Gokhale Memorial Girls' College

Date:13/04/2023

To whom it may concern

Subject: Completion of ENVS Project by PLSA Gr. A students of Semester II in 2022

The undersigned hereby certifies that the students mentioned in the table given below have completed their AECC 2 - ENVS projects for the University of Calcutta B.A/B.Sc. Semester-II Examination, 2022. These students are mentioned in the modified template of Metric 1.3.2 as ENVS-PLSA Gr. A (as DVV compliance) with pdf link of their projects stated alongside.

SL.NO.	REGISTRATION NO.	COLLEGE ROLL NO.	NAME	SUBJECT
1	013-1211-0008-21	21/BAH/0028	RIYA PODDAR	PLSA
2	013-1211-0040-21	21/BAH/0133	PAAVANI PAL	PLSA
3	013-1211-0041-21	21/BAH/0135	MUSKAN SINGH	PLSA
4	013-1211-0044-21	21/BAH/0138	PRITHA MAITRA	PLSA
5	013-1211-0045-21	21/BAH/0139	SRISTI CHAKRABORTY	PLSA
6	013-1211-0048-21	21/BAH/0146	BHAGYALAXMI PATRA	PLSA
7	013-1211-0050-21	21/BAH/0149	SNIGDHA PAUL	PLSA
8	013-1211-0058-21	21/BAH/0163	HUMAIRAH REHMAN	PLSA
9	013-1211-0060-21	21/BAH/0165	SRIJEETA SEN	PLSA
10	013-1211-0062-21	21/BAH/0168	ANWESHA CHAKRABORTY	PLSA
11	013-1211-0068-21	21/BAH/0178	RITIKA MAJUMDAR	PLSA
12	013-1211-0071-21	21/BAH/0182	SHAILJA GAUTAM	PLSA

Gokhale Memorial Girls' College Kolkata

Principal
Gokhale Memorial Girls' College

1/1, Harish Mukherjee Road, Kolkata - 700 020
Phones : 2223-2355, 2223-3020 / E-mail : gokhalecollegekolkata@gmail.com
website - www.gokhalecollegekolkata.edu.in

SELF DATA

NAME :- RIYA PODDAR

DEPARTMENT :- POLITICAL SCIENCE

SUBJECT :- ENVS [AECC]

TOPIC :- ENVIRONMENTAL POLLUTION

ROLL NO. :- 21/BAH/0028

UNIVERSITY REG NO :-
013-1211-0008-21

Teacher's Signature

CONTENT

Teacher's Signature

INTRODUCTION

Environmental Pollution is unwarrented disposal of mass or energy into earth's natural resour-ce pool such as water, land, or air that results in long - or short term detriment to the atmosphere and its ecological health to negetively impact the living beings and their life both quantitatively and qualitavely. Environ-mental pollution reflects a measurement of contamination of the living and non-living con-stituents of the earth, in a manner and to extent, to adversly affect the normal optium environmental processes.

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CONCEPT OF ENVIRONMENT -AL POLLUTION

Environmental Pollution can be defined as any undesirable change in physical, chemical or biological characteristics of any component of the environment i.e air, water, soil which can cause harmful effects on various forms of life or property.

"Environmental pollution is an incurable diease. It can only be prevented"

- Barry Commoner.

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TYPES

AIR POLLUTION

Air pollution may be defined as the presence of any solid, liquid or gaseous substance inc-luding noise and radioactive radiation in the atmosphere. It is the world's single greatest environmental risk to health, prematurely killing some 6.5 million people across the world every year.

CAUSES

- Burning fossil fuels releases gases and chemicals into the air. CO_2 and methane raises the earth's temperature.
- Hazardous air pollutants are emitted during gas or coal combustion.
- Smog or ground level ozone occurs when emis-sion from combusting fossil fuel react with sunlight.
- Chlorofluorocarbon are released from AC & refrigrator.

EFFECT

The effect of air pollution are alarming some of them are:-

- Respiratory and Heart problems
- Child health problems
- Global warming
- Acid rain
- Eutrophication
- Effects wildlife
- Depletion of the ozone layer

CONTROL

- Using the public mode of transport.
- Adopting better household practices like using clean products and paints.
- Practicing Energy conservation.
- Using Energy-Efficient devices can be helpful.
- Understanding 'Reduce, Reuse & Recycle'. Eg- using old jars to store cereals or pulses.

WATER POLLUTION

It occures when harmful substances - often chem -icals or - contaminate a stream, river, lake ocean, acquifer degrading water quality.

CAUSES

- The numerous infectious agent that contaminate the water through sewage, human waste, and animal excreta.
- radioactive waste like uranium, thorium & radon pollutes water.
- Pesticides, insecticides, herbicides pollutes excessively during agricultural activities.

EFFECT

- Destruction of Ecosystem
- Diseases - causes typhoid, cholera, hepatitis.
- Euhophication is caused as it increases the growth of algae.
- Effects the food chain when toxins are consum -ed by aquatic animals.

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CONTROL

- Water Hyacinth' a plant, absorbs dissolved toxic and removes pollutants.
- disposing - off waste carefully.
- Establishing Sewage treatment plant & by water recycling.
- Using Natural fertilizers & pesticides.

NOISE POLLUTION

It is considered to be any unwanted or disturbing sound that affects the health and wellbeing of all organisms.

CAUSES

- Industrialization are capable of generating a large amount of noise
- Improper of urban Areas disrupts the environd Conshuction sites contributes greatly to the problem.
- Vehicles and transportation lead to situation of hearing disability.

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EFFECT

- Long exposure results in hyperkension.
- can damage the eardrum resulting in hearing dis -ability.
- Sleeping disorder is caused as it affects sleepcycle.
- Cardiovascular issues due to increase in BP.

CONTROL

- Sound - proof chambers should be installed for machine generating loud noise.
- acoustic zoning by distancing human settlements from industrial areas.
- Silence zone should be created for school, hospi -tal and offices.

MARINE POLLUTION

It refers to trash and pollutants that come from land sources to end up in the ocean. It causes widespread damage to ocean life as well as economic shucture.

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EXPT. NO.

CAUSES

- Direct discharge of toxic wastes pollutes the ocean.
- land run - off from farming, industrial, urban activities.
- Deep sea mining contributes immensly to marine pollution.

EFFECT

- Reproductive failure from exposure to poisnous waste
- Consumption of toxic substances in fatty tissues of marine animals.
- Can lead to skin & eye irritation and lung
- and liver problem from oil deposits & by products.

CONTROL

- Increasing funding for marine pollution preven -tion and control.
- Strengthening laws on marine litter.
- Building local expertise and technical capacity.
- Ban on single use plastic and adopt litter control policies.

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SOLID WASTE MANAGEMENT

It is a term that is used to refer to the proces of collecting and treating solid waste. It offers solution for recycling items that do not belong to garbage or trash.

CONTROL MEASURES BY MUNCIPAL

(•) Waste generation - materials of no value are gath-ered together for disposal. & Reducing it at source is now included in system evalutions.

(•) Waste handling, Sorting, Storage and processing at source - it is of primary importance due to public health issues.

(•) Collection - after collecting empting it in transfer station.

(•) Sorting, processing and transformation of solid waste - These constitue the fourth of the Funchonal element.

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Transfer & Transport - involves 2 steps (a) from colle-ction vechicle to larger transport equipment. (b) waste to disposal site.

Disposal - by landfilling or uncontrolled dumping is the ultimate fate of all solid waste.

BIOMEDICAL

(•) Incineration - controlled combustion process with the primary objective of volume reduction.

(•) Chemical disinfection - adding a disinfectant to water which reacts with the organic matter.

(•) Wet (autoclaving) and dry thermal treatment - involves high temperatures in processing waste feed-stock.

(•) Microwave irradiation - heating technology involve elechomagnetic waves in 300 MHz - 300 GHz range.

(•) Land disposal - LDU is a site in which hazardous waste is remedied through natural & manmade process.

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e-WASTE

- Purchase fewer items opting for recyclable or long lasting electromic product
- Selling old Elechonics
- Recycle and dispose of E-waste properly this can save lot of energy and reduce the need for minning of new raw resources.
- Storing Data online without need to carry a storage device at all times.
- Buying Energy star Rated elechonics it consumes less energy and reduces electric bill significantly.

CONCLUSION

Environmental pollution is causing a lot of distress not only to humans but also animals driving many animal species to endangerme-nt and even extinction. We should adopt a holistic view of nature - it is not an entity that exists seperatly from us; the nature is us, we are an inalienable part of it and we should care for it in the most appropriate manner.

