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ENVIRONMENTAL ISSUES : LOCAL, REGIONAL AND GLOBAL ENVIRONMENTAL ISSUES

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Abstract

Human activities in past decades have raised serious issues related to environment and its conservation. Air pollution, poor management of its waste, growing water scarcity, falling ground water tables, water pollution, waste disposal, desertification, endangered species, preservation and quality of forest, biodiversity loss, and land/soil degradation, Global Climate change, pollution, environmental degradation, Global Warming, Greenhouse effect, Acidification, Ozone depletion and other local, regional and global level environmental problems and genetically modified foods are the current environment problem that make us vulnerable to disasters and tragedies now and in the future. In this chapter the essential aspects of environmental problems, causes, effects will be reviewed and some solution to overcome from the environmental issues.

What is Environment?

The word environment refers to all ecological units which are naturally present on earth in the form of land, water, air, soil, forest, sunlight, minerals, living organisms etc. This earth is full of natural surroundings, some are biotic and some are non- biotic. Biotic element are those elements like human, birds, animals, plants, and microorganisms. Whereas non-biotic elements are those which have no life like air, sunlight, water, land, soil, minerals etc. further it is also divided among four different sphere viz. biospheres, lithosphere, atmosphere and hydrosphere. In which hydrosphere is the largest part on the earth among all life on earth has become possible due to some kind of action and reactions between different kinds of resources that are present in environment.

Currently, the situation of environment is very poor that could never be imagine by our ancestor in previous time. We have endlessly spoil our environment by using its resources in very wrong way. We can see that every day and everywhere pollution is rapidly increasing on earth where it is air, land, water or soil pollution, deforestation, acid rain, and other dangerous disasters created by the human beings through technological advancement. Use of natural resources should be carefully planned and executed. For providing a better and healthy life to our forth coming generation.

Environmental issues

An environmental problem occurs when there comes a change in quality or the quantity of the environmental factor that directly or indirectly affect everything on earth. "***Environmental issues are defined as problems with the planet's system (air, water, soil etc.) that have developed as a result of human interference or mistreatment of the planet."***

A variety of environmental problems now affect our entire world. As globalization continues and the earth's natural processes transform local problems into international issues. Some largest problems now affecting the world are: acid rain, air pollution, global warming, hazardous wastes, ozone depilation, smog, water pollution, overpopulation and rain forest destruction. It is related to not only environment bur with everyone that live in the planet. It effect every human, animal, and nation on this planet.

Human have faced poor environmental conditions throughout history, but what we think of as environmental problems become more common and apparent with industrialization and urbanization. In the United State for the example, air and water pollution from the factories and dense urban living conditions attracted growing attention throughout the last centuries, and by the **1960s** become recognized as significant problems. Concern over air and water pollution rapidly spread to a range of other conditions-

soil erosion, pesticides contamination, deforestation, declining animal population and species and so on through the efforts of environmental scientist, activists, and policy-makers. These diverse concerns gradually merged into environmental problems, and the **1970 Earth Day** in **United States** and then the **1972 United Nation Conference** on the **Human Environment** in Stockholm helped turn "Environmental Quality" into a major international issue. By the time of the **United Nation Conference on Environment and Development** in **Rio De Janeiro in 1992**, significant **"Green Parties"** had been formed in Europe and environmental problems were the subject of citizen and governmental attention worldwide. Environmentalist, a social and environmental movement addresses environmental issues through advocacy, education and activism. The environmental issues can occurs at three levels local, regional and global.

Local environmental issues-Some major local environmental issues are given below-

1. Pollution
2. Waste Disposal
3. Desertification
4. Water Scarcity
5. Endangered Species

1. Pollution

Pollution can be defined as an undesirable addition of constituents to water, land, or air which adversely affect human life, species, living conditions and will deteriorate our resources. Pollution can be classified mainly into four categories- air pollution, water pollution, soil pollution, noise pollution. The pollution is occurs at the local and also global level.

Air pollution:

Air pollution is refers to any physical, chemical and biological change in the air. It is the contamination of air by harmful gases, dust and smoke which affect the plant, animals, and human drastically. There is a certain percentage of gases present in the atmosphere.

Major air pollutants their sources and their impact:

- **Carbon monoxide (CO)**: its main source is fuel combination from engines and vehicles. It reduces the amount of oxygen, aggravate heart disease, chest pain.
- **Lead (Pb):** it release from metal refineries and other metal industries, waste incinerators. It impacts on our nervous system, result in IQ loss, cardiovascular and renal effects in adult, effects related to anemia.
- **Nitrogen oxide:** it release in environment due to fuel combustion, wood burning. It's mainly impact our lung, lung diseases leading to respiratory symptoms increases susceptibility to respiratory infection.
- **Sulphur dioxide (SO_2)**: it release due to fuel combustion as well as natural occurrences like volcanoes. It causes asthma and breathing difficulty.

Air pollution control:

The techniques employed to reduce or eliminate the emission into the atmosphere of substances that can harm the environment or human health. Different types of method use for the air pollution control –

Control of particulates- airborne particles can be removed form a polluted airstream by a variety of physical process. Some common types of equipment for collecting fine particulates includes cyclones, scrubbers, electrostatic precipitators, and baghouse filters. Once collected, particulates adhere to each other, forming agglomerates that can readily be removed form equipment and disposed of, usually in landfill.

Control of gases- gaseous criteria pollutants, as well as volatile organic compounds (VOCs) and other gaseous air toxics, are controlled by means of three basic techniques: absorption, adsorption and incineration. These techniques can be employed singly or in combination. They are effective against the major greenhouse gases as well. In addition, a fourth technique, known as carbon sequestration, is in development as a mean of controlling carbon dioxide levels.

b) Water pollution

Water pollution is the contamination of pollutants in water bodies like lakes, rivers, oceans, aquifers and groundwater without treatment very often by human activities which leads to harmful effects.

