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ENVIRONMENTAL IMPACT OF PLASTIC POLLUTION

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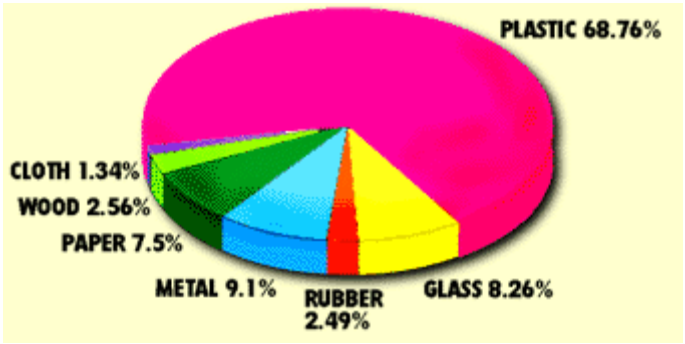
INTRODUCTION

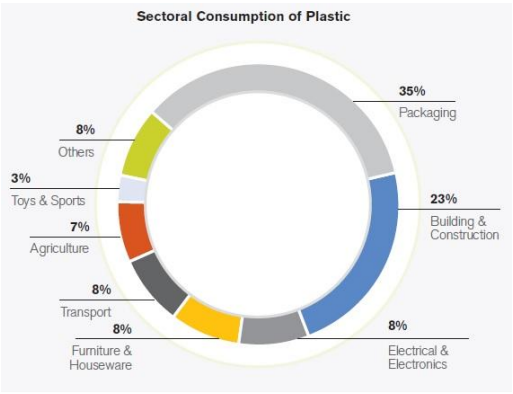
The word 'plastic' comes from the Greek word 'plasticos', which means to be able to be shaped or moulded by heat. 'Polymers' is the generic term for all plastic materials, referring to organic, carbon based compounds whose molecules are linked together in long-chain patterns.

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

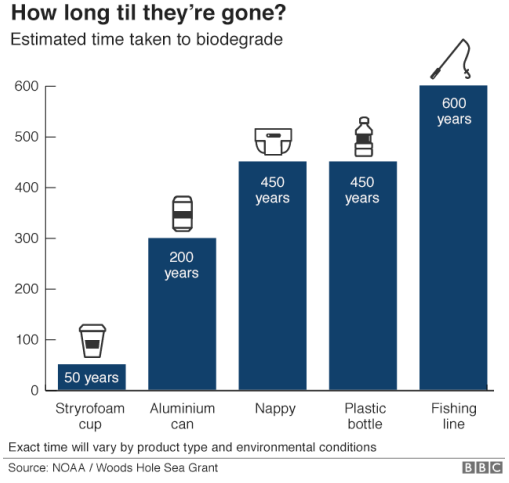
Accumulation of plastic products in the Environment that adversely affects wildlife, wildlife habitat, or humans is a major concern for the governments now. Plastic Pollution occurs in many forms, including but not limited to littering, marine debris (man-made waste that has released in a lake, sea, 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.

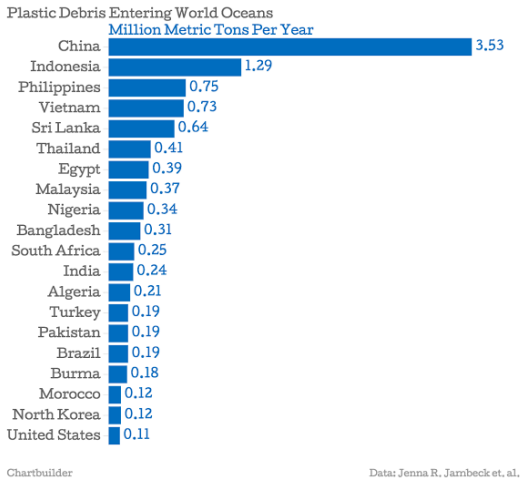
Plastic is meant to last, it is nearly impossible to break down. Burning plastic is incredibly toxic, and can lead to harmful atmospheric conditions and deadly illness. Therefore, if it is in a landfill, it will never stop releasing toxins in that area.

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.

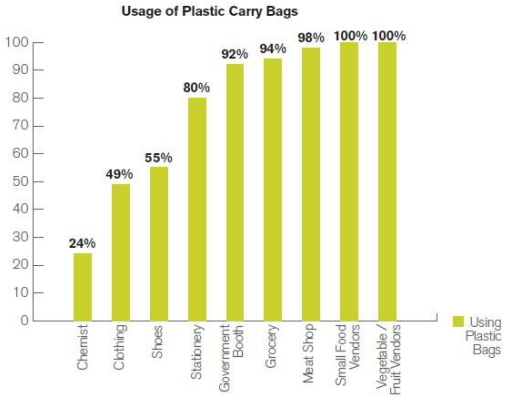
The amount of garbage in the world increases as the population grows, and disposable plastic products, like water bottles and soda cans, accumulate over time. Plastic pollution occurs when enough plastic has gathered in an area that it affects the natural environment and harms plants, animals, or humans.

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.

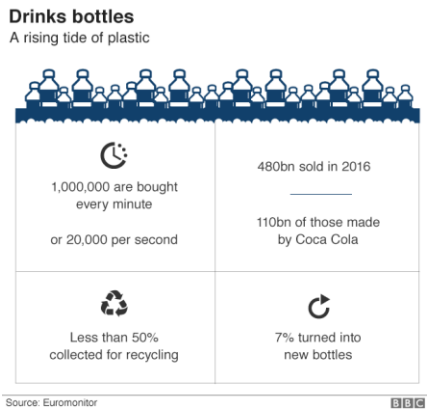


Drinking from a reusable water bottle instead of a disposable one can also be very helpful. If everyone drank the recommended amount of water per day from disposable bottles, it would create an unbelievable amount of plastic waste.

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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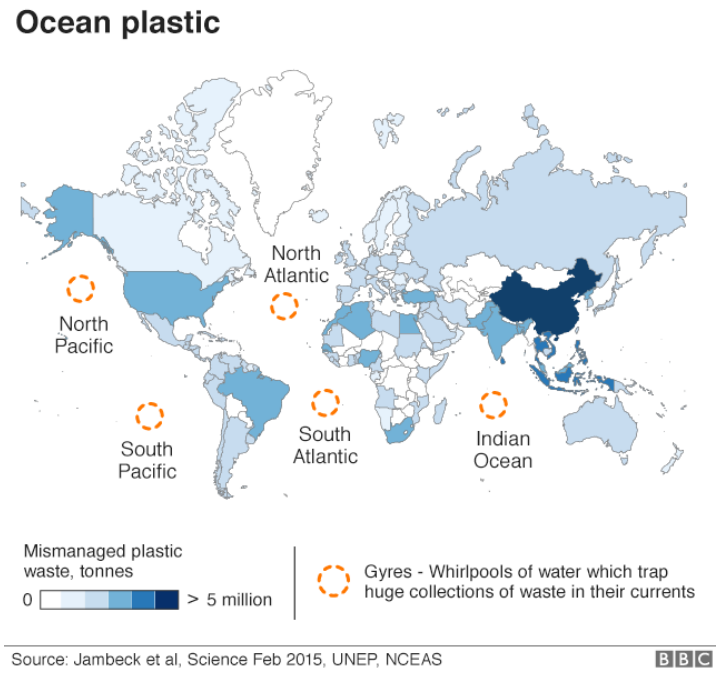

Avoid plastic, save nature to save earth…..

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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.

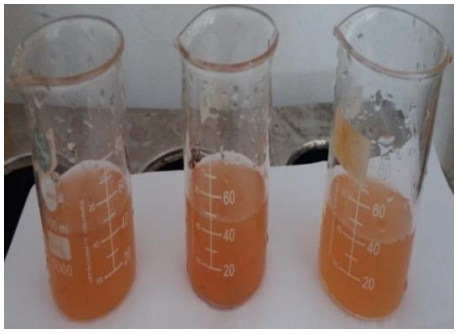


Fig. 1.

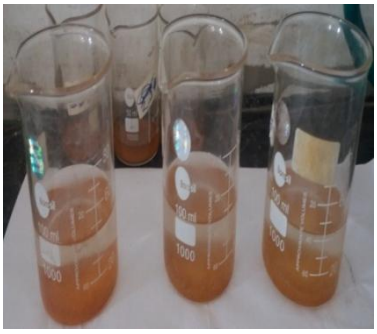


Fig. 2.