" ONLY WHEN THE LAST TREE HAS DIED
AND THE LAST RIVER HAS BEEN POISONED
AND THE LAST FISH BEEN CAUGHT
WILL WE REALIZE WE CANNOT EAT MONEY "

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Samanta 25/05/2022

To complete my project several sources were useful to me -

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Teacher's Signature

GOKHALE MEMORIAL GIRLS COLLEGE

NAME : PAAVANI PAL

SEMESTER : 2

DEPARTMENT: POLITICAL SCIENCE

COLLEGE ROLL NO : 21/BAH/0133

UNIVERSITY REGISTRATION NO :

013-1211-0040-21

PROJECT NAME : AECC 2 ENVS

UNIVERSITY ROLL NO : 212013-11-0024

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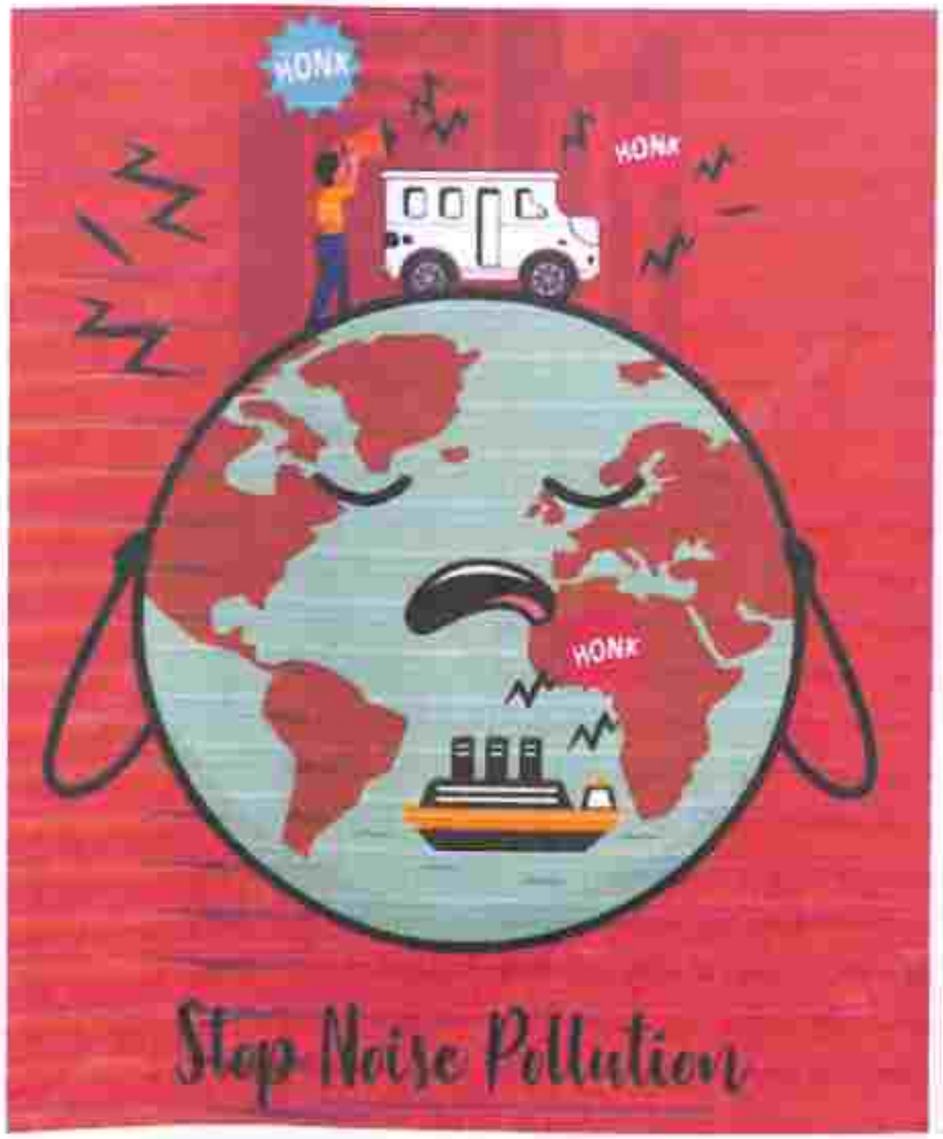
CONTENTS

TOPIC

NOISE POLLUTION



MEANING OF NOISE POLLUTION

Noise pollution can be defined as any disturbing or unwanted noise that interferes or harms humans or wildlife. Although noise constantly surrounds us, noise pollution generally receives less attention than water quality and air quality issues because it cannot be seen, tasted, or smelled.

Noise generated by mining operations is often of higher intensity than natural noise, and mining operations can occur throughout the night. Common mining and mineral processing activities that

contribute to noise pollution include overburden removal, drilling and blasting, excavating, crushing, loading and unloading, vehicular traffic, and the use of generators.

Noise pollution is unwanted sound, it needs to be controlled to make the workplace comfortable. This chapter analyses noise mathematically and the effects of multiple sources are examined. Two noises of exactly the same level can have a combined noise level that is 3 dB higher than the individual values. The greater the difference between the two individual noise sources, the lower is the combined noise level.

Causes of Noise Pollution

1. Industrialization

Most of the industries use big machines which are capable of producing a large amount of noise. Apart from that, various equipment like compressors, generators, exhaust fans, grinding mills also participates in producing big noise .

2. Poor Urban Planning

In most of the developing countries, poor urban planning also plays a vital role. Congested houses, large families sharing small space, fight over parking,

6. Noise From Air Traffic

While many find it difficult to believe, air traffic too contributes to significant levels of noise pollution. Noise from a single aircraft may produce sounds of up to 130 dB. Now, imagine the amount of noise produced by the numerous aircraft traveling our airspace.

7. Catering and Nightlife

When the weather is good, restaurants, bars, and terraces spill outside. Late night parties continue with loud music and unnecessary noise made by the party mongers. These can produce more than 100 dB. The noise from pubs and clubs are also included.

How it is Hampering the Environment

1. **Communication.** Animals, like humans, use sound to communicate —many species have developed distinctive calls to warn others of danger, attract mates, or identify their own offspring or packs in a crowd. Recordings done by soundscape ecologists have suggested that the different species within a habitat have distinct sonic niches, sounding out their calls at different pitches or intervals than other species to ensure that they'll be heard. Humans can disrupt this balance when they generate noise (e.g., airplane engines, construction equipment, lawnmowers), drowning out important messages.

2. **Mating.** In many species (particularly birds and frogs), males rely on particular calls to attract mates. The most enticing calls are typically low-pitched, but some animals have been observed making their voices higher to compete with low-frequency noises like car engines. These less attractive vocalizations can lower the males' ability to find and keep mates.
Additionally, the calls resonate through a smaller range in noisy environments, creating smaller breeding poois. Scientists have

4. **Foraging.** Animals like owls and cats have evolved complex ears to help them hear prey, but it's harder for them to do so in loud environments. Humans can barely perceive a one-decibel difference, but a study found that for every 1dB increase in noise, owls in the area were 8% less successful at catching prey. The psychological impacts of noise can also impact herbivory. One study found that noise drew in nectar-eating hummingbirds (increasing pollination) but deterred several seed-eating birds (decreasing the spread of seeds), indicating that noise may have the potential to alter a habitat's plant community.

EFFECTS OF NOISE POLLUTION

Health Effects

Noise pollution adversely affects the lives of millions of people. Studies have shown that there are direct links between noise and health. Problems related to noise include stress related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity. Noise Induced Hearing Loss (NIHL) is the most common and often discussed health effect, but research has shown that exposure to constant or high levels of noise can cause countless adverse health affects.

HOW IT IS HARMFUL FOR THE HUMAN BEINGS

Noise pollution impacts millions of people on a daily basis. The most common health problem it causes is Noise Induced Hearing Loss (NIHL). Exposure to loud noise can also cause high blood pressure, heart disease, sleep disturbances, and stress. These health problems can affect all age groups, especially children. Many children who live near noisy airports or streets have been found to suffer from stress and other problems, such as impairments in memory, attention level, and reading skill.

