi road, 13 km from Alibag to the northeast. This very famous Shiv temple on a 900 ft. high hill. It is a 5000-foot climb on well-paved stairs, which takes around one hour. Landmarks along the route are tombs of MohanGiri and Balgiri, Nagoba Rest, Jambhali Plateau, God's stair, Gaymandi etc. The scenic temple premises comprises small temples of Sri Paleshwar, Sri Hanuman, Sri Balram Krishna and Lord Shiv. The special attraction is an ancient sweet water tank enclosed in traditional structure of black stone. The ancient temple was built by Raja Ramdeorai yadav. The height of the Shiv temple is 54 ft. The front gate has lion sculpture on both sides with traditional lamp-pillar (deepmaal) in front. The 4-foot 'pindi' of Lord Shiv is silver-plated. The premises also include Nagaar-khana, Bheem Kunda, a garden for flowers to be offered to the Lord, Sri Ram Ganesh temple and Gomukha. Every year, there is a fair on Kartik Poornima in Hindu calendar. On this hill, a variety of herbs are found.

Mandawa:

It is situated about 17 km north of Alibag. The catamaran/ferry services are available from Mumbai to the Mandawa jetty. Many Bollywood celebrities own bungalows here.

Kashid Beach:

It is 49km from Alibag, on the Alibag-Murud highway, also this beach is possibly one of the cleanest and most beautiful beaches in the region with almost 'white' sand. There are many cottages and resorts available ranging from around INR 1500 to INR 20,000. Prakruti resort is the luxury and the costliest of all. This village does not have any wine shops. One has to go around 6 km towards Murud to buy alcohol. Kashid is the perfect place to relax for urban people. One can find water sports facility and number of small shops for snacks. There is a danger board warning people of dangerous tides.

Korlai Beach:

A quiet serene beach with alternate white and black sands, along a serene stretch of the Arabian coastline, adjacent to a village of Korlai Creole Portuguese-speaking Indians. Just across the bridge, to the right there is Korlai fort within the sea and attached to the mainland by a narrow land strip through the Korlai fort through the Korlai Village. It is supposed to have been built by the Portuguese in 1521. The main gate has an inscription which means 'no entry without a fight'. The fort has seven gates, a sweet water well, a church in disuse, a Hindu temple and a lighthouse which is still used for navigation.

Conclusion:-

1) Alibag tehsil has great tourism potential for the development of tourism.
2) Beaches are prime attraction of Tourists.
3) Alibag tourism is provide more facilities to tourist, like hut cottage, boating, parasailing, entertainment and best of the Konkani test. etc.
4) Alibag is the coastal town, and one of the tourist destination in India.

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ANALYSIS OF WATER QUALITY USING PHYSICO-CHEMICAL PARAMETERS OF DRINKING WATER SOURCES OF MURUD NAGARPARISHAD AREA DISTRICT-RAIGAD, MAHARASHTRA, INDIA

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Abstract
The water sample from different drinking water resources of Murud Nagarparishad area was analyzed for their physicochemical characteristics. Laboratory tests were performed for the analysis of samples for Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity were analyzed in the month of December 2017. By observing the result it can be concluded that the parameters which were taken to study the water quality are below the pollution level for water which satisfies the requirement for the use of various purposes like domestic, agricultural etc. The usefulness of these parameters in predicting dam water quality characteristics were discussed.
Keywords: *Drinking water resources, water quality standard, Physico-chemical Parameter.*

INTRODUCTION:

Water is one of the most important and abundant compounds of the ecosystem. Physico chemical parameter study is very important to get exact idea about the quality of water and we can compare results of different physico-chemical parameter values with standard values. It is very essential and important to test the water before it is used for drinking, domestic, agricultural or industrial purpose [1]. Ground water contributes 0.6% of the total water resources on the earth is the major source of drinking and agriculture water in rural and urban areas [2]. The quality of ground water depends on various chemical constituents and their concentration. It is very essential and important to test the water before it is used for drinking, domestic, agricultural or industrial purpose. Water must be tested with different physic-chemical parameters. Selection of parameters for testing of water is solely depends upon for what purpose we going to use that water and what extent we need its quality and purity [3-5]. Water does content different types of floating, dissolved, suspended and microbiological as well as bacteriological impurities. Some physical test should be performed for testing of its physical appearance such as temperature, color, odour, pH, turbidity, TDS etc, while chemical tests should be perform for its BOD, COD, dissolved oxygen, alkalinity, hardness and other characters [6-8].

Prabhakar R. Pawar and Balasaheb G. Kulkarni [9] have studied assessment of water quality in the karanja creek (Raigad). Budharatna Bhavare, Miguel A. Rodriguez, Anil Kurthe [10] has studied different physic chemical parameter and nutrients in water of Bhatye estuary, Ratnagiri central, West coast of India. Francis Andrade, H.B. Arvinda, and E.T. Puttaiah [11] have studied Manglore coastal water pollution by analysis of physical, chemical parameter. Ramalingam manikannan, Subramanian asokan and A.H.M.S. Ali [12] have studied Seasonal variation of physicochemical properties of the great vedaranyam swamp point calimere wildlife Sanctuary, South east coast of India. Sujata Sen, Dr. Minal Kanti Paul, and Madhab Borah [13] have studied the some physico chemical parameter of pond and river water with reference to correlation study. G.Velsamy, N. Manoharan, S.Ganesan [14] has studied analysis of physicochemical variations in sea water sample Uppanarestuary, Cuddalore, Tamilnadu (India).

Murud-Janjira is the local name for a fort situated on an island just off the coastal village of Murud, in the Raigad district of Maharashtra, India. **Murud** is a taluka city and a municipal council in Raigad district in the Indian state of Maharaashtra. Situated at a distance of 42 km from Alibag, Murud is a tourist destination. The Palace of Nawab is located in Murud. The palace was built in 1885 for administration purposes. The palace is still owned by the descendants of the Nawab and is a private property.

The water sample such as Pipe water, bore well water and well water was collected early in the morning between 8.00 am to 10.00 am and was analyzed to compare the differences occurred in Physico-chemical parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Ca-hardness, Magnesium hardness and Salinity.

The research work is carried out, keeping in mind the following objectives.

- To study the chemical composition and water quality parameters of different sources.
- To investigate the possible sources and Cause of pollution in the water if any.
- To study if these effects can be attributed to the change in the chemical composition of the different water sources.

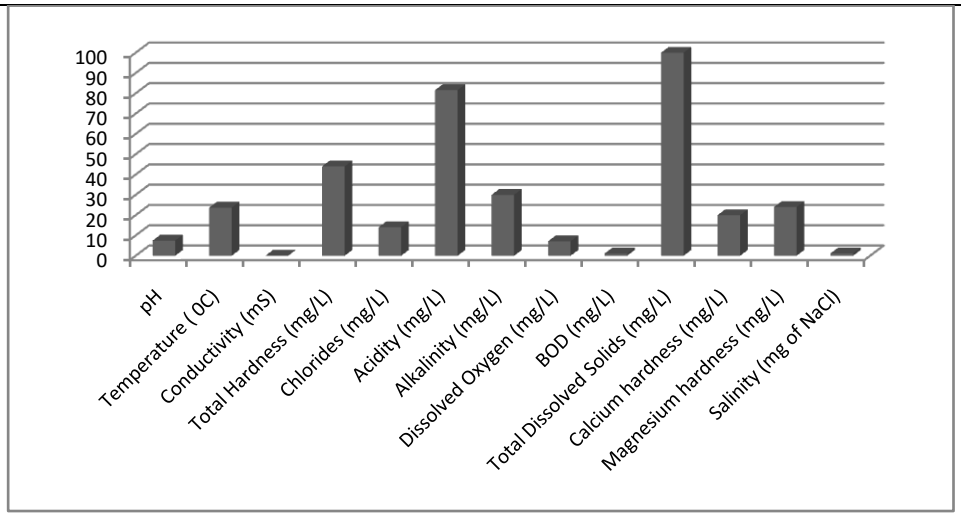
MATERIAL & METHOD:-

Sample of water was collected in sterile plastic bottle of 2 litre capacity from the dam. At the same time the temperature & pH were noted. The physico-chemical analysis was carried out within 24 hours of collection in a laboratory as per APHA (1989), (1992), AWWA & WPFA, Trivedy & Goel (1986) [15-16]. The chemicals were used of A. R. grade and are standardized as per Inorganic quantitative analysis by Vogel (1964) & (2006) [17-18]. The result is statistically analyzed by calculating mean & standard deviation.

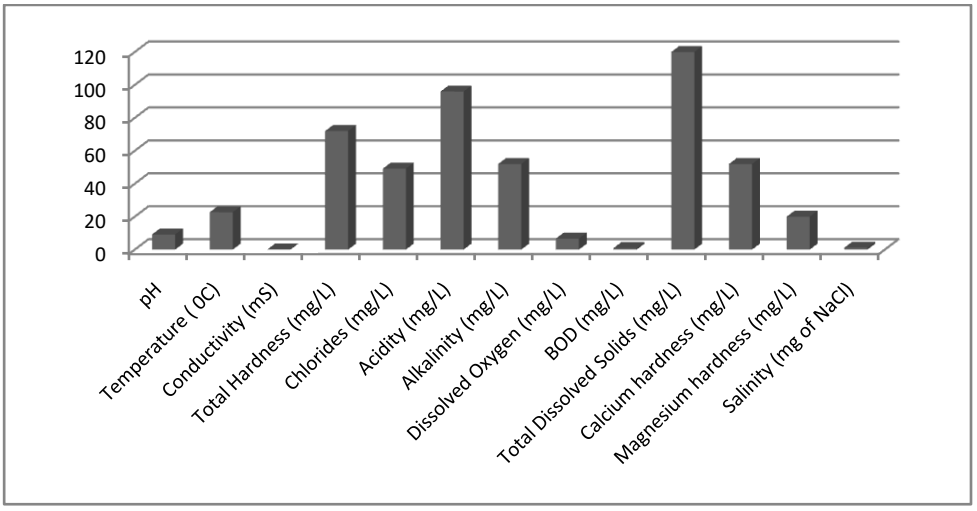
RESULTS & DISCUSSION:-

Parameters	**Tap water Mean+S.D**	**Bore well water Mean+S.D**	**Well water Mean+S.D**
pH	7.47 + 0.02	9.20+ 0.02	7.13+ 0.02
Temperature (^{0}C)	23.7 + 0.3	22.7 + 0.3	24.7 + 0.3
Conductivity (mS)	0.109 + 0.002	0.126 + 0.002	0.418 + 0.002
Total Hardness (mg/L)	44 + 1.0	72 + 1.0	240 + 1.0
Chlorides (mg/L)	14.05 + 0.18	49.15 + 0.18	29.13 + 0.18
Acidity (mg/L)	81.6 + 0.3	96.0 + 0.3	106.3 + 0.3
Alkalinity (mg/L)	30 + 0.3	52 + 0.3	206 + 0.3
Dissolved Oxygen (mg/L)	7.126 + 0.015	6.716 + 0.015	7.436 + 0.015
BOD (mg/L)	1.081 + 0.03	0.953 + 0.03	1.117 + 0.03
Total Dissolved Solids (mg/L)	100 + 1.0	120 + 1.0	215 + 1.0
Calcium hardness (mg/L)	20 + 0.3	52 + 0.3	136 + 0.3
Magnesium hardness (mg/L)	24 + 0.3	20 + 0.3	104 + 0.3
Salinity (mg of NaCl)	1.172 + 0.003	1.162 + 0.003	1.182 + 0.003

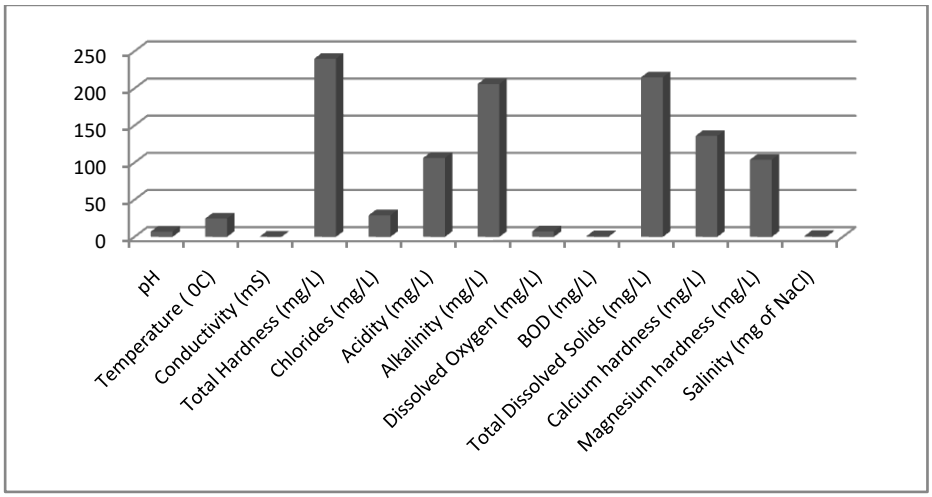
Table-1:- Values of different parameters of water sample of different drinking sources in Murud Nagarparishad area. (Mean and Standard deviation is calculated)



a. Graph showing concentration range of various parameters of Tap water.



b. Graph showing concentration range of various parameters of bore well water.



c. Graph showing concentration range of various parameters of well water.

1. Temperature:

Temperature is the most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimize temperature change. The Water temperature depends on the depth of the water column, climatic and topographic changes [19].

A rise in temperature of water leads to the speeding up of chemical reactions in water, reduces the solubility of gases and amplifies the tastes and odour. At higher temperature with less dissolved

gases the water becomes tasteless and even does not quench the thirst and decreases the solubility of oxygen.

Temperature also determines various other factors such as pH, Conductivity, saturation level of gases and various forms of alkalinity. The temperature of Tap water is 23.7+0.3 ^{0}C, bore well water temperature is 22.7+0.3 ^{0}C and temperature of well water is found to be 24.7+0.3 ^{0}C.

2. pH:

pH, one of the most common analyses in soil and water testing, is the standard measure of how acidic or alkaline a solution is. pH has no direct adverse effect on health. pH governs the distribution, transport and fate of heavy metals in aquatic ecosystem. It is measured a scale from 0 -14. pH of 7 is neutral, pH is less than 7 is acidic and pH greater than 7 is basic. Aquatic organisms need the pH of their water body to be a certain range optimal growth and survival.

The pH of Tap water is 7.47 + 0.02, bore well water pH is 9.20 + 0.02 and pH of well water is found to be 7.13 + 0.02. Amongst these three samples, bore well water is comparatively basic in nature.

3. Electrical Conductance:

Conductivity is the measure of a substance or solution to conduct electric current. Presence of salts and contamination with wastewater increases conductivity of water. It is a indication of pollution. Electrical conductivity used to quickly estimate the ionic or soluble salt concentration in soils, water supplies, fertilizer solution and chemical solution. It is highly depended upon temperature.

Conductivity however is an important criterion in determining the suitability of water for irrigation. The conductance of Tap water is 0.109+ 0.002 mS, bore well water conductance is 0.126 + 0.002 mS and conductance of well water is found to be 0.418 + 0.002 mS. Amongst these three samples, well water is comparatively high electrical conductance. The observed values of electrical conductance for others are quite low and less electrolyte.

4. Total Hardness:

Total hardness is defined as the sum of calcium and magnesium hardness in mg/L as $CaCO_3$.Total hardness of water an important factor that indicates toxic effect and poisonous elements [20].

There is no adverse effect of hardness on health. Hard water is also not suitable for domestic and irrigation purposes. Total hardness of Tap water is 44 +1.0 mg/L, bore well water is 72 +1.0 mg/L and the well water is 240 +1.0 mg/L.

The degree of hardness of drinking water has been classified in terms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/L, Medium - 60-120 mg/L, Hard - 120-180 mg/L, Very hard - >180 mg/L. The observed values were quiet less than the acceptable limit of 300 mg/L.

5. Chlorides:

Chloride is mainly obtained from the dissolution of salts of hydrochloric acid as table salt (NaCl), NaCO2 and added through industrial waste, sewage, sea water etc. Surface water bodies often have low concentration of chlorides as compare to ground water. It has key importance for metabolism activity in human body and other main physiological processes. High chloride concentration damage metallic pipes and structure as well as harms growing plants. According to WHO standards concentration of chloride should not exceed 250 mg/L.

The chloride content of the tap water sample is 14.05 +0.02 mg/L, bore well water is 49.15+0.18 mg/L and Chlorides in well water sample is 29.13 +0.05 mg/L.

6. Acidity:

Acidity of water is its capacity to neutralize a strong base and is mostly due to the presence of strong mineral acids, weak acids and the salt of strong acids and weak bases. Addition of wastewater

having acidity producing substances increases the acidity of water. The observed acidity of tap water sample is 81.6+ 0.015 mg/L of $CaCO_3$, bore well water sampleis 96.0+ 0.3 mg/L. of $CaCO_3$. While acidity of well water samples is 106.3+ 0.3 mg/L of $CaCO_3$. The value is much less than threshold value i. e. 200 mg/L of $CaCO_3$. This indicates that sample of water are in safe range.

7. Alkalinity:

Alkalinity is a chemical measurement of water's ability to neutralize acid. Alkalinity is also a measure of water buffering capacity or its ability to resist changes in pH upon the addition of acids or bases. Alkalinity of natural water is due to primarily to the presence of weak acid salts, although strong bases may also contribute (i.e. OH^-) in the extreme environment. Bicarbonate represents the major form of alkalinity in natural water, so its source being the partitioning of CO2 from the atmosphere and the weathering of carbonate minerals in rocks and soil. Other salts of weak acids, such as borate, silicates, ammonia, phosphate, and organic bases from natural organic matter may be present in small amounts.

The observed alkalinity of tap water sample is 30+0.3 mg/L of $CaCO_3$, bore well water sample is 52+0.3 mg/L. of $CaCO_3$ while alkalinity of well water sample is 206+0.3 mg/L of $CaCO_3$. The observed values of alkalinity of tap water and bore well water are within permissible range i. e. below 200 mg/L of $CaCO_3$. The well water is not in safe range i.e. higher than permissible range of 200 mg/L of $CaCO_3$.

8. Dissolved Oxygen:

The amount of oxygen dissolved in water, such as a lake, river or stream. Dissolved oxygen is the most important indicator of the health of water bodies and its capacity to support a balanced aquatic ecosystem of plants and animals. Warm water released from industrial outlets, flowages or storm sewers can also reduce dissolved oxygen levels. Dissolved oxygen may play a large role in the survival of aquatic life in temperature lakes and reservoirs during summer months. Dissolved oxygen of tap water sample collected is 7.126 + 0.015mg/L, bore well water sample is 6.716 + 0.015mg/L, whereas well water sample is 7.436 + 0.015mg/L . It may be due to high temperature and inorganic reluctance such as hydrogen sulfide, ammonia, nitrites, ferrous ions and other oxidizable substances also tend to decrease dissolved oxygen in water.

9. Biochemical Oxygen Demand (BOD):

Biochemical oxygen measures the amount of oxygen that microorganisms consume while decomposing organic matter, it also measures the chemical oxidation of inorganic matter. BOD is a measure of organic material contamination in water, specified in mg/L. BOD is the amount of dissolved oxygen required for the biochemical decomposition of organic compounds and the oxidation of certain inorganic materials (e.g., iron, sulphites).

The observed value of BOD for tap water is 1.081 + 0.03 mg/L, for bore well water is 0.953 + 0.03 mg/L and for well water sample is 1.117 + 0.03 mg/L which is within the permissible range i. e. 0.75-1.5 mg/L.

10. Total Dissolved Solids (TDS):

Total dissolved solids are the total amount of mobile charged ions, including minerals, salts or metal dissolved in a given volume of water in mg/L. TDS is directly related to the purity of water and the quality of water purification system and affects everything that consumes, lives in, or uses water, whether organic or inorganic, whether for better or for worse. Common inorganic salts that can be found in water include calcium, magnesium, potassium and sodium, which are cations and carbonates, nitrates, bicarbonates, chlorides and sulphates which are anions. They give a particular taste to water at higher concentration and also reduce its palatability.

The total solid present in tap water sample collected is 100 + 1.0 mg/L, for bore well water is 120 + 1.0 mg/L, while that of for well water sample is 215 + 1.0 mg/L which is lower than threshold value of total solid content i.e. 500 mg/L.

11. Calcium hardness:

Calcium is naturally present in water. Calcium is a determinant of water hardness, because it can be found in water as Ca^{2+} ions. As per Indian Standards the calcium content of water should not be more than 75 mg/L. This has been specified in the IS 10500:- Drinking Water –Specifications.

In the study the calcium content in water sample has been found to be for tap water sample is 20 + 0.3 mg/L, for bore well water is 52 + 0.3 mg/L and for well water is 136 + 0.3 mg/L. Tap water and bore well water possess values calcium hardness which is within the limit as per Specification. The observed value for well water shows higher concentration of calcium.

12. Magnesium hardness:

Magnesium is naturally present in water. Magnesium is a determinant of water hardness, because it can be found in water as Mg^{2+} ions. As per ISI the magnesium content of water should not be more than 50 mg/L.

In the study the magnesium content in water sample has been found to be for tap water sample is 24 + 0.3 mg/L, for bore well water is 20 + 0.3 mg/L and for well water is 104 + 0.3 mg/L. Tap water and bore well water possess values magnesium hardness which is within the limit as per Specification. The observed value for well water shows higher concentration of magnesium.

13. Salinity:-

Salinity which is defined as the total concentration of electrically charged ions in the water. These ions are the four major cations-calcium, magnesium, potassium and sodium, and the four common anions carbonates (CO_3), sulphates (SO_4), chlorides (Cl) and bicarbonates (HCO). Other components of salinity are charged nitrogenous compounds such as nitrates (NO_3), ammonium ions (NH_4) and phosphates (PO_4) **[**21]. In general the salinity of surface waters depends on the drainage area, the nature of its rock, precipitation, human activity in the area and its proximity to marine water [22]. Waters with salinity below 1% are fresh and waters with salinity higher than 1% are brackish/marine [23].

The observed value of salinity for tap water sample is 1.172 + 0.003 mg of NaCl, for bore well water sample is 1.162 + 0.003 mg of NaCl and for well water sample is 1.182 + 0.003 mg of NaCl .

CONCLUSION:

The present paper deals with analysis of water quality in different drinking water resources available in Murud Nagarparishad region which was carried out by taking certain important parameters like Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity. The data of physico-chemical and biological parameters clearly shows that the drinking water of Murud Nagarparishad region is within the permissible range as per APHA (1989), (1992), Trivedi and Goel (1986). Such water is suitable for drinking purpose and can be used for domestic as well as irrigation purpose.

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THE EMOTIONAL BOND BETWEEN INDIA AND BANGLADESH THROUGH LITERARY ENDEAVOUR

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Abstract

South Asia has a rich tradition of art and literature. The neighboring countries i.e. India and Bangladesh share some common concerns, interests and insights. Most important among them is, the countries have a rich tradition of poetry. "Poetry offers an aesthetic experience". The contribution of Indian and Bangladeshi poets in the literary culture brought a revolution. The poets like R Tagore, Kazi Nazrul Islam, Kamala Das, Kaiser Haq to the modern poets Meena Kandasamy, Sonnet Mondal to Taslima Nasreen brought a liberty in thought and action. They are the role models who transformed the role of literature in the mode of resistance in the urge of armed and political struggle. With the music of verse, the wonder of creative imagination, richness of description, marvels of metaphor, and the force of emotion, poetry can educate, motivate, ennoble, and enlighten us. Poetry can also help us appreciate the plenitude, brevity, and beauty of human life. It actually bridges the gap of differences. The present work tries to bring out the essence of literary exchange that binds the neighboring countries together. In addition to qualities of memorability, musicality, imagination, and invention, we find poetry to touch us at an emotional level.

Keywords: *Literature, Poetry, Tradition, Culture, Thought & Action.*

"Art is long; life is short" is a very old saying. Poetic art is considered as a long-lasting art. An American poet said that a poem is "a time machine" made out of words, by means of which people in the past may speak to present and vice versa and even can get connected to future. Poetry is a reflection of a person's innermost thoughts, feelings and desires. The purpose of poetry is to evoke a response or a feeling within someone, but it varies from individual to individual whether they agree or disagree on your analysis of certain subjects. It's a tool which basically influences people because of its emotive and linguistic capture upon its audience. If you are a good poet you can intrigue a person or can persuade anyone to your way of thinking or swaying them into your ideas. This can be a most powerful instrument, the most effective writing skill, to touch and to compel a person with mere word. Thus poetry has the means to influence a society, it is important because it makes us think, it opens us to wonder the astonishing possibilities of language.

Bangladesh and **India** are South Asian neighbors. Relations have been friendly.] They are common members of SAARC, BIMSTEC, IORA and the Commonwealth. The two countries share many cultural ties. We see socio-economic commonalities too. The more liberal newspapers of the area print articles, which underlines the ties which unite the people of the two countries. The articles remind us of our close cultural affinity, our common history, the religions and the languages that we share. What is unnoticed is the process of social change and development which each one of our societies is experiencing today.

Geographically it is easy to define the regions. Historically and culturally they share the same domain. World's major religions exist here. History and geography has placed these two countries together in an environment characterized by homogeneity, intimacy and interdependence.

India seeks to build a new future with Bangladesh. The time has come to chart a new path. The countries have a rich tradition of poetry and share certain common concerns, insights and interests. Poets not only accurately describe and analyze powerful emotions; they also convey or evoke them.

Poetry affects different people in different ways, and can easily do through written words what many conversations fail at – it can heal, inspire, enrage and even spark joy in the darkest of spaces inside you. Poets are blessed to have a special kind of power that allows them to speak to each and every person on an intimate level and keep you hooked and astonished, even if it's a subject you have little-to-no interest in.

Poetry has the power to reach out and touch lives, beyond tangible and intangible borders. The power of good poetry is limitless. Poetry bridges the gap among individuals, rich and poor, present and future and above all across borders. There can be many differences between the countries but poetry overcomes them.

Cohesion means the degree of similarity, here interaction on the basis of social cohesion (whether history, culture, language, ethnicity and common heritage) is the focus. History and geography have placed these two countries together in an environment characterized by homogeneity, intimacy and interdependence. The objective is to promote active collaboration and mutual assistance in the social, cultural, economic and other fields.

There is a class of contemporary Indian poets who have revived a love of poetry in their own unique way. They've given voice to a myriad of subjects, from light to heavy.

Kamala Das (b 1934) as a poet merits as one of the best poets of the twentieth century. "An Introduction" is an autobiographical verse of Kamala Das that throws light on the life of a woman in the patriarchal society. It's a confessional poetry and till today nobody has dared to write anything of such kind.

I was child, and later they
Told me I grew, for I became tall, my limbs
Swelled and one or two places sprouted hair.
When I asked for love, not knowing what else to ask
For, he drew a youth of sixteen into the
Bedroom and closed the door, He did not beat me
But my sad woman-body felt so beaten.
The weight of my breasts and womb crushed me.
I shrank pitifully.

She was child-like or innocent; and she knew she grew up only because according to others her size had grown. Married at the early age of sixteen, her husband confined her to a single room. She was ashamed of her feminity that came before time, and brought her to this predicament. This explains her claim that she was crushed by the weight of her breast and womb.

It's the poet's individuality and feminine identity against social and cultural conformity. The poetry of Kamala Das has been hailed as excellent because of the apparent imaginative daring, stylistic innovation, richness of energy and music. She is a natural poet and has consistently written about herself.

Meena Kandasamy (b.1984) expressed that the "aim of her poetry is to send a social message". As a Dalit woman, she gives a voice to issues such as caste oppression, discrimination and gender relations, her powerful poetry creates waves that are both celebrated as well as questioned by many in our patriarchal society. Kandasamy is political and selective with her words and has stayed true to her identity in carving out space for the voice of resistance and dissent in our tumultuous social and political climate.

There is fierce and exuberant wit and word play in Meena's works. Back-Street Girls is a poem that draws women to the independence enjoyed by men breaking all constraints. Meena's women need not chain themselves by the rules anymore. They can act according to their whims and fancies. They need not confine themselves within the iron bars of culture and tradition.

She has brought in the mythological character, Karaikkal Ammayar who stands for the dalit women who are sexually exploited by men. Karaikal Ammayar was deserted by her merchant-husband to marry "a fresh and formless wife" inspite of her beauty and "the magic of my (her) multiplying love". Her love for Lord Shiva posed her to be a mystic in the eyes of her husband. Meena expresses the pain of deserted women through the mouth of Karaikkal Ammayar. The society viewed her as a mad woman living with faltered step, felted flying hair, hollowed cheeks and bulging eyes.

I am a dead woman walking asylum corridors,
with faltering step, with felted flying hair,
with hollowed cheeks that offset bulging eyes,
with seizures of speech and song, with a single story
between my sobbing pendulous breasts
The poem sarcastically underlines how such women die while they are physically alive.

Tishani Doshi's (b.1975) poetry on the other hand covers a range of themes and subjects, ranging from travel, love and longing to finding and transforming your identity across borders, self-illumination, all tinged with her own experience with the same. Doshi has long reflected on the idea of immigration and creating a new home in new land in "Immigrant's Song"

Instead, let us speak of our lives now —
the gates and bridges and stores.
And when we break bread
in cafes and at kitchen tables
with our new brothers,
let us not burden them with stories
of war or abandonment.
Let us not name our old friends
who are unravelling like fairytales
in the forests of the dead.
Naming them will not bring them back.
Let us stay here, and wait for the future
to arrive, for grandchildren to speak
in forked tongues about the country
we once came from.

Tishani Doshi says she worries about the "culture of fear" that has developed toward immigrants in the United States and Britain. "You think you live in one kind of community and then… you realize that there are huge rifts in society that come out of fear— fear that has been artificially created and manipulated." She blames politicians for playing to very base emotions, scaring people that immigrants will take their jobs or incite violence. "That kind of talk is very misleading and very dangerous."

In the last more than four decades, the two countries have continued to consolidate their relations and have built a comprehensive institutional framework to promote bilateral cooperation in all areas. More than 50 bilateral institutional mechanisms are operational at present between India and Bangladesh.

Bangladesh is highly prone to natural disasters like floods, cyclones and has history moved by powerful emotion of nationalism, independent identity. Asad Chowdhury (b. 1943) poet, writer, translator, radio personality and journalist and cultural activist from Bangladesh in his ironic poem 'Rights of the Tiger' has said:

……. "Sir, your tiger rights are being violated all
around. We have been fighting to establish human rights.
If you permit, we can try the same for all the tigers of Asia,
Africa and Latin America.
Hearing this the tiger howled with laughter just like
a scary villain of the tinsel world.
"Didn't you once write a poem to heal all the unwell green of
this earth? "
I had to agree, nodding my head sheepishly.
"Please leave tiger rights alone for some time
and try curing yourselves for a change.

Man and earth are seriously ill, in case you noticed."
He seemed really disturbed at it all,
and that's how I got rid of worries about tiger rights.
(Translated by Afsan Chowdhury)

In the above poem man approaches the Tiger in order to start a movement for the rights of the Third World Tigers. But the Tiger ask him to leave the Tiger – Rights alone for some time and to try curing himself for a change as Man and his Earth are alike seriously ill.

The liberation war in 1971, where three million people gave their lives for the country, was the most significant period for Bangla literature. The new literature with new voices from a newly emerged country flourished only from then on. New Bangla poetry is moving forward along with its traditionalism and modernism although many have practiced post modernism styles.

Rumana Siddique's *Five Faces of Eve: Poems* (2007) reflects the timeless experience of a woman symbolized by their biblical ancestor, Eve. Rumana's poems are a mix of the pleasures and pains of life. The poems in this collection have been written over a span of twenty-five years and mark the rites of passage from girlhood to womanhood. Inspired by the joys and pains of roles that women play, each bringing with it a new face to wear, the volume is a reflection of the timeless experience of womanhood symbolised by a common ancestor "Eve." The poems are wry, ironic, rueful, sometimes sad and sometimes playful.

Kaiser Haq (b.1950) is the most leading English language poet in Bangladesh. His poetic output is quite substantial. A freedom fighter himself, Kaiser Haq is a consummate artist who has painted the contemporary Bangladeshi scene with powerful imaginative mind and artistic precision. His work bears all the hallmarks of good poetry. In "Senior Citizen," Haq introduces the way people are mocking aged persons. There is mild sarcasm in their tone and pitch. The people's tone makes double connotation of the spoken words with its meaning.

I'm Sixty.
Facetious fools say that's nothing
If one's young at heart,
Or, absurdly: Sixty's the new forty.

An aged person who worked so hard by using his or her intelligence, ideas, genius and now at the evening hour of his or her life, forcing them to engage in their socially constructed reality. They are granted as useful element still they are fulfilling their role. Then, when they have nothing more to give to the society they were tossed aside.

The events of 1971 inspired Bengali poets to write about the horrors of the war as they did about the heroism of the people. Shamsur Rahman (b.1929-d.2006) a poet, journalist and columnist wrote about the destruction of landmarks and of inhuman massacres.

Rahman, who emerged in the latter half of the 20th century, wrote more than sixty books of poetry and is considered a key figure in Bengali literature. He was regarded as the *unofficial poet laureate* of Bangladesh. Major themes in his poetry and writings include liberal humanism, human relations, romanticised rebellion of youth, the emergence of and consequent events in Bangladesh, and opposition to religious fundamentalism

From the short lyric to the dramatic monologue, from strictly rhymed verses to flexible mixed forms, he has handled all modes with effortless mastery. He is equally interesting in his treatment of topical and historical subjects and the timeless themes of poetry – political turmoil, war, political leaders; the many faces of love, the exploration of the self, the passage of time; mortality.

For A Few Lines of Poetry
I go to a tree and say:
Dear tree, can you give me a poem?
The tree says: If you can pierce

My bark and merge into my marrow,
Perhaps you will get a poem.
I whisper into the ears
Of a decaying wall:
Can you give me a poem? ……
[Translated from the Bengali by Syed Najmuddin Hashim]

Through the above quoted poetries we can conclude that poetry has something to do with morality and religion on one hand on the other with politics and society and above all with the emotions of the poet or his/her perspective of life.

"There may be various misunderstanding between India and Bangladesh, but if there is a people-to-people contact amongst us, it strengthens the fraternity between us. It also helps in the development of non-fundamental thoughts and both nations will get inspired for socio-economic development," said by Member of Parliament Ziaul Haque Mridha in 2015. Thus creativity, and sheer human strength, verses sprung forth in both the countries. All visual and performing arts, crafts and culture are means to unite people. These inspired poems are as diverse as the individuals and communities that this bridge links together. There can never be wars between wise people. Thus *poetry bridges the gap between* high and popular culture and reaches a broader audience. Literary Festivals and programmes help in strengthening the bonds between the countries and will pave the way for socio-economic development and many more. Thus:

And forever and forever,
As long as the river flows,
As long as the heart has passions,
As long as life has woes;
The moon and its broken reflection
And its shadows shall appear,
As the symbol of love in heaven,
And its wavering image here.
Henry Wadsworth Longfellow.

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SYNTHESIS AND CHARACTERIZATIONS OF ZINC COBALT FERRITE ($Zn_{0.5}Co_{0.5}Fe_2O_4$) NANOPARTICLE USING GREEN AND ORGANIC CHELATING AGENTS VIA SOL-GEL AUTO COMBUSTION TECHNIQUE: - IT'S COMPARATIVE STUDY

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Abstract
The nano size particle of Zinc Cobalt ferrite having the chemical formula $Zn_{0.5}Co_{0.5}Fe_2O_4$ was synthesized by a Sol-Gel auto combustion route using green and organic chelating agents. The obtained material was sintered at 700 °C for 8 hours. The sintered nanoparticles were characterized by means of Fourier transform infrared spectroscopy (FT-IR), X-ray diffraction analysis (XRD), scanning electron microscopy (SEM) and energy dispersion X-ray analysis (EDAX). FT-IR study was performed to ascertain the structure of the nanoparticles. XRD analysis revealed a single crystalline cubic phase for nanoparticles thermally treated at 700 ºC. The average crystallite size was found to be around ***15.6 nm and 15.9 nm****. Scanning Electron Microscopic (SEM) studies revealed nano crystalline nature of the sample. Energy dispersion X-ray analysis (EDAX) was performed to know an elemental composition of the sample and to confirm the stoichiometry.*
Keywords: *$Zn_{0.5}Co_{0.5}Fe_2O_4$, Sol-Gel auto combustion; X-Ray Diffraction; SEM; EDAX*

1. INTRODUCTION:

Spinel ferrite nanoparticles and their coated, specially Co-Zn ferrite have been extensively investigated during the recent years, due to their favorable magnetic properties in all areas of biomedicine and bioengineering, such as contrast enhanced magnetic resonance imaging, cell separation, hyperthermia, detoxification of biological fluids, drug delivery and tissue regeneration[1-6]. Synthesis of magnetic nanoparticle has been desperately interested because of their unique features and potential applications, such as magnetic resonance imaging, treatment of cancer and biomedical drug delivery [1,2, 7-10].

Cobalt ferrite ($CoFe_2O_4$) is a well-known hard magnetic material with high coercivity and moderate magnetization. These properties, along with their great physical and chemical stability, make $CoFe_2O_4$ nanoparticles suitable for magnetic recording applications [11]. Many efforts have been made to improve the basic properties of these ferrites by substituting or adding various cations of different valence states depending on the applications of interest. Among spinel ferrites, Zn^{2+} substituted $CoFe_2O_4$ nanoparticles exhibit improved properties such as excellent chemical stability, high corrosion resistivity, magnetocrystalline anisotropy, magnetostriction, and magneto-optical properties [12-13].

In addition, metallic nanoparticles are made of iron, nickel or cobalt, mostly due to their chemical instability for biological applications are ignored and are easily oxidized in the presence of water and oxygen [14]. Cobalt zinc ferrite nanoparticles have been synthesized by different methods, such as co-precipitation, hydrothermal, sol-gel and other chemical methods [15-17].

In this paper, focus was placed on the comparative study of size controlled synthesis and characterizations of zinc cobalt ferrite ($Zn_{0.5}Co_{0.5}Fe_2O_4$) nanoparticle using green chelating agent such as lemon juice and conventional chelating agent such as citric acid via Sol-Gel auto combustion method. Their characterization was investigated by X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), and scanning electron microscopy (SEM) with EDAX.

2. EXPERIMENTAL

2.1. Materials

All the chemicals used in this study are commercial samples and belong to analytical grade. They were used as received without further purification. Iron nitrate nonahydrate$Fe(NO_3)_3.9H_2O$, Zinc nitrate hexahydrate $Zn(NO_3)_2.6H_2O$, Cobalt nitrate hexahydrate $Co(NO_3)_2.6H_2O$, were used as a precursors and lemon and citric acid as a binding agent.

2.2. Synthesis of Zn-Co-ferrite nanoparticle

In the preparation of Zn-Co-ferrite nanoparticles were synthesized by sol-gel auto combustion method, using starting material of high purity AR grade metal nitrate and lemon juice and citric acid. The metal nitrate solutions were mixed in the required stoichiometric ratios in minimum quantity of distilled water. The solutions will be mixed on a magnetic stirrer at 353K. In order to maintain alkaline condition, ammonia solution was added to the reaction mixture (pH 9 - 9.5). The solution mixture was slowly heated around 373K with constant stirring to obtain a fluppy mass. On further heating, colored powder will obtained. The powder will cooled for some time. The obtained powder nanoparticles were annealed at temperature of 973Kfor 8 hours.

2.3. Size characterization of Zn-Co-ferrite nanoparticle

The ferrite nanoparticles prepared was analyzed by X-ray diffraction technique (XRD) for structure and crystallinity. The formation of mixed metal ferrite nanoparticles was confirmed by Fourier transform infrared (FT-IR) studies. X-ray diffraction (XRD) data was collected at room temperature. Crystallographic properties e.g. phase of the material and crystal structure was determined using the same data.

FT-IR analysis was carried out in the range of **4000-400** cm^{-1}. The samples were pelleted with KBr.

SEM-EDAX analysis was also performed to assure the prepared nanomaterials.

3. RESULT & DISCUSSION

3.1. FTIR ANALYSIS

- ✓ In the FT-IR spectra the frequency bands near 564-588 cm -1 and 425-442 cm-1 are assigned to the tetrahedral and octahedral clusters and confirms the presence of M-O stretching band in ferrites.
- ✓ The authors suggested that the vibrational mode of tetrahedral clusters is higher as compared to that of octahedral clusters, which is attributed to the shorter bond length of tetrahedral clusters.
- ✓ So, FT-IR not only used to collect information about the structure of a compound, but it is also utilized as an analytical tool for assessing the purity of a compound.
- ✓ Fig. 1 & Fig. 2 exhibits the FTIR absorption bands for spinnel ferrites at room temperature in the wave number range of 400–4000 cm^{-1}.
- ✓ It is obvious that the higher frequency band is around 550 cm^{-1} and the lower frequency band is around 400cm^{-1} shown in fig (1 & 2).
- ✓ The highest one corresponds to the intrinsic stretching vibrations of the metal at the tetrahedral site, whereas the lowest band is assigned to octahedral-metal stretching.

Fig. 1. FTIR spectra of $Zn_{0.5}Co_{0.5}Fe_2O_4$ synthesized by using lemon sintered at 800^0C

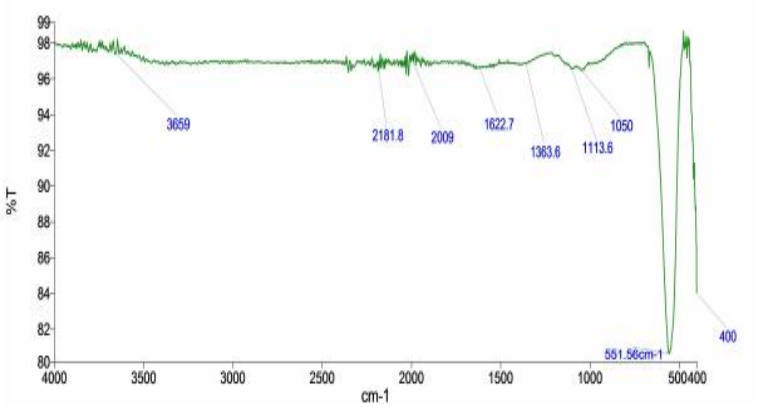
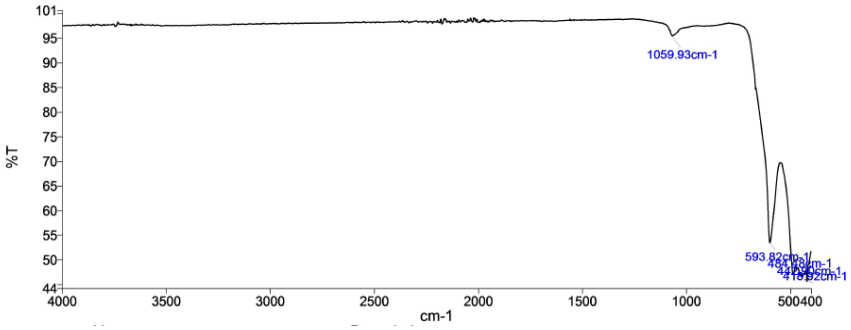


Fig. 2.FTIR spectra of $Zn_{0.5}Co_{0.5}Fe_2O_4$ synthesized by using citric acid sintered at 800^{0}C



3.2. XRD ANALYSIS

- Fig.(3 & 4) shows the XRD patterns of the MOD synthesized **$Zn_{0.5}Co_{0.5}Fe_2O_4$** powder sintered at 800^{0}C for 8 hrs. XRD peaks are indexed with the JCPDS Cards (# 22-1086 for $CoFe_2O_4$ and # 89-1012 for $ZnFe_2O_4$).
- The patterns show characteristic diffraction lines (220), (311), (222), (400), (422) and (511) of spinel cubic structure. The extra reflection peaks of Fe_2O_3 are also observed in XRD patterns of doped samples.
- The observation is not unusual particularly at a low sintering temperature.

Fig. 3. XRD spectra of $Zn_{0.5}Co_{0.5}Fe_2O_4$ synthesized by using lemon sintered at 800^{0}C

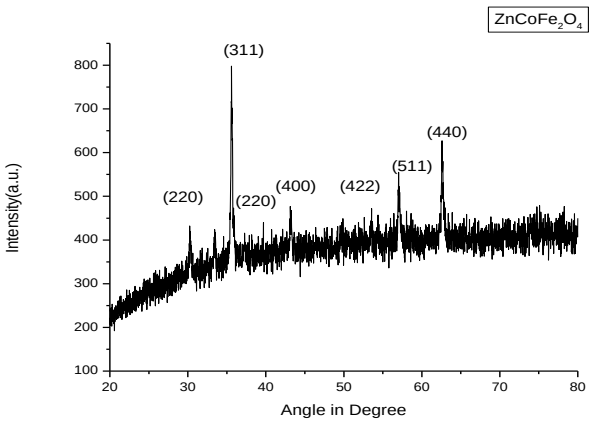
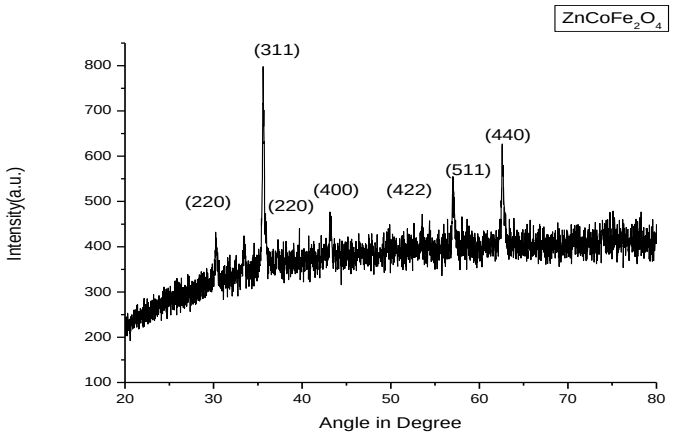


Fig. 4. XRD spectra of $Zn_{0.5}Co_{0.5}Fe_2O_4$ synthesized by using citric acid sintered at 800^{0}C



3.3. PARTICLE SIZE CALCULATION OF $Zn_{0.5}Co_{0.5}Fe_2O_4$ NANOPARTICLES BY SCHERER FORMULA:

The sizes of the nanoparticles at different annealing temperatures have been determined using Scherer equation from the Full width at Half Maximum (FWHM) value of [311] diffraction peak.

$D = 0.9\lambda/\beta \cos\theta$

Where D is the particle size, λ is the X-ray wavelength (1.5418), θ is the Bragg angel and β is the half maximum width.

The size of nanoparticles samples synthesized by green and organic chelating agent was obtained as 15.7 nm and 15. 9 nm respectively at 973K annealing temperature for 8 hour.

3.4 SEM ANALYSIS

- ✓ The scanning electron microscope (SEM) images of Co-Zn ferrites sintered at 800^0C is shown in Fig.5 & 6.
- ✓ In Fig.5 & 6, it can be seen that particles are well distributed and agglomerated.
- ✓ Usually, these agglomerates are formed by smaller size particles.
- ✓ The size of the grain is 142nm from Fig.5 & 6.
- ✓ SEM image reveal dense microstructures.

Fig. 5. SEM micrograph of $Zn_{0.5}Co_{0.5}Fe_2O_4$ synthesized by using lemon sintered at 800^0C

Fig. 6. SEM micrograph of $Zn_{0.5}Co_{0.5}Fe_2O_4$ synthesized by using citric acid sintered at 800^0C

3.5 Energy dispersive x-ray spectroscopy (EDAX)

- ✓ Energy dispersive x-ray spectroscopy (EDX) spectra of **$Zn_{0.5}Co_{0.5}Fe_2O_4$** sample sintered at 800^0C are shown in Fig. 7 & 8.
- ✓ The presence of Co, Zn and Fe in the samples is depicted in the spectra.
- ✓ The EDX analysis indicates the wt% of cobalt and zinc in these samples.

Fig. 7. EDAX spectra of $Zn_{0.5}Co_{0.5}Fe_2O_4$ synthesized by using lemon sintered at 800^0C

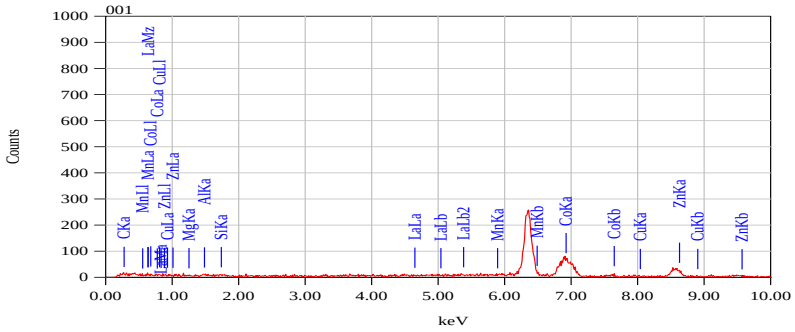
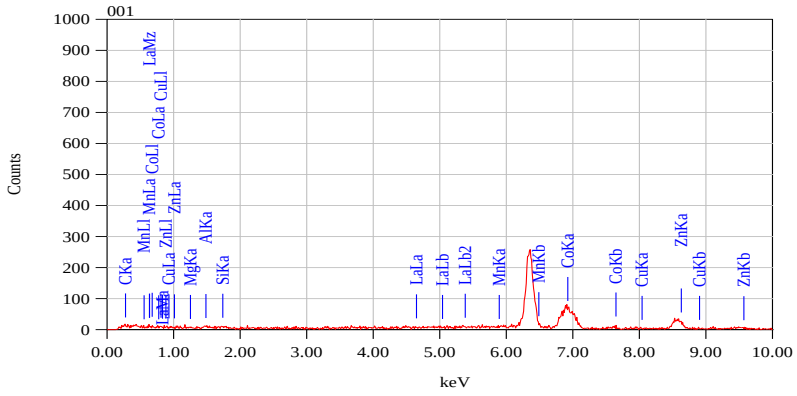


Fig. 8. EDAX spectra of $Zn_{0.5}Co_{0.5}Fe_2O_4$ synthesized by using citric acid sintered at 800^0C



4. CONCLUSIONS

- ✓ The system $Zn_{0.5}Co_{0.5}Fe_2O_4$ system have been successfully synthesized by Sol-gel auto combustion method using lemon juice as a chelating agent at controlled pH and exhibits the single phase cubic spinel structure.
- ✓ FT-IR spectra explain tetrahedral and octahedral clusters and also confirm the presence of M-O stretching band in $Zn_{0.5}Co_{0.5}Fe_2O_4$ nanomaterial.
- ✓ X-ray diffraction pattern confirms the formation of cubic spinel structure in single phase without any impurity peak. It is in good agreement with the standard data from ICSD.
- ✓ The crystallite size of $Zn_{0.5}Co_{0.5}Fe_2O_4$ system synthesized by green and organic chelating agent was obtained as 15.7 nm and 15. 9 nm respectively.
- ✓ SEM image of prepared sample show that the particles have an almost homogeneous distribution, and an agglomeration of nanoparticles with inhomogeneous broader grain size distribution.
- ✓ EDAX data give the elemental % and atomic % in the mixed $Zn_{0.5}Co_{0.5}Fe_2O_4$ system and it shows the presence of Zn, Co,Fe and O without precipitating cations.

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WORK CULTURE AND EMPLOYEE SATISFACTION

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Abstract

Work culture has recently emerged as one of the key areas of research in organizational behaviour. The type of work culture that exists in within the industry influences the employee. The impact of work culture on productivity, profits and organizational effectiveness has, in recent years, drawn the attention of top management. Employee satisfaction is an employee's sense of achievement and success on the job. Employee satisfaction implies doing a job one enjoys, doing it well and being rewarded for one's efforts. Employee satisfaction is an important component in organizational health and industrial relations too. It also effects on various aspects of work behaviour such as accidents, absenteeism, turnover and productivity. The organization has to depend upon its work culture to attain its objectives. Workers satisfaction plays an important role in developing the synergic and strong work culture among the workers. Hence, productivity, efficiency and prosperity are the outcome of the work culture and employee satisfaction.

Keywords*: Work Culture, Employee Satisfaction, Productivity.*

INTRODUCTION

Work culture has recently emerged as one of the key areas of research in organizational behaviour. The type of work culture that exists in within the industry influences the employee. Organizational work culture has potential influence on production, satisfaction, absenteeism, motivation, turnover and overall prosperity of the business. The impact of work culture on productivity, profits and organizational effectiveness has, in recent years, drawn the attention of top management.

Employee satisfaction is an employee's sense of achievement and success on the job. It is generally perceived to be directly linked to productivity as well as to personal wellbeing. Employee satisfaction implies doing a job one enjoys, doing it well and being rewarded for one's efforts. It further implies enthusiasm and happiness with one's work. Employee satisfaction is the key ingredient that leads to recognition, income, promotion, and the achievement of other goals that lead to a feeling of fulfillment.

A satisfied, happy and hardworking employee is the biggest asset for any organization. Workforce of any industry is responsible to a large extent for its productivity and profitability. Efficient human resource management and maintaining higher job satisfaction level in industries determine not only the performance of the organization but also affect the growth and performance of the entire economy.

Employee satisfaction is an important component in organizational health and industrial relations too. It also effects on various aspects of work behaviour such as accidents, absenteeism, turnover and productivity. Several studies have focused on these factors of work behaviour.

STATEMENT OF THE PROBLEM

Roha is one of the Taluka place in the Raigad district. In 1973, the State Government has established Maharashtra Industrial Development Corporation in Dhatav-Roha. Many small and medium scale industries have started industrial units and running successfully over the last forty years. The total number of workers in this industrial area is near about 3000. Work culture plays a very important role in productivity, industrial peace, work behaviour, accidents, and employee satisfaction. Therefore, I have undertaken to study the correlation between work culture and employee satisfaction among workers in selected industries in Roha industrial. Area. Hence, the present study examines the correlation between work culture and employee satisfaction of industrial workers in Roha industrial area.

OBJECTIVES OF THE STUDY

This study is undertaken specially with the following objectives.

a) To study the various dimensions of work culture.

b) To study the various variables of employee Satisfaction.

c) To study correlation between work culture and employee satisfaction.

LITERATURE REVIEW

Culture is a continuous process it comes from past, adjust itself with present and prepares for future. Culture is the integrated system of learned behaviour patterns.

Shared beliefs, values norms and tradition are characteristics of the members of a particular group. It is a collective mental programming of the people in an environment and it is purely social, without even slightest element of biological inheritance. Culture consists of complex patterns explicit and implicit of and for learnt and shared behaviour acquired and transmitted by symbols.

"Sinha (1990) defines "work culture as the totality of the various levels of interacting forces around the focal concern of work". Work culture means work related activities in the framework of norms and values regarding work.

Work Culture in this context would include: -

- Work related activities
- The cognitions, the affect and the values attached to them
- The normative structure within
- A setting

Work culture has been defined by *Walton (1979)* as 'the combination of attitudes, relationships, developed capabilities, habits and other behavioral patterns that characterize by dynamics of the organization'.

Peters and Waterman (1982) had stamped the casual association between culture and performance. They agreed that superior firm performance is possible only when a company moves from a pure technical and rationalist approach towards a more adaptive and humanistic approach.

The germs of the employee satisfaction found in the early 1900 with the different study on job satisfaction. These perspectives are the characteristics of the job and the job environment. The Hawthorne studies (1924-1933) by Elton Mayo of the Harvard Business School, was the biggest preludes in the job satisfaction study. The work of Scientific Management by Frederick Winslow Taylor published in book; "Principles of Scientific Management" in 1911 also had a significant impact on the study of job satisfaction. Maslow's hierarchy of needs theory called as a 'motivation theory' laid a foundation for the job satisfaction theory.

Kayis short listed 11 dimensions which are used to measure employee satisfaction and they are: (1) social cohesiveness (2) pay levels (3) job security (4) decision making (5) promotion opportunities (6) training and development (7) teamwork and cooperation (8)autonomy (9) external customers (10) overall job satisfaction (11) overall satisfaction with the current organization.

METHODOLOGY ADOPTED

In order to identify the items of work culture in industries, exhaustive literature survey was done. On the basis of literature survey and pre testing of the questionnaire, total 22 items were chosen for the study. These items were made statements in the questionnaire. The workers of the twenty industries in Roha industrial estate were asked to rate these statements on a six point Likert scale ranging from 1 to 6. According to that scale 6 being very much satisfied, 5 Much satisfied, 4 Somewhat satisfied, 3 Somewhat dissatisfied, 2 Much dissatisfied and 1 Very much dissatisfied.

Secondly, the questionnaire was administered to the respondents. The tool was meant to measure the employee satisfaction. On the basis of literature and the pre-testing of the questionnaire, total 26 items were chosen to capture the satisfaction level of workers. The respondents were asked to rate these factors on a 5 point Likert scale ranging from 1 to 5; 1 Not available, 2 being Quite Unsatisfied, 3 Unsatisfied, 4 Moderately Satisfied, and 5 Quite Satisfied.

These factor includes:- S1- Salary and Perks; S2- Opportunities for career development; S3- Housing facilities; S4- Housing facilities S5- Working Hours; S6- Leave conditions; S7- Training Facilities; S8- Transfer; S9- Increments; S10- Discipline at work place; S11- Health facilities; S12- Other welfare facilities; S13- Leave Travel Concession; S14-- Freedom to take decisions; S15-; Special

facilities for women employees; S16- Shift Duties; S17- Performance Appraisal; S18- Reward for sincere and honesty; S19- Rest rooms and lavatories; S20- Canteen Facilities S21- Information & communication system; S22- Sports facilities; S23- Safety measures at the work place; S24- Entertainment facilities; S25-Cultural Activities; S26- Counseling and Coaching

The questionnaire was personally given to 404 workers in different twenty industrial units from Roha industrial area and their responses are collected. On basis of factor analysis, the dimensions of work culture and employee satisfaction are derived.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.904
Bartlett's Test of Sphericity	Approx. Chi-Square	2632.641
	Df	231
	Sig.	.000

The above table shows the Sampling Adequacy is .904 and it is significant as the value is .000.

Cronbach's alpha was calculated to measure the internal consistency and reliability of the both instrument. The Cronbach alpha of work culture instrument came as 0.894 and employee satisfaction 0.883 as shown in the following Table, thus the instruments was considered reliable for the study.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
1) .894 2) .883	.894 .883	22 26

STATISTICAL TOOLS FOR ANALYSIS

The factor analysis was done to extract and club the items as the inter-related items of work culture are in large number. The method used for the factor analysis is Principal component Analysis and Varimax with Kaiser Normalization Rotation method. Correlation between the dimensions of work culture and employee satisfaction is calculated.

RESULTS AND DISCUSSIONS

After getting the factors of work culture and employee satisfaction, the next step is computing the correlations between work culture dimensions and the dimensions of employee satisfaction. It is shown below in the following Table followed by discussion.

Correlations between Work Culture and Employee Satisfaction Dimensions

Dimensions of Employee Satisfaction → / Dimensions of Work Culture ↓	Participative Environment	Hygiene Factor	Fair Empathic Managnt.	Feel Good Factors	Trust	Efficient Environment
Commitment to Work	.103*	-.020	.071	.024	.240**	.042
Job Affect	.175**	.083*	.158**	.085*	.751**	.080
Hard Work	.014	.027	.093*	.043	.145**	.061
Job Clarity	.312**	.197**	.382**	.297**	.734**	.313**
Job and Life Satisfaction	.302**	.177**	.338**	.234**	.788**	.276**

*Correlations are significant at 0.05 levels (1-tailed)

**Correlations are significant at 0.01 levels (1-tailed)

1. Participative Environment

The correlations of dimensions of Work Culture are all positive and significant (P ≤ 0.05). The correlation between Commitment to work and Participative Environment is (r = .103, P ≤ .05) significant and positive. The workers of the industries are committed for the extra work also because of the participative environment. They have a commitment to work because of the nature of job, the level of motivation they obtained from the superiors and management and the career opportunities offered by their job. These are the factors resulted from factor analysis in the dimension of commitment to work and they are significant.

The correlation of another dimension of work culture Job Affect is (r =.175, P ≤ .01) also positive and significant. The job affect or job involvement is mostly concerned with the participation of workers they are given by the management in the important decision making or the manner of used for solving the conflicts and the scope of the job provided for achieving their aspirations and ambitions. When the workers get participation by different ways increases their involvement automatically in the organization.

Similarly, the Job Clarity also has a positive correlation with Participative Environment (r = .312, P ≤ .01). The way of information flows around in the organization and the goals are identified by the workers clearly encourage them for the participative environment. The workers always expect the transparency in the information flow from the management and superiors. If the information is received to them authentically that helps for the participative environment. The goals of the organization reflect through the actions and participation of workers in the activities. This factor has emerged as a significant aspect of the work culture and it is significantly correlated with the participative environment.

Finally, Job and Life Satisfaction also positively correlates (r = .302, P ≤ .01) with Participative Environment. The workers are satisfied with their relationships with other people at work and the level of salary relative to their experience. The factor of salary has a highest factor value i.e. .716 which suggests that the workers are happy with their salary and relationship with their co-workers and superiors. Job and life satisfaction showed a positive correlation for creating the participative environment.

2. Hygiene Factors

It can be observed from the Table 4.32 that all the independent variables have a positive and significant correlation (P ≤.01) with Hygiene Factors except the Commitment to Work, Superior-Subordinate Relationship and Work Pressure.

The Job Involvement have a positive and significant correlation (r = .083, P ≤ .05) with Hygiene Factors. Health facilities, Rest Rooms and Lavatories and Sports facilities are adequately available which contribute to the job involvement in the organization. Similarly, Job Clarity also indicates significant correlation (r = 0.197, P ≤ .01) with hygiene factors. Because of the adequate hygiene factors the workers are motivated and maintain a good relationship with co-workers and superiors. The job and life satisfaction also have a significant correlation (r = 0.177, P ≤ .01) with hygiene factors. The Up-to-date technology shows a significant correlation (r= 0.156, P ≤ 0.01) with hygiene factors. Because of the positive hygiene factors the workers have positive response to the up-to-date technology. Similarly, the Reinforcements also indicates significant correlation (r = .212, P ≤ .01) with hygiene factors. The expectations of hard work and sincerity from workers are fulfilled due to satisfied hygiene factors.

3. Fair and Empathic Management

An analysis of correlation reveals that all the independent variables have a significant correlation (P ≤ .01) with Fair and Empathic Management except, Work Pressure only.

Job Affect have a positive and significant correlation (r = .158, P ≤ .01) with Fair and Empathic Management. Harmonious relationship with other people at work, highly motivated employees and

freedom and flexibility given by an organization always results into Fair and empathic management. There is significant relationship between Hard Work (r = .093, P ≤ .05) and Fair and Empathic Management. The hard work culture of the employees creates Fair and empathic Management.

It is revealed from the correlation between Job Clarity (r = .382, P ≤ .01) and Fair and Empathic Management that they have significant relationship. It seems that the workers having clear understanding of goals, adequate information regarding organization and which kind of task they have to perform must turns the management into empathic mood towards workers. The work culture providing scope for participation in the important decision and achieving aspirations and ambitions to the workers always results into friendly management environment.

Job and Life Satisfaction also have a significant correlation (r = .338, P ≤ .o1) with Fair and Empathic Management. Satisfied workers in job content and opportunities available for their career always cooperate with management. Satisfied workers promote empathic work culture.

4. Feel Good Factors

The correlation between Job Affect and Feel good factor is significant at .05 level (r = .085, P ≤ .05). It shows that the job involvement of the workers through good relationship and adequate motivation or flexibility and freedom makes the workers feel good. Similarly, Job Clarity also have positive and significant correlation (r = .297, P ≤ .01) with Feel Good Factors. The clear understanding of goals, information, changes or innovations, nature of work to be performed, participation in important decisions of the organization makes the employees feel good and participative.

As per the analysis, the correlation between Job and Life Satisfaction (r = .234, P ≤ .01) and Feel good Factor is positive and significant. It clearly shows that job satisfaction and the factors contributing the life satisfaction makes the workers happy and feel good atmosphere.

An analysis shows that the Commitment to Work have a significant correlation (r = .240, P ≤ .01) with Trust. The workers have a positive attitude culture and their devoted nature in their job creates a Trust between workers and Management. Similarly, Job Affect also have positive significant correlation (r = .751, P ≤ .01) with an item of Trust. Job Affect or involvement created by relationship, motivation, and job security has created a trust in the minds of workers. Thirdly, the correlation between Hard work and Trust is also significant at .01 level (r = .145, P ≤ .01) .Hard work nature of the workers and giving importance to the job first created a synergetic work culture resulted into Trust. The correlation of Job clarity and Trust is positive and significant (r = .734, P ≤ .01). The job clarity through goals, information, innovations, kind of task, etc. makes management trustworthy towards workers. The variable of Job and Life Satisfaction also shows significant correlation (r = .788, P ≤ .01) with the independent variable of Trust. This is the highest correlation among all the variables and therefore it seems that the workers have a job and life satisfaction at the maximum level so it resulted into trust with management.

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CONCLUDING REMARKS

Work culture can have potential effects on employee motivation and behaviour, so it has long been effect on outcomes such as productivity, performance, commitment, self-confidence and ethical behaviour. The correlations of dimensions of Work Culture with dimension of employee's satisfaction i.e. Participative Environment, Hygiene factors, Fair and Empathic Management, Feel good factors, Trust and Efficient Environment are all positive and significant (P ≤ 0.05) and all the Organizational Climate Factors also shows positive and significant.

At the end, on the basis of above analysis, it can be concluded that workers satisfaction factors plays an important role in developing the synergic and strong work culture among the workers.

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TO STUDY THE PRE-TREATMENT OF COOLING ON SEED GERMINATION IN CICER ARIENTINUM

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Abstract
To study seed germination in Cicer arientinum under chilling pre-treatment at various time duration. The germination of seeds per day, percentage of seed germination, Formation of plumule, average shoot length, average radical length in cm are parameters under study. The germination of seeds of Cicer arientinum is more in 80 min chilled seeds than control and other treated seeds.The seed germination percentage is more in the seeds which are chilled for 80 min than control seeds and the seeds which are chilled for 20 min, 40 min and 60 min . The number of seeds showing plumule in Cicer arientium are affected due to cooled pre-treatment. . The seeds of Cicer arientium which are chilled for 60 min shows minimum average shoot length. Maximum average length of radical is seen in control as well as the seeds which are chilled for 20 min.

Introduction:-

The chickpea or chick pea (Cicer arietinum) is a legume of the family Fabaceae, subfamily Faboideae. Its different types are variously known as gram. According to UN Food and Agriculture Organization, Corporate Statistical Database *(FAOSTAT)*, in 2016, India produced 64% of the world total of chickpeas.

In 1793, ground-roast chickpeas were noted by a German writer as a substitute for coffee in Europe. In the First World War, they were grown for this use in some areas of Germany. They are still sometimes brewed instead of coffee.

A collaboration of 20 research organizations, led by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) identified more than 28,000 genes and several million genetic markers. Scientists expect this work will lead to the development of superior cultivars, among which 77 have already been released to farmers around the world.

Hummus is the Arabic word for chickpeas. According to Marks, Gil (2010) by 2010, 5% of Americans consumed hummus on a regular basis. It was present in 17% of American households is studied by *Ferretti, Elena (April 5, 2010).*

Chickpeas are a nutrient-dense food, providing rich content (20% or higher of the Daily Value, DV) of protein, dietary fibre, folate, and certain dietary minerals such as iron and phosphorus. This was learned by *El-Adawy, T.A. (2002).*

Germination of chickpeas improves protein digestibility, although at a lower level than cooking. Germination degrades proteins to simple peptides, so improves crude protein, non protein nitrogen, and crude fiber content studied by *El-Adawy, T.A. (2002).*

Sheila, J.; Sharma, N. (1996). Learned that most widely distributed pathogens are *Ascochyta rabiei* (35 countries), *Fusarium oxysporum* f.sp. *ciceris* (32 countries) *Uromyces ciceris-arietini* (25 countries), bean leafroll virus (23 countries), and *Macrophomina phaseolina* (21 countries). *Ascochyta* disease emergence is favored by wet weather; spores are carried to new plants by wind and water splash.

Materials and Methods:- Cicer arientinum seeds are collected and placed 10 each in set of petridish. Each petridish is placed with normal blotting paper at bottom. First petridish is treated as control.

5 sets of petridishes are taken for the study of seed germination. Each petridish contains 10 seeds of Cicer arientinum. Here we are taking 2 replicas of 5 sets of petridishes with 10 seeds of Cicer arientinum. The observations of both experiments are considered as average. The germination of seed is treated as one of the important criteria to study the impact of cooling treatment on Cicer arientinum.

Among the 5 petridishes 1st petridish kept common for control reference. Another 4 petridishes are kept in refrigerator at 0^0 C. From the zero time to 20 min 2nd petridish is removed from the refrigerator. After 40 min, 60 min, 80 min from zero time the 3rd, 4th and 5th petridishes are removed from the refrigerator respectively.

The control and the chilled pre-treated petridishes with 10 each Cicer arientinum seeds were under 10 days observation. It was study to seed germination of Cicer arientinum under cooling treatment at various time durations.

The treated petridishes (2nd, 3rd, 4th and 5th) with 10 seeds of Cicer arientinum are cooled as pre-treatment at the time duration of 20 min between each petridish. These cooled petridishes and the control petridishes then kept for seed germination for 10 days. To study the seed germination of Cicer arientinum we will observe the number of seed germinated per day, germination percentage of seeds, number of seeds showing plumule, average shoot length, average radical length within 10 days are the parameters considered to study.

The entire process is repeated for 10 days. The observations are taken as an average of both replicas.

Result and discussion:-

Table 1:- Effect of Cold pre-treatment at various duration on number of germination in Cicer arientinum.

Cooling Treatment	Number of seed germination/day									
	Day One	Day Two	Day Three	Day Four	Day Five	Day Six	Day Seven	Day Eight	Day Nine	Day Ten
Control	0	3	5	6	7	8	9	9	9	9
20 min	0	0	0	0	1	5	7	7	7	7
40 min	0	2	3	4	5	7	6	6	6	6
60 min	0	2	3	4	5	7	6	6	6	6
80 min	0	4	5	6	7	10	10	10	10	10

From Table-1 it is clear that the germination of seeds of Cicer arientinum starts on 2nd day in control. The germination starts on second day in seeds which are kept for 40 min, 60 min and 80 min in refrigerator at 0^0 C. There is no germination starts on 2nd day in seeds which are kept for 20 min in refrigerator at 0^0 C. The number of seed germination in 20 min starts from 5th day increasing with one seed to the seven seeds on 10th day. Number of seed germination in Cicer arientium of 40 min and 60 min are same. They starts from 2nd day with 2 seeds increase up to 10th day with 6 seeds. Maximum germination is 10 seeds on 10th day of 80 min chilled seeds starting from 2nd day with 4 seeds.

The overall conclusion from discussion is to draw as, the germination of seeds of Cicer arientinum is more in 80 min chilled seeds than control and other treated seeds. It means 80 min cooling treatment is stimulating and useful to germination process.

Table 2:- Effect of Cold pre-treatment at various duration on germination percentage in Cicer arientinum

Cooling Treatment	Seed germination percentage									
	Day One	Day Two	Day Three	Day Four	Day Five	Day Six	Day Seven	Day Eight	Day Nine	Day Ten
Control	0	30%	50%	60%	70%	80%	90%	90%	90%	90%
20 min	0	0	0	0	10%	50%	70%	70%	70%	70%
40 min	0	20%	30%	40%	50%	70%	60%	60%	60%	60%
60 min	0	20%	30%	40%	50%	70%	60%	60%	60%	60%
80 min	0	40%	50%	60%	70%	100%	100%	100%	100%	100%

Table-2 shows the seed germination percentage of Cicer arientinum after pre-treatment of cooling. It shows the seed germination percentage per day up to 10 days of experiments for control and treated conditions from table, it is clear that seed germination percentage is maximum i.e. 100% from 6th day to 10th day of 80 min chilled seeds of Cicer arientinum. While germination percentage is minimum in the seeds which are chilled for 20 min. On 5th day it is 10% and 70% on 10th day. The percentage of seed germination in seeds which are chilled for 40 min and 60 min are same i.e.it starts from 2nd day with 20 % and on 10 day it is 60%. In control seeds the seed germination percentage is 90% on 10th day.

It is concluded that seed germination percentage is more in the seeds which are chilled for 80 min than control seeds and the seeds which are chilled for 20 min, 40 min and 60 min . As the duration of treatment of cooling increases, the favorable effect of the seed increases. The maximum adverse effect seen in the seeds cooled for 20 min.

Table 3:-Effect of Cold pre-treatment at various duration on plumule in Cicer arientium.

Cooling Treatment	Formation of Plumule	
	Initiation	No. of seeds showing plumule
Control	5th day	06
20 min	5th day	04
40 min	6th day	02
60 min	5th day	02
80 min	5th day	03

Now we will see the progress of Cicer arientium seeds in the form of plumule. It is clear that the maximum number of seeds showing plumule in control starts from 5th day. It shows the 6 number of seeds showing plumule. The formation of plumule in 20 min chilled seeds starts from 5th day with 4 number of seeds showing plumule. The formation of plumule of 40 min and 60 min chilled seeds starts from 6th day and 5th day respectively. Both are having same number of seeds showing plumule i.e. 2. The number of formation of plumule in 80 min chilled seeds starts from 5th day is 3.

The above observation arrives at the conclusion that the number of seeds showing plumule in Cicer arientium are affected due to cooled pre-treatment.

Table 4:- Effect of Cold pre-treatment at various duration on average of shoot length in Cicer arientium.

Cooling Treatment	Average shoot length on 10th day of seed germination
Control	6.6 cm
20 min	3.7 cm
40 min	7.4 cm
60 min	3.0 cm
80 min	4.4 cm

From Table-4 it is clear that seeds of Cicer arientium which are chilled for 40 min shows maximum average shoot length. i.e. 7.4 cm. The average root length on 10th day of seed germination of control is 6.6 cm. The average root length on 10th day of seed germination is 3.7 cm, 3.0 cm and 4.4 cm of the seeds which are chilled for 20 min, 60 min, and 80 min respectively. The seeds of Cicer arientium

which are chilled for 60 min shows minimum average shoot length. In Cicer arientium the treatment of pre-cooling at 0^0C for 40 min is more advantageous than control seeds.

Table 5:- Effect of Cold pre-treatment at various duration on average of radical length in Cicer arientium.

Cooling Treatment	Average radical length on 10th day of seed germination
Control	2.5 cm
20 min	2.5 cm
40 min	2.0 cm
60 min	1.6 cm
80 min	1.8 cm

From Table 5 it is clear that the control seeds and the seeds which are chilled for 20 min shows maximum average radical length. The length of radical of both seeds is 2.5 cm. The average length of radical of seeds which are chilled for 40 min is 2.0 cm. The minimum length of radical is seen in the seeds which are chilled for 60 min. i.e. 1.6 cm. The average length of radical of 80 min chilled seeds is 1.8 cm.

The overall conclusion from discussion is to draw as, maximum average length of radical is seen in control as well as the seeds which are chilled for 20 min.

Conclusion

To study seed germination in Cicer arientinum under chilling pre-treatment at various time duration. The germination of seeds per day, percentage of seed germination, Formation of plumule, average shoot length, average radical length in cm are parameters under study. The germination of seeds of Cicer arientinum is more in 80 min chilled seeds than control and other treated seeds.The seed germination percentage is more in the seeds which are chilled for 80 min than control seeds and the seeds which are chilled for 20 min, 40 min and 60 min . The number of seeds showing plumule in Cicer arientium are affected due to cooled pre-treatment. . The seeds of Cicer arientium which are chilled for 60 min shows minimum average shoot length. Maximum average length of radical is seen in control as well as the seeds which are chilled for 20 min

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ANALYSIS OF ANTINUTRITIONAL FACTORS FROM SOME WILD VEGETABLES

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Wild vegetables are economic source for adivashi people in Poladpur and adjoining areas during rainy season. The nutritional value of a food depends upon its nutritional contents and their digestibility and the presence or absence of antinutrients and toxic factors. As the wild vegetables contain antinutritional factors that can affect the availability of the nutrients. Antinutritional factor is known to interfere with metabolic processes such that growth and bioavailability of nutrients are negatively influenced (Abara, 2003; Binita and Khetarpau, 1997). According to Ademoroti (1996), phytate and oxalates have the ability to form chelates with di-and trivalent metallic ions such as Cd, Mg, Zn and Fe to form poorly soluble compounds that are not readily absorbed from the gastrointestinal tract thus decreasing their bioavailability. He further stated phytate inhibits the functions of some digestive enzymes. It has also been reported that oxalates causes irritation and swelling in the month and throat (Ladeji, et al 2004)

The purpose of this study therefore is to evaluate the levels of anti-nutritional factors of some common wild vegetables in Poladpur region of Raigad district. Wild vegetables like ***Cleorodendrum serratum***, ***Chlorophytum borivilianum, Holarrhena antidysenterica Colocasia esculenta*** **and** ***Cassia obtusifolia*** which are utilized by people are analysed for their antinutritional factors and discussed here

Material and Methods:

Wild vegetables selected for study purpose were collected locally from nearby villages. Leaves of *Cleorodendrum, Chlorophytum, Colocasia and Cassia* separated from plants. Pods and flowers of *Holarrhena* were used as vegetable also separated from plant. Samples were washed to remove dirt and dried at 50^0C in hot air oven. Samples were powdered with grinding machine and stored in airtight container and used for analysis.

Total Oxalate:

Total oxalate was determined according to Day and Underwood (1986) procedure. 1 g of the ground powder was taken into 100 ml conical flask. 75 ml of 1.5 N H_2SO_4 was added. The solution was carefully stirred intermittently with a magnetic stirrer for 1 h and filtered using Whatman No.1 filter paper. The filtrate (25 ml) was then titrated while hot against 0.1 M KMnO4 solution until a faint pink colour appeared and persisted for at least 30 sec. Prepare a standard graph by using 0.1mg/ml oxalic acid. Finally, oxalate content was expressed as milligram per gram dry wt.

Estimation of Tannins

Weight 0.5gm of powder transfer in 250ml conical flask. 75ml water was added in the sample. Heat the flask gently and boil for 30 mins and filtered through Whatman No.1 filter paper. Make up the volume 100ml with distilled water. Transfer 1ml of sample extract to 100ml volumetric flask containing 75ml water. Add 5ml Folin Denis reagent, 10ml of sodium carbonate solution and dilute 100ml of distilled water. Shake well read the absorbance at 700nm after 30mins. If absorbance is greater than 0.7, make a 1+4 dilution of the sample. Prepare a blank with water instead of the sample. Prepare a standard graph by using 0.1mg/ml tannic acid.

Estimation of Nitrate

The nitrate contains in vegetable samples were determined using rapid colorimetric method by Cataldo *et al.* In 50ml test tube 100mg of powder was suspended in 10ml deionized water. The suspension was incubated at 45ºC for 1 hr. After incubation sample was filtered through Whatman No.1 filter paper.

The residue filtrate was taken for nitrate estimation. In 50ml test tubes 0.2 ml of extract mixed with 0.8 ml 5% salicylic acid (W/V) in Conc.H2SO4. After 20
min at room temperature 19ml of 2N NaOH was added slowly to raise the pH above 12. Samples were cooled to room temperature and absorbance was recorded at 410 nm. Instead of extract, distilled water was used to prepare blank. The standard curve was prepared from 1M KNO3 and from this, nitrate content was calculated.

Estimation of Phytic Acid

Phytate content was determined by the method of Wheeler and Ferrel (1971) with minor modification. Three grams sample was mixed in 40 ml of 10% TCA in a 125 ml flask and shaken the same with mechanical shaker for 2 hrs. This sample mixer was centrifuged at 3000 rpm for 20 min. To a 50 ml centrifuge tube, 10 ml of the supernatant was mixed with 4 ml of FeCl3 solution by rapid blowing from the pipette. The solution was heated then in boiling water bath for 45 min. To make the supernatant clear, one or two drops of 3% sodium sulphate in 10% TCA was added and continued heating; then centrifuged for 10 to 15 min at 3000 rpm and finally the clear supernatant was decanted. The precipitate so obtained was washed twice by dispersing in 25 ml 10% TCA and heated again in boiling water for 10 min and centrifuged after cooling to room temperature. The precipitate was again dispersed in a few ml of water followed by addition of 3 ml of 1.5 N NaOH and made the volume upto 30 ml with distilled water. After heated in boiling water for 30 min, the solution was filtered with Whatman No 2 paper; the precipitate was washed with 70 ml hot water and the filtrate was discarded. The precipitate obtained on the filter paper was then dissolved with 40 ml hot HNO3 (3.2 N) into a 100 ml volumetric flask. A 5 ml aliquot taken in 100 ml volumetric flask was diluted to 70 ml with dist. Water followed by addition of 20 ml 1.5 M potassium thiocynate (KSCN). The pinkish-red colour so obtained was measured immediately (within 1 min) at 470 nm in a colorimeter with reference to the Ferric Ammonium sulphate as standard. The phytate content was expressed as mg/g dry wt.

Results and Discussions

Total oxalates:

Oxalates is a dicarboxylic acid and is found in the form of soluble salts of potassium and sodium and as insoluble salts of calcium, magnesium and iron in algae, fungi, lichens, ferns and higher plants. Oxalate is one of the antinutritional factors are widely distributed in plant foods. Presence of oxalates in food causes irritation in the mouth and interfere with absorption of divalent minerals particularly calcium by forming insoluble salts with them (Hassan and Umar, 2004). Consumption of oxalates may also result in kidney disease (Hassan *et al.*, 2007). Toxic level for humans was set as 2 – 5 g (Hassan and Umar, 2004).

Total oxalate of seven wild vegetables from Poladpur is depicted in Table 1. The value ranges from 3.24 to 32.75 mg g^{-1}. High total oxalate content found in *Cassia obtusifolia* leaves and flowers of *Holarrhena antidysenterica* and lower value is found in *Chlorophytum borivilianum* (3.24 mg g^{-}1dry wt.).

Umar *et al.* (2011) reported 202.50 mg 100 g^{-1} (2.03 mg g^{-}1dry wt).). Gupta *et al.*(2005) analyzed total oxalates from thirteen underutilized green leafy vegetables. They found 1410, 1270, 1250 and 1080 mg100 g^{-1}fresh wt. from *Digera arvensis*, *Amaranthus tricolor*, *Boerhaavia diffusa* and *Trianthema portulacastrum* respectively. These values are lower than current investigation. Pattan and Devi (2014) investigated 15 unconventional leafy vegetables from markets of Bangalore city. They found higher total oxalates from *Brassica oleracea* (27.54 mg g^{-1}) and *Moringa pterygosperm* (26.28mg g^{-1}). These values are lower than current investigation. *Amaranthus graecizans*, *Celosia argentea* and *Pachycymbium quadrifida* contained the highest level of oxalic acid with 14067, 12706 and 10162 mg/100g dry wt., respectively (Getachew, 2013). The values of present investigation are lower than that of *A. graecizans*, *C. argentea* and *P. quadrifida.*

Table 1. Levels of Antinutritional factors in wild vegetables of Poladpur

Sr. No.	Name of plant	Total oxalates mg g^{-1} dry wt	Tannins g100 g^{-1} dry wt.	Nitrate mg g^{-1} dry wt	Phytic acid mg g^{-1} dry wt
1	*Cleorodendrum serratum* (Leaves)	6.49	1.67	**15.50**	**32.91**
2	Pods *of Holarrhena antidysenterica*(Pods)	9.25	**3.75**	**22.14**	**14.56**
3	*Holarrhena antidysenterica*(flowers)	**32.25**	**2.56**	**11.65**	**70.69**
4	*Chlorophytum borivilianum*(Leaves)	3.24	0.26	0.45	12.32
5	*Colocasia esculenta*(Leaves)	12.50	0.58	2.69	8.97
6	*Cassia obtusifolia*(Leaves)	**32.75**	0.63	4.48	15.00

8. Tannins:

Tannins are basically polyphenolic compounds having complex mixture and are present in many plants. They form complexes with proteins, starches and digestive enzymes thereby reducing the nutritional value of foods (Serrano *et al.* 2009) and causing growth depression. They also interfere with protein absorption and reduce iron availability. Tannins are known to inhibit activities of digestive enzymes (Jumbunathan, 1981) hence presence of even low levels of tannins is not desirable from nutritional point of view.

Table 1 reveals tannin content in wild vegetables of Poladpur. Pod (3.75 g100 g^{-1} dry wt.) flowers (2.56 g100 g^{-1} dry wt.) of *Holarrhena antidysenterica* and *Cleorodendrum serratum* (1.67g100 g^{-1} dry wt.) had higher tannins.

Gupta *et al.* (2005) reported tannin content of underutilized green leafy vegetables and the tannin values ranged between 61 and 205 mg/100 g with the exception of *Coleus aromaticus* (15 mg/100 g) and *Delonix elata* (1330 mg/100 g). Tannins of present study had higher values than those values reported by Gupta *et al.* (2005). Tannins content in unconventional leafy vegetables in Bangalore City investigated by Pattan and Devi (2014) and values of tannins ranged between 161mg/100g dry wt.–1688 mg/100g dry wt., with lowest content in Anne soppu, *Celosia argentea* (161.60mg) and highest in *Gynandropsis pentaphylla.* Sood *et al.* (2012) reported higher tannin content in four cultivars of *Chenopodium. Ximenia caffra* has the highest with 6314 mg 100 g dry wt. (Getachew, 2013). The tannin content of pods of *Holarrhena antidysenterica* has lower than that of fruit of *Ximenia caffra.*

Nitrate content:

Studies have indicated that nitrates generally cause methaemoglobinaemia in young infants, but not in adults. However when reduced to nitric oxide it plays an important role in the body as it provides host defense against numerous micro-organisms (Benjamin, 2000).

The nitrate content in wild vegetables of Poladpur has been shown in Table 1. It is evident from the results that the concentration of nitrate in pods (22.14 mg g^{-1}**)** and flowers (11.65 mg g^{-1}) of *Holarrhena species and* leaves (15.50 mg g^{-1}) of *Cleorodendrum serratum* is high. Umar *et al.* (2011) reported nitrate content 25 mg $100g^{-1}$ in *Amaranthus viridis* leaves. Fytianos and Zarogiannis (1999) reported that spinach contains high nitrate concentrations (1000 – 3000 ppm i.e. 0.1 to 0.3%) while as high as 6000 ppm (0.6%) has been reported in lettuce. Cabbage contains nitrate at concentrations ranging from several hundreds to over 1000 ppm. The nitrate content of spinach and lettuce is considered to be the highest among number of vegetables. The European Commission (EC) has set maximum allowable level of nitrates in leafy green crops (Anon, 2005) and they have preferred lettuce

nitrate level as maximum allowable limit. Level of Nitrate contents of pods and flowers *Holarrhena species* and leaves of *Cleorodendrum serratum* had beyond the maximum allowable level of nitrates in leafy green crops.

Phytic Acid (1, 2, 3, 4, 5, 6 hexaakis dihydrogen phosphate myoinositol):

Phytic acid is a common storage form of phosphorus in plants and also considered as an antinutritional factor. The phytic acid forms complex with nutritionally essential elements and interfere with proteolytic digestion. This activity is considered as antinutritional activity. The phosphorus in phytic acid is not nutritionally available to the monogastric animals. Phytic acid also interferes with calcium and iron absorption (Wheeler and Ferrel, 1971). Hence, estimation of phytic acid in wild vegetables is essential.

