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ENVIRONMENT AND TECHNOLOGY

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ABSTRACT

Environmental technology (envirotech), green technology (greentech) or clean technology (cleantech) is the application of one or more of environmental science, green chemistry, environmental monitoring and electronic devices to monitor, model and conserve the natural environment and resources, and to curb the negative impacts of human involvement. The term is also used to describe sustainable energy generation technologies such as photovoltaics, wind turbines, bioreactors, etc. Sustainable development is the core of environmental technologies. The term environmental technologies is also used to describe a class of electronic devices that can promote sustainable management of resources.

Keywords- *Environment, Technology etc.*

I. INTRODUCTION

In contrast to the natural environment is the built environment. In such areas where man has fundamentally transformed landscapes such as urban settings and agricultural land conversion, the natural environment is greatly modified into a simplified human environment. Even acts which seem less extreme, such as building a mud hut or a photovoltaic system in the desert, modify the natural environment into an artificial one. Though many animals build things to provide a better environment for themselves, they are not human, hence beaver damsand the works of Mound-building termites are thought of as natural. The term environmental technologies is also used to describe a class of electronic devices that can promote sustainable management of resources.

Example :

- Biofiltration
- Bioreactor
- Bioremediation
- Desalination
- Doubly fed electric machine
- Energy saving modules
- Energy conservation
- Electric vehicles
- Wave energy
- Hydroelectricity
- Wind power
- Wind turbine
- Hydrogen fuel cell
- Ocean thermal energy conversion
- Solar power
- Photovoltaic
- Thermal depolymerization

The natural environment encompasses all living and non-living things occurring naturally. The term is most often applied to the Earth or some part of Earth. This environment encompasses the interaction of all living species, climate, weather, and natural resources that affect human survival and economic activity. The concept of the *natural environment* can be distinguished by components:

- Complete ecological units that function as natural systems without massive civilized human intervention, including all vegetation,microorganisms, soil, rocks, atmosphere, and natural phenomena that occur within their boundaries and their nature
- Universal natural resources and physical phenomena that lack clear-cut boundaries, such as air, water, and climate, as well as energy,radiation, electric charge, and magnetism, not originating from civilized human activity

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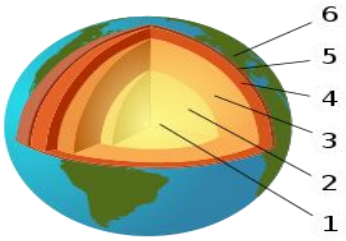
Composition:

Earth science generally recognizes 4 spheres, the lithosphere, the hydrosphere, the atmosphere, and the biosphere[3] as correspondent to rocks, water, air, and life respectively. Some scientists include, as part of the spheres of the Earth, the cryosphere (corresponding to ice) as a distinct portion of the hydrosphere, as well as the pedosphere (corresponding to soil) as an active and intermixed sphere. Earth science (also known as geoscience, the geosciences or the Earth Sciences), is an all-embracing term for the sciences related to the planet Earth. There are four major disciplines in earth sciences, namely geography, geology, geophysics and geodesy. These major disciplines use physics, chemistry, biology, chronology and mathematics to build a qualitative and quantitative understanding of the principal areas or *spheres* of Earth.

A.

B.

C.



Water on Earth:

1) Oceans:

An ocean is a major body of saline water, and a component of the hydrosphere. Approximately 71% of the Earth's surface (an area of some 362 million square kilometers) is covered by ocean, a continuous body of water that is customarily divided into several principal oceans and smaller seas. More than half of this area is over 3,000 meters (9,800 ft) deep. Average oceanic salinity is around 35 parts per thousand (ppt) (3.5%), and nearly all seawater has a salinity in the range of 30 to 38 ppt. Though generally recognized as several 'separate' oceans, these waters comprise one global, interconnected body of salt water often referred to as the World Ocean or global ocean.[5][6] The deep seabeds are more than half the Earth's surface, and are among the least-modified natural environments. The major oceanic divisions are defined in part by the continents, various archipelagos, and other criteria: these divisions are (in descending order of size) the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Southern Ocean and the Arctic Ocean.

Rivers:

The Columbia River, along the border of the U.S. states of Oregon andWashington.
A rocky stream in the U.S. state ofHawaii

A river is a natural watercourse,[7] usually freshwater, flowing toward an ocean, a lake, a sea or another river. In a few cases, a river simply flows into the ground and dries up completely before reaching another body of water. Small rivers may also be termed by several other names, includingstream, creek and brook. In the United States a river is generally classified as a watercourse more than 60 feet (18 metres) wide. The water in a river is usually in a channel, made up of a stream bedbetween banks. In larger rivers there is also a wider floodplain shaped by waters over-topping the channel. Flood plains may be very wide in relation to the size of the river channel. Rivers are a part of the hydrological cycle. Water within a river is generally collected from precipitation throughsurface runoff, groundwater recharge, springs, and the release of water stored in glaciers and snowpacks.