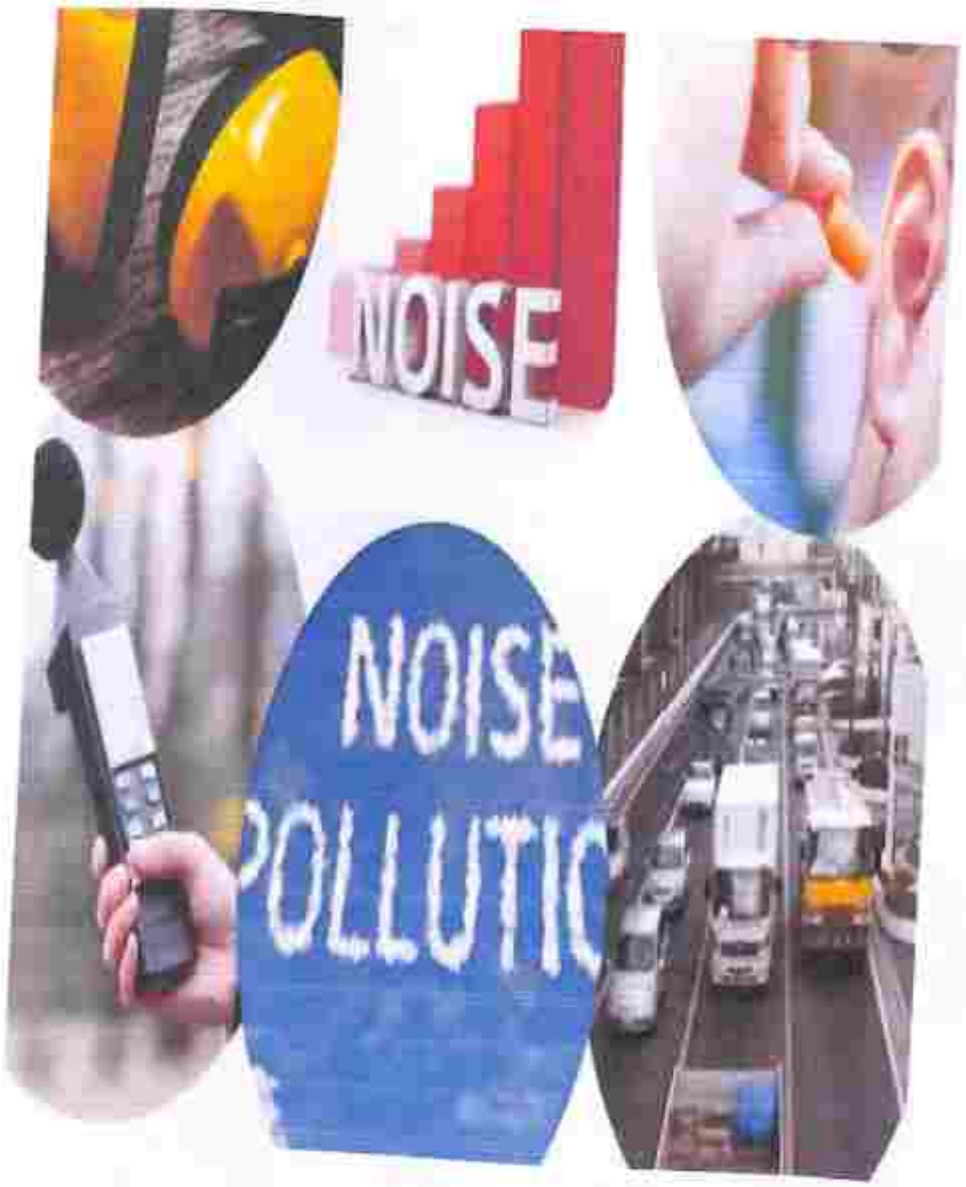
Noise pollution also impacts the health and well-being of wildlife. Studies have shown that loud noises can cause caterpillars' dorsal vessels (the insect

equivalent of a heart) to beat faster, and cause bluebirds to have fewer chicks. Animals use sound for a variety of reasons, including to navigate, find food, attract mates, and avoid predators. Noise pollution makes it difficult for them to accomplish these tasks, which affects their ability survive.

Increasing noise is not only affecting animals on land, it is also a growing problem for those that live in the ocean. Ships, oil drills, sonar devices, and seismic tests have made the once tranquil marine environment loud and chaotic. Whales and dolphins are particularly impacted by noise pollution. These marine mammals rely on echolocation to communicate, navigate, feed, and find mates, and excess noise interferes with their ability to effectively echolocate.

Some of the loudest underwater noise comes from naval sonar devices. Sonar, like echolocation, works by sending pulses of sound down into the depths of the ocean to bounce off an object and return an echo to the ship, which indicates a location for object. Sonar sounds can be as loud as 235 decibels and travel hundreds of miles under water, interfering with whales' ability to use echolocation. Research has shown that sonar can cause mass strandings of whales on beaches and alter the feeding behavior of endangered blue whales (*Balaenoptera musculus*). Environmental groups are

urging the U.S. Navy to stop or reduce using sonar for military training.



Remedies To Stop Noise Pollution

Lower the volume

We can listen to songs, radios, TVs in lower volume when listening from headphones or speakers.

Stay away from Noisy area

Noise producing industries, airports, vehicles should be far from residential areas as it is very dangerous for infants and senior citizens.

Follow the Limits of Noise level

Community law should check the use of loudspeakers, outdoor parties as well as political public announcements.

Control Noise level near sensitive areas

There should be control on noise level (Silent zones) near schools, hospitals. Place noise limits boards near sensitive areas.

Go Green by planning trees

We can plant more trees as they are good noise absorbents. According to studies, it can reduce noise by 5 to 10 decibels Db around them.

Create Healthy noise to eliminate unwanted noise

If we can't eliminate unwanted noise coming from outside then we can create healthier noise such as music, singing birds or waterfalls in homes or offices.

CONCLUSION

Unwanted sound (noise) can damage physiological health. *Noise pollution can cause hypertension, high stress levels, tinnitus, hearing loss, sleep disturbances, and other harmful and disturbing effects. Noise is any disturbing or unwanted sound, and noise pollution affects people's health and quality of life.*

Samanta
25/05/2022

GOKHALE MEMORIAL GIRLS COLLAGE

Name – Muskan Singh

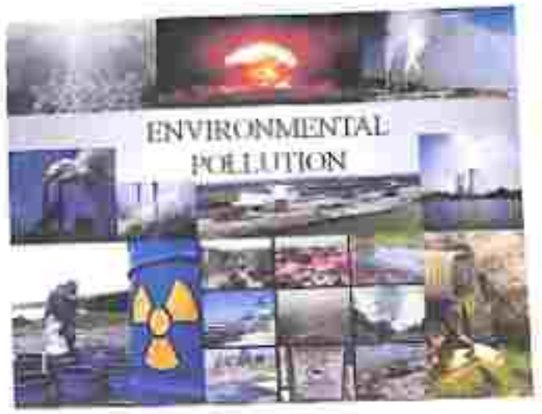
ENVS Tutorial Project

College Roll no — 21/BAH/0135

University Registration no-
013-1211-0041-21

University Roll no —
212013-11-0025

Semester — 2



ENVIRONMENTAL POLLUTION

CONTENT

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Samanta 25/05/2022

TEACHER SIGNATURE

MSingh

Muskan Singh

INTRODUCTION

Pollution was not much of a problem in the past as the earth's natural mechanism took care of the waste generated. The population was less and the earth could sustain the load of pollution. However, with the advancement in technology and the rise in population, pollution has not only increased manifold but its nature has changed tremendously.

The complex pollutants now created are highly toxic and need special treatment to be disposed off. The enviroment is being made unclean by human activities.

What is Pollution ?

Pollution refer to any undesirable change which takes place in the physical, chemical or biological characteristics of any realm of the earth air, water, soil, noise & marine which is capable of causing harm to living beings as well as non-living things.

Enviromental pollution is defined as the "contamination of the physical and biological components of the earth system to such an extent that normal enviromental process are adversely affected". Any use of natural resources at a rate higher than nature's capacity to restore itself can result in pollution.

POLLUTENT

The unwanted and harmful agents that contaminate the environment are termed as pollutants. It can be naturally occurring substances or energies but they are considered contaminants when in excess of natural level.

Pollution are of two types:

- Natural Pollution occur from volcanic eruptions, soil erosion, dust storms, forest fire, UV radiation, emission of natural gas etc.
- Man-made Pollution occur from burning of fossile fuels, deforestation, mining, industrial waste etc.

Types of Pollution

Air Pollutin

Air pollution is a mixture of solid particles and gases in the air. It occurs when harmful or excessive quantities of substances are introduced into Earth's atmosphere. The pollutants can be smoke, unburnt fuel, gases like Carbon monoxide, Carbon dioxide, hydrocarbon, ash

Sources Of Air Pollution

- Natural Sources like Volcano or dust storms, decaying of organic matter, release of Carbon particles and ash during forest fire pollutes the air.
- Man-made Sources include pollution caused by mining, industries and other household units, transportation and agriculture.

Effects

- The breathing in of polluted air for over a long period can cause respiratory problems and disease of lung.
- The acidic gases like nitrogen oxide, sulphur dioxide are highly reactive air. They rapidly oxidise to acids, which quickly dissolve in water and are washed out to the ground as acid rain. This may damaged

the buildings, soil, statues, metal structure etc.
- Burning of fossil fuels, deforestation release lot of CO_2 and this leads to overall increase in temperature. This phenomenon is called as global warming.
- Automobiles which burn diesel and petrol, also produce tiny particles which remain suspended in air and reduce visibility.
- The air pollutants suspend on the water bodies and affect the aquatic life. It also compels the animals to leave their habitat and shift to new place.

Control

- Non polluting sources of energy like solar, wind, hydro energy can be used for generating electricity.
- Use of LPG in houses and CNG in vehicles.
- To minimise industrial pollution, emission reduction devices should be used in chimneys.
- To reduce the effect of pollution is to shift the manufacturing plants, factories and industries to remote areas with a low level of population.
- Electricity should be used only when it is required so that there are fewer loads on its production and less pollution is created. Use of CFLs also control pollution
- Strict enforcement of law like the "Enviroment Protection Act" of 1986 could go long way to reduce air pollution.

Water Pollution

Water pollution occurs when a water body is contaminated by sewage, toxic chemicals, metals or any other substances in a quantity that is large enough to alter the natural quality of water. These contaminants are called water pollutants. It is the contamination of water bodies. This degrade the quality of water. Thus, the waste exceeds the cleaning capacity of the water body then the extra waste contaminates the water body.