Source of water pollution:

Natural sources: these includes decay, the composition of plants and animals, volcanic eruptions, coastal, cliff erosion, landslides and soil erosion.

Anthropogenic sources: this include industry, urban, agricultural and cultural sources.

Effect of water pollution:

- Death of aquatic animals.
- Irrigation by polluted water affect plants resulting in yellowish coloration and defoliation.
- Diseases- hepatitis, cholera, typhoid, jaundice, diarrhea and skin diseases.
- Disruption of food chains. Destruction of ecosystems.

Control measure of water pollution:water pollution, to a larger extent, can be controlled by a variety of methods. Rather than releasing sewage waste in water bodies, it is better to treat them before discharge. Practicing this can reduce the initial toxicity and the remaining substances can be degraded by the water bodies itself. If the secondary treatment of water has been carried out, than this can be reused in sanitary systems and agricultural fields.

Some chemical methods that helpin the control of water pollution are precipitation, the ion exchange process, reverse osmosis and coagulation. As an individual, reusing, reducing, and recycling wherever possible will advance a long way in overcoming the effects of water pollution.

2. Waste Disposal

Waste disposal, the collection, processing, and recycling or deposition of waste material of human society. Waste is classified by source and composition. Waste materials are either liquid or solid in form, and their components may be either hazardous or inert in their effects on health and environment. We used plastic bag, broken glass, obsolete cell phone, or used battery cells, they are all used products that require appropriate disposal to limit their harm to the environment. The term waste is typically applied to solid waste, sewage, hazardous waste, and electronic waste.

Sources of waste:

- **Medical or clinical sources of wastes-** this includes the surgical items, pharmaceuticals, blood, body parts, would dressing materials, needles, syringes.
- **Agricultural sources of wastes-** waste generated by agricultural activities, including horticulture, livestock breeding, market gardens and seedling nurseries are called agricultural wastes.
- **Industrial sources of wastes-** these are the wastes released from manufacturing and processing industries like chemical plants, cement factories, power plants, textile industries, petroleum industries.
- **Wastes from construction or demolition-** concrete debris, wood, huge package boxes. Some other sources such as Commercial sources, mining sources, radioactive sources, electronic sources are also the big sources of waste pollution.

Waste disposal problems:

- **Production of too much waste-** one of the major problem related to disposal is attribute to the generation of too much waste. Mumbai and Delhi generate about 11,000 and 8,700 tones of solid waste per day, respectively. India is getting buried under mounds of garbage as the country has been generated more than 1.50 lakh metric tone of solid waste every day. Worse approximately 90 per cent of the total amount is collected waste.
- **Most of the waste is toxic and harmful for the human beings and the environment-** the majority of the state and local authority legislations are generally lax on regulating the even expending manufacturing industries produce toxic products that end up getting thrown away after use. Most of the products contain hazardous and health threatening chemicals. This chemicals causes majority of water pollution, soil pollution.
- **Landfill are a problem as well-** most landfills lack proper on site waste management there by contributing to additional threats to the environment. In long term, landfills leak and pollute ground water and other neighboring environment habitat making waste disposal very difficult. They also give off potentially unsafe gases.
- **Reliance of dying technologies to reduce and recycling waste-** waste disposal and management facilities as well as state

resources have continued to rely on myopic and quickie solutions instead of developing effective recycling and waste reduction programs.

Solution to Waste Disposal:

- **Eco responsibility** –"reduce, reuse, recycle"- Eco-responsibility pertains to the three Rs mantra of reuse, reduce and recycle. Local communities authorities and state need to put more efforts towards the education of waste management.
- **Effective waste disposal and management-** it ensures there is gradual improvement of new and cost- effective facilities which aim to encourage higher environmental protection standards. An effective management strategy will also see to it that landfills are purposefully located to ease waste collection, transfer, and monitoring or recycling.
- **Control and monitoring of land filling and fly-**tipping activities- thousand of tones of construction and demolition materials are generated by various local construction industries. In most of case, a large portion of these waste materials can be re used, reclaimed or recycled. With the control and monitoring of land filling and fly- tipping activities in the area of public work, constructions and demolition materials an be resourcefully reclaimed, reused or recycled in other projects such as landscaping, village houses, recreation facilities or car parks, or roads.
- **Waste diversion plans-** A multifaceted approach on waste transfer and diversion in terms of more hygienic and efficient waste disposal management can offer tremendous solution to waste problems.
- **Improvement of thermal waste treatment-**thermal waste treatment have been proved not to be 100% green as they are normally pronounced. Therefore, to mitigate the problems that come with thermal waste treatments issues such as emission of toxic gases with organic compounds such as furans, PAHs, and dioxins: states and researches as well as green groups and academicians can explore the possible developments with regards to advanced thermal waste treatment techniques.

3. Desertification –

Desertification is a type of land degradation in dry lands in which biological productivity is lost due to natural processes or induced by human activities where by fertile areas become increasingly more arid. It is the spread of arid areas caused by a variety of factors, such as through climate change and through the overexploitation of soil through human activity.