Table 1 presents results of phytic acid contents from wild vegetables. Results reveals that highest phytic acid content in flowers and pods of *Holarrhena antidysenterica* and leaves of *Cleorodendrum serratum.* Umar *et al.* (2011) reported phytate content 1326mg $100g^{-1}$ in spiny *Amaranthus viridis.* High amount of phytate was also reported in some leafy vegetables such as *Tralinum triangulare* (2341.1 $mg/100g^{-1}$), *V. amygdalina* (1466.7 mg/100g) and *Basella alba* (2030.8 mg/100g) (Akindahunsi and Oboh, 1999; Oboh *et al.*, 2005). Aberoumand and Deokule (2009) recorded phytate content in *Portulaca oleracea* (823.6 mg/100g). Phytate content 1.01 g $100g^{-1}$ in *Colocasia esculenta* also reported by Adejumo *et al.* (2013). These results are in the range of present investigation.

Summary and Conclusions:

Wild vegetables are rich in nutrients such as proteins, vitamins, and mineral nutrients etc. however these also possesses certain anti-nutritional factors which interfere with metabolic processes such that growth and bioavailability of nutrients are negatively influenced. Hence analysis of wild vegetable is important. In present investigation, attempts have been made to estimate anti-nutritional factors in wild vegetable of Poladpur.

The significant findings of the present work are summarized as follows.

1. High total oxalate content found in *Cassia obtusifolia* leaves and flowers of *Holarrhena antidysenterica.* But, these values are below toxic level.
2. Pod and flowers of *Holarrhena species* and *Cleorodendrum serratum* had higher tannins. These values are below toxic level.
3. Nitrate contents of pods and flowers *Holarrhena species* and leaves of *Cleorodendrum serratum* had highest nitrates i.e. beyond the maximum allowable level of nitrates in leafy green crops.
4. Phytic acid content in flowers and pods of *Holarrhena antidysenterica* and leaves of *Cleorodendrum serratum* found to be higher.

Cleorodendrum serratum, flowers and pods of *Holarrhena antidysenterica* had somewhat highest antinutritional factors. *Cassia obtusifolia* leaves had medium level of antinutritional factors and remaining others medium level of antinutritional factors. This indicates *Cleorodendrum serratum;* flowers and pods of *Holarrhena antidysenterica* and *Cassia obtusifolia* have antinutritional status and should be used by using processing techniques.

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TO STUDY THE IMPACT OF CERTAIN EXTERNAL CONDITION ON SEED GERMINATION IN VICIA FABA (FIELD BEAN)

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Abstract
Aqueous extract of Spinach leaves and prawns of 1%, 5%, 10% and 20% (w/v) was treated to vicia faba seeds was studied. Treated seeds show late germination, decreased rate of germination percentage, less redicle length and no plumule formation. Beginning of germination delayed more by prawn extract treatment than spinach leaves extract treatment. Seed germination percentage is more affected by prawn extract treatment than spinach leaves extract treatment. Prawn extract treatment is more adverse in terms of radicle growth during germination than Spinach leaves extract treatment to seeds of Vicia faba. There is no plumule formation takes place in both treated seeds during germination. The adverse effect of spinach leaves extract treatment and prawn extract goes on increasing treatment and prawn extract goes on increasing with increasing concentration extract.

INTRODUCTION-

Vicia faba of family fabaceae commonly called as Field bean, Broad bean, fava bean, bell bean or tic bean.

Cited from http:// en.wikipedia.org/wiki/ Vicia faba, field bean is native to North Africa. The field beans are dense with nutrition. It does not have saturated fat or cholesterol and contain a high concentration of thiamin, vitamin k, vitamin B-6, Potassium, copper, selenium, zinc and magnesium. They are also an inexpensive source of lean protein. There is an inverse relationship between per capita income level and consumption of legumes such as field bean. Therefore, the Vicia faba is selected for present study.

The germination is one of vital process in plant physiology. According to Raven et al (2005) seed germination depend upon internal and external conditions. In present study an attempt is made to study the impact of certain external conditions. In present study an attempt is made to study an attempt is made to study the impact of certain external condition on seed germination in Vicia faba (field bean). Vegetable extract of spinach leaves and non vegetable extract of prawn extract are used as external factors to observe effect on seed germination of Vicia faba.

MATERIAL AND METHOD-

Vicia faba (field bean) seeds are selected for present study. Two sets of Petri plates with blotting filter paper at base are taken. 10 seeds of Vicia faba are placed in each petridish. Adequate distilled water is applied for first petridish as control. Treated petridishes are applied adequate quantity of 1 %(w/volume) 5%, 10% and 20% aqueous Extract of Spinach leaves. The experiment is repeated as it is for second time. The observations of both experiments are considered as average.

Similarly, apply 1%, 5%, 10% and 20% aqueous extract of dried prawns to 2 replicas of 4 petridishes with 10 seeds of field beans each. The control reference kept common.

The germination of seeds is treated as one of the important criteria to study the impact of vegetable extract and non-vegetable extract on field bean. From day one of experiment up to 10^{th} day, the number of seeds (out of 10) underwent germination were observed. Similarly the redicle length is also treated as another parameter for study of treated and control seeds germination. Average plumule

length formation on 10th day of germination is considered as another mean to find the impact of vegetable extract on seed germination process in field bean.

***RESULT AND DISCUSSION-**

Table I – A Effect of Spinach leaves extract on emergence of Vicia faba.

Treatment (Spinach leaves extract)	Number of seeds germination per day/s									
	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day	8th Day	9th Day	10th Day
Control	0	3	3	4	5	6	8	8	10	10
1%	0	1	2	2	3	3	5	5	6	6
5%	0	0	0	1	1	2	2	3	4	4
10%	0	0	0	0	1	2	2	3	3	3
15%	0	0	0	0	0	0	01	01	01	01

Table I-B Effect of Spinach leaves (vegetable) extract on germination percentage in seeds of Vicia faba.

Treatment (Spinach leaves extract)	Number of seeds germination per day/s									
	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day	8th Day	9th Day	10th Day
Control	0	30	30	40	50	60	80	80	100	100
1%	0	10	20	20	30	30	50	50	60	60
5%	0	0	0	10	10	20	20	30	40	40
10%	0	0	0	0	10	20	20	30	30	30
15%	0	0	0	0	0	0	10	10	10	10

Table I-C Effect of spinach leaves extract on radicle (root) length in Vicia faba.

Treatment Spinach leaves extract	Average radicle length in Cm on 10th day of treatment
Control	2.50 cm
1%	1.80 cm
5%	1.02 cm
10%	0.3 cm
15%	0.1 cm

Table I-D Effect of vegetable extracts (spinach leaves extract) on plumule (shoot) length during seed germination of Vicia faba.

Treatment Spinach leaves extract	Average radicle length in Cm on 10th day of treatment
Control	1.80 cm
1%	-
5%	-
10%	-
15%	-

Table I-A, I-B, I-C and I-D shows germination of field bean seeds from day one to day 10 in control and spinach extract treated seeds germination at 1%, 5%, 10% and 20% concentration, average radicle length and average plumule length on 10th day of experiment.

From Table I-A it is clear that the germination started on second day in control and 1% Spinach treatment. In 5% and 10% spinach extract treatment, the germination started on 4th day and 5th day respectively. While in 20% spinach extract treatment, the germination was stimulated on seventh day. It

means the spinach extract treatment shows late germination. It delays the seed germination in Vicia faba.

The seeds germination percentage from first day to 10th day is also seen in Table I-B in field bean under controlled and treated conditions. It is observed that seed germination is 100% in control on 9th day of germination. In 1% spinach treatment, it is 60% germination, while in 5% spinach treatment and 10% spinach treatment it is 40% and 30% respectively on 9th day of germination. The 20% spinach treated seeds of Vicia faba shows only 10% germination percentage even on 9th day of germination. It shows that rate of germinations more in control while rate of germination percentage is less in spinach leaves extract treated seeds in Vicia faba.

The rate of germination percentage goes on decreasing as the concentration of spinach leaves extract treatment goes on increasing.

The Table I-B shows the 100% seed germination in control seeds of field bean on Tenth day while 60%, 40%, 30% and 10% seed germination rate in 1%, 5%, 10% and 20% spinach leaves extract treated seeds respectively. It means the rate of seed germination is less in Spinach leaves extract treated leaves as compared to control.

From the Table I-C, it is clear that average redicle length is 2.50 cm in 1% Spinach leaves treated seeds it is 1.80cm, 1.20 cm, 0.3 cm and 0.1 cm in 5%, 10%, 20% Spinach leaves extract treated seeds of Vicia faba respectively, It is clear from these observations that average redicle length is affected due to spinach leaves extract treatment. The effect goes on increasing as the concentration of spinach leaves extract also goes on increasing.

The shoot length i.e. plumule length of control and treated seeds during germination on 10th day of treatment is shown in Table I-D. It is observed that the plumule formation is only seen in control seeds of Vicia faba as compared to Spinach leaves extract treated seeds. It means the treatment of spinach leaves extract shows adverse effect on the plumule formation during germination in Vicia faba.

Table II – A Effect of Prawn extract on emergence of Vicia faba.

Treatment (Prawn extract)	**Number of seed/s germination per day/s**									
	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day	8th Day	9th Day	10th Day
Control	0	4	6	8	9	10	10	10	10	10
1%	0	0	0	0	1	1	2	3	4	5
5%	0	0	0	0	1	1	2	3	3	4
10%	0	0	0	0	0	0	2	2	2	2
15%	0	0	0	0	0	0	0	0	0	0

The Table II-A Shows the effect of prawn extract on the seed germination in Vicia faba. It is seen from observation that the seed germination started in control seeds on second day of experiment. The seed germination started on 5th day of treatment in 1% prawn extract treatment. In 5% extract treated seeds, the seed germination started at 5th day of treatment. In 10 % prawn extract treated seeds, the seed germination started at 7th day of treatment. In 20% prawn extract treated seeds, the seed germination not takes place even on 10th day of germination. It means the beginning of seed germination is affected due to the treatment of prawn extract. It is further added the delay in beginning of seed goes on decreasing as the concentration of prawn extract treatment goes on increasing.

Table II-B Shown the effect of percentage of concentration of prawn extract on seed germination in Vicia faba. From these observations it is clear that the seed percentage goes on increasing from first to 10th day of germination in control seeds. It is 100% rate of germination on 6th day of treatment in control seeds on 10th day of treatment. It is 40% and 20% rate of seed germination in 5% and 10% prawn extract treated seeds on 10th day of treatment. However in 20% prawn extract treatment, the seed germination rate is nil even on 10th day of experiment. It means the rate of seed

germination is affected by prawn extract treatment in Vicia faba. The effect goes on adverse as the concentration of prawn extract goes on increasing.

Table II-C Effect of Prawn extract on redicle (root) length in Vicia faba.

Treatment Spinach leaves extract	Average radicle length in Cm on 10th day of treatment
Control	2.30 cm
1%	1.80 cm
5%	0.90
10%	0.57
15%	0

Table II-C Shows the average radicle length of seeds in vicia faba on 10th day of germination in control and prawn extract treated seeds. It is clear from table II-C that the average length (redicle) is 2.30 cm in control seeds as on 10th day of germination. It is 1.80 cm, 0.90 cm, 0.57 cm in 1%, 5% and 10% prawn extract treated seeds while there is no redicle formation in 20% prawn extract seeds. It indicates that the prawn extract treatment has adverse effect on radicle length in seeds of Vicia faba. The adverse effect of prawn extract treatment goes on increasing as the concentration of prawn extract treatment goes on increasing from 1% to 20%.

Table II-D Effect of prawn extract on plumule (shoot) length during seed germination of Vicia faba.

Treatment (Prawn Extract)	Average plumule (shoot)length in Cm on 10th day of Treatment
Control	2.30 cm
1%	-
5%	-
10%	-
15%	-

Table II-D Shows effect of prawn extract treatment on plumule (shoot) formation in seeds of Vicia faba. It is clear from Table II-D that the length of plumule is 2.30 cm in control seeds. There is no plumule formation in 1%, 5%, 10% and 20% prawn extract treated seeds. It means there is inhibiting effect of prawn extract treatment plumule formation in seeds of Vicia faba. When observation of Table I-A and Table II-A are compared, it is found that seed germination begin on 2nd day in controlled seeds of Vicia Faba. The 1% Spinach leaves extract treated seed shows beginning of germination on 2nd day while 1% prawn extract treated seeds shows germination beginning on 5th day. The 1%, 5%, 10% and 20% Spinach leaves extract treated seeds shows germination beginning on 4th day, 5th day and 7th day of treatment respectively. However, in 1%, 5%, 10% and 20% prawn extract treated seeds of Vicia Faba shows beginning of germination on 5th day, 5th day, 7thday and no germination respectively. It means beginning of germination delayed more by Prawn extract treatment than the Spinach leaves extract treatment on seeds of Vicia faba.

Comparative account of Table I-B and Table II-B shows that the germination percentage of control seeds of Vicia faba is about 100% on 10th day of treatment. While it is 60%, 40%, 30% and 10% in 1%, 5%, 10% and 20% Spinach extract treated seeds. It is 50%, 40%, 20% and zero in 1%, 5%, 10% and 20% prawn extract treated seeds. It means seed germination percentage is more affected by prawn extract treatment than Spinach leaves extract treatment.

From Table I-C and Table II-C, it is observed that the radicle length is maximum (2.50 cm) in control seeds of Vicia faba. The length of radicle is 1.80cm, 1.02cm, 0.3cm and 0.1cm in 1%, 5%, 10% and 20% Spinach leaves extract treated seeds during germination on 10th day of treatment. The length of radicle is 1.80cm, 0.90cm, 0.57cm and 0cm in seeds. It means, the prawn extract treatment is more adverse in terms of radicle growth during germination than Spinach leaves extract is seeds of Vicia faba.

Table I-D and Table II-D comparative account shows that shoot formation in control, however, there is no shoot (plumule) formation in either Spinach leaves extract treated seeds or prawn extract treated seeds of Vicia faba. It means either Spinach leaves extract treatment or prawn extract treatment affect the plumule (shoot) formation.

*Analia perello, Martin Gruhlke and slusarenko (2013) published a research paper. In this paper the effect of garlic extract on seed germination of wheat seed. This study confirm that natural mycoflora present in wheat grain was capable of causing poor seed germination and was capable of negatively influencing seeding growth. When treatment with Garlic juice containing allicin. It results in reduction of infection. Seeds treated with garlic juice had a relatively better germination percentage.

*Ziaebrahimi L, et.al.pak J Biol Sci 2007

In this, research paper showed that effect of water extracts of eucalyptus leaves examined on germination and growth of three wheat cultivar seeds and seedlings. Results showed that germination percentage strongly decreased leaf and root lengths also affected and dry and wet weights of both roots and shoots showed similar change patterns. Activity of polyphenoloxidases increased only in one of three cultivars and again roots showed more activity of this enzyme is response to eucalyptus extract.

*In May 2005, Plant ecology Laboratory of the Department of Crop Botany, Bangladesh, Investigate the effects of water soluble extract from different parts of Banana plant on seed germination and seeding growth of some vegetable crops. The test crops were lettuce, radish, cucumber, ribbed gourd, bean and okra.

Among the extracts from different parts of banana plant, extract from rhizome showed strongest inhibition on the seed germination and seeding growth of the test crop. The test plant species responded differently to the rhizome extract and lettuce seedling was found most sensitive

*An J, et al.chemosphere.2009.

Biochemical responses of wheat(Triticum aestivum) seedling stressed by two typical personal care products- Triclosan (TCS) and galaxolide(HHCB).The results showed that wheat shoot and root elongation was significantly inhibited by 50-250 mg L(-1) TCS and HHCB. Wheat roots were sensitive TCS, while shoots were sensitive to HHCB.

*Licx, et. al.J Environ sci (china). 2007

The effect of Arsenic(AS) were investigated on seed germination, root and shoot length and their biomass and some other factors to elucidate the toxicity of As. The results indicated as could exert harmfulness in the early development stage of wheat at inappropriate concentrations.

*Effect of scialert.net.Allelopathic Effects of
Asian Journal of plant Sciences
Izzet Kadioglu and Yusuf Yanar
Volume 3(4):472-475, 2004

This study examined the effects of extracts of plants, mostly weeds. Also, chemical compounds in extracts having significant positive or negative allelopathic effects on other plants, should be studied in detail for their specific effects on plant growth.

E.A.Grant, W.G.Sallans
June 1964, contribution No.129, Reaserch station Canada

Seeds of four legumes and four grasses were germinated in the presence of aqueous extracts of the same species, using distilled water as a check. Based on the number of significant reaction to the extracts, the species may be classified in the following order of decreasing inhibition-Alfalfa and timothy were the species least affected by the extracts while reed canary grass was the most susceptible. With the exception of alfalfa, extracts of aerial portions of the plants had greater inhibitory effects than root extracts.

*S.Roy, M.Asaduzzaman, M.H.R.Pramanik and A.K.M.A.Prodhan (2006)

In this paper the effect of Banana plant extracts revealed a significant inhibition on seed germination and seedling growth of lettuce and the degree of inhibition increases with the increase of extract concentration.

Rhizome extract strongly delayed and inhibited the germination of lettuce.

*M.S.A.Mamun and M.Shahjahan (2011) Agril.Res.36 (4):733-739-

An experiment was conducted to determine the effect of some indigenous plant extracts on the germination of wheat seeds. This study showed that the seeds treated with plant materials did not adversely affect the seed germination.

*According to Chang Naihang (1996), the effect of vermicompost on seed germination.

The effect of vermicompost of Salvinia, Eichhornia, Chromolaena and Parthenium on percentage of seed germination, shoot and root length and wet and dry weight of wheat are measured. Regarding that it has concluded that, the lower concentration of vermicompost extract enhances the root length, shoot length, number of roots and wet and dry weights of seedlings in all the wheat seeds tested.

*M. A. I. Talukdar.M.Rahaman, B.Roy and K.C.Saha.

In this paper the effect of aqueous extracts of different herbal plant leaves on the germination of selected vegetables are studied. A significant effect of aqueous extracts was found on the germination of vegetables throughout the growing period. In Turnip and Ladies finger it found to be maximum.

*Md. Zahangir Alam, Islam Hamim, MA Ali, M. Ashrafuzzaman, Bangladesh Agricultural University (BAU) (2014).

The result of the present investigation showed that, seed treatment with different physical, chemicals, biological and botanical agents especially Biofungicide, allamonda leaf extracts, neem leaf extracts and Chitosan solution is useful to prevent germination failure to produce healthy, disease free and morphologically strong seedling and to promote production of vigorous seedling.

*Eckhard Koch, Steven J.Roberts (2014) JKI, Institute for biological control, Darmstadt, Germany.

The paper gives an overview of approaches that have been taken to utilize the non-chemical methods for control of important seed borne pathogens of vegetables and small grain cereals. The treated plants include bacterial fungal diseases and viral diseases, which can be controlled in seeds.

Rishi P. Singh, K. Raja Reddy, in Advances in Agronomy, 2015.

This research shows the treatment technology in which it revealed that by using specific products and specific techniques can improve the growth environment for the seed, seedling and young plant. The seed is dressed with either a dry formulation of the seed treatment chemicals

*Alice D.Rao A.V.1986.Antifungal effects of plant extract on Drechslera oryzae in rice.Int.Rice Res.Newsl.12 (2):28.

In this research, the percent reduction in seed borne infection of target pathogenic fungi recorded in mungbean seeds were treated with five different treatments. All treatments were found to significantly reduce the occurences of seed borne fungi but did not completely control them. Plant extracts have played a significant role in the inhibition of seed borne pathogens such as fusarium oxysporum and in the improvement of seed quality and emergence of seed embryo.

Similarly, an attempt is made to study the impact of certain external conditions on seed germination of Vicia faba.

CONCLUSION-

Aqueous extract of spinach leaves and prawns of 1%,5%,10% and 20%(w/v) was treated to Vicia faba seeds was studied. Treated seeds show late germination, decreased rate of germination percentage, less radicle length and no plumule formation. Beginning of germination delayed more by prawn extract treatment than spinach leaves extract treatment. . Seed germination percentage is more affected by prawn extract treatment than spinach leaves extract treatment. Prawn extract treatment is more adverse in terms of radicle growth during germination than spinach leaves extract treatment to seeds of Vicia faba. There is no plumule formation takes place in both treated seeds during germination.

The adverse effect of spinach leaves extract treatment and prawn extract goes on increasing with increasing the concentration extracts.

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KAMALADEVI CHATTOPADHAY, FEMINIST FREEDOM FIGHTER AND CULTURE QUEEN

Dr. Tanaji S. Lokhande, *D.G.Tatkare Mahavidyalay, Mangaon –Raigad, 402104*

1. Introduction :

Kamaladevis multi faced accomplishments and her Immense contribution in enriching India's cultural and Social fabric. Widely known for persuading mahatma Gandhi to call upon women to participate in civil dis obedience movements during india's freedom struggle. Kamladevi is among the handful of women who championed the rights of the fairer sex at that time.

She propounded that civil rights religious freedoms and political independence were all 'inter-related issues and worked relentlessly for the upliftment of women. She pioneered the co-operative movement which helped raise the socio-economic status of women around the country.

Born on April 3, 1903 in manglore (now magluru) Kamaladevi was married at the age of 14 and was widowed two years later. She then traveled to London to further her Education and after her return to india. Joined the 'Indian National congress in 1927'

Her career was one of many first from being the first woman to be arrested by British for selling contraband salt, to becoming the first woman to run for Legislative office. She was among the chosen few national leaders who had the privilege of signing the new constitution of india document after Independence.

Dubbed as culture queen of India Kamaladevi is credited as the drivin force behind the renaissance of Indian handicrafts handlooms and theatres in the post-Independence era.

1. She setup :

She went on to setup the famous theatre institute National School of Drama, sangeet Natak Akadami, Central cottage Industries Emporium and the crafts Council of India.

2. She received fellowship :

Kamaladevi is also the recipient of Sangeet Akadami fellowship the highest honour conferred by the Sangeet Akadami, India's National Academy of music, Dance & Drama. She passed away on October 29, 1988 at the age of 85.

3. A Revolutionary women :

Who broke every social and cultural norm of that era. She engaged in India's freedom struggle at the highest level as a critic who could ignored writing in new's papers, Journal's, as well as political documents. There are hardly any sub stantial writings by prominent modern history scholars on her life. A passionate life. Correct that neglect substantially and also stimulates a call for more on her life and work. Valume is composed of two introductory essays one by Dubois and the other by Lal both historians at the university of culifornia, Los Angeles CUCLA Both these essays are master pieces. I have yet to come across an essay on the history and evolution of feminism which is as inclusive and accurate as the one written by Dubois. Lal's introduction tracing the passion and politics in Kamaladevis life is equally brilliant in both depth and perspective.

In addition there is a section called critical assessment containing five essays written by scholars living in the united states and one in South Africa.

4. Kamaladevis Ten essays :

Ten essays have been selected for in clusion in another section called "Kamaladevis writing" some are from her own memories called 'Inner Recesses and outer spaces' published in 1986 initially by Indian Co-operative union (ICU) which she founded A later edition was printed by 'Nivogi Books' in 2014. The others are from her speeches and writings in journals and news papers, both in India and the united status (US).

5. About the Kamaladevis life :

Her father was senior civil servant and her mother was a supporter of both Pandit Ramabai and Sri Aurobindo. Her parents befriends many prominent freedom Righters and intellectuals such as mahadev Govind Rande and Gopal Krishna Gokhale, and women leader like Rumabai Rande and Annie Besant. This made the young Kamaladevi early enthusiast of the Swadeshi Nutionalist movement. However it does seem intriguing that such parents could have got her married age of 12/14 second husband. Harindranath Chattopaddyay after four years and bearing one son. Thoughout her life and her time in the freedom struggle, she faced resistance to her leadership from male comrades.

6. A New World :

She became the first women to be jailed by the British in 1930 a reflection of new level of energy that t he unleashing of womens involvement would bring to Nationalist movement. She was briefly released from jail in 1931. In time to contribute to the writing of the "Fundamental right's portion of the proposed constitution for an Independent India. She notes that she was the lone women involved and emphasizes the inclusion of an explicit quarantee of equal franchise rights for women something which the British had never allowed. "To me the clause" there should be no discrimination on the grounds of sex opened the gates to a new world.

One of her transforming experiences was when her father died and left no will and the property in which she and her mother had groun up, was given away to a step brother, who had never engaged with them the first women to stand for election in the madras presidency Council and lost only by a difference barely 55 votes while addressing 2000 peoples at the clock Tower maidan in the district of Bangalor in 1926. She said "for years you have been sending men to the councils some have been done something for the districts. Others have done nothings.

7. Coloured women :

While in America for 18 months during 1939-41. She aimed to increase American support for Indian Independence, while establishing connection with American feminists and African Americans and defending the rights of women and people of colour throughout the world. Kamaladevi championed a coloured consmopolitanism that defied narrow, chauvinist definitions of race, religion or nation, while simulantaneously encouraging the unity of coloured a crucial step towards the liberation of the entire coloured world" There is a telling poster of her used in the U.S. with the heading I am a colored woman."

Like many of the old order of freedom Righters and congress socialist she moved away from the congress and the new boundless energy, her skills, and her intellect, she addressed what could be a part of what M.K. Gandhi would have called the second freedom from wants she revived across the board, tribal arts being her Pavourite, and the hadloom industry. She helped setup National Institutions for the promotion of dance, music, and theatre, which continue to live in and embellish India. She was engaged with whole range of cultural expressions.

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NETWORK STRUCTURE OR TOPOLOGY

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Abstract
The geometrical arrangement of computer resources, remote devices and communication facilities is known as Network structure or Network topology. A computer network is comprised of nodes and links, a node is the end point of any branch in a computer, a terminal device, workstation or interconnecting equipment facility. A link is a communication path between two nodes. The terms "circuit" and "Channel" are frequently used as synonyms for the link. There are different types of the topologies like bus, ring, tree, mesh etc. However, we will consider five basic network structures- topology.

I. Introduction

Network Topology is the study of the arrangement or mapping of the elements (links, nodes, etc.) of a network interconnection between the nodes.

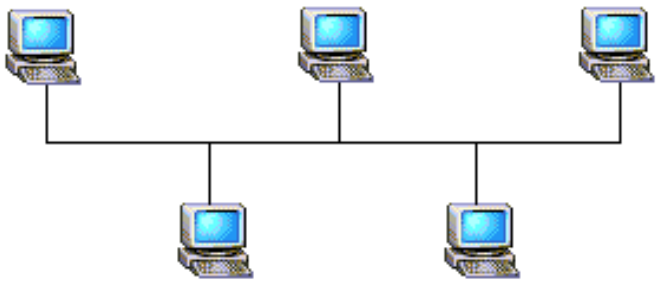
Topologies can be physical or logical. Physical Topology means the physical design of a network including the devices, location and cable installation. Logical Topology refers to the fact that how data actually transfers in a network as opposed to its design.

Some of the most common network topologies are:

- **Bus Topology**
- **Ring Topology**
- **Star Topology**
- **Mesh Topology**

I. Bus Topology

This structure is very popular for local area networks. In this structure or topology, a single network cable runs in the building or campus and all nodes are linked along with this communication line with two endpoints called the bus or backbone as show figure.



By this type of topology, if one node goes faulty all nodes may be affected as all nodes share the same cable for the sending and receiving of information. The cabling cost of bus systems is the least of all the different topologies. Each end of the cable is terminated using a special terminator.

[A]. Advantages:

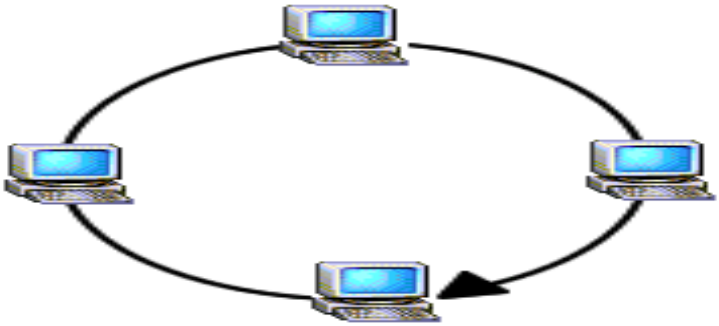
- Reliable in very small networks as well as easy to use and understand.
- Requires least amount of cable to connect the computers (nodes) together and therefore is less expensive than other cabling arrangements.
- It's easy to extend, Two cables can be easily joined with a connector, making a longer cable for more computers to join the network.
- A repeater can also be used to extend a bus configuration.

[B].Disadvantages:

- Heavy network traffic can slow a bus considerably because any computer can transmit at any time. But networks do not Coordinate when information is sent. Computer interrupting each other can use a lot of bandwidth.
- Each connection between two cables weakens the electrical signal.
- The bus configuration can be difficult to find and can cause the whole networks to stop functioning.

II. Ring Topology

In this topology, the network cable passes from one node to another until all nodes are connected in the form of a loop or ring. There is a direct point-to-point link between two neighboring nodes (the Next and the Previous). These links are unidirectional which ensures that transmission by a node traverses the whole ring and comes back to the node, which made the transmission as shown in figure.



Information travels around the ring from one node to the next. Each packet of data sent to the rink is prefixed by the address of the station to which it is being sent. When a packet of data arrives, the node checks to see if the packet address is the same as its own, if it is, it grabs the data in the packet. If the packet does not belong to it, it sends the packet to the next node in the ring.

Faulty nodes can be isolated from the ring. When the workstation is powered on, it connects itself to the ring. When power is off, it disconnects itself from the ring and allows the information to bypass the node.

The most common implementation of this topology is token ring. A break in the ring causes the entire network to fail.

Individual nodes can be isolated from the ring.

[A]. Advantages:

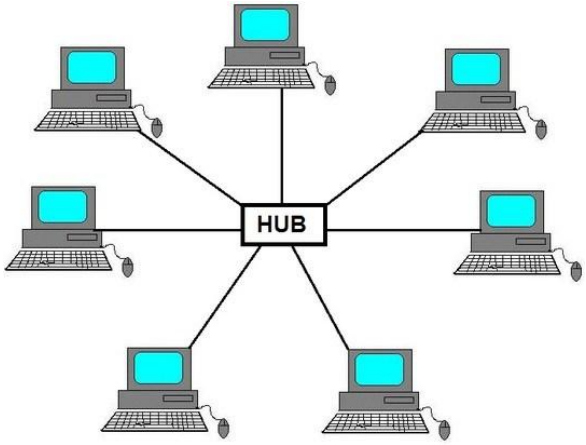
- Ring networks offer high performance for a small number of workstations or for larger networks where each station has a similar workload.
- Ring networks can span longer distances than other types of networks.
- Ring networks are easily extendable.
- Unlike Bus topology, there is no signal loss in Ring topology because the tokens are data packets that are re-generated at each node.

[B].Disadvantages:

- Relatively expensive and difficult to install
- Failure of one computer on the network can affect the whole network.
- It is difficult to find fault in a ring network.
- Adding or removing computers can disrupt the network.
- It is much slower than an Ethernet network under normal load.

III. Star Topology

Star topology uses a central hub through which, all components are connected. In a Star topology, the central hub is the host computer, and at the end of each connection is a terminal as shown in Figure.



Nodes communicate across the network by passing data through the hub. A star network uses a significant amount of cable as each terminal is wired back to the central hub, even if two terminals are side by side but several hundred meters away from the host. The central hub makes all routing decisions, and all other workstations can be simple.

An advantage of the star topology is that failure, in one of the terminals does not affect any other terminal; however, failure of the central hub affects all terminals. This type of topology is frequently used to connect terminals to a large time-sharing host computer.

[A]. Advantages:

- It is more reliable (if one connection fails, it does not affect others)
- The center of a star network is a good place to diagnose network faults and if one computer fails whole network is not disturbed. Hub detects the fault and isolates the faulty computer.
- It is easy to replace, install or remove hosts or other devices, the problem can be easily detected-It is easier to modify or add a new computer without disturbing the rest of the network by simply running a new line from the computer to the central location and plugging it to the hub.
- Use of multiple cable types in a same network with a hub.
- It has good performance

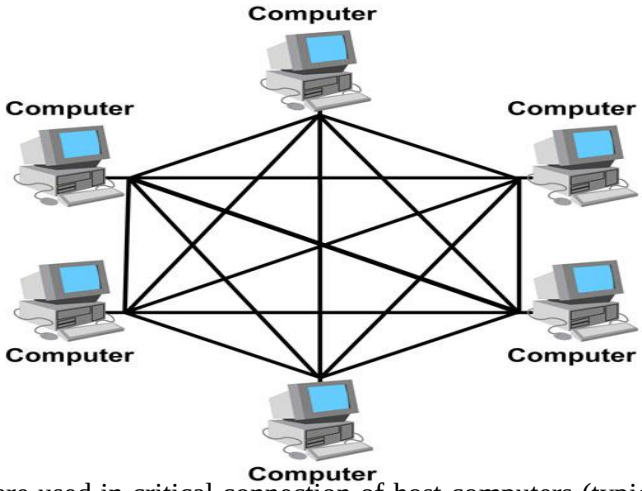
[B].Disadvantages

- It is expensive to install as it requires more cable, it costs more to cable a star network because all network cables must be pulled to one central point, requiring more cable length than other networking topologies.
- Central node dependency, if central hub fails, the whole network fails to operate.
- Many star networks require a device at the central point to rebroadcast or switch the network traffic.

IV. Mesh Topology

Devices are connected with many redundant interconnections between network nodes. In a well-connected topology, every node has a connection to every other node in the network. The cable requirements are high, but there are redundant paths built in.

Failure in one of the computers does not cause the network to break down, as they have alternative paths to other computers.



Mesh topologies are used in critical connection of host computers (typically telephone exchanges). Alternate paths allow each computer to balance the load to other computer systems in the network by using more than one of the connection paths available.

A fully connected mesh network therefore has no (n-1) /2 physical channels to link n devices. To accommodate these, every device on the network must have (n-1) input/output ports.

[A]. Advantages

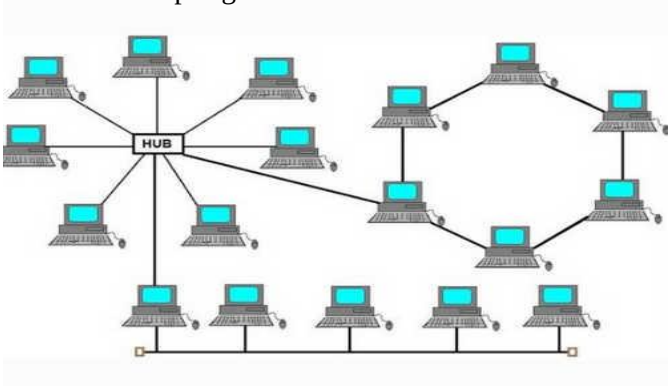
- Yield the greatest amount of redundancy in the event that one of the nodes fails where network traffic can be redirected to another node.
- Point-to-point link makes fault isolation easy.
- Privacy between computers is maintained as messages travel along dedicated path.
- Network problems are easier to diagnose.

[B].Disadvantages

- The amount of cabling required is high.
- A large number of I/O (input/output) ports are required.

VI. Tree Topology

The most common structure or topology known as Tree topology, Tree topology is a LAN topology in which only one route exists between any two nodes on the network. The pattern of connection resembles a tree in which all branches spring from one root.



Tree topology is a hybrid topology, it is similar to the star topology but the nodes are connected to the secondary hub, which in turn is connected to the central hub. In this topology group of star-configured networks are connected to a linear bus backbone.

[A]. Advantages

- Installation and configuration of network are easy.
- The addition of the secondary hub allows more devices to be attached to the central hub.
- Less expensive when compared to mesh topology.

- Faults in the network can be detected traces.

[B].Disadvantages

- Failure in the central hub brings the entire network to a halt.
- More cabling is required when compared to the bus topology because each node is connected to the central hub.

VII. Conclusion

In this paper we have to study the different types of the topologies like Bus Topology, Ring Topology, Star Topology, Mesh Topology and Tree Topology.

In this paper we have considered above five topology uses and its merits and demerits that will study will help to know that which structure or topology is best for which organization or business. We have to study the topology and finally we have to find the fact that all topologies are alternate options for business like that Bus Topology is use full for small network but its some demerits so its alternate option is Ring Topology. So finally, we can say that all topologies have some extra and different feature are available from other topology and that features are making it special from other topology.

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RECENT TRENDS AND CHALLENGES OF E-COMMERCE IN INDIA

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Abstract
Today the internet and E-commerce are daily routine in our life. It is no longer a device to be used only by highly wealthy and technologically advanced people. With rising use of internet and Smartphone, e-commerce has witnessed a strong growth in India in the past and the total size has jumped from US $ 2.9 billion in 2013 to US $16 billion in 2015 at a compounded annual growth rate of 34%. It is the India's fastest growing market; it will touch 36.7 billion by 2020. Effective implementation of government's fastest growing programs such as digital India, Make in India, Skill development will help to overcome challenges related to ineffective rural interest penetration & lack of skilled manpower. GST may enhance the growth of e-commerce. Evolution of new payment solution will also ease the transaction. Rural India has also accepted the new development of e-commerce, but it will take some time to become habitual. For country such as India, one of the most important benefits of e-commerce is its potential to help a developing rural community to leap-frog into the knowledge paradigm.

I Introduction :-

Modern electronic commerce typically uses the World Wide Web for at least one part of the transactions life cycle, although it may also use other technologies such as e- mail. Before 40 years the commerce concept created very important aspect in its area and turned in to E-Commerce, which is the buying & selling of goods & services through the Internet. Over the last ten years, the way of buying & selling goods & services has been changed by the internet. E-commerce is transforming the shopping experience of Indian Customers. The introduction of electronic data inter change spreads into producer, retailers, stock market operation & travel reservation etc. which resulted in a higher growth of the economy. In few foreign countries it is a regular process for the seller & buyer, and today more than 85% of the customer is buying products on a daily basis, like online bill, online shopping, payment of purchasing from an e-retailer etc. also known as business to consumer e-commerce (B2C). Another form of e-commerce involves transaction from one consumer to another and is known as consumer to consumer e-commerce (C2C) such as eBay, OLX, Quicker, Flipchart etc. Business to Business (B2B) refers to situation in which one business make a transaction with other.

There were only 21 million active internet users in 2006, which rose to about 354 million by June 2015. However the penetration of e-commerce is low as compared to markets like the USA, France & the UK, but is growing at much faster rate, adding around 6 million new entrants every month. According to study conducted by the Internet & Mobile Association of India the e-commerce sector is estimated to reach Rs.2, 11,005 crorer by December 2016. The Association also states that the Indian online retail market is expected to grow at the rate of 52%. Electronics & Apparel are the biggest categories in terms of sales. By 2020, India is expected to generate $100 billion online retail revenue Online apparel sales set to grow four times in coming years.

II. Objectives of study –

1) To study the role of e-commerce in India over the past few years.
2) To study the recent trends of e-commerce in India.
3) To study the challenges of e-commerce for the Indian economy.

III Research Methodology –

The research paper is based on the secondary data collected from various magazines, articles, news paper, various websites & books on the various aspects of recent trends of e-commerce in India & its challenges for the Indian economy.

IV. Internet Users –

In 2006, there were only 21 million active internet users, which rose to more than 100 million internet users in the year 2010 & this value reached 121 million users by the end of 2011. IAMAI report says that over all internet penetration in India is currently around 31%. The number of internet user in India is expected to 450-465 million by June 2017, up 4.8% from 432 million in December 2016. Urban India with an estimated population of 444 million already has 269 million (60%) using the Internet. Rural India with an estimated population of 906 million as per 2011census has only 163 million (17%) internet users. Thus, there are potential approximately 750 million users still in rural India who are yet to become internet users if only they can be reached out properly.

V. Recent trends in E-Commerce-

- Now day's large number of shopping use smart phones tables & other mobile devices are the main tool for accessing internet or browsing E-commerce company websites for their convenience.
- Social commerce is a subject of e-commerce that involves social media & online buying & Selling of products & services.
- Video based marketing is unavoidable in our shopping experience, it will increase sales by better helping people perceive their choice.
- New technologies like facial recognition, virtual fitting rooms, etc. plays most import role in current e-commerce system.
- Promotion of products, recruitment through social media, the pattern of advertisement by corporate sector etc. are made online.
- Various innovative models are being tested and launched in the market.
- Increasing trust in E-commerce companies.
- There are customer's delightment due to fast delivery, easy payment & easy returned policy.

VI. Growth of E-Commerce in India

India's e-commerce Sector tripled or rather grew by 209 percent over a period of five years – from 4.4 billion U.S Dollars (Rs.20,020 crore) in 2010 to 13.6 billion U.S Dollars in 2014. According to an Associated Chambers of Commerce & Industry of India (Assoc ham) report which was released in January 2016, it is estimated that India's e-commerce market will reach38 billion U.S Dollars. The percentage of Indians who use the internet is low-19 percent in 2014, as compared to Australia (90 percent), the US (87 percent), Japan (86 percent), Brazil (53 percent) and China (46 percent). According to a Mint report, in 2014, only 18 of 100 Indians used the internet, against 49.3 for China and 48.3 for Vietnam. Poorer countries such as Ghana also had greater internet penetration - 18.9 users per 100 people. However, there has been an increase in mobile internet spending from 54 percent to 64 percent from 2014 to 2015 respectively, e-commerce growth. Speed remains a major constraint despite of the rise in broadband and mobile internet users. According to an India Spend report, the average broadband speed in India is 2 mega bits per second (mbps), thus globally ranking 115. Similarly, the average mobile internet speed is 1.7 mbps which rank below Thailand, China, Hong Kong and Singapore. This year in March, the government allowed 100 percent foreign direct investment in online retail market places .i.e. electronic platforms that connect buyers and sellers. In April 2016, US retailer Amazon became the second-largest online marketplace by shipments in India, after domestic rival Flipkart, pushing former number two, Snapdeal to the third place. According to the Morgan Stanley report dated February 12, 2016; India is adding three Internet users every second and is already the second-largest Internet market globally in terms of users. It is expected that internet penetration will increase from 32% in 2015 to 59% in 2020, thus translating to a near doubling of the Internet user base. Also, it estimated that India will have almost 320 million online shoppers by 2020 compared with 50 million in 2015.

VII Challenge of e-commerce-

There are several challenges of e-commerce to be faced by the online shoppers & sellers, despite of several opportunities in the field of e-commerce..

- Due to growing competition in the e-commerce profit margin of online sellers is declining.
- Problems for Rural customers due to low internet speed.
- Scarcity of trained manpower may slow down the growth of e-commerce.
- Challenges of customer loyalty.
- There are no specific e-commerce laws. The sector is governed by the IT Act 2000.
- Online buyers prefer to make payment on cash on delivery basis. Manual cash collection is risky and expensive for the online sellers.
- Problem of language mostly in Rural areas..
- In India, Customer does not trust online marketing, as they are suspicious about the quality, price, delivery etc. Even in rural areas there are no perfect channels of distribution.
- Lack of personal interaction.
- Rapidly changing business models.
- Taxation challenges.
- Low entry barriers leading to reduced competitive advantage.

VIII. Impact of E-commerce.

E-Commerce is a growing sector in India. Just like the growth of IT industry in India through the 1990s, the 2010s will be remembered for the growth in the E-Commerce industry. In its present state the contribution of E-Commerce to GDP is around 0.2% which is expected to grow 15 times to around 2.5% by 2030. The impact is so huge that the present wave of de-monetisation could have not been thought if E-Commerce did not exist. By 2030 the contribution to GDP by E-Commerce is expected to reach to around 300 Billion Dollars which is around 20 Billion Dollars in its present state.

1. **Technology**- One of the major drivers of technology will be E-Commerce industry and vice versa. We are seeing new age technological solutions being taken up to solve the business problems to bring commerce to everyone digitally. This is seen in both B2C and B2B sector. Investment into technology sector is happening to drive growth in the E-Commerce domain.
2. **Logistics**- Logistics industry is both a bottleneck and a driver for e-commerce. For the same we see how last mile and inter-city logistics solutions have come up to digitally connect the different stakeholders across the country. The Uber model of moving passengers is implemented in some form or the other in the logistic sector. The growth of E-Commerce will drive innovation in the logistic sector to make the products available to the end user.
3. **Travel**- At the moment 70% of the contribution to E-Commerce comes from the travel sector which includes the online ticket bookings to other travel arrangements. This has made the market competitive by bringing all players on the same platform and has also given consumer more options. Travel industry will be earliest adopters to become completely digitised.
4. **Education-** The ability of E-Commerce to provide quality education to everyone is immense. India will have one of the biggest set of youth population and hence the scope for education sector to be the biggest achievers because of E-Commerce is sure.
5. **E-Retail**- The flag bearers of the E-commerce wave have been the various E-Retail commerce platforms. E-Retail sector is projected to contribute to around 3% of the total Retail sells by 2020 and is at present around 1%. This wave is seen in both B2C and C2C model and is bound to grow further.
6. **Other Industries**- The way of working in the Real Estate sector is already seeing the change because of the E-Commerce industry. This will change further with all property related transactions coming online and getting closed online as well. Banking sector is benefiting as well

with reduced operations cost of online transactions. E-Commerce in health care has brought health related solutions to the urban India and will further penetrate deep into Tier I and Tier II cities.

IX. Conclusion:-

E-commerce is emerging as an important tool to ensure inclusive growth. An Emergence of internal shipping option creates the opportunities to reach online consumers around the globe. It is important for physical retailers, especially located in metro cities to make a serious effort to upgrade themselves with new technology and constantly innovate in order to delight their customers. The concept of virtual companies is taking concrete shape and will usher into an era of boundary less world. E-commerce has the scope to lead India into an Economic superpower. On the other hand E-commerce faces some challenges also which we need to work on, like lack of cyber laws & computer education.

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CLOUD COMPUTING: SECURITY ISSUES

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Abstract
Cloud computing is an architecture for providing computing service via the internet on demand and pay per use access to a pool of shared resources namely networks, storage, servers, services and applications, without physically acquiring them. So it saves managing cost and time for organizations. Many industries, such as banking, healthcare and education are moving towards the cloud due to the efficiency of services provided by the pay-per-use pattern based on the resources such as processing power used, transactions carried out, bandwidth consumed, data transferred, or storage space occupied etc. Cloud computing is a completely internet dependent technology where client data is stored and maintain in the data center of a cloud provider like Google, Amazon, Salesforce.som and Microsoft etc.

INTRODUCTION

Cloud Computing is a distributed architecture that centralizes server resources on a scalable platform so as to provide on demand computing resources and services. Cloud service providers (CSP's) offer cloud platforms for their customers to use and create their web services, much like internet service providers offer costumers high speed broadband to access the internet. CSPs and ISPs (Internet Service Providers) both offer services. Cloud computing is a model that enables convenient, on-demand network access to a shared pool of configurable computing resources such as networks, servers, storage, applications that can be rapidly provisioned and released with minimal management effort or service provider's interaction. In general cloud providers offer three types of services i.e. Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). There are various reasons for organizations to move towards IT solutions that include cloud computing as they are just required to pay for the resources on consumption basis. In addition, organizations can easily meet the needs of rapidly changing markets to ensure that they are always on the leading edge for their consumers.

II. CLOUD COMPUTING BUILDING BLOCKS

A. Different models of cloud computing Generally cloud services can be divided into three categories: Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). Software-as-a-Service (SaaS): SaaS can be described as a process by which Application Service Provider (ASP) provide ISSN: 2249-9555 136 IRACST - International Journal of Computer Science and Information Technology & Security (IJCSITS) Vol. 1, No. 2, December 2011 different software applications over the Internet. This makes the customer to get rid of installing and operating the application on own computer and also eliminates the tremendous load of software maintenance; continuing operation, safeguarding and support [3]. SaaS vendor advertently takes responsibility for deploying and managing the IT infrastructure (servers, operating system software, databases, data center space, network access, power and cooling, etc) and processes (infrastructure patches/upgrades, application patches/upgrades, backups, etc.) required to run and manage the full solution. SaaS features a complete application offered as a service on demand. Examples of SaaS includes: Salesforce.com, Google Apps.

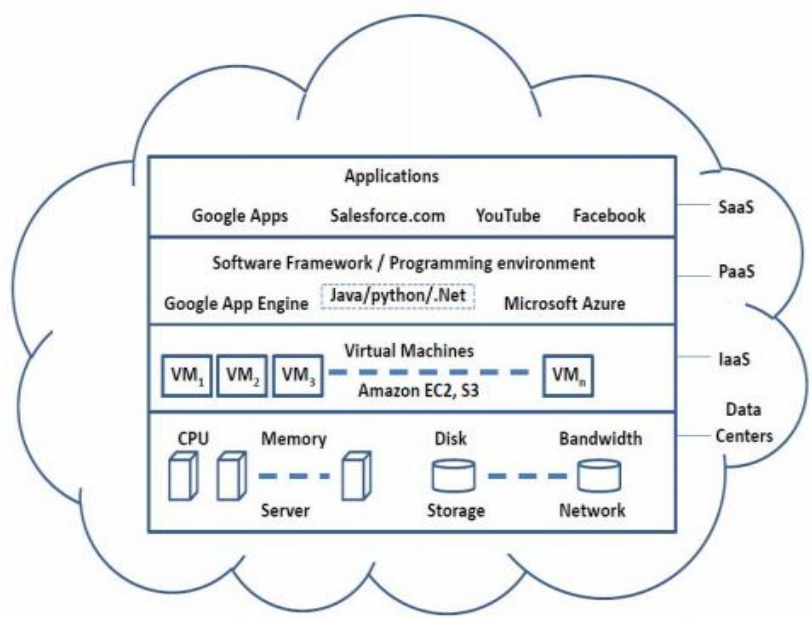


Figure 1. High Level View of Cloud Computing Architecture

A cloud environment operating according to this model may exist locally or remotely. An example of a Community Cloud includes Facebook which is showing in figure 1.

B. Cloud computing entities Cloud providers and consumers are the two main entities in the business market. But, service brokers and resellers are the two more emerging service level entities in the Cloud world. These are discussed as follows Cloud Providers: Includes Internet service providers, telecommunications companies, and large business process outsourcers that provide either the media (Internet connections) or infrastructure (hosted data centers) that enable consumers to access cloud services. Service providers may also include systems integrators that build and support data centers hosting private clouds and they offer different services (e.g., SaaS, PaaS, IaaS, and etc.) to the consumers.

I. CLOUD COMPUTING SECURITY ARCHITECTURE

Security within cloud computing is an especially worrisome issue because of the fact that the devices used to provide services do not belong to the users themselves. The users have no control of, nor any knowledge of, what could happen to their data. This is a great concern in cases when users have valuable and personal information stored in a cloud computing service. Users will not compromise their privacy so cloud computing service providers must ensure that the customers' information is safe. This, however, is becoming increasingly challenging because as security developments are made, there always seems to be someone to figure out a way to disable the security and take advantage of user information.

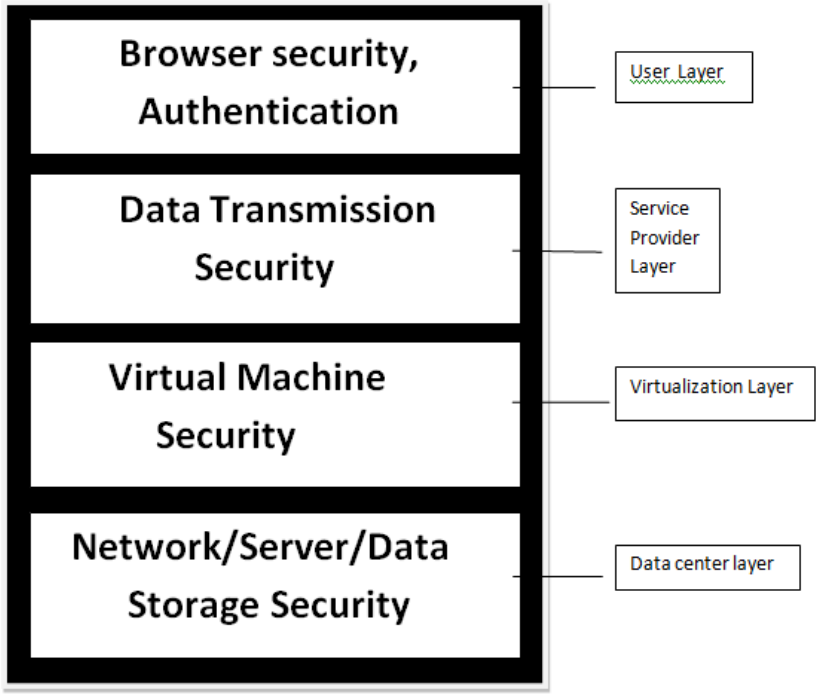


Figure 2 showing the high level view of the cloud computing security architecture.

II. KEY SECURITY ISSUES IN CLOUD COMPUTING

Cloud computing consists of applications, platforms and infrastructure segments. Each segment performs different operations and offers different products for businesses and individuals around the world. The business application includes Software as a Service (SaaS), Utility Computing, Web Services, Platform as a Service (PaaS), Managed Service Providers (MSP), Service Commerce and Internet Integration. There are numerous security issues for cloud computing as it encompasses many technologies including networks, databases, operating systems, virtualization, resource scheduling, transaction management, load balancing, concurrency control and memory management. Therefore, security issues for many of these systems and technologies are applicable to cloud computing. For example, the network that interconnects the systems in a cloud has to be secure and mapping the virtual machines to the physical machines has to be carried out securely. In some situations, customers may not want to encrypt data because there may be a case when encryption accident can destroy the data. Make sure that encryption is available at all stages, and that these encryption schemes were designed and tested by experienced professionals .

Conclusion and Feature work ISSN:

2249-9555 144 IRACST - International Journal of Computer Science and Information Technology & Security (IJCSITS) Vol. 1, No. 2, December 2011 One of the biggest security worries with the cloud computing model is the sharing of resources. Cloud service providers need to inform their customers on the level of security that they provide on their cloud. In this paper, we first discussed various models of cloud computing, security issues and research challenges in cloud computing. Data security is major issue for Cloud Computing. There are several other security challenges including security aspects of network and virtualization. This paper has highlighted all these issues of cloud computing. We believe that due to the complexity of the cloud, it will be difficult to achieve end-to-end security. New security techniques need to be developed and older security techniques needed to be radically tweaked to be able to work with the clouds architecture. As the development of cloud computing technology is still at an early stage, we hope our work will provide a better understanding of the design challenges of cloud computing, and pave the way for further research in this area.

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GRID COMPUTING AND CLOUD COMPUTING: COMPARATIVE STUDY AND CHALLENGES

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Abstract
This paper provides overview of Grid Computing and Cloud Computing conceptually, Main aim of the paper is to show similarities and difference between grid computing and cloud computing and elaborating advantages of cloud computing over just grid computing. This paper also focuses on common challenging issues for grid and cloud computing.

Introduction

This paper explores two technologies first grid computing and cloud computing. Both computing are explained with their basic ideas and concepts. Finally their common goals and challenges are discussed with similarities, differences and dependability.

GRID Computing

Definitions:

1. A computational grid is a hardware and software infrastructure that provides dependable, consistent, pervasive and inexpensive access to high-end computational capabilities.
   -Carl Kesselman, Ian Foster in "the Grid: Blueprint for a New Computing Infrastructure", 1998.
2. Grid computing is coordinated resource sharing and problem solving in dynamic, multi institutional virtual organization's"
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Explanation

Grid computing links disparate computers to from one large infrastructure, harnessing unused resources. Utility computing is paying for what you use on shared servers like you pay for a public utility(such as electricity, gas and so on). A grid is a system that:

1. Coordinates resources that are not subject to centralized control.(Otherwise, we are dealing with a local management system.)
2. Uses standard, open, general-purpose protocols and interface.(Otherwise, we are dealing with an application specific system.)
3. Used to deliver nontrivial qualities of service.(It should meet complex user demands, so that the utility of the combined system is significantly greater than that of the sum of its parts.)

Some Concepts

1. Resource are locally managed and controlled.
2. Different resources can have different policies and mechanism.
3. Computing resources managed by different batch systems & shared within grid.
4. Different storage system on different node.
5. Different policies granted to the same user on different resources on the GRID.
6. Dynamic nature: Job is scheduled in any grid.
7. Resources and users can change frequently.
8. Collaborative environments for e-communities.

Working

Grid computing requires the use of software that can divide and farm out pieces of a program as one large system image to several thousand computers. One concern about grid is that if one piece of the software on a node fails, other pieces of the software on other nodes may fail. This is alleviated if that component has a failover component on another node, but problems can still arise if components rely on other pieces of software to accomplish one or more gird computing tasks. Large system images and associated hardware to operate and maintain them can contribute to large capital and operating expenses.

Cloud Computing

To get cloud computing to work, you need three things: thin clients(or clients with a thick-thin switch),gird computing, and utility computing.

With Grid computing, you can provision computing resources as a utility that can be turned on or off. Cloud computing goes one step further with on-demand resource provisioning. This overprovisioning when used with utility pricing. It also removes the need to over-provision in order to meet the demands of millions of users.

Cloud computing evolves from gird computing and provides on-demand resource provisioning. Grid computing may or may not be in the cloud depending on what type of users are using it. If the users are systems administrators and integrators, they care how things are maintained in the cloud. They upgrade, install and virtualize servers and applications. If the users are consumers, they do not care how things are run in the system.

Common Objective

Objectives and working applications of Gird an Cloud Computing are same. Both provides following services:

1.Infrastructures as a Services (IaaS)

2. Platform as a services (PaaS)

3. Software as a service(SaaS)

Both are available in private and public forms. Following are common benefits of these technologies:

1. **Rapid Elasticity:** Elasticity is defined as the ability to scale to resources both up and down as needed. To the consumer, the cloud appears to be infinite, and the consumer can purchase as much or as little computing power as they need. This is one of the essential characteristics of cloud computing in the NIST definition.
2. **Measured Service:**In a measuredservice, aspects of the cloud service are controlled and monitored by the cloud provider. This is crucial for billing, access control, resource optimization, capacity planning and other tasks.
3. **On demand Self-Service:**The on-demand and self –service aspects of cloud computing mean that a consumer can use cloud service as needed without any human interaction with the cloud provider.
4. **Ubiquitous Network Access:** Ubiquitous network access means that the cloud providers capabilities are available over the network and can be accessed through standard mechanism by both think and thin clients.
5. **Resource Pooling:** Resource pooling allows a cloud provide to serve its consumers vi a a multitenant model. Physical and virtual resources are assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or a knowledge over the exact location of the provided but may able to specify location at a higher level of abstraction(e.g. country, state or datacentre).

Similarities and Differences

Cloud computing and gird computing are scalable. Scalability is accomplished through load balancing of application instances separately on a variety of operating systems and connected through web

services. CPU and network bandwidth is allocated and de-allocated on demand. The systems storage capacity goes up and down depending on the number of users, instances and the amount of data transferred at a given time. Both computing types involve multi-tenancy and multitask, meaning that many customers can perform different tasks, accessing a single or multiple application instances. Sharing resources among a large pool of users assists in reducing infrastructure costs and peak load capacity, Cloud and grid computing provide service-level agreements(SLAs) for guaranteed uptime availabilityof, say, 99 percent. while the storage computing in the grid is well suited for data intensive storage, it is not economically suited for storing objects as small as 1 byte. In a data grid , the amounts pf distributed data must be large for maximum benefit.

Challenging Issues to Consider

1. **Threshold Policy:** Lets suppose I had a program that did credit card validation in the cloud and we hit the crunch for the December buying season. Higher demand would be detected and more instance would be diminished and the instance of that resource would be de-allocated and put to other use.
2. **Interoperability Issues:** If a company outsources or creates applications with one cloud computing vender, the company may find it is difficult to change to another computing vender that has proprietary APIs and different formats for importing and data. This creates problems of achieving interoperability of applications between these two cloud computing venders. You may need to reformat data or change the logic in applications. Although industry cloud-computing cost is already fixed and shared among consumers.
3. **Hidden Costs:**Cloud computing does not tell you what hidden costs are. For instance, Companies cloud incur higher network charges from their service providers for storage and database applications containing terabytes of data in the cloud. This outweighs costs they cloud save on new infrastructure, training new personnel or licensing new software. In case of just grid computing cost is already fixed and shared among consumers.
4. **Unexpected Behaviour:**Lets suppose your credit card validation application works well at your company internal data centre. It is important to test the application in the cloud with a pilot study to check for unexpected behaviour. Example of test include how the application validates credit cards and how, in the scenario of the December buying crunch. It allocates resources and releases unused resources, turning them over to other work. If the tests show unexpected results of credit card validation or releasing unused resources, you will need to fix the problem before running the application in the cloud.
5. **Security Issues:** Most important problem is outage. Even though there is data recovery and service credits for this type of outage, consumers missed sales opportunities and executives were cut off from critical business information they needed during the outage. Instead of waiting for an outage to occur, consumers should do security testing on their own-checking how well a vender can recover data. The test is very simple. No tools are needed. All you have to do is to ask for old data you have stored and check how long it takes for the vendor to recover. If it takes too long to data you have stored and check how long it takes for the vendor to recover. If it takes too long to recover, ask the vender why and how much service credit you would get in different scenarios. Verify id the checksums match the original data.

An area of security testing you should do is to test a trusted algorithm to encrypt the data on your local computer and then try to access data on a remote server in the cloud using the decryption keys. You may need to address the algorithm with the vendor.

Another issue is the potential for problems with data in the cloud. To protect the data, you need to manage your own private keys. Check with the vendor on the private key management. Amazon will give you the certificate if you sign up for it.

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TO STUDY THE IMPACT OF CERTAIN EXTERNAL CONDITIONS ON SEED GERMINATION IN VIGNA UNGUICULATA (BLACK EYED PEA)

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Abstract
Aqueous extract of spinach leaves and prawns of 1%, 5%, 10% and 20 %(W/V) was treated to vigna unguiculata seeds was studied. Treated seeds show late germination, decreased rate of germination percentage, less radical length and no plumule formation. Beginning of germination delayed more by prawn extract treatment than spinach leaves extract treatment seed germination percentage is more affected by prawn extract treatment than spinach leaves extract treatment. Prawn extract treatment is more adverse in terms of radical growth during germination than spinach leaves extract treatment of seeds of Vigna unguiculata.There is no plumule formation takes place in both treated seeds during germination. The adverse effect of spinach leaves extract treatment and prawn extract goes on increasing the concentration extract.

INTRODUCTION-

Vigna unguiculata of family fabaceae commonly called as black eyed pea, chawli.

Cited fromhttp://en.wikipedia.org/wiki/vigna unguiculata, Black eye pea is the first domestication probably occurred in West Africa. But it widely grown in many countries in Asia. Black eyed peas are extremely drought tolerant, throughout the south; the black eyed pea is still a widely used ingredient in soul food and cuisines of southern United States. The crop is relatively free of pests and disease. As a legume, black eyed peas are especially good source of soluble fiber, which helps to prevent type 2 diabetes by keeping blood sugar balanced. It also binds to cholesterol.

Therefore the vigna unguiculata is selected for present study.

The germination is one of the vital processes in plant physiology, According to Raven et al (2005); seed germination depends upon internal and external conditions. In present study an attempt is made to study the certain external condition on seed germination in vigna unguiculata (Black eyed pea).Vegetable extract of spinach leaves and non vegetable extract of prawn extract are used as external factors to observe effect on seed germination of vigna unguiculata.

MATERIALS AND METHODS-

VIGNA UNGUICULATA (Black eyed pea) seeds are selected foe present study. Two sets of Petri-plates with blotting filter paper at base are taken.10 Seeds of vigna unguiculata are placed in each petridish. Adequate distilled water is applied to first Petridish as control. Treated petridishes are applied adequate quantity of 1 %(wt/volume) 5%, 10%, and 20% Treated aqueous extract of spinach leaves. The experiment is repeated as it is for second time. The observations of both experiments are considered as average.

Similarly, apply 1%, 5%, 10%, and 20% aqueous extract of dried prawns to 2 replicas of 4 petridishes with 10 seeds of black eyed pea each. The control reference kept common.

The germination of seeds is treated as one of the important criteria to study the impact of vegetable extract and non-vegetable extract on black eyed peas.

RESULT AND DISCUSSION

Table I – A Effect of Spinach leaves extract on emergence of Vigna Unguiculata

Treatment (Spinach leaves extract)	Number of seeds germination per day/s									
	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day	8th Day	9th Day	10th Day
Control	0	5	8	8	9	9	9	9	10	10
1%	0	1	2	2	2	2	2	2	2	2
5%	0	1	7	8	8	8	8	8	8	8
10%	0	2	4	4	4	5	5	5	5	5
15%	0	1	1	1	1	1	1	1	1	1

Table I – B effect of Spinach leaves (Vegetable) extract on germination percentage seeds of Vigna Unguiculata.

Treatment (Spinach leaves extract)	Germination percentage per day/s									
	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day	8th Day	9th Day	10th Day
Control	0	50	80	80	90	90	90	90	100	100
1%	0	10	20	20	20	20	20	20	20	20
5%	0	10	70	80	80	80	80	80	80	80
10%	0	20	40	40	40	50	50	50	50	50
15%	0	10	10	10	10	10	10	10	10	10

Table I – C Effect of Spinach leaves extract on radicle (root) length in Vigna Unguiculata.

Treatment Spinach leaves extract	Average radicle length in Cm on 10th day of treatment
Control	3.76 cm
1%	0.65 cm
5%	0.44 cm
10%	0.32 cm
15%	0.2 cm

Table I – D Effect of vegetable extract (Spinach leaves extract) on plumule (shoot) length during seed germination of Vigna Unguiculata.

Treatment Spinach leaves extract	Average plumule (shoot) length in cm on 10th day of germination
Control	1 cm
1%	0
5%	0
10%	0
15%	0

Table I-A, I-B, I-C and I-D shows germination of black eyed peas from day one to day 10 in control and spinach extract treated seed germination at 1%, 5%, 10%, and 20 % concentration, average radicle length and average plumule length on 10th day of experiment.

From Table I-A it is clear that the germination started on second day in control and 1%, 5%, 10% and 20% spinach treatment. But In 10% and 20% spinach treatment germinate rate is very slow. It means the spinach extracts treatment shows late germination. It delays the seed germination in Vigna unguiculata.

The seeds germination percentage from first day to tenth day is also seen in Table-I-B in Black eyed peas under controlled and treated conditions. It is observed that seed germination is 100% in control on 9th day of germination. In 1% spinach treatment, it is 20% germination while in 5% spinach treatment and 10% spinach treatment it is 80% and 50% respectively on 9th day germination. The 20% spinach treated seeds of Vigna unguiculata shows 10% germination even on 9th day of germination.

It shows that rate of germination is more in control while rate of germination percentage is less in spinach leaves extract treated seeds in Vigna Unguiculata. The rate of germination percentage goes on decreasing as the concentration of spinach leaves extract treatment goes on increasing.

The Table I-B shows 100% seed germination on in control seeds of black eyed pea on Tenth day while 20%, 80%,50% and 10% seed germination rate in 10%, 5%, 10% and 20% spinach leaves extract treated seeds respectively. It means the rate of seed germination is less in spinach leaves extract treated leaves as compared to control.

From the Table I-C it is clear that average radicle length is 3.76cm. In 1% spinach leaves treated seeds it is 0.65cm, and it is 0.44 cm, 0.32cm& 0.2cm in 5%,10%, 20% spinach leaves extract treated seeds of Vigna unguiculata respectively. It is clear from these observations that average radicle length is affected due to spinach leaves extract treatment. The effect goes on increasing as the concentration of spinach leaves extract also goes on increasing.

The shoot length i.e. plumule length of control and treated seeds during germination on 10^{th} day of treatment is shown in Table I- D. It is observed that the plumule formation is only seen in control seeds of vigna unguiculata as compared to spinach leaves extract treated seeds. It means the treatment of Spinach leaves extract shows adverse effect on the plumule formation during germination in Vigna unguiculata

Table II- A Effect of Prawn extract on emergence of seeds of Vigna unguiculata.

Treatment (prawn Extract)	**Number of seeds germination per days**									
	1^{st} Day	2^{nd} Day	3^{rd} Day	4^{th} Day	5^{th} Day	6^{th} Day	7^{th} Day	8^{th} Day	9^{th} Day	10^{th} Day
Control	0	5	8	8	9	9	9	9	10	10
1%	0	0	0	0	0	0	0	0	0	0
5%	0	1	4	4	5	6	6	6	7	7
10%	0	1	1	1	1	1	1	1	1	1
20%	0	0	0	0	0	0	0	0	0	0

The Table- II- A shows the effect of prawn extract on the seed germination in vigna unguiculata. It is seen from observation that the seeds on second day of experiment. No seed germination started on second day in 1% prawn extract treatment. In 5% extract treated seeds the seed germination started at 2^{nd} of treatment. In 10% prawn extract treated seeds, the seed germination started is on second day of treatment. In 20% prawn extract treated seeds, the seed germination not takes place even on 10^{th} day of germination. It means the beginning of seed germination is affected due to the treatment of prawn extract. It is further added that the delay in beginning of seed goes on decreasing as the concentration of prawn extract treatment goes on increasing.

Table- II- B Effect of prawn extract on germination percentage of seeds of Vigna Unguiculata.

Treatment (prawn Extract)	**germination percentage per days**									
	1^{st} Day	2^{nd} Day	3^{rd} Day	4^{th} Day	5^{th} Day	6^{th} Day	7^{th} Day	8^{th} Day	9^{th} Day	10^{th} Day
Control	0	50	80	80	90	90	90	90	100	100
1%	0	0	0	0	0	0	0	0	0	0
5%	0	10	40	50	50	60	60	60	70	70
10%	0	10	10	10	10	10	10	10	10	10
20%	0	0	0	0	0	0	0	0	0	0

Table- II- B shows the effect of percentage on concentration of prawn extract of seed germination Vigna Unguiculata. From these observations, it is clear that the seed percentage goes on increasing from first to tenth day of germination in control seeds. It is 100% rate of germination of 9^{th} day of treatment. The rate of germination is only 70% in 5% prawn extract treated seeds on 10^{th} day. It is only 10% rate of seed germination in 10% prawn extract treated seeds on 10^{th} day of experiment.

However, in 1%& in 20% prawn extract treatment, the seed germination rate is nil even on 10th day of experiment. It means the rate of seed germination is affected by prawn extract treatment in VignaUnguiculata. The effect goes on adverse as the concentration of prawn extract goes on increasing. There is no germinations percentage at all in Vigna Unguiculata.

Table II- C Effected of prawn extract on radicle (root) length in Vigna Unguiculata.

Treatment Prawn Extract	**Average radicle (root) length in cm on 10th day of Treatment**
Control	4.83 cm
1%	0.4 cm
5%	0.3 cm
10%	0.2 cm
15%	0

Table II-C shows the average radicle length of seeds in Vigna unguiculata on 10th day of germination in control and prawn extract treated seeds. It is clear from table II-C that the average root length (radicle) is 4.83cm in control seeds as on 10th day of germination.

It is 0.4cm, 0.3 cm and 0.23 cm in 1%, 5% and 10% prawn extract treated seeds while there is no radicle formation in 20% prawn extract seeds. It indicates that the prawn extract treatment has adverse effect on radicle length is seeds of Vigna unguiculata. The adverse effect of prawn extract treatment goes on increasing as the concentration of prawn extract treatment goes on increase from 1% to 20%

Table II –D- Effect of prawn extract on plumule (shoot) length during seed germination of Vigna unguiculata.

Treatment Prawn Extract	**Average radicle (shoot) length in cm on 10th day of Treatment**
Control	2.07cm
1%	0 cm
5%	0 cm
10%	0 cm
15%	0 cm

Table II- D shows effect of prawn extract treatment on plumule (shoot) formation in seeds of Vigna unguiculata. It is clear from Table II-D that the length of plumule is 2.07 cm in control seeds. There is no plumule formation in 1%, 5%, 10% and 20% prawn extract treated seeds. It means there is inhibiting effect of prawn extract treatment on plumule formation in seeds of vigna unguiculata when observation of Table I-A and Table II-Aare compared it is found that seed germination begin on 2nd day in control of vigna unguiculata.The 1% Spinach leaves extract treated seed shows beginning of germination on 2nd day while 1% prawn extract treated seed shows no germination beginning on 2nd day. The 1%,5%,10%and 20% spinach leaves extract treated seeds shows beginning of germination on 2nd day of treatment However, in 1%,5%10%and 20% prawn extract treated seed of vigna unguiculata shows beginning of germination on 0 day,2nd day, 2nd day and no germination respectively. It means beginning of germination delayed more by prawn extract treatment than the spinach leaves extract treatment on seeds of vigna unguiculata.

Comparative account of Table I-B and Table-II-B shows that germination percentage of control seeds of vigna unguiculata is about 100% on 10th day of treatment. While it is 0%, 70%, 10% and 0%, in 1%, 5%, 10%, and 20% prawn extract treated seeds. It means seed germination percentage is more affected by prawn extract treatment than spinach leaves extract treatment.

From Table I-C and Table II-C, it is observed that the redicle length is maximum(3.76) in control seeds of vigna unguiculata .The length of radicle is 0.65cm,0.44cm,0.32cm and 0.2cm in 1%,5%,10% and 20% spinach leaves extract treated seeds during germination on 10th day of treatment. The length of radicle is 4.83cm in control seeds of vigna unguiculata and it is 0.4 cm, 0.3cm, 0.2cm and 0cm in 1%, 5%, 10% and 20% prawn extract treated seeds during germination on 10th day of treatment.

Prawn extract treatment is more adverse in terms of radicle growth during germination than spinach leaves extract in seeds of vigna unguiculata.

Table I-D and Table II-D comparative account shows that shoot formation in control, however, there is no shoot (plumule) formation in either spinach leaves extract seeds or prawn extract treated seeds of vigna unguiculata .

It means either spinach leaves extract treatment or prawn extract treatment affect the plumule (shoot) formation.

*Analia perello, Martin Gruhlke and slusarenko (2013) published a research paper. In this paper the effect of garlic extract on seed germination of wheat seed. This study confirm that natural mycoflora present in wheat grain was capable of causing poor seed germination and was capable of negatively influencing seeding growth. When treatment with Garlic juice containing allicin. It results in reduction of infection. Seeds treated with garlic juice had a relatively better germination percentage.

*In May 2005, Plant ecology Laboratory of the Department of Crop Botany, Bangladesh, Investigate the effects of water soluble extract from different parts of Banana plant on seed germination and seeding growth of some vegetable crops. The test crops were lettuce, radish, cucumber, ribbed gourd, bean and okra.

Among the extracts from different parts of banana plant, extract from rhizome showed strongest inhibition on the seed germination and seeding growth of the test crop. The test plant species responded differently to the rhizome extract and lettuce seedling was found most sensitive.

*Ziaebrahimi L, et.al.pak J Biol Sci 2007

In this, research paper showed that effect of water extracts of eucalyptus leaves examined on germination and growth of three wheat cultivar seeds and seedlings. Results showed that germination percentage strongly decreased leaf and root lengths also affected and dry and wet weights of both roots and shoots showed similar change patterns. Activity of polyphenoloxidases increased only in one of three cultivars and again roots showed more activity of this enzyme is response to eucalyptus extract.

*Licx, et al.J Environ sci (china). 2007

The effect of Arsenic(AS) were investigated on seed germination, root and shoot length and their biomass and some other factors to elucidate the toxicity of As. The results indicated as could exert harmfulness in the early development stage of wheat at inappropriate concentrations.

*An J, et al.chemosphere.2009.

Biochemical responses of wheat(Triticum aestivum) seedling stressed by two typical personal care products- Triclosan (TCS) and galaxolide(HHCB).The results showed that wheat shoot and root elongation was significantly inhibited by 50-250 mg L(-1) TCS and HHCB. Wheat roots were sensitive TCS, while shoots were sensitive to HHCB.

E.A.Grant, W.G.Sallans

June 1964, contribution No.129, Reaserch station Canada

Seeds of four legumes and four grasses were germinated in the presence of aqueous extracts of the same species, using distilled water as a check. Based on the number of significant reaction to the extracts, the species may be classified in the following order of decreasing inhibition-Alfalfa and timothy were the species least affected by the extracts while reed canary grass was the most susceptible. With the exception of alfalfa, extracts of aerial portions of the plants had greater inhibitory effects than root extracts.

*Effect of scialert.net.Allelopathic Effects of

Asian Journal of plant Sciences

Izzet Kadioglu and Yusuf Yanar

Volume 3(4):472-475, 2004

This study examined the effects of extracts of plants, mostly weeds. Also, chemical compounds in extracts having significant positive or negative allelopathic effects on other plants, should be studied in detail for their specific effects on plant growth.

*S.Roy,M.Asaduzzaman, M.H.R.Pramanik and A.K.M.A.Prodhan(2006)

In this paper the effect of Banana plant extracts revealed a significant inhibition on seed germination and seedling growth of lettuce and the degree of inhibition increases with the increase of extract concentration.

Rhizome extract strongly delayed and inhibited the germination of lettuce.

*M.S.A.Mamun and M.Shahjahan (2011) Agril.Res.36 (4):733-739-

An experiment was conducted to determine the effect of some indigenous plant extracts on the germination of wheat seeds. This study showed that the seeds treated with plant materials did not adversely affect the seed germination.

*M. A. I. Talukdar.M.Rahaman, B.Roy and K.C.Saha.

In this paper the effect of aqueous extracts of different herbal plant leaves on the germination of selected vegetables are studied. A significant effect of aqueous extracts was found on the germination of vegetables throughout the growing period. In Turnip and Ladies finger it found to be maximum.

*According to Chang Naihang (1996), the effect of vermicompost on seed germination.

The effect of vermicompost of Salvinia, Eichhornia, Chromolaena and Parthenium on percentage of seed germination, shoot and root length and wet and dry weight of wheat are measured. Regarding that it has concluded that, the lower concentration of vermicompost extract enhances the root length, shoot length, number of roots and wet and dry weights of seedlings in all the wheat seeds tested.

*Alice D.Rao A.V.1986.Antifungal effects of plant extract on Drechslera oryzae in rice.Int.Rice Res.Newsl.12 (2):28.

In this research, the percent reduction in seed borne infection of target pathogenic fungi recorded in mungbean seeds were treated with five different treatments. All treatments were found to significantly reduce theoccurences of seed borne fungi but did not completely control them. Plant extracts have played a significant role in the inhibition of seed borne pathogens such as fusarium oxysporum and in the improvement of seed quality and emergence of seed embryo.

*Eckhard Koch, Steven J.Roberts (2014) JKI, Institute for biological control, Darmstadt, Germany.

The paper gives an overview of approaches that have been taken to utilize the non-chemical methods for control of important seed borne pathogens of vegetables and small grain cereals. The treated plants include bacterial fungal diseases and viral diseases, which can be controlled in seeds.

Rishi P. Singh, K. Raja Reddy, in Advances in Agronomy, 2015.

This research shows the treatment technology in which it revealed that by using specific products and specific techniques can improve the growth environment for the seed, seedling and young plant. The seed is dressed with either a dry formulation of the seed treatment chemicals

*Md. Zahangir Alam, Islam Hamim, MA Ali, M. Ashrafuzzaman, Bangladesh Agricultural University (BAU) (2014).

The result of the present investigation showed that, seed treatment with different physical, chemicals, biological and botanical agents especially Biofungicide, allamonda leaf extracts, neem leaf extracts and Chitosan solution is useful to prevent germination failure to produce healthy, disease free and morphologically strong seedling and to promote production of vigorous seedling.

Similarly, an attempt is made to study the impact of certain external conditions on seed germination of vigna unguiculata.

CONCLUSION-

Aqueous extract of spinach leaves and prawns of 1%,5%,10% and 20%(w/v) was treated to Vigna unguiculata seeds was studied. Treated seeds show late germination, decreased rate of germination percentage, less radicle length and no plumule formation. Beginning of germination

delayed more by prawn extract treatment than spinach leaves extract treatment. . Seed germination percentage is more affected by prawn extract treatment than spinach leaves extract treatment. Prawn extract treatment is more adverse in terms of radicle growth during germination than spinach leaves extract treatment to seeds of vigna unguiculata. There is no plumule formation takes place in both treated seeds during germination. The adverse effect of spinach leaves extract treatment and prawn extract goes on increasing with increasing the concentration extracts.

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INFLUENCE OF VARIOUS EXTRACT ON GERMINATION PROCESS IN MATKI CHAULI (MAT BEANS)

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Abstract
*To study the seed germination of Mat bean (Vigna aconitifolia**)** under the aqueous extract of plant and animal origin of 1%, 5%, 10% and 20% Concentration are used. The germination of seeds per day percentage of germination, average radical length and average plumule length in cm are parameters under study. The germination is more in control than treated seeds. Either plant extract or animal extract treatment is non stimulating and harmful to germination process in general. The effect of animal extract is very harmful than the plant extract treatment. Seed germination percentage is more in control than treatment. The seed germination percentage is more affected in aqueous extract of animal origin than plant origin. In both the treatment as the concentration increases the maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin average radical length is affected due to the treatment. The treatment of aqueous extract of prawn is more is destructive than the aqueous extract of spinach. There is adverse effect of aqueous extract of plant origin (spinach) and prawn on average plumule growth of Mat bean seeds. Amongst the both treatment, aqueous extract of plant origin (spinach) shows less harmful..*

Introduction-

Mat bean belonging to family fabaceae. Moth bean (Vigna aconitifolia L.) is an exceptionally hardy legume that thrives in South Asia in hot, dry, tropical conditions. It is annual plant. Yellow flowers develop into a brown pod 2.5 to 5 cm in length, which holds 4 to 9 seeds inside[1]. The rectangular seeds exist in a variety of colours including, yellow-brown, whitish green and mottled with black[2].

Mat beans seed are having great nutritional values. Mat beans contain carbohydrates, protein, fat, and vitamin. Also contain Vitamins A, Vit B6, Vit C, Vitamin k, Phosphorous, Magnesium, Copper, Iron, Zinc and Carbohydrates and Fat [3]. The seeds of these pods contain approximately 22–24% protein [4].

Mat beans different food products such as dhal (i.e. thick stews from dehulled and split grains), sweets, snacks and savory foods have evolved and became popular in the Indian subcontinent [5,6].

For vegetarians, it is a good protein and calcium source. It also offers fibre, vitamins and minerals. Whole or split moth bean seeds can be cooked or fried. In India, particularly in the state of Maharashtra, moth beans are sprouted before cooking and used for making Usal (spicy stew).

They can be used for breakfast or other meals.The usal is essential part of the popular dish Misal Pav [7,8] Fried splits make up a ready-to-eat traditional namkeen, or savory dry snack, in India called dalmoth [8] and can be used to make traditional dal. The moth bean pods can be boiled and eaten, and seeds can be ground into flour that is used for another traditional namkeen called bhujia. It is believed that consumption of the seeds can help treat a fever.

Mat bean seeds are having great medicinal value; Calcium is one of the many nutrients found in moth beans. As everyone knows, the said mineral is important for making the bones stronger and preventing osteoporosis from striking. There is also phosphorous in moth beans, which is another nutrient vital for strengthening the bones, experts say. With the remarkable number of nutrients found in moth beans, it’s no wonder why their consumption can help make your body more defended against disease-causing bacteria, viruses and even fungi. Moth beans help save you from ending up constipated.

It's for the fact that fiber is one of the many nutrients they have

According to Devadas et al., 1977 Oligosaccharides, such as raffinose, stachyose and verbascose are associated with intestinal gas (flatus) production after consumption of beans. Flatulence is caused by such oligosaccharides that escape digestion and are fermented by the intestinal microfloras[9,10]

However, there are no scientific studies on the influence of aqueous extract of plant origine and animal origin of varying concentration on seed germination in Gram seed. Miransari and Smith(2014) said that seed germination is an important process affecting crop production , and is influence by range of factors, including enzymes and hormones[11] . Seed germination is simple and nondestructive technique for measuring plant biochemical growth and development.Therefore seed germination, germination percentag, radical length and plumul length are consider for understudy .

The number of seed germinate per day, germination percentage of seed, radical length and plumule length on 10^{th} day are the parameters consider to study

The treated petri dishs (6^{th}, 7^{th}, 8^{th} and 9^{th}) with 10 seed Mat beans each treated with adequate amount of aqueous extract of prawn of 1%, 5%, 10% and 20% for 10 days to study the seed germination of Mat bean. The germinate per day, germination percentage of seed and plumule length on 10^{th} day of treatment are parameters consider for study.

The entire process repeated for next 10 days . The observation are taken as an average of both the replicas.

MATERIAL AND METHOD

Mat bean are collected placed ten each set of 9 Petri dishes'. Each Petri dish is placed with normal blotting paper at bottom. First Petri dish is treated as control. It is poured with adquate distill water daily. Next four petri dish are treated with adequate amount of aqueous extract of plant (spinach leaves) remaining four petridish are poured and treated with adequate amount of aqueous extract of animal origine (dried prawn). The contoll and treated petri dishes with 10 each Mat seed are under 10 day's observation. It was to study the seed germinaion of Gram seed under the aqueous extract of plant and animal origin.

For aqueous extract of plant origin preparation weight to volume ratio is consider for 1% aqueous extract of plant origin, 1 gm fresh spinach leaves homogenized with 100 ml distill water. The content is filter through the normal filter paper. The filtrate is used as 1% aqueous extract of plant origin, similarly 5%, 10% and 20% aqueous extract of plant origin is prepared daily freshly. Thus 1%, 5%, 10% and (w/v) concentrated aqueous extract of plant origin is prepared.

For aqueous extract of animal origin preparation, weight to volume ratio is considered for 1% aqueous extract of animal origin, 1gm of dried prawn homogenised with 100 ml distill water. The content is filter through normal filter paper. The filterate is used as 1% aqueous extract of animal origin. Similarly 5%, 10% and 20% aqueous extract of animal origine prepared daily freshly. Thus 1%, 5%, 10% and 20% (w/v) concentrated aqueous extrat of lant origin is prepared.

The treated Petri dish of Green pea treated with aqueous extract plant origin and of 1%, 5%, 10% and 20% for 10 days to observe seed germination of Mat beans.

RESULT AND DISCUSSION:-

Table 1. Number of seed germination 1day of Mat beans due to treatment of aqueous extract of plant and animal origin.

Petri dish Number	Treatment		Number of seed germination/ day.									
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
1	Control	1	4	7	7	7	7	7	7	8	9	10
2.	Spinach Extract	1%	4	6	6	6	6	6	7	7	7	7
3.		5%	3	4	4	4	4	6	6	6	6	6
4.		10%	4	5	6	6	6	6	6	6	6	6
5		20%	1	2	2	2	2	2	2	2	2	2
6.	Control	2	8	9	9	9	9	9	9	9	10	10
7.	Prawn Extract	1%	3	6	6	6	7	7	7	7	8	8
8.		5%	1	3	3	4	6	6	6	7	7	7
9.		10%	0	0	0	0	3	3	3	3	4	4
10.		20%	0	0	0	0	1	1	1	1	2	2

From Table-1, it is clear that the germination of seeds of Mat beans starts on first day in control. There is germination in 1% of plant extract and as well as there is germination on animal extract. Germination of seed increases on day to 10^{th} day. Maximum germination of nine seeds on 10^{th} day in control as well as 1%, 5% and 10% respectively. The 20% animal extract (prawn extract) treated seeds shows very less germination even on 10^{th} day. In 5%, 10%, 20% plant extract treated seed germination is less as compare to the control. Similarly in 5%, 10% prawn extract treated seeds the germination of seeds is less. It is almost non-significance.