Source Of Water Pollution :

- POINT SOURCES include factories, powerplant, underground coal mine & oil wells.
- NON-POINT Sources include runoff from fields, lawns, garden, street. This is difficult to regulate, monitor or treat as they do not have any specific location for discharge. Other ways of causes of water pollution include domestic sewage, Oil spills, industrial & agriculture waste etc.

Effects

- The ecosystem can be critically affected, modified and disbruted because of water pollution.
- Humans are affected by pollution & can contract disease such as hepatitis, Cholera etc. Poor drinking water treatment & unfit water causes problem.
- It have a huge impact on food chain.
- It drastically affects aquatic life. It effect their metabolism behavior causes illness & death. dioxin is the chemical that causes problem and also intered into the food chain process.
- Water bodies in the vicinity of urban areas are extremely polluted, due to garbage dumping & released of chemicals from industries, etc.

Control

We can control pollution at the individual level or in an organised actions by communities or government. Social actions are the bst way to draw the attention of masses.

- Each city and town should have a mandatory sewage treatment plant in order to treat waste.
- Conserve forest and plant more trees to maintain the water cycle.
- Adopt water harvesting technique to replenish ground water.
- Strict enforcement of law should be followed.
- Industries and factories must treat their waste to make it harmless befor disposal in water bodies. do not pollute the water by throwing non-biodegradable waste. Garbage and dead bodies should not be thrown in the water bodies.

Soil Pollution

Soil pollution, soil contamination or land degradation refer to the decline in the quality of the earth's surface or soil with concentration of toxic substances. It is serious enviromental concern since it harbours many health hazards.

Soil pollution can be caused by natural or human activity. Natural cause include differential deposition of soil by atmosphere, transportation of soil pollutant with precipitation water etc.
Human causes include pesticide, inorganic fertiliser, Industrial activity include mining, smelting and manufacturing, heavy metals, fumes generated by transportation etc.

Effects

- Soil pollution affect the plant, animal & human life. Polluted soil leads to a loss of fertile land for agriculture.
- The endangerment and extinction of species in wildlife.
- Habitat shifting, where some animals are forced to flee where they live in order to survive.
- Climatic change usually occur which causes an onslaught

of problem floods, irregular rainfalls etc.
- An increase in wildfire due to polluting area often become very dry.

Control

- Excavation and subsiquent transportation of polluted soil to remote or uninhabited locations.
- Bioremediation involve the use of microorganism and plants for the decontamination of soil.
- Reforestation involve replanting an area with trees. These will bind the soil and protect it from erosion.
- Using fewer pesticides and chemical in agriculture by adopting the alternative method such as switching from bio-fertilizer to manure.

Noise Pollution

The word noise is derived from latin word Nausea which mean sickness. Noise pollution is the unpleasant and undesirable sound which leads to discomfort in human beings. The intensity of sound is measured in decibels (dB). Noise pollution can be of three kinds:
* Transport noise caused by vehicels, aircraft etc.
* Neighbourhood noise caused by TV, loudspeaker, cracker
* Industrial noise caused by industrial machine etc.

Effects

- Hypertension is caused by noise pollution which is caused due to elevated blood level for a long period.
- Constant exposure of ear to loud noise can damage the eardrum
- Noise pollution hampers the sleep cycle that leads to low energy level and fatigue throughout day.
- Heart-related issue like blood pressure, stress, cardio-disease might come to normal person.

Control

- Honking in public places like school, hospitals should be banned.
- Dense tree cover is useful in noise pollution prevention
- Explosives should be used in forest, mountain, mining areas to prevent the pollution
- Industrial plant that produce lot of noise can use soundproof material to reduce sound frequencies.

Thermal Pollution

Thermal pollution is the degradation of water quality by any process that changes ambient water temperature. A common cause of thermal pollution is the use of water as a coolant by power plant and industrial manufacturers. Other causes are soil erosion, deforestation, runoff from paved areas etc.

Effects

- Loss of biodiversity, were the sudden heating can kill of vulnerable organism. Not only water pollution rather thermal pollution change the aquatic ecosystem.
- Toxins in the water are more a side effect of dumping waste water than a direct effect of thermal pollution.
- Warm water hold less oxygen than cool water as a result aquatic animal began to die.
- Thermal pollution damages water ecosystem and reduce animal population.

Control

- Thermal pollution could be controlled by employing construction of artificial lakes, cooling ponds, cooling towers.
- These human-made water bodies gives a potential alternative for cooling of power plants.
- Cooling ponds is the simplest and low cost method for regulating thermal discharge.
- Cooling tower techniques is a condenser is used for cooling of heat effluents at the time of returning to the water bodies. These towers are well designed to control the water temperature.

Hazard & Human health risk

The Occurance of adverse health effects is dependent on the way the hazardous chemical enter the body. The toxicity of a chemical also determine the effect on the body.

Hazardous Waste is a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment. Most hazardous waste are produced by industry, mining sites, agriculture, research labotories. The waste is classified as hazard if it is ignitable, corrosive, reactive or toxic. These hazards impact emergency responder & effect the communities. Harmful effect of these hazardous waste on humans include:

Behavioral abnormalities, cancer, birth defects, physical deformation, nausea, difficulty in breathing and other type of illness. The group at risk from the unscientific disposal of solid waste include - the population in area where there is no proper waste disposal method, especially waste worker, worker producing toxic & infectious material. Uncollected solid waste also increase risk of injury & infection. Certain chemicals if released untreated eg are highly toxic and exposure can lead to disease. Some studies have detected incidences of cancer in resident exposed to hazardous waste. Many studies have been carried out in various parts of the world to establish a connection between health and hazard waste

Disposal of Waste

The process of waste handeling and disposal in India can be classified as:

- Muncipal Solid Waste
- Hazardous Solid Waste.

Muncipal Solid waste can further be classified as biodegradeable, recycleable, hazardous waste. Biodegradeable waste include - rotten food, vegetable peel, Recycle waste include plastic. The industry generated waste from the chemical factories, medical waste from hospital are considered as hazardous waste, and they need special setting to dispose them. In any region, Solid waste mangement is very important for the safe disposal of waste and to reduce environmental pollution and avoid any health hazard it may cause. Landfills are the most common method of disposing of Solid waste. Modern day landfills are designed by taking care of various environmental factor and type of waste so as to minimise pollution and health risks.

Solid Waste Management

Solid waste management is a term that is used to refer to the process of collecting and treating solid waste. It also offer solution for recycling item that do not belong to garbage. Improper disposal of municipal solid waste can create unsanitary condition and these condition in turn can lead to pollution of the invironment and to outbreak of disease spread by insects.

Effects

- Due to improper disposal of solid waste particularly by waste management, the collected waste get up heat & become problem for enviroment. By dumping of huge garbage it create unhygienic conditions and after few days it give disease causing insects.
- Solid waste produced by industries include toxic metals chemicals and when they are released to enviroment, they produce biological & physiochemical problem.
- If these hazardeous waste get mixed up with normal waste the disposal process become even more harder.

Sources of Solid Waste includes:
Solid from domestic garbage, Solid waste material from various industries, Solid agriculture waste, Plastic, glass, metals, e-waste, Medical waste, Sewage sludge.

Biomedical

Biomedical or hospital waste is a kind of waste containing infectious material. It is generated from biological or medical sources and activites like diagonosis, prevention treatment of disease. Biomedical waste may include Solid or liquid waste. Biomedical is a kind of Solid waste and a type of biowaste.

EFFECTS — Disposal of waste in an invironment may lead to the spread of infectious disease. Daily exposure of waste leds to accumulation of harmful micro organism. Improper disposal led to landfills that can spread parasite & bacterial infection. In humans it led to HIV, lung infection, Skin infection, viral illness etc.

MANAGEMENT — Its management involve 3 steps.
1. Biomedical waste collection and segregation - One must manage the waste by collecting and use the right container to collect waste.
2. Biomedical waste Storage and transportation - Clinical waste need to be stored in a secure facility from public and for transpostation, a Spcial vehical is equipped.
3. Bio medical waste disposal and treatment - Incineration, autoclave or the use of a medical waste shredder or steam sterillization and shreeding are the way of disposing bio medical waste and treatment.

Method of Solid Waste Management

- SANITARY LADFILL - This is the most popular solid waste disposal. Garbage is spread out in thin layers, compressed and covered with soil, sand. The bottom of landfill is also covered to protect the groundwater from being contaminated
- INCINERATION — This method involve the burning of solid waste at high temperature until the waste turn into ash. Incinerator that recycle heat energy through furnace and boiler are called waste to energy plants. This method of Solid waste management can be done by individuals, municipalities and institution.
- RECOVERY AND RECYCLING — Recyling or recovery of resources is the process of taking useful but discarded item for the next use. Plastic bags, tin, glass, containers etc; these items are processed and clean before they are recycled
- COMPOSTING — Due to lack of adequate space for landfill, biodegradable yard waste is allowed to decompose in a medium designed yard. It is biological process were microorganism convert organic waste into humus
- PYROLYSIS - This is a method of solid waste management whereby soil waste are chemically decomposed by heat without the presence of oxygen. The solid waste turn into gases, solid residue when given at pressure & temperature.