ISSN 2348 – 8034
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Atmosphere, climate and weather

The atmosphere of the Earth serves as a key factor in sustaining the planetary ecosystem. The thin layer of gases that envelops the Earth is held in place by the planet's gravity. Dry air consists of 78% nitrogen, 21% oxygen, 1% argon and other inert gases, such as carbon dioxide. The remaining gases are often referred to as trace gases,[12] among which are the greenhouse gases such as water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Filtered air includes trace amounts of many other chemical compounds. Air also contains a variable amount of water vapor and suspensions of water droplets and ice crystals seen as clouds. Many natural substances may be present in tiny amounts in an unfiltered air sample, including dust, pollen and spores, sea spray, volcanic ash, and meteoroids. Various industrial pollutants also may be present, such as chlorine (elementary or in compounds), fluorine compounds, elemental mercury, and sulphur compounds such as sulphur dioxide [SO_2].The ozone layer of the Earth's atmosphere plays an important role in depleting the amount of ultraviolet (UV) radiation that reaches the surface. As DNA is readily damaged by UV light, this serves to protect life at the surface. The atmosphere also retains heat during the night, thereby reducing the daily temperature extremes.

2) Atmospheric layers

a) Principal layers

Earth's atmosphere can be divided into five main layers. These layers are mainly determined by whether temperature increases or decreases with altitude. From highest to lowest, these layers are:

- Exosphere: The outermost layer of Earth's atmosphere extends from the exobase upward, mainly composed of hydrogen and helium.
- Thermosphere: The top of the thermosphere is the bottom of the exosphere, called the exobase. Its height varies with solar activity and ranges from about 350–800 km (220–500 mi; 1,150,000–2,620,000 ft). The International Space Station orbits in this layer, between 320 and 380 km (200 and 240 mi).
- Mesosphere: The mesosphere extends from the stratopause to 80–85 km (50–53 mi; 262,000–279,000 ft). It is the layer where mostmeteors burn up upon entering the atmosphere.
- Stratosphere: The stratosphere extends from the tropopause to about 51 km (32 mi; 167,000 ft). The stratopause, which is the boundary between the stratosphere and mesosphere, typically is at 50 to 55 km (31 to 34 mi; 164,000 to 180,000 ft).
- Troposphere: The troposphere begins at the surface and extends to between 7 km (23,000 ft) at the poles and 17 km (56,000 ft) at the equator, with some variation due to weather. The troposphere is mostly heated by transfer of energy from the surface, so on average the lowest part of the troposphere is warmest and temperature decreases with altitude. The tropopause is the boundary between the troposphere and stratosphere.

Life:

An example of the many animal species on the Earth.

Evidence suggests that life on Earth has existed for about 3.7 billion years. All known life forms share fundamental molecular mechanisms, and based on these observations, theories on the origin of life attempt to find a mechanism explaining the formation of a primordial single cell organism from which all life originates. There are many different hypotheses regarding the path that might have been taken from simple organic molecules via pre-cellular life to protocells and metabolism.

Although there is no universal agreement on the definition of life, scientists generally accept that the manifestation of life is characterized by organization, metabolism, growth, adaptation, response to stimuli and reproduction.[23] Life may also be said to be simply the characteristic state of organisms. In biology, the science of living organisms, "life" is the condition which distinguishes active organisms from inorganic matter, including the capacity for growth, functional activity and the continual change preceding death.

A diverse variety of living organisms (life forms) can be found in the biosphere on Earth, and properties common to these organisms—plants, animals, fungi, protists, archaea, and bacteria—are a carbon and water-based cellular form with complex organization and heritable geneticinformation. Living organisms undergo metabolism, maintain homeostasis, possess a capacity togrow, respond to stimuli, reproduce and, through natural selection, adapt to their environment in successive generations. More complex living organisms can communicate through various means.

Ecosystems:

Rainforests often have a great deal of biodiversity with many plant and animal species. This is the Gambia River in Senegal's Niokolo-Koba National Park.

An ecosystem (also called as environment) is a natural unit consisting of all plants, animals and micro-organisms (biotic factors) in an area functioning together with all of the non-living physical (abiotic) factors of the environment.