From Table-1 it is clear that the number of seeds germination third to nine days in control and 1% plant extract treated seeds that 1% plant extract shows more germination than control seed. It may conclude that 1% plant extract stimulates the germination in Mat beans seed.

The overall conclusion from discussion is to draw as the germination of seed of Mat bean is more in control than treated seed. It means either plant extract treatment or animal extract treatment is non stimulating and harmful to germination process, except the 1% plant extract. The effect of animal extract is very harmful than the plant extract treatment.

Table-2. Seed germination percentage of Pisum sativum after treatment of

Petri dish Number	Treatment		Number of seed germination/ day.									
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
1	Control	1	40	70	70	70	70	70	70	80	90	100
2.	Spinach Extract	1%	40	60	60	60	60	60	70	70	70	70
3.		5%	30	40	40	40	40	60	60	60	60	60
4.		10 %	40	50	60	60	60	60	60	60	60	60
5		20 %	10	20	20	20	20	20	20	20	20	20
6.	Control	2	80	90	90	90	90	90	90	90	100	100
7.	Prawn Extract	1%	30	60	60	60	70	70	70	70	80	80
8.		5%	10	30	30	40	60	60	60	70	70	70
9.		10 %	00	00	00	00	30	30	30	30	40	40
10.		20	00	00	00	00	10	10	10	10	20	20

		%										

Seed germination percentage of Mat bean after treatment of aqueous extract of plant and animal source origin is seen in Table 2.It shows the seed germination percentage per day up to ten days of experiment for control and treated conditions from the table. It is clear that seed germination percentage maximum on 10th day of treatment in control aq plant extract treated as well as animal extract treated seed in control. The seed germination percentage is 70 on 2nd day. However it is interested to note that it is zero percentage in both 10%, 20%% treatment animl extract .It 90% in control while 70% and 60% in 1% and 5% plant extract treatment seeds. It seems to stimulating effect of plant extract on germination percentage. The seed germination percentage is 60% and 20% each on 10th day in 10% and 20% plant extract treatment respectively. In aqueous extract of plant origin it is hardly 70%, 60%, 40% and 20% in 1% 5% 10% and 20% treatment respectively. It is to conclude that seed germination percentage is more control than treatment amongst the treatment unclear study; the seed germination percentage is more effect in aqueous extract of animal origin than plant origin. In both the treatments the concentration increases the adverse effect on seed germination increases. The maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin.

Table- 3. Average radical length on 10th day of treatment in Mat beans after treatment of aqueous extract of plant and animal origin.

Treatment	Concentration	Average radical length on 10th day of treatment
Control	-	0.70
Aqueous extract of plant Origin (spinach extract control)	1% 5% 10% 20%	0.44 0.31 0.28 0.20
Control	-	2.94
Aqueous extract of Prawn	1% 5% 10% 20%	2.67 1.42 0.28 0.10

From Table 3, it is clear that control seeds of Mat beans shows average radical length is maximum (2.94 cm) than 0.44cm, 0.31cm, 0.28cm and 0.20cm of aqueous extract of plant origin treated seeds with 1%, 5%, 10% and 20% concentration respectively. It means the average radical length is less in plant extracts treated seeds. It is decreasing as the concentration of spinach extract goes on increasing similarly from the table. It is also seen that the average radical length 2.67cm at 1% aqueous extract of animal origin (prawn) treated seeds. It is 1.42cm, 0.28cm, 0.10cm for 5%, 10%, and 20% treated seeds respectively. Above observation are arrived at conclusion that the average radical length is affected due to the treatment with aqueous extract of spinach and prawn. The treatment of aqueous extract of plant origin is more destructive than aqueous extract of spinach.

Table-4- Average plumule length on 10th day of treatment of aqueous extract of spinach and prawn.

Treatment	Concentration	Average plumulel length on 10th day of treatment(cm)
Control	-	6.62
Aqueous extract of spinach	1% 5% 10% 20%	3.2 - - -
Control	-	5.56
Aqueous extract of Prawn	1% 5% 10% 20%	- - - -

Table-4. Depicts the average plumule length on 10th day of treatment in control and treated seeds of Mat beans. It is noted that 6.62cm is maximum average plumule length seen in control seed. 3.2 cm is average growth of plumule in aqueous extract of spinach treated seeds at 1 % concentration. The aqueous extract of prawn treated seeds of Mat beans are showing the average plumule length as zero for 1%, 5%, 10% and 20% means no plumule growth at all for 1%, 5%, 10% and 20% concentration of aqueous extract of prawn.This discussion conclude that there is adverse effect of aqueous extract of plant (spinach) on plumule growth of p.sativum seeds. Amongst the both treatment, aqueous extract of plant origin shows less harmful than prawn extract [11,12,13]

Alkalization and salinization of soils have become a global environmental problem. These are important factors for limiting agricultural productivity. Alkali stress has been clearly demonstrated as more severe than salt stress.[14]. When a saline soil contains HCO_3– and/or CO_3– it causes injury to plants not only through salt stress but also an alkali stress, because soil salinization and alkali-zation frequently co–occur in nature, the conditions of which are very complex.[15,16].

According to He and Cramer[17] growth analysis is fundamental to the characterization of a plant's response to environmental stress. The tolerance of seedling to salt and alkali stresses is lower than that of germinating seeds.[18] The saline–alkaline stress decreased germination rate.

A decrease in growth due to salinity has been reported by Sheoran and Gang[19]. Inhibition of seed-ling growth under saline conditions may be brought out due to number of reasons such as inhibition of cell division and cell elongation[20]. Decrease in plant height under saline conditions is a common phenomenon in mung bean.[21]

C. Beasse (2000) studied effect of epidermics of mycophaerella pinocles on crop growth radiation interception efficiency (PIE) and radiation use efficiency by dispersion on ground of pea. Which decrease the photosynthesis in leaves [22].

Dry seeds do not germinate. Water is an essential factor to trigger off the process of seed germination. Shortage of water at any stage of plant growth usually results in a reduction in vegetative growth but many annual crop plants are sensitive changes in soil moisture condition during the period from flower initiation to the development of full flower [23-25].

Heat cultivation and micronutrient coupling are two relatively methods that are used to increase the yield and size of the Gram seed. Recent research has indicated that a combination of heat treatment along with the two vital micronutrients, phosphorus and nitrogen, are the most critical components to increasing the overall yield of Cicer arietinum[23]. Unlike other food crops, the perennial Horse gram seed shows a remarkable capacity to change its nutritional content in response to heat cultivation. Treating the Horse gram seed with a constant heat source increases its protein content almost threefold [23]. Consequently, the impact of heat cultivation not only affects the protein content of the Horse gram seed itself, but the ecosystem that it supports as well. Increasing the height and size of Horse Gram seed plants involves using micronutrient fertilization with varying doses of inorganic phosphorus and nitrogen [24].

Temperature affects cellular metabolic and growth rates. Seeds from different species and even seeds from the same plant germinate over a wide range of temperatures. Seeds often have a temperature range within which they will germinate, and they will not do so above or below this range. Baskin, Carol C and Jerry M (2014) shows that variation in Seed dormancy and germination within and between Individuals and Populations of a Species[25].

Light or darkness can be an environmental trigger for germination and is a type of physiological dormancy. Most seeds are not affected by light or darkness, but many seeds, including species found in forest settings, will not germinate until an opening in the canopy allows sufficient light for growth of the seedling.

When the seed imbibes water, hydrolytic enzymes are activated which break down these stored food resources into metabolically useful chemicals.[26]. Oxygen is required by the germinating

seed for metabolism.[27]. Oxygen is used in aerobic respiration, the main source of the seedling's energy until it grows leaves [26]. Oxygen is an atmospheric gas that is found in soil pore spaces, if a seed is buried too deeply within the soil or the soil is waterlogged, the seed can be oxygen starved.

Conclusion:

To study the seed germination of Mat bean (Vigna aconitifolia**)** under the aqueous extract of plant and animal origin of 1%, 5%, 10% and 20% Concentration are used. The germination of seeds per day percentage of germination, average radical length and average plumule length in cm are parameters under study. The germination is more in control than treated seeds. Either plant extract or animal extract treatment is non stimulating and harmful to germination process in general. The effect of animal extract is very harmful than the plant extract treatment. Seed germination percentage is more in control than treatment. The seed germination percentage is more affected in aqueous extract of animal origin than plant origin. In both the treatment as the concentration increases the maximum adverse effect is seen at 20% concentration of aqueous extract of animal origin average radical length is affected due to the treatment. The treatment of aqueous extract of prawn is more is destructive than the aqueous extract of spinach. There is adverse effect of aqueous extract of plant origin (spinach) and prawn on average plumule growth of Mat bean seeds. Amongst the both treatment, aqueous extract of plant origin (spinach) shows less harmful.

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A STUDY OF CHANGING RESEARCH PARADIGMS IN THE HUMAN RESOURCE MANAGEMENT

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Abstract

The recent dynamic changes in the technology, competition and other environmental changes has multidimensional effect on every sector of economy. In respect of specific industrial unit they have affected Production, finance, marketing and also HR activities. It is a time to review and analyze the impact of such factors on Human Resource Management and search the new paradigms for research. The HR Department performs several practices to train, motivate, stimulate, develop and retain the quality human resources. The research examined and evaluated the changing nature of Human Resource Management (HRM) in Indian Industries. The research revealed that the different environmental dimensions have direct and indirect effects on employer and employee relations. The research suggests that the HR Department should initiate necessary steps to rectify the existing HR Strategies suitable to the satisfaction of employees,organization and changing environment.. The paper ended with a discussion on implications and limitations of the research and scope for future studies.

Keywords: *Human Resource Management, Globalisation, e-HRM.*

Introduction:

In the last decade, the strategies of Human Resource Management(HRM) was changed from organizational goal to employees career development. Thus, the organsational culture has been changed from mere organizational development to employees welfare and subsequently their development in respect of career. In return, the employees work in the overall development and progress of organization. In the present era employees remain loyal towards the organization , if the opportunities of skill and career development are explored to them. The organizations have to design policies and programs in HRM to develop people and their potential for growth. Earlier, the personnel department was concerned with the traditional functions such as to attract, recruit, train, assess, promote and compensate the employees. But, the present HRM has gone to radical changes as employment is moving towards task oriented contractual basis. The traditional approach is changed to strategic and dynamic approach. By 1990 onwards ,the process of Globalisation compelled the business organizations to under go drastic changes in its policy, structure , management practices and so on. In recent period, the emergence of knowledge economy has given priority to talented and skill oriented workers and managers. To accommodate innovations and also to manage such paradigm changes, organisations need to become more flexible, dynamic and responsive .In respect of HR the oranisations have to plan and prepare a programme in three ways viz. career development , creating leaders and providing good leadership. It is a time to revaluate and assess the HRM in recent days of globalization, deregulisation ,changing expectations of consumers, digitization , robotisation and dynamic technological changes. The research paradigms in HRM are required to change accordingly so as to retain quality of H-factor (Human Factor) ass it is today in organizational structure.

Literature Review:

No doubt that the human factor shall not loose its importance in the organizational set up though there is outburst of technology and dynamic environment. The need to utilize human brain will remain in spite of replacing human work by robots.

In a book Globalizing Human Resource Management by Paul Sparrow, Chirs Brewster and Hillary Harries (2004) have explained the HRM concept in the different perspective by dividing it in to nine chapters. They have written on the complex issues which are faced by most HR professionals in present days. The book begins with defining what is meant by globalization and examining the debate surrounding its impact. This book contains data based on survey and a model of the processes involved in globalizing HRM. There is analysis of effect that technology is having on the delivery of HR

services on a global basis through shared service models, e-enablement of HR and a series of other technical developments. The book also contains the overall impact of technology and automation on traditional HR activities.

Helena D. Cooper-Thomas and Neil Anderson (2006) The aim of this paper is to highlight organizational socialization (OS) research, to present a new model of OS and to draw from both of these to suggest practical steps for both organizations aiming to socialize newcomers. In this paper testable relationships are proposed between these indicators and both five learning domains and five learning sources. The research model has not been tested empirically. Further, the fifth success indicator, external representation, is a new and untested concept in the OS literature. The paper provides a model that managers and newcomers may find useful to successfully negotiate the OS process. Further, the third section of the manuscript extensively discusses practical implications from the model and more broadly from the initial literature review. The model proposed is novel and raises the important issue of appropriate OS success indicators. New propositions are made regarding relationships between learning sources and domains with these success indicators. This testable model is a valuable resource for researchers. Further, for managers, whether newcomers themselves or responsible for newcomers, the model provides a framework for considering what they are aiming to achieve and how they might get there.

Joe Duke II & Ekpo Nya Udono (2012) states and identifies the identifies the number of approaches and practices that are designed to help organizations wrestle with new work-place realities, the impact of globalization and international competition. They also provide the measures to replace the traditional human resource management practices, which are increasingly becoming inadequate. The measures are mainly focused on promoting new work-place cultures, organizational language, multi-skilling and customer focus. The researchers however conclude that a number of tested and established human resource management practices need to be combined with the new paradigm in order to achieve significant productivity improvements that can lead to widespread superior corporate performance. The study also suggests further scope of research in order to establish the effective HRM system to utilize human factors in changing environment .

Research Gap:

The changing environmental factor will compel the organizations to bring necessary changes in their HRM System an important and core area of the Organisation. HRM shall have multidimensional effect on every component of organization such as marketing, production, finance and so on. In this respect, there are several areas of HR practices where in detailed study is required to explore means and measures to adjust with dynamic environment. Thus, the objectives of HRM can be achieved. On referring several books and papers especially on HRM with reference to global changes, it is understood that there is a wide scope for research in HRM.

Objectives of the Study:

1. To know the need of advanced research in Human Resource management
2. To assess the efforts and Contribution of researchers in the context of Changing Environment.
3. To analyze the Factors which will influence the HRM in the coming years.
4. To identify the limitations and Hurdles in the Path of HRM.
5. To offer useful Suggestions in the light of Findings

Research Methodology:

This paper is basically descriptive and analytical in nature. In this paper an attempt has been taken to analyze changing research paradigms in the field of HRM. The data used in it is purely from secondary sources according to the need of this study and need based primary information through self experience and experts from the field of HRM.

Changing Need and Importance of HRM :

In recent period we are sensing the several changes in every sector in the world. The changing nature of competition ,globalization, increasing competition, mergers, acquisitions, restructuring ,technology etc. have forced the business units to initiate time to time redesigning their activities. In this dynamic environmental changes the HR department has a momentous role. Though, the organisastion goes for automation the HR shall have changing role as:

1. ***HR Department Creates Leaders and Provide Leadership***:

HR Department creates best leaders who will develop leadership qualities in their subordinates. In creating leaders the attempts are made to change the attitude, aptitude, social approach and network of the leader. There is a striking difference between leader and leadership. A good leader is that who provides good leadership.HRM is needed to provide system oriented,process driven and effectively communicative leadership at different level.HR department gives emphasis on leadership, and the leader has to be role model and self example. It grooms the potentials in the managers to reach at top positions.

2. ***HR creates Organisational Culture*** :

HR Department provides perfect harmonised relation among all levels of management, based on ethics, transparency, friendliness, clarity in communication, and best societal relations, which shall reflect on the organisational culture. A well cultured organization can endow with innovative HR policy to provide the extra mile so that the enterprise attracts the best talents and retains them.

3. Contractual Employment:

In recent days HRM role is not limited to recruitment , training, promotion and record keeping, it has vital for HR professionals must understand that the nature of employment is gradually moving towards contractual, task-based and time-frame-driven.HRM has a significant role to inter and intra placement of such employees to maintain image of organisation.

4. ***Shifting of Loyalty***:

In traditional management the business units were second home for managers and employees and only a sense of job opportunity was inspiring them to remain loyal towards organization. In last decade the loyalty of the people in the organization shifted from mere job opportunity to career development. A quality human resource will be retained in the organization if they see some future career opportunities. In this phase the HRM has a strategic role to retain them.

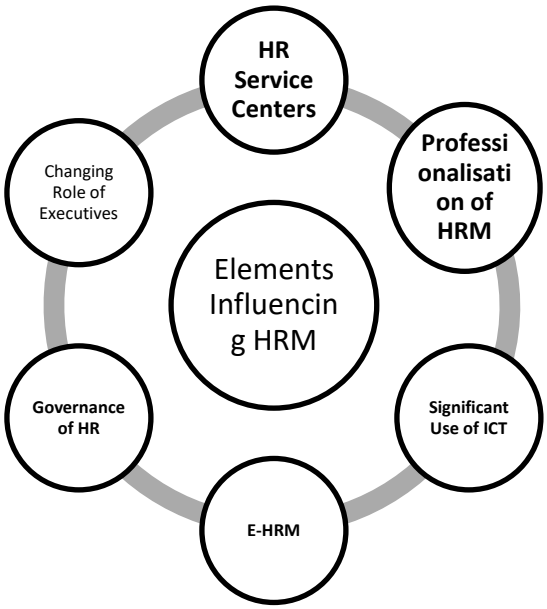
5. High Attrition Rate and Industry Collaboration:

Retention of Human Resource is a challenge before every organization. In these days the mainly IT companies have collaboration along with NASSCOM (The National Association of Software and Services Companies) to backlist and stop therecruitment of such employees for a particular period of time, in order to moderate attrition rates.HR department plays a vital role in framing such strategies in the interest of industry.

Elements Influencing HRM And Exploring Research Opportunities:

In order to place HRM to cope up with and overcome the challenges posed by new dynamic environment and development, it is developing in respect of content,approach,outlook and context. A number of human resource practices indicate a new paradigm in the management of people in organizations.The most important and having immediate implications on HRM are shown in the Figure -1 mentioned below.These changing paradigms will definitely explore the further scope of research in HRM.

Figure -1 : Elements Influence HRM



s

1. HR Service Centers :

The HR department has to perform a dual role as 1.Strategic Role 2. Operational Role.In strategic role it perform the range of activities from HR planning,HR retention and attraction and HR utilization in the interest of orgaisation. Operational role is routine in nature such as resolving individual problems, quarries etc. Now a days HR Service Centers -a group of HR professionals are handling such issues on behalf of management. Thus, the HR Departments can concentrate on strategic activities more.

2. Professionalization of HRM:

Professional approach is scientific and more realistic approach ,which can be used in different areas of activities. Since the approach of the people towrds the orgaisation has shifted from traditional-emotional and personal to more career oriented-professional. The HRM policies, procedures and strategies are required to be changed in the organization.

3. Significant Use of ICTs:

In different domains in the organization a data analysis is in very high demand .Use of ICTs (Information and Communication Technology).This facilitates knowledge sharing and adding experience. Human Resource Management plays a remarkable role in supporting continuous innovation and new ICTs can enable this process. It is a responsibility of every HR Department to create our own authentic, reliable HRIS (Human Resource Information System) to enable fruitful decision making.

4. E-HRM :

Use of electronic means such as Intranet, Extranet and Internet and soft wares such as ERP (Enterprise Resource Planning),Bio-red,SAP (Sysytem Approach and Product) and HR pay Roll System improves the HRM performance in respect of training ,development, record keeping ,data gathering & analyzing and also reducing bias.In this changing paradigm there is a ample scope in research to introduce E-HRM,E-training,e-recruitment,e-selection ,e-job analysis ,e-HR records and e-aapraisal.

5. Governance of HR

In these days the employees are more career oriented and would like to explore opportunities within the organization for their future development. Hence, the HR Governance matters managing of HR Factors. Along with careers the people in the organization expects not only compensations but also other perks and facilities such as health care, retirement, training, and other human capital investments. Goverance of HR motivates the managers and employees in return the HR risk can be minimized by organization. Thus, this is another broad area which provides scope for research.

6. Changing Role of Executives :

No executive has remained boss in this changing environment. In coming days the boss and subordinate relations shall be no more.It may not be required to please the boss rather the boss has to maintain close relationship with employees. In this shifting of concepts the HRM has to play a key role .The executives have to provide leadership in talent management, development and serving the organizational objectives.

Hindrances in the Path HRM:

The hurdles observed in the Human Resource Management process are:

1. Difficulties in adaptation of Innovations ,which is dynamic.
2. Especially small size companies may struggle to provide big compensation.
3. Difficulties in making available a good traines to provide training to the employees.
4. Possibility of no dedicated involvement of mangers and employees as they are career oriented.
5. Difficulties in recruitment and retention of talented employees.employees.

Discussion and Conclusion:

The recent changes in the orgnisation due to globalization and other factors , the HRM put forth the challenges before policy makers to identify importance of quality human resources. There is a key role of HR department to recruit ,select,train and retain skillful eemployees. The experts form HR department and executives should make purposeful attempt to rationalize HRM system. A study of changing research paradigms in HRM reveals that:

1. Empirical Research is required from the point of view of HRM perspective
2. Instead of deciding HRM policies centrally, the participation of managers and employees are required to be initiated.
3. Instead of traditional approach in utilizing human potentials ,the professional approach is required to be adopted.
4. Collaborative Partnership with similar type of organization may prevent switching over of employees.
5. It is necessary to study the effects on human capital in case if the robots are placed to human resources.

Limitations of the Study and Scope for Future Research

This study is primarily based on secondary data and need based primary information. An empirical study was not conducted to validate the finding of the study. Since the environmental factors are ever changing , it will be too early to evaluate and analyse actual implications on Human Resource Management activities in the industry. But it has a wide scope for Researchers, Practitioners and academicians to undertake a detail study of different aspects which will have a considerable effect on HRM.

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The Growing Native Advertising Landscape in India: Its Emergence, Implications, Risks and Opportunities

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Introduction

Native advertising term was first coined by Fred Wilson at Online Media, Marketing, and Advertising Conference in 2011. Social networks like Facebook and Twitter are also avid users of native advertising, meeting advertisers' needs by displaying sponsored posts and tweets throughout their feeds. Starting 2011, Facebook started featuring "Sponsored Stories" in users' News Feed, streamlining its advertisements into a combined unit with social context. Similar to Facebook, Twitter interacts with businesses through its "Promoted Tweets" purchased by advertisers seeking to attract a particular audience group's attention.

Native advertising is an inclusive and relative terminology. The term native advertisement covers a variety of advertisements. According to the IAB, native advertisements include: [Native Advertising Playbook, (2013)]

In-feed units-These advertisements appear in the middle of editorial or social media content on sites such as Facebook or BuzzFeed.

Paid search units-These advertisements are search results, typically highlighted in a different colour, that appear at the top of the page before other search results on sites such as Google, Yahoo!, etc.

Recommendation widgets-These advertisements are posts that appears on the side of a page or at the bottom of an article and recommends additional content for the reader on sites such as Huffington Post or ESPN.

Promoted listings-These advertisements are product listings that might appear on shopping websites or search pages that are promoted by sellers such as Amazon.com or Google.

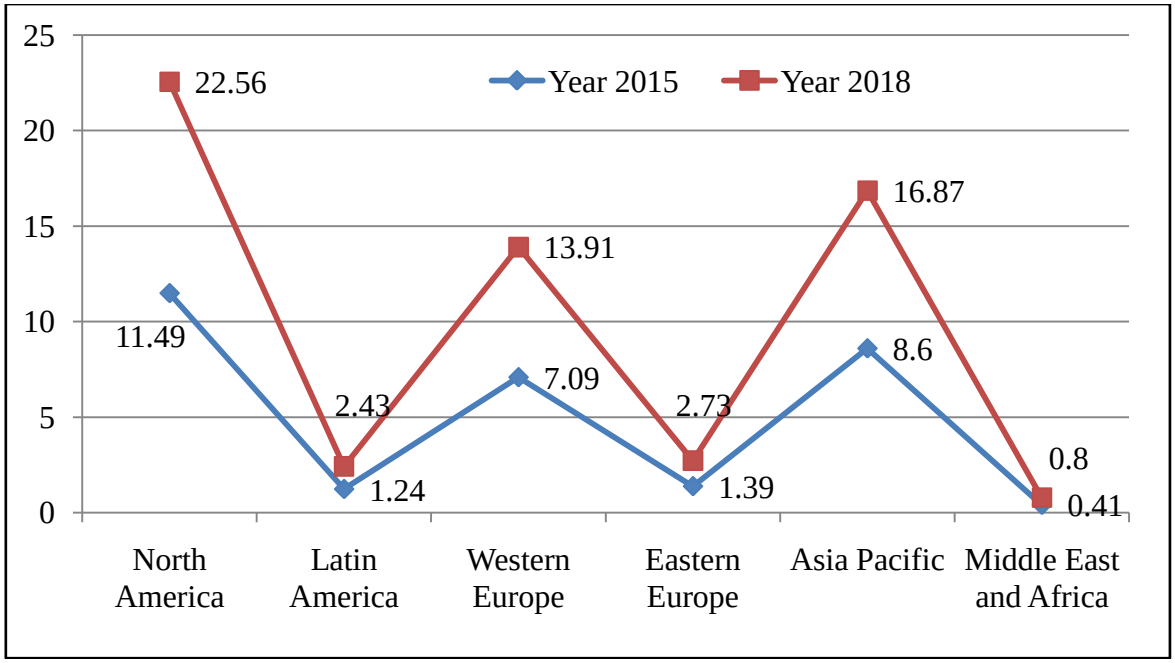
In-ad with native element units-These advertisements contain content that is meant to look like the editorial content around it.

Custom/can't be contained-These advertisements fall into a catch-all category for other native content.

Emergence

With the emergence of the Internet, the 21st century now provides an ideal environment for native advertising. Modern-day native advertising is no longer constrained to radios or TV programs. The rise of search engine companies like Google, Yahoo, etc. have prompted businesses to promote their services through search advertising that automatically help them connect with target customers. The most recent websites to employ native advertising would be digital media giants like BuzzFeed, Mashable and Forbes.

Native Advertising Spending Worldwide in 2015 and expected in 2018
(Amount in Billion US $)



Source: Compiled by Researcher from the data on www.entrepreneur.com/article/290705

Indian Implications

Native advertising is fairly a new approach to digital advertising, in which brands offer content based on what audience are passionate about, as opposed to sponsored content, where brands push their marketing message. These advertisement are called 'native' because they don't appear to be advertisements, rather they appear as a part of content. In fact it is extensive since it is about content and not about the form in which content is rendered. It could be images, text, video, info-graphics, apps or even a micro website. Some common examples are promoted videos, images, articles and music. Examples are sponsored stories on Facebook, promoted tweets on Twitter, paid search results, pre-roll ads on YouTube and so on. There is a variety of forms or layouts of native advertising on mobile such as content walls, app walls, chat list, news feed, content streams, which complement the design of different types of apps. Native advertising is expected to grow from a $1.9 billion market in 2014 to $4.6 billion by 2017, according to research firm BIA/Kelsey. The objective of native advertising is to create appealing content as per the interest areas of the target audience's and then seed their brands message. In a newspaper, it could be a pullout and so on while in a magazine, one can see 3-4 pages of sponsored content. It looks like an article but it's actually written completely by the advertisers. Native advertising is different from traditional advertising because it blends into the content stream but it's an advertisement with a clear advertiser and call to action.

Native advertising is any form of advertising that seeks to attract customers by providing content within the context of their experience. Unlike traditional display or pay-per-click forms of online advertising, native ads are built into the visual design as part of the content.

Brands in India are changing the mode of their advertising. Recently, Indian publication such as Flipkart, Snapdeal, Rediff, NDTV, Zero Games, HT Media and many more have started using Native Advertising for various brands. For **Flipkart and Snapdeal**, it's not enough that they are among the biggest advertisers in the country — they want to be advertising companies of sorts themselves.

As millions more people warm up to shopping online for things as diverse as refrigerators and groceries, these marketplaces are developing capabilities to place ads in their own pages, aiming for a slice of the expanding ecommerce ad pie. They are also partnering with ad tech companies to create contextual ad content - known as native Advertising.

Flipkart was among the earliest to spot an opportunity. The country's most valuable online marketplace recently created an advertisements business segment overseen directly by cofounder and group chief executive Sachin Bansal.

These so-called native ads - often disguised as regular content - are placed strategically on websites to be topically relevant to the content alongside, making them non-intrusive and more effective than

traditional banner or pop-up ads. For online marketplace these ads promise a significant additional stream of revenue from the hundreds of thousands of merchants selling wares on their platforms.
"A lot of the ecommerce companies want native ads today," said Piyush Shah, chief product officer at InMobi, a mobile advertising network that competes with global giants such as Google and Facebook. "Native is a big focus area for us as it gives better conversion rates and better quality of users."

HT Media found its beginning in 1924 when its flagship newspaper, Hindustan Times was inaugurated by Mahatma Gandhi. HT Media (BSE, NSE) has today grown to become one of India's largest media companies.
Produced by an editorial team known for its quality, innovation and integrity, Hindustan Times (English newspaper) and Hindustan (Hindi newspaper through a subsidiary Hindustan Media Ventures Limited),Hindustan Times is the choice for nearly 3.7 million readers across India, who turn to it daily for news, information, analysis and entertainment. Hindustan, the group's Hindi daily, continues to be the second-largest daily in the country with a total readership of 36.6 million,(based 0n Indian Readership Survey (IRS) for the first quarter (Q1) of 2011. Both dailies enjoy a strong brand recognition among readers as well as advertisers.

In addition to Hindustan Times, HT Media also publishes a national business newspaper, Mint. Mint is a one-of-its-kind newspaper in the sense that the company has an exclusive agreement with the Wall Street Journal to publish Journal-branded news and information in India. Mint is today the second-largest business newspaper in India with presence in the key markets of Delhi, Mumbai, Chennai, Bengaluru, Chandigarh, Pune, Kolkata and now Ahmedabad too.HT Media has also made its foray into electronic media. Diversifying its ambit of operations, the company in a consulting partnership with Virgin Radio, has launched the FM radio channel – Fever 104. Currently available in Delhi, Mumbai, Bengaluru and Kolkata, Fever 104 has established a strong presence as being one of the most vibrant channels on air. In a short span, the channel's rise has been meteoric considering its position in Mumbai and Bengaluru at No. 1 and in Delhi asthe No. 2 station on the popularity charts.

Internet businesses of HT Media incorporated under Firefly E-ventures, operate leading web portals Hindustantimes.com and livemint.com in the general and business news categories respectively. The company's job portal Shine.com which has received high appreciation from consumers and industry for its innovative design and usability crossed 7 million registrations. Desimartini.com -a platform to discover and express oneself on movies. The company also has an education portal www.HTCampus.com aimed at students passing out of school and college to help them take the right decision about their higher education.

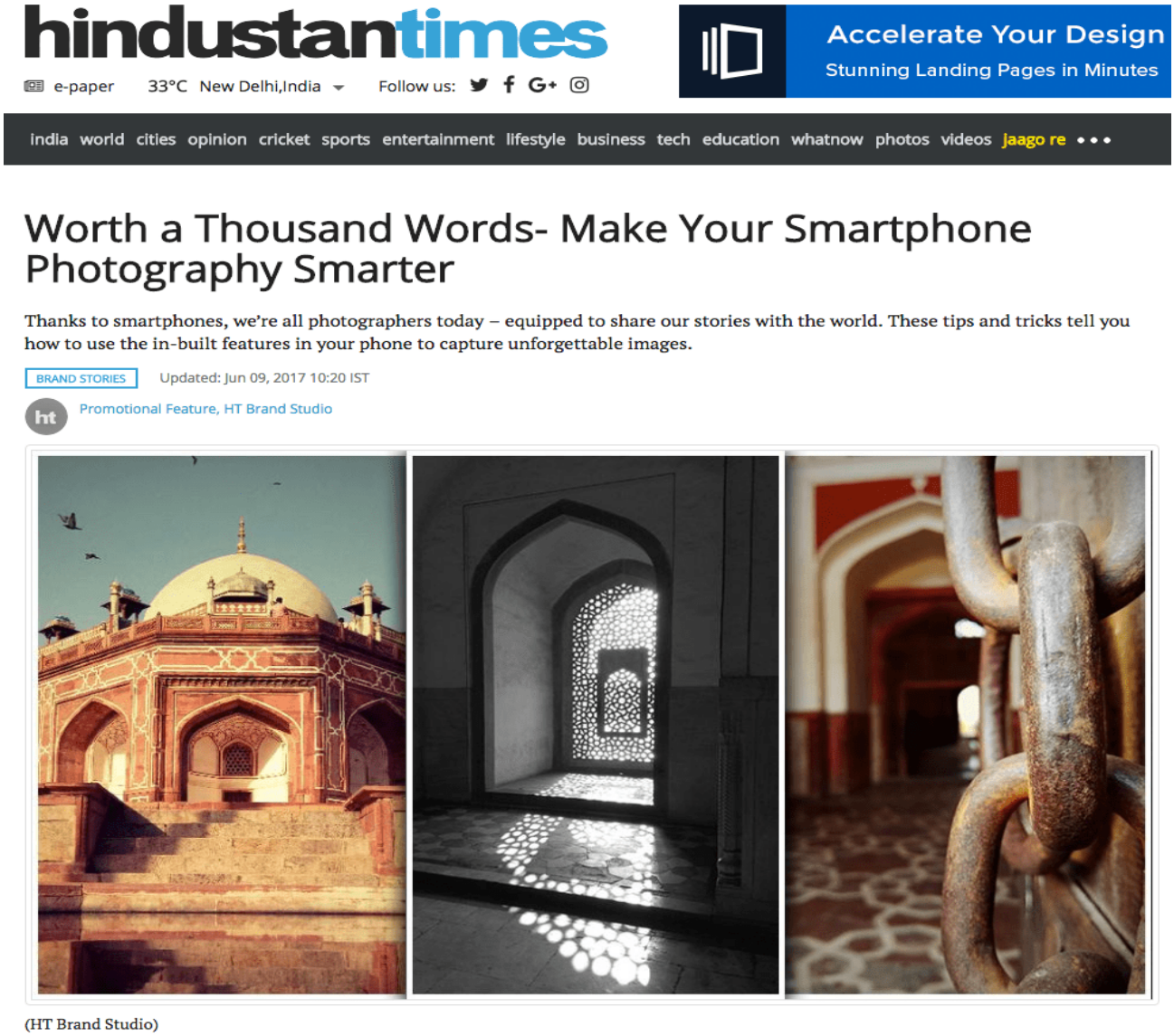
While the overall economy continued to face constraints, our diversification strategy kept us in good stead. On a consolidated basis, our Total Revenue reached Rs 2,142 Crore in FY2013, driven Print Advertising Revenues at Rs 1,529 Crore, Circulation Revenues at Rs 223 Crore and Radio Revenues at Rs 78 Cr. Digital revenues also contributed to revenue growth and reached Rs 54 Cr in FY2013. EBITDA improved to Rs 376 Crore in FY2013 and EBITDA margin improved to 18% from 17% in FY2012 mainly due to strict cost control initiatives.

How HT Brand Studio produces native advertising?
HT Brand Studio is an **independent team**, set up specifically to create native content. The editorial team plays no role in creating branded content and it was a conscious decision to keep the two separate.HT Brand Studio is currently an eight member team and we're looking to expand quickly. We're a collective of journalists, creative writers, brand and digital marketers, video producers, animators and graphic designers. But along with the in-house team, we also have a panel of domain experts who work on a project-to-project basis. Outsourcing gives us the flexibility to address a wide range of briefs and novelty to content.

The team is an **eclectic mix** and each member brings something unique to the creative process. We were conscious of this while hiring and sought out curious and engaged minds, each of whom is a storyteller in their own right and in their own way. We ask **all candidates to submit two to three case studies** as

part of the interview process. The objective is to assess whether the candidate can think innovatively and outside his/her comfort zone. It has however been hard to recruit for the studio. Finding people with a blend of managerial and client servicing skills, ability to work with product owners while ensuring seamless execution is a tough ask. But over time the team has worked well together and developed many soft skills needed for the job. Our creative portfolio includes; stories, animated and live action videos, info-graphics, comic strips & illustrations, photo essays, webinars, podcasts, microsites & branded pages – basically anything that is web compatible. The team today is well equipped to handle this.

The photo below: *An example of one of HT Brand Studio's native advertising stories on theHindustantimes.com for Lava Smartphone photography.*



(HT Brand Studio)

Risks

It's no secret that India has a massive internet user base. The **society** in India is a **multilingual** in nature. The number of internet users is expected to hit to 730 million by 2020. But many of these users are increasingly surfing the web using regional languages and not English. The local language user base is growing at 47% and will reach to more than 250 million in 2020.

The biggest challenge faced is the **lack of authentic services** in regional language translation. This is one of the reasons still most of the brands prefer to run native ads in English. Approval of vernacular native ads takes time and hence campaign delivery might get affected.

There is possibility of providing **Misleading Information** to the customers while making the native advertising more attractive and effective through various means like stories and visual effects. This is resulting in the dishonesty of advertiser towards the customer and also violates the guiding principles of advertising.

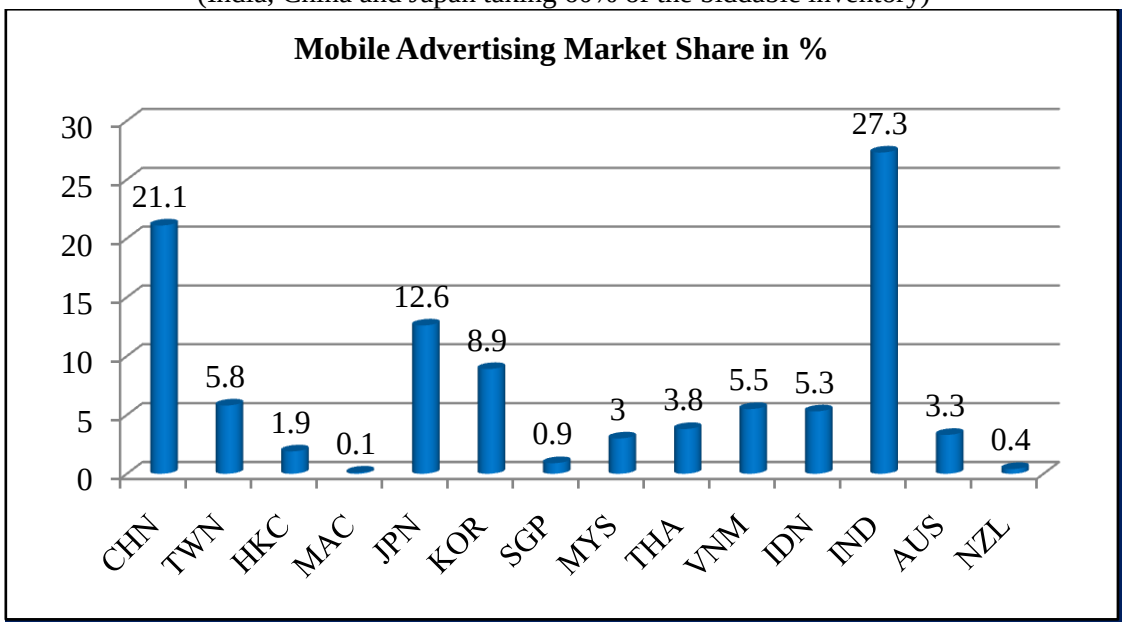
Poor ability and futility of the Contents is the doses for not retaining the customers. The quality of contents developed for the brand publicity and advertising. This is because of the lack of proper and suitable education and training facilities and availability.

There are serious **issues related to transparency and disclosure practices** adopted in native advertising by the advertisers. Not clearly showing the sponsored stories, sponsored identity or showing in the style so that there is further creation of difficulty in visibility. The native advertisers are producing unrealistic and impractical contents to impress the customers. Such issues which are ethical issues, disclosure and transparency issues are hurdles in the positive and smooth development of native advertising landscape in India.

Opportunities

Native advertising is new bracket of revenue available to the advertisers to increase the total earning from the advertising business. The native advertising is beneficial to all forms and types of businesses. It attracts the attention of customers faster than any other mode of advertising. It creates meaningful customer relationship with customer engagement. Moreover the rate of customer retention through native advertising is comparatively better.

Mobile Advertising Market – Top three
(India, China and Japan taking 60% of the biddable inventory)



Source: Compiled by Researcher from the data on www.entrepreneur.com/article/290705

India is holding the first position in case of mobile advertising market with a market share of 27.3% the scope for native advertising is widening. This strong potential of mobile platform has the capabilities to push up this newly evolving type of advertising in India.

The native advertising is an emerging opportunity for advertisers is in many ways such as superior Return on investment, improved reach to the customers, rich & appealing experience, etc. For publishers, it is a new form of premium inventory. For social platforms, it is a new advertising product. For brands, it is a new opportunities for attention, engagement and message syndication. For agencies, it is a creative and media opportunities. For technology, it is a new solution that facilitates and scales both the creative and delivery aspects of native advertising.

As native advertising is more sympathetic to its environment it is more welcomed by consumers; a recent study from the University of Antwerp stated '86% of consumers are OK with Native advertising'. Thus, native advertising is a sustainable mechanism.
The native advertising is an opportunity to differentiate brand through service. Since, the concept of native advertising is increasingly being driven by competition to deliver the most relevant and engaging content for a specific environment. This pattern has been seen in search marketing over the past 10 years in which success is driven by defining the most appropriate message (and bid) for very specific terms driving forward the utility of that message for both brand and consumer. Native allows this concept to be applied not just to text but to both content and services.

Major Suggestions and Conclusion

- ✓ There is a need of proper education, training, regulations around transparency and disclosure and a greater emphasis on maintaining the authenticity of the created and published native advertising.

- ✓ While creating native advertising disclosures, companies should use an understandable label, consistent language for disclosures, present the disclosure noticeably with brand logos, visually separate the advertisement from editorial content, avoid interaction between the editorial content and the advertisement and avoid over-disclosing.

- ✓ The trustworthy and reliable language translation services are required so that utilization of the benefits of regional language can reach to optimum level. This will surely uplift campaign delivery and will help brands tell their story in an individualistic way.

- ✓ The team should be highly unified because the nature of work requires that everyone works well together. The native advertising department or unit should have more young people and from diverse backgrounds and the nature of roles to be performed is highly creative.

Conclusion

The popularity of native advertising is still on its way to reaching its peak. With traditional publications like The New York Times also creating native ads as part of their offering, it is expected that native advertising will soon become as mainstream as the TV ad. Whether a brand is seeking to promote its service or increase its online presence, businesses will continue to find that going "native" will be a key to their advertising success.

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LIBRARY SERVICES USING OPEN-SOURCE SOFTWARES

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Abstract

In this paper discuss and throw light on concept of use of open source software because the impact of ICT and his development change the educational scenario.Now a days many open source software applications are available for library and information management, the organization have an option to acquire and implement such kind application. Today library promote the global use of digital information through interface and satellite and provide the information to user but at the same time library face so many problems. It also discuss the reasons to use open source software, advantages and disadvantages. All library professionals must be aware about the advantages of OS software and use it in their library for the sake of users on a large scale. Each and every library professional must have at least basic knowledge of maintenance, selection and installation. This paper discuss the definition, feature and software of open source library management.

Keyword:*Open Source Software,Koha, NewGenLib , Evergreen, e-Granthalaya, Greenstone, DSpace, Fedora, Wordpress, Drupal, Ubuntu, Open Office ,Firefox, PDF Creator*

Introduction

Open-source software (**OSS**) is a type of computer software with its source code made available with a license in which the copyright holder provides the rights to study, change, and distribute the software to anyone and for any purpose. Open-source software may be developed in a collaborative public manner. According to scientists who studied it, open-source software is a prominent example of open collaboration. The term is often written without a hyphen as "open source software".

Open-source software development, or collaborative development from multiple independent sources, generates an increasingly more diverse scope of design perspective than any one company is capable of developing and sustaining long term. A 2008 report by the Standish Group states that adoption of open-source software models has resulted in savings of about $60 billion (£48 billion) per year to consumers.

History

In the early days of computing, programmers and developers shared software in order to learn from each other and evolve the field of computing. Eventually the open source notion moved to the way side of commercialization of software in the years 1970-1980. However, academics still often developed software collaboratively, for example Donald Knuth in 1979 with the TeX typesetting system or Richard Stallman in 1983 with the GNU operating system. In 1997, Eric Raymond published *The Cathedral and the Bazaar*, a reflective analysis of the hacker community and free software principles. The paper received significant attention in early 1998, and was one factor in motivating Netscape Communications Corporation to release their popular Netscape Communicator Internet suite as free software. This source code subsequently became the basis behind SeaMonkey, Mozilla Firefox, Thunderbird and KompoZer. The free software movement was launched in 1983. In 1998, a group of individuals advocated that the term free software should be replaced by open-source software (OSS) as an expression which is less ambiguous and more comfortable for the corporate world. Software developers may want to publish their software with an open-source license, so that anybody may also develop the same software or understand its internal functioning. With open-source software. The Free Software Foundation (FSF), started in 1985, intended the word "free" to mean *freedom to distribute* (or "free as in free speech") and not *freedom from cost* (or "free as in free beer"). Since a great deal of free software already was (and still is) free of charge, such free software became associated with zero cost, which seemed anti-commercial. The Open Source Initiative (OSI) was formed in February 1998 by Eric Raymond and Bruce Perens. With at least 20 years of evidence from case histories of closed software development versus open development already provided by the Internet developer community, the OSI

presented the "open source" case to commercial businesses, like Netscape. The OSI hoped that the use of the label "open source", a term suggested by Christine Peterson of the Foresight Institute at the strategy session, would eliminate ambiguity.

Definitions

Open source software (OSS) refers to software that is developed, tested, or improved through public collaboration and distributed with the idea that the must be shared with others, ensuring an open future collaboration. The collaborative experience of many developers, especially those in the academic environment, in developing various versions of the UNIXoperating system, Richard Stallman's idea of Free Software Foundation, and the desire of users to freely choose among a number of products - all of these led to the Open Source movement and the approach to developing and distributing programs as open source software. Despite initially accepting it, Richard Stallman of the FSF now flatly opposes the term "Open Source" being applied to what they refer to as "free software". Although he agrees that the two terms describe "almost the same category of software", Stallman considers equating the terms incorrect and misleading. Stallman also opposes the professed pragmatism of the Open Source Initiative, as he fears that the free software ideals of freedom and community are threatened by compromising on the FSF's idealistic standards for software freedom. The FSF considers free software to be a subset of open source software, and Richard Stallman explained that DRM software, for example, can be developed as open source, despite that it does not give its users freedom (it restricts them), and thus doesn't qualify as free software.

Advantages and disadvantages

Open source software is usually easier to obtain than proprietary software, often resulting in increased use. Additionally, the availability of an open source implementation of a standard can increase adoption of that standard. It has also helped to build developer loyalty as developers feel empowered and have a sense of ownership of the end product. Moreover, lower costs of marketing and logistical services are needed for OSS. OSS also helps companies keep abreast of technology developments. It is a good tool to promote a company's image, including its commercial products. The OSS development approach has helped produce reliable, high quality software quickly and inexpensively. Open source development offers the potential for a more flexible technology and quicker innovation. It is said to be more reliable since it typically has thousands of independent programmers testing and fixing bugs of the software. Open source is not dependent on the company or author that originally created it. Even if the company fails, the code continues to exist and be developed by its users. Also, it uses open standards accessible to everyone; thus, it does not have the problem of incompatible formats that exist in proprietary software.It is flexible because modular systems allow programmers to build custom interfaces, or add new abilities to it and it is innovative since open source programs are the product of collaboration among a large number of different programmers. The mix of divergent perspectives, corporate objectives, and personal goals speeds up innovation. Moreover, free software can be developed in accord with purely technical requirements. It does not require thinking about commercial pressure that often degrades the quality of the software. Commercial pressures make traditional software developers pay more attention to customers' requirements than to security requirements, since such features are somewhat invisible to the customer.It is sometimes said that the open source development process may not be well defined and the stages in the development process, such as system testing and documentation may be ignored. However this is only true for small (mostly single programmer) projects. Larger, successful projects do define and enforce at least some rules as they need them to make the teamwork possible. In the most complex projects these rules may be as strict as reviewing even minor change by two independent developers.Not all OSS initiatives have been successful, for example SourceXchange and Eazel. Software experts and researchers who are not convinced by open source's ability to produce quality systems identify the unclear process, the late defect discovery and the lack of any empirical evidence as the most important problems (collected data concerning productivity and quality). It is also difficult to design a commercially sound business model around the open source paradigm. Consequently, only technical requirements may be satisfied and not the ones of the market. In terms of security, open source may allow hackers to know about the weaknesses or loopholes of the software more easily than closed-source software. It depends on control

mechanisms in order to create effective performance of autonomous agents who participate in virtual organizations.

Open Source Software for Libraries

Open source is a fairly new concept that has gained huge popularity in the field of IT in recent year. Open source software is computer software whose source code is available under a licence for users to look at and modify freely and permits users study, change and improve the software and to redistribute it in modified or unmodified form. The open source software differs from the closed source or proprietary software. The primary difference between the two is the freedom to modify the software. The development of Open source software in the present age has made the transition from traditional to technology based library services ,which gives room for more efficient service provision very easy and cost effective hence, libraries are now adopting them in their technical services, digitization processes and general library management. Open Source Software is an important Library solution which assists in the maintenance, storage, collection and access of Library materials which fulfils the primary objectives of many libraries institutions. The use OSS in libraries is an increasing trend. OSS tools and implementation provide library institutions with access to a dynamic and cost effective solution for content and facilitating communications between various institutional and public entities. Hence, introducing few library management softwares.

Koha: Integrated Library System

Koha is a promising full featured open source ILS (integrated library system) currently being used by libraries all over the world. For those of you out there unfamiliar of what an ILS is, well, it is a system of keeping track of the operations of a library - payroll, expenses, purchases, and most importantly, keeping track of the various media being checked out by the librarians patrons. Many smaller libraries cannot afford to purchase, install, and maintain an ILS, and Koha is a perfect alternative. Koha is built using library ILS standards and uses the OPAC (open public access catalog) interface. In addition, Koha has no vendor-lock in, so libraries can receive tech support from any party they choose.

NewGenLib

NewGenLib (New Generation Library) is an Integrated Library Automation and Networking Solution Developed by Verus Solutions Pvt Ltd and The Kesavan Institute of Information and Knowledge Management, India. In March 2005, NewGenLib version 1.0 was released and versions 2.0 and 2.1 have come up later. On 9th January 2008, NewGenLib has been declared Open Source Software under GNU GPL Licence by the Verus Solutions Pvt Ltd, Hyderabad, India.

Evergreen

Evergreen ILS is another option when researching open source ILS options. Developed by Equinox Software, Evergreen is a robust, enterprise level ILS solution developed to be capable of supporting the workload of large libraries in a fault-tolerant system. It too is standards compliant and uses the OPAC interface, and offers many features including flexible administration, work-flow customization, adaptable programming interfaces, and because its open source, cannot be locked away and can benefit from any community contributions.

e-Granthalaya

e-Granthalaya is a Library Management Software developed by National Informatics Centre, Ministry of Electronics and Information Technology, Government of India. e-Granthalaya is useful for automation of in-house activities of libraries and to provide various online member services. The software provides built-in Web OPAC interface to publish the library catalog over Internet. The software is UNICODE Compliant thus, supports data entry in local languages. Latest version of e-Granthalaya i.e. Ver.4.0 is a 'Cloud Ready Application' and provides a Web-based data entry solution in enterprise mode with a centralized database for cluster of libraries.

Digital Library
Greenstone Digital Library Software

The Greenstone digital library software is an open-source system for the construction and presentation of information collections. It builds collections with effective full-text searching and metadata-based browsing facilities that are attractive and easy to use. Moreover, they are easily maintained and can be augmented and rebuilt entirely automatically. The system is extensible: software "plugins" accommodate different document and metadata types. The aim of the Greenstone software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries.

DSpace

Dspace is a groundbreaking digital institutional repository that captures, stores, indexes, preserves, and redistributes the intellectual output of a university's research faculty in digital formats. It manages and distributes digital items, made up of digital files and allows for the creation, indexing, and searching of associated metadata to locate and retrieve the items. DSpace design and developed by Massachusetts Institute of Technology (MIT) Libraries and Hewlett-Packard (HP). DSpace was designed as an open source application that institutions and organizations could run with relatively few resources. It is to support the long-term preservation of the digital material stored in the repository. It is also designed to make submission easy. DSpace supports submission, management, and access of digital content.

EPrints

Eprints is an open source software package for building open access repositories that are compliant with the Open Archives Initiative Protocol for Metadata Harvesting. It shares many of the features commonly seen in Document Management systems, but is primarily used for institutional repositories and scientific journals. EPrints has been developed at the University of Southampton School of Electronics and Computer Science and released under a GPL license.

Fedora

Fedora open source software gives organizations a flexible service-oriented architecture for managing and delivering their digital content. At its core is a powerful digital object model that supports multiple views of each digital object and the relationships among digital objects. Digital objects can encapsulate locallymanaged content or make reference to remote content. Dynamic views are possible by associating web services with objects. Digital objects exist within a repository architecture that supports a variety of management functions. All functions of Fedora, both at the object and repository level, are exposed as web services. These functions can be protected with fine-grained access control policies. This unique combination of features makes Fedora an attractive solution in a variety of domains. Some examples of applications that are built upon Fedora include library collections management, multimedia authoring systems, archival repositories, institutional repositories, and digital libraries for education.

Web Publishing:

Wordpress

Wordpress started out as a quick, free, open-source solution blogging solution just a few years ago; today it is a perfect alternative to building a web site from scratch. In addition to being free to use (and easy to install), the Wordpress community has exploded, with thousands of users and programmers creating custom themes and plug-ins to completely change the way the software looks and operates. The most important aspect of the software is it's easy-touse interface and content management system. With it's visual rich editor, anyone can publish text and photos to the web site. Other options include multiple authors (with separate log-ins), built in RSS (Real Simple Syndication) technology to keep subscribers updated, and a comment system that allows readers to interact with the sites content. A fantastic way to communicate with patrons, staff, etc.

Drupal

Drupal is another open source web publishing option that allows an individual or a community of users to easily publish, manage and organize a wide variety of content on a website. Tens of thousands of people and organizations have used Drupal to power scores of different web sites, including Community web portals, Discussion sites, Corporate web sites, Intranet applications, Personal web sites or blogs, E-commerce applications, Resource directories, Social Networking sites.

Other Computer Programs:

Ubuntu

Ubuntu the most popular player in the Linux based operating system game. (Linux is the open-source answer to Microsoft's Windows operating system; Ubuntu is a modification of Linux). Ubuntu is a perfect solution for libraries who need to upgrade their older computers using outdated Windows or for bulk computer purchases requiring a new operating system. Many libraries feature computers for users to gain access to the internet, and that being the only function those computers serve. Why pay for all the unwanted things on Windows when you just need to get online? You might be a little scared at first of a new operating system, but just like anything else, the hardest part is getting started. Plus, there's plenty of Ubuntu installations help out there to give you a hand.

Open Office

OpenOffice.org is a multiplatform and multilingual office productivity suite and an open-source project. Compatible with all other major office suites, the product is free to download, use, and distribute. It includes the key desktop applications, such as a word processor, spreadsheet, presentation manager, and drawing program, with a user interface and feature set similar to other office suites. Sophisticated and flexible, OpenOffice.org also works transparently with a variety of file formats, including those of Microsoft Office, and the vendor-neutral OpenDocument standard from OASIS.

Firefox

Firefox is the Mozzila organizations answer to Microsoft's Internet Explorer web browser, and has taken the web by storm over the past few years as the biggest competitor to IE in quite some time. Firefox offers a much more secure browsing experience compared to IE (mostly because the majority if the population uses IE and that's who the bad guys are targeting). The biggest draw, however, is the modifications that can be made to Firefox through its many plug-ins, which can make using the net more constructive. Firefox runs on various versions of Microsoft Windows, Mac OS X and Linux.

PDF Creator

The PDF (portable document format) file is an industry standard format that everybody uses everyday. The purpose of creating a PDF file is usually to provide an important document for display that cannot be modified by the reader (unless permission is given). Many programs exist that will enable you to create your own PDF files, but they require you to spend money, which is not in our budget. Instead, we're going to use the open-source PDF creator to take our Open Office files and convert them into professional PDF documents.

Selection criteria of open source software

Evaluation of open source software is different from proprietary programs. A key difference for evaluation is that the information available for open source programs is usually different than for proprietary programs; source code, analysis by others of the program design, discussion between users and developers on how well it is working, and so on. Often proprietary programs always hide all information from users and only allow running the software. Following criteria's can be adopted for open source software selection:

Open Source Software's on the WWW

Most convenient option to identify particular software for your library need is to ask professional friends who have experience in using open source software's. You can directly contact other libraries in your locality or post a message in any popular email discussion forum of librarians. Certain open source software's are highly popular among librarians community, for example Greenstone digital library software is a favourite candidate for the libraries who make use it for the collection and organization of digital materials. Librarians can select the software without much effort,

if more popular software's are available for various library purposes. Websites which provide detailed listing of open source software are:

- Free Software Foundations software directory (www.fsf.org)
- UNESCO Free & Open Source Software Portal (www.unesco.org)
- Source Forge (http://sourceforge.net/)

Open source licenses

Open source licenses are assure users freedom to use, copy, improve and distribution of software. GPL is the most popular license for free and open source software and provides feasible terms of use. Using GPL license, a user can modify the software without the permission of its creator. At the same time BSD license impose certain restrictions on modification of software without the permission of its developer. If you have decided to choose the software with non General Public License, check the license if it contains any un-acceptable clauses.

Conclusion:

So, it seems that there are some very powerful solutions available today that could be used to create a much more resourceful library. By using open source software in the library, money that otherwise would be spent on software solutions can be used for other important resources, such as purchasing additional media resources (books, journals, etc.), or can be used to hire educated, technical support that provides patrons with the know how to better use already existing resources. In addition, this free software is constantly being updated, changed, and customized to meet the library's needs. While all of this is fine and dandy, and sounds like the win-win solution for your library, there are still pitfalls and hurdles we'll need to overcome. Hopefully this article provides some introductory information as to how to wean your library off of traditional computing products and dive into the pool of open source resources available today.

References:

1) ***http://eprints.rclis.org/13172/1/Open_Source_Software_and_Libraries.pdf***
2) ***file:///C:/Users/KESCDCC2/Downloads/Open_Source_Software_for_Library_Services.pdf***
3) ***http://egranthalaya.nic.in/***
4) ***http://paperity.org/p/75310605/open-source-software-for-library-services***
5) ***https://opensource.com/education/14/4/top-5-open-source-tools-libraries***

शेतक-यांच्या आत्महत्या ःएक समस्या

प्रा . सुकुमार दत्ता पाटील □अर्थशास्त्र विभाग □डॉ . सी . डी . देशमुख वाणिज्य व सौ . के . जी . ताम्हाणे कला महाविद्यालय रोहा रायगड फोनः **7276573589**

प्रस्तावनाः

आज भारतीय शेती आणि येथील शेतकरी हा भारतीय अर्थव्यवस्थेच्या पाठीचा कणा आहे असे असले तरी आपल्या देशात दर तीन तासास एक शेतकरी आत्महत्या करीत आहे . भारतातील **40%** शेतकरी अशा स्थितीत येऊन पोहोचले आहेत की जर त्यांना वेगळा व्यवसाय उपलब्ध झाला तर ते एका पायावर शेती व्यवसाय सोडून द्यायला तयार आहेत . त्यामुळे आज आपल्या देशातील शेतक-यांच्या वाढत्या आत्महत्या हा गंभीर प्रश्न बनला आहे आणि त्याकडे विशेष लक्ष देणे गरजेचे आहे . भारतीय शेतक-यांच्या आत्महत्या या भारतात जवळजवळ प्रत्येक राज्यात आज होताना दिसत आहेत . त्यामुळे या प्रश्नाचा आज गांभीर्याने विचार होणे गरजेचे आहे . भारतीय शेतीचे अर्थव्यवस्थेत असणारे महत्व आणि राष्ट्रीय उत्पन्नात शेतीचा असणारा वाटा लक्षात घेतल्यानंतर शेतक-यांच्या आत्महत्या हा विषय फारच गंभीर असल्याचे दिसून येते . त्यामुळे शेतक-यांच्या आत्महत्या थांबल्या पाहिजेत आणि शेतक-याला व शेतीला चांगले दिवस आले पाहिजेत .

अभ्यासाचे महत्व ः

इंग्रज सरकारच्या राजवटीत भारतीय शेतीची म्हणावी तेवढी प्रगती झाली नाही ; कारण त्यांच्या काळात शेतीवर कराचे प्रचंड ओझे होते . परिणामी शेतक-यांनीही शेती व्यवसायात फारसा उत्साह दाखवला नाही . परिणामी भारतीय शेती विकसीत झाली नाही . तसेच तिचे दरहेक्टरी उत्पादनही वाढले नाही . मात्र देशाला स्वातंत्र्य मिळाल्यानंतर भारत सरकारने नियोजनाच्या माध्यमातून देशाचा विकास करण्याचे ठरविले . **1951** साली पहिली पंचवार्षिक योजना सुरू केली आणि या योजनेत शेती विकासावर विशेष भर देण्यात आला . त्यामूळे **1951** ते **1956** या काळात शेती व्यवसायाचा चांगला विकास झाला . परंतू त्यानंतरच्या योजनांमध्ये मात्र औद्योगिक विकास व व्यापार विकास यावर भर देण्यात आला . आणि शेती क्षेत्राच्या विकासावर कमी आर्थिक तरतूद करण्यात आली . तसेच शेती क्षेत्रातील सरकारची गुंतवणूकही कमी होत गेली . त्यामुळे शेती व्यवसाय तोटयात जाऊ लागला . तसेच शेत्रक-यांची अवस्थाही कठीण होत गेली यातून शेतक-यांच्या आत्महत्या सुरू झाल्या आणि ही बाब भारतीय शेती आणि तिचा विकास व ग्रामीण विकास यामध्ये बाधा निर्माण करणारी ठरली . त्यामुळे 'शेतकरी जगला तरच देश जगेल'या उक्तीनुसार शेतक-यांच्या आत्महत्या या समस्येकडे दुर्लक्ष करून चालण्यासारखे नाही . आज भारतात शेती व्यवसायावर आधारित अनेक प्रकिया उद्योग जसे साखर उद्योग ,ताग उद्योग , सुती कापड उद्योग, फळ प्रकिया उद्योग असे उद्योग उदयाला आले आहेत . त्यामूळे औद्योगिक क्षेत्राचा विकास आणि तेथे रोजगाराच्या संधीही वाढत गेल्या . अशास्थितीत भारतातील शेतक-यांच्या आत्महत्या हा प्रश्न अतिशय गंभीर आहे . त्यादृष्टीने हा विषय अतिशय महत्वाचा वाटतो .

अभ्यासाची उद्दिष्टे

1 . शेतक-यांच्या आत्महत्यांचा अभ्यास करणे .

2 . शेतक-यांच्या आत्महत्येसाठी जबाबदार कारणांचा शोध घेणे .

3 . शेतक-यांच्या आत्महत्या रोखण्यासाठी उपाययोजना सुचविणे .

अभ्यास पद्धती

सदरचा अभ्यास हा शेतक-यांच्या आत्महत्यांच्या संदर्भात असून सदरील अभ्यासासाठी दुय्यम साधन सामग्रीचा वापर करण्यात आला आहे . यात भारताचे आर्थिक सर्वेक्षण , नॅशनल क्राईम रेकॉर्ड ब्युरो , शेतकरी मासिक ,तज्ञांची पुस्तके इ . चा आधार घेण्यात आला .

सांख्यिकिय विश्लेषण

भारतात **1995** ते **2015** या काळात नॅशनल क्राईम रेकॉर्ड ब्यूरोच्या अहवालानुसार **3,22,028** शेतक-यांनी आत्महत्या केलेल्या आहेत . त्यात महाराष्ट्र, कर्नाटक ,आंध्रप्रदेश , मध्यप्रदेश आणि छत्तीसगड या मोठया राज्यातील शेतकरी आत्महत्यांचे प्रमाण अधिक आहे . आणि ही बाब अतिशय भयानक आहे हे आपणास खालीलआकडेवारीवरून लक्षात येते .

वर्ष	आत्महत्या केलेले शेतकरी
1995	**10720**
1996	**13729**
1997	**13322**
1998	**16015**
1999	**16082**
2000	**16603**
2001	**16415**
2002	**17971**
2003	**17164**
2004	**18241**
2005	**17131**

वर्ष	आत्महत्या केलेले शेतकरी
2006	**17060**
2007	**16632**
2008	**16796**
2009	**17368**
2010	**15964**
2011	**14027**
2012	**13754**
2013	**11772**
2014	**12360**
2015	**12602**
एकूण	**322028**

वरील तक्त्यामध्ये **1995** ते **2015** या कालावधीतील भारतीय शेतक-यांच्या आत्महत्येची आकडेवारी दिली आहे . या आकडेवारीनुसार **2004** मध्ये भारतातील शेतक-यांच्या तर सर्वात कमी आत्महत्या **1995** साली **10720** इतक्या होत्या . या आत्महत्या रोखण्यासाठी सरकारच्या वतीने विविध प्रयत्न केले जात आहेत . तसेच आत्महत्याग्रस्त शेतक-यांच्या कुटूंबाला मदतही दिली जात आहे . पण असे असले तरी या आत्महत्या काही थांबायला तयार नाहीत .

शेतक-यांच्या आत्महत्या थांबण्यासाठी जुजबी सुधारणांचा आणि उपायांचा समावेश होणार नाही . तर त्यासाठी काही कायम स्वरूपी सुधारणा करणे गरजेचे आहे . राजकारणी , सरकारी अधिकारी आणि समाज यांची मानसिकता बदलणे गरजेचे आहे . या पुढील कोष्टकात महाराष्ट्रातील शेतक-यांच्या आत्महत्यांचे प्रमाण दर्शविले आहे .

वर्ष	शेतकरी आत्महत्या	% वाढ / घट
2001	**3536**	**-**
2002	**3695**	**4 . 30**
2003	**3836**	**3 . 67**
2004	**4147**	**7 . 49**
2005	**3926**	**-5 . 62**
2006	**4453**	**11 . 83**
2007	**4238**	**-5 . 07**
वर्ष	शेतकरी आत्महत्या	% वाढ / घट
2008	**3802**	**-11 . 46**
2009	**2872**	**-32 . 68**
2010	**3141**	**8 . 56**
2011	**3337**	**5 . 87**
2012	**3786**	**11 . 85**
2013	**3146**	**-20 . 34**
2014	**2568**	**-22 . 50**

महाराष्ट्रातील शेतकरी आत्महत्या **2001** ते **2014**संदर्भ -नॅशनल क्राईम रेकॉर्ड

वरील आकडेवारीवरून एक गोष्ट स्पष्ट होते आणि ती म्हणजे **2001** ते **2014** या काळात महाराष्ट्रात **50483** शेतक-यांनी आत्महत्या केलेल्या आहेत .**2006** साली महाराष्ट्रात सर्वात जास्त म्हणजे **4453** शेतक-यांनी आत्महत्या केल्या तर सर्वात कमी आत्महत्या या **2009** मध्ये **2872** इतक्या झाल्या . असे असले तरी शेतकरी आत्महत्या या दरवर्षी न चुकता होत आहेत .

शेतक-यांच्या आत्महत्येची कारणे

1 . **शेतकरी सामाजिकदृष्टया असुरक्षित** - सरकारी नोकर तसेच खाजगी आस्थापनामध्ये काम करणा-या कर्मचा-याप्रमाणे नियमीत पगार, महागाई भत्ता, घरभाडे ,आजारपणात मदत, पेन्शन ,अपघाताप्रसंगी मदत अशा अनेक सामाजिक सुरक्षितता योजना उपलब्ध आहेत . मात्र शेतक-यांना अशा कोणत्याच सामाजिक सुरक्षितता योजना नाहीत . परिणामी त्याला शेती व्यवसायावरच अवलंबून रहावे लागते . परिणामी शेती व्यवसाय नुकसानीत गेल्यास त्यांना आत्महत्येशिवाय पर्याय रहात नाही .

2 . **शेतमालाच्याबाजारभावाचीअनिश्चितता-** डॉ .स्वामीनाथन यांनी शेतक-यांना उत्पादन खर्चावर आधारित भाव द्यावा असे सांगीतले मात्र त्याची अंमलबजावणी आजही होत नाही .भारतीय शेतक-यांवे दुर्दैव म्हणजे उन्हात, वा-यात ,पावसात ,थंडीत काबाडकष्ट करून जो शेतकरी शेतमाल पिकवितो त्या शेतक-याला आपल्या शेतमालाचा भाव ठरविण्याचा अधिकार नाही . तर व्यापारी त्याच्या मालाचा दर ठरवितो जो कधी शेताच्या बांधावर गेला नाही परिणामी हा व्यापारी कमी भाव देऊन स्वत:चा फायदा आणि शेतक-यांची मात्र पिळवणुक होते .

3 . **नैसर्गिक आपत्ती-** भारतीय शेती ही पावसावरील जुगार मानली जाते .कारण जेव्हा वेळेवर आणि योग्य पाऊस पडतो तेव्हा शेती चांगली पिकते . मात्र जेव्हा दुष्काळ पडतो तेव्हा शेती पिकत नाही . कधी दुष्काळाने शेतीचे नुकसान होते तर कधी अतिपावसाने शेतीचे नुकसान होते आणि शेतकरी आत्महत्या करतात .

4 . **कर्जपुरवठयाचा अभाव** -ग्रामीण भागात कर्जासाठी सावकाराचा आधार घ्यावा लागतो . कारण ग्रामीण बॅका आणि राष्ट्रीयकृत बॅका ग्रामीण भागात उपलब्ध नसल्याने शेतक-यांना कर्जासाठी सावकाराकडे जावे लागते . पण सावकाराचे व्याजदर जास्त असल्याने शेतक-यांची पिळवणूक होते आणि शेतकरी आत्महत्या करतात .

5 . **सवलतींचा व धोरणांचा लाभ-**सवलतींचा व धोरणांचा लाभगरीब शेतक-यांपर्यंत पोहचत नाही .मोठे शेतकरी राजकारणी आणि सरकारी अधिकारी यांच्या अभद्र युतीमुळे श्रीमंत शेतकरीच या सरकारी सवलतींचा लाभ घेतात आणि गरीब शेतक-यांना आत्महत्या करण्यावाचून पर्याय राहात नाही

6 . **निर्यात धोरण-** जेव्हा शेतमालाची आवक कमी होते तेव्हा घाऊक बाजारात भाववाढ झाल्यावर शेतमालाचे निर्यात मुल्य वाढविले जाते व निर्यात थांबविली जाते .परिणामी शेतक-यांचे नुकसान होते .कांद्याचा घाऊक बाजारात भाव वाढल्यावरोबर कांद्याचे निर्यात मुल्य हे **250** यू .एस .डॉलर वरून **700** यू .एस .डॉलर प्रती टन इतके सरकारने

वाढविले . निर्यात मुल्य भरणे कठीण झाल्याने निर्यात ठप्प होऊन मिळेल त्या भावाने शेतक-याला आपला कांदा विकावा लागला .

7 . **कौटूंबिक समस्या** -आज गरीब शेतक-यांना अनेक कौटूंबिक समस्यांना तोंड द्यावे लागते त्यामध्ये सततची नापिकी, कमी भाव, मुलामुलींचे उच्च शिक्षण मुलीचे लग्न अशा एक ना अनेक समस्यांना शेतकरी तोंड देत आहे . त्यामुळे शेतकरी निराश होऊन आत्महत्या करतात .

निष्कर्षः

शेतक-याच्या आत्महत्येला वरील सर्व कारणे जबाबदार आहेत . मित्रहो या देशात एखादा व्यापारी, एखादा कारखानदार,एखादा उद्योजक यांनी आत्महत्या केली आहे असे क्वचितच आढळेल . पण या सर्वांना मोठा करणारा, कोटयावधी जनतेचा पोशिंदा जो शेतकरी तो मात्र आता मोठया संख्येने आत्महत्या करीत असल्याचे दिसते आहे . आणि ही गोष्ट कृषीप्रधान भारताला निश्चितच भूषणावह नाही . त्यामुळे हे कोठेतरी थांबलेच पाहिजे आणि शेतक-यांना चांगले दिवस आलेच पाहिजेत . यासाठी काही उपाययोजना होणे आवश्यक आहेत त्या पुढीलप्रमाणे

1 . डॉ . स्वामीनाथन आयोगाप्रमाणे शेतमालास उत्पादनखर्च व 50% नफा गृहित धरून हमीभाव देणे अत्यंत गरजेचे आहे .

2 . सरकारी धोरणे किंवा सवलती जाहिर केल्या जातात त्यांची अंमलबजावणी वेळेवर करणे व यावर नियंत्रण ठेवणे

3 . देशात कृषी विद्यापीठे आणि कृषी महाविद्यालये यांची संख्या वाढविणे आवश्यक आहे .

4 . शेतक-यांचे समुपदेशन करणे .

5 . सामाजिक सुरक्षितता योजना शेतक-यांनाही चालू करणे .

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SEAWATER DESALINATION: TECHNOLOGY AND ENVIRONMENTAL ASPECTS IN UTILIZING RENEWABLE ENERGY

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Introduction

Water is an essential and inevitable component of life on earth. Besides life processes, water plays a pivotal role in socio-economic development and environmental sustainability. However, water, especially potable fresh water, is a limited and finite resource that is depleting due to increasing population, changing lifestyle pattern, water pollution, inefficient use of water and climatic changes (1).

Shortage of potable water will be a major crisis in decades to come. There are some highly alarming geographical regions where a shortage of fresh water is going to impart a major influence on the socio-economic structure of the population (1).

Unfortunately, the supply of freshwater cannot be increased by conventional technologies or it cannot be made available through any recycling process. However, the huge reservoir of saline seawater and brackish water can be utilized to generate salt-free freshwater. This technique is practiced since ancient times but is limited due to several technical demerits and shortcomings (2).

The major constraints in using desalination in a wide manner were technological limitations, high capital and unit cost and above all requirement of enormous expenditure of energy resources. Energy resources based on fossil fuels are becoming scarce with time and thus highly expensive to run desalination plants (2).

However, a tremendous advance in science and technology in past three decades has reduced the capital cost of establishing a desalination plant and enabled the use of renewable energy sources to meet up the energy requirement of the desalination project. This review describes the use of renewable energy sources in desalination procedure and discusses the economic and environmental impact of the same.

Coupling of Renewable energy to desalting technologies

It is estimated that 97% of the water available on earth is saline and less than 1% of freshwater is accessible to human. In addition, there will be a predictable rise in human population, especially in African and Asian countries making 40% of world population struggling with the freshwater shortage. In such situation, desalination of brackish water is the only solution that can be opted (3).

However, existing technology for desalination requires the burning of a substantial amount of fossil fuel which is unacceptable with our present understanding of the harmful effect of elevated CO_2 level in atmosphere and greenhouse effect. For example, present estimation shows that a production of 13 million m3 of potable water per day requires burning of 130 million tons of oil per year (4).

Therefore, a coupling of renewable energy systems (RES) to the production of desalted water may have a positive socio-economic and can contribute significantly towards environmental sustainability. Presently, renewable energy from wind, solar, photovoltaic and geothermal sources are being used in the desalination process.

Different Desalination Technologies

- *Solar still*

The most common method of coupling between the renewable energy source and desalination processes is the use of direct sun rays to produce fresh water by means of solar stills. This technology directly utilizes solar energy coming from the sunshine and produce electricity. In remote villages, this technology acts as the main alternative energy source used for desalination technique without depending on high technology and expertise (5).

However, the main disadvantage of this system is that the installation costs of solar stills tend to be considerably higher than other methods. In addition, the stills are vulnerable to weather damage and they require large areas of land for installation and have a low output (6).

- *PV-driven RO and ED processes*

PV (photovoltaic) –driven reverse osmosis (RO) and electrodialysis (ED) are high-cost technologies that use photovoltaic (PV) devices to generate electricity. The main disadvantages of these technologies are its high cost and, the availability of PV cells.

- *Concentrating solar thermal driven desalination*

In most of the thermal processes, a requirement of energy is huge to create a substantial amount of heat. Use of conventional energy resource is neither cost-effective nor environmentally friendly. Therefore, solar energy is increasingly becoming popular as an energy source in the desalination process. The major challenge is to maintain the continuous supply of energy and to concentrate the solar energy which is generally of very low yield.

- *Wind-driven water desalination*

Use of wind energy is popular energy resource in remote areas or specifically in windy seashores or island area. The process is highly cost-effective. Wind desalination plants are frequently found in Greek and Spanish islands (3).

- *Desalination powered by biomass and geothermal energy*

Use of biomass and geothermal energy is not a very popular method of generating energy is desalination process. Oftentimes, the growth of biomass requires more fresh water than the total yield from the plant. Moreover, organic residues which are required for the growth of biomass is scarce in the arid region (7).

Advantages and Disadvantages of Different Methodologies

The desalination techniques can broadly be divided into two categories. One is membrane-based techniques [eg. Reverse osmosis (RO) and electrodialysis (ED)] and the other is thermal techniques [eg Thermal vapor Compression (TVC)]. Both the categories have their own merits and demerits (8).

Advantages of membrane driven processes over the thermal processes include:

- Less energy requirement
- Lower cost of establishment
- Higher production and higher recovery ratios
- Minimum interruption to the process when maintenance is required
- Operates at ambient temperature, therefore, less vulnerable to corrosion and scaling
- Chances of microbial contamination is less due to membrane barrier

Advantages of thermal processes over membrane-based processes include:

- A proven and established method for ages
- Quality of water produced is very high
- Less monitoring required than membrane-based systems
- Dependence of output on feed water quality (salinity) is less
- No recurring cost for replacing membrane

Environmental impact of Desalination process

The desalination process may impart several environmental concerns during both the input and output steps. The intake of brackish water is achieved by two major methods, either by open intake or through beech wells. In case of open intake, the ocean environment must be away from port areas where a risk of oil spillage is obvious. Overall, a strong monitoring of contamination of seawater should be there during the input to the desalination plant.

In addition, environmental hazards related to the use of chemicals for the purpose of pre-and post-treatment of sea water, membrane cleaning, anti-corrosion and anti-scaling must be taken into consideration (9).

Economics of Desalination Process

A proper implementation of desalination project depends on several factors including cost effectivity. The following factors are taken into consideration when deciding the economics of a desalination project:

1. Quality of feed water: Its salinity, impurity should be minimized to reduce the pre-treatment cost of energy.
2. The total area of the plant: To accommodate treatment units, pumping, water storage tank, and water distribution system.
3. Location of the site: Geographical location can influence the cost depending on availability of land and other socio-economic factors.

Conclusion and Future Prospect

Keeping in mind the issue of environmental sustainability, the effort to employ renewable energy sources in desalination process has been intensified in recent times. The future efforts are directed towards integrating the photovoltaic cell based energy source to membrane-based desalination processes. However, more research and studies are warranted to understand the environmental and socio-economic impact of using renewable energy source in desalination plants.

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PHARMACOGNOSTICAUTHENTIFCATION OF GENUINE CRUDE DRUG OF ECHINOPS ECHINATUS (ROXB.)

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Abstract
Traditional medicines which are in used are mainly extracted from the medicinal plants. The medicinal plants which are directly taken as the medicines include herbs and shrubs. In this study we are aim to focus on the pharmacognostic characteristics of the Echinops echinatus, which can be used to prepare contraception. It is a xerophytic herbaceous plant commonly known as the Brahmadandika, used for sexual debility. In the recent past several attempt to have been made to study the contraceptive nature of plants and their products on scientific footing in males. Generally the crude drugs are adulterated with sub-standard material which have direct effect on efficiency of crude drugs of the animal system there is urgent need for evaluation and authentication of crude drugs by comparing with genuine crude drugs.
Keywords: *Echinops, Crude Drugs, Pharmacognosy*

Introduction:

The medicines and drugs obtained from the plants and other natural sources are counted into the Pharmacognosy (Orhan, 2014).Knowledge of medicinal plants and treatment of diseases are known since the existence of human beings (Shakya, 2016).The traditional medicines and diagnosis are the basis of modern medicines (Wachtel-Galor and Benzie, 2011).The thorough scientific studies and step by step gradual development in the traditional medicines leads to the establishment of the field of allopathy (Patwardhan et al., 2004). Hence most of the prescriptions of the modern medicines are the products which are derived from the higher ethnobotanical plants (Panet. *et. al.,* 2013).Except very few of all medicinal herbs of commercial important are collected or cultivated in this country. Medicinal herbs have been of use of thousands of years in one or another under the indigenous system of medicine like Ayurveda, Siddha and Unani (Pan *et. al*., 2014). Herbal medicine has used since the dawn the civilization to maintain health and diagnosis of diseases (Eddouks *et al*., 2012).

Man's great reproductive potential and immensely increased survival in recent years have posed a major riddle of population growth. Population expansion at an alarming rate and creating immense pressure on the population systematic. The consequences of this continued unchecked population growth could be devastating (Singh and Singh, 1970).For the limitation of exploding populating hormones, chemical and surgical methods were developed but most of these can lead to unacceptable side effects. This methods do not meet many and varied requirements for the user, particularly in the cultured and religious diverse population. Awareness and development of cheap, easily available methods of contraception is the major need of developing countries due to the alarming increasing populations (Kapur *et. al*., 1984).Hence, the search of medicinal plants that could be useful for the formulations of contraceptives or contraceptive pills is the most after approach (Jain *et. al*., 2015).In the recent past several attempt to have been made to study the contraceptive nature of plants and their products on a scientific footing in males (Adewale *et. al*., 2014). Some of the plants with its anti-fertility activities have been discussed such as *Embelia ribes* (Lal and Mishra, 2013), *Momordica*

charantia (Adewale *et al*., 2014), *Hibiscus rosa-sinensis* (Singh *et al*., 1982), *Curcuma longa*, *Mentha arvensis* (Gupta, 1994), *Gossypium* sps. (Hsueh *et. al.*, 1979), *Abrus precatorius*, *Azadirachta indica* (Umadevi *et. al*., 2013), *Solanum xanthocarpum* (Dixit and Gupta, 1982), *Carica papaya* (Krishna *et. al*., 2008), etc.

Materials and Methods:

The plant material is collected from premises of Swami Ramanand Teerth Marathwada University (SRTMU), Nanded. The herbarium specimen was prepared and deposited in Botanical Depository of SRTMU. The plant material is authenticated by detailed taxonomic study and by the experts Prof. (Dr.) R.M. Mulani and correct botanical identity is established and authentication number is **SLS/SRTMU/BOT/HERB-98/2017-18** given to the herbarium.

Organoleptic properties:-

The properties and characteristics of crude drugs which are sensed by color variations, taste and odor is to be categorized in macroscopic characterization and powder analysis as mentioned below:

Microscopic characterizations:

The roots were washed and hand cut sections were taken, stained by safranin and light green and mounted on a slide and observed for anatomical details. Stained roots placed on plastic sheets and dried and further investigated for the organoleptic features with the magnifying glass.

Powder analysis:

Color variation is to be observed in the crude powder extract of the *Echinops* root. For this we have chosen 16 different chemical reagents and treated with the crude powder extract and observed under different light sources such as visible light, UV light of wavelength 365 nm and UV light of 254 nm.

Physical constant determination

Total Ash:

Approx. 2-4 gm of previously ignited and grounded crude powder of *Echinops* were taken and air dried it and transferred to silica crucibles. Further, the material taken in crucible heated with increasing heat up to 450 ^{0}C, till the material becomes whitish. The material after appearance of white coloration transferred to desiccators and weighed again. Ash value is further calculated by Upreti et al., (2013).

$$\text{Ash value} = \frac{\text{Initial weight - final weight}}{\text{Initial weight}} \times 100$$

Acid Insoluble Ash: The total material obtained from desiccation boiled with 25 ml dil. HCl for 5 min and insoluble ash material separated and washed with hot acid water and heated, further allowed it to cool and weighed again. With reference to air dried material ash value of the drug calculated as mentioned below:

As Total Ash = Acid Soluble Ash + Acid Insoluble Ash

So that, Acid Soluble Ash = Total Ash - Acid Insoluble Ash

Results and Discussion

E. echinatus collected from local premises of the Swami Ramanand Teerth Marathwada University and identification of the plant is done by depositing herbarium sheet of the plant to the depository of department of Botany, SRTMU, Nanded and herbarium sheet number of the plant is SLS/SRTMU/BOT/HERB-98/2017-18. Since, civilization of human society, the medicinally important organisms collected traditionally from the natural flora (Strobel and Daisy, 2003). With the growth and establishment of pharmaceutical industries, the consumption of these has increase tremendously in recent years (Dias et al., 2012). As a result, the density and frequency of many species is fast dwindling and those with exceptionally high therapeutic value are on the verge of extinction from natural flora (Duwe et al., 2017).Generally the crude drugs are adulterated with sub-

standard material which has direct effect on efficacy of crude drugs of the animal system so there is urgent need for evaluation and authentification of crude drug by comparing with genuine crude drug. In *E. echinatus* the phytochemical and pharmacological work has been carried out while there is not much work on pharmacognostic details of these drugs.

Macroscopic characters

For macroscopic characterization we have chosen five characters of the plans such as: color, odor, taste, shape and size. We found that that fresh root and dry root of the plant having color difference like fresh root shown light gray while dry root shown light brown coloration. Among five characters the size of the roots also showing difference in the length of the root from the bases i.e. 1-4 cm long while dry root having only 1-2 cm in length (See table 1)

Table 1: Macroscopic characteristics of plant material

Sr. No.	Characters	Fresh root	Dry root
1	Color	Light gray	Light brown
2	Odor	Odorless	No characteristic odor
3	Taste	Tasteless	Tasteless
4	Shape	Oblique crooked	Oblique crooked
5	Size	1 -4 cm at the base & about 0.5 cm at the end.	1-2 cm at the base and 0.5 cm at the end.

Microscopic characters

The roots are growing obliquely in the soil which is about 20 cm long, light to dark color outside and white color inside. The outer surface shows the continuous secondary and tertiary peridermal tissues, the rootlet is less. Internally young root shows isodimetric non lignified cells which are radially arranged. Inside there is cortical cells which increases phloem cells in the ring internally there is large amount of secondary xylem with large vessels containing medullary rays which are transversely present. The roots are also increase starch grains (See Figure 1-4).

T.S. stem

Transverse section of stem is mainly circular single layered epidermis inside which there is ring of vascular bundles having phloem towards outer side and xylem towards inner side, protoxylem facing towards the centre. The pith is in the centre, so vascular bundle is conjoint collateral open as there is intrafascicular cambium present in each vascular bundle, the stele is eustele (Fig. 2).

T.S. of leaf

Leaf is dorsiventral has distinct mesophyll differentiated into upper and lower palisade and lower spongy tissue covered with upper and lower epidermis. The palisade layer made-up of 2 to 3 elongated cells. In the midrib there is collenchymatous hypodermis, while the vascular bundles are in the centre of the midrib (Fig. 3).