Municipal Solid Waste Management

Muncipal Solid waste include commercial and domestic waste generated in muncipal in solid or semi solid form excluding industrial hazardous waste.

Ways for managing Muncipal Solid Waste.

1. Collection of Solid muncipal waste — Organising house to house collection of muncipal solid waste on scheduled time. Biomedical waste shall not be mixed with muncipal solid. Waste that are collected should be seperated as biodegradable and non-biodegradable and treated accordingly. Waste shall not be burnt.

2. Storage of Muncipal Solid Waste — Muncipal authority shall establish and maintain storage facilities in such a way they do not create unhygienic condition Manual handling of waste shall be prohibited. After storage processing of waste is required. Municipal authorities shall adopt suitable technology to make use of waste so as to minimize burden on landfills. The waste shall be processed by composing, vermicomposting, anaerobic digestion etc.

3. Disposal of Muncipal Solid Waste — Landfilling shall be restricted to non biodegradable, inert waste

and other waste that are not suitable either for recycling or biological process. Land filling or mixed waste shall be avoided unless the same is founded unsuitable for waste processing.

- Managing Non-biodegradable Solid Waste – Non biodegradable solid waste covers the variety of material ranging from asbestos to Zinc batteries, polythene etc. These waste material are known to cause considerable environmental hazard

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Samanta
25/05/2022

NAME: PRITHA MAITRA

COURSE NAME: AECC2 ENVS

SEMESTER: 2

COLLEGE ROLL NO: 21/BAH/0138

UNIVERSITY REGISTRATION NO:013-1211-0044-21

DATE OF SUBMISSION:24TH MAY,2022

TOPIC : ENVIROMENTAL MOVEMENTS

AKNOWLEDGEMENT

I would like to express my heartfelt gratitude to my professor who gave me this opportunity to do this project and also for guiding me throughout. The research in doing this project helped me understand the concepts more deeply and minutely.

CONTENT

INTRODUCTION

Environmental degradation and ecological imbalance are widely recognized as pressing problems in the contemporary world. The enormity of the problems has attracted a serious attention from policy- makers and scholars belonging to different disciplines.

The growing evidences of environmental decline and the role of unsustainable development in its have generated intense environmental activism all over the world since 1970s.

BISHNOIMOVEMENT

The Bishnoi's are an Indian religious group with a solid commitment to protecting the environment, especially animals. The community was founded by Guru Jambeshwar and had 29 tenets, known as the 29 principles or commandments given by Guru Jambeshwar in 1485 AD. The Bishnoi subsistence economy is based on livestock and agriculture. The Bishnoi's are strictly against killing animals for food or sport. They believe that all life is sacred; humans have no right to kill any living thing, whether an animal or a plant. They have been described as the world's first ecological community because of their sustainable lifestyle and emphasis on environmental protection. The cutting of trees and hunting animals are strictly prohibited for the community members. The Bishnoi movement is a community-based environmental protection campaign operating in the Thar Desert of Rajasthan, India, since the 15th century. The organization believes that protecting nature is a religious duty and has grown to become a mass movement with influence on India's local and national politics.

The Bishnoi movement is a social movement led by Amrita Devi Bishnoi. The movement was founded in response to a massive deforestation program carried out by the rulers of Marwar, following a severe drought that had lasted seven years. Amrita Devi, a Bishnoi woman, led 363 villagers in protest against the felling of Khejri trees to build a palace for the Maharaja of Marwar. Maharaja Abhay Singh's soldiers brutally killed Amrita Devi and her followers, but their sacrifice prompted him to order no other trees be cut down. The movement was formed to protect Khejri and other wildlife such as antelope, deer, and wildfowl. Many Bishnoi's were killed while attempting to protect their trees from being cut down by soldiers led by Abhay Singh of Jodhpur in 1730.The Bishnoi movement has a remarkable ecosystem that replenishes itself and nurtures wildlife with its reforestation project. While not as well-known as other environmental movements, the Bishnoi movement offers a version of sustainability that echoes many of today's most prominent environmental issues. It is a lesson for everyone about the power of conscious action.

SILENTVALLEY MOVEMENT

Described as golden chapter in the history of the conservation movement, the Silent Valley movement developed in Kerala in the 1970s to oppose the construction of a dam over the Kuntipuzha river. Its stated purpose was to generate electricity to facilitate industrialization, which Kerala with its high density of population and unemployment needed for economic growth. The environmentalists feared that the proposed hydroelectric plant would destroy one of the oldest surviving tropical forests with rich biodiversity. It would also push the lion-tailed macaque, already an endangered species, to extinction. The movement was spearheaded by the Kerala Sastra Sahitya Parishad. Following intense debate, fierce lobbying and committed mobilization the project was finally abandoned and in 1984 the Silent Valley was declared a national park.

CHIPKO MOVEMENT

Chipko Movement also called Chipko Andolan, non-violent social and ecological movement by rural villagers, particularly women, in India in the 1970s, aimed at preventing trees and forests slated for government backed logging. The movement originated in the Himalayan region of Uttar Pradesh in 1973 and quickly spread throughout the Indian Himalayas. The Hindi word Chipko means "to hug" or "to cling" and reflects the demonstrators' primary tactic of embracing the trees to impede the loggers.

The first Chipko protest occurred near the village of Mandal in the upper Alaknanda valley in April 1973. The villagers, having been denied access to a small number of trees with which to build agricultural tools, were outraged when the government allotted a much larger plot to a sporting goods manufacturer. When their appeals were denied, Chandi Prasad Bhatt led villagers into the forest and embraced the trees to prevent logging. After many days of those protests, the government canceled the company's logging permit and granted the original allotment requested by DGSM.One of the next major protests occurred in 1974 near the village of Reni, where more than 2,000 trees were scheduled to be felled. Following a large student-led demonstration, the government summoned the men of the surrounding villages to a nearby city for compensation, ostensibly to allow the loggers to proceed without confrontation. However, they were met with the women of the village, led by Gaura Devi, who refused to move out of the forest and eventually forced the loggers to withdraw. The action in Reni prompted the state government to establish a committee to investigate deforestation in the Alaknanda valley and ultimately led to a 10-year ban on commercial logging in the area.

NARMADA BACHAO ANDOLAN

Narmada Bachao Andolan is the most powerful mass movement, started in 1985, against the construction of huge dam on the Narmada River. Narmada is the India's largest west flowing river, which supports a large variety of people with distinguished culture and tradition ranging from the indigenous (tribal) people inhabited in the jungles here to the large number of rural populations. The proposed Sardar Sarovar Dam and Narmada Sagar will displace more than 250,000 people. The big fight is over the resettlement or the rehabilitation of these people. The two proposals are already under construction, supported by US$550 million loan by the world bank. There are plans to build over 3000 big and small dams along the river.

It is a multi-crore project that will generate a big revenue for the government. The Narmada Valley Development plan is the most promised and most challenging plan in the history of India. The proponents are of the view that it will produce 1450 MW of electricity and pure drinking water to 40 million people covering thousands of villages and towns. Some of the dams have been already been completed such as Tawa and Bargi Dams. But the opponents says that this hydro project will devastate human lives and bio diversity by destroying thousands of acres of forests and agricultural land. On the other hand, it will overall deprive thousands of people of their livelihood. They believe that the water and energy could be provided to the people through alternative technological means, that would be ecologically beneficial.

Led by one of the prominent leader Medha Patkar, it has now been turned into the international protest, gaining support from NGO'S all around the globe

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CONCLUSION

In the past we have seen environmental movements bringing positive changes to the nation. But with the increase in population and demands of the consumers and the main focus of the governments engaging in economic and military development in the country, the environment factor has been largely ignored.

But it is largely due to the persistent environmental movements that environmental problems have not completely faded into oblivion. It is the political pressure that the citizens create which leads the government to take measures to conserve the ecosystem of our nation. Additionally, pressure from international bodies and partner nations helps bring change to the way the current system works.They not only bring the environmental issues in the focus of the government, but also help spread awareness about them to common man and helps him introspect their outlook towards nature as Former US President barrack Obama had stated-

"Change will not come if we wait for some other person or some other time. We are the ones we've been waiting for. We are the change that we seek."

Samanta
25/05/2022

Gokhale Memorials Girl's College

Name :- Sristi Chakraborty

Semester :- 2nd Sem

College Roll Number :- 21/BAH/0139

University Roll Number :- 212013-11-0029

University Registration Number :- 013-1211-0045-21

Subject :- Enviromental Studies AECC-2 Tutorial

Human Population

Acknowledgment

I'm extremely grateful to our professor Dr. Shantanu Samanta. This project would not have been possible without his guidance and support. The project helped to become more aware of our current situation of Human Population and the impacts it is having on the non-renewable resources and what should we do to overcome the impacts of it globally.