Various causes of desertification-

- **Overgrazing** – if there are too much animals that that are overgrazing in certain spots it makes it difficult for the plant grow back, which hunts the biome and make it loss its former green glory.
- **Deforestation-** wood extraction, and infrastructure expansion such as road building and urbanization, then it contributing to problems related to desertification. Without the tree rest of the biome cannot thrive.
- **Farming practice-** some farmers do not know how to use the land effectively. They may essentially strips the land of everything that it has before moving the another plot of land. By stripping the soil of its nutrients, desertification becomes more of a reality for the area that is being used for the farming.
- **Excessive use of fertilizers and pesticides-** the use of excessive amount of fertilizer and pesticides to maximize to their crop yields in the short term often lead to significant damages for the soil. In the long run, this may turn from arable into arid land over time and not suitable for the farming.
- **Over drafting of groundwater-** over drafting is a process in which groundwater ids extracted in excess of the equilibrium yield of the aquifer that is pumping or the excessive pulling up of groundwater from underground aquifers. Its depletion causes desertification.
- **Climate change-** climate change play a huge role in desertification. As the days get warmer and periods of drought become more frequent, desertification becomes more and more eminent. Unless climate change is slowed down, huge areas of land will become desert.
- There are also some reason such as natural disasters, soil pollution, overpopulation and excessive consumptions, mining etc. causes desertification.

Effects of desertification-

- **Farming become next to impossible-**an area become desert than it's impossible to grow sustainable crops there without special technologies. This can cost a lot of money to try and do, so many farmer will have to sell their desert land. Hunger is

also a problem, without farms in this area the food that this farm produce will become much scarcer, and people try and deal with hunger problems.

- **Flooding-** without life in an area, flooding is a lot more imminent. Not all desert are dry; those that are wet could experience a lot of flooding because there is nothing to stop the water from gathering and going all over the place.
- **Biodiversity loss, endangerment and extinction of species-** the destruction of habitats and desertification may also contribute to a loss of biodiversity. Many species will not to able adjust to the altered environmental conditions and may suffer from serious decline in population.
- **Migration-** when large areas of land that are currently used for farming will no longer be suitable for farming due to water triggered by global warming. This results in serious migration movements.

Solution to desertification:

- **Policy changes related to how people can farm-**policy change related to how much they can farm and how much they can farm on a certain areas could be put into place to help reduce the problems that are often associated with farming and desertification.
- **Education-** in developing countries, education is an incredibly important tool that needs to be utilized in order to help people to understand the best way to use the land that they are farming on. By educating them on sustainable practices, more land will be save from becoming desert. Sustainable practice to prevent desertification from happening.
- **Technology advances-**research and application of the latest technology that pushes the limit of what we currently know about the drivers of desertification.
- **Restricting mining practice-** mining often implies the destruction of large area of land. Therefore it should be regulated by governments to keep the nature reserves intact and protect the natural habitats of many animals and plants. Thus, less land will arid and the desertification issues can be mitigated to a certain extent.
- **Reforestation-** the area that have been subject to deforestation in past should be considered for reforestation. Planting trees in those areas are quite important since they are natural carbon dioxide storage spaces; they slow down the global warming and contribute to maintaining a natural balance. Therefore, planting trees in the affected areas not only prevents desertification but also fight against additional environmental issues.

4. Water Scarcity

Water scarcity involves water crisis, water shortage, water deficit or water stress. Water scarcity can be due to physical water scarcity and economic water scarcity. Physical water scarcity refers to a situation where natural water resources are unable to meet a region's demand while economic water scarcity is a results of poor water management resources.

"Water scarcity is the lack of sufficient available water resources to meet the demands of water usage within a region. It already 2.8 billion people around the world at least one month out of every year. More than 1.2 billion people lack access to clean drinking water."

Causes of water scarcity :

- **Overuse of water-**water overuse is a huge issue that a lot of people are dealing with. It may be overused on people, animals, land or many other numbers of things.
- **Pollution of water-**water pollution can come from a variety of sources. Pollution comes from oil, carcasses, to chemicals, industrial wastes, and from municipality waste makes a lot of issues for people who may need to use it.
- **Global warming-** when our average air temperature become warmer, water from rivers and lakes evaporates faster, which may contribute to drying up of water bodies.
- **Illegal dumping-** industries frequently dispose of their industrial garbage into near by river and lakes since it is an easy and cheap way to get rid of this waste. It leads to serious water pollution, which may result in several water scarcity for their local people.
- **Natural disasters-** Natural disasters like tsunamis, floods may also cause serve water shortages for local population since important public infrastructure may be destroyed. The serve natural disaster may entirely collapse the local water supply.
- **Drought-** A drought is, in short, an area especially hot and dry, which is not getting enough rainfall to be able to sustain the

life that is residing there. Some areas are in a perpetual drought, whereas other areas may be dealing with a drought on occasion.

Effects of water scarcity:

- **Lack of access to drinking water-** the biggest problem that happens when you have water scarcity is that people are not able to get fresh, clean drinking water.
- **Hunger and poverty-** if there is no water that can be used to help water the crops, then you are going hungry. People who are dealing with water scarcity are often stuck in poverty as well .
- **Diseases and sanitation issues-** if we don't have clean water access than we will be more likely to get disease from the water .we need water for several tasks of our daily life, without having access to clean water for drinking, cooking, washing or bathing, it usually results in unhygienic conditions for people and causes diseases like diarrhoea, typhoid, cholera etc.
- **Destruction of habitats and loss of biodiversity-**water is crucial for all life forms on our planet. If water scarcity persists over a longer period, it lead to the destruction of whole habitats. Animals and plants may no longer be able to get enough water and may therefore die or have to move to other regions. Some animals become extinct they no longer be able to grow and reproduce in a sufficient manner causing serious biodiversity loss.