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

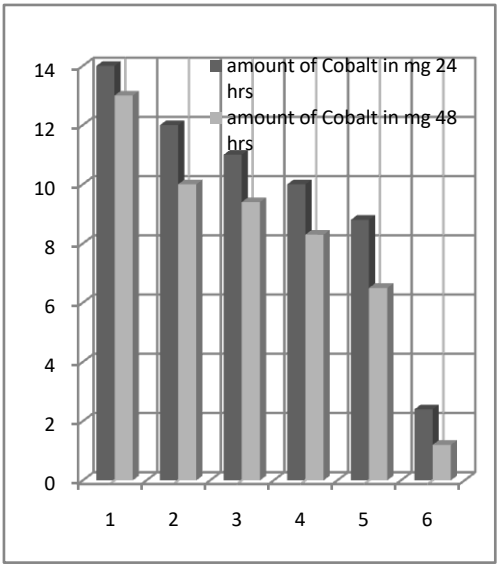


Fig. 3. 3.2.1. (b)

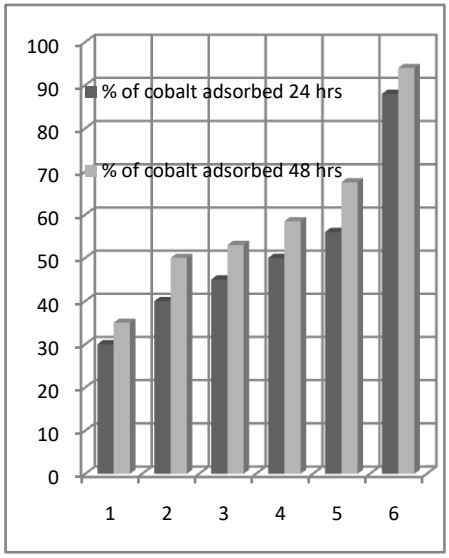


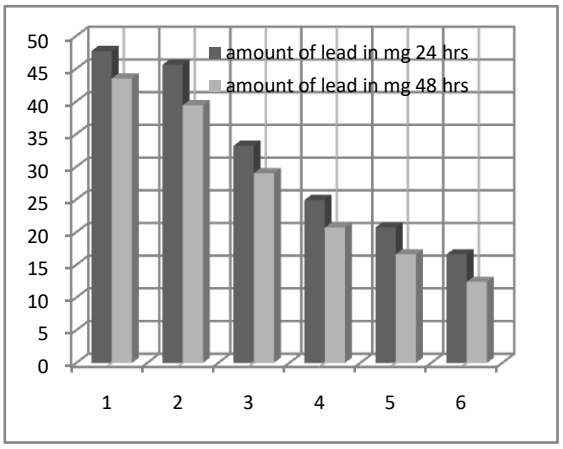
Fig. 4. 3.2.1. (c)

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



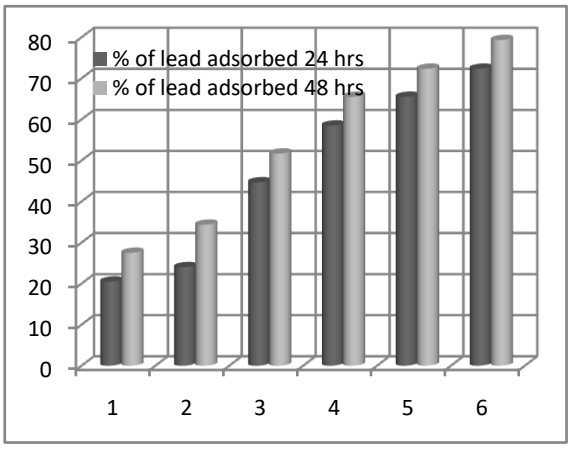


Fig. 5. 3.2.2. (b) **Fig. 6. 3.2.2. (c)**

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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DETERMINATION OF PHYSICO-CHEMICAL PARAMETERS OF DRINKING WATER SOURCES OF MAJGAON VILLAGE OF MURUD TEHSIL DISTRICT- RAIGAD, 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.

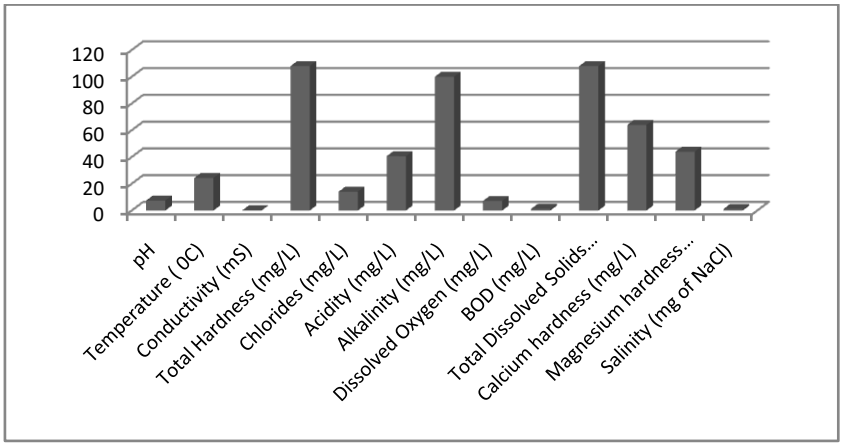
MATERIAL & METHOD:-

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.

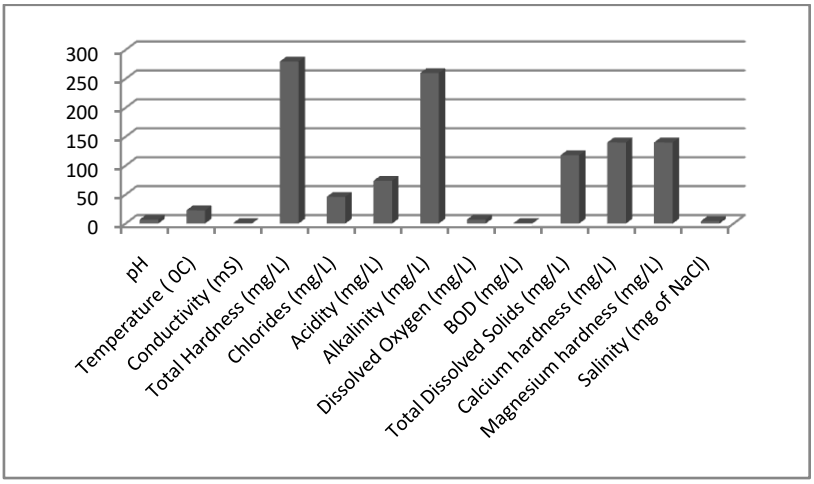
RESULTS & DISCUSSION:-

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

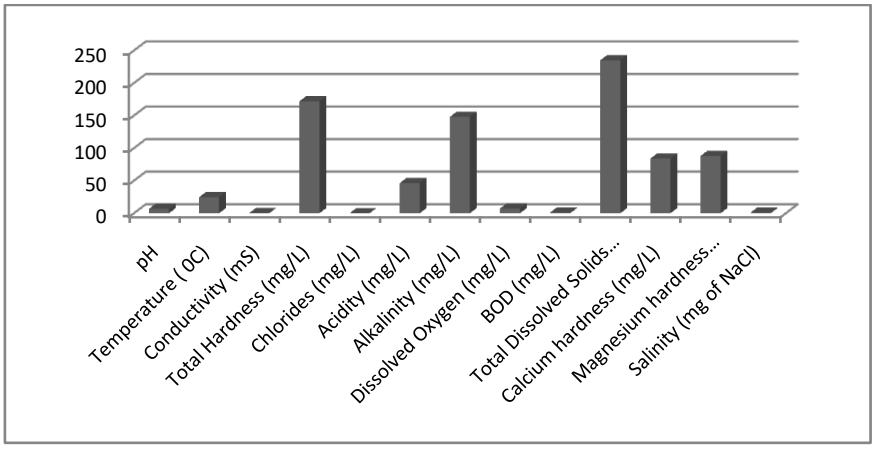
Table-1:- Values of different parameters of water sample of different drinking sources in Majgaon village area. (Mean and Standard deviation is calculated)



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.