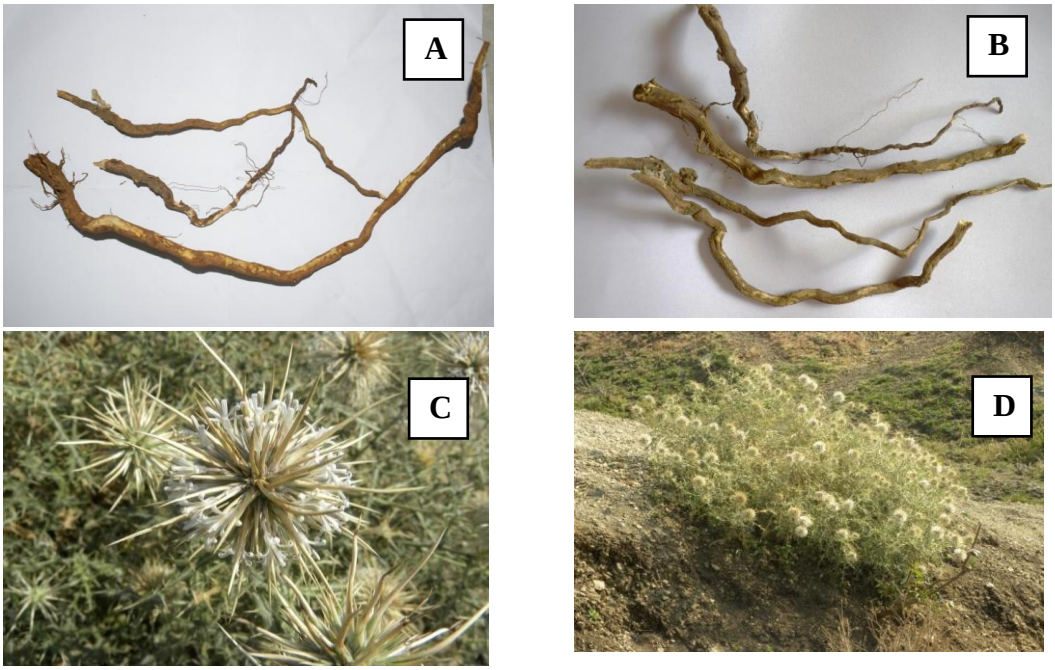


Fig. 1 A, B Habit; C- Fresh roots of *Echinops* D- Dried roots of *Echinops* plant in the Campus of Swami Ramanand Teerth Marathwada University, Nanded.

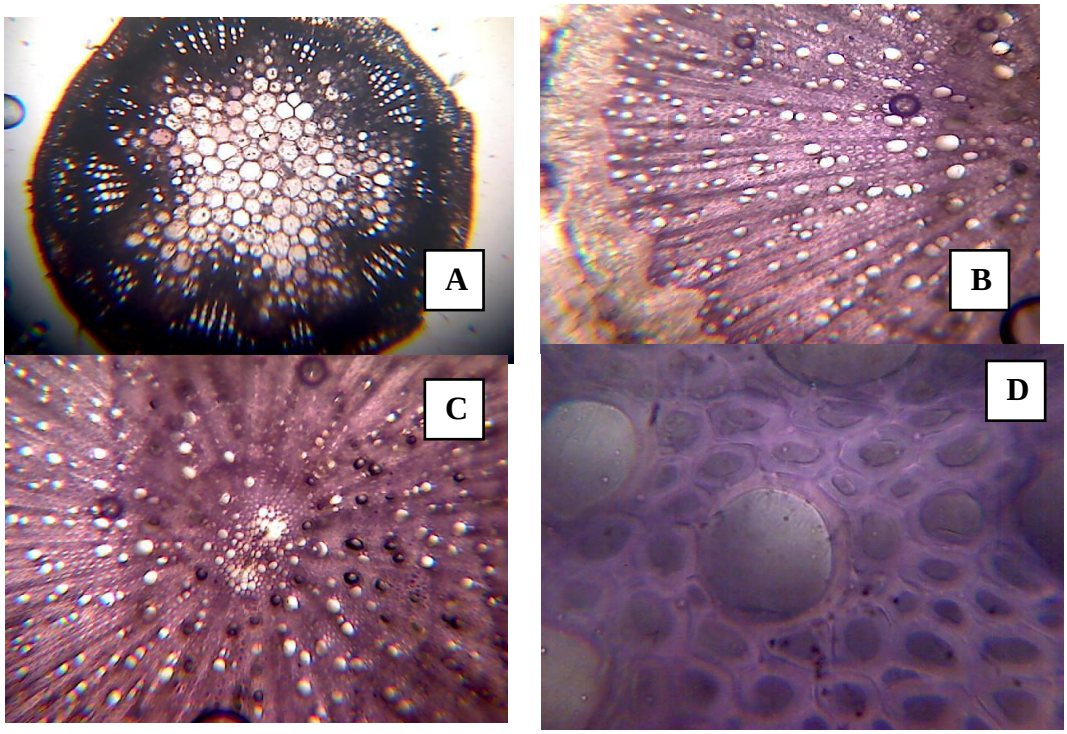


Fig. 2 T.S. of stem and Peridermal cortex of root; A-T.S. of stem; B -T.S. of root showing cortex and the secondary xylem; C-T.S. of root showing protoxylem towards the centre;
D- T.S. of root showing xylem vessels surrounded by xylem parenchyma, while sclerenchymatous tissue present around the vessels.

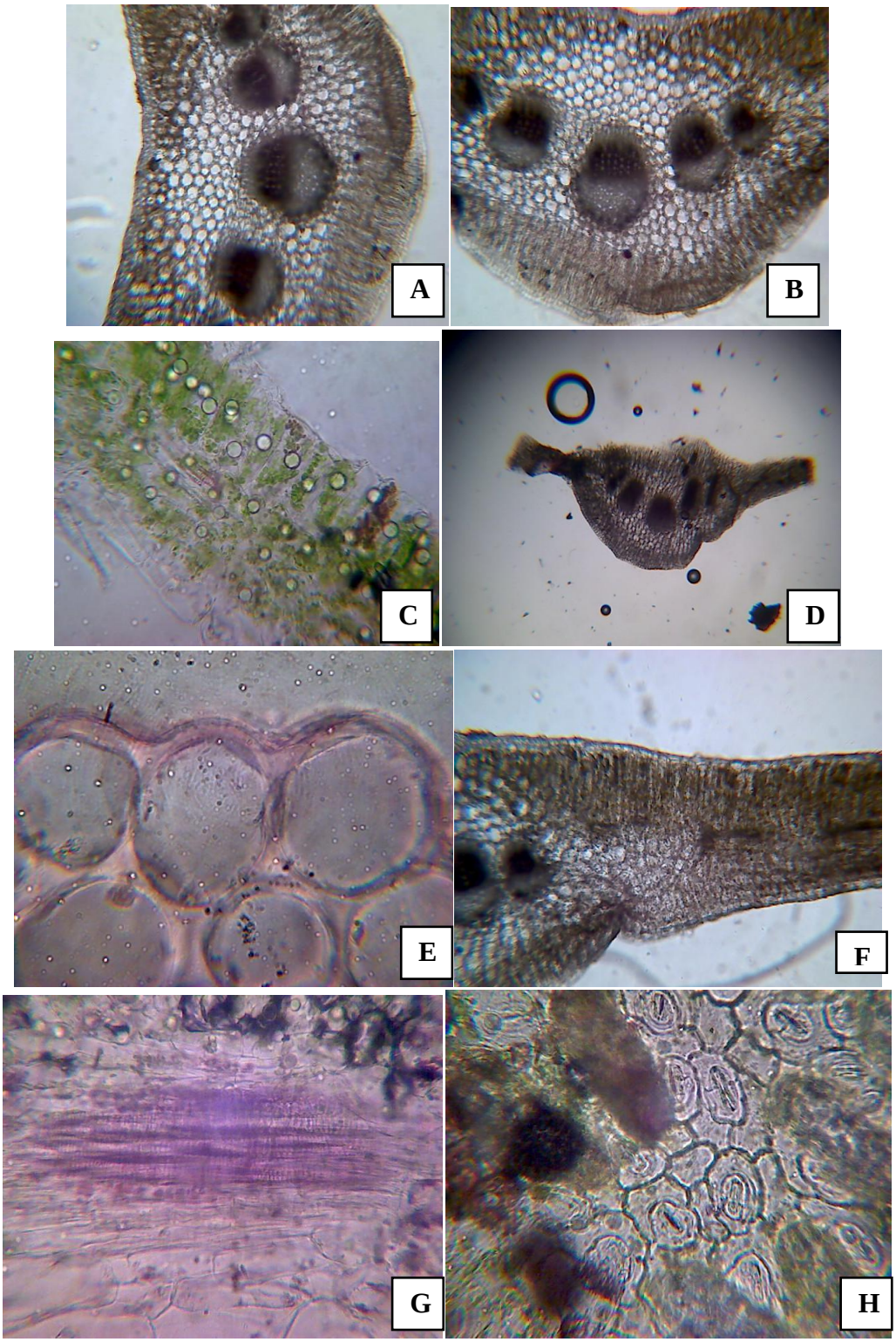


Fig. 3 A, B, D & E-midrib portion of leaf, C-mesophyll tissue, F- Epidermis with thick cuticle and intercellular spaces also thickened with deposition of lignin;
G-fibers T.S of vascular bundle H- stomata are parasitic

Fluorescence characteristics and Powder analysis

For the powder analysis we have taken 16 reagents and tested against crude powder of *Echinops*, (roots) and visualized against different light sources such as visible, UV 254 nm and UV 365 nm.

Crude powder extract as such also has color variation such as it has shown light green in visible light and UV 356 nm whiles in the UV 254 it shown a buff green. In this study we found that the each reagent shows some significant color variation in each of the different light sources. Peculiar difference with the treatment of concentrated nitric acid shown light orange in visible light while in both the UV light it has shown green coloration. With the treatment of picric acid, it has shown color variation in all three light, yellow in visible light, dark purple in UV 254 nm and green in UV 365 nm (See table 2).

Table 2: Powder analysis of crude extract of *Echinops*

Sr. No.	Reagents	Visible/Day Light	UV 254 nm (Short)	UV 365 nm (Long)
1.	Picric acid	Yellow	Dark Purple	Green
2.	Conc. H_2SO_4	Dark brown	Brownish green	Dark green
3.	Conc. HNO_3	Light orange	Green	Green
4.	HCl	Yellowish brown	Chocolate brown	Green
5.	Acetic acid	No Change	Buff green	Buff green
6.	Lactic acid	No Change	Buff green	Buff green
7.	Iodine	Buff green	Dark green	Green
8.	Ferric chloride	Dark green	Black	Blackish green
9.	Sudan III	Red	Bright red	Green
10.	Powder + 1 N NaCl	Light brown	Light brown	Green
11.	Drug + 1 N NaOH (aq)	Blackish green	Yellow green	Yellowish green
12.	Drug + 1 N HNO_3	Buff green	Greenish yellow	Dark green
13.	Powder + Ammonia	Greenish yellow	Blackish green	Green
14.	Powder as such	Light green	Yellowish green	Buff green
15.	1 N NaOH (methanol)	Yellowish green	Yellowish green	Yellowish green
16.	Powder as such	Light green	Buff green	Light green

Physical constant value

Total ash value of the crude extract of the *Echinops* were calculated and it was found that among total ash content (11%), acid insoluble were 2% and acid soluble ash found to be 9% (See Table 3).

Table 3: Physical constant value of crude drugs

Total Ash	11 %
Acid insoluble Ash	2 %
Acid soluble Ash	9 %

Conclusion and Future prospective

In this study we found several pharmacognostic characteristics to identify plants and plant products to avoid its adulterations with sub-standard products. The roots of *E. echinatus* are crusade and with less secondary and tertiary roots. The root is circular in outline with a periderm tissue. The secondary xylem is maximum, medullary rays are multicellular, vessels are oval, rounded and in groups. Powder analysis with different chemical under normal light and under fluorescent light shows characteristic color which is useful for separating it from adulterants.

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PHYSICO-CHEMICAL PARAMETERS ANALYSIS OF WATER QUALITY OF DRINKING WATER SOURCES OF SHIGHRE VILLAGE OF MURUD TEHSIL DISTRICT- RAIGAD, MAHARASHTRA, INDIA

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Abstract

Water is an important component to human survival. Water must be purified for a better life style. It is the fundamental duty of every individual to conserve water resources. The present study attempts to bring an acute awareness among the people about the quality of drinking water by taking water samples from different sources for analysis. The experiment analyses its various Physico-chemical and biological parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity were analyzed in the month of December 2017. The results are compared with standards of WHO. By observing the result it can be concluded that the parameters which were taken to study the water quality are below the pollution level for water which satisfies the requirement for the use of various purposes like domestic, agricultural etc.

Keywords: *Drinking water resources, water quality standard, Physico-chemical Parameter.*

INTRODUCTION:

Water quality plays important role for all living beings. The quality of surface water within a region is governed by both natural processes such as precipitation rate, weathering processes and soil erosion and anthropogenic effects such as urban, industrial and agricultural activities and the human exploitation of water resources [1-5]. Ground water quality has become an important water resources issue due to rapid increase of population, rapid industrialization, unplanned urbanization, flow of pollution from upland to lowland, and too much use of fertilizers, pesticides in agriculture [6]**.** The major problem with the ground water is that once contaminated, it is difficult to restore its quality. Hence there is a need and concern for the protection and management of ground water quality. It is well known that no straight forward reasons can be advanced for the deterioration of water quality, as it is dependent on several water quality parameters [7-8]. Ground water quality in the industrial areas is determined by measuring the concentration of some physico-chemical parameters and comparing them with drinking water standards [9].

Budharatna Bhavare, Miguel A. Rodriguez, Anil Kurthe [10] has studied different physic chemical parameter and nutrients in water of Bhatye estuary, Ratnagiri central, West coast of India. Francis Andrade, H.B. Arvinda, and E.T. Puttaiah [11] have studied Manglore coastal water pollution by analysis of physical, chemical parameter. Ramalingam manikannan, Subramanian asokan and A.H.M.S. Ali [12] have studied Seasonal variation of physicochemical properties of the great vedaranyam swamp point calimere wildlife Sanctuary, South east coast of India. Sujata Sen, Dr. Minal Kanti Paul, and Madhab Borah [13] have studied the some physico chemical parameter of pond and river water with reference to correlation study. G.Velsamy, N. Manoharan, S.Ganesan [14] has

studied analysis of physicochemical variations in sea water sample Uppanarestuary, Cuddalore, Tamilnadu (India).

According to Census 2011 information the location code or village code of Shighre village is 554261. Shighre village is located in Murud Tehsil of Raigad district in Maharashtra, India. It is situated 4km away from sub-district headquarter Murud and 54km away from district headquarter Alibag. As per 2009 stats, Shighre village is also a gram panchayat.

The total geographical area of village is 259.22 hectares. Shighre has a total population of 1,847 peoples. There are about 421 houses in Shighre village. Murud is nearest town to Shighre which is approximately 4km away.

The water sample such as Pipe water, bore well water and well water was collected early in the morning between 8.00 am to 10.00 am and was analyzed to compare the differences occurred in Physico-chemical parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Ca-hardness, Magnesium hardness and Salinity.

The research work is carried out, keeping in mind the following objectives.

- To study the chemical composition and water quality parameters of different sources.
- To investigate the possible sources and Cause of pollution in the water if any.
- To study if these effects can be attributed to the change in the chemical composition of the different water sources.

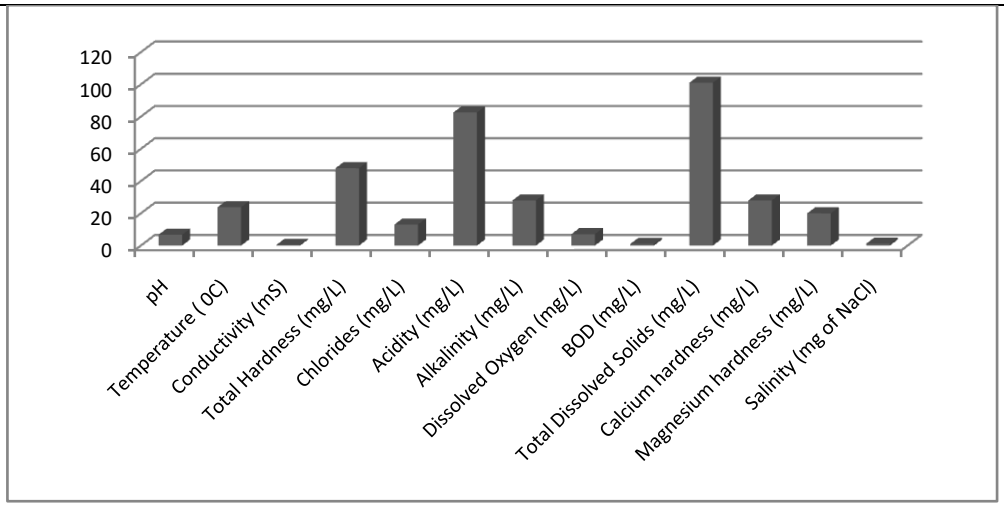
MATERIAL & METHOD:-

Sample of water was collected in sterile plastic bottle of 2 litre capacity from the dam. At the same time the temperature & pH were noted. The physico-chemical analysis was carried out within 24 hours of collection in a laboratory as per APHA (1989), (1992), AWWA & WPFA, Trivedy & Goel (1986) [15-16]. The chemicals were used of A. R. grade and are standardized as per Inorganic quantitative analysis by Vogel (1964) & (2006) [17-18]. The result is statistically analyzed by calculating mean & standard deviation.

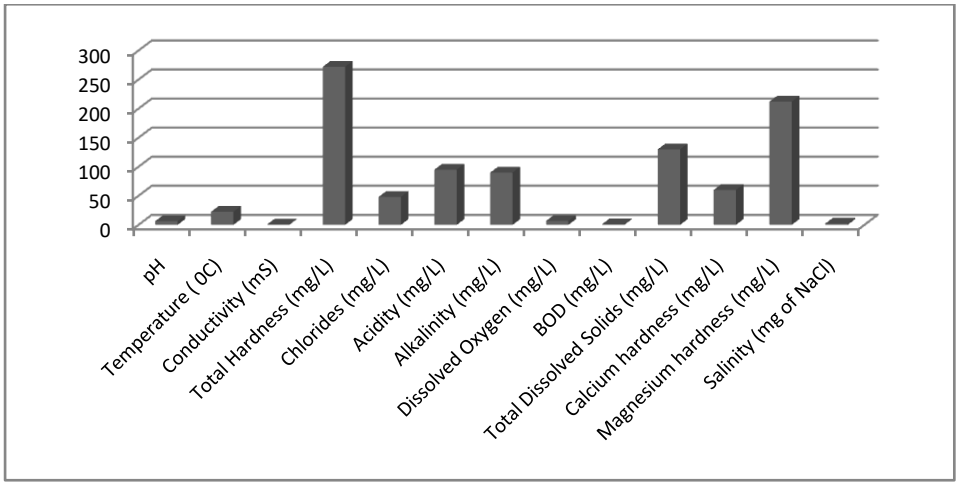
RESULTS & DISCUSSION:-

Parameters	**Tap water Mean+S.D**	**Bore well water Mean+S.D**	**Well water Mean+S.D**
pH	6.73 + 0.02	6.43 + 0.02	6.60 + 0.02
Temperature (^{0}C)	23.8 + 0.3	22.6 + 0.3	24.9 + 0.3
Conductivity (mS)	0.462 + 0.002	0.467 + 0.002	0.894 + 0.002
Total Hardness (mg/L)	48 + 1.0	272 + 1.0	340 + 1.0
Chlorides (mg/L)	13.05 + 0.18	48.15 + 0.18	28.13 + 0.18
Acidity (mg/L)	82.6 + 0.3	95.0 + 0.3	105.3 + 0.3
Alkalinity (mg/L)	28 + 0.3	90 + 0.3	388 + 0.3
Dissolved Oxygen (mg/L)	7.106 + 0.015	6.816 + 0.015	7.276 + 0.015
BOD (mg/L)	1.031 + 0.03	0.973 + 0.03	1.107 + 0.03
Total Dissolved Solids (mg/L)	101 + 1.0	130 + 1.0	235 + 1.0
Calcium hardness (mg/L)	28 + 0.3	60 + 0.3	48 + 0.3
Magnesium hardness (mg/L)	20 + 0.3	212 + 0.3	292 + 0.3
Salinity (mg of NaCl)	1.172 + 0.003	2.162 + 0.003	2.182 + 0.003

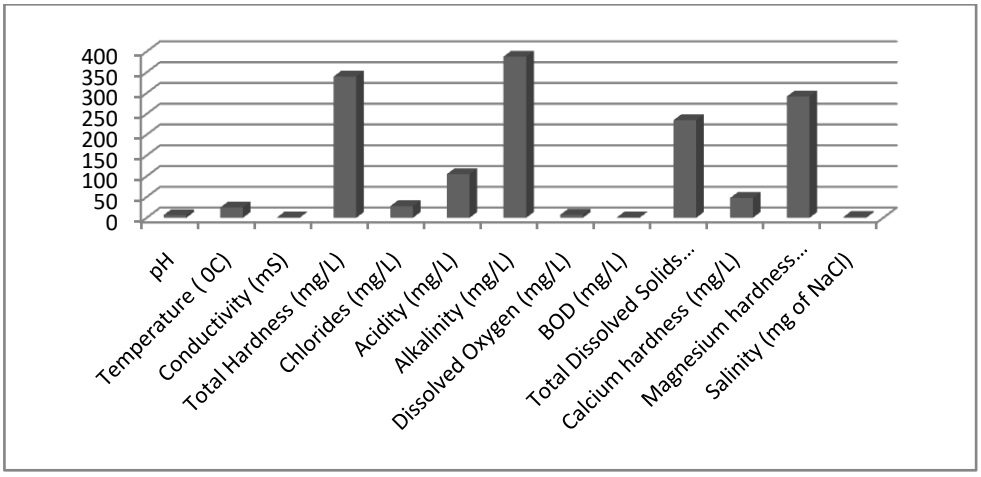
Table-1:- Values of different parameters of water sample of different drinking sources in Shighre village area. (Mean and Standard deviation is calculated)



a. Graph showing concentration range of various parameters of Tap water.



b. Graph showing concentration range of various parameters of bore well water.



c. Graph showing concentration range of various parameters of well water.

1. Temperature:

Temperature is the most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimize temperature change. The Water temperature depends on the depth of the water column, climatic and topographic changes [19].

A rise in temperature of water leads to the speeding up of chemical reactions in water, reduces the solubility of gases and amplifies the tastes and odour. At higher temperature with less

dissolved gases the water becomes tasteless and even does not quench the thirst and decreases the solubility of oxygen.

Temperature also determines various other factors such as pH, Conductivity, saturation level of gases and various forms of alkalinity. The temperature of Tap water is 23.8+0.3 ^{0}C, bore well water temperature is 22.6+0.3 ^{0}C and temperature of well water is found to be 24.9+0.3 ^{0}C.

2. pH:

pH, one of the most common analyses in soil and water testing, is the standard measure of how acidic or alkaline a solution is. pH has no direct adverse effect on health. pH governs the distribution, transport and fate of heavy metals in aquatic ecosystem. It is measured a scale from 0 - 14. pH of 7 is neutral, pH is less than 7 is acidic and pH greater than 7 is basic. Aquatic organisms need the pH of their water body to be a certain range optimal growth and survival.

The pH of Tap water is 6.73 + 0.02, bore well water pH is 6.43 + 0.02 and pH of well water is found to be 6.60 + 0.02. Amongst these three samples, water is comparatively acidic in nature.

3. Electrical Conductance:

Conductivity is the measure of a substance or solution to conduct electric current. Presence of salts and contamination with wastewater increases conductivity of water. It is a indication of pollution. Electrical conductivity used to quickly estimate the ionic or soluble salt concentration in soils, water supplies, fertilizer solution and chemical solution. It is highly depended upon temperature.

Conductivity however is an important criterion in determining the suitability of water for irrigation. The conductance of Tap water is 0.462 + 0.002 mS, bore well water conductance is 0.467 + 0.002 mS and conductance of well water is found to be 0.894 + 0.002 mS. Amongst these three samples, well water is comparatively high electrical conductance. The observed values of electrical conductance for others are quite low and less electrolyte.

4. Total Hardness:

Total hardness is defined as the sum of calcium and magnesium hardness in mg/L as $CaCO_3$.Total hardness of water an important factor that indicates toxic effect and poisonous elements [20].

There is no adverse effect of hardness on health. Hard water is also not suitable for domestic and irrigation purposes. Total hardness of Tap water is 48 +1.0 mg/L, bore well water is 272 +1.0 mg/L and the well water is 340 +1.0 mg/L.

The degree of hardness of drinking water has been classified in terms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/L, Medium - 60-120 mg/L, Hard - 120-180 mg/L, Very hard - >180 mg/L. The observed values were quiet less than the acceptable limit of 300 mg/L for tap water sample. But for bore well water and well water sample, total hardness values are high and near about less and more than 300 mg/L. It shows that water is very hard.

5. Chlorides:

Chloride is mainly obtained from the dissolution of salts of hydrochloric acid as table salt (NaCl), NaCO2 and added through industrial waste, sewage, sea water etc. Surface water bodies often have low concentration of chlorides as compare to ground water. It has key importance for metabolism activity in human body and other main physiological processes. High chloride concentration damage metallic pipes and structure as well as harms growing plants. According to WHO standards concentration of chloride should not exceed 250 mg/L.

The chloride content of the tap water sample is 13.05 +0.02 mg/L, bore well water is 48.15+0.18 mg/L and Chlorides in well water sample is 28.13 +0.05 mg/L.

6. Acidity: Acidity of water is its capacity to neutralize a strong base and is mostly due to the presence of strong mineral acids, weak acids and the salt of strong acids and weak bases.

Addition of wastewater having acidity producing substances increases the acidity of water. The observed acidity of tap water sample is 82.6+ 0.015 mg/L of $CaCO_3$, bore well water sample is 95.0+ 0.3 mg/L. of $CaCO_3$. While acidity of well water samples is 105.3+ 0.3 mg/L of $CaCO_3$. The value is much less than threshold value i. e. 200 mg/L of $CaCO_3$. This indicates that sample of water are in safe range.

7. Alkalinity:

Alkalinity is a chemical measurement of water's ability to neutralize acid. Alkalinity is also a measure of water buffering capacity or its ability to resist changes in pH upon the addition of acids or bases. Alkalinity of natural water is due to primarily to the presence of weak acid salts, although strong bases may also contribute (i.e. OH^-) in the extreme environment. Bicarbonate represents the major form of alkalinity in natural water, so its source being the partitioning of CO2 from the atmosphere and the weathering of carbonate minerals in rocks and soil. Other salts of weak acids, such as borate, silicates, ammonia, phosphate, and organic bases from natural organic matter may be present in small amounts.

The observed alkalinity of tap water sample is 28 +0.3 mg/L of $CaCO_3$, bore well water sample is 90 + 0.3 mg/L. of $CaCO_3$ while alkalinity of well water sample is 388 + 0.3 mg/L of $CaCO_3$. The observed values of alkalinity of tap water and bore well water are within permissible range i. e. below 200 mg/L of $CaCO_3$. The well water is not in safe range i.e. higher than permissible range of 200 mg/L of $CaCO_3$.

8. Dissolved Oxygen:

The amount of oxygen dissolved in water, such as a lake, river or stream. Dissolved oxygen is the most important indicator of the health of water bodies and its capacity to support a balanced aquatic ecosystem of plants and animals. Warm water released from industrial outlets, flowages or storm sewers can also reduce dissolved oxygen levels. Dissolved oxygen may play a large role in the survival of aquatic life in temperature lakes and reservoirs during summer months. Dissolved oxygen of tap water sample collected is 7.106 + 0.015mg/L, bore well water sample is 6.816 + 0.015mg/L, whereas well water sample is 7.276 + 0.015mg/L . It may be due to high temperature and inorganic reluctance such as hydrogen sulfide, ammonia, nitrites, ferrous ions and other oxidizable substances also tend to decrease dissolved oxygen in water.

9. Biochemical Oxygen Demand (BOD):

Biochemical oxygen measures the amount of oxygen that microorganisms consume while decomposing organic matter, it also measures the chemical oxidation of inorganic matter. BOD is a measure of organic material contamination in water, specified in mg/L. BOD is the amount of dissolved oxygen required for the biochemical decomposition of organic compounds and the oxidation of certain inorganic materials (e.g., iron, sulphites).

The observed value of BOD for tap water is 1.031 + 0.03 mg/L, for bore well water is 0.973 + 0.03 mg/L and for well water sample is 1.107 + 0.03 mg/L which is within the permissible range i. e. 0.75-1.5 mg/L.

10. Total Dissolved Solids (TDS):

Total dissolved solids are the total amount of mobile charged ions, including minerals, salts or metal dissolved in a given volume of water in mg/L. TDS is directly related to the purity of water and the quality of water purification system and affects everything that consumes, lives in, or uses water, whether organic or inorganic, whether for better or for worse. Common inorganic salts that can be found in water include calcium, magnesium, potassium and sodium, which are cations and carbonates, nitrates, bicarbonates, chlorides and sulphates which are anions. They give a particular taste to water at higher concentration and also reduce its palatability.

The total solid present in tap water sample collected is 101 + 1.0 mg/L, for bore well water is 130 + 1.0 mg/L, while that of for well water sample is 235 + 1.0 mg/L which is lower than threshold value of total solid content i.e. 500 mg/L.

11. Calcium hardness:

Calcium is naturally present in water. Calcium is a determinant of water hardness, because it can be found in water as Ca^{2+} ions. As per Indian Standards the calcium content of water should not be more than 75 mg/L. This has been specified in the IS 10500:- Drinking Water –Specifications.

In the study the calcium content in water sample has been found to be for tap water sample is 28 + 0.3 mg/L, for bore well water is 60 + 0.3 mg/L and for well water is 48+0.3 mg/L. Tap water and bore well water possess values calcium hardness which is within the limit as per Specification. The observed values for all water samples are within permissible range of concentration of calcium.

12. Magnesium hardness:

Magnesium is naturally present in water. Magnesium is a determinant of water hardness, because it can be found in water as Mg^{2+} ions. As per ISI the magnesium content of water should not be more than 50 mg/L.

In the study the magnesium content in water sample has been found to be for tap water sample is 20 + 0.3 mg/L, for bore well water is 212 + 0.3 mg/L and for well water is 292 + 0.3 mg/L. Tap water possess value of magnesium hardness which is within the limit as per Specification. The observed values for bore well water and well water shows higher concentration of magnesium.

13. Salinity:-

Salinity which is defined as the total concentration of electrically charged ions in the water. These ions are the four major cations-calcium, magnesium, potassium and sodium, and the four common anions carbonates (CO_3), sulphates (SO_4), chlorides (Cl) and bicarbonates (HCO). Other components of salinity are charged nitrogenous compounds such as nitrates (NO_3), ammonium ions (NH_4) and phosphates (PO_4) **[**21]. In general the salinity of surface waters depends on the drainage area, the nature of its rock, precipitation, human activity in the area and its proximity to marine water [22]. Waters with salinity below 1% are fresh and waters with salinity higher than 1% are brackish/marine [23].

The observed value of salinity for tap water sample is 1.172 + 0.003 mg of NaCl, for bore well water sample is 2.162 + 0.003 mg of NaCl and for well water sample is 2.182 + 0.003 mg of NaCl .

CONCLUSION:

The present paper deals with analysis of water quality in different drinking water resources available in Shighre village region which was carried out by taking certain important parameters like Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity. The data of physico-chemical and biological parameters clearly shows that the drinking water of Shighre village region is within the permissible range as per APHA (1989), (1992), Trivedi and Goel (1986) except few limitations in one or two parameters. Such water is suitable for drinking purpose and can be used for domestic as well as irrigation purpose.

ACKNOWLEDGEMENT:

Authors are thankful to Principal Dr. S. S. Phulari for the encouragement and motivation.

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SURVEY OF DIFFERENT ASPECTS OF GOVERNMENT SCHEMES RELATED TO GIRL CHILD

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Abstract
In any society, females form 50% of the total population for the development of the society. The income of women is also included in the national income and gross domestic production(GDP) of the country. It is imperative that the total population is participant in the development. Hence the importance of the girl child education lies on par with the male child education. Girls are equally as important as boys in the society to maintain the social equilibrium. Few years ago, there was huge reduction in the number of women in comparison to the men. In such a scenario, the role of the government and NGOs becomes all the more important in order to ensure that girls are allowed to be born and flourish in life, since they form the part of developing society. Some initiatives giving incentives to people are launched by the central or state government for flourishing the girl child. Among these includes different schemes related to their progress and development. These schemes are Beti Bachao Beti Padhao, Sukanya Samridhi Yojana, Kishori Shakti Yojna for adolescent girls, Sabla, Mazi Kanya Bhagyashree scheme, etc. This paper tries to study the impact of different aspects of schemes launched by central and state government of India specifically in Mumbai metropolis. The present paper gives survey of a information about the participants in the schemes.
Keywords*: Girl child, government, schemes, metropolis, Gross Domestic Product(GDP).*

Introduction:

In ancient time birth of a girl child was considered as auspicious. As per an Indian proverb, “A home without a daughter is like a body without soul”. The birth of a daughter in the house was compared with the advent of Goddess Laxmi, the Goddess of wealth and Goddess Saraswati, the Goddess of Knowledge and Wisdom.

Women are the most important section of the society and equally participate in the life existence on the earth. However, regular decrease in the sex ratio of female in India because of the crimes against women, it has created the fear of total finish of women. So, it is very necessary to save girl child in order to maintain the ratio of women in India. InIndia mostly male dominated societiesare prevailing.Hence women are considered at the secondary position.Contrary to this, now a days “Save girl child” is a Motto of the day in India. Girls are many times suppressed and they have to pass through variety of risks and therefore it is a needed to help in their upliftment.There has been an increase in crimes against women like rape, illiteracy, gender discrimination, female foeticide and dowry deaths.

The trend of decline in the Child Sex Ratio (CSR), which is defined as number of girls per 1000 of boys between 0-6 years of age, has been unabated since 1961. This decline from 945 in 1991 to 927 in 2001 and further to 918 in 2011 is alarming. The decline in the CSR is a major indicator of women disempowerment. CSR reflects both, pre-birth discrimination manifested through gender biased sex selection, and post birth discrimination against girls suppression. Modern scientific developments and techniques and their easy availability enable sex selective elimination of girls leading to low Child Sex Ratio.Since coordinated and convergent efforts are needed to ensure survival, protection and empowerment of the girl child. Following are some initiatives in the form of different schemes launched by the central or state government relating togirl child to save and flourish them. They are:

1. **Beti Bachao, Beti Padhao** : Beti Bachao, Beti Padhao (BBBP) scheme has been introduced in October, 2014 to address the issue of declining Child Sex Ratio (CSR).
   The scheme was launched on 22nd January, 2015. Beti Bachao Beti Padhao is an effective initiative taken by central government to save the girl child and educate the girl child all over the India. A budgetary allocation of 100 Cr. has been made under the budget announcement for Beti Bachao, Beti Padhao campaign.
2. **Sukanya Samridhi Yojana**: It is a small deposit scheme for girl child. Sukanya Smariddhi Yojana is launced as a part of the Beti Bachao, Beti Padhao campaign,. The scheme was launched by Prime Minister Narendra Modi on 22nd January, 2015. This scheme currently provides an interest rate of 8.1% and tax benefits. "Sukanya Samridshi Account" can be opened at any time from the birth of a girl child till she attains the age of 10 years, with a minimum deposit of Rs. 1000. A maximum of Rs. 1.5 Lakh can be deposited during a financial year. The account can be opened in any post office or authorized branches of commercial banks. The account will remain operative for 21 years from the date of opening of the account or marriage of the girl child afterattaining 18 years of age.
3. **Kishori Shakti Yojna**: Kishori Shakti Yojna was launched by the Ministry of Women and Child Development. This scheme aims to empower adolescent girls (Age) of 11-18 years with focus on out-of-school girls. The scheme emphasis on their nutritional and health status and upgrading various skills like home skills, life skills and vocational skills. This scheme provides nutritional and health education including sanitation and personal hygiene aspects.
4. **Sabla**: The Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG) Sabla is a centrally sponsored program of Government of India initiated on April 1, 2011 under Ministry of Women and Child Development . The objectives of this scheme are to enable the adolescent girls for self development and empowerment, improve their nutrition and health status, provide guidance about existing public services such as PHC, CHC, post office, Bank, Police station, etc.
5. **Mazi Kanya BhagyashreeScheme** : The Maharashtra government has released a chene known as Mazi Kanya Bhagyashree scheme. The main moto of this scheme is to encourage the girl child towards the education and the higher quality of living. The Mazi Kanya Bhagyashree scheme is only applicable for those people who belongs to the below poverty line or the poor families. The financial assistance will be given to the girls of these families in such a way that when a girl child will be born then the mother of that child will get Rs. 5000 per month till the child reaches the age of 5 years. Whereas the girl child will get an amount of Rs. 2000 during the completion of 5 years. When the girl child will be in 5th standard then she will get Rs. 2500 per years. At the time of 12th standard, the girl child will get Rs. 3000. When girl child attains the age of 18 years she will be provided with an amount of Rs. 1 lakh per year.

Objective:

1. To know how many people are aware aboutgovernment schemes for girl child.
2. Do the people know the benefits of these schemes?
3. Whether people take the advantage of the above schemes.
4. Whether the schemes are helpful to girl child.

Review of Literature:

The present study is made on different aspects of government schemes related to girl child.From the study of related literature it is found that few problems have been dealt with women and children regarding their upliftment and solution to these problems in their progress.

Khandelwal et.al, (2014) reviewed the government program for women and children regarding their nutrition. Sadh and Kapoor studied the initiatives to save the girl child in India. Dr.

Agnihotri and Malipatil, (2018) studied a brief information about Beti Bachao, Beti Padhao scheme. Department for international development, (2005) published a report on Girl's education towards a better future for all wherein educational problems of girls have been dealt with.

Details have been given on several government sites regarding the schemes related to girl child. The sites are as follows:

http://www.wcd.nic.in/
https://www.india.gov.in/
http://www.nari.nic.in/schemes?
https://www.indiastat.com/socialwelfareschemes/
www.womenchild.maharashtra.gov.in

Although the attempts have been made in all related problems of girl child to solve them for the betterment of girl child, no concise report is available on central and state government schemes which are related to financial helpfor the girl child. The present paper gives the general information about the involvement of public in above schemes in the region ofMumbai metropolis.

Methodology:

The study is based on primary and secondary data. The primary data is collected with the help of questionnaire. The questionnaire is prepared with the help of google form. The google form consists of total 33 questions. The first section of google form contains the questions related to general information like age, marital status, nature of employment, number of girl child of the sample respondents. The second section of google form contains the questions related to different government schemes related to girl child. It contains the questions like which schemes are known to the people, scheme they have opted, benefits of the schemes, etc.

The secondary data is collected from the different government sites.

With the help of google form, 45 samples have been collected from Mumbai metropolis. The data were collected with the help of google form.

Hypothesis:

H1 : People are aware of the government schemes related to girl child.

Data Analysis:

General Information of the respondents:

From the collected data, it is observed that out of 45 respondents,

- 33% are male and 67% are female (See Figure-1).
- 65% people are employed and 35% peoples are not employed.
- 31% are from 20 to 30 years group, 51% from 30 to 40 years group, 11% are from 40 to 50 years, 2% are from 50 to 60 years group and no one is from 60 years and above.
- 7% respondents are HSC, 42% are graduate and 51% are post graduate and no one is professional (See Figure-2).
- 56% respondents are doing service, 7% are doing business, 5% are professional and 30% are housewife and 2% are farmers..
- 70% respondents have only one child, 21% have two children and 9% have more than 3 children.
- 30% people have no daughter and 70% people have daughter (See Figure-3).

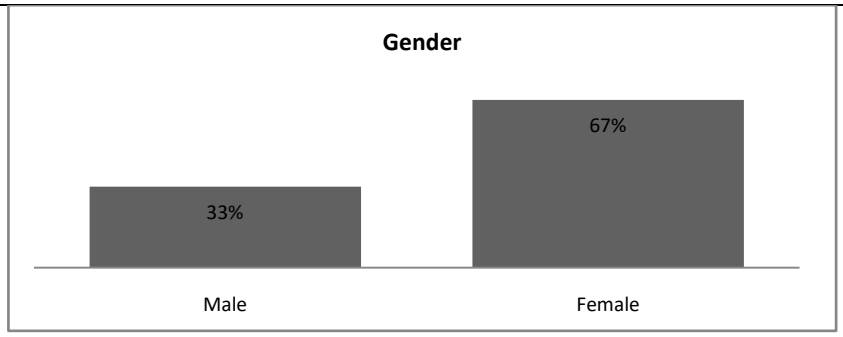


Figure-1

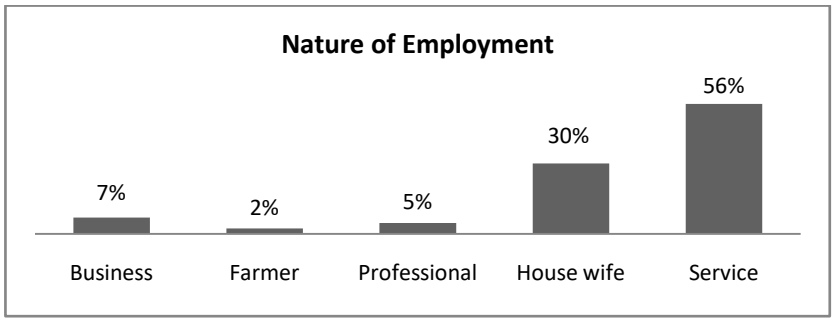


Figure-2

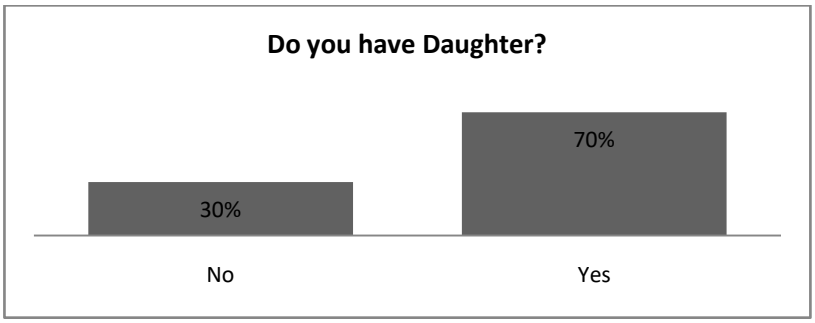


Figure-3

Specific information about the schemes related to girl child:

- 45% people are know about the government schemes related to girl child and 55% people don't know the schemes.
- Govt. Schemes known by parents having Daughter:(See Figure-4)
  - 3% people know about "Beti Bachao, Beti Padhao", "Sukanya Samriddhi Scheme" and "Sabla" scheme.
  - 3% people are aware about "Beti Bachao, Beti Padhao" and "Sabla" scheme.
  - 7% people are aware about "Sukanya Samriddhi Scheme", "Beti Bachao, Beti Padhao" and "Kishori Shakti Yojana" and "Sabla" scheme.
  - 7% people are aware about only "Beti Bachao, Beti Padhao" scheme.
  - 7% people are aware about "Sukanya Samriddhi Scheme", "Beti Bachao, Beti Padhao" and "Kishori Shakti Yojana".
  - 17% are aware about "Sukanya Samriddhi Scheme".
  - 17% people are aware about "Beti Bachao, Beti Padhao" and "Kishori Shakti Yojana"
  - 23% are aware about only "Sukanya Samriddhi Yojana".
  - 20% people don't know about any of the scheme.

- 12% people have opted some schemes and 58% people are have not opted any of the scheme and 30% people does not have daughter (See Figure-5).
- 7% people think that their daughter is burden on them and 93% people does not think that their daughter is burden on them.
- 17% people have opened the Sukanya Samriddhi account for their daughter, 60% have not opened it and 23% people are intend to open it.
- 39% people have faced the problem such as lack of Aadhar card of daughter, birth certificate of daughter and 61% people did not face any problem.
- Only 44% people know the benefits of Sukanya Sariddhi Yojana, 37% people know the benefits of Kishori Shakti Yojana, and 19% people know the benefits Sabla scheme (See Figure-6).
- 3% people think only Sabla scheme is helpful, 3% people think only Kishori Shakti Yojana is helpful for girl child, 3% people think Kishori Shakti Yojana, Sukanya Samriddhi Yojana, Sabla scheme is helpful, 7% people think that Beti Bachao, Beti Padhao and Kishori Shakti Yojana is helpful, 13% people think only Sukanya Samriddhi Yojana is helpful, 13% people think Sukanya Samriddhi Yojana and Beti Bachao, Beti Padhao yojana is helpful, 13% people think that "Beti Bachao, Beti Padho", Sukanya Samriddhi Yojana and Kishori Shakti Yojana are really helpful to flourish the girl child, 37% people think only Beti Bachao, Beti Padhao scheme is helpful, (See Figure-7).

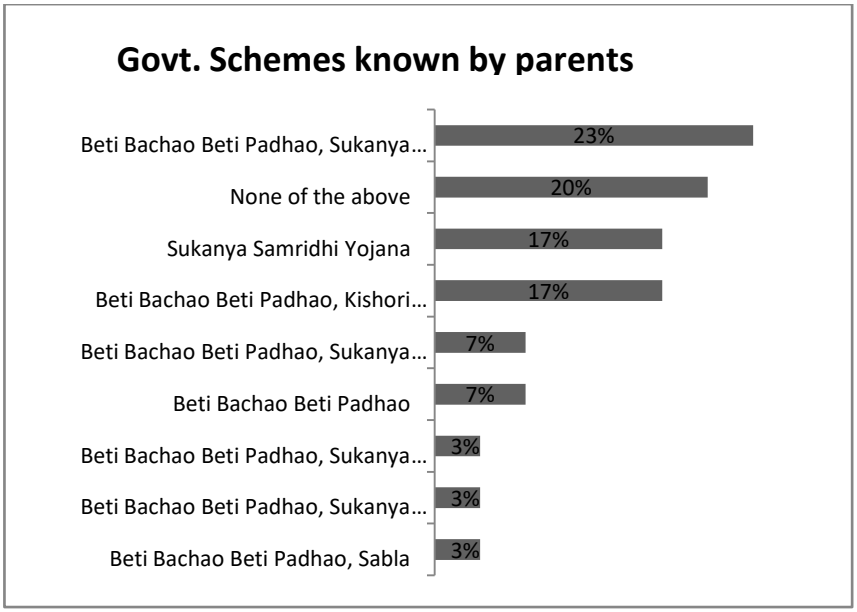


Figure-4

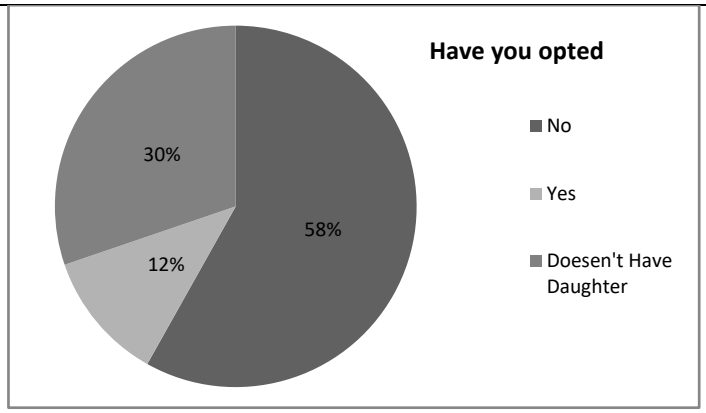


Figure-5

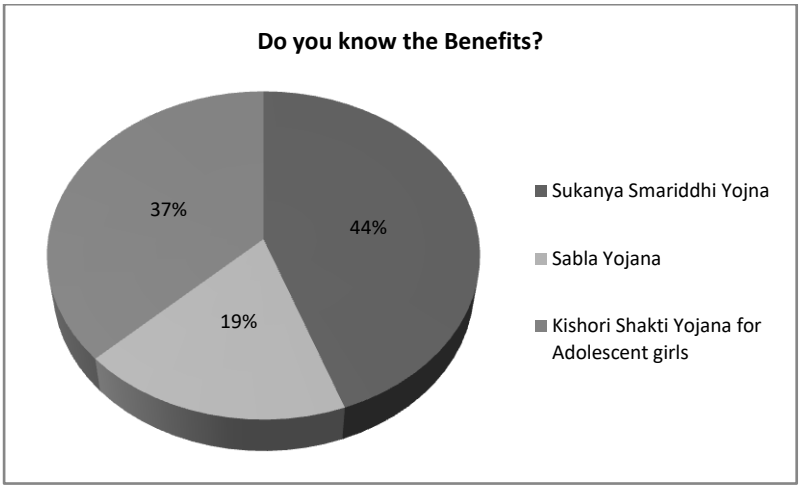


Figure-6

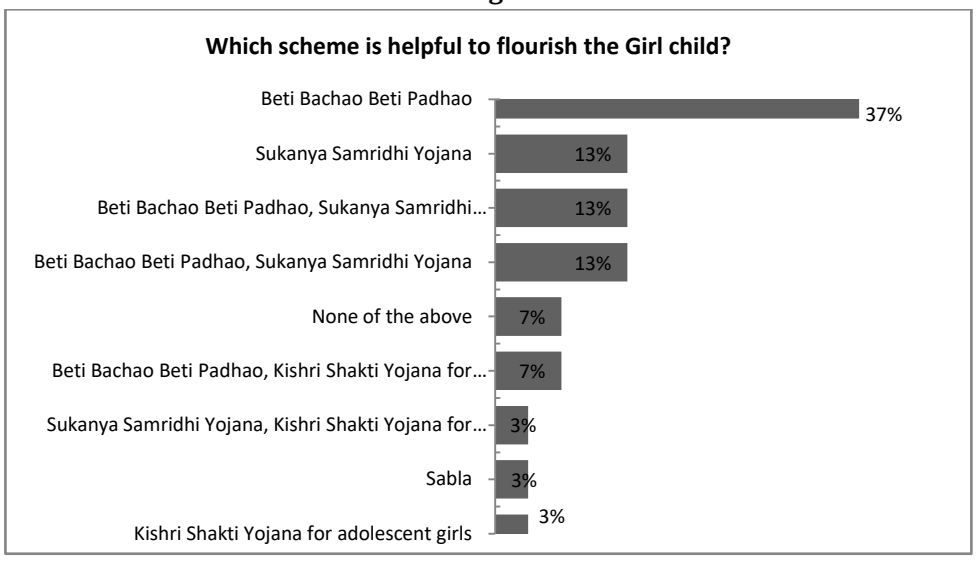


Figure-7

Discussion:

The present paper gives the different aspects of schemes including nature of schemes, their financial implications, and availability of financial help by governments, scheme's benefits to girl child and their parents, awareness of parents and their desire to help girl child for development.

On the basis of above findings and information, it is observed that in a given sample all people are not aware of the schemes and some people know only one or two schemes. Even financial

implications, its availability, its exact benefit to girl child at a proper time are not also known to the parents. Even after giving financial incentives in the form above schemes sex ratios of female to male has not increased. Unawareness and negligence may be possibly due to the educational and financial status of the parents.

Hence, earlier hypothesis that people are aware of the government schemes related to girl childfails in the light of above findings and therefore it is not acceptable.

Conclusions:

The following conclusions are drawn from the present study:

- More than 50% of the people in the metropolis like Mumbai are not aware (53%) of the schemes related girl child launched by central and state government.
- Girl child is not a burden to the parents (93.3%).
- People are aware of some schemes but not all the schemes launched by governments.

From the above study it is observed that variations in the findings may be due to several other factors also which include educational background, financial status, residence, etc of the parents. These factors may be responsible for the uneven results and need to be surveyed sepaprately.

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https://www.indiastat.com/socialwelfareschemes/

www.womenchild.maharashtra.gov.in

APPLICATION OF ICT (INFORMATION COMMUNICATION TECHNOLOGY) IN LIBRARIES

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Abstract
ICT has changed library services in all over the world. Current era is considered as a digital era. Most of the information are in digital format. With the help of ICT libraries can perform its functions more effectively, and the it can provide more accurate updated information as per its user's need. The article states that what is information technology?, components of information technology, application of information technology in libraries, what is information and communication technology?, what is library? and application of ICT on libraries.
Keywords: *Information communication technology and its application in libraries*

Introduction

"Information and Communication Technologies" ICT refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums.

In the past few decades, information and communication technologies have provided society with a vast array of new communication capabilities. For example, people can communicate in real-time with others in different countries using technologies such as instant messaging, voice over IP (VoIP), and video-conferencing. Social networking websites like Facebook allow users from all over the world to remain in contact and communicate on a regular basis. Library have to perform many duties and services. With the help of ICT libraries can perform their duties and services very effectively.

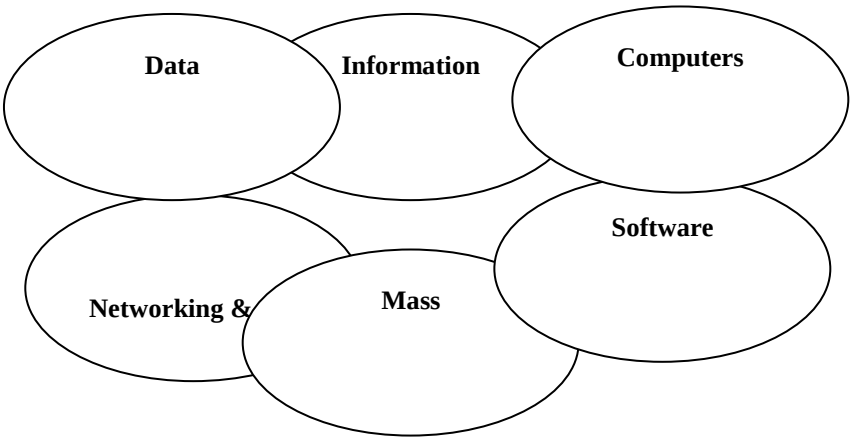
What is Information Technology?

The world Information Technology is a combination of two words. One is Information and the other is Technology. Information means knowledge, it can be a bit or a para or a page. In addition, dictionary definition of technology is the systematic application of scientific and other organized knowledge, skills to practical tasks by the use of computers and communication.

Information Technology is a generic term used to denote activities connected with computer based processing, storage and transfer of information. It includes micro processors, cable access television, fiber optics, satellite, word processing, electronic mail, video, robotics and such others. Information Technology is collective term for the whole spectrum of technologies providing ways and means to acquire, store, transmit, retrieve and process information. Information Technology is not one technology but many, which have converged to serve the needs of the information revolution. Computing technology, Telecommunications, Audio and Video technology, printing technology all are part of it. Any definition of Information Technology (I.T.) must therefore be very broad.

COMPONENTS OF INFORMATION TECHNOLOGY

Technological change is becoming a driving force in our society. Information technology is a generic term used for a group of technologies. Following are the major components of information technologies as most relevant in modern library and information system.



APPLICATION OF INFORMATION TECHNOLOGY IN LIBRARIES

The library is the main information centre which can make use of the fat development IT for the benefits of mankind as a whole. The librarian's preference of IT should include all those technologies which are expected to be used in the library activities/ operations and other library services for collection, processing, storage, retrieval and dissemination of recorded information, the fast developing information technologies have showered almost every areas of application including libraries. In case of libraries, these are good use in the following environments.

a) Library Management: Library management includes the following activities which will certainly be geared up by the use of these fast IT developments: Classification, Cataloguing, Indexing, Database creation, Database Indexing.

b) Library Automation: Library automation is the concept of reducing the human intervention in all the library services so that any user can receive the desired information with the maximum comfort and at the lowest cost. Major areas of the automation can be classified into two organization o f all library databases and all housekeeping operations of library.

c) Library Networking: Library networking means a group of Libraries and information Centers are interconnected for some common pattern or design for information exchange and communication with a view to improve efficiency.

d) Audio-Video Technology: It includes photography, microfilms, microfiches, audio and tapes, printing, optical disk etc.

e) Technical Communication: Technical Communication consisting of technical writing, editing, publishing, DTP systems etc.

What is Information and Communication Technology (ICT)?

Information and communications technology or information and communication technology (ICT), is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary software middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information.

What is Library?

A **library** is a service institution. It is a store house of information which is represented in the form of books, periodicals, newspapers, manuscripts, films, maps, prints, documents, microform, CDs, cassettes, videotapes, DVDs, Blue-ray Discs, e-books, audio books, databases, and other formats.

These collection of sources of information and similar resources, made accessible to a defined community or parent body for reference or borrowing. It provides access to material which is available in physical or digital form. It is the primary duty of library to organize its resources which is helpful to those who use. It means that the arrangement of library resources should be in easy and convenient.

There are many services offered by the library such as: Books Lending service, Document Delivery Service, Inter-Library Loan and so on.

Application of Information Communication Technology in Libraries

Information Communication Technology is very useful for libraries in creating databases of their own and meeting them available to users through networks. It also enables libraries to provide effective and efficient services. Most of the library operations like book acquisition, circulation, office management, information services, etc.

A) Computer Technology

Computers are now extensively used in the library operations and has great impact in the management of libraries and information centers. Computer technology can be used in various fields of library activities. Some of the areas where computer application takes place are:

1. Information Resource Building:

Acquisition of books, monographs, audio-visual, electronic materials such as CD-ROM, maps and so on. There are some specific functions of an acquisition process. (Suggestion, recommendations and selection of library collection.)

- Duplication checking/library holding checking.
- An vender selection.
- Preparation of order/cancellation of order lists with terms and conditions of the supply.
- Checking of overdue orders.
- Record of items on order.
- Record of received and non-received items and receipt to the vender.
- Items verification with order file and invoice.
- Inspection of items by the concerned department.
- Prepare for payment after accessioning.
- Preparation budget and maintain accounts and statistics subject wise etc.
- Final report. (Items/subjects wise/chronologically/booksellers reported etc.)

2. Data Entry:

Database is required for each:

- Books.
- Clients/Members.
- Serials.
- Audio-visuals.
- CD-ROMS, Floppies.
- Gifted items.
- Maps, Reports etc.

3. Classification and Cataloguing:

- Catalogue card production.
- On-line cataloguing.
- Duplication checking of catalogue cards.
- Production of duplicate catalogue cards.
- Preparation of authority file subject heading list.

 Shorting, checking and filing of catalogue cards.
 Automatic generation of added entries (author, title,series etc).
 Generation of monthly accession list.
 Developing centralized and on-line cataloguing.

4. Circulation Control:

 Registration/cancellation and make time for membership.
 Issue, return, renew, reservation of documents and produce the slip for proof.
 Charges for late, lost book, binding and production of penalty slip.
 Maintenance of circulation statistics.
 Inter library loan.
 Use of bar code system.
 Report/statistics of circulation.

5. Serial Control:

 Input essential serials data.
 Order list of new serials.
 Mode of payment, prepare for payment
 Receipt and updating the records.
 Receipt to vendors or publishers.
 Preparing the list of present holdings, additions, missing, cancelled serials chronologically, subject-wise, etc.
 Renewal and cancellation of present subscriptions.
 Sending reminders and follow-up of missing issues.
 Binding control.
 Accession register of bound serials.
 Prepare budget and maintain accounts/statistics- subject wise, binding etc.

6. Documentation and allied services:

 Indexing and abstracting of micro and macro documents.
 Thesaurus construction.
 Compilation of union catalogue.
 Bibliographical control.
 Current Awareness Services.(CAS)
 Literature search.
 Selective Dissemination of Information.(SDI)
 Newspaper clippings.

7. Information Retrieval:

 Database creation and maintenance, interactive searching, saving of in house as well as external databases.
 Search and print outs of queries against specified requirement.
 Information about the books (issued, reserved, lost, overdue, weed out), member-ship, inter library loan, penalty charges, periodicals, newspaper clippings, reports etc.
 According alphabetically, chronologically, subject-wise, members wise, keywords with each particular such as accession no-wise, title, author, call number, edition etc.

B) Communication Technology

Communication is the process of transforming information from an information source to a destination. Communication, the exchange of information and the transmission is very essence in a social system or in an organization. Dictionary meaning of communication is news or the act of

making oneself understand the means of sending information between one place to another. In modern days, various means of communicating the information came into existence. There is a need to communicate information effectively, efficiently and timely by applying modern technologies such as communication technology. The major areas of communication technology are:

1. Audio-visual technology
2. Fax
3. Telex
4. E-mail
5. Video text
6. Tele text
7. Online search
8. Tele conference
9. Voice Mail Box
10. Satellite Technology
11. Cellular telephones
12. Internet
13. Intranet
14. Extranet
15. CD-ROM
16. DVD

Conclusion

ICT has changed library services in all over the world. Current era is considered as a digital era. Most of the information are in digital format. With the help of ICT libraries can perform its functions more effectively, and the it can provide more accurate and up-to-date information as per user's need. Some libraries are interconnected with each other, they are exchanging their information with member library. Using ICT tools in the libraries leads to high speed satisfaction of user's need, and libraries can provide it's services with more assurance.

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LIBRARY PROVIDES ACDAMIC AS WELL AS SOCIAL REFERNCE SERVICE

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INTRODUCTION :-

In a Sense, the Student's smile is a direct Consequence of the American's with Disabilities Act. 1990. Among its finding & Stated that " censers data, national polls & other studies have documented that people with disabilities as group accept an inferior Staten in our society and are severally disadvantages Socially Vocationally, Economically & educationally .

The purpose of this Act is " to provide a clear & comprehensive national mandate for the elimination of discrimination against individuals with disabilities, " to preside enforceable Standard age vast with discrimination."The major areas of discrimination faced day to day by people with Since the AOA prohibits discrimination in public entities and public accommodation & Services operated by private entities its relates directly to public & private libraries.

Dr. S.R. Ranganathan

Def. : - Reference service "Establishing Contact between Reader & Book by personal service.

Digital Reference Service : - Digital reference to service by which library reference service in conducted online and reference transaction is a computer – mediated communication forms of digital reference.

- Email
- Web form
- Chat using Commercial Application
- Chat using Instant Massaging

TRANSLATION SERVICE :-

Translation is the comprehension of the meaning of the subsequent production of an equivalent text like wise called a " translation" that communicates the same message in another language.

REFERENCE SERVICE:-

Research is largely a matter of combining knowledge of sources techniques, knowledge of Sources and persistence. Research initiating inquiries will want to be aware of Specialized encyclopedias and state- of- the- art review articles and then of the several techniques that can be used to find more in- depth information.

REFERENCE SOURGES:-

Encyclopedia :-

Here the specialist Sets devoted to particular subject areas are at ten more useful that the Gridley Known general set purpose of an encyclopedia is to summarized knowledge and provide a starting point for more extensive research.

Index & Abstracts :-

These Serve to get you to the journal articles & research reports an your Subject .

Computer Database:-

These often Contain the Same information as conventional indexes & Abstracts.

Bibliographies : - These list publication of a particular subject.

Guide to the literature : - These often provide a connected expository overview of the literature.

Review Articles : - State – of – the – art reviews are some what like encyclopedia

Directories : - There serve to lead you to people organization or institution that are interested in a knowledgeable about particular subject.

Year Book : - There provide reviews and arrestments of the most recent years development in a field.

Hard Book & Almanacs : - There serve as compendia of a variety of miscellaneous information.

Newsletters and loose- leaf services : - These provide daily and weekly updates of information in rapidly changing fields.

Needs Of Reference Service :-

- Initiation of new comers.
- To help Research Scholars.
- To Serve Passive Clientele.
- To help Absentee Enquirer.

Importance of Reference Service :

Providing accurate, efficient and in dividend reference assistance to all clients in courteous and encouraging manners. providing structure and a positive learning experience for student to aid them in the development of information literacy skills. Providing equitable reference assistance to all diets in time frame to their needs. Providing appropriate level of service to all clients.

Conclusion : -

Reference is likely to alert you to the existence of so many good serves that, right there, you may start allowing yourself to ask question you never through could be answered. Need of the library were are constantly changing in repairs to societal changing the talk of reference libraries in the present & future is to help users meet their needs by consistently improving and finding better way to provide.

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WHEEL CHAIR CONTROL USING FLEX SENSOR

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Abstract
For the people with physical disability , sickness or injury in their legs, wheelchairs are designed to ease their mobility and to provide them with proper moving technology. This paper describes an intelligent motorized wheelchair for physically handicapped people using flex sensor technology.It is useful for physically disabled person with his hand movement with the help of hand gesture recognition.In this proposed model dc motors are used to moving the wheelchair. The sensor is used to control the direction of wheel chair as left ,right,forward and reverse.FLEX SENSOR produces analog signal i.e its resistance increases or decreases depending on the direction of bend which is given to the arduinouno, the arduinouno converts three analog signals into digital. Depending on the angle and direction of bend corresponding values are calculated by arduinouno and the motor moves in the desired direction.

Introduction:

Driving a wheel chair in domestic environment isa difficult task even for normal people and becomes even more difficult for the people with arms or hand impairments .People with physical disabilities every time find it complicated to navigate through their house without the assistance of someone.The proposed project is useful for the patients where they can move their wheelchair in their own directions, without any third party's help or support.This describes an intelligent motorized wheelchair for physically handicapped people using flex sensor technology.

This robotic type wheel chair allowing the end user to just perform safe movements and accomplish some daily life important task.Since motorized wheel chair can move at a fair speed ,it is important to control the speed of motor as per the end user requirement.Thus the speed of motor is control using PWM method. The sensor is used to control the direction of wheel chair as left ,right,forward and reverse.

Gesture control wheelchair is divided into two parts:

1. Transmitter: the Hand gesture
2. Receiver: the wheel chair

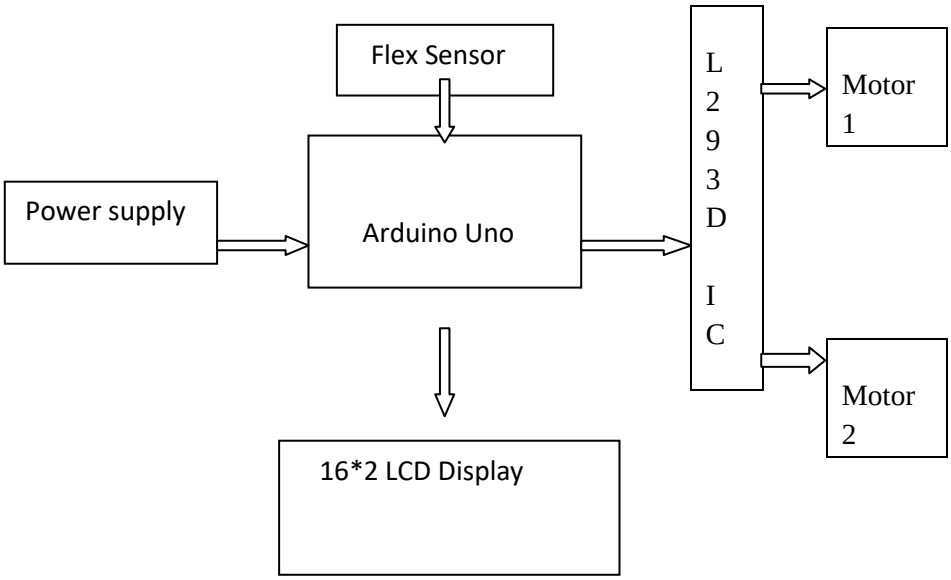
This system consists of three flex sensor . Dc motors are used to moving the wheelchair. The hardware part of the system provides main component as Arduino uno which controls and command the entire system.

SYSTEM DESCRIPTION:

The system consists of Arduino uno,flex sensor,IC L293D,Dc Geared motor and LCD display.Common 12v power supply is provided to all circuite which generated by USB wire .All devices are interfaced with Arduino uno.We uses port and port pins to interface these devices as per requirements.Three Flex Sensor is used as input device to navigate the Automatic wheelchair in different directions. FLEX SENSOR produces analog signal i.e, its resistance increases or decreases depending on the direction of bend.Resistence of flex sensor is depend upon finger movements.As per the movement of the finger,resistance of the flex sensor is changes.This change in resistence gives the input to the L293D IC. Therefore different ADC values are obtained with different touch positions. With this command DC motors driver which in turn rotates the DC motor(wheel).Arduino uno is

used for taking sensor input and gives process command to the LCD.LCD display is interfaced to the Arduino uno for displaying the command in text format as visual and the mobility of the wheelchair is observed.

Architecture:



Arduino Uno.

Arduino Uno is a microcontroller based on the datasheet. It has 14 digital input or output pins of which 6 can be

used as Pulse Width Modulation (PWM) as output, 6 analog inputs, a 16 MHz quartz crystal, an USB connection,

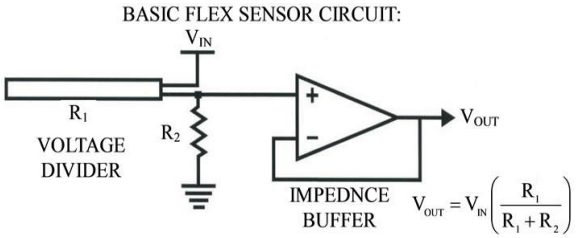
ICSP header and a reset button.

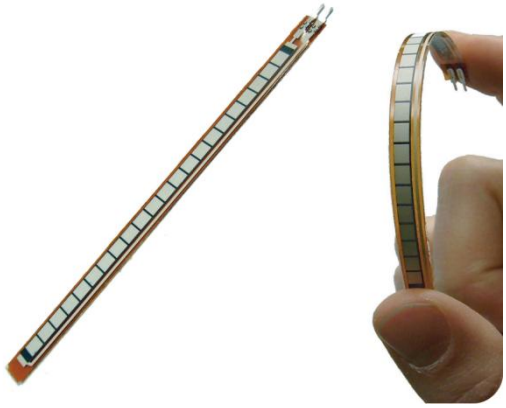


The Microcontroller simply connected to the computer with a USB cable or a power with an AC to DC adapter or battery to get started. Here the purpose of arduino is used to transmit the command through the signal.

Flex Sensor:

The Flex Sensor is a unique component that changes resistance when bent. An unflexed sensor has a nominal resistance of 10,000 ohms (10 K). As the flex sensor is bent the resistance gradually increases. When the sensor is bent at 90 degress its resistance will range between 30-40 K ohms.

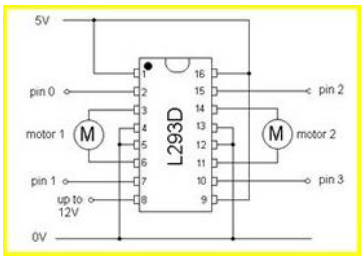




A flex sensor uses carbon on a strip of plastic to act like a variable resistor. The resistance changes by flexing the component. The sensor bends in one direction, the more it bends, the higher the resistance gets. In simple word ,flex sensor are analogue resistor which works as a variable analogue voltage divider

Motor Driver (L293D IC):

L293D is a dual H-bridge motor driver integrated circuit (IC).L293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction. The motor operations of two motors can be controlled by input logic at pins 2 & 7 and 10 & 15. Input logic 00 or 11 will stop the corresponding motor. Logic 01 and 10 will rotate it in clockwise and anticlockwise directions, respectively.



There are two Enable pins on l293d. Pin 1 and pin 9, for being able to drive the motor, the pin 1 and 9 need to be high. For driving the motor with left H-bridge you need to enable pin 1 to high. And for right H-Bridge you need to make the pin 9 to high. If anyone of the either pin1 or pin9 goes low then the motor in the corresponding section will suspend working. It's like a switch.

Advantages:

1. Minimal effort is needed to control the wheelchair because you use a simple Flex Sensor.
2. Easy to move from one place to another place.
3. Operating principle is very simple.
4. Non-skilled person can also operate this machine.

Conclusion:

Recent advancements in technology are making lives easier for everybody.This work is to help the disabled person by implementing flex sensor and voice command based control system for the wheel chair and providing alternative method to control the equipment,thereby serving many disabilities.Thus the wheel chair understand the signal coming from the control system and reacts accordingly.Functional intelligent wheel chair is practical and helpful to people with certain types and degree of handicap.Through we are mainly focusing on Flex sensor and voice recognition based system interface,more advancements can be done through more research.

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SURVEY OF ARBUSCULAR MYCORRHIZAL FUNGI ASSOCIATED WITH COLOCASIA

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Abstract
An attempt has been made to survey of Arbuscular Mycorrhizal fungi associated with Colocasia plant . Rhizosphere soil and roots samples of colocasia plant were collected from two locality of mahad area. Two genera with six species were reported from above localities. The genus Glomus was most common with four species with two species of Scutellespora were reported . The average number of AM propgules per 100 gram soil, was between 50 to 70 the percentage root infection was ranging between 20 to 60 percent.
Keywords : *Survey , Arbuscular Mycorrhizal fungi, colocasia .*

INTRODUCTION

Colocasia Plant is one of the vegetable crop . It is grown in various types of soils. The Arbuscular Mycorrhizal (AM) fungi play important role as a bio fertilizer for promoting plant growth. They also play an important role for uptake and accumulation of phosphorus and other ions like Copper, Zinc etc. Mycorrhizal Fungi survive on the root exudates, which contain sugars, amino acids. Organic acids, vitamins. Nucleotides etc.

MATERIALS AND METHODS

Colocasia Plant cultivated on two different localities of Mahad area. Dist Raigad at an interval of 30 days. These samples were analyzed for presents of Mycorrhizal fungi. The isolation of AM propagules was done by wet sieving and decanting method (Gerdemann and Nicolson 1963). The percentage root infection was measured by Phillips and hayman's (1970) method. Isolated spores were identified by using the Manual of Schench and perez (1990). The no. of propagules was counted under trinocular research microscope.

RESULTS AND DISCUSSION

The survey of AM fungi was carried out from two localities of Mahad area. The first soil samples were collected at the interval of 30 days from rhizosphere of Colocasia Plant.

Two genera ***Glomus*** and ***Scutellispora*** were found associated with Colocasia Plants. The genus ***Glomus*** was most abundant with four species two species of ***Scutellispora***. The rhizosphere soil from locality -2 had maximum no. of AM propagules 50 to 70 per 100gm of soil in the month of June minimum number of AM propogules and in the month of January Maximum Number of AM propogules. Locality 2 had maximum percentage of root infection was 60% & minimum was 20%.

Table No. 1 Arbuscular Mycorrhizal fungi reported from soil.

Sr.No.	AM Fungi	Locality-1	Locality-2
01	*Glomus albidum*	+	+
02	*Glomus boreale*	-	-
03	*Glomus convolutum*	+	-
04	*Glomus fasciculatum*	-	+
05	*Scutellospora arenicola*	+	-
06	*Scutellospora pellucida*	+	+

+Present- Absent

Table No. 2 Number of propagules per 100 gm of soil and percentage root infection.

Sr. No	Month	Locality-1 No.of Prpa.	Locality-1 % root infe	Locality-2 No.of Prpa.	Locality-2 % root infe
01	June-17	52	20%	54	20%
02	July-17	55	20%	57	20%
03	Aug-17	57	30%	59	30%
04	Sept -17	60	30%	62	35%
05	Oct-17	62	40%	65	40%
06	Nov-17	64	50%	67	50%
07	Dec-17	66	50%	69	50%
08	Jan-18	69	60%	70	60%

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CONSEQUENCE OF ANNEALING ON STRUCTURAL PROPERTIES OF ZINC SULPHIDE THIN FILMS

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Abstract
Zinc sulphide films were deposited on non-conducting glass substrates by dip method. The resultant films were annealed upto 473 K temperature. The X-ray diffraction spectra showed that zinc sulphide thin films are polycrystalline. As deposited sample shows hexagonal phase whereas sample annealed at 423 and 473 K shows hexagonal and cubic mixed phase. The grain size and microstrain were calculated and correlated with annealing temperature.

1. Introduction

Zinc sulphide (ZnS) belongs to the II-VI family of semiconducting material receiving ever-increasing attentions due to its wide variety of applications [1]. It is an excellent host material for electroluminescent phosphors and is being commercially used for electroluminescent displays [2]. It can be used for fabrication of optoelectronic devices such as blue light-emitting diodes, electro-optic modulator, optical coating, photoconductor and especially photovoltaic devices. It is also used an n-type window layer for thin film heterojunction solar cells. ZnS/Cu (In, Ga) Se_2 photovoltaic cells have shown an efficiency of 17.2% [3-6].

Thermal treatment is necessary for fabrication process of several kinds of opto-electronic devices. The role of thermal annealing process is very important in achieving high performance devices. Therefore, studies of annealing effect on the surface, the structure and optical properties play a very important role in enhancing device efficiency [7].

The aim of this work is to examine change in the properties of ZnS films deposited on glass substrate as a function of annealing temperature.

2. Experimental details

In actual experimentation, 20 mL (0.2 M) zinc sulfate heptahydrate solution was taken in 100 mL beaker. 2.5 mL (1M) succinic acid, 25 mL (2.8 M) ammonia, 25 mL (2 %) hydrazine hydrate and 20 mL (0.2 M) thiourea were added in the same reaction bath. The pH of the reactive mixture is 10.70. The temperature of the bath was maintained at 278 K using ice bath. Individual solutions were cooled at 278 K and mixed to avoid precipitation. The solution was stirred vigorously before dipping non-conducting glass substrates. The substrates kept vertically slightly tilted in a reactive bath. The temperature of the bath was then allowed to increases up to 298 K very slowly. After 9 hours, the slides were removed washed several times with double distilled water. The film was dried naturally preserved in dark desiccators over anhydrous $CaCl_2$. The films were annealed at 348K, 423K and 473K for 3 hours.

3 Results and Discussions

3.1 XRD Studies

The crystallographic study of as grown as well as annealed at zinc sulphide thin films was examined by X-ray diffractometer. The XRD patterns are shown in Fig. 1. Zinc sulphide can be grown with either hexagonal, wurtzite type structure (JCPDS 39-136) or the cubic zinc blende type structure (JCPDS 77-2100). As deposited films shows poor crystallinity with hexagonal phase. The XRD pattern of as deposited film shows the highest intensity peak at d = 3.159 Å (008). Along with (008) plane, (110) and (118) planes were observed. Annealing of film at 348K increases the intensity

of the above. Annealing of film at 423K and 473K, mixture of hexagonal and cubic phases is observed. It introduces further peaks at d = 2.707 Å (200) of cubic phase. The diffused background is due to amorphous glass substrate and also to some amorphous phase present in zinc sulphide thin films. The peak intensity increases with increase in temperature. No impurities were detected in XRD pattern. The peak intensity increases with increase in temperature.

The annealed film shows increase in crystallite size due to annealing. The crystallite size (D) is calculated using Debye-Scherrer formula [8]. The average crystallite size was calculated by resolving the highest intensity peak. It is found that crystallite size increases from 55 to 98 nm as the annealing temperature increases upto 473K. The origin of the strain is related to lattice misfit who depends upon the deposition conditions. The microstrain (ε) developed in the films were calculated from the equation;

$\varepsilon = \beta\cos\theta/4$----------1.1

As the annealing temperature increases, the microstrain decreases from 3.06×10^{-3} to 1.05×10^{-3}. This is due to the predominant recrystallization process in the polycrystalline thin films and due to the movement of interstitial zinc atoms from inside the crystallites to its grain boundary which dissipate and lead to a reduction in the lattice imperfection [9-10].

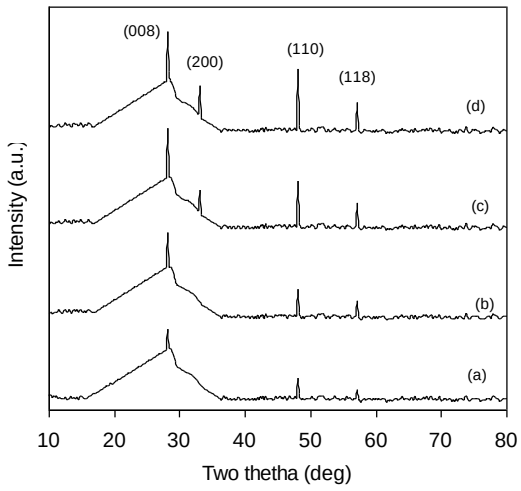


Fig. 1: XRD pattern of annealed zinc sulphide thin film.
a) as deposited
b) annealed at 348 K
c) annealed at 423 K
d) annealed at 473 K zinc sulphide thin film.

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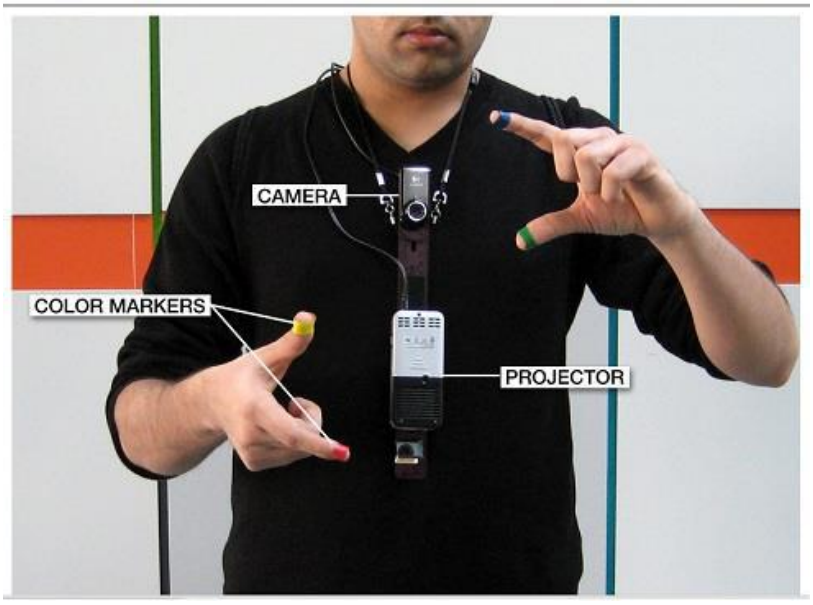
SIXTH SENSE TECHNOLOGY

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Abstract
The Sixth Sense also known as 'A Clairvoyance (Extrasensory) Perception' has emerged as 'The Sixth Sense Technology' in the past few years. Human beings have evolved over millions of years to sense the world that exists around us with the help of our five natural senses which is used to perceive the information whenever we come across a thing, a person or a place. That information helps us to make judgments and instigate the appropriate action which is required to be taken. This paper focuses on a wearable gestural interface (a device) consisting the idea of the same above mentioned Sixth Sense Technology that links the informational and data-oriented knowledge not cognoscible naturally by the five senses from the physical world around us, with the digital information and allows us to use our natural hand gestures to communicate with the digital information, comprising of various applications along with different kinds of components, making the information available on our finger-tips at lightning speed.

INTRODUCTION

"Sixth Sense Technology", it is the newest jargon that has proclaimed its presence in the technical arena. This technology which has emerged has its relation to the power of these six senses. Our ordinary computers will soon be able to sense different feelings accumulated in the surroundings. It frees information from its confines by seamlessly integrating it with reality, and thus making the entire world your computer.



It's a wearable gestural device that can turn any surface into a touch screen for computing, controlled by simple hand gestures. The device, consisting of components like LED projector, cell phone, camera, mirror and some different coloured tapes to get the gestures recognized, are connected together through Bluetooth or Wi-Fi with each other. The technology is mainly based on hand pattern

recognition, image capturing, processing and manipulation, etc. The software of the technology uses the captured video stream, which is captured by the camera, and also tracks the location of the tips of the colored markers rolled on fingers to recognize the gestures by using computer vision techniques. This paper makes us cognizant how the sixth sense technology provides an integration of the digital world with the real world by vanquishing the five natural senses.

HISTORY OF SIXTH SENSE TECHNOLOGY

Idea behind this marvellous technology was started late in 1990's by Steve Mann at MIT who actually proposed first wearable computer. Initially it was proposed as a head worn projector and camera back in 1994, thereafter he developed it and proposed it as a neck worn projector and camera in 1998. It was further developed and prototyped by PranavMistry, a PhD student in the Fluid Interfaces Group at MIT lab a as part of his research curriculum. But, we can still consider Steve Mann as the "father of emergence Sixth Sense" technology. The first archetype of the sixth sense developed by PranavMistry was very much bigger and was not a functional model so they came out with a modified neck worn type device which was like a pendant.

The first article by Arjun KR says that they started working with a big projector mounted on a helmet but that proved cumbersome if someone was projecting data onto a wall and then turned to speak with a friend then data will project on friend's face thus he switched up with a smaller projector and created the pendant prototype to be worn around the neck. The archetype was built from an ordinary webcam and a battery-powered 3M projector, with an attached mirror and all connected to an internet-enabled mobile phone here.

He says that the movies "Robocop" and "Minority Report" gave him the inspiration to create his view of a world where computers and other digital devices enhance people's enjoyment of the physical world and not dominated by computers, digital information and human robots.

WORKING WITH SIXTH SENSE TECHNOLOGY

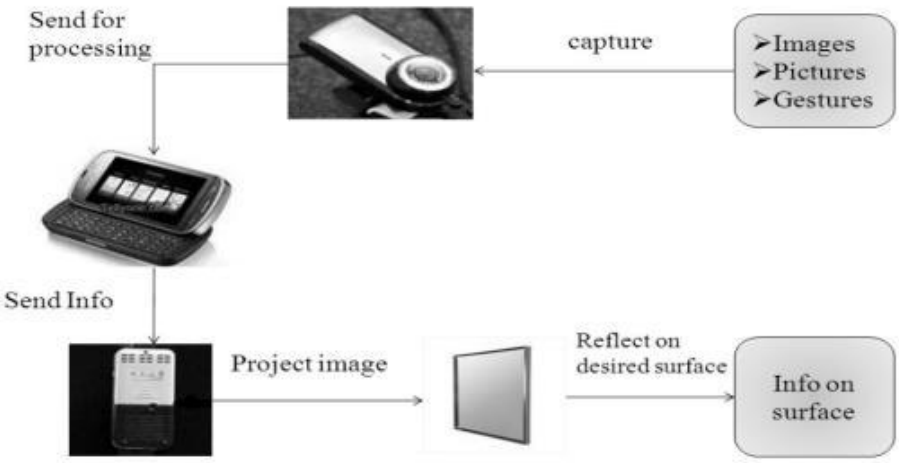


Figure 3.6: Working

The device consist of components like a camera, a mirror and a projector connected wirelessly to a Bluetooth smart phone that can slip comfortably into one's pocket. The camera recognizes individuals, images, pictures, gestures one makes with their hands with the help of the coloured markers. The data caught by the camera is then analysed by a software program and tracks down the location of the markers with the help of single vision technique. This software recognizes 3 kinds of gestures: - Multi-touch, freehand and iconic.

Information is then processed by the smartphone after which the downward- facing projector projects the output image on to the mirror which in turn reflects image on to the desired surface. Thus, digital information is freed from its confines and placed in the physical world.

VARIOUS APPLICATIONS

The various applications of Sixth Sense exhibiting the efficiency, viability and flaccidity of the system are:

o**Make a Call** by just bringing the hand in front of the device and dialling it on a virtual keypad on your palms.

o**Get Flight Updates** by getting the details of flight timings.

o**The Map** application that allows the user to navigate a nearby map.

o**3D Drawing Application** lets the user draw on any surface by tracking the tips movements of the user's index finger.

o**The Clock** lets the user to just draw a gesture a circle on his wrist and showcases a clock on his wrist.

o**Motion Capture** lets you capture photos using fingers and allows to share it with people.

o**Video Newspapers** allows the user to retrieve the latest related stories or interview videos streamed from internet.

o**Book Information** lets the user get the details of the book such as ratings, next page preview and some other additional information. Likewise, for some other products as well

CHALLENGES

A) Software Limitations includes dependency on Microsoft code libraries; image processing challenges and accurate positioning along with timing difficulties with synchronization are the main obstacles before implementation.