Central to the ecosystem concept is the idea that living organisms are continually engaged in a highly interrelated set of relationships with every other element constituting the environment in which they exist. Eugene Odum, one of the founders of the science of ecology, stated: "Any unit that includes all of the organisms (ie: the "community") in a given area interacting with the physical environment so that a flow of energy leads to clearly defined trophic structure, biotic diversity, and material cycles (i.e.: exchange of materials between living and nonliving parts) within the system is an ecosystem."[27]

Old-growth forest and a creek onLarch Mountain, in the U.S. state ofOregon.

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The human ecosystem concept is then grounded in the deconstruction of the human/naturedichotomy, and the emergent premise that all species are ecologically integrated with each other, as well as with the abiotic constituents of their biotope.

A greater number or variety of species or biological diversity of an ecosystem may contribute to greater resilience of an ecosystem, because there are more species present at a location to respond to change and thus "absorb" or reduce its effects. This reduces the effect before the ecosystem's structure is fundamentally changed to a different state. This is not universally the case and there is no proven relationship between the species diversity of an ecosystem and its ability to provide goods and services on a sustainable level.

The term ecosystem can also pertain to human-made environments, such as human ecosystems and human-influenced ecosystems, and can describe any situation where there is relationship between living organisms and their environment. Fewer areas on the surface of the earth today exist free from human contact, although some genuine wilderness areas continue to exist without any forms of human intervention.

II. Affect of technology on the environment

3) Technology negatively affects the environment by compromising human health and safety, endangering natural ecosystems and biodiversity, having a cumulative impact on global systems, and depleting natural resources. Technology positively affects the environment through the application of environmental science to solve problems caused by human environmental impact.

III. Positive human impact on the environment

A positive human impact on the environment occurs when a person takes action to improve society, nature and its resources. Acting positively, even in a small manner, has a major impact on the environment, especially when it is done consistently.

4) Impact on the deciduous forest :

Land utilization for agricultural, industrial and infrastructural use remains the most striking human-driven intervention on the forest ecosystem. Clearing the land breaks the cycle of life in the forest by stripping away huge numbers of trees and displacing the living organisms that once lived in them and on the land.

Centuries of human intervention have altered the land where deciduous forests thrive. Deciduous forest once covered about half of the land area on Earth, but it has now been reduced to one-third due to forest clearing. Humans also indirectly contribute to the destruction of deciduous forests through activities such as burning fossil fuels and deforestation through burning the land. These activities greatly contribute to global warming, leading to acid rain and air pollution that damages trees and plants, and also cause water pollution. Deciduous trees have broad leaves, which are used to collect sunlight and generate energy. If damaged, the trees may get sick easily and be less resistant to pests and diseases.

Some deciduous forests are mined for minerals such as coal and oil. Mining not only strips the forest of its trees, it also depletes the soil of its nutrients and prevents plants and trees from growing there again. Some irresponsible mining companies also throw their excavated waste and chemicals on the ground or in nearby bodies of water, leading to water pollution and further destruction of the forest ecosystem.

Effects of e-waste on **Environment** Through Landfills. When we throw out our computers, they wind up in landfills, causing the possibility of toxic metal leaching into the groundwater. Toxic metals in e-waste leach into our supply of resources, threatening their integrity

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IV. EFFECTS OF E-WASTE ON OUR ENVIRONMENT

Electronics for consumers are being treated like disposable items more and more every day. One major factor causing this trend is that companies are endlessly marketing new technologies to us, which effectively render recent products as obsolete. In 1999 the average lifespan of a United States computer was six to four years. By 2005 the lifespan had shrunk down to less than two years. In 2016, that number shrunk even further with the introduction of more and more devices. Compounding the problem is the fact that we are disposing of electronic waste (e waste) improperly. Improper Electronic Waste Disposal leads to negative effects of E-waste on Environment Computers and your other ITAD assets contain toxic materials like zinc, nickel, lead, barium and chromium, which is why it's critical to do proper computer recycling. Each of these metals occur in concentrations that are higher than the federally regulated levels. Our growing stream of e-waste is a threat to our environment. In 2005 an estimated 5.3 billion pounds of electronic waste was generated (EPA, 2005). Of this, only 9% was recycled (Yadong et al., 2006). When we retire our computers we have four options: to recycle it, donate it, return it to the manufacturer or throw it in the trash. Most commonly, we throw it away.

a) Effects of e-waste on Environment Through Landfills:

When we throw out our computers, they wind up in landfills, causing the possibility of toxic metal leaching into the groundwater. Toxic metals in e-waste leach into our supply of resources, threatening their integrity. When e-waste is warmed up, toxic chemicals are released in to the air, damaging the atmosphere. E-waste management is a critical consideration for future generations as proper electronic recycling is becoming harder to find.