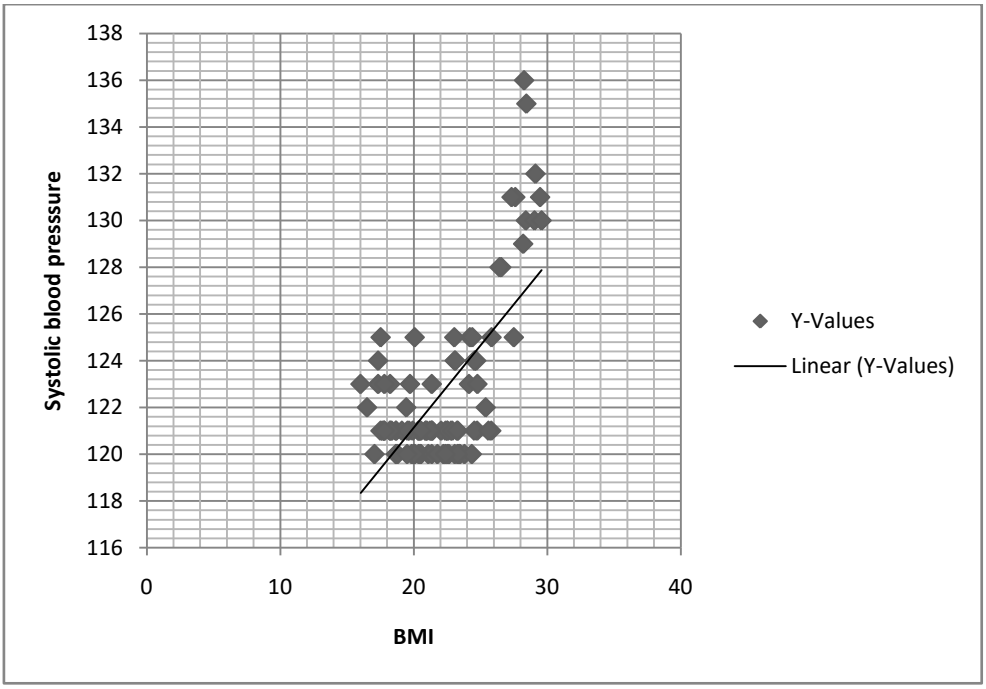
Table 2: Distribution of categories according to BMI

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

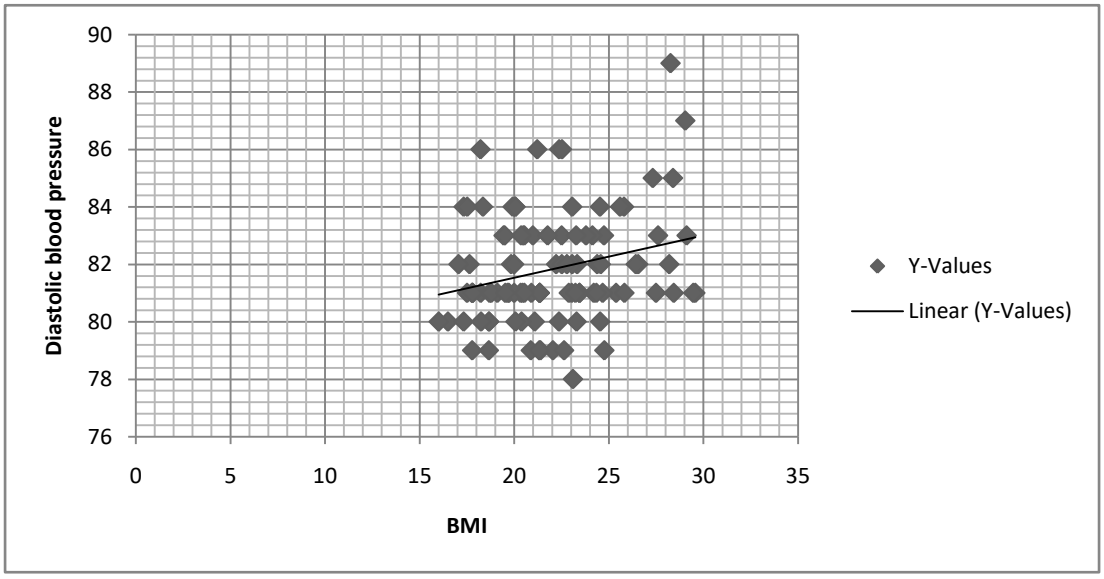
Statistical analysis of BMI and blood pressure revealed that there is correlation in between these two attributes. Both systolic and diastolic blood pressure are positively correlated with the blood

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

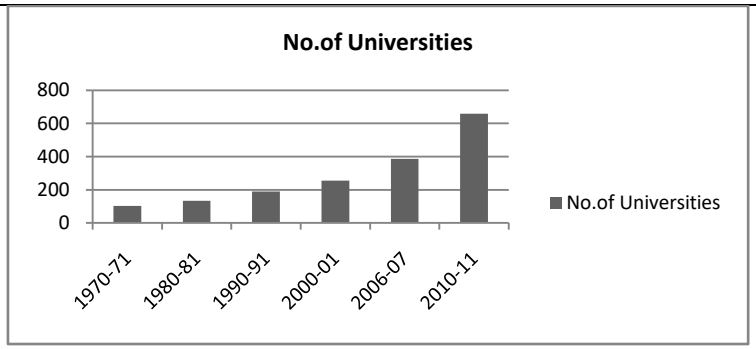
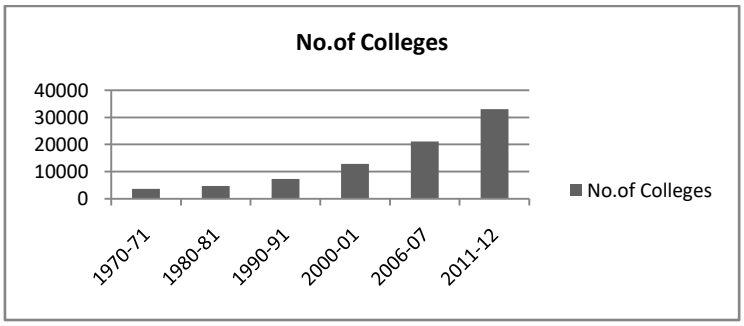


Chart 2



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.

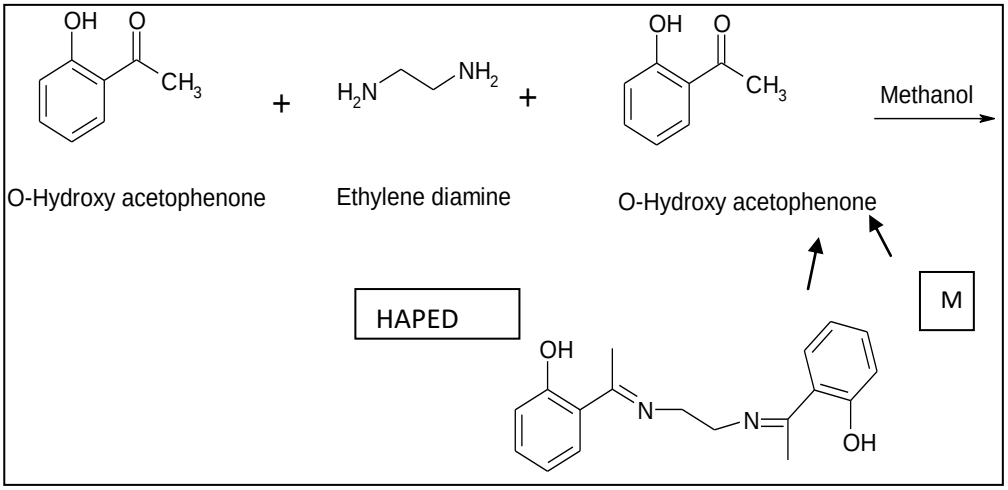
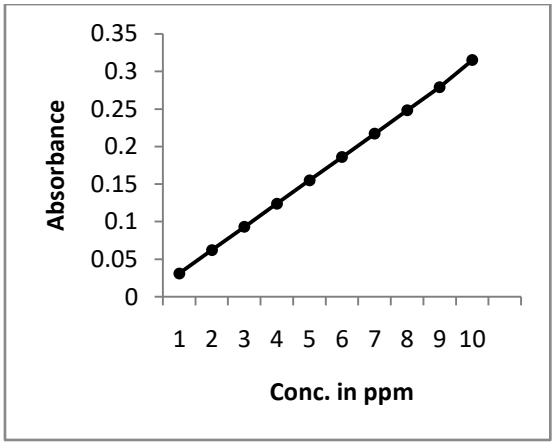


Figure-1:-Synthesis of reagent N,N"-bis (O-hydroxy-acetophenone) ethylene diimine (HAPED)

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.

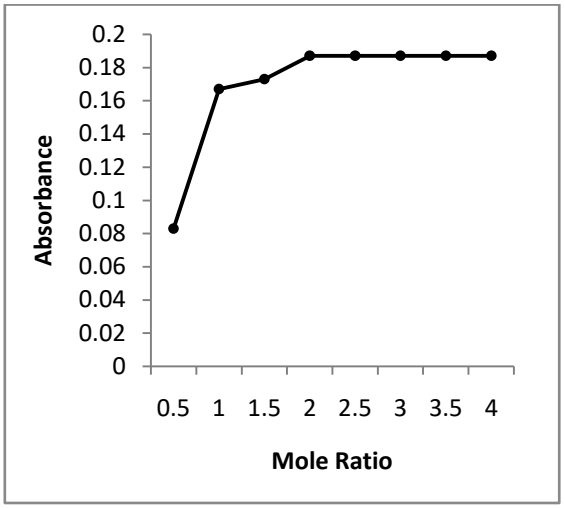


Figure,.2: Calibration plot for extractivespectrophotometric

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.