B) Implementation Limitations includes conversion into a final product as no live demos are given, only recorded videos of the application are available.

C) Security and Privacy Issues includes hacking information from Facebook, taking pictures in public, obtaining information about a total stranger in public due to the face recognition algorithm of the device as some of the many security issues that can occur.

D) Health and Safety Concerns such as brightness of projector on user's eyes; safety concerns with regards to wearing the device while driving are the main ones.

E) Away from Reality detaches the user from reality and pulls them away from the feel of the physical touch.

WHY SIXTH SENSE? (ADVANTAGES)

The digital information and its objects are integrated into the physical world with the help of the Sixth sense interface, hereby making the entire world as our own computer.

- Sixth Sense makes machines like computers to adapt to human needs and not the other way round.
- Apart from hand gestures that are used to communicate with digital information, Multi-touch and multi-user interaction is also supported.
- Data from machine is directly accessed into real time. It is an open source, cost effective idea that can be minded anywhere.
- All the relevant information is provided by the gesture controlled wearable computing device that manipulates any surface into a display.
- It is portable.
- Easy to carry as it can be worn on our neck.
- Even a novice with little or no knowledge of mouse and computer can use this device.
- Need to carry a camera no longer persist.

 The total cost invested for the making of the sixth sense technology proto type is exceptionally low. A basic sixth sense device sums up to approximately $350.

LATEST ALTERNATIVE TECHNOLOGIES PROPOSED

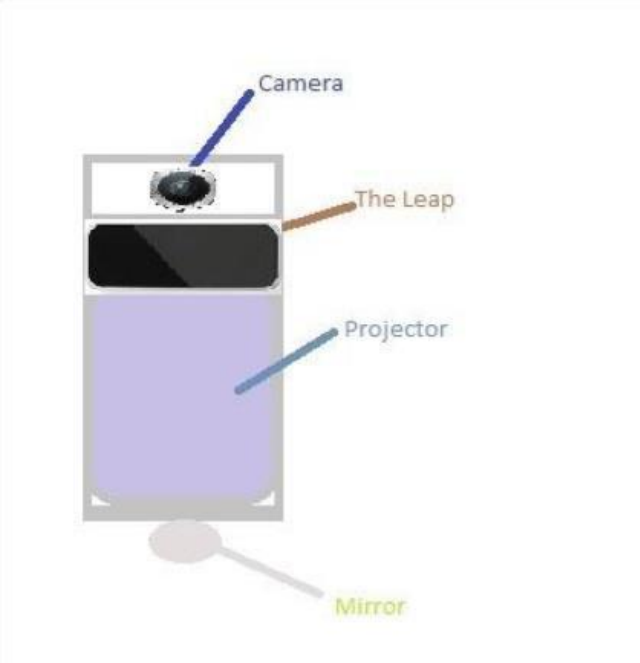
1. LASER 3D PROJECTOR

Currently, in latest version of the interface the projector used is not very efficient. The batteries of the projector used lasts only for 3 hours, as reported by an article. Also, as the device is been worn by the user, eventually it leads to a lot of focus problems.

So to overcome these problems we can use laser projector with a laser diode inside capable of projecting on any surface. Technically the interesting thing about laser projector is that it never goes out of focus. Since the application suggested in the interface requires user to wear projector on their body, a laser projector becomes more advantageous as it does not requires to adjust focus.

2. NEW CONCEPT OF SIXTH SENSE GLASS

There are some loopholes in present sixth sense design and that is there is no privacy when you are browsing your data. In this concept we can use laser filter glass having an interface between digital and real world. This glass has gesture recognition infrared camera, infrared 3D laser projector and 2 lasers fitted at both the ends of the glass and also acts as a small display and normal projector at centre. Concept of privacy is maintained. Display is made up of optical glass and have a prism layer and a mini projector which will directly project on optical nerve of eye making it seem as if your eye is projecting information.

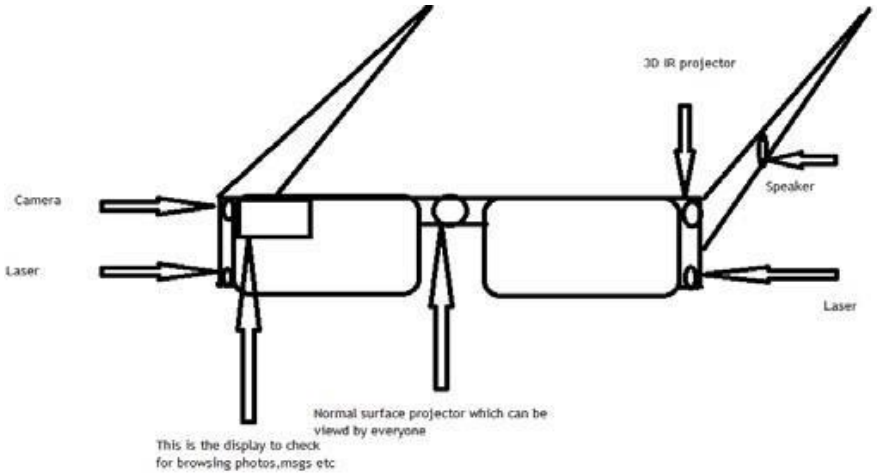


It will also include microphone which is used for sound recording and browsing of data using voice. This glass will connect with computing device with the help of Bluetooth and the glass will work on battery. Using this glass we can click photos, record video, browse data, check for direction, send message verbally, dial a call by just uttering their name, send message if number are saved or else you can simply dial the number in air.

Assuming that we are using Infrared projector, the projected things can only be seen through laser filter glasses which will protect the privacy of the user. In case of using normal projector the projector will project the information on surface which will be visible to other person. Using 3D infrared laser one can interact with 3D objects and changes can be made just like a 3D workspace. Small display in

front of the glass will display the photos; messages etc. Whilst the user can interact with it. Laser will detect the gesture and accordingly pass the signal to computing devices.

There will also be an application in computing device if user is in private browsing mode. Thus the augmented reality have gone into a different dimension where it can also be used as a night vision device and can be used by militaries. Apart from it, it can also act as a fifth sense for the disable people. Thus not only economically but it can also be used for well-being of humans.



ENHANCEMENTS

Searching the alternative for the colour markers would be another asset of this device. Kinect and The Leap have shown that it is possible. Enhancing the device to be practiced in various fields like gaming, education systems, entertainment fields will generate wide range of customer. Extra speaker can be added or mobile computing device with inbuilt speaker can be used to prepare this device. This allows developers to develop an application that can translate the gesture into sound. Integrating camera and projector in the mobile computing device would be an infallible idea as the devices like The Leap, Kinect have inbuilt sensors to recognize the gesture which could solve the limitation of camera algorithm, if the camera is been replaced by any one of these devices.

The Leap is a device that tracks movement of both hands and all 10 fingers through an open space between a user and user's computing device. It operates using LED lights and camera sensors. The software detects user's hands and fingers and translates the data into information for the device (Leap Motion 2013.)

The suggestion for the enhancement of the device would be first to finish porting the code in JAVA and to adjust it for Android also. Eventually, phones with projector can be used with little modifications like adding The Leap just below the camera section and adding the mirror right below the projector. After the modification, shaping the device as wearable is not really a problem. This modification provides multiple options to the users. They can use the phone by touching the front screen or use it by gestures and images by operating it from back side. By adding speech integrated circuit, the device can be built useful for the users with disabilities.

FUTURE (SUGGESTED) ENHANCEMENTS

To get rid of colour markers and hand use, easily used by voice recognition.

o Interactive advertisement.

o Sixth sense with holographic visualizes the better world.

o True 3D print media.

o 3D visualization and gesture tracking.

o Camera can act as an eye for blind people as a fifth sense for them.
o It is almost like setting up a digital system into our body and making use of it.
o In the given concept, the computing device has inbuilt microphone and speakers in it so the user can use that feature to connect to the external devices as well.

CURRENT STATUS

Despite of its wide press coverage in 2009, no commercial product of the Sixth Sense technology had been achieved. Also in September 2013, the open source code which was published has not been updated since October 2012 and the Java development branch of the project was similarly stalled. With many users encountering difficulties compiling and running the source code, the technology itself has not spread as widely as its media coverage. PranavMistry hinted at several reasons for not able to deliver the technology so far, including the need to incorporate newer hardware's and to remove the dependencies on proprietary Microsoft code libraries.

FUTURE SCOPE

Further development in this technology will lead to evolvement of new markets. Hardware used in the current technology can be perfected as it plays an important role in this technology by interacting with the user.

- Security of the current technology can further be improved and more accuracy could be aimed.
- Enhancements could be made so that visually impaired people can use this technology.
- The current technology is a little bulky to carry around, so few improvements can make it user friendly.

CONCLUSIONS

The insightful use of gesture movement and speech integrated circuits has made sixth sense technology a progressive and developing innovative idea. It provides us a smooth access to information that may help us to make crucial decisions. The ultimate power of Sixth Sense lies within the potential it holds is to connect Internet with the real world and superimposing the data on the real-world itself. Although upcoming technologies like 5 pen PC technology allow us to carry computers alongside with us in our pockets, a link between the digital devices we can carry and its interactions with real world, also our speech, has not yet been found. The masterstroke here is that Sixth Sense identifies the objects around oneself, lets us access the information in the way we want and displays that information as well, all this in the most simplest of the ways. Felicitous awareness of this technology will point to even further development and use of this technology, which in-turn will aid in obtaining information and operating any type of function practically at any time, simply by using gestures and commands.

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THE OSI MODEL

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Abstract
The Open Systems Interconnection model (OSI model) is a product of the Open SystemsInterconnection effort at the International Organization for Standardization. It is a way of sub-dividing a communications system into smaller parts called layers. A layer is a collection of conceptually similar functions that provide services to the layer above it and receives services from the layer below it. On each layer an instance provides services to the instances at the layer above and requests service from the layer below. For example, a layer that provides error-free communications across a network provides the path needed by applications above it, while it calls the next lower.

Introduction

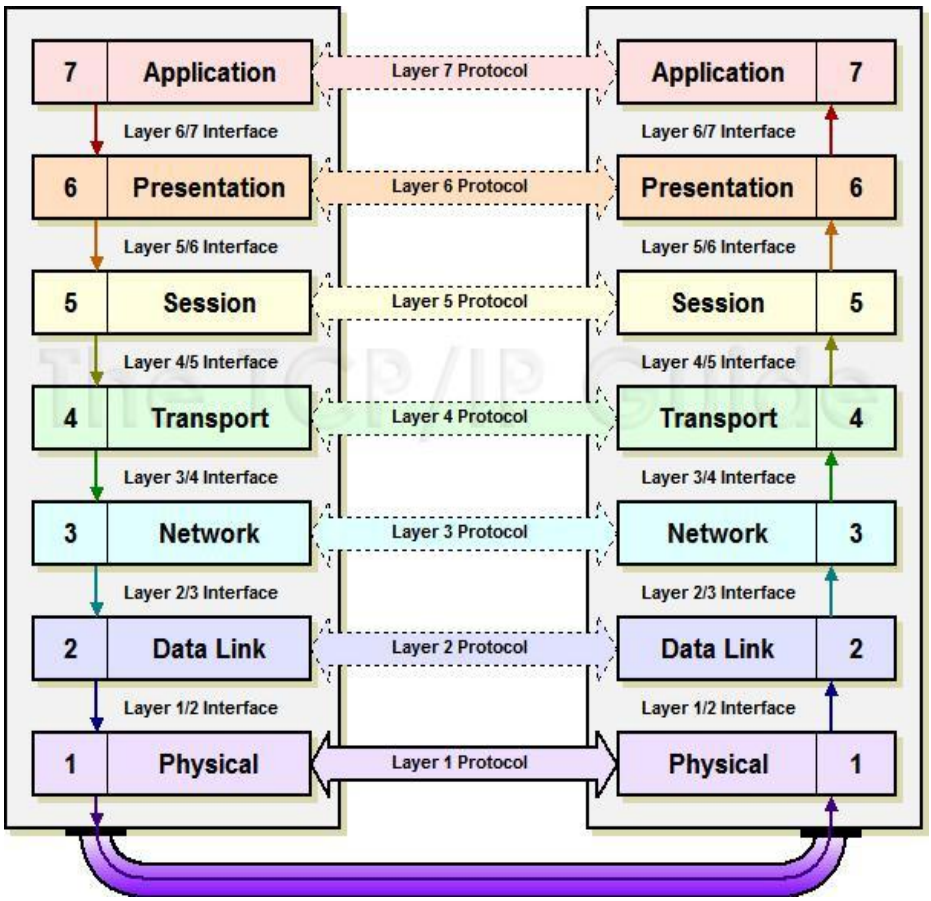
The Open System Interconnection (OSI) reference model is a framework for defining the conventions and tasks required for network systems to communicate with one another. The work on the OSI model began in the late 1970s, mostly independently, by the International Organization for Standardization (ISO) and the International Telegraph and Telephone Consultative Committee or CCITT (which comes from the translation of the title in French). CCITT has been succeeded by the Telecommunications Standardization Sector of the International Telecommunications Union (ITU-TS). In 1983 the work of the two organizations was combined, and a single document describing the reference model for Open Systems Interconnection was produced. The term “open systems” refers to the fact that the specifications are publicly available toeveryone. The purpose of the OSI model was to assist vendors and communications software developers to produce interoperable network systems. Although the OSI model was designed to replace all previous computer communications standards, it is no longer viewed as such a replacement. Rather, the OSI model has succeeded as a tool for describing and defining how heterogeneous network systems communicate.

I. HISTORY

Work on a layered model of network architecture was started and the International Organization for Standardization (ISO) began to develop its OSI framework architecture. OSI had two major components: an abstract model of networking, called the Basic Reference Model or seven-layer model, and a set of specific protocols.

The concept of a seven-layer model was provided by the work of Charles Bachman, Honeywell Information Services. Various aspects of OSI design evolved from experiences with the ARPANET, the fledgling Internet, NPLNET, EIN, CYCLADES network and the work in IFIP WG6.1. The new design was documented in ISO 7498 and its various addenda. In this model, a networking system was divided into layers. Within each layer, one or more entities implement its functionality. Each entity interacted directly only with the layer immediately beneath it, and provided facilities for use by the layer above it.Protocols enabled an entity in one host to interact with a corresponding entity at the same layer in another host. Service definitions abstractly described the functionality provided to an (N)-layer by an (N-1) layer, where N was one of the seven layers of protocols operating in the local host.

II. DESCRIPTION OF OSI LAYERS



Layer 1: physical layer

The physical layer has the following major functions:

[A]. it defines the electrical and physical specifications of the data connection. It defines the relationship between a device and a physical transmission medium (e.g., a copper or fiber optical cable). This includes the layout of pins, voltages, line impedance, cable specifications, signal timing, hubs, repeaters, network adapters, host bus adapters (HBA used in storage) and more.

[B]. It defines the protocol to establish and terminate a connection between two directly connected nodes over a communications medium.

[C]. it may define the protocol for flow control.

[D]. it defines a protocol for the provision of a (not necessarily reliable) connection between two directly connected nodes, and the modulation or conversion between the representation of digital data in user equipment and the corresponding signals transmitted over the physical communications channel. This channel can involve physical cabling (such as copper and optical fiber) or a wireless radio link.

The physical layer of Parallel SCSI operates in this layer, as do the physical layers of Ethernet and other local-area networks, such as Token Ring, FDDI, ITU-T G.hn, and IEEE 802.11, as well as personal area networks such as Bluetooth and IEEE 802.15.4.

Layer 2: Data Link Layer

The data link layer provides reliable transmission of data (frames) between adjacent nodes, built on top of a raw and unreliable bit transmission service provided by the physical layer. To achieve this, the data link layer performs error detection and control, usually implemented with a Cyclic

Redundancy Check (CRC). Note that the data link layer provides reliable transmission service over a single link connecting two systems. If the two end systems that communicate are not directly connected, then their communication will go through multiple data links, each operating independently. In this case, it is the responsibility of higher layers to provide reliable end-to-end transmission. Bridges, which connect two similar or dissimilar local area network segments, operate at this layer. Some well-known protocols for the data link layer include High-level Data Link Control (HDLC), LAN drivers and access methods such as Ethernet and Token Ring, and the LAP-D protocol in ISDN networks.

Layer 3: Network Layer

While the data link layer deals with the method in which the physical layer is used to transfer data, the network layer deals with organizing that data for transfer and reassembly. In short, the main function of this layer is Path determination and logical Addressing. This layer provides logical addresses to the packets received which in turn helps them to find their path.

"The network layer provides the functional and procedural means of transferring variable length data sequences (called datagrams) from one node to another connected to the same network. A network is a medium to which many nodes can be connected, on which every node has an address and which permits nodes connected to it to transfer messages to other nodes connected to it by merely providing the content of a message and the address of the destination node and letting thenetwork find the way to deliver ("route") the message to the destination node. In addition to message routing, the network may (or may not) implement message delivery by splitting the message into several fragments, delivering each fragment by a separate route and reassembling the fragments, report delivery errors, etc."

Layer 4: Transport Layer

The transport level provides end-to-end communication between processes executing on different machines. Although the services provided by a transport protocol are similar to those provided by a data link layer protocol, there are several important differences between the transport and lower layers:

[A]. **User Oriented:** Application programmers interact directly with the transport layer, and from the programmersperspective, the transport layer is the ``network". Thus, the transport layer should be oriented more towards user services than simply reflect what the underlying layers happen to provide. (Similar to the beautification principle in operating systems.)

[B]. Negotiation of Quality and Type of Services: The user and transport protocol may need to negotiate as to the quality ortype of service to be provided. Examples? A user may want to negotiate such options as: throughput, delay, protection, priority, reliability, etc.

[C]. Guarantee Service: The transport layer may have to overcome service deficiencies of the lower layers (e.g. providingreliable service over an unreliable network layer).

[D]. Addressing becomes a significant issue: That is, now the user must deal with it; before it was buried in lower levels.

Two solutions:

Use well-known addresses that rarely if ever change, allowing programs to ``wire in" addresses. For what types of service does this work? While this works for services that are well established (e.g., mail, or telnet), it doesn't allow a user to easily experiment with new services.

Use a name server. Servers register services with the name server, which clients contact to find the transport address of a given service.

In both cases, we need a mechanism for mapping high-level service names into low-level encoding that can be used within packet headers of the network protocols. In its general

Form, the problem is quite complex. One simplification is to break the problem into two parts: have transport addresses be a combination of machine address and local process on that machine.

[A]. Storage capacity of the subnet: Assumptions valid at the data link layer do not necessarily hold at the transport Layer.Specifically, the subnet may buffer messages for a potentially long time, and an ``old'' packet may arrive at a destination at unexpected times.

[B]. We need a dynamic flow control mechanism: The data link layer solution of reallocating buffers is inappropriatebecause a machine may have hundreds of connections sharing a single physical link. In addition, appropriate settings for the flow control parameters depend on the communicating end points (e.g., Cray supercomputers vs. PCs), not on the protocol used.

[C]. Don't send data unless there is room: Also, the network layer/data link layer solution of simply not acknowledgingframes for which the receiver has no space is unacceptable. Why? In the data link case, the line is not being used for anything else; thus retransmissions are inexpensive. At the transport level, end-to-end retransmissions are needed, which wastes resources by sending the same packet over the same links multiple times. If the receiver has no buffer space, the sender should be prevented from sending data.

[D]. Deal with congestion control: In connectionless Internets, transport protocols must exercise congestion control. Whenthe network becomes congested, they must reduce rate at which they insert packets into the subnet, because the subnet has no way to prevent itself from becoming overloaded.

[E]. Connection establishment: Transport level protocols go through three phases: establishing, using, and terminating aconnection. For data gram-oriented protocols, opening a connection simply allocates and initializes data structures in the operating system kernel.

Connection oriented protocols often exchanges messages that negotiate options with the remote peer at the time a connection are opened. Establishing a connection may be tricky because of the possibility of old or duplicate packets.

Finally, although not as difficult as establishing a connection, terminating a connection presents subtleties too. For instance, both ends of the connection must be sure that all the data in their queues have been delivered to the remote application.

Layer 5: Session Layer

The session layer permits two parties to hold ongoing communications called a session across a network. The applications on either end of the session can exchange data or send packets to another for as long as the session lasts. The session layer handles session setup, data or message exchanges, and tears down when the session ends. It also monitors session identification so only designated parties can participate and security services to control access to session information. A session can be used to allow a user to log into a remote time-sharing system or transfer a file between two machines.

The session layer has the option of providing one-or-two-way communication called dialogue control. Sessions can allow traffic to go in both directions at the same time, or in only one direction at a time. Token management may be used to prevent both sides from attempting the same operation at the same time. To manage these activities, the session layer provides tokens that can be exchanged. Only the side holding the token is permitted to perform the critical operation. Another session service is synchronization. Consider the problems that occur when transferring a file between two machines and the system crashes not being able to complete the transfer. This process must be restarted from the beginning. To avoid this problem, the session layer provides a way to insert checkpoints into the data stream, so that after a crash, only the data after the last checkpoint has to be repeated. It accepts the

data from presentation layer and provides services to it and accepts the services of the transport layer. The name of data unit in the session layer is SPDU (Session Protocol Data Unit) or sessions.

Therefore session layer functionality includes:

1. Virtual connection between application entities
2. Synchronization of data flow
3. Creation of dialog units
4. Connection parameter negotiations
5. Partitioning of services into functional groups.
6. Acknowledgments of data received during a session
7. Retransmission of data if it is not received by a device

Layer 6: Presentation Layer

The presentation layer formats the data to be presented to the application layer. It can be viewed as the translator for the network. This layer may translate data from a format used by the application layer into a common format at the sending station, and then translate the common format to a format known to the application layer at the receiving station. The presentation layer provides:

1. Character code translation: for example, ASCII to EBCDIC.
2. Data conversion: bit order, CR-CR/LF, integer-floating point, and so on.
3. Data compression: reduces the number of bits that need to be transmitted on the network.
4. Data encryption: encrypt data for security purposes. For example, password encryption.

Layer 7: Application Layer

This is the level that the user often interacts with. This is where data turns into websites, chat programs and so on. Many protocols run at this layer, such as DNS, FTP, HTTP, HTTPS, NFS, POP3, SMTP, and SSH.

"This layer supports application and end-user processes. Communication partners are identified, quality of service is identified, user authentication and privacy are considered, and any constraints on data syntax are identified. Everything at this layer is application-specific. This layer provides application services for file transfers, e-mail, and other network software services."

III. BENEFITS OF THE OSI MODEL

"By separating the network communications into logical smaller pieces, the OSI model simplifies how network protocols are designed. The OSI model was designed to ensure different types of equipment (such as network adapters, hubs, and routers) would all be compatible even if built by different manufacturers."

The OSI model has many benefits which include:

a. Compatibility: The OSI model can fit to any compatible software/hardware from different users in other parts of theworld. As software/hardware differs among various users so OSI is a model that is compatible to all.

b. Easy Troubleshooting: Since each layer in an OSI is independent of each other so it makes it easier to detect and solveall errors prevailing in it.

c. Easy Understanding Nature: OSI model is very interactive and even guides us to know what a Model is, how itoperates, and common methodologies, how new technologies are developed in existing networks.

d. Security: OSI model have functionality for Encryption and Decryption which has a major contribution for securitypurpose. This makes it Reliable.

E. Add Multiple Network Models: The OSI model is designed in such a way that user can further extend.

IV. CONCLUSION

In this paper we have tried to explain what exactly an OSI reference model is, why it is used and contribution of various researchers in this reference. OSI is basically an architecture which only gives us an idea how packets transfer over the network during any communication. OSI enhancements are done time to time for developing new technologies. Scheidell et al., proposed three different layers in his paper for improvising security in any network. Future implementation in OSI will lead to enhancement in security and many other fields.

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भारतातील दारिद्रयाची कारणमिमांसा
(Causes of Poverty in India)

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प्रस्ताविक :

जगातील सर्वच विकसित आणि विकसनशील देशात दारिद्रयाने गंभीर स्वरूप धारण केले आहे. यात विकसित देशापेक्षा विकसनशील देशातील दारिद्रयाची समस्या अतिशय गंभीर स्वरूपाची आहे. स्वातंत्र्यप्राप्तीनंतर भारताने मिश्र अर्थव्यवस्थेचा मार्ग अंगिकारला सन 1951 पासून भारताने आर्थिक विकासासाठी नियोजनाचा अवलंब करूनही मिश्र अर्थव्यवस्थेत साधनसामुग्रीच्या मालकी हक्काच्या नियोजन प्रक्रीयेत भ्रष्टाचार, राजकीय पुढाऱ्यांचा दबाव इ. कारणांमुळे अदयपावतो भारतातील दारिद्रयाचे प्रमाण कमी होऊ शकले नाही ही वस्तूस्थिती नाकरता येत नाही.

दारिद्रय, बेकारी व आर्थिक विषमता या महाभंकर समस्येने केवळ अविकशित,विकसनशिल राष्ट्रानाच ग्रासले नाही तर विकशित देश देखील या दृष्टचक्रातून सुटले नाहीत प्रस्तुत लेखात दारिद्रयाची संकल्पना, कारणे, व परिणामाचा अभ्यास करण्यात आला आहे.

दारिद्रयाचा अर्थ (Meaning of Poverty)

कोणत्याही संकल्पनेचा अर्थ देशपरत्वे, काळपरत्वे, व व्यक्ती परत्वे बदलत असतो हया कारणामुळे दारिद्रय या संकल्पनेची सर्वमान्य होईल अशी एकच व्याख्या करणे कठीण आहे. या संकल्पनेच्या महत्वाच्या व्याख्या पुढीलप्रमाणे.

1. **नियोजन मंडळ :**
   ''ग्रामीण भागात दरडोई 2400 कॅलरीज आणि नागरी भागात किमान 2100 कॅलरीजचा उपयोग जे कुटुंब /व्यक्ती घेऊ शकत नाहीत त्यांना दारिद्रय रेषेखालील कुटूंब म्हणतात''.
2. **जागतिक विकास अहवाल (2000-01) नुसार :**
   ''सुस्थितीपासून वंचित असणे म्हणजे दारिद्रय होय''.
3. **डॉ.सुभाष कदम यांच्या मते :**
   ''मुलभूत गरजा भागविण्याच्या कुटूंबाच्या / व्यक्तींच्या असमर्थतेस दारिद्रय म्हणतात''.
4. **सर्वसामान्य व्याख्या :**
   ''मुलभूत गरजा (अन्न, वस्त्र, निवारा) भागविण्याचा अभाव म्हणजे दारिद्रय होय '' .

दारिद्रयाच्या संकल्पना (Concept of Poverty)

दारिद्रय या संकल्पनेचे दोन भागात विभाजन करण्यात आले आहे. भारतात या संकल्पनेचा संबंध किमान उष्मांकाशी जोडला आहे. भारतीय नियोजन आयोगाने दारिद्र रेषा निश्चित करण्यासाठी एक तज्ञ समिती नियुक्ती केली (Task force on minimum needs and effective consumption on demand) या समितीच्या अहवालानुसार भारतातील ग्रामीण भागात एका व्यक्तीला 2400 उष्मांकाची आणि शहरी भागात 2100 उष्मांकाची गरज असते या पेक्षा कमी ज्यांना उष्मांक मिळतात त्यांना दारिद्रय रेषेखालील मानण्यात येते दारिद्रयाच्या दोन्ही संकल्पनेचे विश्लेषण खालील प्रमाणे.

निरपेक्ष दारिद्रय (Absolute Poverty)

देशातील प्रत्येक व्यक्तीला जगण्यासाठी किमान काही मुलभूत गोष्टी मिळविणे आवश्यक असते या काही मुलभूत गोष्टी प्रत्येकाला किमान किती मिळाल्या पाहिजेत ते ठरविले जाते त्यापेक्षा ज्या लोकांना या गोष्टी कमी मिळतात ते लोक निरपेक्ष दारिद्रयात आहेत. असे म्हटले जाते आपणास या संकल्पनेची सर्वसाधारण व्याख्या पुढीलप्रमाणे करता येईल "किमान आवश्यक गरजा भागविण्याची क्षमता नसणे म्हणजे निरपेक्ष दारिद्रय होय.'

सापेक्ष (Relative Poverty)

व्यक्तीच्या उत्पन्नाची तुलना केल्यानंतर सापेक्ष दारिद्रयाची कल्पना येऊ शकते व्यक्तीच्या उत्पन्नातील विषमता ज्या दारिद्रयाच्या साहायाने स्पष्ट होते त्या दारिद्रयास सापेक्ष दारिद्रय म्हणतात. सापेक्ष दारिद्रय जगातील अमेरिका व इतर वैभव संपन्न विकशित देशातही आढळून येते या संकल्पनेची व्याख्या आपणांस पुढीलप्रमाणे करता येईल 'समाजाच्या अपभोगातील किंवा उत्पन्नातील अंतर म्हणजे सापेक्ष दारिद्रय होय'.

दारिद्रयाचे कारणे (Causes of Poverty)

भारतीय नियोजन मंडळाने व्यक्त केलेल्या आर्थिक मागासलेपण व उत्पन्नातील विषमता या दोन प्रमुख कारणा व्यतिरिक्त अनेक कारणे दारिद्रयाच्या दुष्टचक्रास कारणीभूत आहेत. पैकी महत्वाचे कारणे पुढीलप्रमाणे

1. परकीय राजवटीचे साम्राज्य :

सन 1947 पर्यंतच्या इतिहासावरून असे स्पष्ट होते की, भारतावर अनेक देशातील राजांनी आक्रमण करून भारताची प्रचंड प्रमाणात लूट केली. मोगलांनी भारतावर 450 वर्षे राज्य केले तर इंग्रजानी जवळपास 350 वर्ष राज्य केले. इंग्रजांनी शेतीच्या विकासाकडे दुर्लक्ष करून भारतातील हस्तकला व कुटीर उद्योग बंद पाडले विविध पध्दतीने भारतातील साधनसामुग्रीची भयानक लुट केली त्यामुळे भांडवल निर्मिती व्हायला पाहिले तेवढी झाली नाही. परिणामतः स्वातंत्र्य प्राप्तीनंतर पाहिजे तेवढया प्रमाणात उत्पादनाचे साधन प्राप्त होऊ शकले नाही त्यामुळे देशातील दारिद्रयात प्रचंड वाढ झाली.

2. वाढती लोकसंख्या :

भारताची लोकसंख्या जलद गतीने वाढत आहे या वाढत्या लोकसंख्येला उत्पादक स्वरूपाचा रोजगार उपलब्ध होत नाही त्यामुळे असंख्य लोक दारिद्रयात जिवन जगत आहेत. म्हणजेच वाढती लोकसंख्या दारिद्रयाचे महत्वाचे कारण आहे.

3. वाढती बेकारी :

आर्थिक विकासाच्या दरापेक्षा लोकसंख्या वाढीचा दर जास्त असल्यामुळे बेकारीत वाढ होत आहे. बेकारीत वाढ झाल्यामुळे दारिद्रयाचे महत्वाचे कारण आहे.

4. आर्थिक विषमता :

स्वातंत्र्यानंतर भारताने मिश्र अर्थव्यवस्थेचा स्विकार केला आणि मिश्र अर्थव्यवस्थेतील साधन सामुग्रीच्या आर्थिक विषमतेची दरी वाढतच गेली त्यामुळे दारिद्रयाचे प्रमाण प्रचंड वाढले आहे.

5. अल्प उत्पादकता :

भारतीय श्रमिकांची व शेतीची उत्पादकता खुपच कमी आहे. श्रमिक व शेतीची उत्पादकता कमी असल्यास अनेक कारणे कारणीभूत आहेत जसे नित्कृष्ट आहार, शिक्षण प्रशिक्षणाचा अभाव, परंपरागत शेती पध्दती , जलसिंचनाच्या अपु-या सोई व भांडवलाचा अभाव इ.कारणामुळे श्रमिकास श्रम करणे व उत्पादकास

उत्पादन करणे परवडत नाही. परिणामतः दारिद्रयाच्या दृष्टचक्रातून त्यामुळे शेतकरी बाहेर पडू शकत नाही.

6. भांडवल निर्मितीचा कमी दर :

भारतीय श्रमिकांचीा व शेतीची उत्पादकता खुपच कमी आहे. श्रमिक व षेतीची उत्पादकता कमी असल्यामुळे गुंतवणुकीचे प्रमाणही कमी आहे. अल्पगुंतवणुकीमुळे उत्पादन व रोजगाराच्या संधी उपलब्ध होत नाहीत परिणामतः दारिद्रयात भर पडते.

7. औद्योगिकरणची मंद गती :

भांडवलाच्या व कुशल कामगाराच्या कमतरतेमुळे औद्योगिकरणाची गती मंद स्वरूपाची आहे. औद्योगिकरणाच्या अभावामुळे रोजगाराच्या संधी उपलब्ध होत नाहीत व दारिद्रयात भर पडते.

8. प्रादेशिक असमतोल :

भारतात प्रादेशिक असमतोल मोठया प्रमाणात आहे. एकीकडे पंजाब, हरियाणा, प. बंगाल इ. राज्यांचा विकास तुलनात्मक दृष्टया जलद झाला आहे. त्यामुळे या राज्यात दारिद्रयाचे प्रमाण कमी आहे. तर दुसरीकडे उत्तरप्रदेश, बिहार, ओरिसा, आसाम, मध्यप्रदेश आणि पूर्वेकडील राज्यांचा आर्थिक विकास तुलनात्मक दृष्टया कमी झाल्याने या राज्यातील दारिद्रयाचे प्रमाण जास्त आहे. थोडक्यात सांगायचे म्हणजे प्रादेशिक असमतोल हा दारिद्रयास कारणीभूत आहे.

9. अयोग्य शिक्षण पध्दती :

भारताची शिक्षण पध्दती दोषयुक्त आहे. स्वातंत्र्यपूर्व काळात इंग्रजांनी सुरू केलेली शिक्षण पध्दती अद्यापावतो जशीच्या तशी सुरू आहे त्यामुळे सध्याच्या शिक्षण पध्दतीत बेकार निर्मितीच्या कारखान्याचे स्वरूप प्राप्त झाले आहे. या कारखान्यातून बाहेर पडणारा युवक एकीकडे कुशल कामगार म्हणुन काम करू शकत नाही तर दुसरीकडे निकृष्ट दर्जाचे काम करण्यास तयार होत नाही. त्यामुळे दारिद्रयास गती प्राप्त झाली आहे.

10. भाव वाढ :

देशातील चलन पुरवठयात सातत्याने वाढ होत असल्यामुळे देशाची खरेदी शक्ती कमी होत आहे त्यामुळे जीवनमानाची पातळी वाढविणे लोकांना कठीण जात आहे. जीवन आवश्यक वस्तूच्या किंमती सातत्याने वाढत असल्यामुळे अल्प दरडोई उत्पन्न असणाऱ्या गटात हालाखीचे जीवन जगावे लागत असल्यामुळे दारिद्रयात भर पडत आहे.

11. नैसर्गिक साधन सामुग्रीचा अपूरा वापर :

देशाच्या नैसर्गिक साधन सामुग्रीत खनिजे, जंगलसंपत्ती,भूमी, औद्योगिक शक्ती साधने इ.चा समावेश होतो. भांडवलाचा अभाव, तंत्रज्ञानाचा अभाव व इतर विविध कारणामुळे नैसर्गीक साधनसामग्रीचा व उत्पन्न साधनांचा पुरेपुर वापर होऊ शकत नाही. परिणामतः राष्ट्रीय उत्पन्नात पाहिजे तेवढया प्रमाणात वाढ होत नाही त्यामुळे दरडोई उत्पन्न कमी होऊन दारिद्रय जन्माला येते.

12. इतर कारणे :

वरील आर्थिक कारणाव्यतिरिक्त दारिद्रयास सामाजिक, सांस्कृतिक व धार्मिक रूढी, परंपरा देखील दारिद्रयात भर पाडत आहे. जसे सण, उत्सव, व्रतवैकल्य, निरक्षरता, संयुक्त कुटुंब पध्दती इ. प्रवृत्तीमुळे विकासाच्या मार्गात अडथळा निर्माण होऊन दारिद्रयाच्या रोपटयाला खतपाणी मिळत आहे.

दारिद्रयाचे भारतीय अर्थव्यवस्थेवर होणारे परिणाम :

भारतीय अर्थव्यवस्था दारिद्रयाच्या दृष्ट चक्रात अडकल्यामुळे अर्थव्यवस्थेतील विविध घटकांवर या संकल्पनेचे विपरीत परिणाम होत आहेत. या परिणामाचे विश्लेषण खालील प्रमाणे

1. उत्पादन वाढीवरील परिणाम :

दारिद्रयामुळे अन्न, वस्त्र, निवारा या मुलभूत गरजा कशा भागवता येतील हा यक्ष प्रश्न असलेल्या जनतेकडून उत्पादन वाढीची अपेक्षा करणे कितपत योग्य आहे यामुळे वाढविण्याच्या ऐवजी घटत असून उत्पादन वाढीवर दारिद्रयाचा विपरीत परिणाम होत आहे.

2. रोजगारावरील परिणाम :

साधन सामुग्रीचा अपुरा वापर, भांडवलाचा अभाव नव नविन तंत्रज्ञानाचा अभाव इ. कारणामुळे दारिद्रयाचा रोजगारावर प्रतिकूल परिणाम होत आहे. त्यामुळे देशाच्या विकासाची गती खुंटली आहे.

3. उत्पन्न वाढीवर परिणाम :

लोकसंख्या वाढीबरोबर विकासात वाढ होत नसल्यामुळे बेकारीत वाढ होऊन उत्पादन व उत्पन्नात घट होत आहे. उत्पन्नातील घटीमुळे दारिद्रयात वाढ, दारिद्रयातील वाढीमुळे विकासाच्या अभाव असे चक्र निर्माण होऊन उत्पन्न वाढीवर दारिद्रयाचा विपरीत परिणाम होत आहे.

4. बचतीवर परिणाम :

मुलभूत गरजा भागवता येत नाही तिथे बचतीचा प्रश्नच उद्‌भवत नाही परिणामतः उत्पादन व उत्पन्नात घट होऊन दारिद्रयाचा बचतीवर विपरीत परिणाम होतो.

5. गुंतवणुकीवरील परिणाम :

दारिद्रयाचा गुंतवणुकीवर विपरीत परिणाम होत आहे. दारिद्रय, बेकारी, व आर्थिक विषमतेमुळे उत्पादन, उत्पन्न व रोजगार निर्मितीस खिळ बसली आहे. परिणामतः देशाची आर्थिक प्रगती खुंटली आहे.

अशा प्रकारे दारिद्रयाचे उत्पादन, उत्पन्न, रोजगार, बचत व गुंतवणुकीवर विपरीत परिणाम होत असल्यामुळे देशाला महासत्ता बनविण्याचे स्वप्न अधुरे राहत आहे.

सारांश : (Abstract)

भारताने तंत्रज्ञानात मोठी झेप घेऊन हरित क्रांतीपासून मंगळ यानापर्यंतचा जगाला थक्क करणारा प्रवास करूनही भारताला दारिद्रयासारख्या समस्येचे भारतीय अर्थव्यवस्थेतून समूळ उच्चाटन करण्यात मात्र अद्यापपावेतो यश प्राप्त झालेले नाही याला अनेक कारणे कारणीभूत आहेत.जसे काळया पैशाचे प्रमाण, दारिद्रय निर्मूलन योजनेतील भ्रष्टाचार, नैसर्गिक साधनसामुग्रीचा अपुरा वापर इ. कारणांमुळे दारिद्रयात घट होण्याऐवजी वाढ होत आहे. भारतीय अर्थव्यवस्थेतील दारिद्रयाचे समूळ उच्चाटन करायचे असेल तर कृषि क्षेत्राचा विकास करुन शेतक–यांच्या आत्महत्येचे समूळ उच्चाटन करणे गरजेचे आहे तसेच भारताने तंत्रज्ञानात उंच भरारी घेवून नवीन पिढी इंटरनेटशी जोडून रोजगार उपलब्ध करुन दिला तर भारतीय युवा पिढी भारतीय अर्थव्यवस्थेतील दारिद्रयाचे समूळ उच्चाटन करुन भारताचेच नव्हे तर जगाचे भवितव्य घडवू शकते.

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IMPORTANCE OF ICT IN EDUCATION

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Abstract
*This paper is a mere attempt to present a glimpse of meaning of ICT, its importance & its mandatory need for education, which is indispensable.ICT stands for INFORMATION & COMMUNICATION TECHNOLOGY .These technologies include:**1)Computers***
2) The Internet
3) Broadcasting technologies (radio and Telephone)
4) Telephony
One of the many challenges facing developing countries today is that of preparing their societies and governments for globalization and the information and communication revolution. Policy-makers, educationists, non-governmental organizations, academics, and ordinary citizens are increasingly concerned with the need to make their societies competitive in the emergent information economy. Globalization and innovations in technology have led to an increased use of ICTs in all sectors - and education is no exception. Uses of ICTs in education are widespread and are continually growing worldwide. It is generally believed that ICTs can empower teachers and learners, making significant contributions to learning and achievement. Of the teachers interviewed on the effectiveness of ICT in education majority of them felt that introduction and use of ICT adequately will be extremely effective in children's learning and achievement. However, current research on the impacts of ICTs on student achievement yields few conclusive statements, pros or con, about the use of ICTs in education. Studies have shown that even in the most advanced schools in industrialized countries, ICTs are generally not considered central to the teaching and learning process. However, there appears to be a mismatch between methods used to measure effects and the type of learning promoted. Standardized testing, for example, tends to measure the results of traditional teaching practices, rather than new knowledge and skills related to the use of ICTs. It is clear that more research needs to be conducted to understand the complex links between ICTs, learning, and achievement.

Introduction

To accurately understand the importance of ICT in Education there is need to actually understand the meaning of ICT.ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a ―diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.‖ ICT permeates the business environment, it underpins the success of modern corporations, and it provides governments with an efficient infrastructure. At the same time, ICT adds value to the processes of learning, and in the organization and management of learning institutions. The Internet is a driving force for much development and innovation in both developed and developing countries. Countries must be able to benefit from technological developments. To be able to do so, a cadre of professionals has to be educated with sound ICT backgrounds, independent of specific computer platforms or software environments. Technological developments lead to changes in work and changes in the organization of work, and required competencies are therefore changing. Gaining in importance are the following competencies:

- critical thinking,
- generalist (broad) competencies,
- ICT competencies enabling expert work,

- Importance Of ICT In Education making,
- handling of dynamic situations,
- working as a member of a team
- Communicating effectively.

In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and nonformal settings. But ICTs are more than just these technologies; older technologies such as the telephone, radio and television, although now given less attention, have a longer and richer history as instructional tools. For instance, radio and television have for over forty years been used for open and distance learning, although print remains the cheapest, most accessible and therefore most dominant delivery mechanism in both developed and developing countries.

The followings are the aim and objectives of ICT implementation in education: 1) To implement the principle of life-long learning / education. 2) To increase a variety of educational services and medium / method. 3) To promote equal opportunities to obtain education and information. 4) To develop a system of collecting and disseminating educational information. 5) To promote technology literacy of all citizens, especially for students. 6) To develop distance education with national contents. 7) To promote the culture of learning at school (development of learning skills, expansion of optional education, open source of education, etc.) 8) To promote the culture of learning at school (development of learning skills, expansion of optional education, open source of education, etc

ICT and Teacher Training

a) Teachers are no longer dispensers of knowledge but proactive facilitators.

b) Redefining the role of the teacher in the new information age.

c) The quality of teachers as a predictor of student learning therefore the importance of teacher training is heightened- in this light what is the role of ICT as a tool facilitating teacher training Vikramshila Education Resource Society Shikshak Sammelan 2009, ICT for Quality Education.

d) Bringing teachers to ICT rather than taking ICT to teachers- relevance in developing nations.

Many teachers are reluctant to use ICTs, especially computers and the internet. Some of the reasons for this reluctance include: poor software design, Skepticism about the effectiveness of computers in improving learning outcomes, lack of administrative support, Increased time and effort needed to learn the technology and how to use it for teaching, The fear of losing their authority in the classroom as it becomes more learner-centered.

Conclusion

Therefore this paper is an attempt to present the important issues that must be addressed by both preservice teacher‘s education and in-service teacher professional development programs if schools and other educational institutions are to fully exploit the potential of computers and the Internet as educational tools. In terms of using internet and other ICT as a resource for lesson preparation, most of the teachers interviewed, admitted to never or rarely using it, while very few used the internet to gather information sporadically or regularly. The teachers particularly felt that they had both access and training inadequacy and hence were unable to utilize internet and other facilities. More teachers were comfortable however, with using computers as an individual than as a teacher. A positive find is that all those teachers who are not well versed with the computer and other technology, expressed keen interest in undergoing training for the same. They felt that if trained, they would be in a position to make use of resources available in the school.

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IMPACT OF GOODS AND SERVICES TAX

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Abstract

The word tax is derived from the Latin word 'taxare' meaning to estimate. Tax policies play an important role on the economy through their impact on both efficiency and equity. 85 percent of the revenue of state governments is generated from the indirect taxes on goods and services and sales tax alone accounts for 61% of the total revenue. Introduction of state level value added tax in 2005 led to uniform tax rates and eliminated cascading tax rates but it is still a step towards more comprehensive reforms as that of GST. More than 150 countries have implemented GST so far. It would be interesting to understand why this proposed GST regime may hamper the growth and development of the country. The proposed GST structure is likely to succeed only if the country has a strong IT network. It is a well-known fact that India is still in the budding state as far as internet connectivity is concerned.

Keywords*: Indian Economy, Economic growth, International market, communication E-commerce, business, Advantages of GST, Type, GST Rates, Process and GST Bill.*

Introduction: The Goods and services tax was launched at midnight on 1st July, 2017 by the Former president of India, Pranab Mukherjee and the Prime Minister of India Narendra modi GST is a kind of tax imposed on sale, manufacturing and usage of goods and services. Goods and Services Tax is applied on services and goods at a national level with a purpose of achieving overall economic growth. The GST tax more than 150 countries have implemented in the world. An idea of GST in India was mooted by Vajpayee government in 2000. The constitutional amendment passed by the Loksabha on 6th May, 2015 but and is yet to be ratified by the Rajyasabha.GST is a comprehensive tax levy on manufacturing of goods and services at a national level.

The GST Tax Bill, also referred to as the constitution (122 Amendment) Bill, 2014. GST will be an indirect tax at all the stages of production to bring about uniformly in the system. On bringing GST into practice would be merger of Central and State taxes into a single tax payment. It would also enhance the position of India in both domestic as well as international market. Communication is considered to be necessity and one cannot without communication. Country Australia France Canada Germany Japan Singapore Sweden New Zealand GST 10% 19.6% 5% 19% 5% 7% 25% 5%, There is GST or VAT, which means taxes for goods and services in more than 150 countries GST The proposed regime seems to ignore the emerging sector of e-commerce. GST will be a good reason to achieve the goal of simplifying India's indirect tax regime to eliminate cascading effects in the supply chain to the level of the final consumer only when all these indirect taxes are fully included in the GST.

What is GST? : GST stands for **Goods and Services Tax**. It is a kind of tax imposed on sale, manufacturing and usage of goods and services. Goods and Services Tax is applied on services and goods at a national level with a purpose of achieving overall economic growth. GST is particularly designed to replace the indirect taxes imposed on goods and services by the Centre and States.

Definition (GST): Goods and Services Tax can be defined as a kind of Value Added Tax imposed by on various goods and services by different countries. The tax charged on goods and services may differ from country to country. Goods and services tax is imposed to collect revenues for the government. This tax is paid by the consumers of goods and services and collected and forwarded to the government by the business entities.

How GST Works? : GST proposes to abolish the varying levels of taxation between States, and consider the country as a single whole organism when it comes to taxes on goods and services instead of as a segmented creature. All the sundry taxes will be clubbed into just 2 levels – Central GST and State GST.

The consumer who buys the product will have to pay only the GST charged by the last dealer in the supply chain, as everyone else would have the opportunity to set-off the taxes paid at the previous stages. GST will also prevent multiple taxes occurring on certain goods and ensure transparency with regards to the rate of taxation and the total amount that goes to the government as taxes on a product. Currently, a consumer is not aware of the total amount of taxes s/he pays for a product, apart from VAT which is mentioned on the bill.

Here's a list of taxes that the GST will likely replace**:** Service Tax , Cess and surcharges related to supply of goods or services, Central Excise Duty, Excise Duties on medicinal and toilet preparations, Additional Excise Duties on textiles and textile products, Additional Excise Duties on goods of special importance. The rates being discussed as of now hover around 18%, which may be higher than the current system for certain goods and services.

Goods and Services Tax origin in India: In India, the Goods and Services Tax Bill was officially introduced in 2014 as The Constitution (One Hundred and Twenty-Second Amendment) Bill, 2014. The GST Bill in India proposes the implementation of nationwide Value Added Tax on sale, manufacturing and the use of different goods and services. The Goods and Services Tax act is expected to be operative in India from April, 2016. Arun Jaitley - the Finance Minister of India announced The Constitution (122nd Amendment) Bill, 2014 or the Goods and Services Tax in LokSabha on 19 December 2014. The Parliament passed the bill on 6th May, 2015, after it received 352 votes for and 37 against it.

Current Taxation System: GST is a kind of indirect tax. Currently, Indian consumers have to pay indirect tax on goods and services such as Value Added Tax, Service Tax, Excise Duty, Customs Duty, etc. Under the current system, each State has a right to levy their own tax on the goods coming into their dominion for sale and consumption, while the Centre levies taxes on manufacture of the goods. All these direct taxes levied on the traders are passed down to the consumer.

The taxes levied by the State and Central Governments are given in the table below:

Central Government	State Government	Local Administration
Excise duty or Centre VAT service Tax, Income-Tax, Custom Duty, Central sales Tax.	Value Added Tax, Sales Tax, Entertainment Tax, Stamp Duty, Road Toll , Luxury Tax, Octroi Entry Tax.	Property Tax

Of these, excise duty/Central Vat, customs duty, service tax, central and state sales tax, VAT, Octroi, entry tax, road toll, luxury tax and entertainment tax are applicable to goods and services.

The current system is burdened with multiple taxation on the same object no way to offset. The taxes already paid at each stage of production-retailing-consumption. If Central Vat and service tax are paid at the manufacturing level, these can be offset against future payments, but none of the other taxes paid at any stage can be reclaimed.

Advantages of GST:

1. This is a federal law, which means that the states will no longer have the right to make new laws on taxation towards goods and services.
2. It simplifies the tax system and makes it easier to understand as well as cheaper to implement at various levels.

3. Tax evasion at various stages will be eliminated as tax offsets can be collected only if taxes have been paid originally.
4. It will be cheaper to buy input goods and services for production from other states.
5. The current supply and distribution chain may undergo a change with a change in taxation system that does away with excise and customs duties.
6. The consumer will get the end-product at cheaper rates because of elimination of multiple taxes and the tax cascade.
7. As of now, petroleum and petroleum products have been kept out of the GST regime until further notice.
8. Sale of newspapers and advertisements are also likely to fall under the GST regime, allowing the government to increase its revenue considerably.
9. While there will be central GST and state GST, the tax applicable on goods and services being exported and imported between states in India would fall under an Integrated GST (GST) system in order to avoid conflict of dominion.
10. Prices of goods are expected to reduce in the long run as the benefits of less tax burden would be passed on to the consumer.

Disadvantages of GST:

1. GST is not good news for all sectors, though. In the current system, many products are exempted from taxation. The GST proposes to have minimal exemption list.
2. GST is not applicable on liquor for human consumption. So alcohol rates will not get any advantage of GST.
3. Stamp duty will not fall under the GST regime and will continue to be imposed by states.

GST Bill Approval Process:

The Constitution Amendment Bill for Goods and Services Tax (GST) was cleared by the RajyaSabha on August 3, 2016. This Bill sanctions a modification in the Constitution to allow both the Centre and the States to levy goods and services tax.

The Bill was first introduced in the LokSabha in March 2011 and reports were submitted around it regularly. However, in 2014, the Bill lapsed as the LokSabha's ongoing term ended. The Bill was passed by the LokSabha on May 6, 2015, and further reports were commissioned and presented.

After RajyaSabha's clearance of the Bill, the LokSabha will ratify the Bill again. At least 15 other states also have to support the Bill to go forward with its implementation as an Act. Once the ratifications are received, the President will constitute a GST Council comprising the Finance Minister, Minister of State in charge of Revenue, Minister in charge of Finance/Taxation, and other ministers nominated by states. This Council will make recommendations on the taxes to be absorbed and done away with, exemptions to GST and their threshold, laws governing the GST levies, actual GST rates and discounts, etc.

Goods and Services Tax Bill:

The Goods and Services Tax Bill is officially known as The Constitution (122 Amendment) Bill, 2014 which is formulated to create a pan-India tax system and end the number of multiple taxes charged by the Centre and the States on various goods and services. The key points of the GST bill are given below:

1. It is an indirect, uniform tax that is levied on the goods and services throughout a particular country. Several developed countries add tax on sale, manufacture and consumption using single comprehensive tax.

2. Surcharge on supply of goods, sales, and special ad-on duty of customs, add-on duties of customs and excise and central excise duty would be replaced by Central Taxes GST.
3. Entertainment tax, entry tax, purchase tax, central sales tax, VAT, etc. would be replaced by State Tax GST.
4. The primary objectives of GST are eliminating the excessive taxation.
5. The 2014 bill deleted the 2011 bill provision that imposed certain restrictions on the states on taxation of the products that are important for inter-state commerce and trade.

Goods and Services Tax Act:

Goods and Services Tax act is one of the most remarkable tax reforms that has taken place in India so far. The GST act, which is also known as The Constitution (One Hundred and Twenty-Second Amendment) Bill, 2014, mainly focuses on changing the Constitution of India. Main features of the Goods and Services tax in India:

1. The Goods and Services Tax will include Central Indirect taxes such as Excise Duty, Service Tax, Special Additional Duty of Customs, Countervailing Duty, Central Surcharges and Cess as long as they are related to the supply and consumption of goods and services.
2. It will also include State Value Added Tax or Sales Tax, Entertainment Tax, (excluding the tax charged by the local bodies), Entry and Octroi tax, Central Sales Tax (taxed by the Centre and collected by the State Government), Purchase Tax, Luxury tax, Taxes on betting, lottery and State Cess and surcharges involved in the supply and consumption of services and goods.
3. Inclusion of the concept of 'declared goods of special importance' as per the Indian Constitution.
4. Will levy integrated Goods and Services Tax on inter-State transactions of goods and services.
5. Will levy additional tax of 1% on supply of goods in inter-State trade which will be collected by the Government of India for a period of two years and will be allocated to the states from where the supply comes.
6. Petroleum and petroleum products and alcohol have been kept out of the reach of GST.

A Goods and Services Tax Council will be created to address the issues relating to goods and services tax and give recommendations to the Union and the States on areas such as rates, exemption list and threshold limits.

GST Rates: The GST council in 23rd meeting on November 10, 2017 recommended Widespread changes in the Goods and Services Tax. The council has decided to keep the highest 28% tax on luxury and sinful items as a result 177 items have been shifted to the 18% bracket. GST on many items has also been reduced. The government has categorized items in five major slabs- 0%, 5%, 12%, 18% and 28%. Here is the updated list of goods and services taxed under various

GST slabs: 1. No tax (0%) Goods : No tax will be imposed on items like jute, fresh meat, fish chicken, eggs, milk, butter milk, curd, natural honey, fresh fruits and vegetables, flour, besan, bread, prasad, salt, bindi. Sindoor, stamps, judicial papers, printed books, newspapers, bangles, handloom, Bones and horn cores, bone grist, bone meal, etc.; hoof meal, horn meal, jaggery, Salt - all types, Kajal, Children's' picture, drawing or coloring books, Khadi Village Industries stores, Clay idols, brooms, etc.

Services: Hotels and lodges with tariff below Rs 1,000, grandfathering service have been exempted under GST. Rough precious and semi-precious stones will attract GST rate of 0.25 per cent, admission to "protected monuments". **0.25%:** Rough industrial diamonds including unsorted rough diamonds to face 0.25% instead of 3% GST.

5% : **Goods** -Items such as fish fillet, apparel below Rs 1000, packaged food items, footwear below Rs 500, cream, skimmed milk powder, branded paneer, frozen vegetables, coffee, tea, spices,

pizza bread, rusk, sabudana, kerosene, coal, medicines, stent, lifeboats, Cashew nut, Cashew nut in shell, Raisin, Ice and snow, Bio gas, Insulin, Agarbatti, Kites, Postage or revenue stamps, stamp-post marks, first-day covers, Branded food, walnuts, dried tamarind, roasted gram, Dhoop batti, Corduroy fabric, saree fall, Paper mache items,Oil cakes, Paper waste or scrap; Real Zari; Cullet or other waste or scrap of Glass..

On January 2018, these items were moved to :

5% GST Slab : Goods- LPG supply to household domestic consumers by private LPG distributors, Tailoring service , Tamarind Kernel Powder , Mehendi paste in cones , Scientific and technical instruments , Basketware and wickerwork Velvet fabric , Cigarette filter rods.

Services: All restaurants, restaurants of hotels with room tariff of less than Rs 7,500, Food parcels, Textile job work, Transport services (Railways, air transport); Supply of e-waste.

12% : Goods - Apparel above Rs 1000, frozen meat products , butter, cheese, ghee, dry fruits in packaged form, animal fat, sausage, fruit juices, Bhutia, namkeen, Ayurvedic medicines, tooth powder, agarbatti, colouring books, picture books, umbrella, sewing machine, cell phones, Ketchup & Sauces, All diagnostic kits and reagents, Exercise books and note books, Spoons, forks, ladles, skimmers, cake servers, fish knives, tongs, Spectacles, corrective, Playing cards, chess board, carom board and other board games, like Cotton quilts(quilts exceeding Rs 1000 per piece),Statues, statuettes, pedestals, ceramic articles, porcelain items, ornamental articles, bells, gongs, non-electric of base metal, animal carving material, synthetic filament yarn, such as nylon, polyester, acrylic, etc; artificial filament yarn.

8% to 12% tax shifted (10-11-2017) Condensed milk, Refined sugar and sugar cubes, Pasta, Curry paste, mayonnaise and salad dressings, mixed condiments and mixed seasoning, Diabetic food, Medicinal grade oxygen, Printing ink, Hand bags and shopping bags of jute and cotton, Hats (knitted or crocheted), Parts of specified agricultural, horticultural, forestry, harvesting or threshing machinery, Specified parts of sewing machine, Spectacles frames, Furniture wholly made of bamboo or cane

12% GST moved On January 18, 2018 : **Goods** - Sugar boiled confectionery , Drinking water packed in 20 liter bottles ,Drip Irrigation system Fertilizer grade Phosphoric acid , Bio-diesel , Bio-pesticides ,Bamboo wood building joinery , Mechanical Sprayer

Services – State-run lotteries, Non-AC hotels, business class air ticket, fertilizers, Work contracts. It is said that GST would impact negatively on the real estate market. It would add up to 8% to the cost of new homes and reduce demand by about 12%.

18% : Goods -Most items are under this tax slab which include footwear costing more than Rs 500, Trademarks, goodwill, software, Biscuits (All categories), flavored refined sugar, pasta, cornflakes, pastries and cakes, preserved vegetables, jams, sauces, soups, ice cream, instant food mixes,, tissues, envelopes, tampons, note books, steel products, printed circuits, camera, speakers, Headgear and parts thereof, Aluminum foil, Electrical Transformer, Rice rubber rolls for paddy de-husking machine, Kitchen gas lighters, Modeling paste for children amusement.

28% to 18% moved 10-11-2017 Goods - Wire, cables, insulated conductors, electrical insulators, electrical plugs, switches, sockets, fuses, relays, electrical connectors, Electrical boards, panels, consoles, cabinets etc for electric control distribution, Particle/fiber boards and ply wood. Article of wood, wooden frame, paving block ,Furniture, mattress, bedding and similar furnishing, Trunk, suitcase, vanity cases, brief cases, travelling bags and other hand bags, cases ,Detergents, washing and cleaning preparations, personald eodorants, bath preparations, perfumery, cosmetic or toilet

preparations, room deodorizer ,Perfumes and toilet waters, Glass of all kinds and articles thereof such as mirror, safety glass, sheets,

18% slab moved 18-1-2018 : Goods- Second-hand medium and large cars and SUVs Bio-fuels powered buses ,The admission to theme parks, water parks etc Cigarette filter rods Services ; Restaurants in hotel premises having room tariff of Rs 7500 and above, telecom services, IT services, branded garments and financial services, Outdoor catering .

28%- Goods -In total 50 luxury and sin products will be taxed at 28% which includes Bidis, molasses, pan masala, aerated water, paint, sunscreen, wallpaper, ceramic tiles, water heater, dishwasher, weighing machine, washing machine, ATM, vending machines, vacuum cleaner, automobiles, motorcycles, aircraft for personal use . Services - Private-run lotteries authorized by the states, race club betting, and cinema will attract tax 28 per cent tax slab under GST.

Current Tax Structure

Example of Car	**Existing**	**GST**	
Cost of Manufactures	5,00,000	5,00,000	
Excise + Infrastructure @ 10%	50,000	CGST@11%	55,000
VAT 12%	66,000	SGST@11%	55,000
Dealer Invoice	**6,16,000**		**6,10,000**
Dealer Cost (5,00,000+50,000)	**5,50,000**	**5,00,000**	
+ Margin @ 10%	55,000	50,000	
Sale price for Dealer(5 L+50 T+55 T)	6,05,000	5,50,000	
VAT 12@		CGST @11%	60,500
	72,600	SGST @11%	60,500
Price to Customer	**6,77,000**		**6,71,000**
Dealers Tax Liability Net **VAT/GST** after set-off (72,600-66,000)	6,600	11,000	
Saving to Consumer 6,600 @ 1%			

Impact of GST on the Indian Economy: GST the biggest tax reform in India founded on the notion of "one nation, one market, one tax" is finally here. The moment that the Indian government was waiting for a decade has finally arrived. The single biggest indirect tax regime has kicked into force, dismantling all the inter-state barriers with respect to trade. The GST rollout, with a single stroke, has converted India into a unified market of 1.3 billion citizens.

The rollout has renewed the hope of India's fiscal reform program regaining momentum and widening the economy. Then again, there are fears of disruption, embedded in what's perceived as a rushed transition which may not assist the interests of the country.

Will the hopes triumph over uncertainty would be determined by how our government works towards making GST a "good and simple tax". The idea behind implementing GST across the country in 29 states and 7 Union Territories is that it would offer a win-win situation for everyone. Manufacturers and traders would benefit from fewer tax filings, transparent rules, and easy bookkeeping, consumers would be paying less for the goods and services, and the government would generate more revenues as revenue leaks would be plugged.

Conclusion: More than 150 countries have implemented GST. The government of India should study the GST regime set up by various countries and also their fallouts before implementing it. At the same time, the government should make an attempt to insulate the vast poor population of India against the likely inflation due to implementation of GST. Success of any tax reform policy or managerial measures depends on the inherent simplifications of the system, which leads to the high conformity with the administrative measures and policies. One of the largest tax reform measures in India The tax on goods and services (GST) is ready to consolidate the national economy and promote overall growth.

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HISTORY OF LIS EDUCATION IN INDIA

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Abstract
LIS education provides skillful training for professionals in the field of library information science. Therefore it is very essential for the development of every library and every library professional in the world. This article deals with LIS education in India, what is LIS education, development of LIS education outside the India, LIS education in India, first course of library science in India, certificate, diploma, and training courses in India, post graduate diploma courses in India
Keywords: *LIS education, LIS education in India*

What is LIS education?

Education is a basic need for every human being in the world. The term 'education' has been interpreted by different people in different ways. Some people refer to it as formal schooling or to lifelong learning. Some others refer to it as acquisition of knowledge, skills and attitudes. Some say that education is nothing, but training of people's mind in a particular direction to bring about desired changes.

"Education in the narrow sense does not include self culture and the general influences of one's surroundings, but only those special influences which are consciously and designedly brought to bear upon the youngster by the adult persons of the community whether through the family, the church or the state." — Thomas Raymont (1906)

Libraries are very important for the development and growth of modern society. This has been strongly realized. In order to satisfy the needs of the users, libraries must develop proper way. In this regard professionals needs education and training. LIS (Library Information Science) education means providing education for a professional career in libraries, the word 'profession' implies: professionalism, prolonged training, and formal education. This type of education wasn't always the case however; it developed as the librarian profession did. In fact, the creation of library schools had a direct impact on making librarianship a professional career in the first place.

Development of LIS Education Outside the India:

The earliest American LIS students were trained under the British apprenticeship system popular in the late eighteenth to early nineteenth centuries. With the increasing industrialization of the 1800s, however, this very limited and highly specific method of training became inefficient to supply librarians for the many new libraries being founded across the US. A new system of training librarians had to be found.

Enter Melville Dewey, who was the most prominent early force in developing librarianship as a profession. After his development of the Dewey Decimal System during his tenure at Amherst College, Dewey founded and became the first president of the American Library Association (ALA). The creation of a professional organization for librarians prompted the creation of the first recognizable library schools. After Dewey was established as the head librarian at Columbia University, the first library school, the School of Library Economy, was opened in January 1887 with two men and seventeen women as its first class. Training took three months, with an internship that lasted up to two years.

The school was later transferred to the New York State Library in Albany after Columbia trustees disagreed with Dewey's inclusion of women in his courses. There, Dewey's vice director, Mary Salome Cutler, added theoretical and cultural aspects of librarianship to what had been a very business-focused curriculum.

The success of this program led to the creation of three additional library schools by 1900: Pratt Institute, Drexel University, and the Armour Institute (which became the Library School at the University of Illinois in 1897). Each school had its own early contribution to the field: Pratt established the first children's librarianship specialization, Drexel's director published the first major texts on reference materials and book selection, and the Armour Institute developed its program into a four-year bachelor degree instead of a certificate. By 1919, there were 15 library programs, most of which awarded a fifth-year bachelor's of library science (BLS) degree after four years of a regular baccalaureate. The MLS was only awarded at Albany. Due to tensions between the ALA and the schools, the library schools formed their own association, the Association of American Library Schools, in 1916.

After the Carnegie Corporation conducted a review on its libraries and found that they had inadequate resources and training, the company commissioned a study on LIS education with particular focus on library schools. The 1923 Williamson Report (headed by C.C. Williamson) profoundly influenced the direction of LIS education. The report advocated librarian training as not simply training, but a professional degree best preceded by a college education. In 1926, the Graduate Library School at the University of Chicago created the first doctoral program in 'library science' and by 1950, most library schools were offering the MLS. The first school to train African-Americans, the Hampton Institute Library School, was established in 1925. It produced some notable graduates, including Virginia Lacy Jones, but was closed due to the Depression's impact on its resources in 1939. It reopened two years later at Atlanta University.

Concerned that LIS education was not theoretical enough, the ALA Board of Education for Librarianship issued standards that required the graduate master's degree as the educational standard in 1951. It formed the ALA Committee on Accreditation in 1956, and these actions spelled the end of other forms of library education besides the graduate schools.

LIS Education in India:

In the early 19th Century, young people learned librarianship by working under the more experienced practitioners. But, gradually the tasks performed by librarians became more complex and more dependent on technology. As a result, the study of library science has moved from the work-setting to professional schools in Universities. The first ever library school was started by Melvil Dewey in USA in 1887 at Columbia College (now Columbia University). In 1889 the programme moved to the New York State Library in Albany when Dewey became the Director there. The success of Dewey's training program and the publication of *Training for Library Service*, a book by the economist Charles Williamson in 1923, led other universities, institutes of technology, and large public libraries to establish their own professional degree programs in library science.

1. First Course of Library Science in India:

In India, The first of librarian the Imperial Library (Now National Library) at Calcutta from 1901-06 in the existence of in service training was initiated by John Macfarlane, as mentioned in some reports. In subsequent years, the training programme was opened to the staff of other libraries and even those interested in librarianship who deal with books and other documents.

i) Baroda School: In 1911, Siyaji Rao Gaikwad (1862-1939), the ruler of Baroda state called the American librarian Mr. William Allenson Borden (1853-1931), a disciple of Melvil Dewey to create a

cadre of men for the newly established libraries in the state library system. In 1912, he initiated the first training school in library education in India. In 1913, another training class for working librarians of town libraries was started. These classes continued even after the departure of Borden.

2. Certificate, Diploma, and Training Courses in India:

i) Lahore School: In 1912, the Punjab University called another librarian Mr. Asa Don Dickinson (1876–1960) from USA. He started the second educational course of three month duration in library science in the year 1915. This happens to be the first university course in India. Mr. Asa Don Dickinson later become the Librarian of Panjab University, Lahore (now Pakistan) during 1915–1916.

ii) Andhra Desa: The Andhra Desa Library Association (founded in 1914) started conducting "training classes for the library workers" at Vijayawadain 1920. The classes covered a module on running adult education classes in addition to library technique.

iii) Mysore State: In 1920, a course for the training of librarians was conducted at Bangalore under the "program of library development" initiated by the then Dewan of Mysore Mr. M. Visweswaraya.

iv) Madras Library Association: A summer school for college librarians and lecturers in charge of college libraries in Madras was held in 1928 and repeated in 1930. The Madras Library Association also organized a regular certificate course in library science from 1929. Then in 1931, University of Madras took up the training course of MALA in 1931 and started offering the course on a regular basis.

v) Andhra University: Andhra University started a certificate course in 1935, which was later abandoned.

vi) Imperial Library, Calcutta*:* The Imperial library, Calcutta started a training class under the supervision of its librarian Mr. K. M. Asudulah in 1935. It was a full time regular Diploma course in librarianship at the Imperial Library, Calcutta (now National Library, Kolkata). It continued till 1946.

3. Post Graduate Diploma courses in India:

i) University of Madras: University of Madras, in 1937, introduced a one year Post Graduate Diploma course in place of the certificate course of three month duration. This was the first P G Diploma in library science in India.

ii) Banaras Hindu University: The second university to start a post graduate diploma course was the Banaras Hindu University in 1942.

iii) Bombay University: University of Bombay initiated a diploma course similar to Banaras Hindu University in 1943.

iv) Government of India's in-Service Training Course: A training course for the staff working in various government organizations was started in 1953. This course was recognized as equivalent to the university diploma courses.

4. Degree Courses

i) Aligarh Muslim University: In 1947, Aligarh Muslim University started B.Lib. Science Course for the first time in the country.

ii) University of Delhi: University of Delhi was the first university to establish a full fledged Department of Library Science in 1946. It also instituted the first post diploma degree course in 1948. In 1949, the structure was changed. The programme of Master of Library Science was introduced as a two year course with the first year leading to Bachelor of Library Science.

In between 1956-59, six new LIS departments were established at Aligarh Muslim University, MS University of Baroda, Nagpur University, Osmania University, Pune University and Vikram University.

iii) Madras University: In 1960, Madras University replaced its full time one year diploma course to B.LibSc. Degree course. By mid 1960, many other universities had fallen in the line of university of Madras following the recommendation of Review Committee Report of UGC in introducing different degree courses.

iv) Government Polytechnique for Women: The Government polytechnique for women, Ambala, Bangalore, Chandigarh, Delhi, Jullandhur, Rourkela started post matric (class X) diploma courses of two years duration in late 1960s.

v) Documentation Research and Training Centre (DRTC): In 1962, Dr. S. R. Ranganathan established Documentation Research and Training Centre at Bangalore. Previously DRTC courses were of 14 month duration which was later on moved to two years programme.

vi) Indian National Scientific Documentation Centre (INSDOC): INSDOC conducted a short term course for Asian Documentalists in 1963. In 1964, it started a one year post graduate course in Documentation and Reprography leading to "Associateship in Documentation and Reprography". In 1977, the programme was renamed as "Associateship in Information Science (AIS)". On September 30, 2002, INSDOC merged with the National Institute of Science COMmunication (NISCOM) and was renamed as National Institute of Science Communication and Information Resources (NISCAIR). At present, it is conducting "Courses in Information Science".

The DRTC and NISCAIR in Delhi concentrate on the training of professionals for special and industrial libraries and information centers. Their course contents are biased toward information science and technology. The programme of these two institutes is a class apart from other similar programmes offered by various institutes.

In India advanced professional education has remained attached to universities, though there are some regional library associations conducting certificate courses of a few months duration and women polytechnics offering post-masters two year diplomas in library science to train paraprofessionals. At present, about 107 institutions, mostly university colleges and polytechnics, have library science education courses. Out of these, the M.Lib.I.Sc. course is being offered by more than 75 universities.

5. Five Year Integrated Course in LIS: In 2010, University of Calcutta introduces five year integrated course in Library & Information Science and thus becomes the first university to launch such course in LIS domain. The entry qualification for this course was set at Higher Secondary (10+2) in Arts / Science or Commerce. Launching of this course will force the learners to choose the LIS by choice and not by chance. It will again help the students to grasp and understand the contents for LIS in a better and exhaustive way.

6. Present Status of LIS Education in India: A few departments and associations provide Certificate Courses in Library and Information Science (CLIS) and Diploma in Library and Information Science (DLIS). The others provide BLISc and MLISc courses. In most of the universities, the prerequisite for admission into the Bachelor or Master degree course in Library and Information Science is 10+2+3 years of education from any faculty (arts, science, commerce etc). The majority of the universities generally conduct two separate courses for the Bachelor's degree followed by the Master of Library and Information Science of one year (or two semesters) duration each. In recent years, some institutions have offered two years of integrated courses of four semester duration. The University of Calcutta went a step ahead and introduced five years integrated course in LIS with entry qualification as 10 +2.

Specialization: Students in most schools of library and information science have the opportunity to develop at least some degree of specialization. Some may take advanced courses in particular library

functions, such as reference work, while others may take courses related to a particular type of library, such as a course in medical librarianship or public librarianship or academic librarianship. In simple, there are many different courses available in LIS. It makes the professionals available to work at all levels of library irrespective of type, structure and function.

Conclusion:

There was initially a technical education that was acquired on the job. Practical work in a library, based on good education in schools, was the only way to train librarians. LIS education as a subject and has been taught at different level in the universities of the world. LIS education provides skillful training for professionals in the field of library information science. Therefore it is very essential for the development of every library and every library professional in the world.

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PRELIMINARY PHYTOCHECMICAL ANALYSIS OF *ISODON NILGHERRICUS* PLANT

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Abstract
Any of various biologically active compounds found in plants are known as Phytochemicals. Lamiaceae family is known for its aromatic plant species and possess various phytoconstituents. Isodon nilgherricus is aromatic plant of Lamiaceae family are annual herb with approximately 1 meter in height. This plant is commonly available and medicinally useful in this geographical area and this study would be foundation for understanding the Phytochemical and therapeutically effectiveness of these varieties. One of such resources is folk medicines. According to literature the leaves of this plant are used against wound by the Kurumba tribes in Nilgiri district ,Tamil Nadu. These plant shows medicinal properties against wound healing. In present study preliminary Phytochemical analysis was carried out and it shows presence of tannin, alkaloid, sterol ,Saponins . It suggest that the Phytochemical properties for curing wound and possess anti microbial property and leads to the isolation of new novel compounds.

Figure: 00 References: 16 Tables: 01
KEYWORDS – Phytochemicals, Isodon nilgherricus, Kurumba , Nilgiri

Introduction-

Many members of the Lamiaceae family are widely cultivated owing not only there aromatic qualities but also their ease of cultivation. Lamiaceae plants are well known for their therapeutic action. This may be due to essential oils invariably present in them. Medicinally important plants of Lamiaceae include Tulsi, pepper mint, thyme, Coleus, Spearmint and many more.

Genus Plectranthus which is also belongs to Lamiaceae , constitute about 300 species of herbs and shrubs native to tropical region. The most frequently cited use of Plectranthus species is for their medicinal properties which accounts for over 85% of all uses(Lukhoba et al 2006). Although the genus is known for its rich diversity and medicinal properties.

Isodon nilgherriucus (Benth) locally known as Sone-gida in Tamil Nadu by Kurumba tribal's in Nilgiri hills used for its ethno-botanical use and medicinal use for wound healing. the Phytochemical analysis refers to the extraction screening and identification of the medicinally active substances found in plants. Some of the bioactive compounds that can be derived from the plants are tannins and phenlos, flavonoid,alkaloids.

Material and Methods

1) **Collection of Plant Material** - Excursion were carried out to different parts of the study area. Plants were collected from the Nilgiri hills, Ooty TamilNadu and identified with the help of floras referring to research floras and expert opinions. Herbarium were made and authenticated in the Botanical Survey of India, Southern region, Coimbator. The voucher specimen was deposited in the Herbarium, BSI, Coimbator (BSI/SRC/5/23/2017/5/1637).
2) **Preparation of Extract** – The collected plant material were brought to the laboratory washed in tap water and shed dried for a one week then made into powdered and stored in clean plastic container till further use. Powdered material extracted in 5 different solvents like Water ,Ethanol, Acetone,Chloroform and Petroleum ether by Soxhlet apparatus and dried material stored and use for further experiment.
3) **Preliminary Phytochemical screening** -

The preliminary phytochemical screening of crude extract were subjected using different solvents of Petroleum Ether, Chloroform, Acetone Ethanol and Water for different test for identification of phytochemicals as Alkaloid, Carbohydrates,Tannins,Resins,Flavonoids Protein, Amino acids, Saponins and Coumarin.

1) Test for Alkaloids:

- Wagner's Test- 1ml of plant extract 3-5 drops of Wagner's reagent is added and formation of reddish brown precipitation
- Mayer's Test – 2 to 3ml of filtrate in a test tube followed by addition of Mayer's reagent - A white precipitate formed.
- Dragendroff"s reagent – 2 to 3ml of filtrate was taken in test tube. To this few drops of Dragendroff's reagent was added. Orange brown precipitate formed.

2) Test for Carbohydrates

- Molisch's test- 1ml of plant extract + 3 to 4 drops of Molisch's reagent is added +1ml of concentrated sulphuric acid. Formation of a violet ring indicates the presence of Carbohydates.

3) Test for glycosides

- Keller Kiliani Test - 1ml of extract+2 to 3 drops of ferric Chloride solution + 1ml of glacial Acetic acid+1ml of concentrated Sulphuric acid.

  Formation o brown ring at the junction of two liquids indicates the presence of glycosides.

4) Test for Flavonoid

- Alkaline reagent test -5ml of plant extract +3 to 5 drops of 20%NaoH formation of yellow colour observed, become colourless on addition of 2 drops of dilute HCl.

5) Test for Amino acid

- 5ml of plant extract + 2 to 3 drops of Ninhydrin solution was added and kept in boiling water bath for 1 to 2 minutes formation of purple colour indicates Amino Acid is present.

6) Test for proteins

- Biuret Test – 5ml of plant extract + few drops of 4% NaOH + few drops of 1% $CuSO_4$
- Millon's Test – 5ml of plant extract was taken in test tube + few drops of Millon's reagent. The solution was boiled – Brick red colour

7) Test for Tannin and Phenol

- Ferric Chloride test – 5ml of plant extract + 2 to 3 drops of Ethanol + Shake well +1ml of 5%Ferric Chloride solution – Deep blue colour

8) Test or Terpenoid

- Salkowski's test - 5ml of Plant extract +2ml of Chloroform+ 3to 5 drops of concentrated of Sulphuric acid in it - reddish then brown precipitation found.

9) Test for Quinones-

- In 5ml of plant extract 3ml of concentrated HCl added yellow precipitation occurred.

10) Test for Resin-

- Turbidity observed on addition of 5ml water in 10 ml of plant extract

11) Test for Coumarin

5ml of Plant extract of 10%NaOH added in 5ml of plant extract, Yellow colour observed.

12) .Test for Saponins-

- Frothing test- 0.5gms of an of an plant extract was taken in test tube and shaken with 5ml of distilled water – formation of stale forms indicated the presence of Saponins

Observation table 1

Phytochemical qualitative analysis of *Isodon nilgherricus* (Benth) plant

Sr. No.	Name of Test	Aqueous	Ethanol	Acetone	Chloroform	Methanol	Ether
1	Alkaloid	++	+	+	+	-	+
2	Carbohydrate	+	+	-	-	-	-
3	Tannins	++	-	+	-	-	-
4	Phenols	++	+	+	+	+	+
4	Proteins	++	++	-	-	-	-
5	Sterol	++	_	+	+	+	+
6	Saponins	++	+	-	++	+	
7	Flavonoids	++	+	+	++	+	+
8	Glycosides	+	+	++	++	-	-
9	Amino acid	++	+	+	_	_	_
10	Quinone	_	_	+	_	+	-
11	Resin	++	_	+	+	+	-
12	Coumarin	++	_	+	+	+	_

Result and Discussion :

In the present study, *Isodon nilgherricus* shows presence of carbohydrate in aqueous, ethanol, solvents only and as it absent in acetone, chloroform,methanol and ether solvent extract. Tannins, present only in aqueous and in acetone solvent extract. Phenol is preent in all solvent extracts. Sterol is present in aqueous and acetone solvent extract except ethanol,chloroform solvent extract. On the other hand resin and coumarin is present in all solvents except ethanol and methanolic solvent extract. Alkaloid is present in all solvent extract except methanolic solvent extract. This plant contains a various phyochemicals as it can be definitely prove the good source for the treatment of allergy as well for antiseptics and other diseases.

Conclusion :

The Phytochemical qualitative analysis of *Isodon nilgherricus* showed positive reaction towards an aqueous extract as most of the phytochemicals was present in it. It is a good source of alkaloid, tannin, sterol,saponins,flavonoids, glycosides, resin and coumarin. Alkaloid and tannins are present in aqueous and ethanolic solvent extract while absent in acetone, chloroform and in petroleum ether solvent extract.

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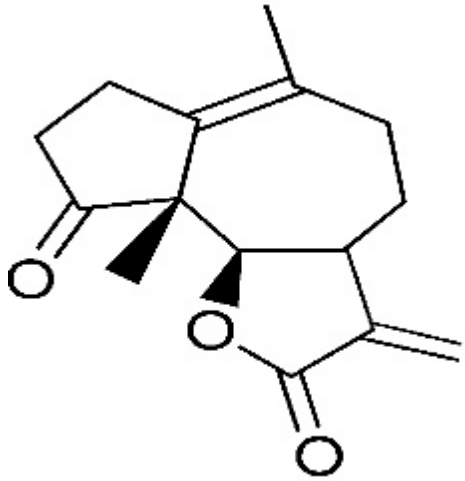
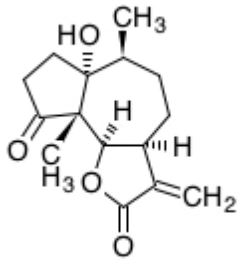
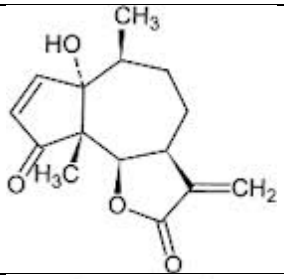
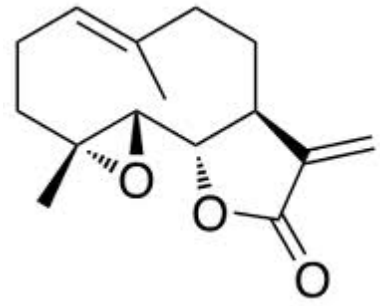
EFFECT OF PARTHENIUMEXTRACTAS HERBICIDE ON SOME ORNAMENTAL AND MEDICINAL PLANTS

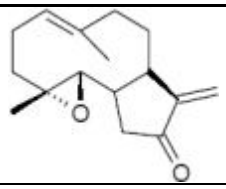
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Abstract
Parthenium hysterophorus, members of the Asteraceae family .Itis a noxious weed native of America. This weed is spread all over Asia, Africa and Australia. It is considered to be a cause of a spectrum of clinical patterns: allergic respiratory problems, contact dermatitis, mutagenicity in human and livestock. Its allelophathic nature can drastically reduced the crop production and aggressive dominance of this weed threatens biodiversity. In India most of the medicinal plants are badly affected by Parthenium. Attempts to control spread of the plant have so far not been successful. First occurrence of parthenium in India is believed to be in 1956.However some reports trace its history of occurrence about one and half century older than as reported. Among the allelopathic weeds, Partheniumhysterophoruslinn.isnow recognized as a cause of serious agricultural problems due to its invasion of croplands and subsequent lowering of crop yield. Chemical control, biological control, mechanical controls are tried to irradicate this weed. But the success of irradiacaion is very limited.
Key words:-Parhenium, sesquiterpenelactone, parthenin, allelochemicals.

Introduction: Partheniumhysterophorus L. is an aromatic annual and obnoxious invasive herb under Asteraceae family, now commonly known as feverfew, Tanacetumparthenium, Chrysanthemum parthenium (Parsons and Cuthbertson, 2001; Bhatt et al., 2012). The normal height of this erect plant is up to 1 m but under favorable conditions the height may reach up to 2 m having deeply penetrating taproot with many finely branched feeding roots and an angular, longitudinally grooved and profusely branched hairy stem (Parsons and Cuthbertson, 2001; Bhatt et al., 2012). Allergen containing 8-20 cm long and 4-5 cm wide shortly hairy pale green leaves are alternate and rosette that are resemble to carrot leaves during initial growth (Parsons and Cuthbertson, 2001; Bhatt et al., 2012). Rising from the stem nodes and terminating at about the same height, each head (4-10 mm diameter) of clustered flowers bears about 40 tubular male and 5 ligulate female white florets and produces 2 mm long flattened black seeds (Parsons andCuthbertson, 2001). Seeds germinate any time of the year under wide range of environmental condition. High humidity, high moisture content and temperature around 25°C are the standard factors for seed germination (Bhatt et al., 2012). A native of tropical America P. hysterophorus was introduced during the 1950s into Africa, Asia and Oceania (Labrada et al., 1994). Now this species is frequently found on roadsides, railway reserves, stock yards, cultivated fields, rundown pastures and vacant lots in China, Taiwan, Pakistan, Nepal, Sri Lanka, Bangladesh, Vietnam, Pacific islands, Ethiopia, Kenya, Madagascar, South Africa, Somalia, Mozambique, Zimbabwe and several countries of South and Central America (Parsons and Cuthbertson, 2001; Bhatt et al., 2012). It is included in the Global Invasive Species database of IUCN due to the invasive nature (Bhatt et al., 2012). Not only this weed is well thought-out to be a factor of allergic respiratory problems, contact dermatitis and mutagenicity in human and livestock but also considered as a severely crop production reducing agent due the allopathic nature (Patel, 2011). Thus P. hysterophorus is a threat for the biodiversity.