Introduction

In demographics, the term world population is often used to refer to the total number of humans currently living, and was estimated to have exceeded 7.9 billion as of November 2021. The human population has experienced continuous growth following the Great Famine of 1315–1317 and the end of the Black Death in 1350, when it was near 370,000,000. The highest global population growth rates, with increases of over 1.8% per year, occurred between 1955 and 1975 – peaking at 2.1% between 1965 and 1970. The growth rate declined to 1.2% between 2010 and 2015 and is projected to decline further in the course of the 21st century. The global population is still increasing, but there is significant uncertainty about its long-term trajectory due to changing rates of fertility and mortality. The UN Department of Economics and Social Affairs projects between 9 and 10 billion people by 2050, and gives an 80% confidence interval of 10–12 billion by the end of the 21st century. Other demographers predict that the human population will begin to decline in the second half

similarly ambiguous usages also prevail in the biological sciences, thereby increasing the chance of misunderstanding. The difference between biological potential and realized fertility is determined by several intervening factors, including the following: (1) most women do not begin reproducing immediately upon the onset of puberty, which itself does not occur at a fixed age; (2) some women with the potential to reproduce never do so; (3) some women become widowed and do not remarry; (4) various elements of social behaviour restrain fertility; and (5) many human couples choose consciously to restrict their fertility by means of sexual abstinence, contraception, abortion, or sterilization.

The magnitude of the gap between potential and realized fertility can be illustrated by comparing the highest known fertilities with those of typical European and North American women in the late 20th century. A well-studied high-fertility group is the Hutterites of North America, a religious sect that views fertility regulation as sinful and high fertility as a blessing. Hutterite women who married between 1921 and 1930 are known to have averaged 10 children per woman. Meanwhile, women in

In the 20th century dramatic changes have taken place in the patterns of marital dissolution caused by widowhood and divorce. Widowhood has long been common in all societies, but the declines of mortality (as discussed above) have sharply reduced the effects of this source of marital dissolution on fertility. Meanwhile, divorce has been transformed from an uncommon exception to an experience terminating a large proportion (sometimes more than a third) of marriages in some countries. Taken together, these components of marriage patterns can account for the elimination of as little as 20 percent to as much as 50 percent of the potential reproductive years.

Many Western countries have experienced significant increases in the numbers of cohabiting unmarried couples. In the 1970s some 12 percent of all Swedish couples living together aged 16 to 70 were unmarried. When in the United States in 1976 the number of such arrangements approached 1,000,000, the Bureau of the Census formulated a new statistical category—POSSLQ—denoting persons of the opposite sex sharing living quarters. Extramarital fertility as a percentage of overall fertility accordingly has risen in many Western countries,

accounting for one in five births in the United States, one in five in Denmark, and one in three in Sweden.

4.Migration

Since any population that is not closed can be augmented or depleted by in-migration or out-migration, migration patterns must be considered carefully in analyzing population change. The common definition of human migration limits the term to permanent change of residence (conventionally, for at least one year), so as to distinguish it from commuting and other more frequent

Impacts of Population Growth

We have only one Earth. Today, the 7.9 billion people on it are using more of its resources than it can provide. Every new person is a new consumer, adding to that demand. Some of us take far more than others and there are many steps those of us who do must take to make our consumption sustainable. Fewer new consumers everywhere is one of them.

RENEWABLE RESOURCES

Everyone understands that many of the Earth's resources are finite. We are currently completely reliant on fossil fuels, iron and other metals, minerals and even such basic commodities as sand to keep the modern world ticking over. Adding more consumers makes those resources run out faster.

The Earth also provides for our needs with renewable resources, such as timber, clean water and air, healthy

FOOD AND WATER

More than 800 million people currently do not get enough food to meet their nutritional needs every day. Meanwhile, 650 million are obese. People go hungry today not because there is insufficient food but because our global economic system distributes it unfairly. In fact, the number of people suffering from hunger has actually increased in recent years - due in part to development progress not keeping up with rapid population growth.

Every extra mouth to feed puts more pressure on our food supply. That is already under threat from multiple factors, including shortage of fresh water, soil depletion, decimated populations of insect pollinators and climate change. The UN currently projects that we will need 70% more food by 2050. Increasing agricultural production comes at a cost to nature, however. Habitat loss and exploitation are the two most significant threats to biodiversity - currently 80% of extinction threats to mammals and birds are due to agriculture.

A landmark report on diet and sustainability by the EAT-Lancet Commission in 2019 concluded that it is possible

POLLUTION

As with every environmental problem, while there are many solutions to pollution, adding more people to the population adds more polluters and makes those solutions less effective. While rich countries produce more plastic waste per person, for instance, poor regions where population growth outstrips the infrastructure to dispose of waste may contribute more plastic overall.

GREED, NEED AND INJUSTICE

Vast disparities exist in consumption and impact between the rich world and the Global South, and within countries themselves. A more just global system, in

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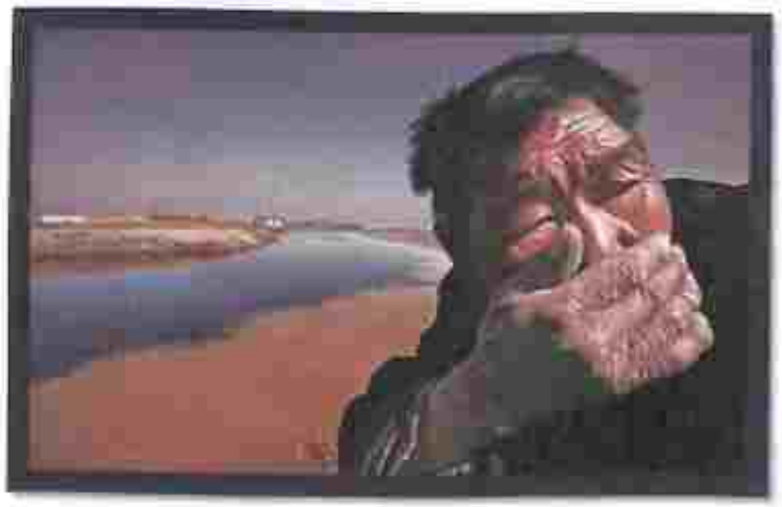
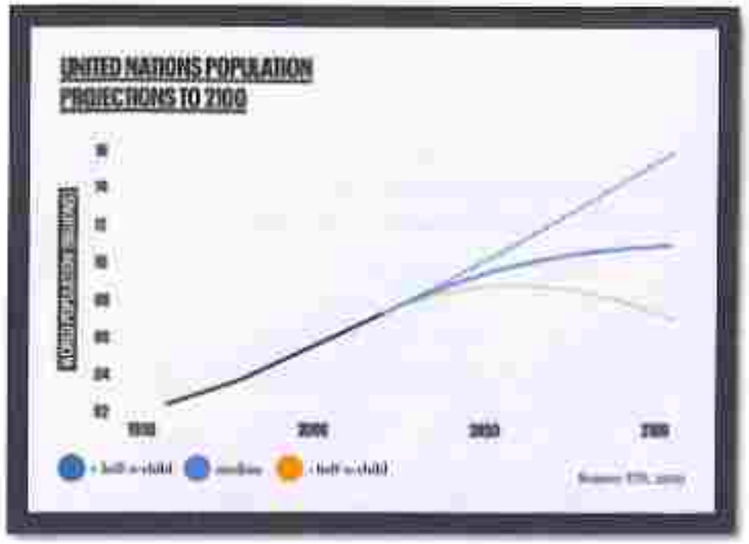


GREED, NEED AND INJUSTICE

Vast disparities exist in consumption and impact between the rich world and the Global South, and within countries themselves. A more just global system, in

BRING BIRTH RATES DOWN

Many countries have had success in reducing their birth rates. Thailand, for instance, reduced its fertility rate (the average number of children per woman) by nearly 75% in just two generations with a targeted, creative and ethical family planning programme. In the last ten years alone, fertility rates in Asia have dropped by nearly 10%.



Samantha
25/05/2022

DATE

EXPT NO.

PAGE NO.

GOKHALE MEMORIAL GIRL'S COLLEGE

NAME -
BHAGYALAXMI PATRA

COLLEGE ROLL NO -
21/BAH/0146

UNIVERSITY ROLL NO -
212013-11-0031

UNIVERSITY REGISTRATION NO -
013-1211-0048-21

SUBJECT - (AECC2)
ENVIRONMENTAL STUDIES

YEAR - 2021-22

SEMESTER - II

PRODUCE

NATURAL RESOURCES

PAGE NO.

CONTENT


industry
natural
resources

INTRODUCTION

A resource is any physical material constituting part of Earth that people need and value. Natural materials become resources when humans value them. The uses and values of resources change from culture to culture and from time to time.

There are two types of resources, renewable and non-renewable resources —

Renewable Resources —

A renewable resource, also known as flow resource, is a natural resource which will replenish to replace the portion depleted by usage and consumption. Renewable resources are an energy source that cannot be depleted and are able to supply a continuous source of clean energy. For example, solar energy, wind, falling water, the heat of the earth (geothermal), plant materials (biomass), waves, ocean currents and the energy of tides.