Solutions to control water scarcity:

- **Save water whenever possible**- this could mean limiting the use of water, the use of washing machines, taking shorts showers instead of full baths. Even if you are no vacation in countries where water is scare, try to save water. You should also try to convince your family and friends to save water.
- **Recycle water-** there are plenty of technologies available that allow you to recycle rainwater and other water that you may used in your home. Not only does it help to prevent scarcity, but it can save some money as well. Advance technology use to conserve water.
- **Improve practices related to farming-** farming and irrigation are often a huge culprit when it comes to water scarcity. Because of that, we need to improve practices so that we don't use as much water and those who are using water are using it to fullest potential.
- **Less use of chemical in farming-** At present, excessive levels of chemical fertilizers and pesticides are used to maximize crop yields. It leads to serious soil pollution, which in turn translates into groundwater pollution and contributes to the water scarcity issue. It is crucial that farmers reduce the use of chemicals for farming to ensure clean water and reduced water shortage problem.
- **Improve sewage systems-** clean drinking water stars with a good sewage system. Without proper sanitation, the water in an area becomes ridden with disease and any number of other problems. By improving the sewage systems, we can prevent water scarcity from becoming any worse.
- **Better water distribution infrastructure-** many people worldwide, especially in poor developing countries, are still not connected to the public water infrastructure. These people are at high risk to suffer from severe water shortages. By cone ting this people to the public water supply, water scarcity risk could be greatly reduced.
- **Education-** by educating those who are not dealing with it can get educated on how they can prevent the problem from becoming even worse in the future.

5. Endangered species-

An endangered species can be define as species that is very likely to be extinct in near future. The number of endangered species has dramatically risen over time. As of 2020, there are 6,811 species that are considered to be critically endangered. This is out of the 120,372 species currently tracked by the IUCN. If the number of endangered species is continuously increased we will loss many species in the future. To prevent this, governments and other institutions all over the world try to save the endangered species by measures by creating protected areas or forbidding hunting.

Classifications of endangered species:

a) **Least concern-** there is no immediate threat to the survival of the species.

E.g. saltwater crocodile, olive baboon, brown bear, cane toad, rock pigeon.

b) **Near threatened-** species in this category might be threatened in the near future.

E.g. emperor goose, American bison, mane wolf.

c) **Vulnerable-** high risk of endangerment in the medium run.

E.g. African leopard, carp, cheetah, golden hamster, blue crane.

d) **Endangered-** high risk of extinction in the near future.

E.g. African penguin, Bengal tiger, blue whale, giant otter, gray parrot.

e) **Critically endangered-** extremely high risk of extinction in the very near future.

E.g. Arabian leopard, Asiatic cheetah, axolotl, black rhino.

f) **Extinct in the wild-** already extinct in their natural environments, but there are some individuals who live in a captive state.

E.g. Guam rail, Hawaiian crow, scimitar oryx, Socorro dove, south china tiger.

g) **Extinct-** there is not a single living individual of this species left on the planet.

E.g. Blackfin cisco, Caspian tiger, eastern cougar, dodo, great auk, java tiger, toolache wallaby.

Causes for endangered species:

- **Destruction of habitats-** many animals and plants which lived in untouched nature are now adversely influences by human behavior since their natural environments are altered or even destroyed. Thus many animals and plants have to took out for new homes or they will be in danger of becoming extinct.
- **Hunting-** illegal hunting and poaching still is a big problem and can cause the extinction of whole species. since people are greedy and often want to make as much money as possible, theykill animals just to get their precious parts like their ivory or fur.
- **Pollution-** water pollution air pollution acid rain and other kind of pollution can harm many species in an extremely adverse way. If they are not adopt to the higher levels of pollution, they will be danger and die out.
- **Insufficient reproduction rate-**some species are quite eager to reproduce, others are just lazy to do so. Especially for animals that have a low reproduction rate, this cause big problems since they may likely not be able to sustain their species.
- **Disease-** not only do people suffer from epidemic diseases, also animal can be adversely affected. Disease like Ebola can cause thousands of deaths among certain species like monkeys and therefore diminish their numbers.
- **Degree of specialization-** highly specialized animals or plants are more likely to become endangered or extinct since they are not flexible at all in their conditions.
- **Conflicts between wildlife and humans**- since our world population is growing, we need more and more settlement space in order to build houses and other infrastructure. To gain this settlement space, it is often necessary to cut down forests or invade other habitats that are currently used by animals. These animals will lose their living space, which may force to move to other areas.

Effect of endangered species:

- **Biodiversity and chain reactions-**since nature is a big system in which species depend upon each other and function as a whole, the extinction of a small number of animals or plants can cause chain reactions to the whole ecosystem and thus have a big effect on the environment. For example, if a species A which eats another species B goes extinct, the number of species B would increase dramatically. Since species B will also eat other species C, species C now be endangered.This circle continues and will often have profound effects on the ecosystem.
- **Diseases-** some animals can serve as buffers between pathogens and humans. Animals can thus lower the probability that human get infected by certain diseases. Thus, if species become extinct, this buffer is lost and humans can be more likely hit by diseases.
- **Decrease in crop yields-** since insect like bees play important role in the crop growing process, losing this species would be extremely harmful to the crop yields of farmers and could also cause global famine.
- **Loss of medical sources-** many components that are contained in drugs are extracted from plants. If these plants become endangered or even extinct, we will not be able to use the plant ingredients for medical purposes anymore.
- **Economic effects-**animal often are popular attraction for tourists. Countries that can provide these animals can often make

significant amounts of money with touristic activities. However, if certain animal species become extinct, these countries will suffer from serve adverse economic effects since tourists may not come to their countries anymore after the animals vanished.