Journal of Medicinal Plants Studies

Name of the compounds	Structure	References
Canin (C15H18O5; mw = 278.31)		(Zhou et al., 2011b)
Charminarone (C15H18O5; mw = 278.31)		(Venkataiah et al., 2003)
Coronopilin (C15H20O4; mw = 264.32)		(Zhou *et al.*, 2011b)
Parthenin (C15H18O4; mw = 262.31)		(Zhou *et al.*, 2011d)
Parthenolide (C15H20O3; mw = 248.32)		(Kuhn and Winston, 2007; Zhou *et al.*, 2011d)

Pathenolide (C16H22O2; mw = 246.35)		(Kuhn and Winston, 2007; Zhou *et al.*, 2011d)

Materials & Methods

Aqueous Extract:

1) Parthenium plants were collected and washed thoroughly withrunning water toremove alldust anddirt.
2) Leaves and stems were chopped with tine blade on the table timely average size of chapped leaves ranges from 2 to 5 mm and that of stem is 5 to 10 mm.
3) 500 ml of distilled water wastaken in the round bottom flask of 1000 ml capacity alongwith 250g of chopped material.
4) The round bottom flask was placed on heating mental and heated at a constant temperature of 80 ^{0} C for 1 hour by keeping an air condenser on the month of the round bottom flask.
5) After getting dark green color extract ; it is filtered twice firstly with cotton filler and then with filter paper. Filtrate received was 350 ml.
6) The extractwas then collected in 500 ml. beaker and evaporated to make it concentrated. Early 100 ml. of extract was collected and kept inanumbercolored bottle.

POT TESTS

Instead of field trials activity of Parthenium extract was tested on small scale by using common pot tests on ornamental and medicinal plants. Following procedure was adopted for the pot test.

1. Ten different plants having medicinal properties were grown in 20 earthen pots. Same herbs were grown in potA and potB.
2. The series of 20 pots were prepared.
3. The solutions of Parthenium extract having concentration from 10 ppm to 90ppm.
4. To the first pot (A) regular watering was done.
5. To the second pot (b) besides regular watering, 100 ml of parthenium extract was added.
6. Regular observations were taken for their growth for 15 days

Effect of Parthenium extract on the following plants.

Name of the plant	No.of days	Effective conc.in ppm
Achyranthusaspera	25	40
Cassia tora	25	70
Solanumxanthocarpum	25	70
Sphaeranthusindicus	25	50
Menthaarvensis	25	60
Ocimumgratisisum	25	-
Coriander sativum	25	50
ArgemoneMexicana	25	60
Trigonellafoenum-graecum	25	70
Allium sepa	25	80

The above plants shows effect on growth and marginal burning of leaves at different conc.

Result and discussion

Herbicide :- The chemical used to skill the weed or it suppress weed growth is known as herbicides .

Bio herbicides are the plant extracts containing toxic alkaloids which kills herb effectively or suppress the growth of it. Pure Parthenin as well as extract of different parts of

P.hysterophorus shows phytotoxic effects on many aquatic (Pandey 1994,1995,1996) as well as terrestrial weeds(Khosala et al.,1990Khosala and Sobati 1981.,Kumari,1990.,Singh et al.,)The sesquiterpene lactone Parthenin has received most attention regarding allelopathy or potential herbicidal properties of the plant(Duke et al.,2007).

Parthenium elaborates four C-6 guaianolides such as parthenin and coronopillin and several phenolic acids such as coffeic ; vanillic, fenulic chlorogenic and anisic acids aqueous extract of parthenium with various concentration n ppm were tried against observation were taken for 8 days it is found that each plant is sensitive towards parthenium at different concentration the effective concentration range is from 40 ppm – 90 ppm only ocimumgratissimum do not show any effect against parthenium extract.

Almost all the plant has shown supersession in growth and marginal burning of leaves it is observed that when aqueous extract if parthenium was added to the test plant it shows systemic action it is absorbed through the roots and translated in the body of the plants and causes marginal burning of leaves as well as suppression of growth of the plant.

Partheniumextract has shown suppression of plant growth and marginal burning of leave because of systemic action.From the above tests and observation it concludes that parthenium in an effective herbicide at higher concentration.

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INFANT CRY DETECTION BY SIGNAL ANALYSIS AND FEATURE EXTRACTION

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Abstract
The first verbal communication of newborn baby with the world is baby's cry. An infant crying signal is the attention call for parents orcaregivers and motivates them to alleviate the distress. Nowadays it is a difficult forhousekeeper mothers to take care of their newborn baby. Thispaper proposes a method to detect infant cry. The cry sound of baby has different frequency and pattern than other surroundingsoundsthus it is necessary to eliminate the surrounding sound and remove the noise for perfect crydetection. The designed system can be used in various applications such as signalingparent's about the cry also distinguishing different sounds. There are some monitoring devices including wireless camera and LCD to solve the problem but they are expensive. Our idea is to present simple algorithm with low cost device to detect infant cry.
Keywords: *Infant, DsPIC, Audio Codec, Wireless Camera, LCD.*

INTRODUCTION

The first verbal communication of newborn baby with the world is baby's cry. Infant crying is a biological alarm system. An infant crying signal is the attention call for parents or caregivers and motivates them to alleviate the distress. Infants need their parents love and care but their parents are not always available to them. This motivates the proposal of the system for infant cry detection.

Nowadays it is a difficult for housekeeper mothers to take care of their newborn baby while doing house chores. Our idea is to present a simple algorithm applicable to create a low cost device with the ability to detect infant's crying and call the parents.

Cry is the infant's most powerful, multimodal, dynamic behavior, and sometimes the only means of communication and sign of life a birth. It involves characteristic vocalization, facial expressions and limb movements, all of which change over time. It is in the most sensitive range of the human auditory sensation\ area. Several models of cry sound have been proposed. The theory that underlies most acoustic analyses of cry sounds is the sound-filter theory. In this theory, cry is expressed by a waveform that impinges upon the listener's ear is a function of the characteristics of the source and its filters.

Infant cry detection technique can be very useful for baby care and monitoring. There are many techniques proposed but there are some drawbacks with the previous designs. The external noise is one of the most important factor which hinders the detection, the noise may corrupt the cry sound and processor may not be able to distinguish between noise and infant cry.

Thus external noise has to be removed in order to have only cry detected. The proposed system focuses on removing the external noise in order to detect only cry sound using DSPIC processor.

RELATED WORK

This section gives a brief introduction about existing infant cry detection techniques.

Kevin Kuo [1] proposed a short-time signal detection method, LPCC feature extraction, and vector quantization to performed and discriminate between three cries of differing pathologies originating from a two month old baby boy. Analysis of the recordings resulted in the discovery of all

three cry types embedded in each recording to varying degrees. Despite the imprecision in the classification results, there were still noticeable presence of the cry whose pathology was predetermined with the aid of the infant's parents. The modest success was encouraging in the fact that it felled under the expected result.

Lichuan Liu et.al [4] suggest that high noise level inside the infant incubator results in numerous adverse health effects for premature newborns and the active noise control (ANC) systems are developed to reduce the noise. The paper proposes an infant cry classification integrated ANC system for infant incubators. The developed system can dramatically reduce the harmful noise level, and the integrated infant cry detector and analyzer can monitor the infants' physical conditions. The infant cry signals are picked up and detected by the same microphones used by the ANC system, the cry signal's features are extracted and then recognized. The simulation and experiment results showed that the cry recognition of specific infants yielded promising results.

Mohammad Kia1 et al. [5] proposes a simple voice recognition system which can be applied practically for designing a device with capability to detect a baby's cry and informing the parents automatically. The overall algorithm is to evaluate the resemblance of the infant's voice signal with the data stored in a database, which is already prepared by recording some cry and laughter samples, using an automatic fuzzy classifier system which can lead to detection of cry or laughter. This algorithm can serve as a reliable foundation on which the future creation of a portable real-time, automatic voice detection system device can be based. To achieve the result they created a database of sample cry and laughter signals and written a sample Matlab program for carrying out the real-time frequency-domain calculations and a sample visual program in Labview programming environment for interfacing with user.

BhagatpatilVarsharani V et al. [7]mainly focused on automation of Infant's Cry. For the implementation LFCC was used for feature extraction and VQ codebook for matching samples using LBG algorithm. First, in training phase, in which LFCC was applied for feature extraction, and then VQ codebooks are generated to compress the feature vectors. Second, is the testing phase in which features extraction and codebook generation of samples are repeated. Here, comparison of the codebook template of samples to the all the available templates in the database are carried based on Euclidian distance between them. LFCC effectively capture the lower as well as higher frequency characteristics than MFCC, hence we will get good results over MFCC.

Proposed System

The proposed block diagram for infant cry detection is shown in figure 1. It comprises of a microphone, DSPIC30F5011 processor and LCD display with speaker. The 30F family of DSPIC processor is mainly used for audio processing.

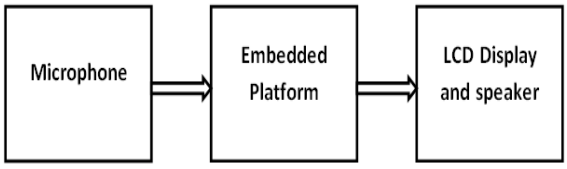


Figure 1: Block diagram of the proposed system

A real time sound is given to the processor via microphone, the given sound then is processed to compare with the testing data. FFT is carried out on the signal to obtain a pattern the obtained pattern of sample is then compared with the testing data at first the sample is seen if the sound is cry or other sound if cry sound is not found the message is displayed that cry is not detected is cry is detected the LCD display's message of cry sound detection.

METHODOLOGY

The proposed system goes through several stages of data capturing and analysis to meet the required results.The figure 2 shows the flow graph of the proposed system.

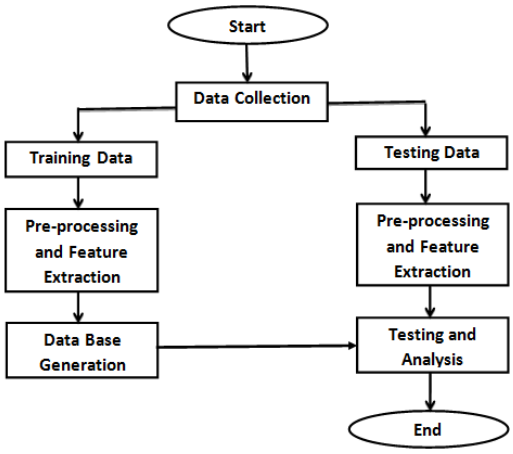


Figure 2. Flowchart of proposed system.

Stage1: The data is collected from the user it can be any audio sound using microphone.

Stage2: The collected data is trained and tested for creation of code book.

Stage3: Collected data undergoes filtering for removal of surrounding sound and FFT is carried out for generation of the pattern.

Stage4: The generated pattern is then compared with the database and the best fitting sample is checked for cry sound.

After all the stages the message is displayed if cry is detected or not.

HARDDWARE USED

The important components of the proposed system are dsPICprocessor and audio codec Ic.

1) dsPIC30F5011:

A digital signal processor, dsPIC30F5011 is a 16 bit microcontroller from Microchip



Figure 3. Pin Diagram of dsPIC30F5011 Processor

The pin diagram of dsPIC30F5011 is shown in Figure 4. The microcontroller has 64 pins which include General Purpose Input Output (GPIO) pins, and dedicated pins for SPI, CAN, UART, ADC, Timers and Output Compare.

Features of dsPIC30F5011:

- 64 pin, high performance RISC CPU
- 66KB Flash Memory, 4KB on-chip RAM
- 16 bit Timers
- 16 bit PWM/ Compare output functions
- 3- wire SPI modules
- Addressable UART modules
- 12 bit Analog to Digital Converter (ADC)
- In circuit serial programming (ICSP) capability with two UART modules.

2) Si3000 Audio codec:

The Si3000 is a complete voice band audio codec that offers integration by incorporating programmable input and output gain attenuation, a microphone bias circuit, handset hybrid circuit and an output driver for 32Ω headphones

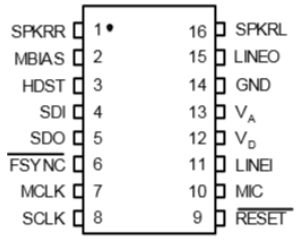


Figure 4. Pin Diagram of Si3000 audio codec.

Features of Si3000 Audio Codec:

- 84 dB ADC Dynamic Range.
- 84 dB DAC Dynamic Range.
- 4–12 kHz Sample Rates.
- 30 DB microphone pre amplifier.
- Programmable input gain: Attenuation: –34.5 dB to 12 dB
- Programmable output gain: Attenuation: –34.5 dB to 12 dB
- Support for 32 ΩHeadphones.
- 3:1 Analog Input Mixer.
- 3.3–5.0 V Power Supply.
- Direct Serial Interface to DSPs.

It also serves as a companion chip to FAT ISO modem chipset with vice features providing hardware support for handset and speaker phone. The device operates from a single 3.3 to 5 v power supply and I s available in 16bit small outline package.

RESULTS

Different sound samples were taken for study, the samples were then analyzed by taking FFT and pattern generation for distinguish between different sound patterns with cry pattern.

Figure 5 and 6 shows patterns of different sound samples. Figure 5 shows the patterns generated by sound samples such as train, owl traffic jam sound. Figure 6 shows the patterns of different cry samples

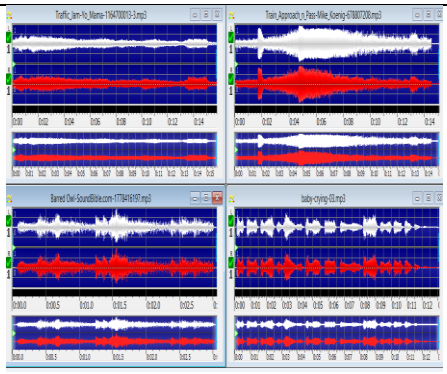


Figure 5. Patterns of different sound samples

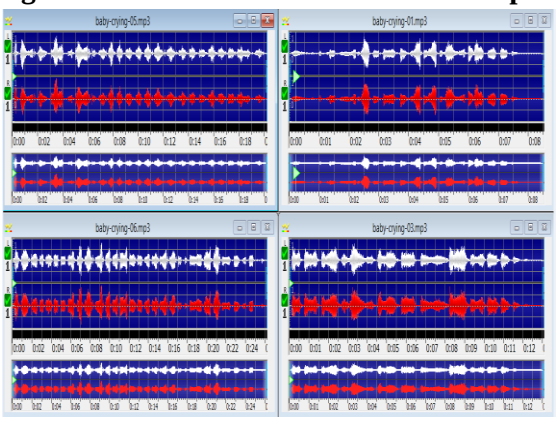


Figure 6. Patterns of different cry samples

It can be seen that the pattern of sound samples such as traffic or train sound are different than the cry sound samples. The frequency and amplitude changes can also be observed. This analysis is used in the algorithm developed for cry detection.

Further detail analysis are carried out on human body sounds and cry sounds because human sounds are similar in nature which can affect the detection of perfect cry sound.

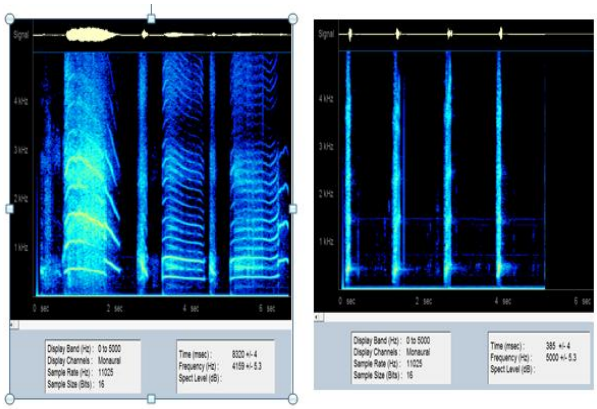


Figure 7(a). Spectrogram of cry sound and hiccup sound

Figure 7(a) shows the spectrogram of infant cry sound and human hiccup sound the pattern difference can be seen in terms of time interval and amplitude of the signal. The infant cry sound can be easily distinguished from the hiccup sound.

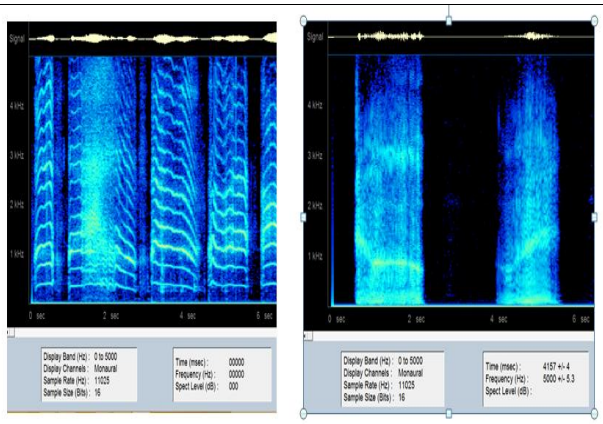


Figure 7(b). Spectrogram of cry samples and human snoring sound.

Figure 8 and 9 show the hardware experimental setup for proposed system. Programming is done in MPLAB XIDE

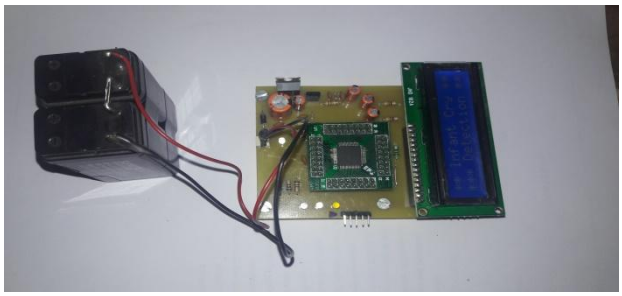


Figure 8: Experimental Setup 1

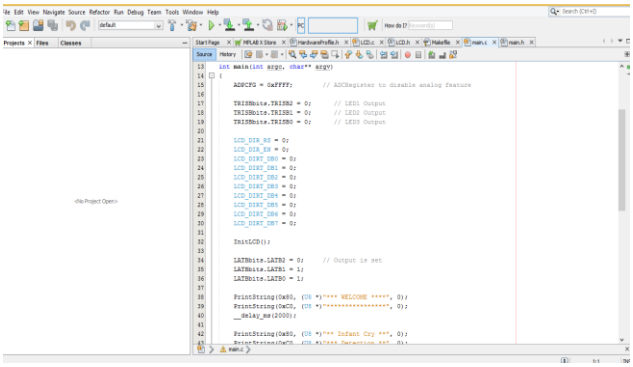


Figure 9: Experimental Setup 2

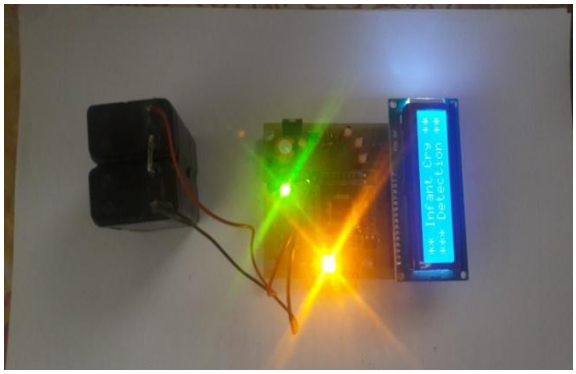


Figure 10: LED glowing when the system is powered.

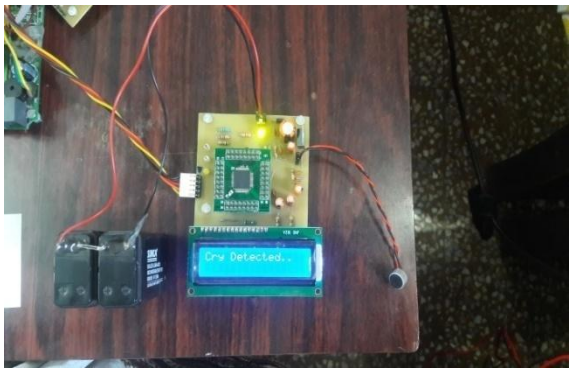


Figure 11: LCD showing detection of cry sound

Fig. 10 shows the blinking of leds when the system is powered and shows a message on the LCD display "Welcome" when battery is connected for 500ms delay and then changes to "Infant Cry Detection" for 1200ms delay. The LEDs used are toggle with a constant delay of 20ms.

Fig 11 and 12 shows the when result of cry detected or cry not detected after the sound sample is processed



Figure 12: LCD showing cry not detected.

CONCLUSION AND FUTURE WORK

Theresults show successful implementation of DsPIC30F5011 processor and Si3000 Audio codec Ic on an embedded platform. The program generated in MPLAB XIDE using embedded C language is dumped successfully and shows the desired results showing proper working of the processor. Different sound samples were analyzed according to the pitch and frequency patterns and the difference was spotted between cry samples and other surrounding sounds.The obtained spectrograms add more details to the study and differentiating of cry samples from other human sounds. Detected results are displayed on the LCD.

Future work is to develop an algorithm that will distinguish between different surrounding sound and detect only cry sound neglecting other sounds.

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रायगड जिल्ह्यातील स्वयंसहाय्यता बचत गटएक अभ्यास

प्रा . लोहकरे शत्रुघ्न नामदेव सहयोगी प्राध्यापक डॉ . सी . डी . देशमुख वाणिज्य व सौ . के . जी . ताम्हाणेकला महाविद्यालय गोहा रायगड .
प्रा . डॉ . मनिषा कर्णे प्राध्यापक अर्थशास्त्र विभाग मुंबई विद्यापीठ मुंबई .

प्रस्तावनाः

भारतीय अर्थव्यवस्था हीग्रामीण आणि शहरी या दोन भागात विभागलीअसून देशामध्ये शहरी अर्थ व्यवस्थेपेक्षा ग्रामीण अर्थव्यवस्थेचा प्रभाव अधिक राहिला आहे . कारण आजही देशाच्या 70च्या जवळपास भाग हाग्रामीण स्वरूपाचा आहे . तेव्हा या ग्रामीण भागाचा विकास हा अर्थव्यवस्थेचा नीतिचा एक अविभाज्य भाग आहे . देशाच्या स्वातंत्र्यानंतरच्या काळात देशासमोर अनेक समस्या आहेत . त्यातही ग्रामीण द्रारिद्रय बेरोजगारी गरिबी या सारख्या समस्या मोठया स्वरूपात आहेत आणि हा ग्रामीण अर्थव्यवस्थेच्या आर्थिक विकासातील अडथळा आहे . तेव्हा या समस्या सोडविण्यासाठी तसेचग्रामीण भारतातील आर्थिकदृष्टया कमकुवत वर्गाला विकासाच्या मुख्य प्रवाहात आणण्यासाठी स्वात्रंत्र्योत्तर काळात भारतात अनेक योजना उपक्रम कार्यक्रम तयार केले जातात आणि ते शासकीय व बिगरशासकीय संस्थामार्फत राबविण्यात आहेत . यासर्वामध्ये वंचितांचा विकास हा मुख्य गाभा आहे . आर्थिकदृष्टयाकमकुवत वर्गालास्वांवलंबी बनविण्यासाठीतसेच त्यांच्या समस्या सोडविण्यासाठी त्यांचे आर्थिक वसामाजिक सबलीकरण होणे आवश्यक आहे . त्यांना समाजात चांगले स्थान व मानसन्मान मिळवून देण्यासाठी असे अनेक कार्यक्रम आखले पाहिजेत कीज्यात स्वयंसहाय्यता बचत गटांचे स्थान महत्वपूर्ण आहे . स्वयंसहाय्यता बचतगटामुळेआर्थि कदृष्टयाकमकुवत वर्गाचेवंचितांचे आणि महिलांचे आर्थिक व सामाजिक परिवर्तन होत असून याआधारे भारतीय अर्थव्यवस्थेत एक नवी विचार प्रणाली नवी व्यवस्था आणि मानसिकता घडविण्यात स्वयंसहय्यता बचत गटांचे योगदान महत्वाचे आहे .

केंद्र शासनाप्रमाणेच महाराष्ट्र शासनाने देखील गरीब लोकांच्या विकासासंबंधी धोरण तयार करूनत्याच्या अंमलबजावणीसाठी अनेक योजना व कार्यक्रम राबविले आहेत . स्वयंसहाय्यता बचत गटांची निर्मिती ही त्यापैकीच एक होय . बचत गट हे वंचितांना आर्थिकदृष्टया सबल बनण्यासाठीचे एक महत्वपूर्ण साधन आहे . यातूनरोजगार व उत्पन्नाबरोबरच समाजात आत्मसन्मान गोष्टी बचत गटांच्या माध्यमातून लोक कमवू शकतात . त्यामुळे आर्थिकदृष्टया दुर्बल समाजाच्या आर्थिक व सामाजिक विकासातील स्वयंसहाय्यता बचत

गटांची भूमिका तपासणे आवश्यक आहे. भारत सरकारने अलिकडील काळात ग्रामीण दारिद्र्याचे समूळ उच्चाटन करण्यासाठी राष्ट्रीय स्तरावर 'राष्ट्रीय ग्रामीण जीवनोन्नती अभियान' सुरू केले आहे. याअभियानाच्या अंमलबजावणीसाठी महाराष्ट्र शासनाच्या ग्रामविकास आणि जलसंधारण विभागाने महाराष्ट्र राज्य ग्रामीण जीवनोन्नती अभियानाची स्थापना केली आहे. हे अभियान सुरूवातीस निवडक जिल्ह्यात आणि नंतर संपुर्ण महाराष्ट्रात राबविण्याचे ठरविले आहे. भारतातील दारिद्र्याचे निर्मुलन करण्यासाठी ग्रामीण गरीब जनतेला एकत्र आणणे□यांचे स्वयंसहाय्यता बचत गट स्थापन करणे□त्यांची वाढ व विकास करणे आणि सदर संस्थामार्फत गरीबांना वित्तीय सेवा पुरविणे□त्यांची कार्यक्षमता वाढविणे□शाश्वत उपजिविकेची साधने उपलब्ध करून देणे आणि त्यामार्फत लोकांना दारिद्र्याच्या दुष्टच□तून बाहेर काढणे ही राष्ट्रीय ग्रामीण जीवनोन्नती अभियानाची प्रमुख उद्दिष्टये आहेत.

रायगड जिल्ह्यातील आर्थिक व सामाजिक स्थिती विचारात घेता बचत गटांची भूमिका महत्वपुर्ण अशीच आहे. रायगड जिल्हा ग्रामीण विकास यंत्रणा□महिला आर्थिक विकास महामंडळ□रायगड जिल्हा आणि रायगड जिल्हा मध्यवर्ती सहकारी बॅंक मर्यादित□अलिबाग□रायगडजिल्ह्याची अग्रणी बॅंक□बॅंक ऑफ इंडियातसेच या व्यतिरिक्त जिल्ह्यातील इतर विविध शासकीय व बिगर शासकीय संस्था तसेच ग्रामपंचायत□ नगरपरिषदा□पंचायत समिती□विविध राजकिय पक्ष आणि महाराष्ट्र तेजस्वीनी महिला सक्षमीकरण कार्य□म इ. नी स्वयंसहाय्यता बचत गटांची निर्मिती करून लोकांच्या आर्थिक व सामाजिक विकासास हातभार लावला आहे. रायगडजिल्ह्यातअशा अनेकसंस्थास्वयंसहाय्यता बचत गटांना प्रोत्साहित करणा□याचे कार्य करतात. रायगड जिल्ह्यातील विविध स्तरावरील सामाजिक व आर्थिक परिस्थिती आणि ऐतिहासिक पार्श्वभूमी रायगड जिल्ह्यातील स्वयंसहाय्यता बचत गटांच्या निर्मिती व वाढी साठी पोषक ठरली आहे.

रायगड जिल्ह्याची भौगालिक व सामाजिक पार्श्वभूमीः

महाराष्ट्राच्या पश्चिमेला असणा□या कोकणविभागामध्ये मुंबईच्या लगतच रायगड जिल्हा येतो. रायगड जिल्ह्यास पुर्वी कुलाबा असे नाव असत. रायगड जिल्हा हा $17^0 51'$ ते$19^0 80'$ उत्तर अक्षांस आणि $72^0 51'$ ते$73^0 40'$ पूर्व रेखांस या दरम्यान पसरलेला आहे. तसेचया जिल्ह्याची दक्षिणोत्तर लांबी 150 कि.मी. व पूर्व□पश्चिम रूंदी 24 ते 48 कि.मी. अशीआहे. हा जिल्हा राज्याच्या पश्चिमेला असणा□या अरबी समुद्र किनारी वसलेला आहे. महाराष्ट्राला 720 कि.मी. लांबीचा समुद्रकिनारा लाभला आहेत्यापैकी ह्या जिल्ह्याला 240 कि.मी. लांबीचा समुद्रकिनारा लाभला आहे. रायगड जिल्ह्याचे एकूण क्षेत्रफळ 7152

चौ . कि . मी . एवढे असून ते महाराष्ट्राच्या क्षेत्रफळाच्या **2 . 32** टक्के इतके आहे . या जिल्ह्यात एकूण **15** तालुके आहेत . जिल्ह्याच्या उत्तर पश्चिमेला मुंबई शहर व उपनगरे उत्तरेला ठाणे जिल्हा आहे व पुर्वेला सह्याद्रीच्या रांगा त्याला लागून पुणे जिल्हा दक्षिण पुर्वेला सातारा जिल्हा दक्षिणेस सावित्री नदी रत्नागिरी जिल्हा आणि पश्चिमेला अरबी समुद्र यामध्ये रायगड जिल्हा पसरलेला आहे . भौगोलिकदृष्टया रायगड जिल्हा अ समुद्र किना यालगतचा पट्टा ब सुपीक व सपाट जमिनीचा मध्य भागातील पट्टा **3** पुर्वेकडील सह्याद्रीचा डोगंराळ भागया तीन चिंचोळया पट्टयात विभागला आहे . रायगडजिल्ह्यातील उत्तरेकडील भागात उल्हास पाताळगंगा आणि अंबा मध्य भागात कुंडलिका आणि दक्षिणेस सावित्री घोड आणि काळनदी या महत्वाच्या नद्या आहेत . कोकणपट्टात चिंचोळया भागामुळे सह्याद्रीत उगम पावून लगेचच अरबी समुद्राला मिळत असल्याने या नद्याची लांबी जास्त नाही तसेच या पश्चिम वाहिनी आहेत . रायगडजिल्ह्यात मोर्बे वाघोली हेटवणे तिनवीरा खैरे इ . प्रमुख धरणे आहेत . तसेच वरील नद्यावर छोटी मोठी धरणे आहेत . या नद्याच्या खाडीच्या ठिकाणी समुद्राच्या भरतीचे पाणी शिरत आसल्याने सिंचनासाठी या पाण्याचाफारसा उपयोग होत नाही . अलीकडे या नद्याच्या पाण्याचा वापर प्रामुख्याने औद्योगिकीकरणासाठी केला जात आहेतसेचकांही ठिकाणी पिण्यासाठी व सिंचनासाठी पाण्याचा वापर होतो . रायगड जिल्हा मुंबईच्या अगदी जवळ असल्यामुळे जिल्ह्यात अलिकडील काळात मोठयाप्रमाणावर औद्योगिकरण होत आहे तरीही या जिल्ह्यातील कांही भागाचा विकास झालेला नाही . रायगड जिल्ह्यातील मैदानी भाग वगळल्यास जिल्ह्याच्या एकूण क्षेत्रफळापैकी बराच भाग डोंगर व उंच सखल पर्वतराजीनी वसलेला आहे . येथील लोकांचे जीवन मोठे कष्टदायी आहे . तसेच येथे पर्जन्यमान जास्तआहे परंतु येथील नदयातीव्रउताराच्या असल्याने पावसाळयानंतरच्या काळात पाण्याचे दुर्भिक्ष जाणवेतपरिणामी शेतीचे उत्पादन कमी होतचालले आहे . या जिल्ह्यात सन **2011** च्या जनगणनेनुसार एकूण लोकसंख्या **26**35**394** इतकी असून **52 . 25** टक्के पुरूष व **47 . 75** टक्के स्त्रिया आहेत तसेच स्त्री पुरूष प्रमाण **959** आणि लोकसंख्येची घनता **368** दर चौ . कि . मी . इतकी आहे . रायगड जिल्ह्यात ग्रामीण लोकसंख्येचे प्रमाण **63 . 08**आणि शहरी लोकसंख्येचेप्रमाण **36 . 92** ऐवढे आहे . **2001**च्या जनगणनेनुसार रायगड जिल्ह्यातील एकूण लोकसंख्येपैकी **41 . 40** टक्के लोकसंख्या काम करणारी आहे . त्यापैकी **28 . 55** टक्के शेतकरी **20 . 36** टक्के शेतमजूर **2 . 66** टक्के घरगुती उद्योग आणि **48 . 43** टक्के इतर कामगार आहेत . सध्या रायगड जिल्ह्यात मोठया प्रमाणावर औद्योगिकीकरण होत असले तरी लोकसंख्येच्या प्रमाणात रोजगाराचे प्रमाण खुपच कमी आहे . तसेच अलिकडे

रोजगारासाठी राज्य व देशातून अनेक लोक रायगड जिल्ह्यात स्थलांतरीत झाले आहेत. यातूनचजिल्ह्यातबेकारीची समस्या उग्र स्वरूपाची बनली आहे. ग्रामीण व शहरी लोकांना आणि महिलांना स्वयंरोजगार करता यावा तसेच आर्थिकदृष्टया वंचितांचेआणि महिलांचे सक्षमीकरण व्हावे. यासाठी रायगड जिल्ह्यात स्वयंसहाय्यतास्वयंसहाय्यताबचतगटांना प्रोत्साहित करर्णा या विविध संस्थांनाबचतगटांची स्थापना करून महत्वाची अशीभूमिका पार पाडता येईल.

भारतातील सहकार आणिस्वयंसहाय्यता बचत गट ऐतिहासिक पार्श्वभूमीः

आज जागतिक पातळीवर जगातील सर्वच देशामध्ये गरिबांच्या विकासासाठी सबलीकरणासाठी आणि सक्षमीकरणासासाठी बांग्लादेशातील डॉ. महमंद युनूस यांच्या विचारसरणीवर आधारित सूक्ष्म वित्त कार्यक्रम व महिला बचत गट चळवळीचा वेगाने प्रचार आणि प्रसार होत आहे. अशाच प्रकारे भारतात देखील सत्तरच्या दशकात बचतगट प्रणालेला सुरूवात झाली आणि नंतरच्या काळात शासकीय व बिगरशासकीय पातळीवर अनेक संघटना व संस्थामार्फत बचत गट स्थापन करून समाजाच्या विकासास हातभार लावला जात आहे. सन **1992** मध्ये नाबार्डने **500** स्वयंसहाय्यता बचत गटांना बॅंकेशी जोडण्याचे पथदर्शक प्रकल्प सुरू केला. यातूनच पुढे भारतीय अर्थव्यवस्थेतील ग्रामीण लोकांबरोबरच शहरी या दोन भागातीलही लोकांना आर्थिकदृष्टया सक्षम बनवून या वर्गाला विकासाच्या मुख्य प्रवाहात आणण्याचे मुख्य कार्य स्वयंसहाय्यता बचत गटामार्फत सुरू झाले आणि आज ही एक मोठी चळवळ बनली आहे. **1996** मध्ये स्वयंसहाय्यता बचत गटांना बॅंक संलग्नता (Bank Linking) सुरू झाली. **1991** मध्ये सर्व व्यापारी बॅंकांना **1993**मध्ये सर्व सहकारी व ग्रामीण बॅंकांना बचत गट व बॅंक जोडणीत सहभागी होण्यासाठी एक परिपत्रक काढले आणि त्यामार्फत सर्व बॅंकांना बचत गट चळवळीत सहभागी करून घेतले. यातून सहकारी चळवळीच्या विकासाबरोबरच स्वंयसहाय्यता बचतगटांच्या विकासास चालना मिळाली. भारतात केंद्र सरकारने डिसेंबर **1997** मध्ये सुवर्णजयंती शहरी रोजगार योजना आणि **1** एप्रिल **1999** रोजी सुवर्णजयंती ग्राम स्वंयरोजगार रोजगार योजना सुरू केली. भारतात स्वंयसहाय्यताबचत गटांचा वेगाने प्रचार व प्रसार झाला. महाराष्ट्रात आंतरराष्ट्रीय कृषी विकास निधी मार्फत महिला सक्षमीकरणाची चळवळ पुढे नेणारा प्रकल्प हाती घ्यावा अशी शिफारस महाराष्ट्र शासनाने केली. या प्रक्रियेतून 'तेजस्विनी महाराष्ट्र ग्रामीण महिला सक्षमीकरण' कार्यक्रमाची आखणी केली. सदर कार्यक्रम महाराष्ट्र शासनाच्या महिला व बाल विकास विभागाच्या वतीने महिला आर्थिक

विकास महामंडळामार्फत सन 2007-08मध्ये सुरू केला . त्यामुळे स्वयंसहाय्यता बचत गट चळवळीला चालना मिळाली तसेच विविध स्वयंसेवी संस्थांच्या माध्यमातून स्वयंसहाय्यता बचत गट स्थापण्यास प्रारंभ झाला . आजमितीस महिला बचत गट चळवळ ही महिला सबलीकरण सक्षमीकरण सशक्तीकरण करणारी तीकारी चळवळ निर्माण झाली आहे .

स्वयंसहाय्यता बचत गटाचीसंकल्पनाः

स्वयंसहाय्यता बचत गटाची मूळची संकल्पना बांग्लादेशातील ग्रामीण बॅंकेचे प्रणेते आणि नोबेल पुरस्काराचे मानकरी प्रा . डॉ . महमंद युनूस यांची आहे . त्यांनी ती सूक्ष्मवित्त या स्वरूपात विकसित केली . स्वयंसहाय्यता बचतगटाची संकल्पना विविध दृष्टिकोनातून सांगितली जाते . स्वयंसहाय्यता बचतगटास ग्रामीण महिला बचतगट स्वावलंबी गट काटकसर गट कर्ज गट सूक्ष्म वित्त या विविध नावाने ओळखले जाते . तेव्हासर्वार्थाने साधर्म्य असणाऱ्या सभासदांनी स्वच्छेने एकत्र येवून सर्वांगीण उन्नतीसाठी बनविलेल्या व चालविलेल्या समूहास किंवा गटास स्वयंसहाय्यता बचतगट म्हणतात . बचतगटांमध्ये सभासदांची संख्या 10 ते 20 च्या दरम्यान असते . बचत गटात एकाच वस्तीतील आर्थिक सामाजीक व वैचारिक स्तरातील समान गरजा असणाऱ्या महिला एकत्र येतात . यातून महिला आपल्या समान गरजा अडचणी व जीवनमूल्ये उंचावण्यासाठी प्रयत्न करतात . त्यासाठी नियमितपणे आपली बचत करतात व त्याआधारे आपल्या समस्यावर मात करण्यासाठी सामूहिक प्रयत्न करतात . स्वयंसहाय्यता बचत गटाची अंमलबजावणी व व्यवस्थापन हे केंद्र राज्य जिल्हा तालुका आणि गावपातळीवर चालते . स्वयंसहाय्यता बचत गटांच्या योजनांची अंमलबजावणी करण्यासाठी त्रिस्तरीय यंत्रणा आहे .

संशोधनाची आवश्यकता व महत्वः

भारतात नव्हेतर जगभर स्वयंसहाय्यता बचत गट उपम चळवळ ही अलिकडे मोठी व व्यापक चळवळीच्या स्वरूपात निर्माण झालेली चळवळ आहे . ग्रामीण भारतातील आर्थिकदृष्ट्या कमकुवत वर्गाला विकासाच्या मुख्य प्रवाहात आणण्यासाठी एक प्रभावी माध्यम म्हणून या स्वयंसहाय्यता बचत गट उपम चळवळीकडे पाहिले जाते . भारताच्या सर्वसमावेशक विकासासाठी वंचितांचा विकास होणे आवश्यक आहे . तेव्हा बचतगटांचा आधार घेवून दारिद्रय निर्मुलन आर्थिक सक्षमीकरण होवू शकते . सामाजिक परिवर्तन स्वयंरोजगाराचा मार्ग व गरिबीतून बाहेर पडण्याचा मार्ग इ . मध्ये बचत गट महत्वाची भूमिका बजावू शकतो . ग्रामीण विकास सर्वांगीण विकास यासाठी बचत गटांचे महत्व अनन्यसाधारण आहे . अलिकडील

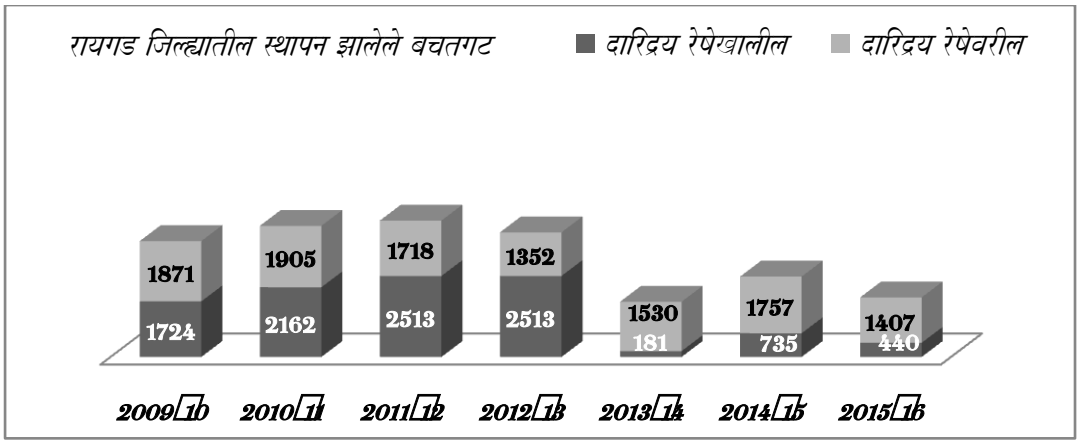
काळात जागतिक स्तरावरही बचत गटांचे महत्व वाढले आहे. रायगड जिल्ह्यातीलबचतगटांना प्रोत्साहित करणाऱ्या संस्थाचे विश्लेषण ग्राहक विकास किंवा गुंतवणूकीच्या पातळीवर होणे आवश्यक आहे.सूक्ष्मवित्ताच्या या उत्क्रांतीच्या या महत्वाच्या टप्प्यावर या क्षेत्रामध्ये अधिकतम संशोधनात्मक अभ्यास व माहितीचे संकलन होणे ही काळाची गरज आहे असे दिसते.

भारतासारख्या जास्त लोकसंख्या असलेल्या विकसनशील देशात दारिद्रय बेकारी निरक्षरता प्रादेशिक असमतोल मांडवलाचा अभाव या समस्या दिसून येतात आणि या सोडविण्यासाठी बचत गटासारख्या मार्गांचा अवलंब करणे गरजेचे आहे.स्वयंसहाय्यता बचत गट ही दारिद्रय निर्मूलनाबरोबरच स्वाभिमान व आत्मविश्वास वाढवणारी चळवळ बनली आहे.वरीलसर्व बाबींचा विचार करून महाराष्ट्रातील रायगड जिल्ह्यात अनेक संस्था व संघटनांनीबचत गटांची स्थापन केलेले आहे.यातूनरायगड जिल्ह्यात बचतगटाचा विकास वप्रगती होत आहे. या बचतगटांचीवंचितांच्या आर्थिक व सामाजिक विकासास मदत होत आहे.

रायगडजिल्ह्यातीलस्वयंसहाय्यता बचत गटः

रायगडजिल्ह्यात स्वयंसहाय्यता बचत गटांना प्रोत्साहित करणाऱ्या संस्था अनेक आहेत. यामध्ये प्रामुख्याने रायगड जिल्हा ग्रामीण विकास यंत्रणा महिला आर्थिक विकास महामंडळ रायगड जिल्हा आणि रायगड जिल्हा मध्यवर्ती सहकारी बॅंक मर्यादित अलिबाग रायगडजिल्ह्याची अग्रणी बॅंकबॅंक ऑफ इंडियातसेच या व्यतिरिक्त जिल्ह्यातील इतर विविध शासकीय व बिगर शासकीय संस्था तसेच ग्रामपंचायत नगरपरिषदा पंचायत समिती आणि विविध राजकिय पक्ष इ.नी स्वयंसहाय्यता बचतगटांची निर्मिती केली आहे.या संस्था तसेच नाबार्ड पुरस्कृत लघुउद्योग विकास कार्यक्रमयोजनेअंतर्गत आणि नाबार्डयांच्या संयुक्त विद्यमाने बचतगटांसाठी पेपरबॅग इमिटेशन ज्वेलरी व कापडी बॅगा या सारख्या वस्तू तयार करणे व विविध प्रकारचे मसाले उपवासाचे पदार्थ बनविणे व नेतृत्व विकासकार्यक्रमासारख्ये कार्यक्रमबचतगटांचा दैनंदिन व्यवहार आणि व्यवस्थापन मार्गदर्शनपर कार्यक्रम या सारख्ी प्रशिक्षण शिबीरे घेण्यात आली.महिला सशक्तीकरणयोजनेअंतर्गत महिला सशक्तीकरण मेळाव्याचे आयोजन केले. रायगड जिल्हा महिला बचतगट सक्षमीकरण फाऊंडेशन फेडरेशन निर्मिती करून रायगड बाजाराच्या रूपाने स्वयंसहाय्यता बचत गटांना बाजारपेठउपलब्ध करून दिली. यातूनस्वयंसहाय्यता बचत गटामार्फत आर्थिकदृष्टया कमकुवत लोकांच्या गरीबांच्या तसेच महिलांच्या वर्गाच्याविकासाची एक नवी संधी निर्माण झाली आहे. यातून प्रत्येक वर्षी स्वयंसहाय्यता बचतगटांची संख्या वाढत आहे हे आपणास पुढील आकडेवारीच्या आधारे असे दिसून येते.

1 . रायगडजिल्ह्यातील स्थापन झालेल्या एकूण बचतगटांची संख्या ः



स्त्रोतः रायगड जिल्हा सामाजिक व आर्थिक समालोचन 2009-2010 ते 2015-16 चे अहवाल .

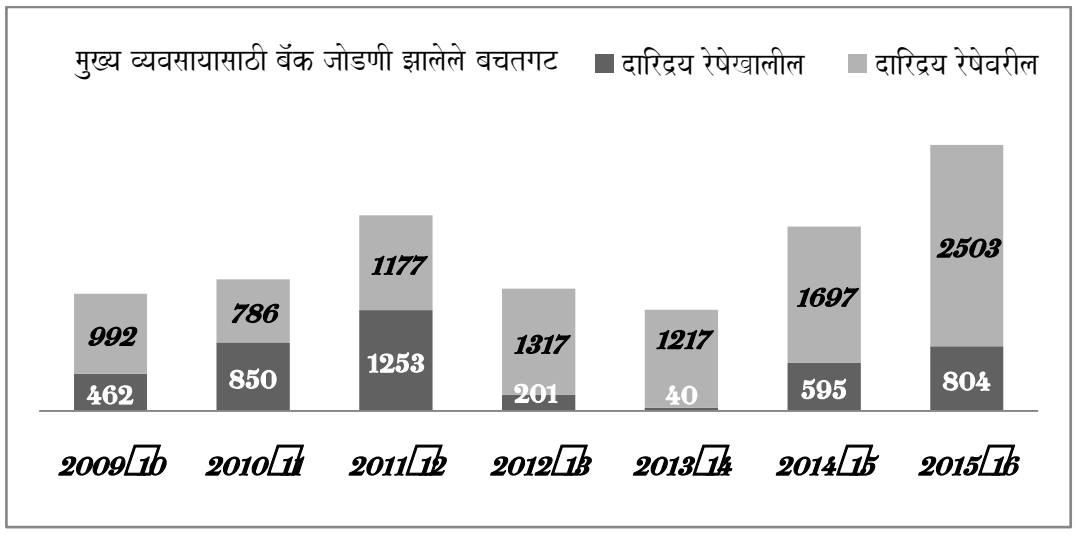
वरील आकडेवारीच्या आधारे असे दिसून येते की प्रत्येक वर्षी स्वयंसहाय्यता बचतगटांची संख्या वाढत आहे . कारण रायगड जिल्ह्यात स्वयंसहाय्यता बचत गटांना प्रोत्साहित करणाऱ्या संस्था अनेक आहेत व त्यांचे योगदान महत्वपूर्ण असेच आहे . सन 2009-10 साली रायगड जिल्ह्यात एकूण 3595 स्वयंसहाय्यता बचतगट स्थापन झाले . यापैकी 1724 दारिद्रय रेषेखालील व 1871 दारिद्रय रेषेवरील होते . यामध्ये नंतरच्या काळात वाढ होऊन सन 2015-16 या वर्षी रायगड जिल्ह्यात एकूण 1847 स्वयंसहाय्यता बचतगट स्थापन झाले . यापैकी 440 दारिद्रय रेषेखालील आणि 1407 दारिद्रय रेषेवरील होते .

2 . रायगड जिल्ह्यातील स्थापन झालेल्या बचतगटासंबंधी माहितीः

स्त्रोतः रायगड जिल्हा सामाजिक व आर्थिक समालोचन 2009-2010 ते 2015-16 चा अहवाल .

	मुख्य व्यवसायासाठी बॅंक जोडणी झालेले बचतगट			खेळते भांडवलासाठी बॅंक जोडणी झालेले बचतगट			व्यवसाय सुरू केलेले बचतगट	
सन	दारिद्रय रेषेखालील	दारिद्रय रेषेवरील	एकूण	दारिद्रय रेषेखालील	दारिद्रय रेषेवरील	एकूण	संख्या	आर्थिक वर्षात केलेली उलाढाल (लाख रू.)
2009-10	462	992	1454	619		619	1314	603.25
2010-11	850	786	1636	1671	294	1965	1636	651.31
2011-12	1253	1177	2430	2263	259	2522	2430	1857.73
2012-13	201	1317	1518	283	1317	1600	1514	1179.63
2013-14	40	1217	1257	402	1217	1619	1257	658.13
2014-15	595	1697	2292	871	1697	2567	2292	1150.84
2015-16	804	2503	3307	508	2503	3011	3307	1684.04

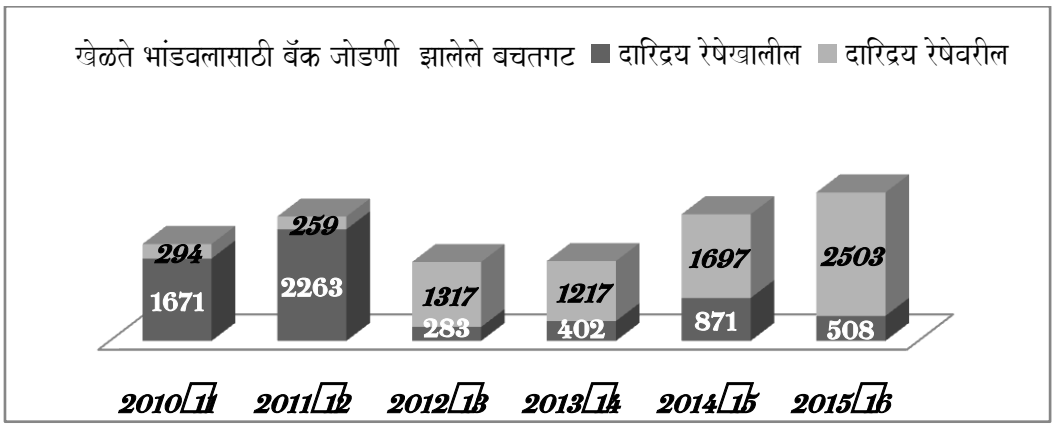
अ. मुख्य व्यवसायासाठी बॅंकजोडणी झालेले बचतगट ः



स्त्रोतः रायगड जिल्हा सामाजिक व आर्थिक समालोचन 2009-2010 ते 2015-16 चा अहवाल .

वरील आकडेवारीवरून असे दिसून येते की रायगड जिल्ह्यातील स्थापन झालेल्या एकूण बचतगटांची संख्येबरोबरच स्थापन झालेल्या बचतगटासंबंधी माहितीच्या तक्ता व आलेखाच्या आधारे रायगड जिल्ह्यातील बचतगट मुख्य व्यवसायासाठी बॅंकजोडणी झालेले बचतगटाची संख्या वाढत गेली आहे. सन 2009-10 साली रायगड जिल्ह्यात मुख्य व्यवसायासाठी बॅंकजोडणी झालेले बचतगटाची एकूण संख्या 1454यापैकी 462 दारिद्रय रेषेखालील व 992 दारिद्रय रेषेवरील होते. यामध्ये नंतरच्या काळात वाढ होऊन सन 2015-16 साली मुख्य व्यवसायासाठी बॅंकजोडणी झालेले बचतगटाची एकूण संख्या 3307 एवढी होती. यापैकी 804 दारिद्रय रेषेखालील आणि 2503 दारिद्रय रेषेवरील होते. यातून हे स्पष्ट होतो की मुख्य व्यवसायासाठी बॅंकजोडणी झालेले बचतगटाची एकूण संख्या वाढली आहे.

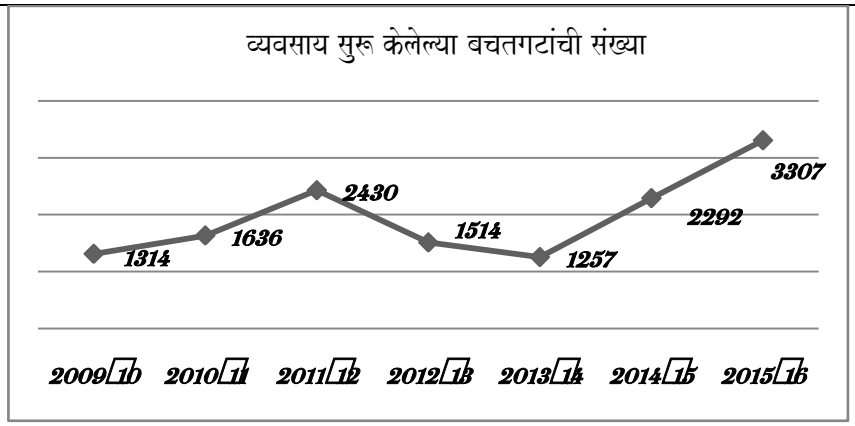
ब. खेळते भांडवलासाठी बॅंकजोडणी झालेले बचतगट ः



स्त्रोतः रायगड जिल्हा सामाजिक व आर्थिक समालोचन 2009-2010 ते 2015-16 चे अहवाल.

वरील आकडेवारीवरूनआणि आलेखाच्या आधारे असे दिसून येते की रायगड जिल्ह्यातील खेळते भांडवलासाठी बॅंकजोडणी झालेले बचतगटाची संख्या वाढत गेली आहे. सन 2010-11 मध्ये रायगड जिल्ह्यात खेळते भांडवलासाठी बॅंकजोडणी झालेले बचतगट1965यापैकी 1671दारिद्रय रेषेखालील व 294दारिद्रय रेषेवरील होते. यामध्ये नंतरच्या काळात वाढ होऊन सन 2015-16 साली एकूण 1847 स्वयंसहाय्यता बचतगट स्थापन झाले. याच वर्षी खेळते भांडवलासाठी बॅंकजोडणी झालेले बचतगटाची एकूण संख्या 3011 एवढी होती. यापैकी 508 दारिद्रय रेषेखालील आणि 2503 दारिद्रय रेषेवरील होते.

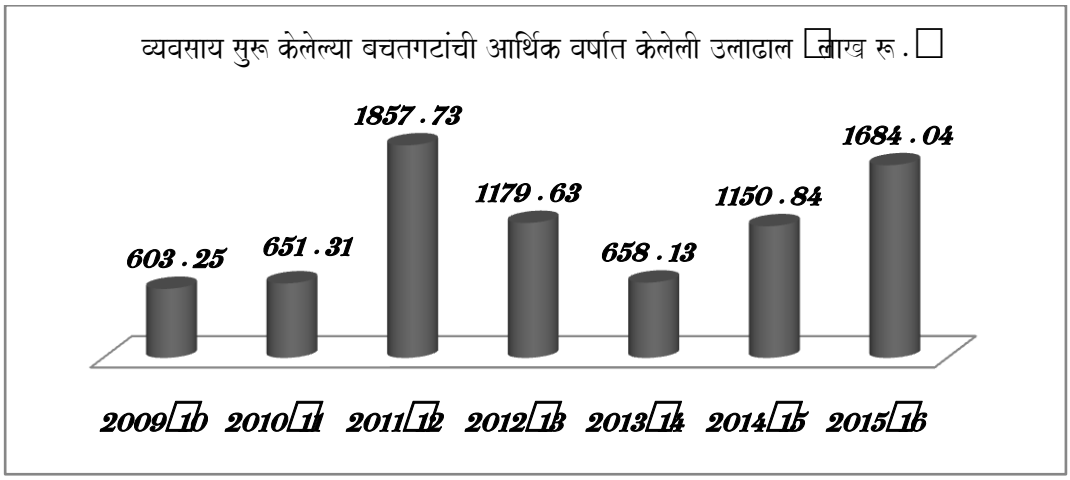
क. व्यवसाय सुरू केलेले बचतगटाची संख्या ः



स्त्रोतः रायगड जिल्हा सामाजिक व आर्थिक समालोचन 2009-2010 ते 2015-16 चे अहवाल .

वरील आकडेवारीच्या आधारे असे दिसून येते की रायगड जिल्ह्यातील ज्या बचतगटांनी व्यवसाय सुरू केलेले आहेत त्यांची वरील कालावधीत संख्या वाढत गेली आहे . सन 2009-10साली रायगड जिल्ह्यात ज्या बचतगटांनी व्यवसाय सुरू केलेले आहेतअसा बचतगटांची संख्या1314होती . यामध्ये नंतरच्या काळात वाढ होऊन सन 2015-16 साली एकूण 3307 स्वयंसहाय्यता बचतगटांनी स्वतःचे व्यवसाय सुरू केलेले आहेत .

ड . व्यवसाय सुरू केलेले बचतगटाचीआर्थिक वर्षात केलेली उलाढाल लाख रू . :



स्त्रोतः रायगड जिल्हा सामाजिक व आर्थिक समालोचन 2009-2010 ते 2015-16 चे अहवाल .

आलेखाच्या आधारे असे दिसून येते की रायगड जिल्ह्यातील ज्या बचतगटांनी व्यवसाय सुरू केलेले आहेत त्यांची सन 2009-10 या आर्थिक वर्षातील त्यांनी केलेली उलाढाल ही 603 . 25 लाख रू . एवढी होती . नंतरच्या काळात त्यामध्ये कमीजास्त प्रमाणात वाढत गेली . ज्याबचतगटांनी व्यवसाय सुरू केलेले

आहेत त्यांचीसन 2015 16 या आर्थिक वर्षातील त्यांनी केलेली उलाढाल ही 1684 . 04 लाख रू . एवढी आहे . रायगड जिल्ह्यातील बचतगटांची स्थापना हा वंचितांच्या सक्षमीकरणाच्या वाटचालीतील एक महत्वाचा टप्पा आहे . यातूनलोकांच्या आर्थिक आणि सामाजिक विकासाबरोबरचलोकांच्या दारिद्रयात घट आणि राहणीमान शिक्षण व आरोग्य आणि स्वयंरोजगार इ . मध्ये वाढ झाली आहे .

सारांशः

स्वयंसहाय्यता बचतगटांमुळे आर्थिक व सामाजिक परिवर्तन घडविण्यात स्वयंसहय्यता बचत गटांचे योगदान महत्वाचे आहे . आज जगभर वंचितांच्याविकासासाठी व सबलीकरणासाठी आणि सक्षमीकरणासासाठी बांग्लादेशातील डॉ . महमंद युनूस यांच्या विचारसरणीवर आधारित सूक्ष्म वित्त कार्य व बचतगट चळवळीचा वेगाने प्रचार आणि प्रसार होत आहे . अशाच प्रकारे भारतात तसेच रायगड जिल्ह्यातील स्वयंसहाय्यता बचतगटांना प्रोत्साहीत करणा या शासकीय व बिगरशासकीय पातळीवर अनेक संघटना व संस्थामार्फत बचतगट स्थापन करून विकासास हातभार लावला जातो . यामुळेच रायगड जिल्ह्यातीलस्वयंसहाय्यता बचत गटांना प्रोत्साहित करणा या संस्थांचे योगदान महत्वपुर्ण आहे .

संदर्भ ग्रंथः

1 . डॉ . महमंद युनुस अनुवाद प्रा . शरद पाटील 2007 बँकर टू द पुअर सुविद्या पब्लिकेशन पुणे .

2 . डॉ . एम . यू . मुलाणी ऑगस्ट 2006 महिला स्वयंसहाय्यता बचत गट डायमंड पब्लिकेशन पुणे .

3 . प्रा . डॉ . विद्या पाटील आणि व्ही . बी . खंदारे 2013 बचतगट महिला सक्षीकरण सम्यकता प्रकाशन धुळे .

4 . रायगड जिल्हा 2009 2010 ते 2015 16 जिल्हा सामाजिक व आर्थिक समालोचन अर्थ व सांख्यिकी संचालनालय
नियोजन विभाग महाराष्ट्र शासन मुंबई .

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INTRODUCTION OF MEDICAL GEOGRAPHY

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Abstract- *As a sub-discipline of geography, medical geography studies the environment and health-related lifestyle, relationships between lifestyle and health, disparities in the distribution of health infrastructure. Medical Geographers should take an oath to answer questions about which, where and where and who gets the proper care and proper care. The attempt to ask such questions is said to have started in 400 BC. The medical geography by Hippocrates involves two major components, e.g.: Geography of the health and health service of the disease; In both cases, health related discussions may be from local point of view, they have certain differences; In recent years, ICT has been received with sub-disciplined state-of-the-art mapping technology and statistical packages. The quality of the map, as a cartographic product, has been multiplied; therefore, it revives the notion of 'It cannot be mapped if it is not geography'. However, the main purpose of this paper is to visit the place of medical geography from its origin.*

Introduction

Medical geography, sometimes called health geography, is a field of medical research that covers geographic techniques in spreading health studies and spreading disease worldwide. In addition, there is an impact on weather and location on the delivery of health and health services of a person in a medical geographical direction. Medical Geography is an important area because its purpose is to understand health issues and to have an impact on the health of people who influence various geographical factors.

A hybrid health research in geographical and medicines related to geographical areas of health and healthcare is a "new" area. Medical Geography Studies the health and locale impact on health. It is to improve the understanding of various factors affecting the health of the population and therefore to target individuals. This is also called health geography.

Discussion on important topics related to medical geography is to 'critically evaluate the social and regulatory health of the disease and health'. Mapping of local issues and health issues. Medical Geography has developed as a sub-discipline of geography that studies the topics related to environment and health, lifestyle and health, disparity in the distribution of health infrastructure, and issues related to local problems. JACUS MJ has summarized Sabadh in his words- "Today we realize that this disease is one such event that happens only when the various components match in time and in space. The scope of interest to incorporate the relationship between various components of this complex and related geographic ecosystem is widespread. This can be called "medical geography". In brief, medical geography is a promising area of research to analyse geological patterns of health and disease, including environmental and social relations. In addition, it shows the location of

geographical factors that affect the access and use of local health services and local methods. Some ideas about medical geography from various points of view have been given below

Table 1: Multiplicity of the Medical Geography idea

Contributors	**Ideas**
De Vise, 1973	Medical geographers try to find out some answer like who gets what, where and why with respect of illness and appropriate care.
McGlashan, 1972	"Medical geography is a tool and but rarely an end itself. It is the application of geographical methods and skills to medical problems. One may consider geographical evidence on medical hypotheses".
Gesler, 1991	In Medical geography '… where a hospital lies within a spatial distribution is given more importance than what goes on within that particular hospital'.
Rosenberg and Wilson, 2005	Medical geographical research has focused on spatial analysis and place-specific examinations of the geographic distribution of medical care facilities, professionals, access and utilization to medical care services to identify under and over served areas.
Cromley, 2011	'Medical geographic research is grounded in place'.

Medical geography is becoming popular among social scientists like medical sociologists, cultural anthropologist, social psychologist.who have relied heavily upon principles of spatial analysis.

Table 2: Social sciences' contribution to Medical Geography

Discipline	Contribution
History	Evolution of the major medical systems, changes in illness prevalence and treatment modes, awareness of historical inertia.
Political science	Impact of type of medical system, role of public and private power-wielding groups.
Economics	Medical costs and cost-benefit analysis, private and public payment plans, health care and economic development.
Anthropology/sociology	Beliefs about illness causes and effective treatments, characteristics of patients and practitioners, patient-practitioners relationships.

History of medical geography

There is a long history in medical geography due to the time of Greek doctors, Hippocrates (5th-4th century BCE); people have studied the effect of their health. For example, early medicines have examined the differences in the diseases experienced by people living at high levels versus high levels. It is easy to understand that people living near low-altitude or low-

lying areas of high-grade or low-lying areas are more likely to have malaria. Though the reason for this diversity is not fully understood at that time, the distribution of this local disease is the beginning of medical geography.

This area of geography did not get importance until the middle of the 1889's, but when Cholera fled to London. As many people became ill, they felt that they were infected with vapors fleeing from the soil. John Snow, a London-based physician believed that if he separated the source of the bacteria in the body of infected people, then they would have been harmed.

As a part of his study, Snowflake distributed deaths throughout London on entire map. After examining this place, they found a cluster of abnormal death near a pump on Broad Street. After this, they concluded that the water coming from these pumps was sick and the officials handed the pump to the pump. Once people then stopped drinking the water, the number of cholera deaths dramatically decreased.

Another example of geography aiding medicine occurred in the early 20th Century in Colorado. There, dentists noticed that children living in certain areas had fewer cavities. After plotting these locations on a map and comparing them with chemicals found in the groundwater, they concluded that the children with fewer cavities were clustered around areas that had high levels of fluoride. From there, the use of fluoride gained prominence in dentistry.

Medical geography today

Today, medical geography has a number of applications as well. Since the spatial distribution of disease is still a large matter of importance though, mapping plays a huge role in the field. Maps are created to show historic outbreaks of things like the 1918 influenza for example or current issues like the index of pain or Google Flu Trends across the United States. In the pain map example, factors like climate and environment can be considered to determine why high amounts of pain cluster where they do at any given time.

Other studies have also been conducted to show where the highest outbreaks of certain types of disease occur. The Center for Disease Control and Prevention (CDC) in the United States for instance uses what they call the *Atlas of United States Mortality* to look at a wide range of health factors across the U.S. Data ranges from the spatial distribution of people at different ages to places with the best and worst air quality. Subjects such as these are important because they have implications on the population growth of an area and the instances of health problems such as asthma and lung cancer. Local governments can then consider these factors when planning their cities and/or determining the best use of city funds.

The CDC also features a website for traveller's health. Here, people can get information about the distribution of disease in countries worldwide and learn about the different vaccines needed to travel to such places.

This application of medical geography is important to reducing or even stopping the spread of the world's diseases through travel.

In addition to the United States' CDC, the World Health Organization (WHO) also features similar health data for the world with its Global Health Atlas. Here, the public, medical

professionals, researchers, and other interested persons can gather data about the distribution of the world's diseases in an attempt to find patterns of transmission and possibly cures to some of the more deadly illnesses such as HIV/AIDS and various cancers.

In the latter part of the 18th century, the term 'medical geographical' was first used by a physician named Louhurhad Ludwig Funk, but this idea is consistent with the time of production Hippocrates. In his famous 'air, water and spaces' he studied the relationship between health and environment in 400 BC. According to August Hirsch, the work of Hippocrates remained a mere effort, which started the philosophical system of geographical data. In addition, the term 'medical geographical' is used to describe the local distribution of the disease, published in 1792 by Leonhard Ludwig Fincke's 'Which Inner Lightmainen Medicine-Practison Zagfee'. They tried to describe the widespread transition of the disease. And as a result of the local environment factors that affect a particular population, there is also a debate for the relationship between illnesses and possible treatments. By arranging sub-titles, medical geography has been prepared to answer the following questions:

1. Why is a phenomenon distributed in a particular way?
2. Why are facilities and businesses located where they are? Why are the offices of physicians, public clinics, or research hospitals located in certain places and not in others?
3. Why do people move in certain directions for certain distances?
4. Why do innovations (including ideas and material goods) spread as they do?
5. Why do people vary in perception of the environment?
6. How do objects, ideas, processes, and living beings interact to characterize and constitute Places?

Medical geography is essentially bifurcated into Geography of disease and the Geography of health care. Geography of disease or ill health describes disease frequency, illness occurrence, relationship between illness and associated environmental factors in respect of answering the three major questions of geography i.e. who, why and where. Whereas, the Geography of health care describes the facility location, accessibility and utilization, patient behaviour patterns from the spatial vantage point. Parr classified medical geographical research into two dimension: research work on the spatial distribution of disease and death and geographical complexities surrounding the provision, access to and (in) equality of health care. Mishra further expands the idea include four perspectives of viewing Medical geography. First, it focuses on pattern of health and ill-health on space. Second, it studies the intensity and frequency of the health problem and various natural and socio-economic factors that determine the health condition. Third, it identifies causes and risk factors of health and ill-health by etiological hypotheses testing. And fourth, medical geography examines the spatial distribution of health care facilities with a view of suggesting policies, programmes and methodologies for locating them optimally and in conformity with the current and future needs.

In the colonial era when Europeans discovered many new lands, the rapid growth of medical geography took place. Because various diseases like plague, cholera, smallpox, tuberculosis, sexually transmitted diseases travelled from one place to another and thus the globalization of diseases took place. However, the growth of research studies in medical geography lost its pace

due to the path breaking and historic feat of inventing the germ theory by Louis Pasteur in 1861. The theory gave importance on identifying the responsible germ of a disease and accordingly administers medicines that killed them. The study of Michael A Osborne on medical geography supported that the fact that germ theory of disease was 'the major reason for the decline of medical geographical activity'. But the germ theory was criticized for simplifying the complex were factors that caused diseases. Numbers of persons inhabiting a same region are not equally influenced by the germ due to differences in cultural practices, level of nutrition and individual attitudes. Hence, it may be concluded that only identification of germ as per the biomedical disease model, is not enough to prevent diseases rather researchers should pay more attention to evaluating the socio-ecological model which identifies the impact of different geographical factors namely physical and socio-cultural factors on health.

The socio-ecological perspective believes in advanced identification and prevention of diseases rather than its treatment. Social inequalities play a vital role in determining the health condition of human populations as the most influential 'determinants of health' are rooted in social structure. There are several works which describe the relation between geographical environment and health. To depict the relationship between environment and health Light has very significantly quoted Finke- 'To which diseases and evils is man exposed, because he lives here and not somewhere else, because he breathes this and no other air, he eats this and no other food, drinks this and no other water, has this and no other way of living and so on'. May also emphasized on geographical environmental factors to describe disease ecology: "…from the water the people get their food, also their cholera, their dysenteries, their typhoid fevers, their malaria; from the earth they get their hookworm; from the crowded village they get their tuberculosis and their yaws; from the type of housing they have been forced to adopt they get their plague and typhus; and from the food which earth, temperature, and rain produce, their protein deficiencies, their beri beri". Daniel Drake identified the geological, meteorological and social determinants of disease including diet, drink and dress in great inter mountainous region between the Rockies and the Alleghenies. With the help of epidemiological data Drake and Numbers found the geographical limits of malaria, typhus and yellow fever of this region. August Hirsch devoted himself to describe the geographical distribution of diseases and the identification of the most important factors (specifically race, climate, soil etc.) of disease occurrence from historical point of view. Warner contributed an important study based on America about the impact of environment on health. According to him 'the notion that the physical and social environments were significant factors in determining appropriate therapeutic behaviour made region a necessary consideration in planning a patient's treatment and in evaluating the applicability of knowledge from another place'. Besides availability and accessibility of health care facilities various socio-economic factors like income, household wealth, education, and living style are strong factors of healthy well-being.

Recent medical geography research studies on the suitability of health services, facilities distributed across different geographical scales are being done on the development of the model.

Medical geography was benefitted from the sophisticated computing trends during 1960's which percolated a bit late in India. Invention of computer, various modern instrument and software

especially Remote Sensing, Geographical Information System (GIS), Global Positioning System (GPS), and different statistical packages have reinvigorated the sub-discipline altogether Armstrong has also considered the use of computer technology for the preparation of data for mapping as a promising development for medical geography. GIS techniques adorn an important place with regard to its capability to plan for future medical service provision and allocation of facilities in different locations. Applications of GIS techniques are also being done by many of research institutions and Universities for gauging health related issues from a geographical perspective.

Conclusion

This paper says that medical geographical geography is a part of the hope. This is a 'borderline discipline' which deals with all health related issues related to the basic area of geographic investigation. The traditional approach to medical geography is to analyse the location of local forms and diseases, diseases and medical treatment centers, whereas recent research in geography of health and health care can be linked to 'new cultural geography' and 'important geographical'. Emphasis on understanding both the approaches to "Health and Location" states, each time they are complementary to each other, how the disease and health facilities spread over time and in span. Space-temporal analysis helps in describing the various disease prone areas, the lack of proper healthcare facilities. It is easy to get more information about the etiology of a specific disease by implementing the technique S and Moon have used the word 'local' to explain the role of local (geographical) roles for the development of health policy. He also recommended the introduction of spatiality and temporization as a key pillar in medical geographical studies because 'people change a difference and place' Includes location and concepts in Duncan et al as well as medical geography Gesler also emphasized that the medical geologist should note that 'how does the healing process work in place (or the circumstances, locale, settings and milieus)?' References (locale) and structure (people) regarding the important concerns in this regard, there is a major research area for medical geography. Medical Geography has appeared as 'a new geography of health' because the emerging importance of space while studying health issues is 'the place for health, health care and health related matters'. Health problems in medical geography may be useful for health care workers, doctors and health policy makers. Local background can be easily illustrated by various diseases and prone areas, in which there is no health facility, which facilitates the distribution of construction facilities or help prevent disease or the spread of diseases. It can be concluded that currently medical geography is a very relevant area of geography and in the future it has a broad scope.

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ASSESMENT OF PHYSICO-CHEMICAL CHARACTERISTICS OF GARAMBI DAM WATER IN MURUD, DIST-RAIGAD (M. S.)

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ABSTRACT:-

The water sample from Garambi dam of Murud Taluka was analyzed for their physicochemical characteristics. Laboratory tests were performed for the analysis of samples for Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity were analyzed in the month of December 2017. By observing the result it can be concluded that the parameters which were taken to study the water quality are below the pollution level for ground water which satisfies the requirement for the use of various purposes like domestic, agricultural, industrial etc. The usefulness of these parameters in predicting dam water quality characteristics were discussed.

Keywords: *Garambi Dam water, water quality standard, Physico-chemical Parameter.*

INTRODUCTION:

Water is the most important in shaping the land and regulating the climate. It is one of the most important compounds that profoundly influence life [1]. Groundwater is used for domestic and industrial water supply and also for irrigation purposes in all over the world. In the last few decades, there has been a tremendous increase in the demand for fresh water due to rapid growth of population and the accelerated pace of industrialization. According to WHO organization, about 80% of all the diseases in human beings are caused by water [2]. Once the groundwater is contaminated; its quality cannot be restored back easily and to device ways and means to protect it.

Bhagat S. Chauhan, S. K. Sagar [3] has studied, in present investigation an attempt was made for assessment of physic-chemical parameter and quality of Sutlej River in Nangal area of Punjab (India). Manjusha Bohr, Prakash Kadave, Sheetal Bhor, Manisha Bhosale [4] has studied Water quality assessment of the River Godavari, at Ramkunda Nashik. Pratiksha Tambekar, pravin P. Morey, R.J. Batra and R.G. Weiginnwar [5] have studied physico-chemical parameter evaluation of water quality around Chandrapur (Maharashtra). Vijaya Kumar K.M. and Vijaya Kumara [6] have studied physico-chemical analysis water quality of Kundapurs Mangrove forest (Karnataka). J.G. Koliyar and N.S. Rokade [7] have studied in order to understand the water quality in pond lake, Mumbai. Prabhakar R. Pawar and Balasaheb G. Kulkarni [8] have studied assessment of water quality in the karanja creek (Raigad).

Garambi Dam is built by Nawab Sir Siddi Ahmed Khan, the last ruler of the east while Siddi reign. This dam is dedicated to Queen Victoria and is the source of water supply to the town. The dam is situated amidst lush greenery which makes it an amazing picturesque location. The sound of nature - water and birds - makes this location a more appealing one.



Garamabi Dam

The water sample was collected from the dam early in the morning between 7.00 am to 9.00 am and was analyzed to compare the differences occurred in Physico-chemical parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Ca-hardness, Magnesium hardness and Salinity.

The research work is carried out, keeping in mind the following objectives.

- To study the chemical composition and water quality parameters of dam.
- To investigate the possible sources and Cause of pollution in the dam if any.
- To study if these effects can be attributed to the change in the chemical composition of the dam water.



Satellite map of Garambi dam

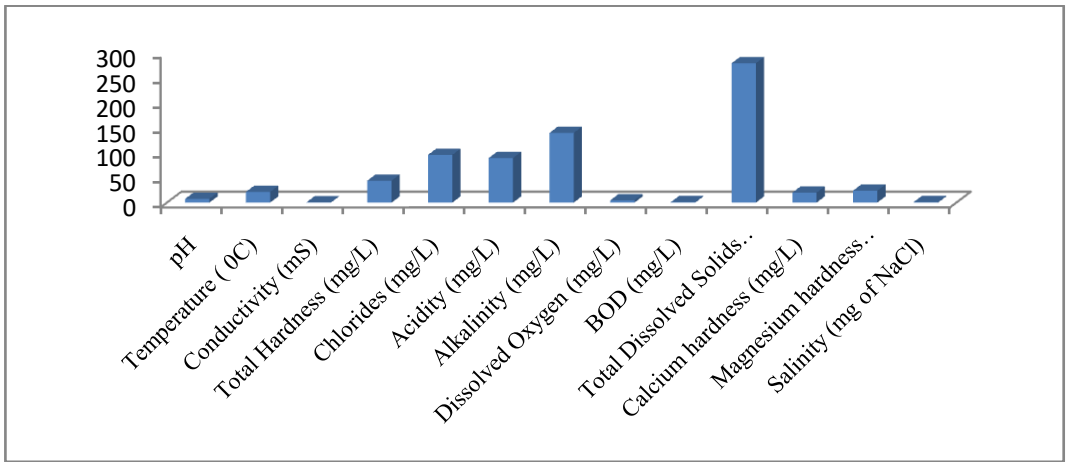
MATERIAL & METHOD:-

Sample of water was collected in sterile plastic bottle of 2 litre capacity from the dam. At the same time the temperature & pH were noted. The physico-chemical analysis was carried out within 24 hours of collection in a laboratory as per APHA (1989), (1992), AWWA & WPFA, Trivedy & Goel (1986) [9-10]. The chemicals were used of A. R. grade and are standardized as per Inorganic quantitative analysis by Vogel (1964) & (2006) [11-12]. The result is statistically analyzed by calculating mean & standard deviation.

RESULTS & DISCUSSION:-

Parameters	Garambi Dam Mean±S.D
pH	7.47± 0.02
Temperature (^{0}C)	21.3 ± 0.3
Conductivity (mS)	0.663 ± 0.004
Total Hardness (mg/L)	44 ± 1.0
Chlorides (mg/L)	95.85 ± 0.02
Acidity (mg/L)	89.6 ± 0.15
Alkalinity (mg/L)	140 ± 0.3
Dissolved Oxygen (mg/L)	4.464 ± 0.016
BOD (mg/L)	1.031± 0.06
Total Dissolved Solids (mg/L)	280 ± 1.0
Calcium hardness (mg/L)	20± 0.3
Magnesium hardness (mg/L)	24± 0.3
Salinity (mg of NaCl)	1.172 ± 0.003

Table-1:- Values of different parameters of water sample of Garambi dam. (Mean and Standard deviation is calculated



Graph showing concentration range of various parameters at Garambi Dam.

1. Temperature:

Temperature is the most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimize temperature change. The Water temperature depends on the depth of the water column, climatic and topographic changes [13].

A rise in temperature of water leads to the speeding up of chemical reactions in water, reduces the solubility of gases and amplifies the tastes and odour. At higher temperature with less dissolved gases the water becomes tasteless and even does not quench the thirst and decreases the solubility of oxygen.

Temperature also determines various other factors such as pH, Conductivity, saturation level of gases and various forms of alkalinity. The temperature of Garambi dam water is $21.3\pm0.3\ ^{0}C$.

2. pH:

pH, one of the most common analyses in soil and water testing, is the standard measure of how acidic or alkaline a solution is. pH has no direct adverse effect on health. pH governs the distribution, transport and fate of heavy metals in aquatic ecosystem. It is measured a scale from 0 - 14. pH of 7 is neutral, pH is less than 7 is acidic and pH greater than 7 is basic. Aquatic organisms need the pH of their water body to be a certain range optimal growth and survival. pH of water sample collected is 7.47 ± 0.02.

3. Electrical Conductance:

Conductivity is the measure of a substance or solution to conduct electric current. Presence of salts and contamination with wastewater increases conductivity of water. It is a indication of pollution. Electrical conductivity used to quickly estimate the ionic or soluble salt concentration in soils, water supplies, fertilizer solution and chemical solution. It is highly depended upon temperature.

Conductivity however is an important criterion in determining the suitability of water for irrigation. The conductance of water sample is 0.663 ± 0.004 mS.

The observed value of electrical conductance is quite low and less electrolyte.

4. Total Hardness:

Total hardness is defined as the sum of calcium and magnesium hardness in mg/L as $CaCO_3$.Total hardness of water an important factor that indicates toxic effect and poisonous elements [14].

There is no adverse effect of hardness on health. Hard water is also not suitable for domestic and irrigation purposes. Total hardness of water collected is 44 ± 1.0 mg/L.

The degree of hardness of drinking water has been classified in terms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/L, Medium - 60-120 mg/L, Hard - 120-180 mg/L, Very hard - >180 mg/L. The observed value was quiet less than the acceptable limit of 300 mg/L.

5. Chlorides:

Chloride is mainly obtained from the dissolution of salts of hydrochloric acid as table salt (NaCl), NaCO2 and added through industrial waste, sewage, sea water etc. Surface water bodies often have low concentration of chlorides as compare to ground water. It has key importance for metabolism activity in human body and other main physiological processes. High chloride concentration damage metallic pipes and structure as well as harms growing plants. According to WHO standards concentration of chloride should not exceed 250 mg/L.

The chloride content of the water sample is found to be 95.85±0.02 mg/L.

6. Acidity:

Acidity of water is its capacity to neutralize a strong base and is mostly due to the presence of strong mineral acids, weak acids and the salt of strong acids and weak bases. Addition of wastewater having acidity producing substances increases the acidity of water. The observed acidity of water sample is 89.6± 0.15 mg/L of $CaCO_3$. The value is much less than threshold value i. e. 200 mg/L of $CaCO_3$. This indicates that sample of water are in safe range.

7. Alkalinity:

Alkalinity is a chemical measurement of water's ability to neutralize acid. Alkalinity is also a measure of water buffering capacity or its ability to resist changes in pH upon the addition of acids or bases. Alkalinity of natural water is due to primarily to the presence of weak acid salts, although strong bases may also contribute (i.e. OH^-) in the extreme environment. Bicarbonate represents the major form of alkalinity in natural water, so its source being the partitioning of CO2 from the atmosphere and the weathering of carbonate minerals in rocks and soil. Other salts of weak acids, such as borate, silicates, ammonia, phosphate, and organic bases from natural organic matter may be present in small amounts.

The observed alkalinity of water sample is 140±0.3 mg/L of $CaCO_3$. The observed value of alkalinity of sample is within the permissible range i.e. below 200 mg/L.

8. Dissolved Oxygen:

The amount of oxygen dissolved in water, such as a lake, river or stream. Dissolved oxygen is the most important indicator of the health of water bodies and its capacity to support a balanced aquatic ecosystem of plants and animals. Warm water released from industrial outlets, flowages or storm sewers can also reduce dissolved oxygen levels. Dissolved oxygen may play a large role in the survival of aquatic life in temperature lakes and reservoirs during summer months. Dissolved oxygen of water sample collected is 4.464±0.016 mg/L. It may be due to high temperature and inorganic reluctance such as hydrogen sulfide, ammonia, nitrites, ferrous ions and other oxidizable substances also tend to decrease dissolved oxygen in water.

9. Biochemical Oxygen Demand (BOD):

Biochemical oxygen measures the amount of oxygen that microorganisms consume while decomposing organic matter, it also measures the chemical oxidation of inorganic matter. BOD is a measure of organic material contamination in water, specified in mg/L. BOD is the amount of dissolved oxygen required for the biochemical decomposition of organic compounds and the oxidation of certain inorganic materials (e.g., iron, sulphites).

The observed value of BOD is 1.031±0.06 mg/L which is within the permissible range i. e. 0.75-1.5 mg/L.

10. Total Dissolved Solids (TDS):

Total dissolved solids are the total amount of mobile charged ions, including minerals, salts or metal dissolved in a given volume of water in mg/L. TDS is directly related to the purity of water and the quality of water purification system and affects everything that consumes, lives in, or uses water, whether organic or inorganic, whether for better or for worse. Common inorganic salts that can be found in water include calcium, magnesium, potassium and sodium, which are cations and carbonates, nitrates, bicarbonates, chlorides and sulphates which are anions. They give a particular taste to water at higher concentration and also reduce its palatability.

The total solid present in water sample collected is 280±1.0 mg/L which is lower than threshold value of total solid content i.e. 500 mg/L.

11. Calcium hardness:

Calcium is naturally present in water. Calcium is a determinant of water hardness, because it can be found in water as Ca^{2+} ions. As per Indian Standards the calcium content of water should not be more than 75 mg/L. This has been specified in the IS 10500:- Drinking Water –Specifications.

In the study the calcium content in water sample has been found to be 20$\pm$ 0.3 mg/L which is within the limit as per Specification.

12. Magnesium hardness:

Magnesium is naturally present in water. Magnesium is a determinant of water hardness, because it can be found in water as Mg^{2+} ions. As per ISI the magnesium content of water should not be more than 50 mg/L.

In the study the magnesium content in water sample has been found to be 24$\pm$ 0.3 mg/L which is within the limit as per Specification.

13. Salinity:-

Salinity which is defined as the total concentration of electrically charged ions in the water. These ions are the four major cations-calcium, magnesium, potassium and sodium, and the four common anions carbonates (CO_3), sulphates (SO_4), chlorides (Cl) and bicarbonates (HCO). Other components of salinity are charged nitrogenous compounds such as nitrates (NO_3), ammonium ions (NH_4) and phosphates (PO_4) **[**15]. In general the salinity of surface waters depends on the drainage area, the nature of its rock, precipitation, human activity in the area and its proximity to marine water [16]. Waters with salinity below 1% are fresh and waters with salinity higher than 1% are brackish/marine [17].

The observed value of salinity for water sample is 1.172 $\pm$ 0.003 mg of NaCl.

CONCLUSION:

The study assessed the evolution of water quality in dam water of Garambi, Murud taluka which was carried out by taking certain important parameters like Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity. The data of physico-chemical and biological parameters clearly shows that the water of Garambi dam is within the permissible range as per APHA (1989), (1992), Trivedi and Goel (1986). Such water is suitable for drinking purpose and can be used for domestic as well as irrigation purpose.