Non-Renewable Resources —

Non-Renewable Resources are the natural resources that cannot be easily replaced by natural means at a pace quick enough to keep up with consumption. It is a finite resource. For example fossil fuel, minerals etc..

The following are the natural resources

Forest Resources
Mineral Resources
Soil Resources
Water Resources
Food Resources
Energy Resources

RENEWABLE RESOURCES

SOLAR ENERGY

Solar energy is the cleanest and most abundant renewable energy source available, and the UK has some of the richest solar resources in the world. Solar energy is the power from the sun that is converted into thermal or electrical energy.

for example - power from the sun to make a car move.

ADVANTAGES OF SOLAR ENERGY

100 % inexhaustible energy, which is renewable and free

No toxic or polluting emissions into the air.

Reduces the need to rely on electricity grid or natural gas.

DISADVANTAGES OF SOLAR ENERGY.

- High Initial Costs
- Time Consuming
- Weather Dependent.

Hydro Energy

Hydropower, or hydroelectric power is a renewable source of energy that generates power by using a dam or diversion structure to alter the natural flow of a river or other body of water. Hydropower is the use of falling or fast-running water to produce electricity or power to machines.

ADVANTAGES OF HYDRO ENERGY	DISADVANTAGES OF HYDRO ENERGY.
Emission free	• Is' Expensive
Reliable and Adjustable	• It displaces people
Create lakes	• There are limited reservoirs.

Tidal Energy

Tidal power or tidal energy is harnessed by converting energy from tides into useful forms of power, mainly electricity using methods. Although not yet widely used, tidal energy has the potential for future electricity generation.

ADVANTAGE OF TIDAL ENERGY

Reliable and renewable energy sources.

Vertical - axis turbines and off-shore turbines are inexpensive.

High energy density than other renewable energy forms.

DISADVANTAGE OF TIDAL ENERGY

- Limited installation sites
- It is expensive and turbines can affect the surrounding ecosystem.
- Gaps between the tides: Tidal power is not constant.

NON-RENEWABLE RESOURCES

Forest Resources

Forest are important non-renewable natural resources Trees, shrubs and herbs dominate forest ecosystem 33% of the world's area consists of forests lands Insects, birds and animals live there. Man-made forests consists of trees, shrubs etc. Boreal coniferous trees are found in Arctic Sea. 35° to 65° north latitude. Tropical forests are found between 30° N latitude and 30° S latitude.

CAUSES OF DEFORESTATION

Overpopulation and shifting cultivation have resulted in a loss of 51 million forests.

The increase in demand for fuel is another reason. The demand was 200 to 500 million tons in 2001, where it was 65 million tons in 1997.

MINERAL RESOURCES

A mineral resource is a concentration or occurrence of material of intrinsic economic interest in or on the earth's crust in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. Gold, silver, platinum metals are used in the jewellary industry. Copper is used in the coin industry for some purposes and also it is used for making paper and wire.

MISUSE OF MINERALS

Minerals have been exploited by the way of open cast mining, underground mining and placer mining.

USA exploit huge amounts of minerals and energy resources and has become the nation which is very rich.

Extraction of some toxic, radioactive minerals leads to life threatening hazards.

WATER RESOURCES

Water resources are natural resources of water that are potentially useful as a source of water supply. 97% of water on the earth is salt water and only 3% is fresh water, slightly over two-third of this is frozen in glaciers and polar ice caps. Natural sources of fresh water include surface water under river flow, ground water and frozen water. Artificial sources of fresh water include treated waste-water and desalinated sea water.

ENVIRONMENTAL IMPACT

The main climate change consequences related to water resources are increases in temperature, shifts in precipitation patterns and snow cover.

Climate change may also markedly change the seasonal variation in river flow.

Soil Resources

Soil resources are a form of environmental asset providing a range of ecosystem services. Soil resources forms a fundamental part of the environment. They provide the physical base to support the productivity and cycling of biological resources, provide the source of nutrients and water for agriculture and forestry systems. and fulfil a complex role against environmental variability.

ENVIRONMENTAL IMPACT

The rapid increase in population results in demand for limited land resources which are subject to degradation. Land degradation takes place due to natural and man-induced activities.

Man-induced causes are deforestation, mining, over-irrigation, dam-construction and use of more fertilizers.

Food Resources

The food resources are a composite of the goods (the foodstuffs) and the services in commerce and distribution through which these are made available for consumption. Food resources is important because it is essential for growth and development of living organisms.

PROBLEMS FACED DUE TO LACK OF FOOD RESOURCES

Low-income families could be affected by multiple overlapping issues such as social isolation, acute and chronic health problems

Lack of affordable housing

High rates of malnutrition can lead to loss in gross domestic product (GDP) of as much as 4 to 5 percent. according to UN Food Agriculture and Organization.

Energy Resources

An energy resource is something that can produce heat power life, move objects or produce electricity. Matter that stores energy is called fuel. For example — coal, natural gas, petroleum, and water power. Nuclear Power Plant is the best reliable energy source.

CHALLENGES FACED DUE TO LACK OF ENERGY RESOURCES

The energy problem that receives most attention is the link between energy access and greenhouse gas emissions.

Increase of oil prices, financial downturns, and it develops the opportunity to develop renewable energies.

Oil reserves are decreasing, which has the effect that the oil prices rise steadily.

CONCLUSION

Of all the natural resources used by humans, two stand out as having the biggest impact on human survival and environmental quality. Mineral and fossil fuel resources are largely responsible for removing human culture - from hunter - gatherer societies to heavily industrialized urban ones. Fossil fuels gave humans the energy needed to power heavy duty machinery, produce electricity and improve transportation and maintain large urbanised cities. The culture that took the most advantage of these resources have caused their depletion through over-consumption and environmental destruction.

OBJECTIVE OF THE PROJECT

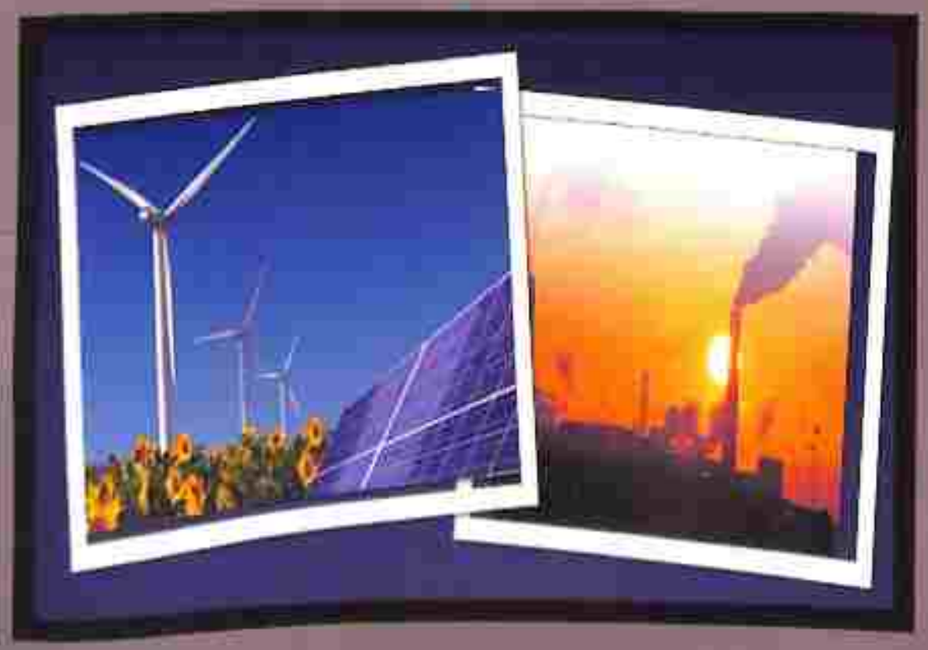
Therefore throughout the whole work we can hopefully or gradually get more prudent resource consumption practices before draconian measures are needed to survive in the world with depleted resources. Most natural resources are limited. This means that they will eventually run out. A perpetual resources has a never-ending supply. The demand for resources can change with new technology, new needs and new economies. Efforts to change the psychological factors leading to resource depletion include promoting sustainability and resource security philosophies.