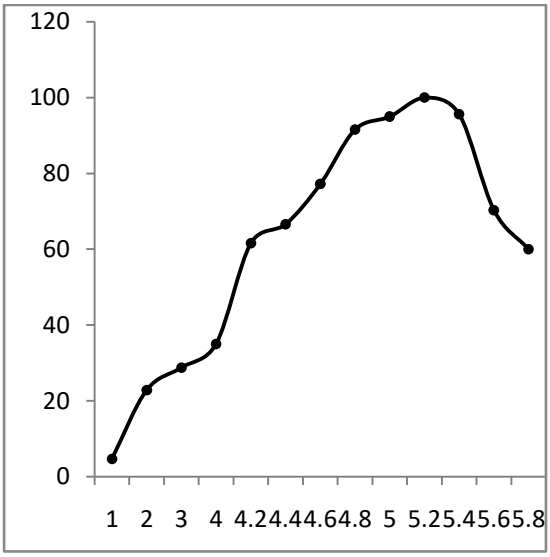


Figure :6- Effect of pH on the extraction of Cr(III):HAPED complex

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.

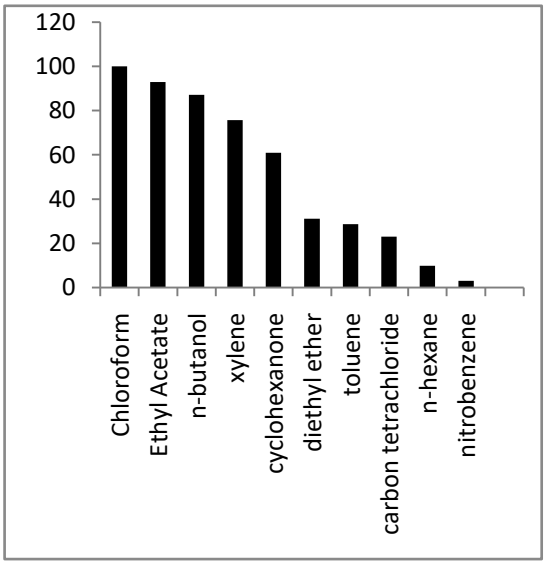


Figure :7 Effect of various solvents on Cr(III) : HAPED complex

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 10th 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 10th 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 10th 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 10th 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

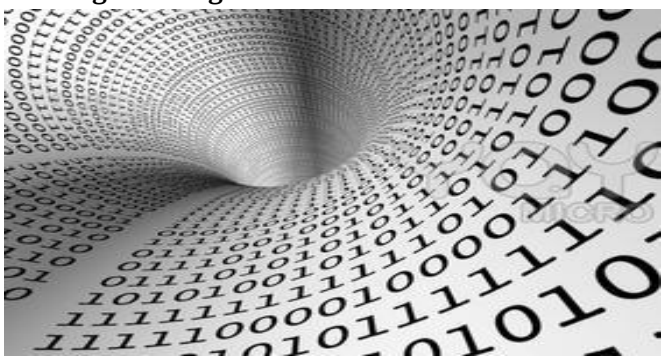
3.3. Research question 3: Types of programming tools:

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 a PowerPC 450, 850 MHz
- Total: 56 teraflops, 16 terabytes of memory
- 4 racks, one row, wired as a 16x16x16 3D torus
- 1 PB of disk space, 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:

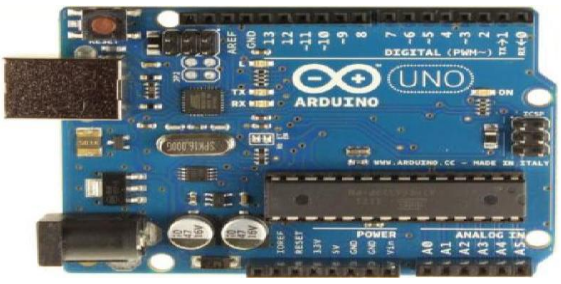


Fig:1

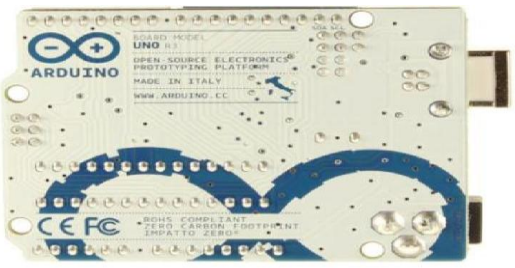


Fig:2

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).

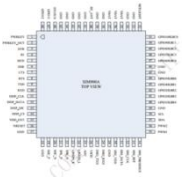


Fig:3

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

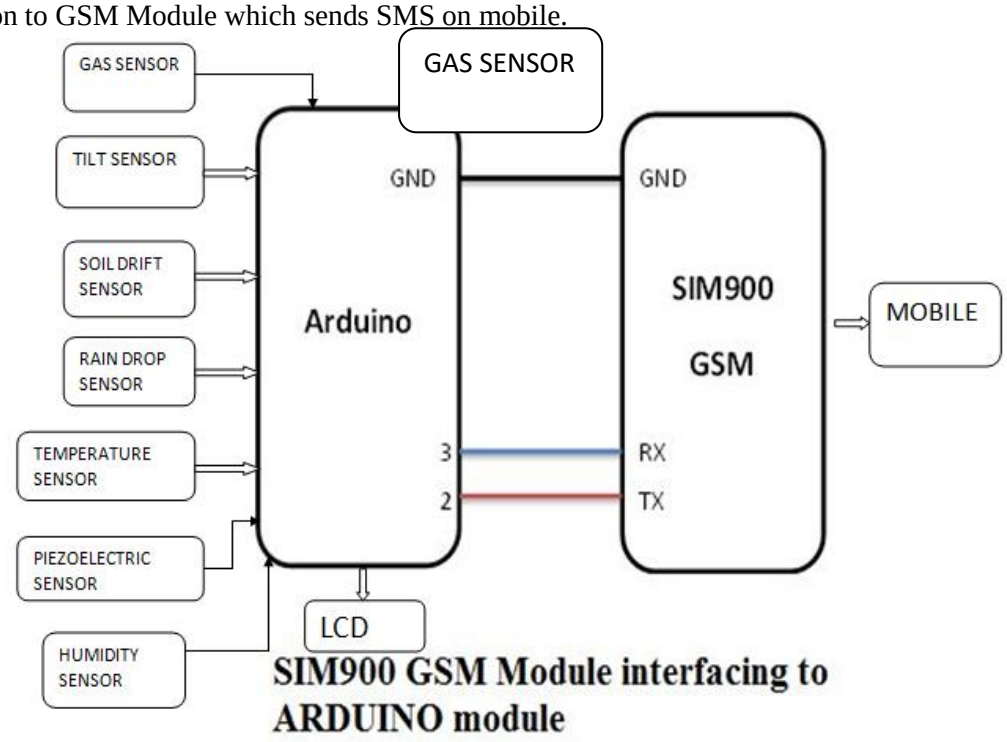
Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload 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:

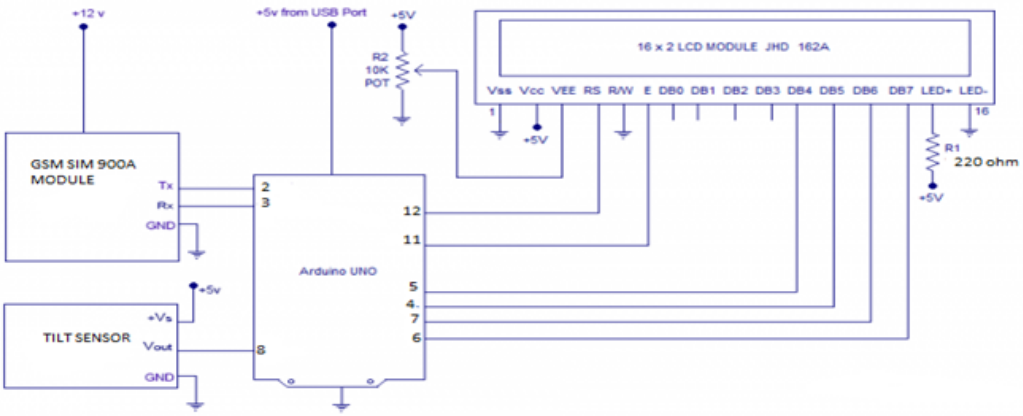


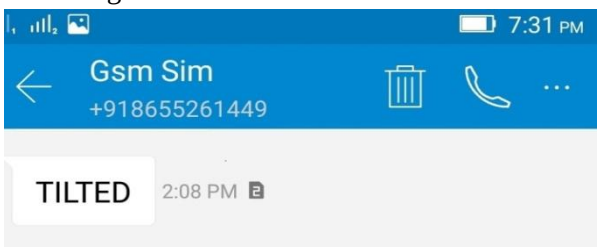
Fig:6

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:

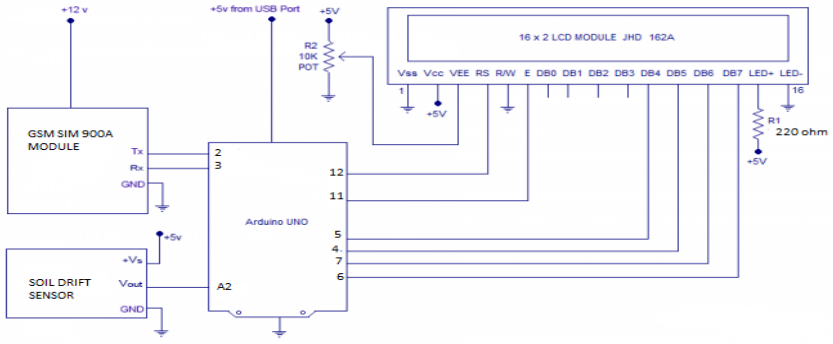


Fig:10

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

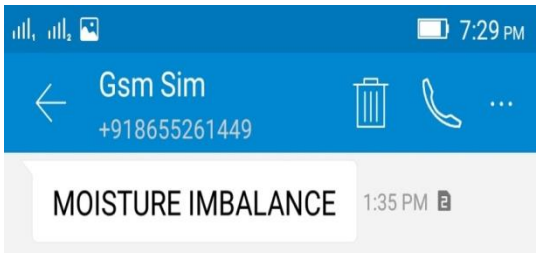


Fig 12

RAIN DROP SENSOR:

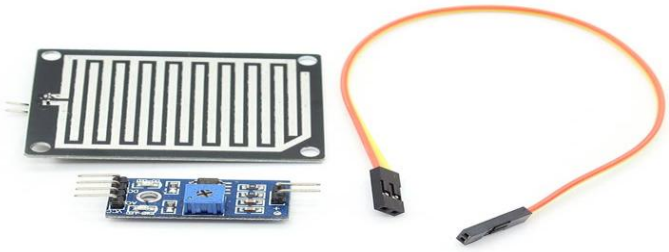


Fig:13

RAIN DROP SENSOR CONNECTION WITH ARDUINO:

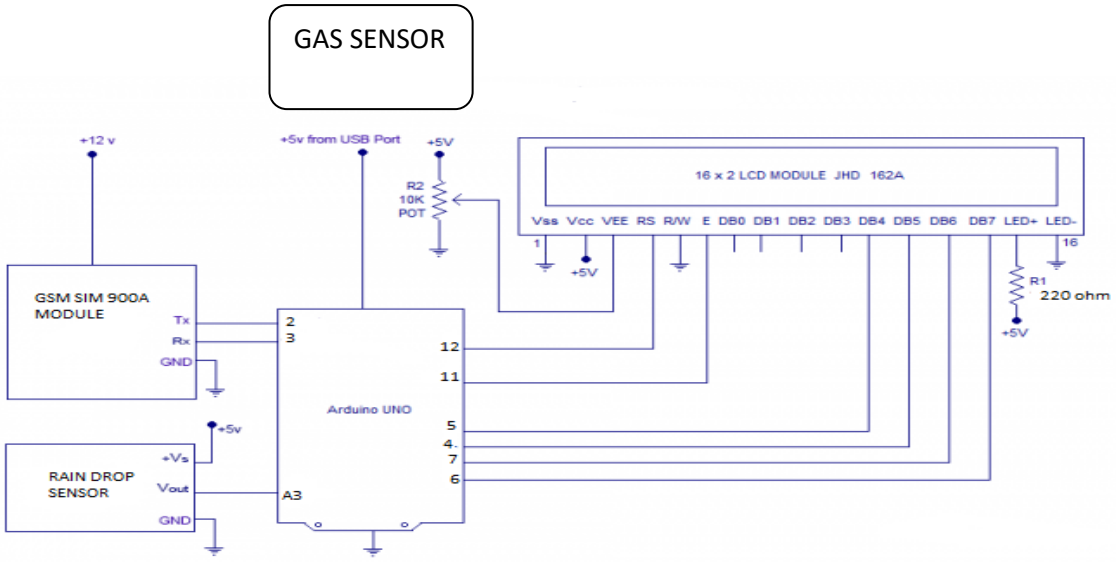


Fig:14

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.

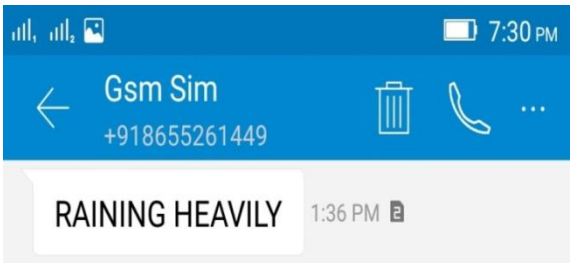


Fig:14

Fig:15

PIEZOELECTRIC (EARTHQUAKE) SENSOR:

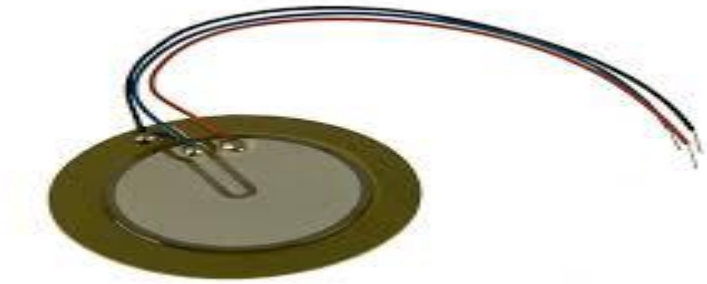


Fig:16

PIEZOELECTRIC SENSOR CONNECTED WITH ARDUINO UNO:

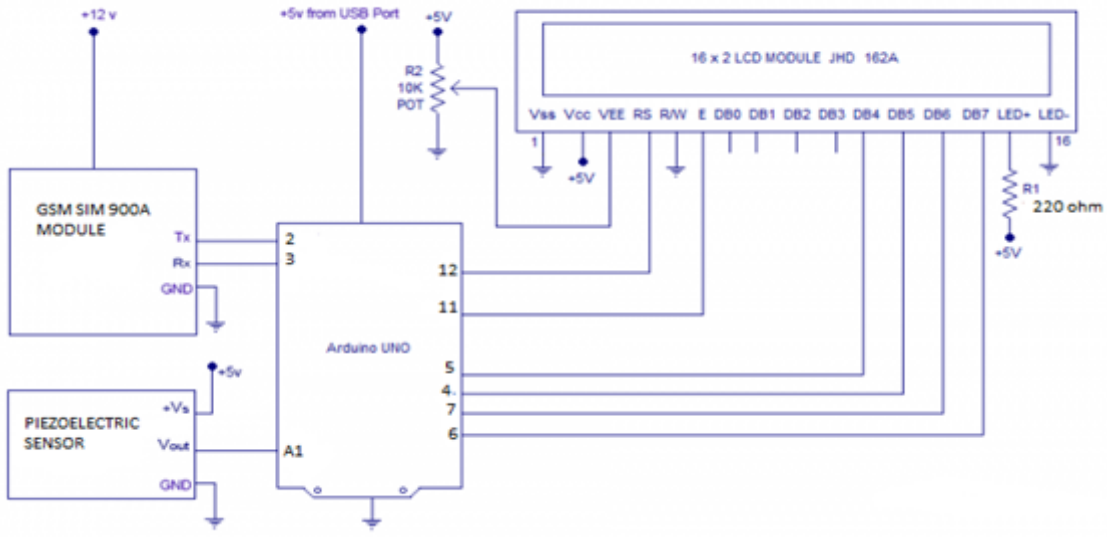


Fig:17

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

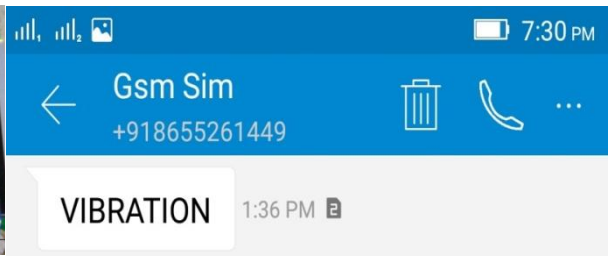


Fig:19

TEMPERATURE SENSOR:

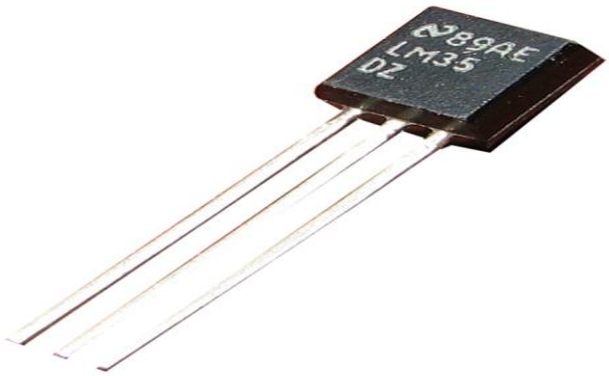


Fig:20

TEMPERATURE SENSOR CONNECTION WITH ARDUINO:

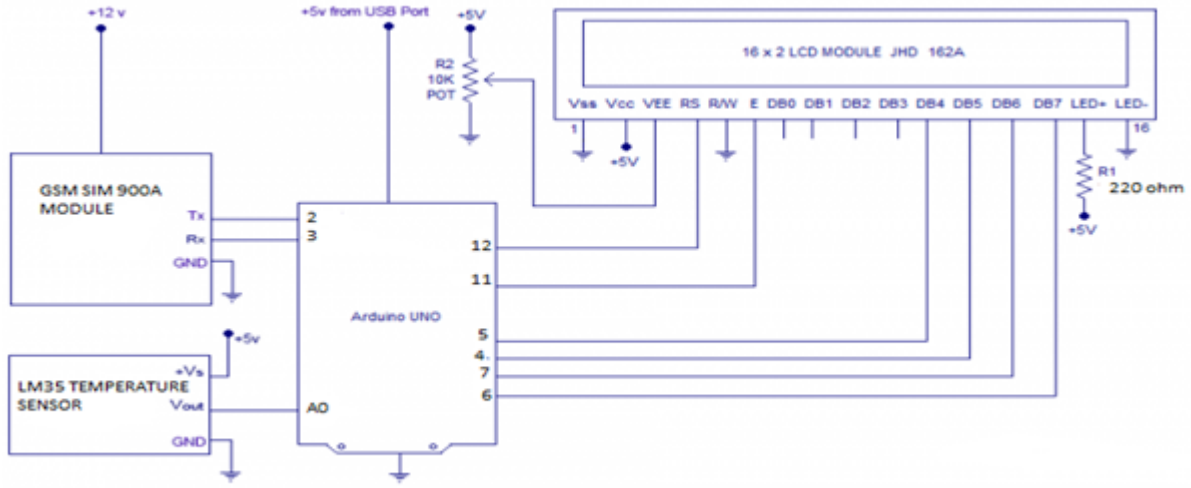


Fig:21

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.

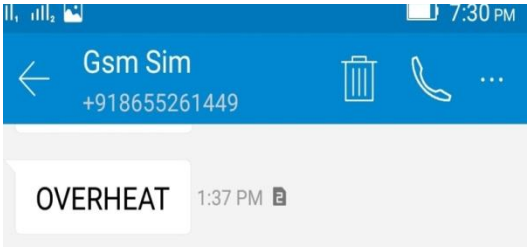


Fig:22

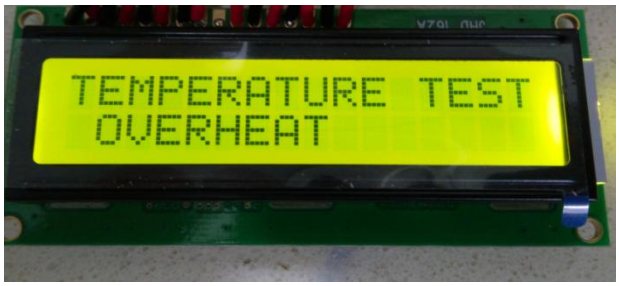


Fig:23

MQ2 GAS SENSOR:

Fig:24

GAS SENSOR CONNECTION WITH ARDUINO:

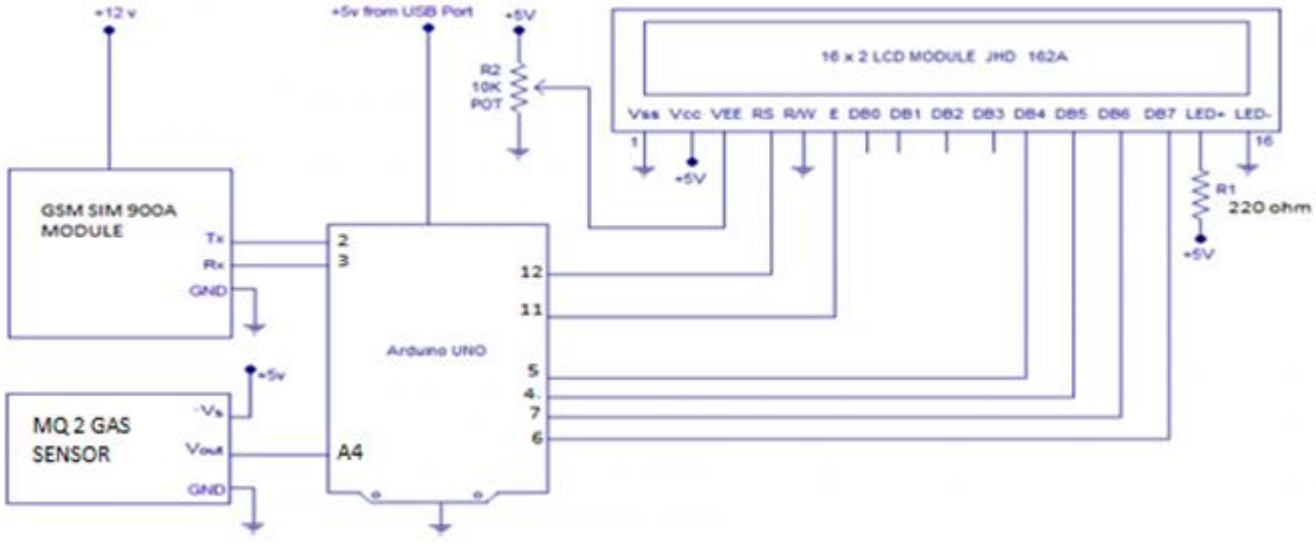


Fig:25

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.

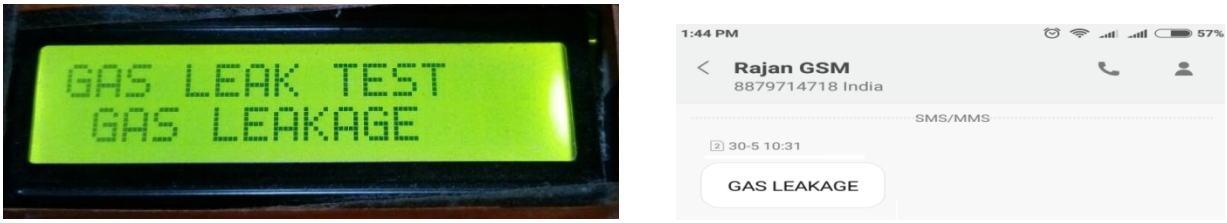


Fig:27

DHT11 HUMIDITY SENSOR:

Fig:28

MQ2 HUMIDITY SENSOR CONNECTION WITH ARDUINO:

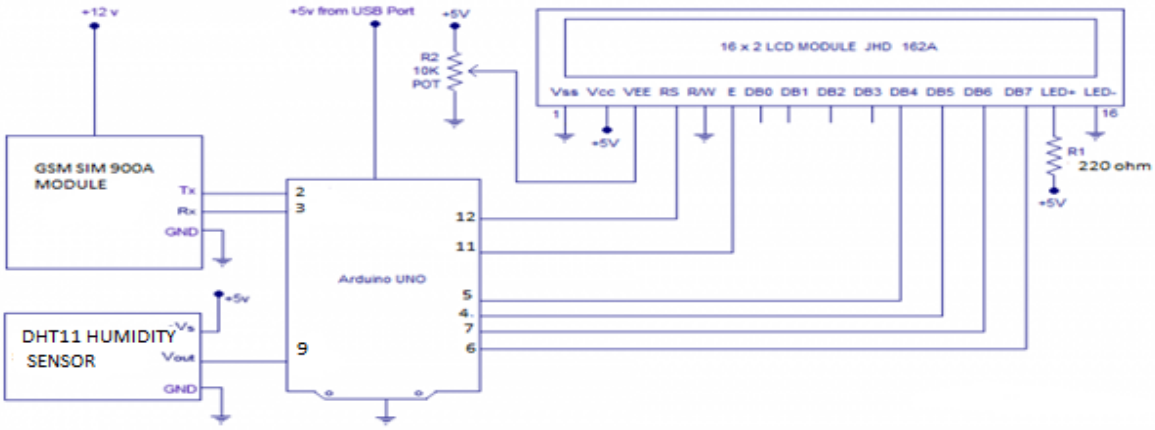


Fig:29

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

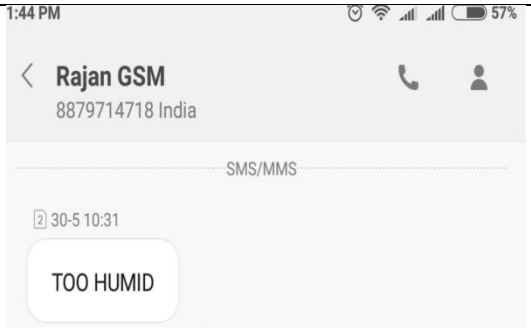


Fig:31

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.