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ISOLATION AND CHARACTERIZATION OF PHOSPHATE SOLUBILISING BACTERIA (PSB) FROM RICE FIELD SOIL AND STUDY OF EFFECTS OF PH AND TEMPERATURE FOR EFFECTIVE PHOSPHATE SOLUBILIZATION

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Abstarct:
In the present study, 05 phosphate-solubilizing bacteria were isolated from rice field around Panvel city. 05 phosphate-solubilizing bacteria (PSB) were isolated from the rice field soil. Isolates further partially identified by studying its cultural and biochemical characteristics and it was revealed that, the isolates resemble with Bacillus, Pseudomonas, Azotobacter, and Rhizobia. The phosphate-solubilizing ability of the isolates was first qualitatively evaluated by the formation of clear zones around the colonies growing on sterile NBRIP media containing tribasic calcium phosphate as a main source of phosphorus. The isolates exhibited the solubilization index ranging from 2 to 5. The quantitative evaluation revealed that, the isolates released organic phosphate upto 52.63 µg/ml. Indole acetic acid production by isolates was also determined and it was found that, isolates produces 3.22 to 35.48 µg/ml of IAA. The pH 7 and temperature 27°C found as optimal parameters. To check biofertilizer efficiency of isolates pot assay was performed. It seen that test plants showed significant growth with respect to root and shoot length as compared to control plant.
Key words: *PSB, Rice field Soil, solubilization index, IAA, Pot assay.*

Introduction:

Microorganisms play a very important role in almost every sector. As microorganisms are involved in biogeochemical cycling of nutrients, they maintain soil fertility and improve crop protection. As we know, numbers of macro and micronutrients are required for the optimal growth of plant. Of those, Nitrogen, Phosphorus and Potassium are major nutrients. Out of these three major ingredients, Phosphorus has been called the *key of life* because it is directly involved in most of the life processes. Phosphorus plays an indispensable biochemical role in plant metabolism cell division, cell enlargement and several other processes in the living plant**. (Sagervanshi A. et.al. 2012).** The level of inorganic P is very low in the soil and the available P is in insoluble form.**(Parsanna A. et.al. 2011).** Maintaining a proper P-supplying level at the root zone can maximize the efficiency of plant roots to mobilize and acquire P from the rhizosphere by an integration of root morphological and physiological adaptive strategies. Furthermore, Phosphorus uptake and utilization by plants plays a vital role in the determination of final crop yield. **(Shen J., et.al.2011).**

Microorganisms solubilise the insoluble phosphates and maintain the soil health and quality.

The most common examples of PSMs are the species of *Pseudomonas, Bacillus, Micrococcus, Flavobacterium, Aspergillus, Penicillium, Fusarium,Rhizobium and Enterobacter. Bacillus megaterium, B. circulans, B. subtilis, Pseudomonas striata* and *Enterobacter* are referred as the most important strains**.** *Penicillium and Aspergillus* fungi are the most powerful P solubilizer. **(Anand K. et.al. 2016)**

These PSB also can stimulate plant growth by other mechanisms such as the production of phytohormones, nitrogen fixation, inhibition of phytopathogenic microorganisms, production of siderophores**,** organic acid production indole acetic acid production etc. **(Aarab S.et.al. 2013).**

Materials and Methods:

1.Collection and Enrichment of soil sample

i. **Sample collection:** Rice field soil sample was collected from around Panvel region and kept at RT in plastic bag.
ii. **Enrichment of soil sample:** 1gm of soil sample in each 100ml of Sterile NBRIP and PVK broth was inoculated. Then flasks were incubated on shaker at 27°C for 3days.

2.Isolation of phosphate solubilising bacteria : Enriched samples were serially diluted and spreaded on Sterile NBRIP and PVK agar plates. Enriched sample also streak plated on Sterile NBRIP media. After incubation at 27^{o} C for two days, colonies showing phosphate solubilisation i.e. forming clear zone around bacterial growth were observed.

3.Maintenance of Isolates: The purified isolates were maintained onto Sterile NBRIP and NA slants with regular sub culturing every after 15 days and preserved at 4^{o}C

4.Soil Analysis : The analysis of soil is essential step as it gives the detailed knowledge about the concentration of nutrient present into soil and thus the soil analysis was carried out by Himedia soil testing kit (K054S-1KT, Lot.No.0000217813). Various parameters such as pH, organic carbon, available phosphate, organic ammonical nitrogen, nitrate nitrogen and available potassium were determined using procedure given in handbook. The color of each test compared with standard chart and amount of nutrient present in the soil was recorded.

5. Screening of phosphate solubilising bacteria:

i. **Qualitative assay:** 24hrs old cultures of isolates were spot inoculated at the centre of Sterile NBRIP plates and PVK's plates. Then plates were incubated at 27℃ for two days.On the basis of zone of solubilisation each of the isolates was screened for their ability to solubilise calcium phosphate present medium. The solubilisation zone in terms of solubilisation index was determined by subtracting the diameter of bacteria colony from the diameter of total zone. **[Patel D. et al (2013)]**

ii. **Quantitative assay:** Soluble phosphate converted to heterocomplex in the presence of molybdate ions, which reduce to in presence of stannous chloride to give blue color complex, which is measured at 660nm. **[Hafsa cherif-silini et al (2013)].** In our study, After enriching culturees in NBRIP for 5 days, cultures were centrifuged at 3000rpm for 30min. Concentration of soluble phosphate was determined in the supernatant by colorimetrically (1ml supernatant+ 10ml ammonium molybdate+ 1ml $SnCl_2$) and volume adjusted up to 50ml with D/W. The intensity of blue color measured at 660nm was directly proportional to concentration of soluble phosphate.The concentration of soluble phosphate was determined by plotting Graph of standard Graph of KH_2PO_4.

6. Morphological and Biochemical identification

Bacteria grow on solid media as colonies. Key features of these bacterial colonies serve as important criteria for their identification. Therefore isolates were partially identified using morphological and Gram nature of isolates and biochemical characterization.

7. Assay of plant growth promoting trait

Plant growth promoting traits includes production of growth hormones/factors like IAA, organic acid etc. In present study, IAA production by isolates was determined.

Test for Indole acetic acid: Indole acetic acid forms chelate with iron at acidic pH. The oxidation of indole acetic acid by ferric salts is the basis of colorimetric determination of acid based on the salkowski's reagent. **[Mores R.M. et al 2012].** For this test, in present study, Isolates were cultured on Luria broth medium containing tryptophan for 24hrs. t 27^{o} C at 150rpm on shaker. Then centrifugation of broth has done at 10,000rpm for 10min. Collected 1ml of each supernatant of particular isolates was mixed with 1.5ml of Salkowski's s reagent and kept for 30minutes. Production of IAA was checked at 530nm using UV-Vis.Spectrophotoeter (Shimatzu). For quantification of unknown amount of IAA, standard was run simulteniously using IAA of 1000µg/ml concentration.

8. Effect of various factors like pH, Temperature:

Growth of microorganisms depends upon various parameters such as pH, Temperature. These are the main parameters if any change happens in theses parameters it affects the growth of microorganisms. Thus optimization of pH and Temperature was carried out. For determining the effect of temperature, cultures in Sterile NBRIP broth were incubated at 20°C, 28°C, and 36°C at pH 7.0 and mixing/aeration conditions were set at 180 rpm. For studying the effect of pH, cultures were inoculated in Sterile NBRIP broth with pH adjusted to 4.0, 7.0 and 8.0. **[Nair S. K. et al (2016)]**

9. Pot assay:

To check the biofertilizing ability of bacterial isolate i.e.PSM, it is necessary to monitor the growth of roots and shoots of the plant under study. In the present study, rice plants were selected to study the biofertilizing effects of PSBs. To achieve this objective, pot assay was performed and biofertilizer activity of all the bacterial isolates was successfully recorded using pot assay.

In the method, surface sterilised seeds were incubated in isolated bacteria's inoculums for 30 mins. Then seeds were sowed in each pot filled with sterile soil individually with isolates.The root length and shoot length were measured up to 21days.

Results and Discussion:

Collection of soil sample: Rice field soil sample was collected around Panvel city in sterile plastic bag and kept at Room Temperature.



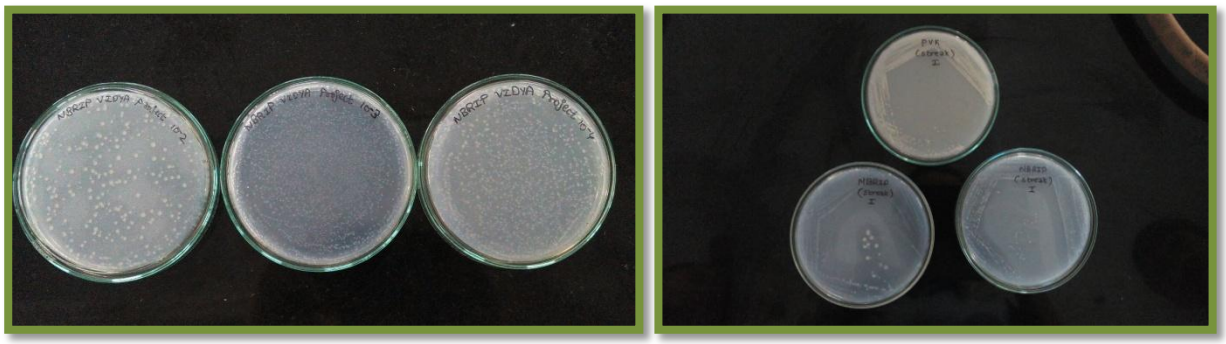
Fig. 1: Collected Rice field soil sample



Fig. 2: Enrichment of soil sample

Enrichment of soil sample: Collected Rice field soil sample was enriched in Sterile PVK broth and Sterile NBRIP broth. These both are worked as selective media for phosphate solubilising bacteria.

Isolation of phosphate solubilising bacteria: After incubation period, total 6 isolates were obtained and labled as RFIS1, RFIS2, RFIS3, RFIS4, RFIS4, RFIS5, RFIS6 but RFIS1 was fungal isolate. As present study was set in the way to focus only on phosphate solubilising bacteria, RFIS1 was not continued for further studies.



(Spread Plate Technique) (Streak Plate Technique)

Fig. 3: Rice Field Soil Isolates

All the bacterial isolates were maintained on sterile NBRIP as well as NA slants and stored at 4^{o}C in the refrigerator.

Soil analysis in the present study revealed that, the pH of rice field soil in the region from where the soil sampling was done, found to be 7.5. The Rice field soil was found to be rich with contains- Oxidizable Organic Carbon, Phosphate, Potassium, Ammonical- Nitrogen and Nitrate Nitrogen in the range of *low* (0.100 -0.300%.), *Low* (less than 22kg/hectare), *medium* (112 to 280 Kg/ha), low (About 15kg/ha as N) and also *low* (About 10kg/ha as N) respectively.

In the Screening of phosphate solubilising bacteria, qualitative assay revealed that, all the isolates have certain solubilization index. Phosphate solubilisation efficacy of each isolate was determined by

measuring solubilisation index (SI) by formula; SI= Colony diameter + Holozone diameter/ Colony diameter.

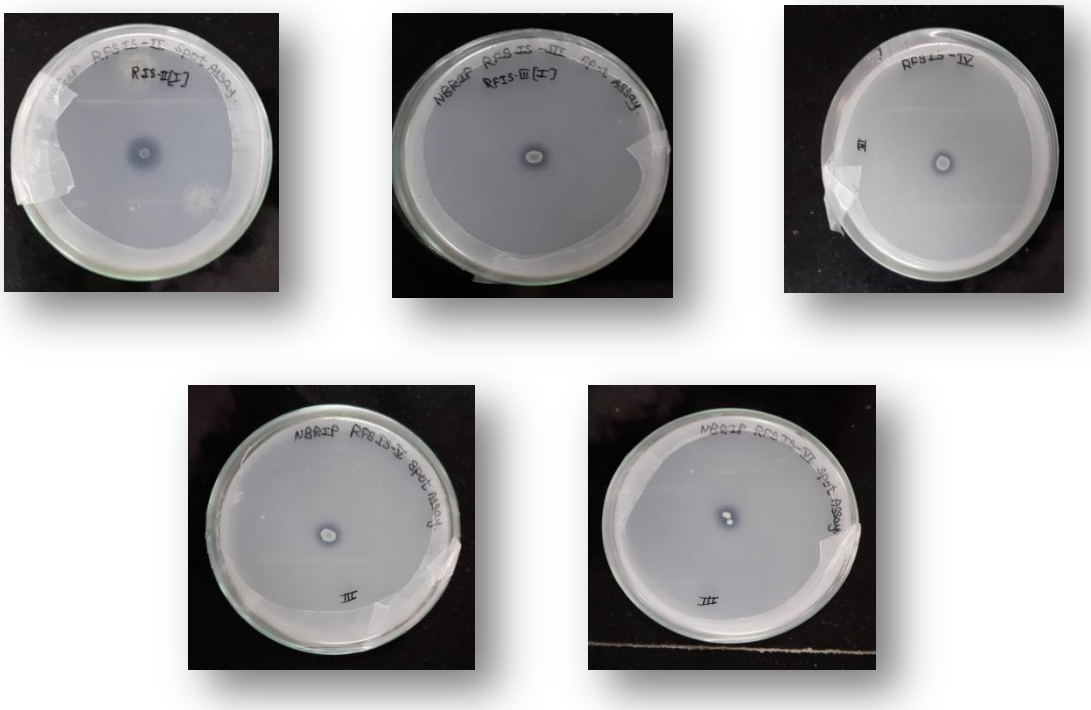
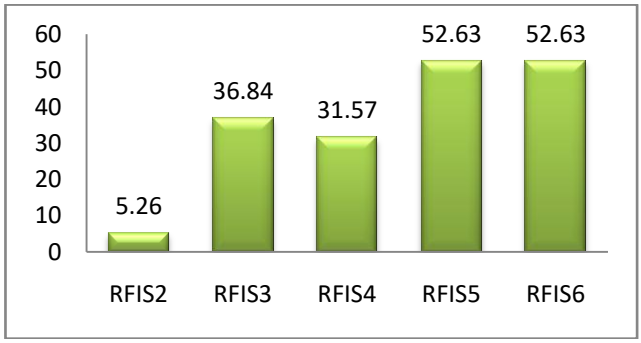


Fig. 4: Clear zone seen around colony shows phosphate solubilisation

Quantitative assay : Phosphate solubilisation ability of isolates was determined by the amount of soluble phosphate released and referring it with standard graph, RFIS 5 and RFIS 6 showed highest phosphate solubilisation i.e. **52.63 µg P/ml.** whereas RFIS2 showed lowest phosphate solubilisation i.e. **5.26 µg P/ml.** In the graph on X-axis- isolates and on Y-axis -amount of phosphate released in µg /ml.



Graph 1: Phosphate solubilisation by Isolates

After enrichment, isolation and screening, total five bacterial isolates were showed phosphate solubilisation and therefore they are further identified by performing Morphological and Biochemical analysis/

Morphological characteristics of isolates are as follows:

Rice field isolates	Colony characteristics								
	Size (mm)	Shape	Color	Margin	Opacity	Elevation	Consistency	Gram nature	Motility

RFIS 2	2	Circular	Pale yellow	Entire	Translucent	Flat	mucoid	Gram negative rods	Motile
RFIS 3	4	circular	Pale yellow	Entire	Translucent	Flat	mucoid	Gram negative	Motile
RFIS 4	4	circular	Pale yellow	Entire	Translucent	Flat	mucoid	Gram positive cocci	Non--Motile
RFIS 5	3	circular	Pale yellow	Entire	Translucent	Convex	mucoid	Gram positive cocci	Non--Motile
RFIS 6	2	circular	Pale yellow	Entire	Opaque	Convex	mucoid	Gram positive cocci	Non--Motile

Table 1: Morphological Characteristics

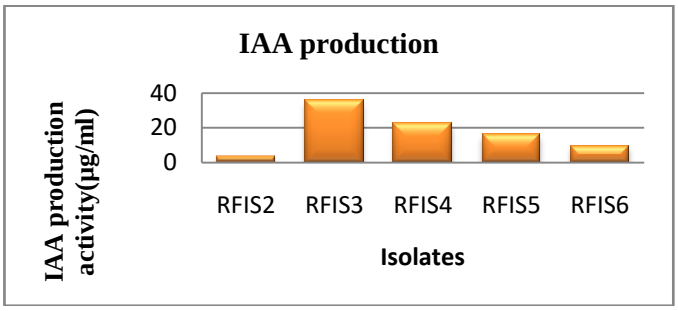
Biochemical characteristics of isolates are as follows:

Biochemical Test	**Isolates**				
	RFIS2	**RFIS3**	**RFIS4**	**RFIS5**	**RFIS6**
Glucose	AG	AG	AG	AG	AG
Lactose	-	AG	A	-	AG
Sucrose	AG	AG	AG	AG	AG
Mannitol	A	AG	AG	A	AG
Catalase	+	+	+	+	+
Oxidase	-	-	-	-	-
Nitrate reductase	+	+	+	+	+
Citrate utilization	+	+	+	+	+
Indole test	-	-	-	-	-
Methyl red	-	-	+	+	+
VP test	+	+	-	-	-

Table 2: Biochemical characteristics

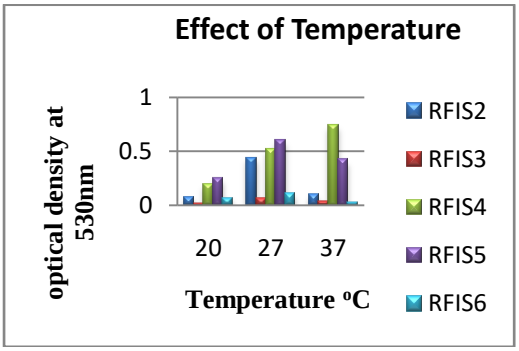
*Key: + = Positive test; - = Negative test; A = Acid Production; G = Gas Production.

In the present study, one of the plant growth promoting trait i.e. IAA was studied. IAA is a common product of L-tryptophan metabolism by several microorganisms including PGPR.. Bacterial IAA producers (BIPs) have the potential to interfere with growth related of plants processes by input of IAA into the plant's auxin pool. Thus, determination of production IAA by isolates is a important aspect of this study. Therefore IAA was determined by colorimetric assay. For comparison, standard assay was done parallel with isolates. Indole Acetic Acid (IAA) production was determined colorimetrically by using Salkowski's reagent. It was revealed that, all the isolates have ability to produce IAA at significant amount. IAA Production by RFIS 3 was found maximum which was equal to **35.48 µg/ml** whereas RFIS 2 showed lowest IAA production i.e. **3.22 µg/ml.** It concluded that RFIS 3 was more significant and potential IAA Producer than the other isolates.

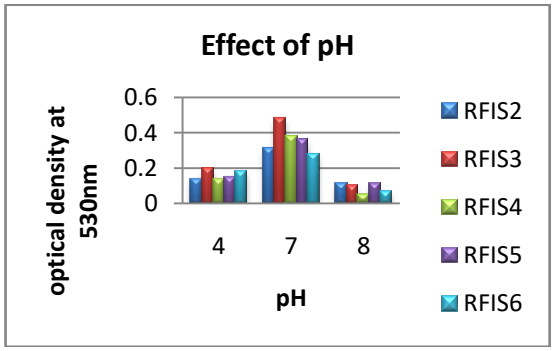


Graph 2: Indole acetic acid production by isolates

Effect of various factors like pH, Temperature: pH and temperature are important parameters for the growth of microorganisms. To determine optimum pH and temperature, bacterial isolates were subjected to different pH range (4,7 and 8) and different temperature range (20, 27 and 37°C). Growth of isolates was determined by colorimetrically at 530nm. By performing optimization of temperature, maximum growth of isolates was observed at 27 °C except RFIS 4 which exhibited maximum growth at 37 °C. Hence optimum temperature of isolates RFIS 2, 3, 5 & 6 was found to be 27 °C.



Graph 3: Optimization of temperature



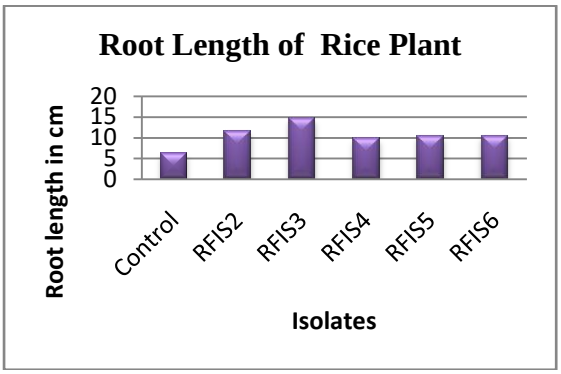
Graph 4: Optimization of pH

While. by performing optimization of pH, maximum growth of isolates was observed at pH 7. Hence optimal pH was found to be 7.

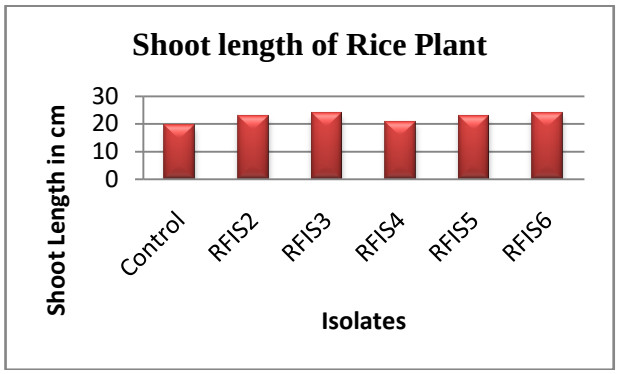
Pot assay : Pot assay was performed in duplicate to check biofertilizer efficacy in the form of growth promotion (Roots and shoots) of bacterial isolates .



Fig. 5: Growth promotion of rice plants with isolates



Graph 5: Average root length



Graph 6: Average shoot length

Recorded after treatment of 21 days (pot assay)

The shoot length and root length of control plant and test plants of rice was recorded in centimeter up to 21 days. It was seen that RFIS 3 showed **highest** shoot length and root length i.e. 23.80cm and 14.60cm respectively. It concluded that RFIS 3 has highest biofertilizer efficiency as compared to other isolates. Adding an insoluble phosphate source significantly increased total PSB populations in the soil, which implies that adding TCP was obviously beneficial for these isolates to proliferate and survive. Hence, more available P would be released into the soil and utilized by rice seeds for its optimal growth (i.e. shoots and roots).

Conclusion:

- Six phosphate solubilizing microbes have been sucessfully isolated from rice field soil sampled from around Panvel region.
- Clear haloes observed around the colonies indicates phosphate solubilisation. By qualitative assay, it can be concluded that, solubilisation index of isolates may be as small as up to 2 to highest up to 5 (RFIS3).
- Two Isolates exhibited highest solubilization and hence maximun release of P was recorded up to 52.63µg P/ml.
- Study also revealed that, the isolates may be *Pseudomonas, Enterobacter, Bacillus, Azotobacter and Rhizobium.* All these isolates have significant IAA production ability.
- The optimum pH for isolates is found to be 7 and their optimum temperature found to be 27^{o}C.
- These parameters are favourable in the area under study. This also help to conclude that, the isolates can be used in the surrounding region of Panvel where the temperature usually remain in the range of 25 ^{o}C to 35 ^{o}C and the pH of soil is around 7.
- Pot assay conclude that, the isolates showed increased shoot length on 21 day as compared to control plant.

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TO STUDY THE IMPACT OF CERTAIN EXTERNAL CONDITIONS ON SEED GERMINATION IN VIGNA MUNGO (BLACK GRAM).

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ABSTRACT:-

Aqueous extract of Spinach leaves and prawns of 1%, 5%, 10% and 20% (W/V) was treated to Vigna mungo seeds was studied. Treated seeds shows late germination, decreased rate of germination percentage, less radicle length and no plumule formation. Beginning of germination delayed more by prawn extract treatment than Spinach leaves extract treatment. Seed germination percentage is more affected by prawn extract treatment than Spinach leaves extract treatment. Prawn extract treatment is more adverse in terms of radicle growth during germination than Spinach leaves extract treatment to seeds of Vigna mungo. There is no plumule formation takes place in both treated seeds during germination. The adverse effect of Spinach leaves extract treatment and prawn extract goes on increasing with increasing the concentration extracts.

INTRODUCTION:-

Vigna mungo of family fabaceae commonly called as black gram, urad bean, minapa pappuy, mungo bean or black matpe bean.

Cited from http:// en.wikipedia.org/wiki/vigra mungo, Black gram is originated in India. It is widely utilized in Indian cuisines. According to Menon and kunup (1976), and Indra and kurup (2013), the black gram has better effect in cholesterol metabolism. They called the black gram as Hypolepidemic pulse. Therefore, the Vigna mungo is selected for present study.

The germination is one of vital process in plant physiology. According to Raven et. al (2005), seed germination depends upon internal and external conditions. In present study an attempt is made to study the impact of certain external conditions. In present study an attempt is made to study the impact of certain external condition on seed germination in Vigna mungo (black gram).Vegetable extract of Spinach leaves and non vegetable extract of prawn extract are used as external factors to observe effect on seed germination of Vigna mungo.

MATERIAL AND METHODS:-

Vigna mungo (black gram) seeds are selected for present study. Two sets of petri plates with blotting filter paper at base are taken.10 seeds of Vigna mungo are placed in each petridish. Adequate distilled water is applied to first petridish as control. Treated petridishes are applied adequate quantity of 1% (wt/volume) 5%, 10% and 20% aqueous extract of Spinach leaves. The experiment is repeated as it is for second time. The observation of both experiments are considered as average.

Similarly, apply 1%, 5%, 10%, and 20% aqueous extract of dried prawns to 2 replicas of 4 petridishes with 10 seeds of black gram each. The control reference kept common.

The germination of seeds is treated as one of the important criteria to study the impact of vegetable extract and non vegetable extract on black gram. From day one of experiment upto 10^{th} day, the number of seeds (out of 10) underwent germination were observed. Similarly the radicle length is also treated as another parameter for study of treated and control seeds germination. Average plumule length formation on 10^{th} day of germination is considered as another mean to find impact of vegetable extract and non vegetable extract on seed germination process in black gram.

RESULTS AND DISCUSSION:-

Table I-A Effect of Spinach leaves extract on emergence of seeds of Vigna mungo

Treatment (Spinach leaves extract)	**Number of seeds germination per day/s**									
	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day	8th Day	9th Day	10th Day
Control	0	3	8	10	10	10	10	10	10	10
1%	0	1	1	2	2	4	4	4	6	6
5%	0	0	0	1	1	3	4	4	6	6
10%	0	0	0	1	3	4	4	4	5	5
20%	0	0	0	0	0	0	2	2	2	3

Table I-B Effect of Spinach leaves (Vegetable) extract on germination percentage in seeds of Vigna mungo.

Treatment (Spinach leaves extract)	**Germination percentage per day/s**									
	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day	8th Day	9th Day	10th Day
Control	0	30	80	100	100	100	100	100	100	100
1%	0	10	10	20	20	40	40	40	60	60
5%	0	0	0	10	10	30	40	40	60	60
10%	0	0	0	10	30	40	40	40	50	50
20%	0	0	0	0	0	0	20	20	20	20

Table I-C Effect of Spinach leaves extract on radicle (root) length in Vigna mungo

Treatment Spinach leaves extract	**Average radicle length in cm on 10th day of treatment**
Control	1.35 cm
1%	1.23 cm
5%	0.95 cm
10%	0.2 cm
20%	0.17 cm

Table I-D Effect of Vegetable extract (Spinach leaves extract) on plumule (Shoot) length during seed germination of Vigna mungo.

Treatment (Spinach leaves extract)	Average plumule (shoot) length in cm on 10th day germination
Control	1.35 cm
1%	--
5%	--
10%	--
20%	--

Table I-A, I-B, I-C and I-D shows germination of black gram seeds from day one to day 10 in control and Spinach extract treated seed germination at 1%,5%,10% and 20% concentration, average radicle length and average plumule length on 10th day of experiment.

From table I-A it is clear that the germination started on second day in control and 1% Spinach treatment. In 5% and 10% Spinach extract treatment, the germination started on third day, while in 20% Spinach extract treatment, the germination was stimulated on seventh day. It means the Spinach extract treatment shows late germination. It delays the seed germination in Vigna mungo.

The seeds germination percentage from first day to tenth day is also seen in Table I-B in black gram under controlled and treated conditions. It is observed that seed germination is 100% in control on fourth day of germination. In 1% spinach treatment, it is 20% germination while in 5% spinach treatment and 10% spinach treatment it is 10% each on fourth day of germination. The 20% spinach treated seeds of Vigna mungo not shows any germination% even on fourth day of germination. It shows that rate of germination is more in control while rate of germination % is less in Spinach leaves extract treated seeds in Vigna mungo. The rate of germination % goes on decreasing as the concentration of Spinach leaves extract treatment goes on increasing.

The Table I-B shows the 100% seed germination in control seeds of black gram on tenth day while 60%, 60%, 50% and 30% seed germination rate in 1%, 5%, 10% and 20% Spinach leaves extract treated seeds respectively. It means the rate of seed germination is less in Spinach leaves extract treated leaves as compared to control.

From the Table I-C it is clear that average radicle length is 4.35 cm. In 1% Spinach leaves treated seeds it is 1.23cm, it is 0.95cm, 0.2cm, 0.17cm in 5%, 10%, 20% spinach leaves extract treated seeds of Vigna mungo respectively. It is clear from these observations that average radicle length is affected due to spinach leaves extract treatment .The effect goes on increasing as the concentration of spinach leaves extract also goes on increasing.

The shoot length i.e plumule length of control and treated seeds during germination on 10^{th} day of treatment is shown Table I-D. It is observed that the plumule formation is only seen in control seeds of Vigna mungo as compared to Spinach leaves extract treated seeds. It means the treatment of Spinach leaves extract shows adverse effect on the plumule formation during germination in Vigna mungo.

Table II-A Effect of Prawn extract on emergence of seeds if Vigna mungo.

Treatment (Spinach leaves extract)	**Number of seed/s germination per day/s**									
	1^{st} Day	2^{nd} Day	3^{rd} Day	4^{th} Day	5^{th} Day	6^{th} Day	7^{th} Day	8^{th} Day	9^{th} Day	10th Day
Control	0	3	8	10	10	10	10	10	10	10
1%	0	0	0	0	2	2	3	4	4	5
5%	0	0	0	0	0	0	0	1	2	2
10%	0	0	0	0	0	0	0	0	1	1
20%	0	0	0	0	0	0	0	0	0	0

The Table-II-A shows the effect of prawn extract on the seed germination in Vigna mungo. It is seen from observation that the seed germination started in control seeds on second day of experiment. The seed germination started on 5^{th} day of treatment in 1% prawn extract treatment. In 5% extract treated seeds the seed germination started at 8^{th} day of treatment. In 10% prawn extract treated seeds the seed germination started at 9^{th} day of treatment. In 20% prawn extract treated seeds, the seed germination not takes place even on 10^{th} day of germination. It means the beginning of seed germination is affected due to the treatment of prawn extract. It is further added that the delay in beginning of seed goes on decreasing as the concentration of prawn extract treatment goes on increasing.

Table II- B Effect of Prawn extract on germination percentage of seeds of Vigna mungo.

Treatment (Spinach leaves extract)	**Number of seed/s germination per day/s**									
	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day	8th Day	9th Day	10th Day
Control	0	30	80	10	10	10	10	10	10	10
1%	0	0	0	0	20	20	30	40	40	50
5%	0	0	0	0	0	0	0	10	20	20
10%	0	0	0	0	0	0	0	0	10	10
20%	0	0	0	0	0	0	0	0	0	0

Table II-B shows the effect of percentage on concentration of prawn extract of seed germination in Vigna mungo. From these observation, it is clear that the seed percentage goes on increasing from first to tenth day of germination in control seeds. It is 100% rate of germination of 9th day of treatment. The rate of germination is only 50% in 1% prawn extract treated seeds on 10th day. It is 20%, 10% rate of seed germination in 5% and 10% prawn extract treated seeds on 10th day of treatment. However in 20% prawn extract treatment, the seed germination rate is nil even on 10th day of experiment. It means the rate of seed germination is affected by prawn extract treatment in Vigna mungo. The effect goes on adverse as the concentration of prawn extract goes on increasing. There is no germinations % at all in Vigna mungo.

Table II-C. Effect of prawn extract on radical (root) length in Vigna mungo.

Treatment prawn extract	**Average radical (shoot) length in cm on 10th day of treatment**
Control	1.29cm
1%	0.75cm
5%	0.57cm
10%	0.28cm
20%	0.0cm

Table II-C shows the average radicle length of seeds in Vigna mungo on 10th day of germination in control and prawn extract treated seeds. It is clear from table II-C that the average root length (radicle) is 1.29 cm in control seeds as on 10th day of germination. It is 0.75cm, 0.57cm and 0.28cm in1%, 5% and 10% prawn extract treated seeds while there no radicle formation in 20% prawn extract seeds. It indicates that the prawn extract treatment has adverse effect on radicle length in seeds of Vigna mungo. The adverse effect of prawn extract treatment goes on increasing as the concentration of prawn extract treatment goes on increasing from 1% to 20%.

Table II-D- Effect of prawn extract on plumule (shoot) length during sees germination of Vigna mungo.

Treatment prawn extract	**Average radical (shoot) length in cm on 10th day of treatment**
Control	1.55 cm
1%	-
5%	-
10%	-
20%	-

Table-II-D shows effect of prawn extract treatment on plumule (shoot) formation in seeds of Vigna mungo. It is clear from Table-II-D that the length of plumule is 1.35cm in control seeds. There is no plumule formation in 1%, 5%, 10% and 20% prawn extract treated seeds. It means there is inhibiting

effect of prawn extract treatment on plumule formation in seeds of Vigna mungo. When observation of table I-A and Table II-A are compared; it is found that seed germination begin on 2nd day in control of Vigna mungo. The 1% Spinach leaves extract treated seed shows beginning of germination on 2nd day while 1% prawn extract treated seeds shows germination beginning on 5th day. The 1%, 5%, 10%and 20% Spinach leaves extract treated seeds shows beginning of germination on 2nd day, 4th day, 4th day of treatment respectively. However, in 1%, 5%, 10% and 20% prawn extract treated. Seeds of Vigna mungo shows beginning of germination 5th day, 7th day 9th day and no germination respectively. It means beginning of germination delayed more by prawn extract treatment than the Spinach leaves extract treatment on seeds of Vigna mungo.

Comparative account of Table I-B and Table II-B shows that germination percentage of control seeds of Vigna mungo is about 100% on 10th day of treatment. While it is 60%,60%, 50% and 30% in 1% , 5%, 10% and 20% prawn extract treated seeds.It is 50%, 20%,10% and zero in 1% , 5%10% and 20% prawn extract treated seeds.It means seed germination percentage is more affected by prawn extract treatment than Spinach leaves extract treatment.

From Table I-C and Table II-C, it is observed that the radicle length is maximum (4.35cm) in control seeds of Vigna mungo. The length of radicle is 1.23cm, 0.95cm 0.2cm and 0.17cm in 1%,5%,10% and 20% spinach leaves extract treated seeds during germination on 10th day of treatment .The length of radicle is 0.75cm,0.57cm, 0.28cm and 0 cm in 1%, 5%, 10% and 20% prawn extract treatment is more adverse in terms of radicle growth during germination than Spinach leaves extract in seeds of Vigna mungo.

Table I-D and Table II-D comparative account shows that shoot formation in control, however, there is no shoot (plumule) formation in either Spinach leaves extract treated seeds or prawn extract treated seeds of Vigna mungo. It means either Spinach leaves extract treatment or prawn extract treatment affect the plumule(short) formation.

Anna Traveset (1998) published research paper. In this paper the effect of different invertebrates on seed germination of nearly 200 plant species was studied for searching patterns that predict the circumstances in which germination of seeds is enhanced, inhibited or unaffected by the passage through the digestive tract of seed disperser. It was found that seed disperse have an effect on the germination of seeds or on the rate of germination, or both. The seed of different plant species differ strongly in their germination response after ingestion.

According to Carley, E.H. and Watson R.D (1968) effect of various aqueous plant extracts seed germination. Aqueous extracts of residues from 23 plant species inhibited the germination of clover, lettuce, radish and wheat seeds. Extract from potato, sugar beat, sugarbrush, green soybean, alfaalfa, pea and bean were extremely toxic to germinating seeds. The extract from Douglas-fir, peat moss and sphagnum moss stimulated the growth of some germinating seeds. The degree of toxicity was dependent upon the maturity of the plant residue, the concentration of the extract, the species from which the extract was obtained, and the species of seed used in making the bioassays.

Water extract of Quack grass (Agropyron repense) leaves or rhizome were not phytotoxic to the germination in oats and Alfaalafa.

Kommedahl, Thor; Kothimer, J.B and Bernardini, J.V. (1959), studied the effects of Quackgrass on germination and seeding development of certain crop plants. Weeds V.7 (1) pp 1-12. They observed the adverse effect of Quackgrass on germination and seedling development in certain crop plants.

Toumeau, D.L; Failes,G.D.and Heggeness, H.G.(1956), observed. The effect of aquous extracts of plant tissue on germination, root growth, Coleoptile formation in wheat, pea seeds. Similerly, an attempt is made to study the impact of certain external conditions on seed germination of Vigna mungo.

CONCLUSION:-

Aqueous extract of spinach leaves and prawns of 1%, 5%, 10% and 20% (W/V) was treated to Vigna mungo seeds was studied. Treated seeds shows late germination, decreased rate of germination percentage, less redicle length and no plumule formation. Beginning of germination delayed more by prawn extract treatment than Spinach leaves extract treatment. Seed germination

percentage is more affected by prawn extract treatment than Spinach leaves extract treatment. Prawn extract treatment is more adverse in terms of redicle growth during germination than Spinach leaves extract treatment to seeds of Vigna mungo. There is no plumule formation takes place in both treated seeds during germination. The adverse effect of Spinach leaves extract treatment and prawn extract goes on increasing with increasing the concentration extracts.

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STUDIES ON PHYSICO-CHEMICAL CHARACTERISTICS OF DRINKING WATER SOURCES OF VIHOUR VILLAGE OF MURUD TEHSIL DISTRICT-RAIGAD, MAHARASHTRA, INDIA

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ABSTRACT:-

Fresh water is essential for agriculture, industry and human existence. It is a finite resource of earth. Fresh water resource are becoming deteriorate day-by-day at the very faster rate. Now water quality is a global problem. The present investigation reveals an acute awareness among the people about the quality of drinking water by taking water samples from different sources for analysis. The experiment analyses its various Physico-chemical and biological parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity were analyzed in the month of December 2017. The results are compared with standards of WHO. From the obtained result it can be predicted that the parameters which were taken to study the water quality are below the pollution level for water which satisfies the requirement for the use of various purposes like domestic, agricultural etc.

Keywords: *Drinking water resources, water quality standard, Physico-chemical Parameter.*

INTRODUCTION:

Water is one of the most important parameter to the ecosystem. The sustainable development will not be possible without adequate quantity and quality of fresh water [1-2]. Fresh water resource are becoming deteriorate day-by-day at the very faster rate. Now water quality is a global problem [2]. The healthy aquatic ecosystem is depended on the biological diversity and Physico-chemical characteristics [3]. Better quality of water is described by its physical, chemical and biological characteristics. But some correlation was possible among these parameters and the significant one would be useful to indicate quality of water. Water supply systems are important, but at the same time wastewater treatment systems are also equally important. Approximately 80% of water turns to waste water after its utilization.

Water quality provides current information about the concentration of various solutes at a given place and time. Its quality parameters provide the basis for judging the suitability of water for its designated uses and to improve existing conditions [4].There is no single or simple measure for water quality. Water may be tested for a few characteristics or numerous natural substances and contaminants depending on their needs. The nature and extent of water pollution is characterized by several physical, chemical and biological parameters. The increased anthropogenic activities due to industrialization have contributed to decline in water quality including climate and precipitation, soil type, vegetation, groundwater and flow conditions. The water quality of rivers and lakes changes with the seasons and geographic areas, even when there is no pollution presents [5].

The deterioration of water quality has led to the destruction of ecosystem balance, contamination and pollution of ground and surface water resources. Water quality degradation world-wide is due to many anthropogenic activities which release pollutants into the environment thereby having an adverse effect upon aquatic ecosystems. Quality of water can be regarded as a network of variables such as pH, oxygen concentration, temperature, etc. and any changes in these physical and chemical variables can affect aquatic biota in a variety of ways [6]. Since the quality water is directly related to health and is important for determination of water utility, it is very essential and important to test the quality of the water before it is used for drinking, domestic, agricultural or industrial purposes. The utility of river water for various purposes is governed by physicochemical and biological quality of the water [7].

It is well known that no straight forward reasons can be advanced for the deterioration of water quality, as it is dependent on several water quality parameters [8]. Ground water quality in the industrial areas is determined by measuring the concentration of some physico-chemical parameters and comparing them with drinking water standards [9].

Chandanshive Navnath Eknath [10] studied "The Seasonal Fluctuation of Physico-Chemical parameters of River Mula- Mutha at Pune, India and their Impact on Fish Biodiversity". MVS Vaishnavi et al [11] studied "Study of levels of heavy metals in the river waters of regions in and around Pune City, Maharashtra, India". Pali Sahu et al [12] studied "Physicochemical Analysis of Mula Mutha River Pune". Nidhi Jain et al [13] studied "Comparative Review of Physicochemical Assessment of Pavana River". Patil. P.N et al [14] studied "Physico-chemical parameters for testing of water".

According to Census 2011 information the location code or village code of Vihour village is 554254. Vihour village is located in Murud Tehsil of Raigarh district in Maharashtra, India. It is situated 4km away from sub-district headquarter Murud and 53km away from district headquarter Alibag. As per 2009 stats, Vihoor is the gram panchayat of Vihour village.

The total geographical area of village is 634.63 hectares. Vihour has a total population of 2,021 peoples. There are about 469 houses in Vihour village. Murud is nearest town to Vihour which is approximately 4km away. The water sample such as Pipe water, bore well water and well water was collected early in the morning between 8.00 am to 10.00 am and was analyzed to compare the differences occurred in Physico-chemical parameters such as Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Ca-hardness, Magnesium hardness and Salinity.

The research work is carried out, keeping in mind the following objectives.

- To study the chemical composition and water quality parameters of different sources.
- To investigate the possible sources and Cause of pollution in the water if any.
- To study if these effects can be attributed to the change in the chemical composition of the different water sources.

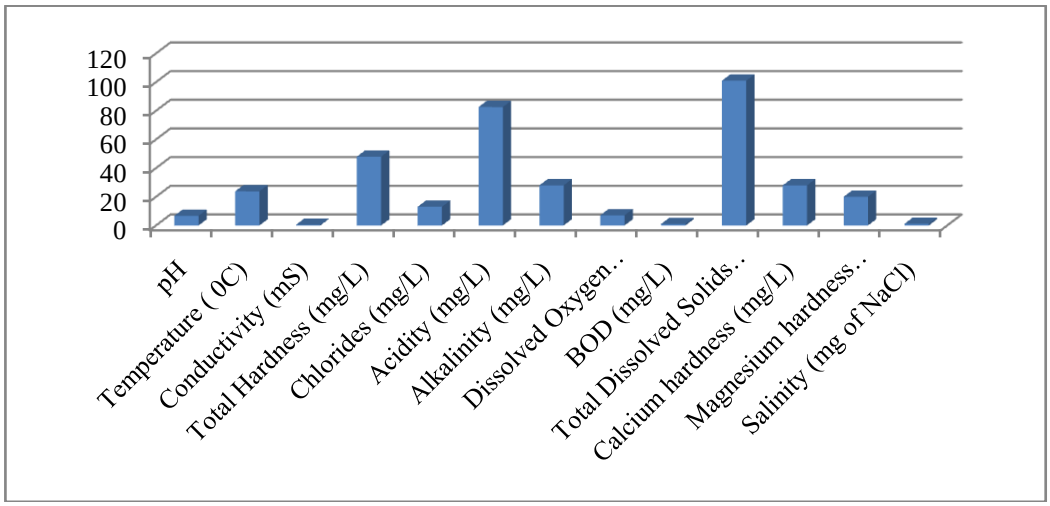
MATERIAL & METHOD:-

Sample of water was collected in sterile plastic bottle of 2 litre capacity from the dam. At the same time the temperature & pH were noted. The physico-chemical analysis was carried out within 24 hours of collection in a laboratory as per APHA (1989), (1992), AWWA & WPFA, Trivedy & Goel (1986) [15-16]. The chemicals were used of A. R. grade and are standardized as per Inorganic quantitative analysis by Vogel (1964) & (2006) [17-18]. The result is statistically analyzed by calculating mean & standard deviation.

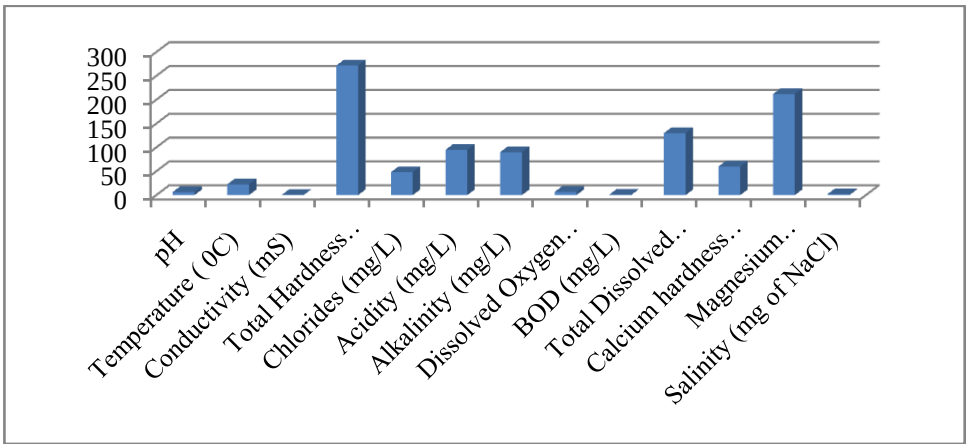
RESULTS & DISCUSSION:-

Parameters	Tap water Mean±S.D	Bore well water Mean±S.D	Well water Mean±S.D
pH	7.72 ± 0.02	6.50 ± 0.02	7.35 ± 0.02
Temperature (^{0}C)	24.3 ± 0.3	22.8 ± 0.3	24.7 ± 0.3
Conductivity (mS)	0.173 ± 0.002	0.480 ± 0.002	0.222 ± 0.002
Total Hardness (mg/L)	84 ± 1.0	212 ± 1.0	116 ± 1.0
Chlorides (mg/L)	15.05 ± 0.18	43.15 ± 0.18	26.13 ± 0.18
Acidity (mg/L)	42.6 ± 0.3	75.0 ± 0.3	45.3 ± 0.3
Alkalinity (mg/L)	90 ± 0.3	198 ± 0.3	126 ± 0.3
Dissolved Oxygen (mg/L)	7.126 ± 0.015	6.896 ± 0.015	7.266 ± 0.015
BOD (mg/L)	1.231 ± 0.03	0.993 ± 0.03	1.127 ± 0.03
Total Dissolved Solids (mg/L)	111 ± 1.0	128 ± 1.0	215 ± 1.0
Calcium hardness (mg/L)	48 ± 0.3	116 ± 0.3	72 ± 0.3
Magnesium hardness (mg/L)	36 ± 0.3	96 ± 0.3	44 ± 0.3
Salinity (mg of NaCl)	1.172 ± 0.003	1.758 ± 0.003	2.344 ± 0.003

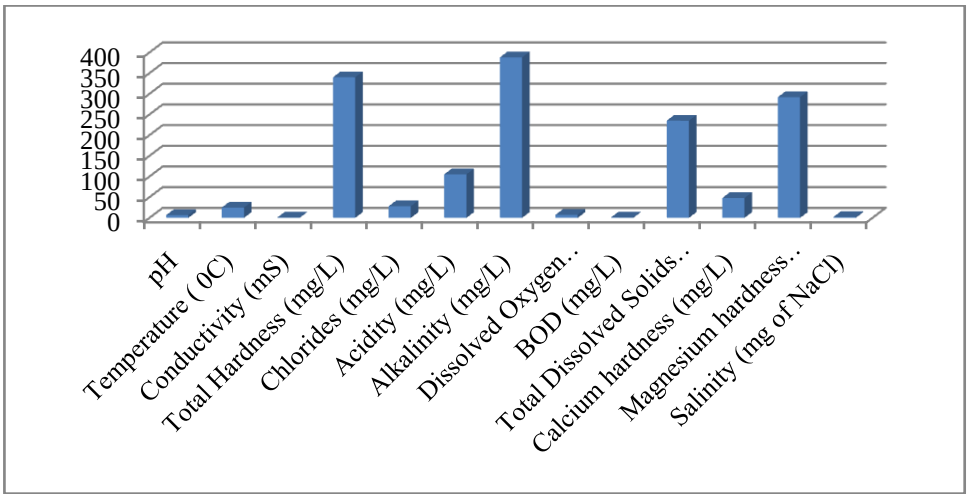
Table-1:- Values of different parameters of water sample of different drinking sources in Vihour village area. (Mean and Standard deviation is calculated)



a. Graph showing concentration range of various parameters of Tap water.



b. Graph showing concentration range of various parameters of bore well water.



c. Graph showing concentration range of various parameters of well water.

1. Temperature:

Temperature is the most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimize temperature change. The Water temperature depends on the depth of the water column, climatic and topographic changes [19].

A rise in temperature of water leads to the speeding up of chemical reactions in water, reduces the solubility of gases and amplifies the tastes and odour. At higher temperature with less dissolved gases the water becomes tasteless and even does not quench the thirst and decreases the solubility of oxygen.

Temperature also determines various other factors such as pH, Conductivity, saturation level of gases and various forms of alkalinity. The temperature of Tap water is 24.3±0.3 ^{0}C, bore well water temperature is 22.8±0.3 ^{0}C and temperature of well water is found to be 24.7±0.3 ^{0}C.

2. pH:

pH, one of the most common analyses in soil and water testing, is the standard measure of how acidic or alkaline a solution is. pH has no direct adverse effect on health. pH governs the distribution, transport and fate of heavy metals in aquatic ecosystem. It is measured a scale from 0 - 14. pH of 7 is neutral, pH is less than 7 is acidic and pH greater than 7 is basic. Aquatic organisms need the pH of their water body to be a certain range optimal growth and survival.

The pH of Tap water is 7.72 ± 0.02, bore well water pH is 6.50 ± 0.02 and pH of well water is found to be 7.35 ± 0.02. Amongst these three samples, bore well water is comparatively acidic in nature.

3. Electrical Conductance:

Conductivity is the measure of a substance or solution to conduct electric current. Presence of salts and contamination with wastewater increases conductivity of water. It is a indication of pollution. Electrical conductivity used to quickly estimate the ionic or soluble salt concentration in soils, water supplies, fertilizer solution and chemical solution. It is highly depended upon temperature.

Conductivity however is an important criterion in determining the suitability of water for irrigation. The conductance of Tap water is 0.173 ± 0.002 mS, bore well water conductance is 0.480 ± 0.002 mS and conductance of well water is found to be 0.222 ± 0.002 mS. Amongst these three samples, bore well water is comparatively high electrical conductance. The observed values of electrical conductance for others are quite low and less electrolyte.

4. Total Hardness:

Total hardness is defined as the sum of calcium and magnesium hardness in mg/L as $CaCO_3$.Total hardness of water an important factor that indicates toxic effect and poisonous elements [20].

There is no adverse effect of hardness on health. Hard water is also not suitable for domestic and irrigation purposes. Total hardness of Tap water is 84 ±1.0 mg/L, bore well water is 212 ±1.0 mg/L and the well water is 116 ±1.0 mg/L.

The degree of hardness of drinking water has been classified in terms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/L, Medium - 60-120 mg/L, Hard - 120-180 mg/L, Very hard - >180 mg/L. The observed values were quiet less than the acceptable limit of 300 mg/L for tap water sample, bore well water and well water sample.

5. Chlorides:

Chloride is mainly obtained from the dissolution of salts of hydrochloric acid as table salt (NaCl), NaCO2 and added through industrial waste, sewage, sea water etc. Surface water bodies often have low concentration of chlorides as compare to ground water. It has key importance for metabolism activity in human body and other main physiological processes. High chloride concentration damage metallic pipes and structure as well as harms growing plants. According to WHO standards concentration of chloride should not exceed 250 mg/L.

The chloride content of the tap water sample is 15.05 ±0.02 mg/L, bore well water is 43.15±0.18 mg/L and Chlorides in well water sample is 26.13 ±0.05 mg/L.

6. Acidity:

Acidity of water is its capacity to neutralize a strong base and is mostly due to the presence of strong mineral acids, weak acids and the salt of strong acids and weak bases. Addition of wastewater having acidity producing substances increases the acidity of water. The observed acidity of tap water sample is 42.6± 0.015 mg/L of $CaCO_3$, bore well water sample is 75.0± 0.3 mg/L. of $CaCO_3$. While acidity of well water samples is 45.3± 0.3 mg/L of $CaCO_3$. The value is much less than threshold value i. e. 200 mg/L of $CaCO_3$. This indicates that sample of water are in safe range.

7. Alkalinity:

Alkalinity is a chemical measurement of water's ability to neutralize acid. Alkalinity is also a measure of water buffering capacity or its ability to resist changes in pH upon the addition of acids or bases. Alkalinity of natural water is due to primarily to the presence of weak acid salts, although strong bases may also contribute (i.e. OH^-) in the extreme environment. Bicarbonate represents the major form of alkalinity in natural water, so its source being the partitioning of CO2 from the atmosphere and the weathering of carbonate minerals in rocks and soil. Other salts of weak acids, such as borate, silicates, ammonia, phosphate, and organic bases from natural organic matter may be present in small amounts.

The observed alkalinity of tap water sample is 90 ±0.3 mg/L of $CaCO_3$, bore well water sample is 198 ± 0.3 mg/L. of $CaCO_3$ while alkalinity of well water sample is 126 ± 0.3 mg/L of $CaCO_3$. The observed values of alkalinity of tap water, bore well water and well water samples are within permissible range i. e. below 200 mg/L of $CaCO_3$.

8. Dissolved Oxygen:

The amount of oxygen dissolved in water, such as a lake, river or stream. Dissolved oxygen is the most important indicator of the health of water bodies and its capacity to support a balanced aquatic ecosystem of plants and animals. Warm water released from industrial outlets, flowages or storm sewers can also reduce dissolved oxygen levels. Dissolved oxygen may play a large role in the survival of aquatic life in temperature lakes and reservoirs during summer months. Dissolved oxygen of tap water sample collected is 7.126 ± 0.015mg/L, bore well water sample is 6.896 ± 0.015mg/L, whereas well water sample is 7.266 ± 0.015mg/L . It may be due to high temperature and inorganic reluctance such as hydrogen sulfide, ammonia, nitrites, ferrous ions and other oxidizable substances also tend to decrease dissolved oxygen in water.

9. Biochemical Oxygen Demand (BOD):

Biochemical oxygen measures the amount of oxygen that microorganisms consume while decomposing organic matter, it also measures the chemical oxidation of inorganic matter. BOD is a measure of organic material contamination in water, specified in mg/L. BOD is the amount of dissolved oxygen required for the biochemical decomposition of organic compounds and the oxidation of certain inorganic materials (e.g., iron, sulphites).

The observed value of BOD for tap water is 1.231 ± 0.03 mg/L, for bore well water is 0.993 ± 0.03 mg/L and for well water sample is 1.127 ± 0.03 mg/L which is within the permissible range i. e. 0.75-1.5 mg/L.

10. Total Dissolved Solids (TDS):

Total dissolved solids are the total amount of mobile charged ions, including minerals, salts or metal dissolved in a given volume of water in mg/L. TDS is directly related to the purity of water and the quality of water purification system and affects everything that consumes, lives in, or uses water, whether organic or inorganic, whether for better or for worse. Common inorganic salts that can be found in water include calcium, magnesium, potassium and sodium, which are cations and carbonates, nitrates, bicarbonates, chlorides and sulphates which are anions. They give a particular taste to water at higher concentration and also reduce its palatability.

The total solid present in tap water sample collected is 111 ± 1.0 mg/L, for bore well water is 128 ± 1.0 mg/L, while that of for well water sample is 215 ± 1.0 mg/L which is lower than threshold value of total solid content i.e. 500 mg/L.

11. Calcium hardness:

Calcium is naturally present in water. Calcium is a determinant of water hardness, because it can be found in water as Ca^{2+} ions. As per Indian Standards the calcium content of water should not be more than 75 mg/L. This has been specified in the IS 10500:- Drinking Water –Specifications.

In the study the calcium content in water sample has been found to be for tap water sample is 48 $\pm$ 0.3 mg/L, for bore well water is 116 $\pm$ 0.3 mg/L and for well water is 72 $\pm$0.3 mg/L. Tap water and well water possess values calcium hardness which is within the limit as per Specification. The observed values for bore well water samples are crosses the permissible range of concentration of calcium.

12. Magnesium hardness:

Magnesium is naturally present in water. Magnesium is a determinant of water hardness, because it can be found in water as Mg^{2+} ions. As per ISI the magnesium content of water should not be more than 50 mg/L.

In the study the magnesium content in water sample has been found to be for tap water sample is 36 $\pm$ 0.3 mg/L, for bore well water is 96 $\pm$ 0.3 mg/L and for well water is 44 $\pm$ 0.3 mg/L. Tap water and well water possess value of magnesium hardness which is within the limit as per Specification. The observed value for bore well water shows higher concentration of magnesium.

13. Salinity:-

Salinity which is defined as the total concentration of electrically charged ions in the water. These ions are the four major cations-calcium, magnesium, potassium and sodium, and the four common anions carbonates (CO_3), sulphates (SO_4), chlorides (Cl) and bicarbonates (HCO). Other components of salinity are charged nitrogenous compounds such as nitrates (NO_3), ammonium ions (NH_4) and phosphates (PO_4) **[**21]. In general the salinity of surface waters depends on the drainage area, the nature of its rock, precipitation, human activity in the area and its proximity to marine water [22]. Waters with salinity below 1% are fresh and waters with salinity higher than 1% are brackish/marine [23].

The observed value of salinity for tap water sample is 1.172 $\pm$ 0.003 mg of NaCl, for bore well water sample is 1.758 $\pm$ 0.003 mg of NaCl and for well water sample is 2.344 $\pm$ 0.003 mg of NaCl .

CONCLUSION:

The present paper deals with analysis of water quality in different drinking water resources available in Vihour village region which was carried out by taking certain important parameters like Temperature, pH, Electrical conductivity, TDS, Alkalinity, Chloride, DO, BOD, Total hardness, Calcium hardness, Magnesium hardness and Salinity. The data of physico-chemical and biological parameters clearly shows that the drinking water of Vihour village region is within the permissible range as per APHA (1989), (1992), Trivedi and Goel (1986) except few limitations in one or two parameters. Such water is suitable for drinking purpose and can be used for domestic as well as irrigation purpose.

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WIRELESS CHARGING OF MOBILEPHONE USING MICROWAVE

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Abstract
Now a days a mobile phones becoming a basic part of our life .this is one of the most important medium for the communication, the mobile phone batteries has always been problem for recharging. Mobile have to be put to recharge after the batteries has drained out. In this paper the main purpose is shown to make the recharging of mobile phones anywhere you want without charger this is done only when there is a use of microwave, themicrowave signal transmitted from transmitter using a special kind of antennas called slotted wave guide antennas at a frequency 2.45GHZ. We have to add a sensor, rectenna circuit in our mobile phone to do this job successfully. This is one of the best technologies and for this purpose we are proposing wireless charging of mobile phones by using microwaves.

INTRODUCTION

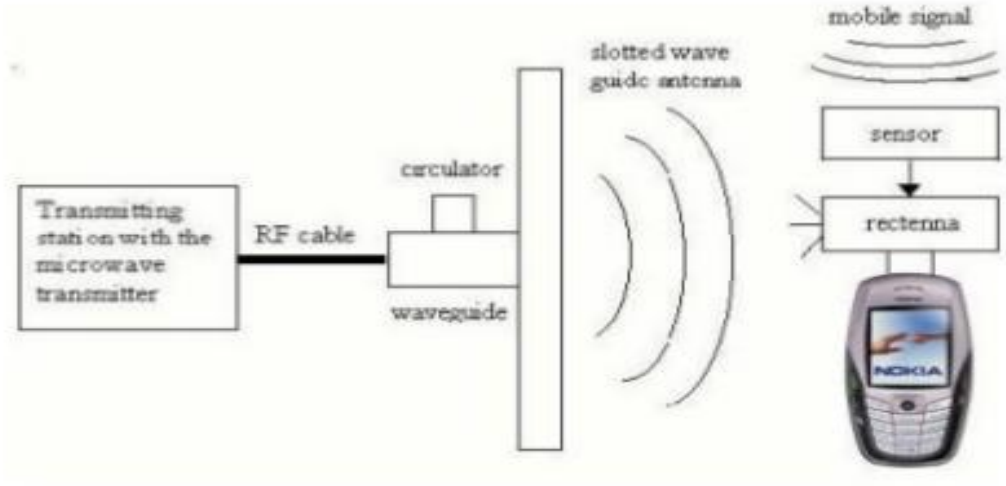
The two main concepts which are base of this technique are

1.Electromagnetic Spectrum:

Electromagnetic spectrum is a range of all possible frequencies of electromagnetic radiation. When white light is shown through a prism it is separated out into all colors this is called a vibal spectrum light. Consist of a very smallparticles are called as photons is a bundle of energy.

light is travelling at the speed of 3,00,000 km/hr.as light hit something that means it may be bounce off, and it comesinto our eyes and we can see object.

GENERAL BLOCK DIAGRAM



Microwave region

Microwave are the radio wave which has the wave length range of 1 mm to 1 meter and the frequency is 3000 MHZto300 GHZ. Microwaves have wavelength that can be measured in centimeters microwaves are good fortransmitting information from one place to another place because microwave

energy can penetrate haze, light rainand snow, clouds and smoke. Microwave radiation is still associated with energy level that is usually consideredharmless except for people with pace makers.

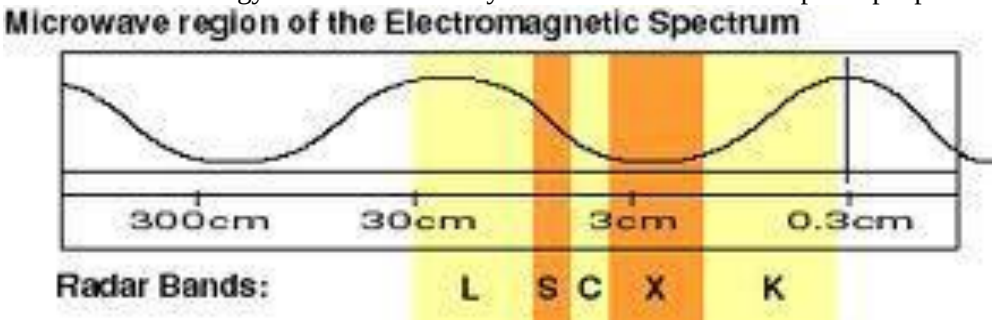


Fig. microwave region of electromagnetic spectrum

DESIGN :

The system design of wireless charging of mobile phones using microwave consist of four parts are follows

Transmitter Design

Typically a transmitter design includes generation of a carrier signal, which is normally sinusoidal, optionally oneor more frequency multiplication stages, a modulator, a power amplifier, and a filter and matching network toconnect to an antenna. A very simple transmitter might contain only a continuously running oscillator coupled tosome antenna system. More elaborate transmitters allow better control over the modulation of the emitted signal andimprove the stability of the transmitted frequency. For example the Master Oscillator-Power Amplifier (MOPA)configuration inserts an amplifier stage between the oscillator and the antenna. This prevents changes in the loadingpresented by the antenna from altering the frequency of the oscillator.

Receiver Design

We have to add a sensor and a Recteen at the receiver side. The recteena actually convert the Microwave into theDC power.It's elements are usually arranged in a mesh pattern. A simple rectenna is constructed by using a schottkydiode. Rectenna are very powerful to convert the Microwave in to the electricity. Actually the size of rectenna canbe reducing using the Nano technology. Another important part is the Sensor. As we know we are going to chargethe phone while a person is talking. So here sensor is used to detect wither the phone is using microwaves or not.

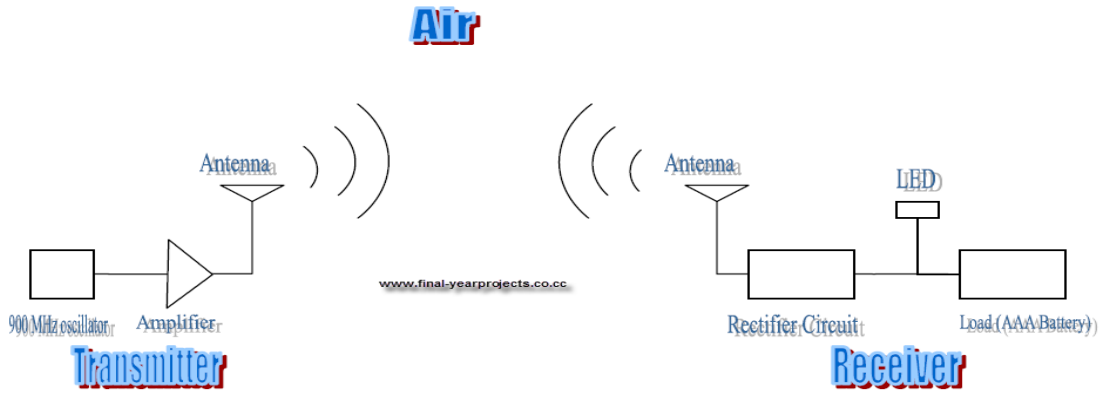


FIG: transmitter design and receiver design

THE PROCESS RECTIFICATION

Microwave energy transmitted from space to earth apparently have the potential to provide clean electrical poweron a very large scale the aim of the study to make a low cost power rectifier for low &high power levels at frequency of 2.45GHZ.the schottky Diode microwave rectifying circuit has the efficiency is greater than90%.Microwave can travel through the media but it also lose some energy.

So our key objective is to rectify thecircuit our objective is to rectify the waves at the low cost. And also we have to make the detection more sensitive.

As we know that bridge rectification is more efficient than the single diode. And we use the shotky diode to get thebatter impedance.

COMPONENTS OF WIRELESS POWER TRANSMISSION SYTEM

Microwave generator

The microwave generator is the one which generates the microwave of preferred frequency. It generates themicrowave by the interaction of steam of electrons and magnetic field.

Transmitting Antenna

There are many types of slotted wave guide antenna available. An electrical current passes through the antenna,inducing a magnetic field, which oscillates at the given frequency. The variations in the current create slightvariations in the radio frequency. These radio waves radiate outward from the antenna in a "beam" according to theantenna's design.

Rectenna

A rectenna is a rectifying antenna, a special type of antenna that is used to convert microwave energy into directcurrent electricity. They are used in wireless power transmission system that transmits power by radio waves. Inrecent years interest has turned to using rectennas as power sources for small wireless microelectronic devices.

ADVANTAGES

Wireless methods are always advantageous than cumbersome, untidy wiry networks.

1.You can have a lot of options if the facility of wireless charging of mobile phones is somehow implemented.

2.Charge the phone by Bluetooth so low risk of electrical shock or shorting.

3.The need of different type of chargers by different manufacturers is totally eliminated.

DISADVANTAGES

The transmitter and receiver also should be very powerful devices as the distance increases the charging isvery slower.

1. Wireless transmission of the energy cause some drastic effects to human body ,because of its radiation.

2. It is more costly practical possibilities are not yet applicable in this field.

CONCLUSION

This paper successfully show a novel method of using the power of the microwave to charge the mobilephones without the use of wired chargers. A novel use of the rectenna and a sensor in a mobile phone could provide anew dimension in the revelation of mobile phone.

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CLOUD COMPUTING AND BIG DATA: INNOVATION OPPORTUNITIES AND CHALLENGES

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Abstract:
Cloud computing -- a consumer/delivery model where information technology (IT) capabilities are offered as services billed based on usage -- has brought big data analysis to the masses by giving businesses access to vast amounts of computing resources on demand. As the technology continues to advance, the question for many businesses is how they can benefit from big data and how to use cloud computing to make it happen. Big Data has emerged in the past few years as a new paradigm providing abundant data and opportunities to improve and/or enable research and decision-support applications with unprecedented value for digital earth applications including business, sciences and engineering. Big Data presents challenges for digital earth to store, transport, process, mine and serve the data
Keywords: big data, cloud computing, big data issues.

Introduction-

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. The cloud model promotes availability and is composed of five essential characteristics: on-demand self-service, broad network access, resource pooling, rapid elasticity and measured service; three service models: Cloud Software as a Service (SaaS), Cloud Platform as a Service (PaaS) and Cloud Infrastructure as a Service (IaaS); and four deployment models: private cloud, community cloud, public cloud and hybrid cloud). The cloud computing model offers the promise of massive cost savings combined with increased IT agility. In addition, cloud computing democratizes big data – any enterprise can now work with unstructured data at a huge scale.

It was the emergence of cloud computing which made it easier to provide the best of technology in the most cost-effective packages. Cloud computing not only reduced costs, but also made a wide array of applications available to the smaller companies.

Big Data refers to the flood of digital data from many digital earth sources, including sensors, digitizers, scanners, numerical modeling, mobile phones, Internet, videos, e-mails and social networks. The data types include texts, geometries, images, videos, sounds and combinations of each. Such data can be directly or indirectly related to geospatial information .The evolution of technologies and human understanding of the data have shifted data handling from the more traditional static mode to an accelerating data arena characterized by volume, velocity, variety, veracity and value . The first V refers to the volume of data which is growing explosively and extends beyond our capability of handling large data sets; volume is the most common descriptor of Big Data

Cloud Computing and Big Data

Cloud computing provides fundamental support to address the challenges with shared computing resources including computing, storage, networking and analytical software; the application of these resources has fostered impressive Big Data advancements.

Just as the cloud is growing steadily, we are also noticing an explosion of information across the web. Social media is a completely different world, where both marketers and common users generate loads of data every day. Organizations and institutions are also creating data on a daily basis, which can eventually become difficult to manage. Take a look at these statistics on Big Data generation in the last five years;

- *2.5 quintillion bytes (2.3 Trillion Gigabytes) of data are created every day.*

- *40 zettabytes (43 Trillion Gigabytes) of data will be created by 2020.*
- *Most companies in the US have at least 100 Terabytes (100,000 Gigabytes) of stored data.*

These high volumes of data present a challenge to the cloud environment. How to manage and secure the essence of this data rather than just stacking it?

It seems like cloud computing and big data are an ideal combination for this. Together, they provide a solution which is both scalable and accommodating for big data and business analytics. The analytics advantage is going to be a huge benefit in today's world. Imagine all the information resources which will become easily accessible. Every field of life can benefit from this information.

ADVANTAGES:

Agility:

The traditional infrastructure of storing and managing data is now proving to be slower and harder to manage. It can literally take weeks to just install and run a server. Cloud computing is here now, and it can provide your company with all the resources you need. A cloud database can enable your company to have thousands of virtual servers and get them working seamlessly in only a matter of minutes.

Affordability:

Cloud computing is a blessing in disguise for a company that wishes to have updated technology under a budget. Companies can pick what they want and pay for it as they go. The resources required to manage Big Data are easily available and they don't cost big bucks. Before the cloud, companies used to invest huge sums of money in setting up IT departments and then paid more money to keep that hardware updated. Now the companies can host their Big Data on off-site servers or pay only for storage space and power they use every hour.

Data processing:

The explosion of data leads to the issue of processing it. Social media alone generates a load of unstructured, chaotic data like tweets, posts, photos, videos and blogs which can't be processed under a single category. With Big Data Analytics platforms like Apache Hadoop, structured and unstructured data can be processed. Cloud computing makes the whole process easier and accessible to small, medium and larger enterprises.

Feasibility:

While traditional solutions would require the addition of more physical servers to the cluster in order to increase processing power and storage space, the virtual nature of the cloud allows for seemingly unlimited resources on demand. With the cloud, enterprises can scale up or down to the desired level of processing power and storage space easily and quickly.

Big Data analytics require new processing requirements for large data sets. The demand for processing this data can raise or fall at any time of the year, and cloud environment is the perfect platform to fulfill this task. There is no need for additional infrastructure, since cloud can provide most solutions in SaaS models.

Challenges to Big Data in the Cloud environment:

Just as Big Data has provided organizations with terabytes of data, it has also presented an issue of managing this data under a traditional framework. How to analyze the large sum of data to take out only the most useful bits? Analyzing these large volumes of data often becomes a difficult task as well.

In the high speed connectivity era, moving large sets of data and providing the details needed to access it, is also a problem. These large sets of data often carry sensitive information like credit/debit card numbers, addresses and other details, raising data security concerns.

Security issues in the cloud are a major concern for businesses and cloud providers today. It seems like the attackers are relentless, and they keep inventing new ways to find entry points in a system. Other issues include ransomware, which deeply affects a company's reputation and resources, Denial of Service attacks, Phishing attacks and Cloud Abuse.

Globally, 40% of businesses experienced a ransomware incident during the past year. Both clients and cloud providers have their own share of risks involved when making an agreement on cloud solutions. Insecure interfaces and weak API's can give away valuable information to hackers, and these hackers can misuse this information for the wrong reasons.

Some cloud models are still in the deployment stage and basic DBMS is not only tailored for Cloud computing. Data Acts is also a serious issue which requires data centers to be closer to a user than a provider.

Data replication must be done in a way which leaves zero room for error; otherwise it can affect the analysis stage. It is crucial to make the searching, sharing, storage, transfer, analysis, and visualization of this data as smoothly as possible.

The only way to deal with these challenges is to implement next-generation technology which can predict an issue before it causes more damage. Fraud detection patterns, encryptions and smart solutions are immensely important to combat attackers. At the same time, it is your responsibility to own your data and keep it protected at your end while looking for business intelligent solutions that can ensure a steady ROI as well.

Research challenges

As we know that cloud and big data technologies work very well together. Even though the partnership between these two technologies have been established, both still pose some challenges.

Concerning the existing problems, we define some of the possible advances in the next few years:

- Security and Privacy can be resolved using data encryption. However, a new generation of systems must ensure that data is accessed quickly and that encryption does not affect processing times so badly;
- Big Data variety can be addressed by using data standardization. This, we believe, is the next step to minimize the impact of heterogeneity;
- Data governance and data recovery plans are difficult to manage and implement, but as Big Data become a de facto technology, companies are starting to understand the need of such plans.;
- New and secure QoS (quality of service) based data uploading mechanisms may be the answer to ease data uploading onto the cloud;
- Scalability and elasticity techniques exist and are broadly used by several Big Data vendors such as Amazon and Microsoft. The major concern relies upon developing fully automatic reactive and proactive systems that are capable of dealing with load requirements automatically.

CONCLUSIONS :

With data increasing on a daily base, big data systems and in particular, analytic tools, have become a major force of innovation that provides a way to store, process and get information over petabyte datasets. Cloud environments strongly leverage big data solutions by providing fault-tolerant, scalable and available environments to big data systems.

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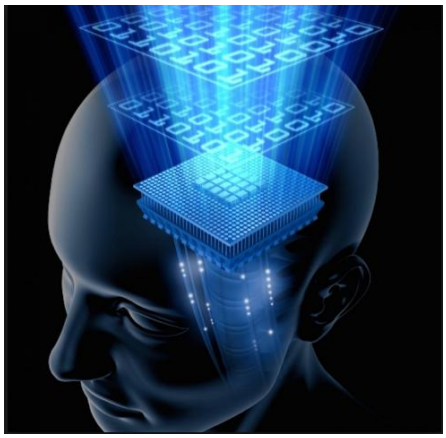
MIND READING COMPUTER

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ABSTRACT

Mind reading is a way to detect or infer the other's mental states. The simplest way for mind reading can be done by simply seeing and understanding the facial expression. For example a smile can give us an expression of happiness. But now it may be possible that not only one human can understand other's mental states but also a computer might understand the mental states of a person. The goal in building mind reading machines is to enable computer technologies to understand and react to people's emotions and mental states. This paper describes the ways how a computer might infer the mental state of a person and thus becomes the mind reading computer. This paper emphasize on the ways by which a computer might infer the mental state, one method is by facial expression analysis (FEA) and the second one by using a futuristic headband. The mental states expressed on the face are combined with facial expressions and head movements. One of the software of mind reading identifies twenty-four features of the face and along with them, it tracks the facial expressions with the real world time. To identify the smile and raised eyebrow gestures, the movement, shape, and color are analyzed. The combination of a movement and a gesture like a smile helps in knowing the mental states.

INTRODUCTION



Mind reading computer may be defined as a machine that infers the human being's mental states. The understanding of a human's thoughts is one of the most complex tasks. No one knows what a person would do in the upcoming second by executing his present thoughts or what would a person thought about any other person or what would a person desires and many more. But a mind reading computer could give answer to all these questions. Mind reading computer infers the thoughts of a human being based on various technologies for example by scanning the facial expressions along with head gestures and by identifying the volume and oxygen level inside the blood which is flowing in the vicinity of the brain. The ability of mind reading by a computer can provides us many applications in the field of medical, crime and one's life also. People employ a variety of nonverbal communication cues to infer underlying mental states, including voice, posture and the face. The human face in particular provides one of the most powerful, versatile and natural means of communicating a wide array of mental states. One subset comprises cognitive mental states such as thinking, deciding and confused, which involve both an affective and intellectual component.

MIND READING &NECESSITY OF MIND READING:

Mind reading may be defined as the inferring of the human thoughts, emotions and desires etc. First simplest step of mind reading is by simply understanding the facial expression given by the person as people express their mental states mostly through facial expressions and gestures. No matter whether they are interacting or not. Our mental states shape the decisions that we make, make us react the way we react in a particular situation and thus affect our performance.

All over our thoughts are the causes of all the things that are happening. Imagine what happened if we have a computer that can reads mind and after predicting the mental states , if there is any wrong intention possess by any person we can prevent it. And what happened if a wrong intention can be changed into good one by a computer. A computer that can reads and moulds the emotions into the

required one, especially in case of a criminal; here no need for a stringent punishment rather a computer is required that can change the mind and hence make the better world than it is now. However, this technology by computer, to change the mind according to a desire is not established now. But in future it might be developed some day. So for all this mind reading computer is just the basic step. Also consider a situation where we are surrounded with mobile phones, online services and cars and the all these systems can read our minds and react accordingly. It makes life so easy as by just thinking we can order our system to work accordingly. Moreover it becomes a boom for a physically handicapped person because he will able to drive a car, access online services and mobile phones just by thinking. All we can do is to give a mind reading machine that will be able to read mind by scanning the facial expression.

Why Mind Reading?

The mind-reading computer system presents data or information about the mental state of the people easily just like the keyboard or mouse presents the data or information on the given instructions. Just imagine a future and we are surrounded by all the devices, vehicles and the internet services, people will know our mood and react to us depending on our mood. This helps the car manufacturing technology because in these days car producers are working to make a car that can analyze the mental state of a driver that whether the driver is angry, drowsy or distracted and much more. In this project, further improvements are going on and these will help to know the mental state of the person depending upon the body postures and gestures. The projects are going on to support the avail of mind reading even in the online shopping.

How does it work?

In the working of mind reading, the technology called functional near-infrared spectroscopy (FNIRS) is used and this measure the amount of oxygen level and blood around the brain of the person i.e. subject. Also by wearing a headband and it transmits the light into the tissues of the head, the light is absorbed by the blood-filled tissues and active tissues. The results of the above are compared by using an MRI, after wearing the functional near-infrared spectroscopy sensors the subject will be asked to count the squares to do other work or task. After this, the subject will be asked to tell the complexity of the task and this rating will be compared with the results of the functional near infrared spectroscopy system.

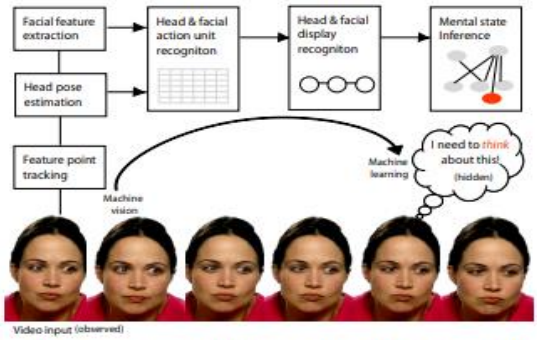
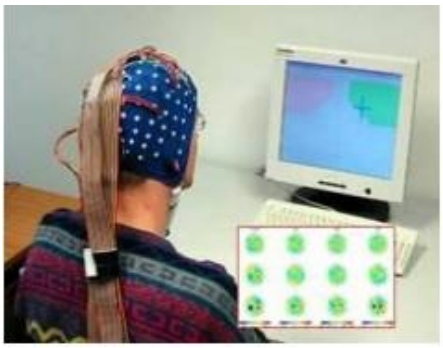


Figure 1: Block diagram of the automated mind reading system

Futuristic head:

The mind reading actually involves measuring the volume and oxygen level of the blood around the subject's brain, using technology called functional near-infrared spectroscopy (fNIRS). The user wears a sort of futuristic headband1 (see fig 1) that sends light in that spectrum into the tissues of the head where it is absorbed by active, blood-filled tissues. The headband then measures how much light was not absorbed, letting the computer gauge the metabolic demands that the brain is making.





Brain Chip:

It is an independent processor linked to the neurocomputer built to house an artificial intelligence. The artificial intelligence program has access to the sensory data and information in the neurocomputer, and can "read" surface thoughts of the owner. Having a (or several) as advisor/secretary/partner is becoming more and more common, although most people realy on an external artificial intelligence system and a wireless neural connection. It is not uncommon for users to get a motoric shunt to give the artificial intelligence the ability to control the body. Chips with monitoring artificial intelligence are sometimes used for or behavior correction in Landfall.



Scientists successfully implants chips that control Brain allowing thoughts, memory and behavior to be transferred from one brain to another brain. In a scene right out of a George Orwell novel, a team of scientists working in the fields of "neural engineering" and "Biomimetic MicroElectronic Systems" have successfully created a chip that controls the brain and can be used as a storage device for long-term memories. In studies the scientists have been able to record, download and transfer memories into other hosts with the same chip implanted. The advancement in technology brings the world one step closer to a global police state and the reality of absolute mind control.

Eye Language Interpreter:

We pursue Baron-Cohen's research on a Language of the Eyes to develop an automated eye language interpreter International Journal of Computer Applications Technology and Research Volume that recognizes eye expressions off image sequences and interprets them as mental states. We are interested in being able to recognize a limited set of complex mental states that go beyond the 6 basic emotions. We use the Facial Action Coding System (FACS) developed by Ekman &Friesen to identify expressions of the eye.

Advantages of mind reading computer :

The use of mind reading has many advantages and some of it is as follows:

- It can be implemented on the wheelchair and the wheelchair can be moved through the mind control. It permits the people who cannot use the normal wheelchairs and other wheelchairs easily due to their disability.
- This will aid the spacewalking astronauts and physically disabled persons.
- This type of system can send instructions to the rover on the other planets and also aid injured astronauts to control devices.
- This can be availed to exchange information on sly, people can avail them on crowded buses without the problem of being overheard.

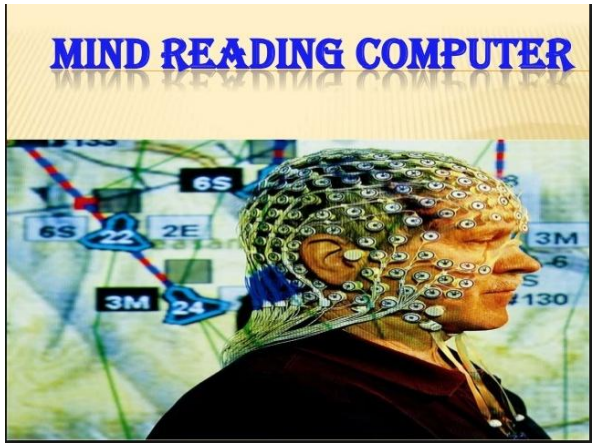
Disadvantages of Mind Reading:

- Before implementing the systems the scientist needs to train the systems about all the patterns to predict the result.
- Because of this scientific development, the scholars are questioning on the theories of criminal justice of the system.

Mind-reading program translates brain activity into words:

Algorithms translated the brain activity associated with hearing 'Waldo', 'structure', 'doubt' and 'property' into recognizable words. Scientists have picked up fragments of people's thoughts by decoding the brain activity caused by words that they hear. The remarkable feat has given researchers fresh insight into how the brain processes language, and raises the tantalizing prospect of devices that can return speech to the speechless. Though in its infancy, the work paves the way for brain implants that could monitor a person's thoughts and speak words and sentences as they imagine them. Such devices could transform the lives of thousands of people who lose the ability to speak as a result of a stroke or other medical conditions.

Mind reader computer can communicate with the patients in coma:



Computer which can read mind and could be helpful to communicate with the people who are in coma. This can be called a Computer Mind reader[14]. A team of researchers from the University of Western Ontario were using the neuroimaging technique to read human thoughts brain activity while giving the specific answerin Yes or No. In their study they asked very simple questions to the participants and told to concentrate only on the response either Yes or No. They were asked questions like "Are you married?" , "Do you like ice cream?" and answers the question which were asked in scanner by only concentrating upon the word they want to speak. By analyzing the activity of their brain they were able to decode the answers perfectly for every single person and for this time window is attached for communication with the brain computer interfaces answers in between 3 min of scanning. This technique is used to talk with the patients who are not able to response because of unconscious state of their mind.

Mind reading computer can be used for police and military purpose:

A science fiction fantasy – the "Thought Police" – where the government reads people's memories and thoughts and then rehabilitate them through torture before they ever even commit a crime based on a statistical computer analysis showing people with certain types of thoughts are likely to commit a certain type of crime in the future. We already pre-emptively invade nations and torture alleged terrorist suspects with absolutely no due process of law, so the idea of pre-emptively torturing a terrorist suspect before hand to prevent them from committing an act of terrorism in the future really isn't that far fetched of an idea.

Who developed mind reading computer :

It might seem the stuff of science fiction, but a **mind-reading** device is being**developed** by scientists which can evesdrop on your inner-voice. Reseachers at the University of California, Berkeley, have **developed** a machine and **computer**programme which converts **brain** activity into sounds and words.

CONCLUSION:

This paper describe mind reading computer that infers mental states from facial expressions along with head gestures in real time video. The mental state is recognized by comparing the present real time video with the preinstalled videos which contain different expressions for different mental state. This technology is helpful to people who has been abnormal condition of there mental state .who lost there past due to some accidental cases ,this mind reading technology is overcome there problem in some manner. Mind reading computer understand emotion of peoples from there expression and mental states . The technology, which monitors brain activity, could help people analyse complex information and make critical decisions.

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MOBILE NETWORKING IN THE INTERNET

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1. Introduction

This issue of Mobile Networking and Applications presents research papers probing the effects of mobility on the Internet. In fact, there are so many different aspects to Internet mobility that no single journal issue or book could possibly describe all of them. Thus, we will have to be content with presenting a representative selection of articles that, in their diversity, give a good hint at the larger picture. At the same time, these articles pro-vide new directions and lead the way towards solving the interesting and new problems raised by mobility.