b) Effects of E-waste on Environments in Third World Countries:

E-waste adversely affects our developing nations. Instead of responsibly recycling our electronic devices, America sends our e-waste to these countries. The e-waste piles up in the landfills, which cause harm to the environment in various ways. Toxins from the metals in electronics are released in to the atmosphere, and what is worse, when e-waste disposal is not subsidized, the pollutants from our electronic waste can end up in toys for our children that are sent back to us. Instead of exporting e-waste, or letting it rot in landfills, we can help our environment by returning our electrical products to stores and manufacturers, sending them to responsible e-waste recycling centers, selling them to people that will find them useful, or donating them to stores such as Goodwill donation center.

c) Poor E-Waste Management Effects Data Security Through Improper Data Destruction:

Proper recycling and disposal of electronics is not only important for the environment but it also has a big impact on data security as well. When e-waste is disposed of improperly and without the use of a company that specializes in proper data destruction, there is a severe risk of identity theft, data breaches and massive liability for the companies involved. Prior to disposing of IT Equipment improperly, always consider all aspects, including data security and liability in addition to the environment.E-waste is not a problem that is going away any time soon. In fact it is only going to get worse. By 2017, the volume of our thrown away e-products throughout the world is expected to rise by 33 percent from 2012, and we can expect the weight of this garbage to equal eight of the Great Pyramids of Egypt. The amount of e-waste that we produce, including computers, DVD players, cellphones and global positioning products, could rise by a whopping 500% over the next decade in countries such as India. It is crucial to know the effects of e-waste on the environment, and what we can do to stop it.

D. Technology:

Technology refers to the practical application of scientific knowledge for a purpose. It also includes the capability and skills required to apply the knowledge. Technology enhances the usefulness of goods and services in a safe manner. It aims at creating value. Technology can be both material and non-material (virtual). Technology includes instruments, tools, machines, and other devices that benefit human life.Technology may include simple items such as clothing, zip, housing, and complex items such as airplanes, robots, etc. Even the discovery of fire during stone age, and the process of producing light, heat, and cooking food are the examples of technology.The non-material (virtual) tools and machines such as computer software, internet, etc. are also considered technology.

V. The advantages of Technology

1. **Increased food output:** We depend on food for our living. With the introduction of methods and techniques of cultivation, human-beings are able to increase food output. The modern irrigation technologies has helped to cultivate lands that were otherwise considered barren. The agriculture equipment such as tractor helps the farmer in his farming.

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Impact Factor- 4.022

2. **Increased industrial output:** As a result of introduction of technology in the process of producing goods, there has been tremendous increase in the industrial output. The automation of industries processes has resulted in processing tasks effectively and efficiently. Large industries make good use of engineering technology for large scale production of goods.

3. **Business growth:** Technology has positively impacted business activities involving manufacturing, selling, marketing, distribution, recording, etc. Technology has touched almost every sphere of business activities. Businesses need to make wide variety of mathematical calculations for various purposes such as counting, estimation cost and profit, etc. Prior to the introduction of calculators, all these mathematical calculations were done manually. With the introduction of computers, large business data are effectively processed and stored in computers. The growth of eCommerce business is an excellent example of how Information Technology can benefit our life.

4. **Comfort:** Technology had made human life comfortable. Everything that we see and use in our daily life is the gift of technology. The clothes we wear, the house we live, the car we travel, the bridge and flyovers, the mobile phone we carry, the fan, etc. are all examples of successful implementation of technology.

5. **Better utilization of resources:** Modern tools and equipment has helped us to utilize the natural resources at optimum level. For example, the irrigation technologies has enabled us to make better utilization of water resource in the field of agriculture. Hydel power plants, thermal power plants, nuclear power plants, etc. uses natural resources to generate power.

6. **Ease in travelling:** The invention of wheel is perhaps the most important technological discovery in human history. Automobiles, trains, etc. are powered by engine and run on wheels.

7. **Improved communication:** Printing press, internet, telephone, email, and other communication technologies has helped us to communicate on global scale.

8. **Education:** Virtual classes are a delivered at many schools. E-learning is a relatively new concept. Students make use of internet technology to download important study materials in the form of text, audio and videos.

9. **Healthcare:** Technology has revolutionized the healthcare industry. The various diagnostic tools such as x-ray machines, blood pressure monitoring machine, glucose level measuring machine, etc. has made possible accurate diagnosis of health related problems. Accurate diagnosis of disease results in faster and effective treatment of the patient.