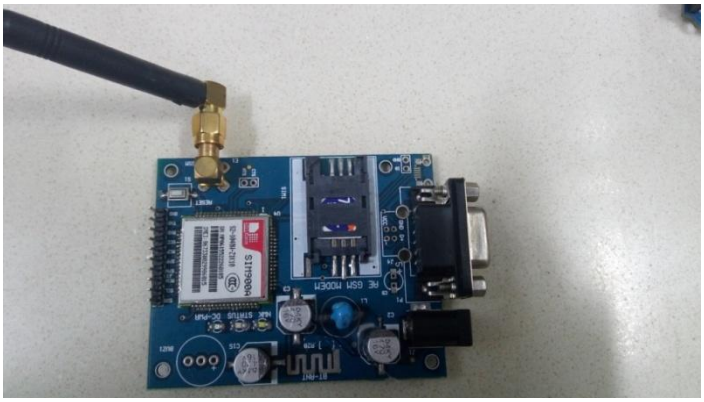


Fig:32

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.

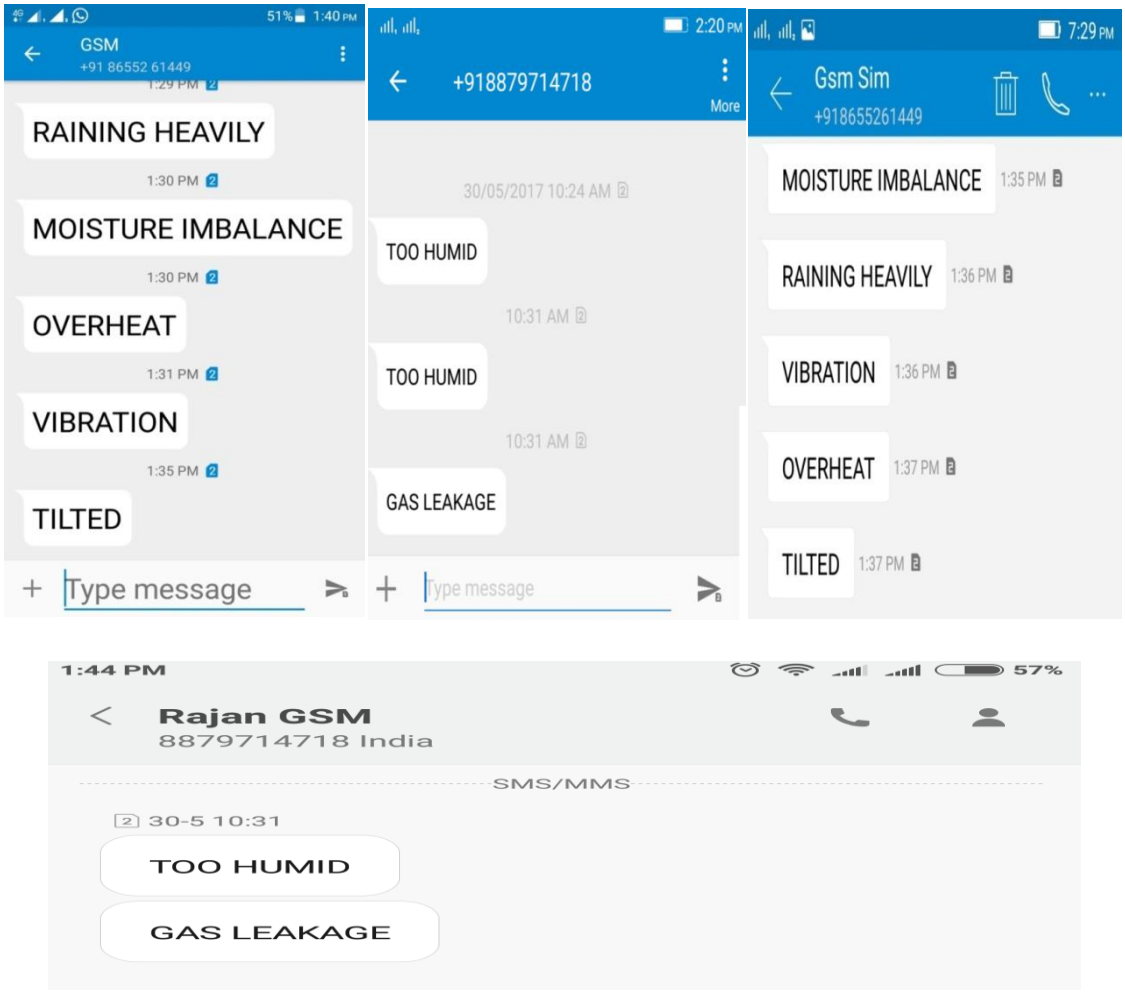


Fig: 32, 33, 34, 35

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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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.

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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.

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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 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 :

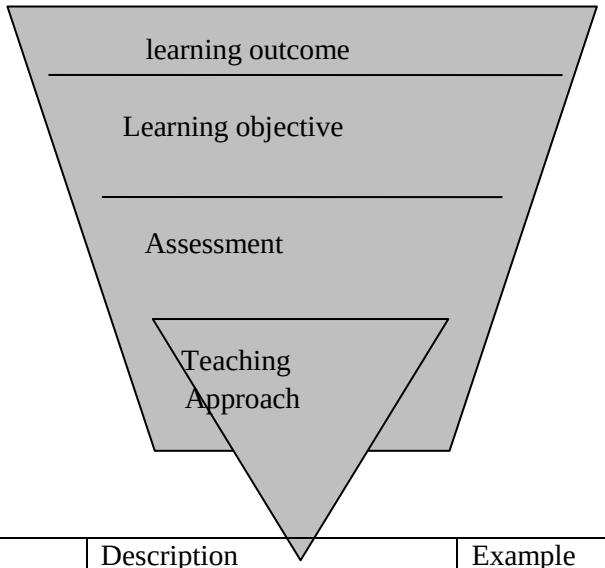
Time : 15 Minutes.

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.

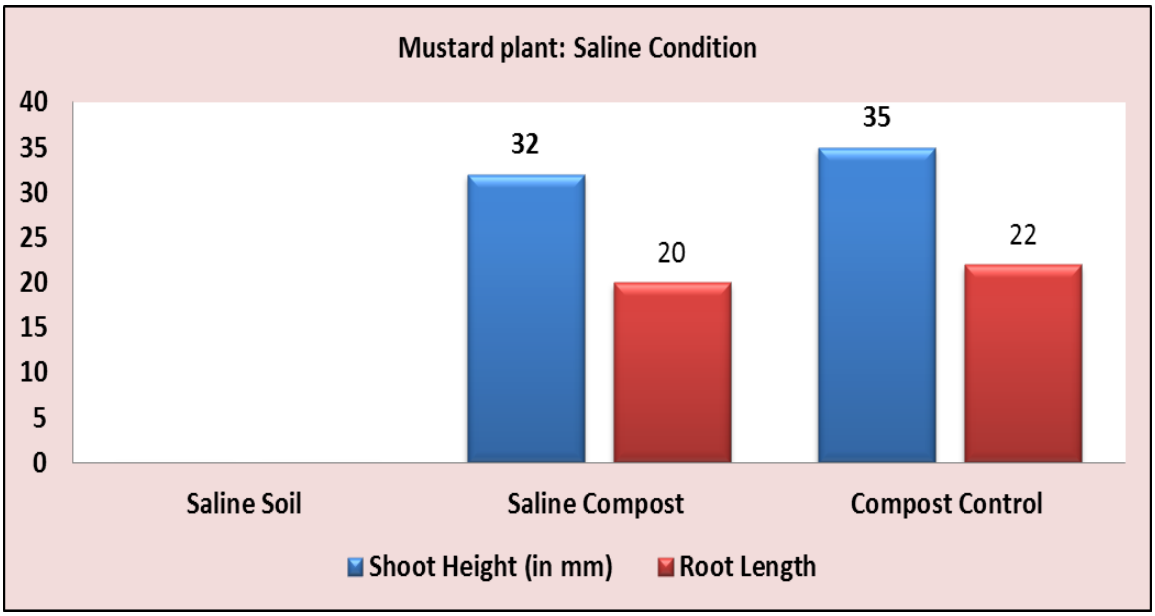

Figure 1: Effect of saline condition on growth of mustard plant. Growth was not observed in the salinized garden soil and significant growth was observed in salinized compost soil.