It is the purpose of this introductory article to briefly mention a larger cross-section of the fresh ideas and proposals for solutions of the problems raised by mobile networking, than could be represented by articles for publication in this journal issue. Thus, this paper will touch on current topics in many areas of networking. From cryptography to routing, from billing to expanded techniques for automatic configuration, mobility changes the way we think about computing, and invalidates some of the design assumptions upon which current network protocols and products have been built.

This article intends to provide an overview of the variety of network protocols and associated technologies at all levels that must be considered when providing solutions for mobile computer users.

2. Overview

In this paper, we organize the description of mobile net-working generally according to a classical layered model of network functions. Each layer, from physical to application, is affected in various ways in the new operating environments encountered by mobile computer users. Although the reduced size and weight of mobile computers has some effect on their system architecture, these effects are not dominant because of the terrific advances in sys-tem miniaturization, display technologies, and communications. There are many mobile computers envisioned that will not have hard disks, and many without keyboards, but these more restricted devices are not principal drivers for the mobile networking techniques explored in this special issue, or within this paper. Conversely, many of the tech-niques and protocols developed for more general purpose mobile computers can be adapted as needed for the special or restricted case.

The variation in the capabilities of the communication devices is one of the main differentiators between mobile computers.

As mobile computers become smaller and cheaper, it becomes more feasible to use them as commodity devices without any personality, much as one might treat a pad of paper. In this scenario, it becomes important to temporarily allow the notepad computer to operate on behalf of the user, and to have all the authorization proper for that user. This can be easily done by allowing the mobile computer to acquire authorization rights and capabilities from information encoded on a smart card owned by the user. It’s easier and more convenient to carry around a smart card in one’s wallet or purse, as long as a suitable computer is available when needed that can acquire the rights and privileges of the cardholder.

3. Physical layer considerations

At the physical layer, the main objective is to detect the signals between the two endpoints of a communications link. Many different media and channel coding schemes have been proposed, for instance:

Analog cellular telephone;

TDMA(Time division multiple Access);
CDMA(Code Division Multiple Access);
Short range radio.
There are a number of variations for each of the above channel types.

For the purposes of higher-level protocols, each channel encoding scheme can just as well be considered as a new physical medium.

The new wireless media becoming available are among the primary drivers for the interest in mobile computing. Thus, it is appropriate to understand the nature of wire-less communications, and the contrast between wireless and wired media.

- For wired media, there is typically:

Well defined broadcast range; Low bit error rate;
High bandwidth;
Symmetric connectivity.

- For wireless media, there is typically:

Point-to-point communication only, poorly controllable boundaries for broadcast range;
Variable (time and distance dependent) bit error rate; Low to medium bandwidth;
Possibly asymmetric connectivity.

These characteristics make protocol design for wireless communications systems challenging. For instance, one result of the way wireless broadcast works (when it is avail-able at all) is that eavesdropping is more difficult to detect and prevent.

4. Link layer considerations

A great deal of attention has been paid to methods for establishing links between mobile computers and base stations or access points. One typical method is the creation of telephone links; the popularity of this method rests largely on the widespread availability of the physical media which can be used. Cellular telephones using various technologies can provide good coverage within the United States, parts of Asia, and Europe, although no single technology so far provides sufficient breadth of coverage.

The following operations are among those sometimes included at the link layer:

- Handoffs;
- Security
- Compression;
- Encryption;
- Elimination of the hidden terminal problem;
- Retransmission of garbled data

4.1. Handoffs

Central to the concept of seamless mobility is the process of establishing links at each new connection point. When-ever this process requires the transfer of state information from the old connection point (e.g., base station) to the new one, a handoff has to occur. There are numerous methods for performing handoffs, as numerous as the kinds of state information that has been designed for mobile nodes, as well as the kinds of network entities that maintain the state information. Often, authentication has to be performed to ascertain the identity of the mobile node.

4.2. Compression

Compression is often desirable because it reduces band-width requirements, and that can be very important for many low-speed wireless media. However, use of compression at the link layer is problematic in some circumstances, because the best compression is almost always achievable at higher level protocol levels, especially the application layer.

4.3. Security

A number of encrypting link layer devices and products have been introduced, especially for use in military applications. Link-layer security introduces further requirements for control of features by applications for reasons entirely different than were important for controlling the use of compression. Among the link layer parameters that may need to be specified or controlled are:
Whether security features are to be used at all; the key to be used for encryption;

The encryption algorithm (and mode);
Whether the data must be encrypted for privacy, or merely authenticated.

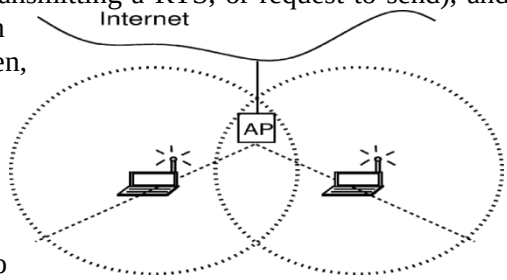
The use of security features at the link layer has the effect of requiring additional processing, which uses more power and which can significantly degrade transmission speed on high-speed wireless links. Even when the transmitter can handle encryption at high speeds, the receiver must decrypt at the same speed. Fortunately, there are encryption algorithms which allow relatively speedy decryption by the mobile wireless receiver, which may have limited power or processing capabilities.

4.4. Hidden terminals

The overall wireless bandwidth available to all mobile computer users can be improved by increasing the number of cells (where a cell is considered to be the range of cover-age of a base station connecting the mobile node to the rest of the network), reusing the frequencies in each cell, and reducing the number of mobile computers per cell. Reducing the number of mobile computers per cell is typically accomplished by making the cells smaller, so that the access points in the cell are within range of fewer wireless computers. The way that frequencies are used in each cell has to be managed carefully so that neighboring cells do not interfere with each other.

Having multiple computers in a cell can give rise to the hidden terminal problem illustrated in figure 1, a difficulty encountered in the use of wireless communications. In the figure, two laptop computers with radio links to an access point AP (say, a base station) may try to communicate with the access point simultaneously. Each computer can hear the access point, and cannot directly detect any interference on the wireless medium. Nevertheless, the access point will likely be unable to receive the transmission from either laptop.

Typically, a sender asks to transmit its data (e.g., by transmitting a RTS, or request to send), and then waits until the intended receiver grants permission (e.g., CTS, or clear to send). The intended receiver, then, does not issue the CTS while it is receiving data from some other sender. It is better to have a separate channel for transmitting RTS that will not interfere with data packets. In any case, the sender should make sure not to send RTS packets too often, compared with reasonable transmission times for data packets that might be coming to the intended receiver from other transmitters.



4.5. Retransmission

As mentioned above, wireless media often find application in situations where error-free transmission cannot be guaranteed. Problems arise when the wireless stations begin to move apart from each other, introducing fading effects as the received signal power decreases. When signal power becomes about the same as power in the channel from other sources (co-channel interference), data errors occur. Noise can overwhelm the received signal power for other reasons. For instance, a wireless receiver can move through an area which has some obstacle preventing the reception of signal from a transmitter, but soon afterwards might emerge from behind the obstacle. Alternatively, a noise source can traverse the area between the transmitter and the receiver. All of these can disrupt the flow of data between wireless nodes, and cause failures at higher level protocols. In order to combat temporary corruption or loss of signal, and the consequent bit errors detected by wireless receivers, the link layer can be designed to supply acknowledgements for packets received, or to transmit requests for retransmissions when packet losses are detected.

4.6. Error correction

As error conditions on a wireless link get better or worse, the number of bits employed for error correction could be decreased or increased to enable error-free reception. When the bit-error rate is relatively high, it is better to enable errors to be fixed directly rather than requesting retransmission of packets as discussed above. However, predicting the number of error-correction bits needed to assure error-free reception is not easy.

5. Network layer considerations

The Internet Protocol (IP) offers a convenient de-sign point for introducing the necessary protocol operations for supporting node mobility. By now, the network layer operations for mobility support are well understood, and are specified in Mobile IP, a freely avail-able standard. To understand Mobile IP, it is first necessary to understand IP. For the purposes of this paper, and the other papers in this special issue, IP may be considered to offer the following functions:

Identifying each network;
Identifying each node on a network;
Forwarding packets to the correct next hop when they arrive at an intermediate node (router) which is not the final destination;
Fragmentation and reassembly as needed;
Triggering mechanisms for resolving IP addresses into lower-level (link layer, or MAC) addresses;
Generating appropriate control and status information for handling exceptional link conditions.

For the purposes of handling node mobility, the forward-ing function is the main thing in IP that needs change. Mi-nor modifications are also needed to the means by which error information is propagated through the network. Lastly, resolving the IP address of a mobile node to a MAC address by way of ARP (the Address Resolution Protocol [49]) presents a delicate design problem because ARP results are usually cached, and the cached information goes stale as soon as the mobile node moves away.

5.1. Reducing registration frequency

One criticism that has been lodged against the base Mo-bile IP protocol is the need for possibly frequent reregistration as the mobile node moves about from place to place. Such reregistration's can cause dropped packets if the mobile node is far away from its home network and route optimization is not in use by the foreign agents. Moreover, in the situation where, say, thousands of mobile nodes are reregistering upon emergence from a densely traveled major tunnel for automobile traffic, the control traffic from the registration protocol may overwhelm local resources.

For this reason, there has been interest in finding ways to enable local processing for Mobile IP messages by the foreign agents, to reduce network traffic, possibly the number of registration attempts, the registration time, and consequently the time for which pending registration state in-formation has to be maintained. One method is to allow the mobile node to use a multicast address for its care-of address. Then, any foreign agent belonging to the associated multicast group will receive all packets for the mobile node; the designated foreign agent serving the mobile node will actually deliver the decapsulated datagrams to the mobile node. There is some additional control protocol to allow one of the foreign agents to be designated as the one currently serving the mobile node, and to allow new foreign agents to assume the designated function as needed when the mobile node moves. If the foreign agents were organized as an anycast group [38] the packet would only have to be delivered to one of the foreign agents. That foreign agent would then have to forward the packet to to the designated foreign agent, with correspondingly higher requirements for transmitting control information, but greatly reduced storage requirements for most of the foreign agents in the anycast group compared to the case or the multicast group.

Another idea is to arrange the foreign agents into a hierarchy. Then when the mobile node moves, it can restrict its registration messages to stay within the hierarchy as long as it can determine that its new point of attachment is in the same hierarchy as its previous point of attachment. The common ancestor is the nearest foreign agent that can handle the reregistration, and no further ancestors need to be aware of the mobile node's movement. The particular case when an administrative domain has a "gateway" foreign agent with many subordinate foreign agents may initially be a popular design point.

5.2. Route optimization

Aside from the basic operations provided by Mobile IP, extended operations allow for mobile-aware correspondent nodes to send their data directly to the mobile node instead of going through the home agent. This route optimization [34,47] is accomplished by sending the mobile node's care-of address to correspondent nodes, in so-called binding updates. Therefore, this technique can only work

for such nodes that are able to process the protocol messages containing the necessary information; today's product computers cannot. Route optimization messages have almost the same need for security that registration messages do in base Mobile IP, since bogus binding updates sent to correspondent nodes allow the same sort of malicious traffic redirection that bogus registrations sent to a home agent would allow. Privacy considerations dictate that the dissemination of binding updates be controllable by the mobile node, since they carry information describing the mobile node's current location.

5.3. Smooth handoffs

Recent investigations have considered the advisability of buffering at the foreign agent, as part of a process of smooth handoffs. The paper in this issue by Caceres´ and Padmanabhan is one of the first published in this area, and shows that substantial speedups can be obtained with min-imal buffering strategies. Additional improvements can be obtained by integrating buffers with regionalized registrations. Handing off the buffered packets can be made secure by establishing security relationships using the binding up-date mechanism specified for use with smooth handoffs in route optimization.

Application of route optimization is also of particular interest. If foreign agents are enabled to maintain binding cache information for a mobile node, then they can improve the robustness of communications with that mobile node even after the mobile node moves away to a new point of attachment. When a foreign agent knows the mobile node's new care-of address, it can forward all packets for the mobile node to that new care-of address. For ex-ample, this would help with packets in flight sent to the mobile node during the time it is trying to complete its registration process, which might otherwise be lost. Note that this smooth handoff is even more important when there are correspondent nodes that are maintaining binding cache information for the mobile node acquired by use of route optimization protocol messages.

Smooth handoff is expected to need binding cache information only for some hundreds of milliseconds, the amount of time it takes for mobile nodes to complete a new registration and to update correspondent nodes with new bind-ing cache entries. After this time, the previous foreign agent can drop the binding cache entry for the mobile node. Moreover, establishing the binding cache entry has reduced (but nontrivial) security requirements. Replay attacks would generally be ineffective, since the cached information has such a short lifetime and a foreign agent would not accept a new binding for any mobile node not already in its visitor list.

Providing any security at all for binding updates sent to a foreign agent by a mobile node may be problematic, because the mobile node and the foreign agent are not ex-pected to have any security relationship before the time of the mobile node's registration. There are a number of meth-ods defined by which a mobile node and foreign agent can establish the necessary security relationship. The meth-ods defined attempt to use existing security relationships whenever available, but allow use of Diffie–Hellman key exchange as a last resort. The possibility of a man-in-the-middle attack, which frequently plagues Diffie–Hellman ex-change protocols, is controlled by using the home agent as a Key Distribution Center (KDC) and allowing it to au-thenticate the extension containing the newly created key for the new security extension between the mobile node and the foreign agent.

5.4. Source routing

Many early approaches to Mobile IP attempted to make use of IP's loose source route (LSR) option. This seems an attractive possibility, because packets sent to a mobile node can be delivered directly to the mobile node by a foreign agent if the foreign agent is specified as part of the loose source route. Moreover, if the mobile node sends a packet to a correspondent node and includes the care-of address in the source route, the correspondent node can use the source route to return packets to the mobile node, achieving a cheap form of route optimization. Since IP specifies that higher-level protocols should reverse source routes, such source routing approaches accomplish mobile networking without creating any new protocol.

However, the gains offered by source routing approaches are, unfortunately, only illusory. In the first place, as with any such remote redirection as indicated by source routes requiring reversal by the receiver, authentication is required, and nodes reversing source routes do not typically perform any

such authentication operations. Thus, malicious nodes could impersonate mobile nodes by sending bogus source routes. Because of the opportunity for foul play, most In-ternet routers do not forward source routed traffic, so that the whole approach is, in practice, unworkable. Moreover, even if the routers were configured to handle source routes, and the end nodes were configured to require authentication before reversing source routes, the performance penalty at the routers proves unacceptable for handling source routes. All of these factors combine to exclude source routing ap-proaches from consideration as a solution for mobile net-working in today's Internet.

5.5. Mobile IPv6

IP version 6 (IPv6) [16,23] is a new network layer protocol designed to increase the address space available for nodes within the Internet, and to improve rout ability for packets using IPv6 addresses. As part of the design process, many deficiencies of the current version of IP (also called IPv4) have been fixed. Support for mobile networking has been laid out as a mandatory requirement for IPv6 [11], and the design for Mobile IP has been modified to take advantage of IPv6's superior capabilities.

All IPv6 nodes are able to autoconfigure an IPv6 address appropriate for their current point of attachment to the Internet moreover there are plenty of IPv6 addresses available, so foreign agents are no longer needed to support mobility. Furthermore, since all IPv6 nodes are required to support authentication and privacy protection at the network layer, binding updates can be supplied in a secure fashion to the correspondent nodes that need them. This means that route optimization fits naturally within the framework offered by IPv6, and does not have to be done as an up-grade to a huge installed base as with IPv4. Since future Internet nodes are expected to be capable of mobility [24], this represents a significant reduction in the network load to be sustained by the IPv6 Internet.

In order to send packets to the mobile node, a routing header (the IPv6 equivalent of source routing) is used by any sender that has the mobile node's care-of address. On the other hand, whenever a packet arrives at the home agent instead of going directly to the mobile node, it can be assumed that the sender does not have the care-of address of the mobile node. In this case, the home agent does not insert a source route to complete the delivery of the packet to the mobile node. Instead, the home agent is required to use encapsulation. Thus, the mobile node can tell whenever it needs to send a binding update to any of its correspondents. Moreover, when the mobile node moves to a new care-of address, it assumes that each of its active correspondent nodes should receive a new binding update. The mobile node can find active correspondent nodes by checking its TCP protocol control blocks; but this only works for TCP traffic.

5.6. Vertical IP

Recent experiments at University of California at Berkeley (UCB) have shown the feasibility of using Mobile IP to assist mobile nodes when switching between heterogeneous physical media. This is important in many applications, for instance when a mobile node moves from a high-speed wireless LAN in an office environment, to a wide-area wire-less connection, as with cellular telephones. The main considerations are handling discovery mechanisms in the dis-parate media, and making policy decisions about when it is best to change from one medium to another. For instance, one would like to maintain a high-speed and cost-free connection to the local wireless LAN as long as possible, until the error rate becomes too high for comfort, and correspondingly to switch back to the wireless LAN as soon as possible upon re-entering the campus or office environment where it is available. Other considerations such as security, proxy availability, route selection, or latency may also come into play. A good example of the work in this area is the paper in this issue by M. Stemm and R. Katz.

5.7. Multicast

Multicast protocols have, in the past, not been designed for the case of mobile nodes. In Mobile IP, a mobile node can pretend to be on its home network and receive tunneled packets, joining multicast groups through the tunnel. It can also attempt to join local multicast groups on the foreign network, but this leads to possibly poor performance in re-constructing the multicast routing tree after each movement, and possibly violates some of the implied semantics of mul-ticast. These design points and many others are explored in the paper by Chikarmane et al. in this issue.

5.8. Tunneling

Mobile IP depends upon tunneling. But, tunneling also plays a part in other protocol operations of interest to mobile nodes. For instance, access to enterprise
computing resources for mobile users often depends upon establishing a tunnel through the firewall protecting the enterprise computing environment from malicious abuse by external Internet attackers. In fact, there seems to be a gradual convergence of efforts in the areas of mobile net-working, virtual private networks (VPNs), and dial-up access to local or remote points of attachment to the Internet. One relatively new effort in this area is the Tunnel Es-tablishment Protocol (TEP) [12], which takes as its initial design point the fact that Mobile IP is, among other things, a way to establish a tunnel between two points. For Mobile IP, the tunnel endpoints are the home agent and the care-of address, but this can be generalized. In fact, the previous ideas developed for hierarchical foreign agents carry over to TEP, and help motivate a way to establish multi-segment tunnels across multi-level security domains.

When Mobile IP was specified, IP-within-IP seemed to be the most suitable candidate for a default tunneling algorithm. Recent developments call for re-examination of that decision. Now, newer tunneling protocols such as L2TP [37] are receiving widespread deployment, and this author believes that they may represent another opportunity for offering the benefits of mobile computing to a new population of mobile users.

5.9. Network address translation

Network address translation is becoming a feature with wide deployment within the Internet. The basic idea is that a collection of nodes can use private IP addresses in a network which is attached to the global Internet by way of a network address translation (NAT) [55] unit, which "hides" the other nodes' IP addresses. As data traverses the NAT unit towards the nodes using the private addresses, the network layer (IP) addresses in the IP header are translated from externally known IP addresses to the privately known addresses of the other nodes.

This technique spells trouble for Mobile IP, because a care-of address on the "inside" of the NAT unit does not make sense to a home agent on the "outside". Until the NAT boxes can be programmed in detail about how to trans-late tunnel addresses, and the addresses inside Mobile IP Registration Requests and Replies, it seems unlikely that Mobile IP can work across NAT boundaries. This is not at all trivial to do, considering Mobile IP's need for au-thenticating the registration messages; changing any of the internal fields would destroy the authentication data. More-over, since NAT (typically) depends on port numbers, and IP-within-IP does not have a port number to use, there is a basic design incompatibility. To overcome this problem, the NAT device should probably also be the foreign agent.

6. Transport layer considerations

Supporting mobility at the transport layer usually means modifying the Transmission Control Protocol (TCP) [1]; other commonly available transport control protocols have not been investigated nearly as often. TCP provides for congestion control, reliable delivery, and sequenced recep-tion of datagrams by the destination.

Providing for mobility by modifying TCP cannot be con-sidered as a complete solution for mobile networking. In fact, modifying the User Datagram Protocol (UDP) to sup-port mobility does not make very much sense, because UDP doesn't keep track of any state relevant to the source or des-tination nodes. Neither the mobile node's IP address nor anything else about it is used by UDP to identify the state of the data communication, so nothing can be done by UDP to help improve the forward progress of communications to or from a mobile node. RTP is not as widely deployed as TCP or UDP, and makes up only a tiny percentage of the total data flowing in the Internet, so that there has been much less consideration given to the transmission of data by mobile nodes using RTP.

TCP, however, offers many interesting possibilities. Careful coordination between the mobile node and TCP running at a base station can provide the following bene-fits:
Reduced retransmission delays; Smooth handoffs; Improved throughput.
For data streams to or from a mobile node, which flow through a base station, several investigators have proposed breaking the data stream into two parts which are handled separately; both substreams

can be terminated at the base station. Some approaches [3,4,63] suffer from the problem of providing TCP ACKs to correspondent nodes, for pack-ets that are never actually delivered to the mobile node. This violates the well-understood end-to-end semantics of TCP, and requires very careful handling, or perhaps even making modifications to application software.

Going a step further, it is possible to equip TCP at the base station with the power to transfer internal state related to the mobile node to a new base station, whenever the mobile node moves from place to place. Providing for mobility in this way shares some features in common with Mobile IP. In the first place, it is often presumed that only the mobile node or the base station can be modified to provide the mobility support. As the mobile node moves to a new point of attachment to the Internet, it must notify the previous intermediate TCP connection point about its new location, so that all necessary TCP control information can be modified or transferred. This can be considered as a variation on Mobile IP's registration procedure, and carries with it all the same requirements for authentication (and, in certain applications, privacy).

6.1. Snooping

When a base station is the last hop from the wired Inter-net to a wireless mobile node, the base station can improve end-to-end performance by retransmitting lost TCP packets only over the wireless link, while still maintaining TCP's end-to-end semantics. These retransmissions are invisible to the remote connection endpoint, and are comparable in effect to retransmissions performed at the link layer 4.5. As the base station delivers packets over the wireless link to the mobile node, it buffers the packets until the mo-bile node sends the expected TCP acknowledgement. If the acknowledgment does not come (in time substantially shorter than the end-to-end round-trip-time (RTT)), or, if the mobile node sends another TCP acknowledgement (a dupack), the base station can retransmit the lost packet and avoid end-to-end timeouts and retransmissions. This ap-proach of snooping and buffering offers big performance improvements [5].

Unfortunately, recent security protocols preclude inspec-tion of the relevant packet contents (e.g., TCP sequence numbers) by base stations. It seems unlikely that the mo-bile computer user would wish to share its privacy keys with every base station (or foreign agent) that it establishes a connection with. There do not appear to be any simple approaches to this problem, so that performance increases available from snoopy base stations will be lost for the du-ration of encrypted data transmissions.

6.2. Errors vs congestion

TCP, as commonly implemented, offers advanced features for controlling Internet congestion. The primary observation about such control algorithms, is that control traffic has to be minimized or nonexistent after congestion occurs, because there is a high probability that any control packets would be dropped, and besides that they add to the congestion anyway. TCP's slow start performs as needed to reduce congestion, by first throttling the data transmission of the connection, and then slowly building back up to an efficient transmission rate.

The problem comes when errors are mistaken as evidence of congestion. Packets which are lost or garbled will effectively not be delivered to TCP, and may trigger the slow-start mechanism. This is bad, because packets with corrupted data should be retransmitted right away, and should not cause such a slowdown in the data rate. Thus, the effect of errors due to wireless media is magnified by slow-start. Poor interactivity and reduced throughput are the likely results. It would be better if TCP could be modified to detect whether a lost packet was the result of con-gestion or instead was lost because of bit errors.

One theory suggests that packets lost due to congestion tend to be lost in long contiguous sequences, and that packet loss because of bit corruption occurs more randomly, inter-mingled with error-free packet reception. It remains to be seen whether TCP can be modified to make the determination about causes for errors, and whether the determination can be exact enough to produce improvements in the over-all response of TCP packet-loss algorithms in real Internet operational environments.

6.3. Asymmetry

Satellite communications with mobile nodes can provide an important type of wireless connectivity to the Internet. In many cases, the communications path is then asymmetric, for mobile nodes that do not transmit data back to the satellite. The mobile node might use a telephone or other land line to maintain end-to-end connectivity with other Internet nodes, relying on the satellite link only for down-loading bulk data (for instance, video information). The data rate available on the satellite downlink is typically far greater than the reverse link from the mobile node back to the Internet. Thus, both the data rate and the routing path are different.

TCP was not constructed to work well with such asymmetric data rates. When the asymmetry is too great, the mobile node cannot supply ACKs back to the source of TCP data fast enough, and the supply of data to the down-link operates at far below capacity. Most solutions to this problem require changes to the Internet node providing data to the mobile node. As with route optimization, solutions in this class will take a long time to deploy, and will probably only happen as satellite communications become important for the general operation of the Internet.

7. Middleware

For the purposes of this paper, we will define middle-ware to be the software which does not directly handle application protocol needs, but on the other hand fulfills, in a generic way, an intermediate or ancillary role in providing network services or environment to network applications.

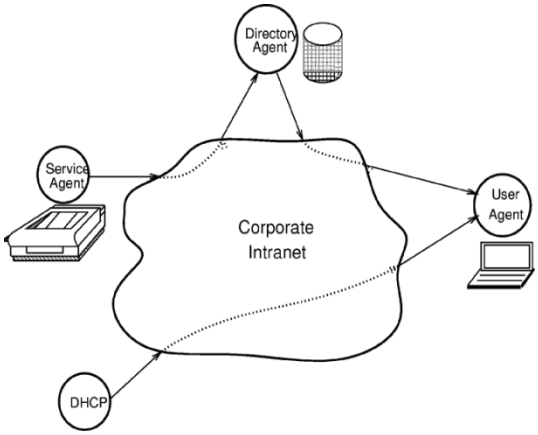
Nomadic computer users, by definition, change their locality and thus need to periodically re-establish their link and connectivity to the Internet. Since the parameters of such connectivity typically depend upon the characteristics of the current point of attachment, nomadic users require that their connectivity be parameterized by those relevant characteristics. This introduces many problems that are not very well satisfied by existing solutions for network connectivity.

For instance, Mobile IP can be understood as a protocol to allow parameterization of the IP address of the mobile node's current point of attachment (i.e., to allow for variable care-of addresses). But, Mobile IP is not invoked by application software, and usually is considered to operate at the network layer; thus it is not middleware. DHCP, on the other hand, could (theoretically) be invoked by applications to obtain application-specific parameters, like server IP addresses that can be used by the client application to initiate a transaction. Thus, DHCP could be considered as middleware.

In this section we list a few potential candidates for middleware functions that are likely to become more important as computers become more mobile.

7.1. Service location

When a nomadic user arrives at a new computing environment, it is likely, and probably typical, that the user will be unaware of basic configuration details about local network services. For instance, there may be a dozen local printers, each with varying capabilities, and each possibly useful at various times to the nomadic user. It would be nice if the user could resolve service needs automatically, dynamically, and based only on the nature of those needs, independent of local naming conventions or network topology.



This ability to dynamically resolve service needs, which is a matter of convenience now, is likely to become a necessity in the service-oriented network of the future. There is likely to be an increased emphasis on accessing data across the network, as the Internet becomes more fully deployed. Consequently, when the network is viewed as a universal (and robust) resource, applications will begin to make use of network resources as a matter of course, much as Web applications now often assume multimedia capabilities which were quite rare and expensive ten years ago. If a typical computer hosts applications which together make use of dozens or hundreds of disparate network re-sources and services, then typical users are quite unlikely to be willing to reconfigure these applications at each new point

of attachment. The number and diversity of network services will make manual configuration obsolete, and the ease and speed of network reattachment offered by wireless communications will make even hard-coded profile-based reconfiguration seem quite awkward.

Service Location Protocol (SLP) [61] enables simple service requests from user agents to be resolved by receiving service replies which contain URLs from service agents. The user agents act on behalf of the application needing service, and the service agent acts on behalf of the network-attached service. The protocol for user agents and service agents is lightweight and places minimal load on the communications medium, as appropriate for typical nomadic computing platforms.

User agents can obtain the necessary service handles directly from service agents, or alternatively they can query a nearby Directory Agent (DA) for the information. These relationships are illustrated in figure 2, where the printer is shown represented by a service agent. In the configuration shown, the User Agent discovers the Service Agent using DHCP [39].

SLP offers other features for convenience and scalability not relevant to this article.

7.2. DHCP and dynamic DNS

The Dynamic Host Configuration Protocol (DHCP)[1] is likely to play a prominent role in the deployment of future mobile computers. DHCP fulfills the basic requirement for allocation of an IP address to a node which needs to begin communications at its new point of attachment. Today, DHCP is not typically employed by mobile computers, but is seeing use with portable computers. When a computer is attached to a LAN, for instance, it can call DHCP to get its IP address, along with a default router, the domain name server for the local network, and various other bits of useful information. This works for mobile computers, too, but each time the connection is made the mobile computer typically needs to be restarted.

Even if the computer could work without restarting, there are severe difficulties with establishing connections to a mobile computer that relies only on DHCP for its network attachment. For one thing, most communications with the mobile node start with its domain name (often, its Fully Qualified Domain Name (FQDN)). Each new IP address would require updating the IP address resolution for that mobile node's domain name unless, all commu-nications with the mobile node are to be initiated by the mobile node. On the other hand, updating DNS is an operation that can be performed only with very tight security. If a bogus update were ever accepted for the mobile node's domain name resolution, all communications depending on that resolution would be disrupted and possibly hijacked. Such security operations are tricky and are only now be-coming standardized.

Moreover, there remains a problem with DNS caching. Whenever the resolution of a mobile node's domain name is cached at an intermediate name server, that cache will be stale as soon as the mobile node moves to a new point of attachment. Thus, as more and more mobile nodes are deployed, misusing DNS for this purpose will cause a proportionate increase in the already huge amount of traffic taken up for name resolution. Combatting the problem by disallowing DNS resolutions to be cached only adds to an already worrisome problem in today's Internet.

Supposing that the appropriate security measures can be taken, supplying new resolution information for each new point where the mobile node attaches to the Internet does not preserve existing communications. And, as wireless cell sizes decrease (see section 3), this will be viewed as increasingly inconvenient until finally it is just unacceptable.

If, on the other hand, the mobile node uses Mobile IP, and is equipped to use DHCP as a mechanism for obtaining a (co-located) care-of address, it can maintain its existing home address resolution for its FQDN. This allows simplified communication with the mobile node at all times, as well as enabling the node to preserve its ongoing communications at each new point of attachment. In this mode of operation, the mobile node can also make use of the de-fault router configuration delivered to it by DHCP. Since no beacons may be expected from any foreign agent, the mobile node with a co-located care-of address may be de-signed to substitute pings to the default router instead of detection of agent advertisements. DHCP can also be used to get information about SLP directory agents at the same time that the care-of address and default router information is obtained, as illustrated in figure 2.

8. Security

Security is an increasing concern in the design of mobile networking protocols and systems. As seen in the discussion about Mobile IP, authentication is critical to authorizing operations indicating the mobile node's new point of attachment. As another example, we have seen how the link layer can be augmented to supply encryption; the need for encryption is increased because of the frequently un-trustworthy nature of the mobile computer's surroundings. Privacy takes on added importance, when the mobile user does not wish to divulge his or her current whereabouts.

Modern approaches to authentication and encryption use cryptographic approaches. The algorithmic results are made unforgeable by including secret keys (possibly with some additional unique data, such as a timestamp, to avoid match-ing any previously authenticated data) along with the data to be authenticated or hidden. Distribution of the secret key is a difficult problem in today's Internet.

Other security measures common in today's Internet affect mobile networking. Firewalls, which are installed to protect an enterprise computing environment from external intrusion and/or disruption, make it more difficult for mobile workers to make use of their office computing environment. Border routers that enforce forwarding policies based on the source address of packets(as opposed to the traditional reliance only on the destination address), make it difficult for mobile nodes to use their home address in foreign domains. This ingress filtering can force even further detours in the routing path between a mobile node and its correspondent nodes.

9. Ad hoc networking

Suppose for the moment that the needs for wireless services and connectivity could be supplied to a population of mobile users while they are within range of foreign agents or base stations connected to the Internet. Next, imagine that the same users met together at a conference which did not offer wireless connectivity to the Internet. These users might still need to communicate data files to each other, browse each other's Web pages, transact electronic mail, or use any of the many network applications which have motivated the tremendous growth of the Internet. They would find that their mobile networking software was useless with-out the needed infrastructure, and might even seriously get in the way.

These users need a way to deliver packets between wire-less stations without infrastructure routers. If all the wire-less nodes are within range of each other, this is not dif-ficult. Mobility poses no problem, unless two nodes that need to communicate have moved out of range from each other. Otherwise, any necessary routing functions must be performed by the mobile nodes themselves. Intermediate mobile nodes could cooperate to forward data from source to destination.

Ad hoc networking is a name given to the creation of such dynamic and multi-hop networks that are created by the mobile nodes as needed for their communication purposes. The mobile nodes can do this in many ways. Most solutions involve running routing protocols on the mobile nodes. Routing protocols have the advantage that they are inherently multi-hop. Their dynamic behavior re-quires careful attention, however, because the typical rate of change in an ad hoc network is likely to be substantially greater than that for the topology of the Internet, for which most routing protocols are engineered. There are numerous routing protocols proposed and in use within the Internet today, and each of them could be potentially modified and applied to the creation of ad hoc networks.

The two main kinds of routing algorithms in use today are link state algorithms, which provide each node with a complete representation of the network topology, and distance vector algorithms.

Ad hoc networking presents interesting challenges for traditional client/server applications. For one example, con-sider whether DNS might be accomplished in an ad hoc network. First, there is no clearly defined way for the ad hoc nodes to discover which node or nodes are offering domain name resolution. Even without that problem, the non-hierarchical nature of ad hoc addressing does not map well into the standard hierarchical domain conventions of DNS. The trouble is the defining characteristic of the ad hoc network, which is that the IP addresses of the nodes are assumed to be unrelated to each other. If, instead, the IP nodes somehow acquire IP addresses dynamically and perform some sort of aggregation, their relative movement would soon make the initial aggregation ineffective. Be-sides that, it is difficult anyway to cause the nodes to dynamically select IP addresses

which are unique across the ad hoc network. Various client/server applications present other difficulties.

10. Conclusion

Mobile computing opens the door to a fresh examination of practically every area of network protocol engineering. The areas discussed in this article, and the articles in this special issue, are only a sampling of the kinds of new re-search results being reported. It is my sincere hope that this special issue will pique the interest of new researchers, and provide a better overall understanding of the problem areas needing more attention and new solutions.

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IMPORTANCE OF MATHEMATICS IN OUR LIFE

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Mathematics is a methodical application of matter. It is so said because the subject makes a man methodical or systematic. Mathematics makes our life orderly and prevents chaos. Certain qualities that are nurtured by mathematics are power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability and even effective communication skills.

Mathematics is the cradle of all creations, without which the world cannot move an inch. Be it a cook or a farmer, a carpenter or a mechanic, a shopkeeper or a doctor, an engineer or a scientist, a musician or a magician, everyone needs mathematics in their day-to-day life. Even insects use mathematics in their everyday life for existence. Snails make their shells, spiders design their webs, and bees build hexagonal combs. There are countless examples of mathematical patterns in nature's fabric. Anyone can be a mathematician if one is given proper guidance and training in the formative period of one's life. A good curriculum of mathematics is helpful in effective teaching and learning of the subject.

I will discuss the use of mathematically rich games to develop in students certain skills and processes that are important in their daily and future workplace life. For example, students will learn through these games how to pose relevant and important questions when faced with a problem, how to formulate conjectures to solve the problem. What strategies or heuristics to use, and how to monitor their progress and their own thinking. The context is very real for these students because the outcome, whether they win or lose, matters to them. (Electronic Proceedings of international Conference on Education: Redesigning Pedagogy: Culture Knowledge and Un)

Use in Kitchen – While preparing food, we always measure the different ingredients so as to cook the desired quantity only. This is possible only because of the mathematics. If we were not aware of the numbers, it would not have been possible to measure, make adjustments and cook tasty food. So you can say that our day begins with the concept of maths.

Shopping – When going for shopping, we prepare a list of items we require, calculate the amount of money needed for it etc. All this calculation is based on numbers which come form mathematics. Without the numbers, you cannot decide how much you need to pay to the vendor and how much you have saved. So in the case of shopping too, you are surrounded by the world of mathematics.

In the field of banking – This is the sector where a number of concepts of mathematics are applied and therefore the experts need to have a good understanding and command of the subject. Handling the transactions of the bank is not simple and you need to have some knowledge of mathematics in order to maintain your account, deposit and withdraw money etc. If you wish to take a loan, you need to have an idea about the interest you will have to pay and what will be the monthly premium that you would need to pay. In short, the banking sector is completely related to maths and so even the customers need to be familiar with it.

Traveling – Everyone loves to travel but there is a lot more to it than the enjoyment. While planning your vacation, you not only have to decide the place where you wish to go but book your hotel, tickets etc. All this requires budget planning and a sense of understanding of mathematics so that you can accomplish the different tasks successfully. From the traveling distance to its cost, bus tickets, hiring cabs etc all requires maths.

Thus from the above examples, you might have got a clear idea that there is no such area where the concept of mathematics is not used. You just cannot do without this subject and that is why

it is essential to keep your basics right to perform the everyday of life. So have fun with the number and enjoy.

Mathematics is one of the most important sunjects of our life. No matter to which field or profession you belong to, its use is everywhere. That is why it is necessary to have a good understand of the subject. Though the basics of mathematics start form school but its usage continues till we become adults and thus it can be said that maths has become an integral part. Imagining our lives without it is like a ship without a sail.

Mathematics is in Principle inexpensive. As the old joke says, a mathematician needs only paper, a pencil, an easy chair and a waste basket. Also, the criterion for success in mathematics, is by and large universally accepted. This make mathematics an attractive 'investment'. Moreover, a mathematical result is valid forever. It may fall out fashion, or fall outside the current area of application, but even the oldest known mathematical formulae – such as that for solving quadratic equations, known 2400 years ago by Babylonians, Chinese and later the Greeks before being crystallized into its present form in 1100 AD by a Hindu mathematician called Baskhara- are the bread and butter of present- day elementary mathematics. Alas, the downside is that the results are usually not immediately applicable and therein lies the risk. Who wants to 'invest' in something that may not lead to applications for several hundred years? The good news is that the distance between theory and application is becoming shorter and shorter.

Experience says learning mathematics can be made easier and enjoyable if our curriculum includes mathematical activities and games. Maths puzzles and riddles encourage and attract an alert and open- minded attitude among youngsters and help them develop clarity in their thinking. Emphasis should be laid on development of clear concept in mathematics in a child, right form the primary classes.

If a teacher fails here, then the child will develop a phobia for the subject as he moves on to the higher classes. For explaining a topic in mathematics, a teacher should take help pictures, sketches, diagrams and models as far as possible. As it is believed that the process of learning is complete if our sense of hearing is accompanied by our sense of sight. Open-ended questions should be given to the child to answer and he/she should be encouraged to think about the solutions in all possible manners. The child should be appreciated for every correct attempt. And the mistakes must be immediately corrected without any criticism.

It is clear that mathematics is heavily used in large industrial projects and in the ever-growing electronic infrastructure that surrounds us. However, mathematics is also increasingly infiltrating smaller scale circles, such as doctors, reception rooms. Sailboat design and of course all kinds of portable devices. There has also been a change in the way mathematics penetrates our society. The oldest applications of mathematics were probably in various aspects of measurement, such as measuring are, price, length or time. This has led to tremendously successful mathematical theories of equation, dynamical systems and so on. In today's world, we already know pretty accurately for example the make-up of the human genome, yet we are just taking the first steps in understanding the mathematics behind this incredibly complex structure of three billion DNA base pairs. Our understanding of the mathematics of the whole universe of heavenly bodies, even going back in time to the first second of its existence, is better than our understanding of the mathematics of our own genes and bodies.

What is the difference between the hereditary information encoded in DNA and the information we have about the movements of the heavenly bodies? Is it that we have been able to encapsulate the latter into simple equations, but not the former? Or is it perhaps that the latter has a completely different nature than the former, one that makes it susceptible to study in terms of equations, while the former comes from a world governed by chance and algorithms, a world of digital data, where the methods of the continuous world do not apply?

Another well-known instance of mathematics in society is cryptography in its various guises. There exist numerous situation in which data must be encrypted such that it can be publicly transmitted without revealing the content. On the other hand, sometimes a party may find it vitally important to break a code that another party has devised for its protection. Some companies want to

examine the data of our credit card purchases in order to have access to our shopping patterns. Some governments want to do the same with regard to what they deem less innocuous patterns of behavior. Cryptography is a typical example of the mathematics of the digital world. Digital data has become important in almost all fields of learning, a natural consequence of advances in computer technology. This has undoubtedly influenced the way people look at fields of mathematics such as number theory, that were previously thought to be very pure and virtually devoid of applications, good or bad. Now suddenly everybody in the possession of big primes has someone looking over their shoulder.

This infiltration is quite remarkable and elevates mathematics to a different position from that which it previously occupied. Mathematics is no longer is no strange otherworldy subject, practiced by a few curious geniuses but for most people best left alone. The spread of microprocessors into every conceivable aspect of our everyday life has brought heavy-duty computing into our homes, into our classrooms and into scientific laboratories of all kinds. Naturally it is unnecessary for everyone to understand all this computing, which can take place in microseconds without our noticing. But it means that anyone who refuses to acknowledge the role of mathematics will see the changing technosphere as something strange and in the worst case as something irrational or even frightening. A very good way to understand and come to terms with an important aspect of modern life our ever-growing dependence on interpreting digital data is to have a basic knowledge of mathematics.

Basic knowledge: what does this means and how is it attained? Clearly, this takes us into the realm of mathematics education. Strictly speaking, education is not an application of mathematics , but it is nevertheless of increasing importance to the mathematical world. Evert time the OECD s PISA (Programme for international Students Assessment) results arrive, some people ask why some countries always seem to score highly in the mathematical skills of 15 year-olds. Without attempting to answer this difficult question, one must admit that it is important and that maths education will face huge challenges in the future, not least because of the infiltration of mathematics into all levels of society. This infiltration clearly has to do with the revolution triggered by the development of computers over the last fifty years. Has this revolution arrived in schools, and in maths education? Most students now own a computer with an internet connection. This is used for games, chatting, text processing and surfing, but do they use the computer for mathematics? Are mathematical modeling (ambitious problem solving) or algorithmic thinking (expressing mathematics in such a way that the computer can handle it) taught at school? There is much that can be done here, in curricula, in textbooks and in everyday life at school.

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VIRTUAL SMARTPHONE OVER IP

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Abstract—
The number of smart phone users and mobile application offerings are growing rapidly. A smart phone is often expected to offer PC-like functionality. In this paper, we present Virtual Smartphone over IP system that allows users to create virtual smart phone images in the mobile cloud and to customize each image to meet different needs. Users can easily and freely tap into the power of the data center by installing the desired mobile applications remotely in one of these images. Because the mobile applications are controlled remotely, they are not constrained by the limit of processing power, memory and battery life of a physical smart phone.

INTRODUCTION

The number of smart phone users and mobile application offerings are growing rapidly. Smart phones are often expected to offer PC-like functionality, which requires powerful processors, abundant memory and long-lasting battery life. However, their hardware today is still very limited and application developers are forced to take these limitations into consideration. A number of service providers such Dropbox and Zumodrive provides online storage services to smart phone users in attempt to alleviate the limitations of smart phone storages. However, to the best of our knowledge, there is still no service that offers full computation resources to smart phone users. In this paper, we propose Virtual Smartphone over IP, which provides cloud computing environment specifically tailored for smart phone users. It allows users to create virtual smart phone images in the cloud and to remotely run their mobile applications in these images as they would locally. The motivation is to allow smart phone users to more easily tap into the power of the cloud and to free them from the limit of processing power, memory and battery life of a physical smart phone. Using our system, smart phone users can choose to install their mobile applications either locally or in the cloud, as illustrated in Figure 1.

Running applications remotely in the cloud has a number of advantages, such as avoiding untrusted applications from accessing local data, boosting computing resources, continuing
to run applications on the background and opening up new ways to use smart phones. This paper presents the design and implementation of Virtual Smartphone over IP. Section II describes the basic design of our system and Section III describes a proof-of concept prototype that we have implemented. Section IV discuss the possible applications of our system and Section V reports the results of our experiments that demonstrate how we can leverage the performance of mobile applications in the cloud. Section VI discusses the related work in the research community and Section VII concludes this paper.

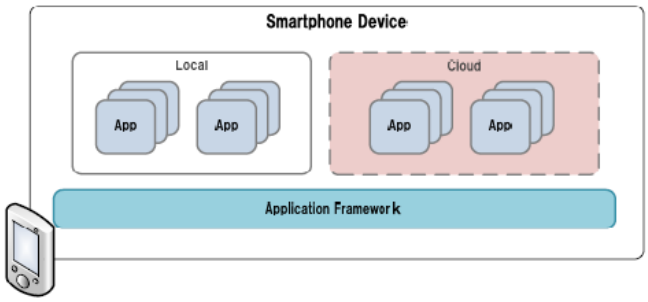


Figure 1. Basic concept of our system

BASIC DESIGN

Our Virtual Smartphone over IP system adopts an architecture similar to ones commonly used by server hosting providers. As illustrated in Figure 2, the system is composed of a number of external Smartphone clients, a front-end server, a virtual Smartphone farm, a management server and a network file system (NFS).

 Virtual Smartphone farm is the most important component of our system. It is a virtualization Environment that hosts a collection of virtual Smartphone images, each of which is dedicated to a Smartphone user.

 The front-end server admits service requests from Smartphone users across the Internet and establishes remote sessions to the appropriate virtual Smartphone images. The frond-end server also allows Smartphone users to create, configure and destroy virtual Smartphone images. Once a remote session is established, the user can install and run mobile applications on one of these images instead of his own physical Smartphone.

 The network file system is used by virtual smart phones for all persistent file storage, in much the same way that an SD card holds data for physical smart phones. Since the NFS is easily scalable, it practically provides each virtual Smartphone unlimited file storage.

 the management server is used to manage the virtual Smartphone farm. Typical operations of a management server include the creation of virtual images in bulk and troubleshooting individual images. Users control their virtual Smartphone images through a dedicated client application installed on their Smartphone. This client application receives the screen output of a virtual Smart phone image and presents the screen locally in the same way as conventional thin-client technology. Since we expect most users to access their virtual Smartphone images through an unstable network such as 3G, the image must continue to run on the farm and be in the same state when the user is connected again after the user is disconnected in an unexpected Manner.

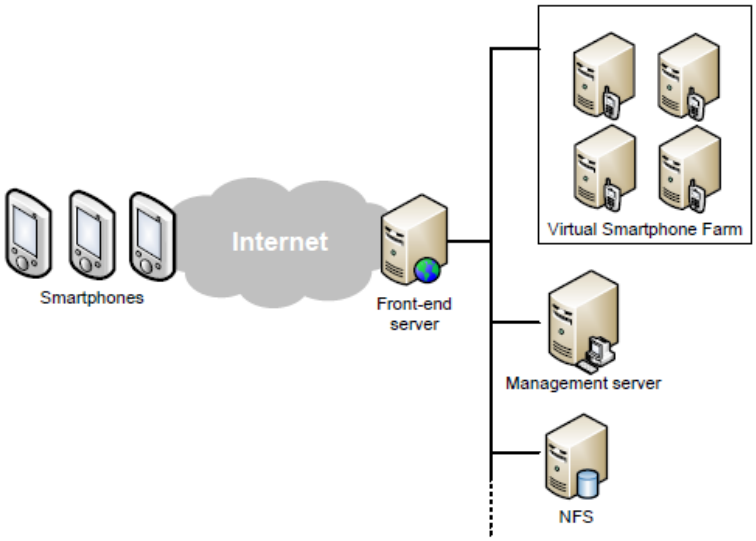


Figure 2. Overall system architecture

CONLUSION

In this paper, we presented Virtual Smartphone over IP system that allows smart phone users to create virtual images of smart phones in the cloud and access these images remotely from their physical smart phone. The prototype we implemented integrates the remote environment with the local environment and allows users to run remote applications as they would locally. Through our prototype, mobile applications installed in the cloud can access sensor readings on the physical smart

phone. Our prototype also boosts the performance of mobile applications by providing virtually unlimited computing resources at user's fingertips, without draining the device battery.

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Prem Chand Ka Aslub-e-Nigaarish

پریم چند کا اسلوب نگارش

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Abstract

پریم چندسے قبل ۱۷ویں و۱۸ویں صدی میں نثر مرصع و مسجع کارواج عام تھا۔ خیال کی پیشکش سے زیادہ آرائش زبان کو فوقیت حاصل تھی۔ اس عہد کی تحریر کردہ رومانی داستانوں، تمثیلی قصّوں ،ناول و دیگر نثری تخلیقات میں عربی و فارسی الفاظ، شاعرانہ صنعتوں ، طول بیانی، استعارہ سازی، قافیہ پیمائی کے استعمال کو بروئے کار لایا گیا۔ یہ اردو نثر غیر نثری تھی کیوں کہ اس وقت شاعری کے مقابلے نثر نے ترقی کے زینے طے نہیں کیے تھے۔ اسی لیے نثر ابھی صحیح صورت میں سامنے نہیں آئی تھی۔شعریت کی موجودگی و لسانی طمطراق کی وجہ سے یہ نثر جاگیر دارانہ سماج کی آئینہ دار تھی لیکن اسے عوامی سطح پربھی اہمیت حاصل تھی۔ ابہام کی وجہ سے یہ نثر دیر پا ثابت نہ ہو سکی اور زوال کا شکار ہوگئی۔

اس کی وجہ یہ تھی کہ ۱۹ویں صدی کی ابتدا سے ہی اردو نثر کا مکتوب نگاری ،ناول ،انشائیہ ،تنقید، *** سوانح و علمی مضامین کی طرف رجحان تیزہونے لگااور اس صدی کے اواخر تک اس نے اپنی واضح صورت اختیار کرلی۔ اس جدید اردو نثر کے فروغ میں فورٹ ولیم کالج کے ادیبوں میر امّن دہلوی ، حیدر بخش حیدری، للولال جی کے ساتھ غالب، سر سید، نذیر احمد، حالی، رتن ناتھ سرشار اور رسوا کی خدمات کو فراموش نہیں کیا جاسکتا۔ اسی جدید نثر کو پریم چندنے بھی اپنی کہانیوں میں خیالات و نظریات کی پیشکش کا وسیلہ بنایا۔ ابتدا میں پریم چند نے بھی اپنی کہانیوں ''دنیا کا سب سے انمول رتن'' اور شیخ مخمور'' میں داستانی اسلوب کو استعمال کیا لیکن پریم چند اپنے پیش روؤں کے پیر وکار نہیں بنے۔ پریم چند کا اختصاص یہ تھا کہ ان کہانیوں میں تشبیہات و استعارات، تمثیلی خیال آرائی ۔فارسی آمیز و مشابہتی زبان کا استعمال کیا لیکن قافیہ پیمائی اور طوالت سے گریز کیا جو مرصع و مسجع نثر کا طرہ امتیاز تھا۔ بہر حال اس داستانی اسلوب کو بہت جلد پریم چند نے ترک کردیا۔ وہ اس بات سے با خبر تھے کہ کہانی کا مجموعی تاثر اسلوب پر منحصر کرتا ہے۔ زبان ہی تجربات و احساسات کے اظہار کا ذریعہ ہوتی ہے۔ وہ ''اس نظریے کے حامی نظر آتے ہیں کہ: ''بات معنی خیز ہو اور زبان سیدھی سادی۔

اسی لیے پریم چند نے جہاں اپنی کہانیوں میں حقیقی زندگی کی ترجمانی کی وہیں اسی مناسبت سے زبان کا انتخاب بھی کیا۔ ویسی زبان کے استعمال پر توجہ دی جسے ہر طبقہ بہ آسانی سمجھ سکے۔ ترسیل و ابلاغ کا مسئلہ پیدا ہوئے بغیر ملک کی صورتحال سے قارئین کو باور کرایا جا سکے۔ان کا ماننا ہے کہ ترسیل کے بغیر تخلیقات کی اہمیت ضمنی رہتی ہے۔ جیسا 'ادب کی غرض و غایت میں رقمطراز ہیں:

'' ہم ادب کو محض تفریح اور تعیش کی چیز نہیں سمجھتے، ہماری کسوٹی پر وہ ادب کھرا اترے گا جس میں تفکر ہو، آزادی کا جذبہ ہو، حسن کا جوہر ہو، تعمیر کی روح ہو،زندگی کی حقیقتوں کی روشنی ہو، جو ہم میں حرکت ، ہنگامہ اور بے چینی پیدا کرے، سلائے نہیں، کیوں کہ اب اور زیادہ سونا موت کی علامت ہوگی۔''

زمانہ ۱۹۳۶ مضمون بشمولہ ادب کی غرض و غایت/پریم چند ص۔۲۰۵

پریم چند نے اپنی کہانیوں میں صرف موضوعات کے سلسلے سے ہی نہیں بلکہ اسلوب کے تعلق سے بھی تجربات کے دروازے واکیے۔ جدید ادبی زبان کی تشکیل و تعمیر پر زور دیا۔اور آج تک یہ زبان فکشن کے

لیے موزوں و مناسب تسلیم کی جارہی ہے۔ اس زبان میں ابہام نہیں بلکہ اظہار کی قوت موجودہے۔ اس کا جائزہ افسانہ طلوع محبّت کے اس اقتباس سے لیا جا سکتا ہے:
'' اس نے سر کی کے دروازے سے جھانک کر دیکھا۔ بھوندو نہ تھا۔ اس کا گدھا آرہا تھا۔ بنٹی آج اس بدبخت گدھے کو دیکھ کر ایسی خوش ہوئی، جیسے انپا بھائی میکے سے بتاشوں کی پوٹلی لیے تھکا ماندہ چلا آرہا ہو۔''
پریم چند کے نمایندہ افسانے/قمر رئیس ص۔۳۰
ان کی زبان میں جہاں معنویت، اثر انگیزی، بے تکلفی اور بے ساختگی ہے وہیں تشبیہات و استعارات میں بھی تصنع و بناوٹ کے بجائے وہ سادگی ہے جو خیالات کی پیشکش میں معاون و مددگار ثابت ہو تے ہیں۔ اس ضمن میں یہ اقتباس دیکھئے:
'' مس پدماحسن میں اندرا سے جُدا ہے۔ اس کے حسن پر رعب ، تمکنت ملاحت اور کشش ہے۔ اندرا کے حسن میں نزاکت اور انکسار۔ ایک چنبیلی کا پھول ہے۔ سادہ اور نازک۔ اس کا حسن اس کی نزاکت اور سادگی میں۔ دوسرا سورج مکھی ہے۔ خوش رنگ اورنظرفریب۔''
افسانہ : ''وفا کی دیوی''
محاوروں، کہاوتوں لوک گیتوں میں بھی عوامی رنگ ہے۔ یہ عوامیت کسی ایک خطّے تک محدود نہیں بلکہ شہری اور دیہاتی دونوں خطّے کی بولیوں سے جڑے ہوئے ہیں۔
''بینی مادھو سنگھ نے شہادت دی بہوبیٹیوں کی یہ عادت اچھی نہیں کہ مردوں کے منھ لگیں۔''
افسانہ : ''بڑے گھر کی بیٹی''
پریم چند کی کہانی کا ایک ایک جملہ ماحول و کردار سے مناسبت رکھتا ہے۔ وہ کرداروں کی گفتگو و لہجے میں صوتیاتی تاثرات کو قائم رکھنے میں بھی محتاط نظر آتے ہیں۔ جس کے سبب ان کے اسلوب میں نیا پن اور رنگا رنگی آجاتی ہے۔ صوتیاتی تاثرات کا جائزہ اس طرح لیا جاسکتا ہے:۔
''بھگت نے چونک کر سراٹھایا، چڈھا بابو کے لڑکے کو؟ وہی چڈھا بابو ہیں نہ، جو بنگلے میں رہتے ہیں، پورب طرپھ''
افسانہ: ''منتر''
پریم چند کی اردو کہانیوں میں مقامی و ہندی بولیوں کے مختلف الفاظ ملتے ہیں۔ جیسے یوگ ۔بھوجن، تیاگ، ستیا گرہ، بلیدان وغیرہ۔ اسی طرح ہندی تخلیقات میں سنسکرت کے علاوہ اردو الفاظ بھی ملتے ہیں۔ ایسا اس لیے ہے کہ ان کے عہد میں لسانی تنازعات کے سلسلے سے یہ ایک اہم بحث تھی کہ اردو ہندی یا ہندوستانی تینوں زبانوں میں سے کسی ایک کو سرکاری درجہ عطا کیا جائے۔ گاندھی جی نے اس لسانی مسئلے کے حل کے لیے ہندوستانی زبان کے استعمال پر زور دیاپریم چند چوں کہ گاندھی جی کے ہم خیال تھے اس لیے انہوں نے ہندی تخلیقات میں اردو اور اردو تخلیقات میں ہندی الفاظ کا استعمال کیا لیکن ان کی ہندی و اردو تخلیقات کے اسلوب کے سلسلے سے یہ غلط فہمی رہی ہے کہ دونوں زبان کی تخلیقات اسلوبیاتی سطح پر مماثلت رکھتی ہیں۔ جس

میں صرف چند مروجہ الفاظ کے استعمال کا فرق ہے اور کچھ بھی نہیں۔ ایسا کہنا درست نہیں کیوں کہ پریم چند کی ہندی و اردو کی کہانیوں میں لفظوں کے انتخاب کے ساتھ ساتھ فقروں کی ساخت اور ادبی مزاج کے اعتبار سے امتیازات واضح طور پر نمایاں ہیں۔
پریم چند کے اسلوب کی ایک خوبی اختصار نویسی بھی ہے۔ جو فقرے جملے و عبارت ان کی کہانیوں میں ملتے ہیں۔ اس میں اختصار سے کام لیا گیا ہے۔ ساتھ ہی پریم چند کی ہنر مندی یہ ہے کہ انہوں نے صرف سماج کی خارجی پہلوؤں کو موضوع نہیں بنایا بلکہ کرداروں کی نفسیاتی پیچیدگیوں و تضادات کو فنّی سطح پر پیش کیا۔ ہمیں زندگی کی ان حقیقت سے روشناس کرایا جہاں تک ہماری رسائی ممکن نہیں تھی۔ پریم چند کے اسلوب میں جو طنزیہ اس میں برجستگی نشتریت مزاح پھبتی کے ساتھ ساتھ ہمدردانہ و مخلصانہ روّیہ بھی کار فرما ہے۔ پریم چند انگریزوں اور جاگیردارانہ سماج کے کھوکھلے آدرشوں و ظلم و

جبر جو ہندوستان کے غریب عوام کو ہر اعتبار سے پسماندہ کر چکی تھی اس سے وہ مطمئن نہیں تھے۔ یہی وجہ ہے کہ وہ طنز کے ذریعہ سماج کے ان کریہہ پہلوؤں کا پردہ چاک کرتے ہیں اور ایک مہذب سماج کی تشکیل چاہتے ہیں جس میں ہندوستان کا مظلوم طبقہ آزادی کی سانس لے سکے۔

:افسانہ ''شطرنج کی بازی'' کا یہ اقتباس دیکھئے

'' اندھیرا ہو گیا تھا، بازی بچھی ہوئی تھی۔ دونوں بادشاہ اپنے اپنے تخت پر رونق افروز تھے۔ ان پر حسرت چھائی ہوئی تھی گویا مقتولین کی موت کا ماتم کر رہے تھے۔ چاروں طرف سناٹے کا عالم تھا۔ کھنڈر کی بوسیدہ دیواریں اور خستہ حال کنگورے اور سربہ سجود مینار ان لاشوں کو دیکھتے تھے اور انسانی زندگی کی بے ثباتی پر افسوس کرتے تھے۔ جس میں سنگ و خشت کا ثبات بھی نہیں۔''

شطرنج کی بازی، پریم چند کی کہانیاں مرتبہ جوگندر پال ص۔۱۱۹

اس اقتباس میں تہذیبی زوال کا نقشہ کھینچا گیا ہے۔ جس میں تلخی کے ساتھ ساتھ عبرت کا پہلو بھی موجود ہے۔ پریم چند نے افسانوں کے علاوہ اپنے ناولوں 'اسرار معابد'، 'کشنا'، 'روٹھی رانی'، 'ہم خرمہ و ہم ثواب'، 'جلوۂ ایثار'، 'بازار حسن'، 'گوشۂ عافیت'، 'نرملا'، 'غبن'، 'چوگان ہستی'، 'پردۂ مجاز'، 'میدان عمل'، 'گؤ دان' اور 'منگل سوتر' کے توسط سے بھی غریب مفلوک الحال ہندوستانی عوام کی دکھتی رگوں پر مرہم رکھنے کی بھرپور کوشش کی ہے۔ غرض کہ پریم چند نے جہاں اپنے ناولوں میں عوامی زندگی کے مسائل اور دیہاتی عوام کو کردار کی شکل میں پیش کیا وہیں موضوع و کردار کے ذریعہ عوامی زبان و اسلوب کا بھی استعمال ہے۔

:پریم چندکے اسلوب کے متعلق عزیز احمد کہتے ہیں کہ

'' ان کے اسلوب کی بڑی خوبی اس کی سادگی ہے۔ان کی زبان حتیٰ الامکان آرائشوں سے پاک ہے۔ زبان کہانی یا اصلاحی مقصد کی خدمت کرتی ہے اور اس کی حیثیت محض ثانوی ہے۔ ان کی زبان قصہ کا تسلسل برقرار رکھنے میں بڑی مدد دیتی ہے۔ طرز تحریر میں وہ اردو اور ہندی کے اسالیب کو ایک دوسرے سے قریب لاتی ہے'' ۔

ترقی پسند ادب/عزیز احمد ص۔۲۴۸

:اختر انصاری نے اپنے مضمون ''اردو نثر کے اسالیب اور پریم چند'' میں کہتے ہیں کہ

'' پریم چند کے اسلوب کا جائزہ لیتے وقت ہماری نظر اس کے جزوی پہلوؤں کے بجائے سب سے پہلے اس کے ایک مجموعی وصف پر پڑتی ہے۔ وہ مجموعی وصف یا جامع و ہمہ گیر خصوصیت اس کا جمہوری و عوامی انداز ہے۔ اسی ایک مادی خصوصیت کی بنا پر پریم چند کا اسلوب اور ان کا طرز ایک خاص طرز ہے۔ بلکہ اگر غور کیا جائے تو یہی وہ چیز ہے جس نے پریم چند کے منفرد اسلوب کو نہایت درجہ منفردبنادیاہے۔''

منشی پریم چند شخصیت اور کارنامے'' ڈاکٹر قمر رئیس۔صہ۔۳۰۳

Conclusion

حاصل کلام یہ کہ پریم چند اردو افسانہ کا ایک ایسا منفرد نام ہے جس نے موضوعاتی اور اسلوبیاتی سطح پر اپنی انفرادیت درج کرائی اور ایک بڑے حلقے کو متاثر کیا اور

شاید یہی وجہ ہے کہ آج بھی پریم چند کے موقف اور اسٹائل کو اپنانے میں لکھنے والے فخر محسوس کرتے ہیں اور یہ سلسلہ ہنوز جاری ہے۔ گویا پریم چند نے اردو فکشن کو اسلوبیاتی سطح پر نئی زندگی عطا کی ۔

References :-

1 زمانہ ۱۹۳۶ مضمون بشمولہ ادب کی غرض و غایت/پریم چند ص۔۲۰۵
2 پریم چند کے نمایندہ افسانے/قمر رئیس ص۔۳۰
3 شطرنج کی بازی، پریم چند کی کہانیاں مرتبہ جوگندر پال ص۔۱۱۹
4 ترقی پسند ادب/عزیز احمد ص۔۲۴۸
5 منشی پریم چند شخصیت اور کارنامے'' ڈاکٹر قمر رئیس۔صہ۔۳۰۳

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प्रस्तावना :

शहरे ही आर्थिक विकास आणि नवनविन कल्पनांचे मुख्य इंजीन आहे. सध्या देशातील लोकसंख्येपैकी एक तृतीवांश लोकसंख्या शहरीभागात राहते. या लोकसंख्येचा जी.डी.पी. मधील वाटा ३/५ पेक्षा अधीक आहे. देशाच्या शहरीकरणाच्या अर्थ व्यवस्थेसाठी ही बाब अत्यंत महत्वाची आहे. कारण या उद्योग क्षेत्राशी २६९ उद्योगामधील अंतर संबंध गुंतलेले आहे. शहरी करणाचा विकास हा थेट रोजगार निर्मिती, जिडीपी आणि अर्थ व्यवस्थेतील वापराचा कल यावर परिणाम करणारा आहे.

शाश्वत शहरीकरण आणि विकास हा सामाजीक आणि आर्थिक स्तराबरोबरच गुणवत्तापुर्ण जीवनावर प्रभाव टाकणारा एक घटक असल्याचे जागतीक समुदायाने मान्य केले आहे. शहरीकरणमध्ये गृहनिर्माण, सेंदाई आराखडा (२०१५) आणि पर्यावरण बदलावरील पॅरीस करार (२०१६) यात मान्य केले की, शहरीकरणाचा शाश्वत विकास आणि आपत्ती प्रतिबंधक गृह निर्माण अत्यावश्यक आहे. शाश्वत विकासाची उद्दीष्ठ्ये यातील अकरावे उद्दीष्ट्ये शहरीकरणाकरीता आर्थिक व पायाभूत सुविधा हे शहरातील मानवी जिवनमान सर्वसमावेशक, सुरक्षित, संवेदनाक्षम आणि शाश्वत असावे. भारताने शहरीकरणाकरीता सामाजिक व आर्थिकस्तर उंचवण्यासाठी पायाभूत सुविधा यांचे महत्व ओळखने आणि २०२२ पर्यंत स्मार्ट सिटी मोहिम हाती घेतली.

शहरीकरणाच्या पायाभूत सुविधा व आर्थिक मागणी पुरवठा व प्रश्न :-

शहरीकरणाच्या विकासातील आव्हाने स्विकारण्या करीता अनेक योजनांची अंमलबजावणी पुर्व तुतवागुंतवीची प्रक्रिया दिर्घ आहे. या प्रक्रियेमध्ये जमीन रुपांतरीत करणे, इमारत आराखडा अभ्यास यासाठी शासन मान्यता, बांधकामासाठी परवानगी व विविध खात्याकडून मिळवावी लागणारी 'नाहरकत प्रमाणपत्रे' या प्रि येमध्ये दोन वर्षाचा कालावधी खर्च होतो.

बाह्य पायाभूत समस्या आणि संप यंत्रेणेचा आभाव कमी करण्याकरीता राज्य सरकाराने याबद्दलची दखल घेतली आहे. त्या अनुषंगाने पावले उचलेली आहेत. ही प्रक्रिया सोपी, सुलभ करणे, धोरण आखणे, प्रक्रियेत बदल करणे इत्यादी उदा. जमीन एकत्रि करणे किंवा अधिक घनता असलेले प्रकल्प उभारणे अशी पावले मध्य प्रदेश व महाराष्ट्र शासनाने उचलेली आहे. जीपीएस प्रणालीवर आधारीत वस्तुनिष्ठ प्रगती पाहणी प्रणाली कनार्ट सर ार-ने सुरु ली आहे.

सन २०२२ पर्यंत शहरीकरणामधील गृहनिर्माण प्रकल्प कल्पना प्रत्यक्षात प्रगतीपथावर आली आणि ालबध्द पध्दतीने पुर्णत्वास गेली. शहरीकरणामध्ये काही महत्वपुर्ण बाबीवर सुध्दा लक्ष केंद्रीत करावे ला ार आहे. उदा. पाणी समस्या, आरोग्य रक्षणाची काळजी, आरोग्य वाहतुक व्यवस्था, शिक्षण, विज पुरवठा, त्याच प्रमा चांगले वातावरण यांची सुध्दा दखल घेतली पाहिजे. समाजाला चांगल्या स्थितीत राहता यावे तसेच शाश्वत विकासासाठी काळजी घ्यावी लागेल. शहरीकरणामध्ये झोपडपट्टीची वाढ होवू न देता चांगला परिसर निर्माण करणे आणि सभोवतालचे आरोग्य जपणे हे महत्वाचे आहे.

आरोग्य सुविधा प्रश्न आणि जल स्त्रोत स्वरूप :-

भारतातील सर्वच शहरामध्ये पाणी पुरवठा खंडीत, कमी दाबाने होणारा व खराब दर्जाचा असल्याचे सर्वत्र दिसुन येते. शहरी लोकसंख्येचा भार त्याच बरोबर सातत्याने वाढत जाणारी शहरे यांना पाणी पुरवठा करणे एक शहरासाठी अव्हान होत आहे. जमीन, पाणी आणि हवा यामध्ये होणारे प्रदुषण आजारांना निमंत्रण देत आहे. उदा: डेंगू, मलेरिया, चिकन गुनिया, माकड गुनिया, डायेरिया, स्वाईन फ्ल्यू, अस्थमा यासारखे विकार यांची दिवसेंदिवस वाढ होत आहे. आरोग्य सेवा तोकडी पडत आहे. भारत सरकारच्या शहरी विकास मंत्रालयाने केलेल्या अभ्यासात असे दिसून आले की, १४ वर्षा खालील २३ दशलक्ष मुले अपु-या आरोग्य सेवेमुळे धोक्याच्या कक्षेत येणारी आहे. ८ दशलक्ष मुले ही शहरामधील निकृष्ठ पाण्यामुळे धोक्याच्या कक्षेत आहे. देशातील बालमृत्यूदर दर हजारी ४२ इतका असून ग्रामीण भारतापेक्षा तो जरी कमी असला तरी सुंस्कृत समाजाला ही बाब स्विकारार्ह वाटणारी नाही.

अनेक वेळा मोठे अंतर कापून शहराला पाणी पुरवठा करण्यात येतो. अनेक वेळा पाईप लाईन फुटल्यामुळे पा ी वाया जाते. त्यामुळे अपुरा पाणी पुरवठा, अपुरी देखभाल यामुळे पाणी पुरवठ्याच्या व्यवस्थेत तांत्रिक नु सा-न होते. सदोष मीटर पध्दती, अनबील्ट वॉटर कंझम्पशन तसेच पाणी चोरी यामुळे व्यापारी तुट येते. सा-याचा एकत्रित परिणाम फार मोठ्या प्रमाणावर महसुलावर होतो. ही सर्व पाणी पुरवठा समस्येची कारणे आहेत. त्याचबरोबर शहरांना नैसर्गीक धोका असतो तो पुर परिस्थिती निर्माण होण्याचा, त्यामुळे पाण्याची पाईप लाईन गंजण्याचा आणि पाणी प्रदुषण होण्याचा पाणी व्यवस्थापनामध्ये या सर्व बाबी एकमेकांशी निगडीत आहेत. सरकारचे पा ी प्र ल्प फायद्यापेक्षा तोट्याची जास्त झाली आहेत. म्हणूनच विकेंद्रीत अशा पाणी व्यवस्थापनाकडे लक्ष देणे गरजेचे आहे.

मलनि-स्सार स्वरूप व प्रश्न :-

मलनिस्सारण क्षेत्राचे (सेवांचे) जाळे कोणत्याही अडथळ्याविणा, कोणत्याही गळती शिवाय विशिष्ट मार्गातून जमा करून मार्गस्थ होणे गरजेचे आहे. अशा तऱ्हेने आपण पाण्याचा अपव्यय तर थांबवूच त्याचप्रमाणे उत्तम तऱ्हेने ठिकवून ठेवू शकू. एकुण वातावरणातही यामुळे चांगली सुधारणा होवू शकते. दुर्दैवाने भारतातील परिस्थिती मात्र कल्पनेपेक्षा एकुणच पाणी पुरवठ्याची परिस्थिती गंभीर आहे. याच अनुषंगाने मलनिस्सारण सुध्दा पुर्णत: अपुरी आहे. आपल्या देशात पाणी पुरवठ्याची सेवा मिळते ती खंडीत स्वरुपाची व निकृष्ठ दर्जाची असते. त्याचा नकारात्मक परिणाम आरोग्यावर होतो. म्हणूनच खालील बाबींकडे लक्ष वेधने गरजेचे आहे.

१. भारतातील ५१६१ शहरापैकी ४८६१ शहरामध्ये पुरेशा मलनिस्सारणाच्या सोयी नाही.

२. बंगलोर, हैद्राबाद, कलकत्ता, दिल्ली, भोपाळ इत्यादी शहरामधील ५०% अधिक राहत्याघरामध्ये मलनिस्सारणाची जोडणी केली नाही. शहरी करणाच्या प्रकल्पामध्ये गृह संकुलामधील १८% गृहसंकुलामध्ये शौचालयाच्या सोयी नाही. त्यांना उघड्यावर आधार घ्यावा लागतो. रस्त्याच्या जाळ्यापैकी २०% पेक्षा कमी रस्ते स्टार्म वॉटर ड्रेनने झाकलेले आहे.

इस. २०५० पर्यंत शहरामध्ये स्वच्छ पाण्याचा पुरवठा, पिण्याच्या पाण्याचा पुरवठा, औद्योगीक वापरासाठी पाण्याच्या पुरवठेची मागणी प्रचंड प्रमाणात वाढणार आहे. वाया जाणाऱ्या पाण्याची निर्मिती एक समस्या आहे. यावर प्रक्रिया केली जात नाही. त्यामुळे असलेल्या मर्यादित पाण्याच्या स्त्रोतांना देखील धोका पोहचत आहे. औद्योगीक वापरासाठी लागणाऱ्या दैनिक वापर हा जल प्रक्रिया संच उभारुन भागविणे गरजेचे आहे. सर्वेक्षणानुसार असा अंदाज व्यक्त केला जात आहे की, पाण्यावर प्रक्रिया न केल्यामुळे दुषित पाण्याच्या समस्येमुळे पाण्यातून होणाऱ्या आजारावरती १५ अब्ज अमेरिकन डॉलर खर्च करण्यात आले आहे. सीआयआय २०१० च्या अहवालानुसार मलनिस्सारण प्रणाली तसेच शौचालय सुविधा मिळविण्यावरही भाष्य केले आहे.

घन कचरा प्रश्न व व्यवस्थापन :-

शहरीकरणामध्ये शहर सुंदर व स्वच्छ करण्यासाठी घन कचरा व्यवस्थापनाची अत्यंत महत्वाची गरज असून खुप कार्याला वाव असलेला विषय आहे. इतर देशाच्या मानाने आपल्या कडे अत्यल्प दराने हे काम करून घेतले जाते. भारतामध्ये घरगुती कचरा, स्थानिक स्वराज्य संस्थाच्या बाबतीतील असो कोणीही ओला कचरा-सुका कचरा असा फरक करण्याचा त्याच प्रमाणे विघटनशील कचरा वेगळा करण्याचा प्रयत्न करीत नाही. या सर्वाचे फायदे व तोटे अजुनही भारतीय मानसिकतेमध्ये आले नाही. कचरा आगारातून कचरा गोळा केलेल्या कचऱ्यावर प्रक्रिया केली जात नाही. तर नियमांचे सरळसरळ उल्लंघन केले जाते. महानगर पालिकेमध्ये सन २००० मध्ये अस्तित्वात आलेली नियमावली आहे. पण त्याची अंमलबजावणी मात्र फारच कमी प्रमाणात दिसते. खरे तर फार

मोठ्या प्रमाणात म्हणजेच भारतामध्ये तयार होणारा सुमारे ६०% कचरा हा विघटनशील आहे. त्यापासून कंपोस्ट करण्याच्या अनेक विविध संधी आपल्याकडे आहे. आपल्या कडील जीवन शैली बदलत आहे. विशेषत: मोठ्या शहरामध्ये त्याचा परिणाम असा होत आहे की, पॅकींग केलेल्या वस्तु वापराकडे लोकांचा कल वाढत आहे. त्यामुळे चरा संचयनाचे प्रमाण १.३ % इतक्या प्रमाणात वाढत आहे. विघटनशील कचरा औद्योगीक देशाच्या तुलनेत कितीतरी पटीने अधिक आहे. भारत सरकारने ०२ ऑक्टोबर २०१४ रोजी 'स्वच्छ भारत अभियान' सुरु केले आणि ०२ ऑक्टोबर २०१९ पर्यंत स्वच्छ भारत करण्याचे उद्दिष्ट ठेवले आहे.

स्वच्छतेचा हक्क:-

जगातील ४०% लोकांकडे स्वच्छतेची मुलभूत सुविधा नाही. संयुक्त राष्ट्राने सन २०१० मध्ये स्वच्छ पाणी व सुरक्षित स्वच्छता गृहाचा मानवी हक्कात समाविष्ट केला आहे. हा हक्क भारतीयांना लागू होणे गरजेचे आहे.

स्वच्छतेचा अनेक देशांना आर्थिक खर्चाचा बोजा वर्ष २००१ ते २०१४

अ.क्र.	आर्थिक वर्ष २००१ ते २०१४	प्रचार प्रसिध्दीवर झालेला देशपातळीवरील खर्च (रू. लाखात)	देशात वैयक्तीक शौचालय बांधलेली एकुण कुटूंब सं या
१.	स-न २००१-२००२	३८२.३७	६३८६६०
२.	स-न २००२-२००३	५५९.४६	५९६३८०
३.	स-न २००३-२००४	३३४४.९८	६१३७०१०
४.	स-न २००४-२००५	३४६३.३६	४५८२२८३
५.	स-न २००५-२००६	४२४४.५५	९१७१४०७
६.	स-न २००६-२००७	६२२३.७२	९७००३८०
७.	स-न २००७-२००८	७७५९.५३	११५२७८९०
८.	स-न २००८-२००९	८५२६.७८	११२६५८८२
९.	स-न २००९-२०१०	११४८५.३९	१२४०७७७८
१०.	स-न २०१०-२०११	११५१२.९७	१२२४३७३१
११.	स-न २०११-२०१२	१०९४८.२५	८७९८८६४
१२.	स-न २०१२-२०१३	१२५८१.४४	४५५९१६२
१३.	स-न २०१३-२०१४	२०८३७.७७	४९७६२५४

१४.	सन २०१३- ३१/१०/२०१७	४०१२.३३	१४२३९१२
	एकुण खर्च	१०६२८२.९	९८०२९६५३

संदर्भ www.mdws.n

स्वच्छतेतून आर्थिक विकास :-

स्वच्छतेची मुलभूत सुविधा नसल्याने अनेक देशांना आर्थिक खर्चाचा बोजा सहन करावा लागतो त्यामुळे वार्षिक आर्थिक विकासावर त्याचा परिणाम होतो. संयुक्त राष्ट्राच्या जागतीक बँकेच्या पाणी व स्वच्छता विभागाच्या अहवालानुसार भारताला वर्षाकाठी ५३.८ दशलक्ष अमेरिकन डॉलर आर्थिकभार अस्वच्छते मुळे सहन करावा लागतो. सहाजीकच त्याचा परिणाम भारतीय देशांतर्गत उत्पन्नावर होत असतो. स्वच्छतेच्या सुविधेची पुर्तता केल्यास आर्थिक विकासाला चालना मिळू शकते.

महा शहर वाहतूक व्यवस्था व स्वरूप :-

शहरी वाहतुक व्यवस्थे संबधी विचार करतांना या शब्दाची व्याप्ती मोठ्या प्रमाणात दिसून येईल शहरांतर्गत प्रवाशी तसेच माल वाहतुकीसाठी लोक जी साधने वापरतात त्यामध्ये पादचारी सायकली, रिक्षा या सारखी खाजगी वाहने उदाः मोटार कार, मोटार सायकल, सार्वजनिक वाहतुकीच्या संदर्भात महामंडळाची बस, रेल्वे, सार्वजनिक, खाजगी वाहतुकीची भागीदारी उदा. टॅक्सी इत्यादींचा समावेश होतो.

शहरी वाहतुकीमध्ये २२% इतके प्रमाण सार्वजनिक वाहतुकीचे आहे. याची तुलना कमी उत्पन्न असलेल्या देशाशी होते. यामध्ये फिलीपाईन्स, व्हेनेझुएला, इजिप्त इत्यादी देश तसेच अधिक उत्पन्न असलेल्या देशामध्ये ४०% हुन अधिक लोक सार्वजनिक वाहतुकीचा फायदा घेतात. यामध्ये दक्षिण आफ्रिका, दक्षिण कोरिया, ब्राझिल इत्यादी देशाचा समावेश होतो. सार्वजनीक वाहतुकीचा वापर लक्षात घेता यामध्ये फार मोठ्या प्रमाणात घसरण दिसून येते. १९५१ साली ११% इतका वापर असलेली संख्या २००१ साली १.१% इतकी घसरलेली आहे. ५ लाख लोक संख्या असलेल्या भारतातील ८५ शहरापैकी, फक्त २० शहरामध्ये फक्त २००९ साली सार्वजनीक बस व्यवस्था सुरु होती.

रस्त्याची घनता (चौ.कि.मी.) सिंगापूर ९.२, कुरीताबा ९.७, सेअल २१.८, जोहान्स बर्ग १० चेन्नई ३.८ नवी दिल्ली १९.२ भारतीय रस्ते व रोडचा विचार करता गुणवत्ता नसलेले खराब रोड, यामुळे भारताचे सार्वजनिक वाहतुक व्यवस्था यामुळे मोठे आव्हान उभे राहिले आहे. अर्थ व्यवस्थेचा विचार करता सार्वजनिक वाहतु व्यवस्था अडथळ्याची ठरत आहे. लोकांच्या आरोग्यावर व जीवनावर परिणाम करत आहे. लोकांना प्रवासामध्ये अनेक तास व्यतित करावे लागतात. अपघातामध्ये जीव गमवावा लागतो. हवा प्रदुषणामध्ये जीव गमवावा लागतो हवा

प्रदुषणामध्ये वाढ या सर्वांचा एकत्रित परिणम खराब वाहतुक व्यवस्थेमुळे दिसून येतो. शहरी लोकांच्या उत्पादन शक्तीवर याचा स्पष्ट परिणाम झाला.

देशामध्ये शहरी भागामध्ये वाहतुकीचे वैशिष्टे म्हणजे अधिक घनता असलेल्या शहरामध्ये ही व्यवस्था साह्यभूत व परिणामकारक ठरु शकतो. शहरातील गरीब व मध्यमवर्गीय लोकांना परवडणाऱ्या किमतीमध्ये तीचा उपयोग होवु शकतो कोणत्याही देशाच्या अर्थव्यवस्थेमध्ये सार्वजनिक पायाभूत सुविधावर अवलंबून राहावे लागते. विशेष करुन शहरी वाहतुक व्यवस्थेवर अधिकच अवलंबून राहावे लागते. या व्यवस्थेमुळे लोकांना शि□□, रोजगार, इ. महत्वाच्या क्षेत्रांना जोडणारी व्यवस्था आहे. पुढील भविष्यामध्ये लोकांना मिळालेल्या संधीत वाढ होऊन पुढील मिळणाऱ्या शिक्षणाचा व रोजगाराचा विचार ते करु शकतात.

धन संपत्तीसह निरोगी आयुष्य आणि समृध्दीसह स्वास्थ हवे असेल तर भारतीयांनो शहराकडे चला असा संदेश भारतीय पंतप्रधान देतात. ही शहरे त्याची कार्यक्षमता व परिणामकारकता या दृष्टीने शहरी वाहतुक व्यवस्थेच्या परिणाम प्रवाशाच्या आरोग्यावर तसेच सुरक्षिततेवर होतो. वाहतुक व्यवस्थेमधून उध्दभवणारे अपघात आणि सुरक्षिततेच्या दृष्टीने घडणारे गुन्हे यांचा वाहतुक नियोजन आणि व्यवस्थापन यांच्याशी संबंध आहे. शहरी □त्रामध्ये परिस्थितीचा विचार करण्याजोगा आहे. वाहनांनी होणारे प्रदुषण हे हवा प्रदुषणामध्ये मोठ्या प्रमाणात भर घालतात.

शहरांना आर्थिक व्यवस्थेच इंजीन असे म्हणतात. देशात नविन उपक्रम राबवण्याचे व नागरिकांना उत्तम जीवनमान द्यावयाचे आहे वाहतुक व्यवस्थेत सुधारणा उत्तम गृहनिर्माण व्यवस्था व्यापारी आस्थापने यांचाही वि□ास करावयाचा आहे. अपुऱ्या पायाभूत सुविधाचा अभाव, सार्वजनिक व्यवस्था, अर्थव्यवस्थेवर ता□, पर्यावर□ीय प्रश्-न, नागरी सुविधा घसरण, रस्ते अपघाताचे बळी, हवा, पाणी, प्रदुषण हे प्रश्न शहरासमोर आ वासून तयार आहे. नियोजनबध्द वाहतुक असेल तर शहरीसुविधामध्ये वाढ व अर्थव्यवस्थेवरील ताण कमी करण्यात येईल.

□ाही प्रमाणात, भारतातील खराब सार्वजनिक वाहतुक व्यवस्थेचे प्रत्यक्ष परिणाम करविषयक धोरणावर देखील दिसतात सार्वजनिक वाहतुक व्यवस्थेवरील करांचा भार खाजगी वाहनाच्या तुलनेत २.६ पट अधिक आहे. शहरी विकासावरील संसदीय स्थायी समीतीने (२०१०) अतिदाट वस्तीवरील वैयक्तिक वाहनांवर टोल टॅक्सच्या स्वरुपात कंजेक्शन टॅक्स शिफारस केली आहे.

नि□ष□र्ष :- २०२२ पर्यंत 'सब का साथ सबका विकास' पंतप्रधानाचे स्वप्न प्रत्यक्षात उतरेल, शहरीकरणाचा विकास हा प्रत्यक्ष रोजगार निर्माता करणारा एक घटक आहे. शहरीकरणाच्या पायाभूत सुविधा तसेच आजची आव्हाने त्यामध्ये आरोग्य सुविधा व जलस्त्रोत जनतेचा सहभाग असेल तर त्याची अंमलबजावणी योग्य पध्दतीने नियोज-न केल्यास लाभार्थींना त्याचा प्रत्यक्ष फायदा मिळेल शहरीकरणामध्ये मलनिस्सारण तसेच घनकचरा प्रकल्प यामध्ये नगरविकासाची भूमीका महत्वाची आहे. शहरी विकास मंत्रालयाने अनेक योजनांच्या माध्यमातून व्यापक कृती

आराखडा तयार करुन पुरक व्यवस्था निर्माण करावी भारतीय गणतंत्राच्या ६९ व्या वर्षीसुध्दा शहरी र ामध्ये फारसा बदल झालेला दिसत नाही. भारतीय गणराज्याच्या ७५ व्या वर्षात पायाभूत विकासाचा संकल्प केला पाहिजे. आरोग्याच्या दृष्टीने वाहतुक व्यवस्थेचा विचार करता शहरीक्षेत्रामध्ये परिस्थिती विचार करण्याजोगी आहे. वाहनांनी होणारे प्रदुषण हे हवा प्रदुषणामध्ये मोठ्या प्रमाणावर भर घालत आहे.

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