Solution to save endangered species:

- The endangered species act (ESA), passed in 1973, was enacted to half the rapid loss of plant and animal life. Frequently referred to as the "crown jewel" of our nation's environmental laws, the ESA has been responsible for saving many species formerly on the brink of extinction, including the bald eagle, gray wolf and California sea otter.
- Learn about endangered species in your area. Teach your friends and family about the wonderful wildlife, animals plants. First step to protecting endangered species is learning about how interesting and important they are.
- Recycle and buy sustainable products- buy recycle paper, sustainable products like bamboo and Forest Stewardship Council wood products to protect forest species. Never purchase products made from threatened or endangered species.
- Herbicides and pesticides may keep yards looking nice but they are in fact hazardous pollutants that effect wildlife at many levels.
- Harassing wildlife is cruel and illegal shooing, trapping, or forcing a threatened or endangered animal into captivity is also illegal and can lead to their extinction. Don't participate in this activity.

Regional and Global environmental issues - there some regional and global environmental issues are given below:

1. Global Warming

2. Ocean acidification

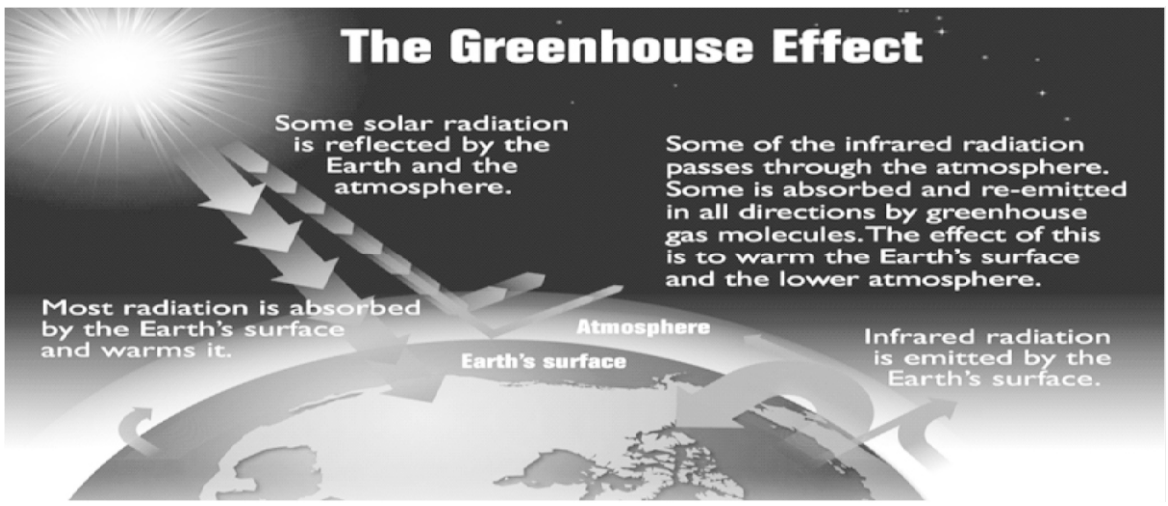
3. Pollution

4. Acid rain

5. Ozone depletion

1. Global Warming

Global Warming is the unusually rapid increase in earth's average temperature over the past century primarily due to the greenhouse gases released by people burning fossil fuels. Global warming occurs when carbon dioxide (CO2) and other air pollutants and greenhouse gases collect in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth's surface. Normally, this radiation would escape into space—but these pollutants, which can last for years to centuries in the atmosphere, trap the heat and cause the planet to get hotter. That's what's known as the greenhouse effect.



Causes Global Warming

Causes of global warming-The issues that cause global warming are divided into two categories include "natural" and "human influences" of global warming.

Natural cause of global warming-

- The climate has continuously changing for centuries. The global warming happens because the natural rotation of the sun that changes the intensity of sunlight and moving closer to the earth.
- Another cause of global warming is greenhouse gases. Greenhouse gases are carbon monoxide and sulphur dioxide it trap the solar heats rays and prevent it from escaping from the surface of the earth. This has cause the temperature of the earth increase.
- Volcanic eruptions are another issue that causes global warming. For instance, a single volcanic eruption will release amount of carbon dioxide and ash to the atmosphere..
- Methane is another issue that causes global warming. Methane is also a greenhouse gas.

Human activity influences global warming:

- First issue is industrial revolution. Industrial have been using fossil fuels for power machines. Everything that we use is involved in fossil fuel. For example, when we buy a mobile phone, the process of making mobile phone have involve machines and machines uses fossil fuels, during the process carbon dioxide is releasing to the atmosphere. Besides industrial, transportation such as cars is also releasing carbon dioxide from exhaust.
- Another issue is mining. During the process of mining, the methane will trap below the earth. Besides, rearing cattle will also cause methane because cattle released the form of manure.
- Next is the most common issue that is deforestation. Deforestation is a human influence because human have been cutting down trees to produce papers, wood, build houses or more

Effect of global warming:

- First effect is polar ice caps melting. As the temperature increase, the ice at the North Pole will melt. Once the ice melt the first effect will be raise on sea levels because the melting glaciers become oceans. According to the National Snow and Ice Data Center "if the ice melted today the seas would rise about 230 feet". It affects many low lying areas such as the Netherlands. In future, the Netherlands will be cover by water once the North Pole is melted. However, it is not going to happen so fast but the sea level will continue rise.
- Another effect is the species loss of habitat. Species that include polar bears and tropical frogs will be extinct due to climate change.
- Next effect is more hurricanes will occur and economic consequences still affect as well. Hurricane causes damage to houses and government need to spend billions of dollars in damage and people need places to stay or have been killed. Once a disaster happens many people have died and diseases happen