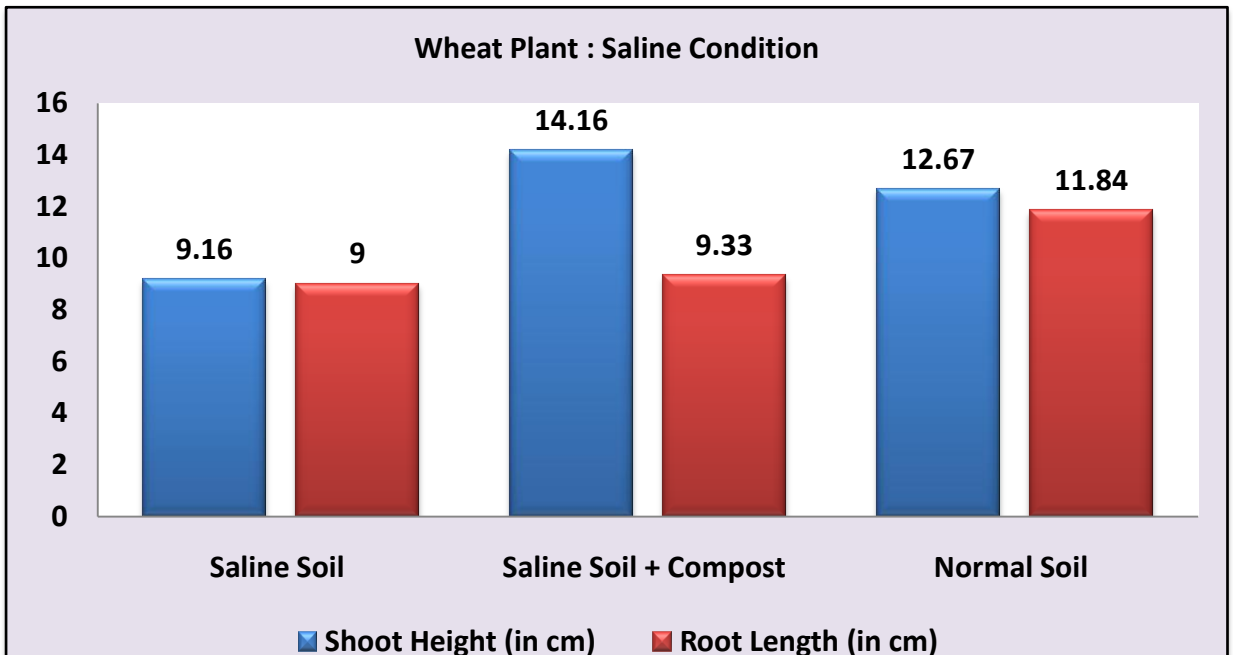

Figure 2: Effect of saline condition on growth of wheat plant. Shoot height and root length of plant grown in saline soil was 9.16 cm and 9 cm and that of plant grown in saline soil + compost was 14.16 cm and 9.33 cm respectively.

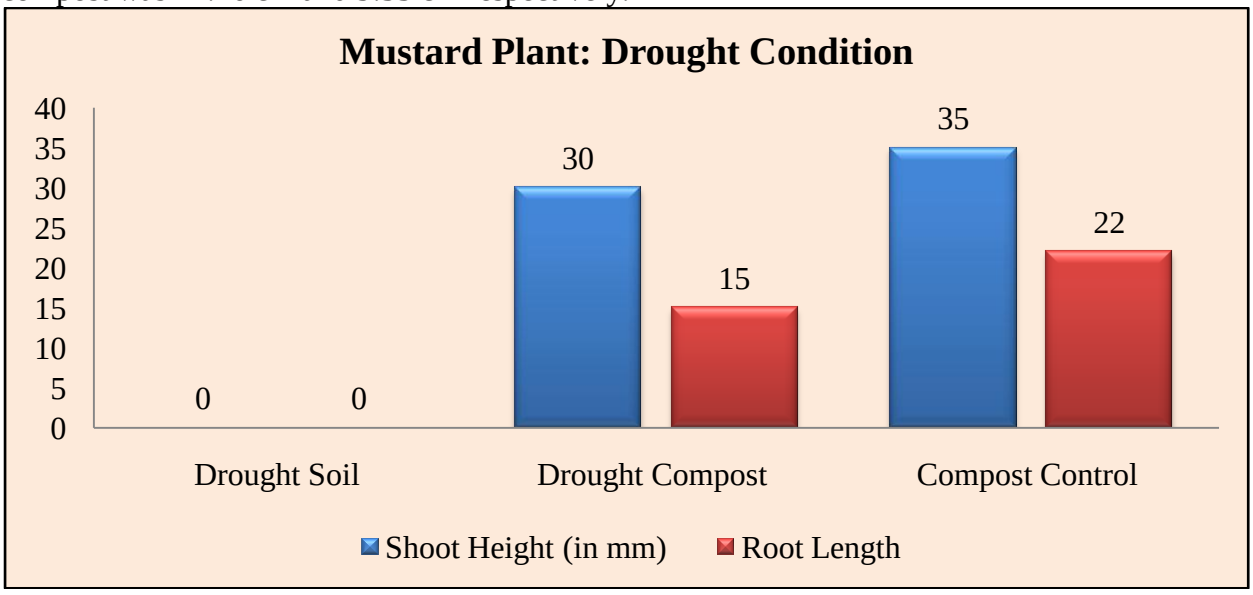

Figure 3: Effect of drought condition on growth of mustard plant. Growth was not observed in the drought affected garden soil and significant growth was observed in drought affected compost soil.

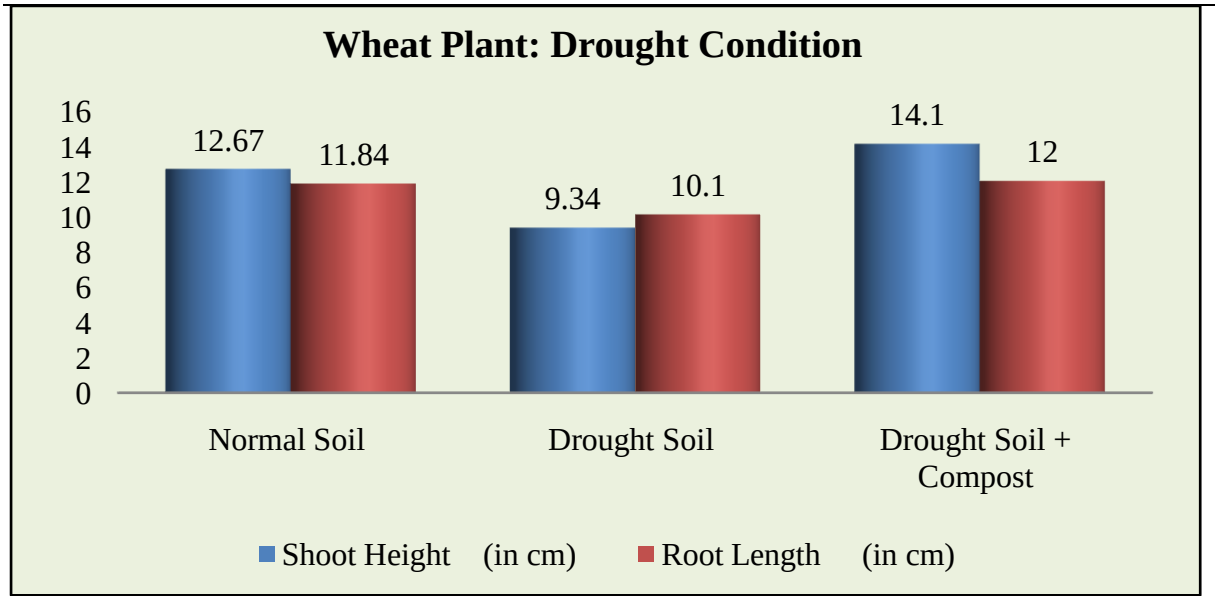

Figure 4: Effect of drought condition on growth of wheat plant. Shoot-height and root-length of plant grown in drought affected soil was 9.34 cm and 10.1 cm and that of plant grown in drought affected soil + compost was 14.1 cm and 12 cm respectively.

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