10. **Emerging technologies:** Emerging technologies such as Information Technology, bio-technology, artificial intelligence, etc. are among the most important technologies of modern times. The introduction of computers, internet, smartphones, etc. have deep impact on common people. Much research are being conducted in the field of artificial intelligence intelligence.

E. Disadvantages of Technology:

1. **Pollution:** Too much use of technology has resulted in an increase in waste products into the environment. This has caused pollution. The discharge of industrial wastes into the environment diminishes the quality of soil, water, air , etc. The vehicle emission is among major causes of air pollution. Excessive use of pesticides in farming has caused soil erosion.

2. **Faster depletion of natural resource reserves:** Modern equipment are very powerful. They can quickly extract huge quantity of natural resources. However, the total reserves of natural resources are depleting as a result of quicker extraction of natural resources.

3. **Production of unwanted products:** Technology has also opened doors for the production and demand of unwanted products or unnecessary products.

4. **Wastage of time in non-productive activities:** Some people waste immense time and energy in doing non-productive activities. For example, internet technology has enabled people to browse the internet for information. However, some people get addicted to internet activities such as browsing, gaming, etc., and waste time and energy.

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Impact Factor- 4.022

5. **Excessive dependency:** We are dependent on technology for all of our task. People are excessively dependent of modern gifts of technologies such as cars, computers, smartphones, etc. They feel helpless if any of these technological equipment, machinery or tool fail to perform. We have adopted technology in our life to an extent that it is impossible to think of performing our day-to-day tasks without the help of technology.

VI. CONCLUSION

Conclusion Science and technology has a profound impact on all of humanity's activities. Science and technology inventions and discoveries, including the theory of the origin of the universe, the theory of evolution, and the discovery of genes, have given humanity many hints relating to human existence from civilized and cultural points of view. Science and technology have had an immeasurable influence on the formation of our understanding of the world, our view of society, and our outlook on nature. The wide variety of technologies and science discoveries produced by humanity has led to the building and development of the civilizations of each age, stimulated economic growth, raised people's standards of living, encouraged cultural development, and had a tremendous impact on religion, thought, and many other human activities. The impact of science and technology on modern society is broad and wide-ranging, influencing such areas as politics, diplomacy, defense, the economy, medicine, transportation, agriculture, social capital improvement, and many more. The fruits of science and technology fill every corner of our lives. The hundred years of the twentieth century have been called the "century of science and technology," the "century of war," and the "century of human prosperity," among other expressions. Science and technology have thus far brought humanity immeasurable benefits. In the twenty-first century, dubbed the "century of knowledge" and the time of a "knowledge-based soci that the diverse potentials of science and technology, built upon the foundation of the hard-won science and technology of the twentieth century, will be used to solve the serious issues faced by humanity, such as global environmental problems. Moreover, it is also important to hold the firm belief that science and technology must be faithfully passed on to future generations as an irreplaceable asset of humanity, driven by the trust and support of the public. Science and technology will most likely continue to be regarded by humanity as an invaluable commodity. However, the relationship between science and technology and society is assuming many shapes with the changing times. Against the backdrop of the historical turnaround in the world order that came with the collapse of the U.S.-Soviet cold war structure, and with accelerating scientific and technological progress, as exemplified by the life sciences and IT, it is no exaggeration to say that society is transforming abruptly and daily becoming more complex. This transformation appears in public opinion polls as changes in public awareness of science and technology and heightened public concern over the safety and security of society. In the present, squarely addressing the relationship between science and technology and society is an essential challenge to the sound development of science and technology, one which it is important to continue addressing in the future based on historical and civilized perspectives, while also maintaining a deep awareness of the needs of the times.ety," it is hoped

REFERENCE

1. *V. Roy • S. Kumar from Inst. Eng. India Ser. C(April–June 2013) 94(2):187–195 DOI: 10.1007/s40032-013-0064-2*
2. *Special issue on Recent Advances in Flexible Automation, International Journal of Innovative Computing, Information Volume 4, Number 3, March 2008 - ICIC International °c 2008 ISSN 1349-4198Department of Mechanical*
3. *Engineering, University of Auckland, Private Bag 92019, Auckland, New Zealand.*
4. *Karl-Heinz Schumacher (2013), Multispindle Lathe. US patent # 2013008702/2013*
5. *In 2013, M. Moses & Dr. Denis Ashok M. Tech, Mechatronic from School of Mechanical and Building Science, VIT*
6. *University, Vellore, India 978-1-4673-6150-7/13/$31.00 ©2013 IEEE*
7. *http://en.wikipedia.org/wiki/Numerical_control*
8. *http://en.wikipedia.org/wiki/Lathe*
9. *http://www.epa.gov/ozone/title6/609/technicians/retrguid.html*