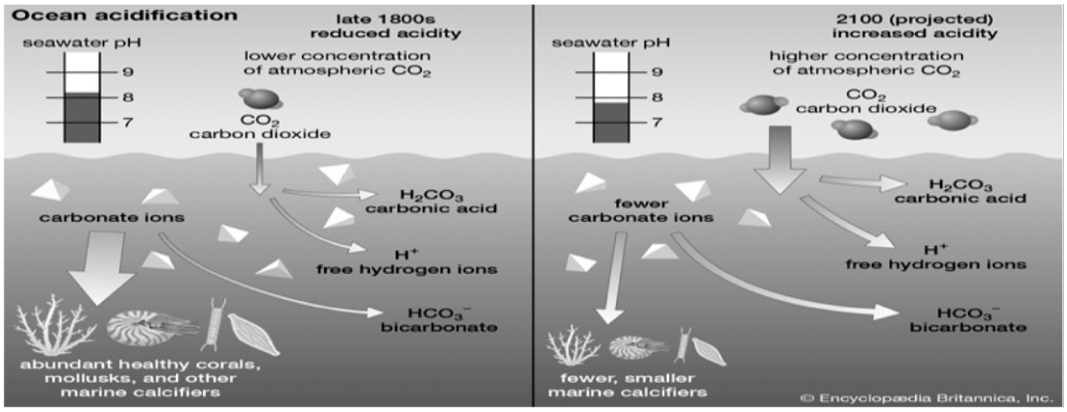
Solution to Stop Global Warming:

- However we human and governments need to move forward to implement the global warming solutions. To reduce global warming we can do to reduce the contribution of greenhouse gases to the atmosphere.
- To reduce gasoline mean we have a choice to choose a hybrid car that reduce using gasoline. Besides, petrol price are increasing. If a person everyday drives to work they need to pump petrol after 3 days and causes carbon dioxide. Another way to reduce gasoline is take public transport or carpool to work. It can help reduce carbon dioxide and save cost.
- Another way to reduce global warming is recycle. Recycle can reduce garbage by reusing plastic bags, bottles, papers or glass. For instance, when we buy foods, we can use our own containers instead of plastic bags. Besides, turn off electricity if unused. It can save thousands of carbon dioxide and buy product that have energy saving because it saves cost and save environment.
- Finally, human should stop open burning such as burning dry leafs or burning garbage. It will release carbon dioxide and toxic if burning garbage with plastic. Besides, government should reduce deforestation because the earth temperatures are increasing. Trees will help to improve the temperature on earth.

2. Ocean Acidification

Ocean acidification is the ongoing decrease in the pH of the Earth's oceans, caused by the uptake of carbon dioxide (CO_2)

from the atmosphere. Seawater is slightly basic (meaning pH > 7), and ocean acidification involves a shift towards pH-neutral conditions rather than a transition to acidic conditions (pH < 7). Carbon dioxide released from the burning of fossil fuels dissolves in seawater and produces carbonic acid, and this lower the pH of the ocean water finally lead to ocean acidification.



Ocean Acidification

Causes of Ocean Acidification:

- **The burning of fossil fuels-** Fuels such as petroleum, diesel, and coal produce lots of carbon dioxide when burnt. This increases the concentration of carbon gas in the atmosphere, which in turn finds a way into the water. Increase in concentration of carbon dioxide in the oceans, which causes acidification of ocean.
- **Waste disposal**- Industrial revolution leading to an increase in pollution. Due to increase in atmospheric carbon dioxide concentration. Alongside direct sewage waste disposal, there are other wastes that increase the level of acidity in the water.
- **Increase in the concentration of hydrogen ion due to the chemical reaction**- at the sea beds, there are some chemical reactions that may take place, and they can have negative impacts on the quality of the ocean water. Such reactions increase in hydrogen ion concentration which combined with other compounds such as nitrogen, water, among other gases, and their reactions lead to ocean water acidity.
- **Lack of eco-friendly laws and regulations-** the harm induced in the atmosphere can spread into the waters. This is when carbon dioxide released into atmosphere through various human activities. This in turn, contaminates the water. A decrease in carbonate ions

Effects of Ocean Acidification:

- **Loss of coral reefs**-Loss of marine plants as more carbon dioxide is absorbed into the oceans, it bonds to form carbonic acid. The acid then produces hydrogen ion and bicarbonate ion and the hydrogen ion bonds with free carbonate ions in the ocean to form other bicarbonate products.The problem with this reaction is that marine organisms possessing shells (corals, crustaceans, molluscs, foraminifera's, and coralline algae) need the carbonate ions to make calcium carbonate shells and skeletons.
- **Disturbance in food chain**-Ocean acidification leads to the death and disappearance of some plants and animals in the sea. When some organisms become extinct, their dependents are also threatened because they have nothing to feed on.
- **A decrease in local economy due to lack of fish and other marine products**- The seawater supports life at its normal conditions. Due to lowered or raised of pH level various type of fish, mammals such as whales, sharks and any many more are affected. when fish die human who depend on them or food and livelihood are hit by the socio- economic problems.
- **Impact on Human Health**-Humans depend on water for various purposes. When the ocean water acidity gets higher, the consumers or the users of such water are living in a perilous situation. Diseases such as cancers can easily be transmitted to humans when they consume fish intoxicated with higher sulfur concentrations.

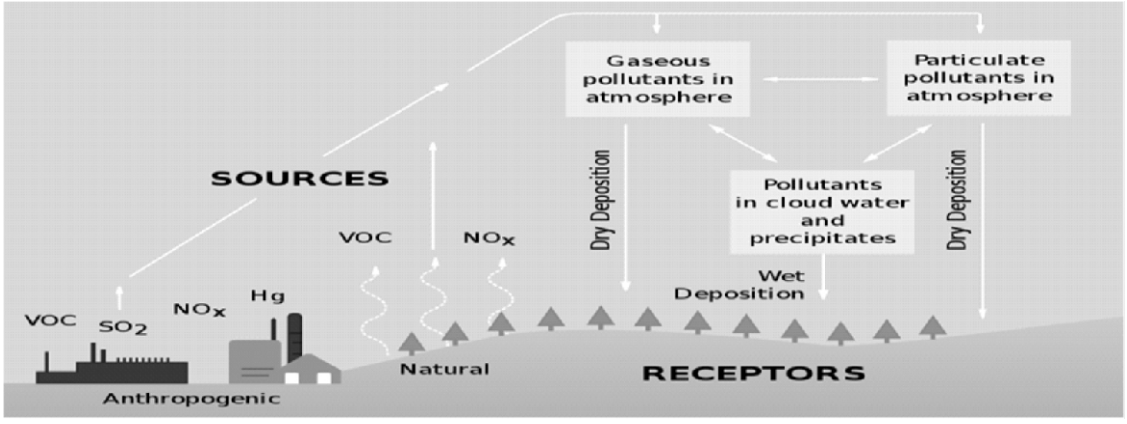
Solution to Ocean Acidification:

- **Reducing the use of fossil fuels**- Carbon emitted from fossil fuels can be reduced through the minimization of the use of such fuels. Adopting the use of alternative/renewable energy sources can be the best available option. Diversification of energy sources such as the use of solar and wind as the alternative energy sources can significantly pay off. Increasing the use of eco-friendly fuels.

- **Making strict regulations**- Human actions are best guarded by the policies of the land. The first step towards the fight against ocean acidification can be commenced through the ratification of legislation that can ensure that the waste handling, among other pollution-risk activities, is controlled. Such regulations would spread to the fisheries department to ensure that safety is maintained in food consumption.
- **Spreading the awareness to the masses and eating less meat-** This is not surprising at all. Raising livestock is a major source of greenhouse gases. It is these greenhouse gases that cause all the problems. By reducing our meat consumption, we would reduce the demand for meat. This, in turn, would result in lesser rearing and raising of livestock.
- **Use of Alternative Water Sources-**Because of the need to ensure that there is safety, scepticism may pay off. Such can be through the use of alternative water sources such as the use of boreholes, wells or tapped rainwater instead of ocean water domestically. This can help in minimizing possible ocean water pollution. Promotion of environmentally friendly initiatives. Use of geo- engineering.

3. Acid Rain

Acid rain, or acid deposition, is a broad term that includes any form of precipitation with acidic components, such as sulfuric or nitric acid that fall to the ground from the atmosphere in wet or dry forms. This can include rain, snow, fog, hail or even dust that is acidic. It can have harmful effects on plants, aquatic animals, and infrastructure. Acid rain is caused by emissions of sulfur dioxide and nitrogen oxide, which react with the water molecules in the atmosphere to produce acids. Some governments have made efforts since the 1970s to reduce the release of sulfur dioxide and nitrogen oxide into the atmosphere with positive results.



Acid Rain Process

Causes of Acid Rain:

- Although all bodies of water have acid in it, but the problem with acid rain is that too much acidic chemical compounds such as sulfuric and nitric acid, formed when Sulfur Dioxide (SO2) and Nitrogen Oxide(NOx) come into contact with water and oxygen in the atmosphere, lower the normal PH of water.
- Together with natural disasters such as wildfires, lightning, and volcanic eruption, which blasts pollutants into the air, rotting vegetation and biological processes are natural sources of acid rain forming gases.
- However, human based sources such as factories, power generations facilities, oil refineries and automobiles are the primary contributors to chemical gases. Electricity generating power plants burn coal and other fossil fuels which are the biggest contributors to gaseous emissions. They are responsible for about 60% of SO2 and 25% of NOx found in the atmosphere. Moreover, the exhaust from cars, trucks, and buses, especially in urban regions with heavy traffic, and factories in industrialized areas release high scores of pollutant gaseous into the air.
- These compound pollutants can be blown by winds or carried in jet streams around the world and turned into acid in presence of water and Oxygen. This acid is capable of reducing the normal pH of rain, which is 5.6, to about 4.3. The lower the number of pH is, the more acidic it is.

Effects of Acid Rain:

- Essential nutrients in soil such as calcium and magnesium, which are essential for trees to survive, are dissolved as a result of acid rain seepage into the soil. In absence of these vital nutrients, the trees and plants are less healthy and more vulnerable to infections and damage by cold weather and insects. Acid rain also causes Aluminum release in soil which makes it difficult for trees to take up water. It inhibits trees' ability to grow and reproduce.
- Water bodies and aquatic environment are the most affected by either direct acid rainfall or flow of precipitations into streams and lakes through forest, roads and fields, which usually contains amount of Aluminum leached from soil.
- Most lakes and streams have a pH level near 6.5, while acid rain reduces this number to about 5 or less and makes the water more acidic. At lower pH levels, most fish eggs cannot hatch and some adult fish even die. Increased acidity and aluminum level in water surfaces are toxic to aquatic wildlife and can also be deadly.
- Acid rain water is too dilute to cause direct health problems for human. However, infinitesimal acid particles like nitrogen oxides (NOx) and sulfur dioxide (SO2) known as gaseous particulates, when inhaled cause serious respiratory diseases or deteriorate them when inhaled. This includes asthma and chronic bronchitis as well as an increase in heart disease risk.
- Not only are living creatures affected, but acid rain damages many objects. It leaves irreplaceable damage on old heritage buildings as well as weathering limestone and marble buildings and monuments like gravestones. It causes corrosion of metals, like steel bridges, pipes, and even affects the surface of vehicles as it peels the paint.

Solution to control Acid Rain:

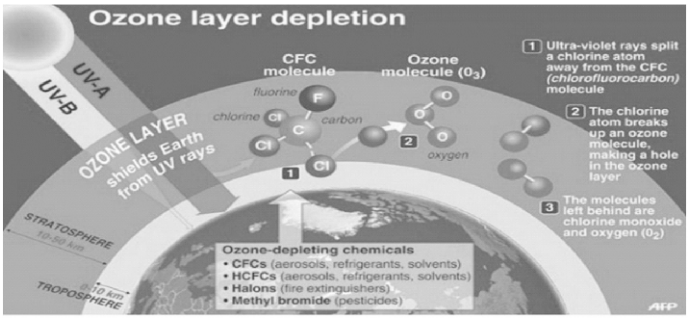
- Acid rain can be stopped in several ways. As well as governments' role in focusing on more sustainable energy sources, such as solar, wind and water energy, and putting restrictions on the use of fossil fuels, we people play a key role in reducing acid rain emissions.
- The biggest step to prevent acid rain is to conserve energy. Simply shutting off electrical appliance. Whenever you're not using them is a good start. You can also help reducing auto emissions by using public transport or carpooling as well as riding bikes or even walking to near destinations.
- Power plants need to do their part as well. Washing coal to remove some of the sulfur or using coal comprised of low sulfur are some actions they can do. They can also use devices called scrubber. They are capable of removing the sulfur dioxide from gases leaving the smokestack.

4. Ozone Layer Depletion-

Ozone layer depletion is the thinning of the ozone layer present in the upper atmosphere. This happens when the chlorine and bromine atoms in the atmosphere come in contact with ozone and destroy the ozone molecules. One chlorine can destroy 100,000 molecules of ozone. It is destroyed more quickly than it is created.Some compounds release chlorine and bromine on exposure to high ultraviolet light, which then contributes to the ozone layer depletion. Such compounds are known as Ozone Depleting Substances (ODS).

The ozone-depleting substances that contain chlorine include chlorofluorocarbon, carbon tetrachloride, hydrochlorofluorocarbons, and methyl chloroform. Whereas, the ozone-depleting substances that contain bromine are halons, methyl bromide, and hydro bromofluorocarbons.

Chlorofluorocarbons are the most abundant ozone-depleting substance. It is only when the chlorine atom reacts with some other molecule, it does not react with ozone.



Ozone Layer Depletion

Causes of Ozone Layer Depletion:

The ozone layer depletion is a major concern and is associated with a number of factors. The main causes responsible for the depletion of the ozone layer are listed below:

- **Chlorofluorocarbons-**Chlorofluorocarbons or CFCs are the main cause of ozone layer depletion. These are released by solvents, spray aerosols, refrigerators, air-conditioners, etc.
- The molecules of chlorofluorocarbons in the stratosphere are broken down by the ultraviolet radiations and release chlorine atoms. These atoms react with ozone and destroy it.
- **Unregulated Rocket Launches-**Researches say that the unregulated launching of rockets result in much more depletion of ozone layer than the CFCs do. If not controlled, this might result in a huge loss of the ozone layer by the year 2050.
- **Nitrogenous Compounds-**The nitrogenous compounds such as NO2, NO, N2O are highly responsible for the depletion of the ozone layer.
- **Natural Causes-**The ozone layer has been found to be depleted by certain natural processes such as Sun-spots and stratospheric winds. But it does not cause more than 1-2% of the ozone layer depletion.

Effects of Ozone Layer Depletion:

The depletion of the ozone layer has harmful effects on the environment. Let us see the major effects of ozone layer depletion on man and environment.

- **Effects on Human Health-**The humans will be directly exposed to the harmful ultraviolet radiations of the sun due to the depletion of the ozone layer. This might result in serious health issues among humans, such as skin diseases, cancer, sunburns, cataract, quick ageing, and weekend immune system.
- **Effects on Animals-**Direct exposure to ultraviolet radiations leads to skin and eye cancer in animals.
- **Effects on the Environment-**Strong ultraviolet rays may lead to minimal growth, flowering and photosynthesis in plants. The forests also have to bear the harmful effects of the ultraviolet rays.
- **Effects on Marine Life** -Planktons are greatly affected by the exposure to harmful ultraviolet rays. These are higher in the aquatic food chain. If the planktons are destroyed, the organisms present in the lower food chain are also affected.

Solutions to Ozone Layer Depletion:

- Following are some points that would help in preventing this problem at a global level:
- **Avoid Using Pesticides-**Natural methods should be implemented to get rid of pests and weeds instead of using chemicals. One can use eco-friendly chemicals to remove the pests or remove the weeds manually.
- **Minimize the Use of Vehicles-**The vehicles emit a large amount of greenhouse gases that lead to global warming as well as ozone depletion. Therefore, the use of vehicles should be minimized as much as possible.
- **Use Eco-friendly Cleaning Products-**Most of the cleaning products have chlorine and bromine releasing chemicals that find a way into the atmosphere and affect the ozone layer. These should be substituted with natural products to protect the environment.
- **The Use of Nitrous Oxide should be Prohibited-**The government should take actions and prohibit the use of harmful nitrous oxide that is adversely affecting the ozone layer. People should be made aware of the harmful effects of nitrous oxide and the products emitting the gas so that its use is minimized at the individual level as well.

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