Samanta
26/05/2022

AECC 2 (ENVS)

TOPIC:-

NATURAL RESOURCES



NAME:-SNIGDHA PAUL
NAME OF COLLEGE:- GOKHALE MEMORIAL GIRLS' COLLEGE
ROLL NO. :- 212013-11-0034
REGISTRATION NO.:- 013-1211-0050-21
COLLEGE ROLL NO.:- 21/BAH/0149

Name: Snigdha Paul

CONTENTS

INTRODUCTION

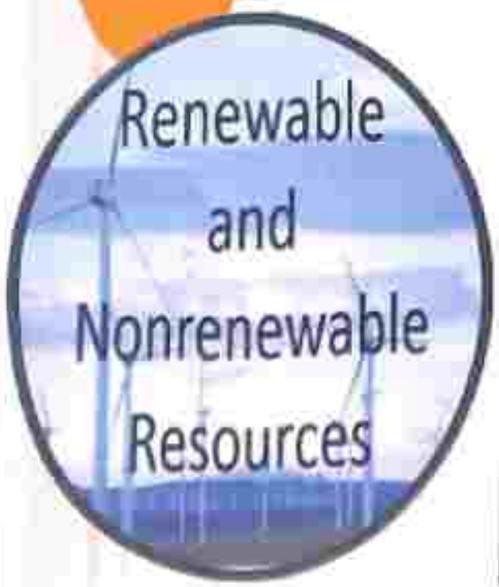
Natural Resources are very much important. Natural resources are materials from the earth that are used to support life and meet people's needs. Any natural substance that humans use can be considered a natural resources. Oil, coal, natural gas, metals, stones are natural resources. Other resources are air, sunlight, soil, water etc.

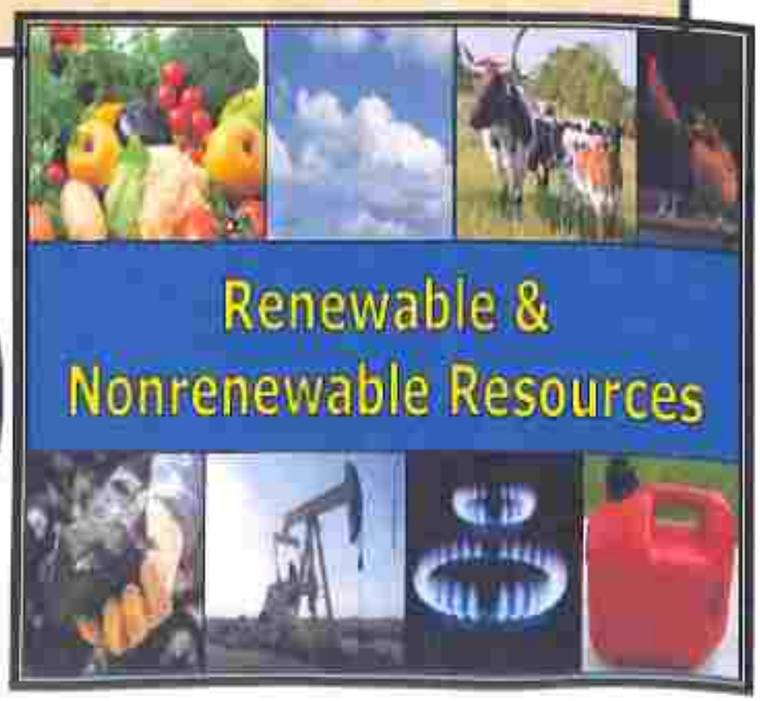
RENEWABLE AND NON- RENEWABLE RESOURCES

A Renewable resources also known as a flow resources. It is the resources that can be used repeatedly and does not run out because it is naturally replaced.

Example of renewable resources are:

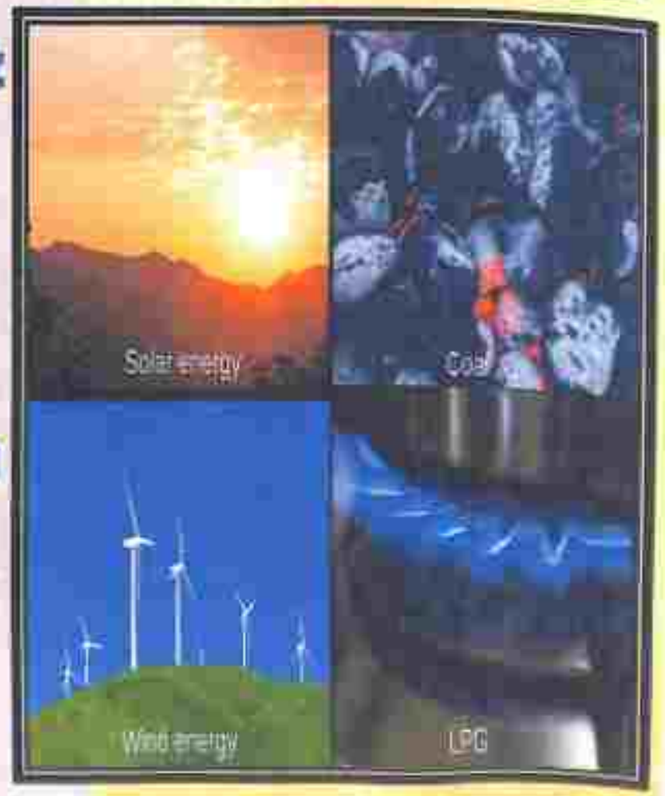
Solar energy, Wind energy, Hydro energy, Geothermal energy, Biomass energy.



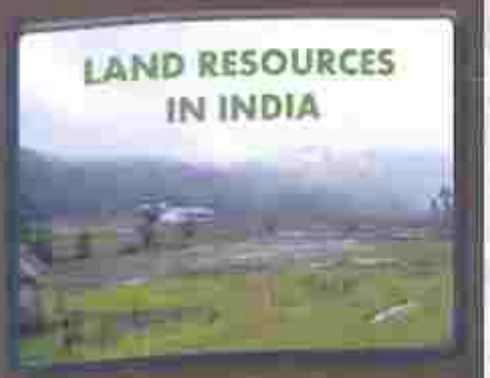


NON- RENEWABLE RESOURCES :-

- **This are natural Resources that cannot be readily replaces by natural means at a pace quick enough to keep up with consumption. It is a finite resource.**
- **Examples are: Fossil fuels such as oil, natural gas, and coal etc.**



LAND RESOURCES



Land resources refers to the land available for exploitation, like non-agricultural lands for building, developing township etc. Land resources occures naturally within environments that relatively undisturbed by mankind, in a natural form.

LAND DEGRADATION

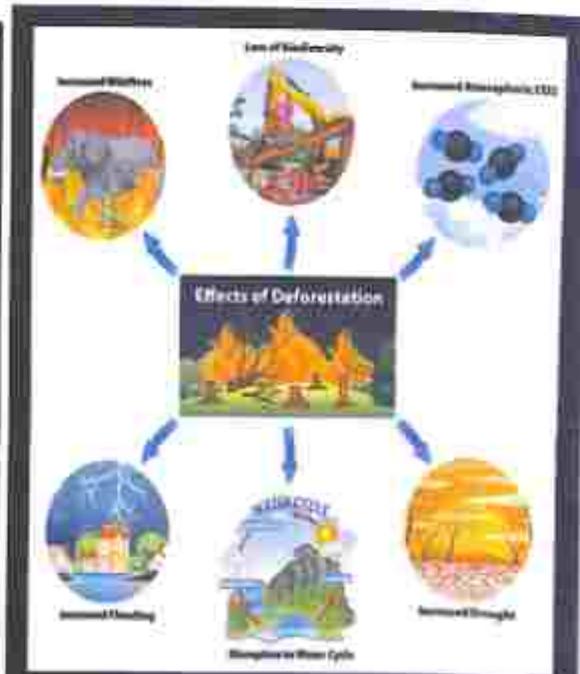
- **Land degradation is a process in which the value of the biophysical environment is affected by a combination of human- induced processess acting upon the land.**
- **Land degradation is caused by multiple forces, including extreme weather condition, particularly drought.**

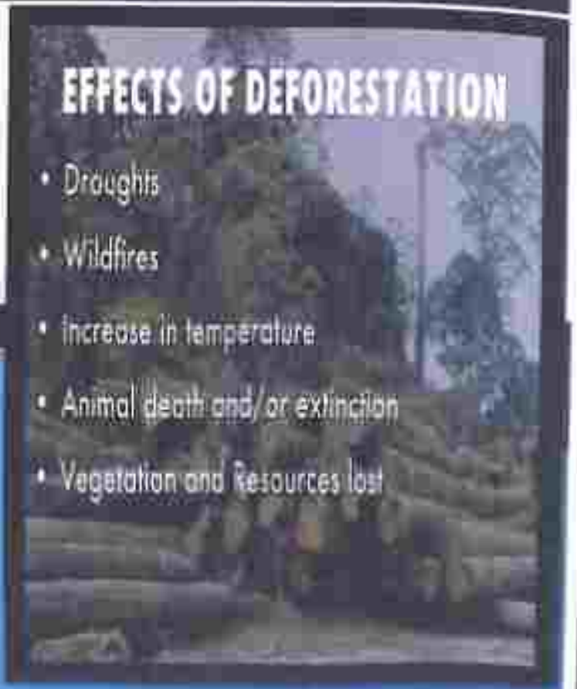
DESERTIFICATION

Desertification is land degradation in arid, semi-arid , and dry-humid areas, collectively known as drylands, resulting from many factors, including human activities and climatic variations.

CONSEQUENCES OF DEFORESTATION

- Climate Change
- Desertification
- Soil erosion
- Fewer crops
- Flooding
- Increase green house gases in the atmosphere
- Increased Drought
- Disruption to Water cycle





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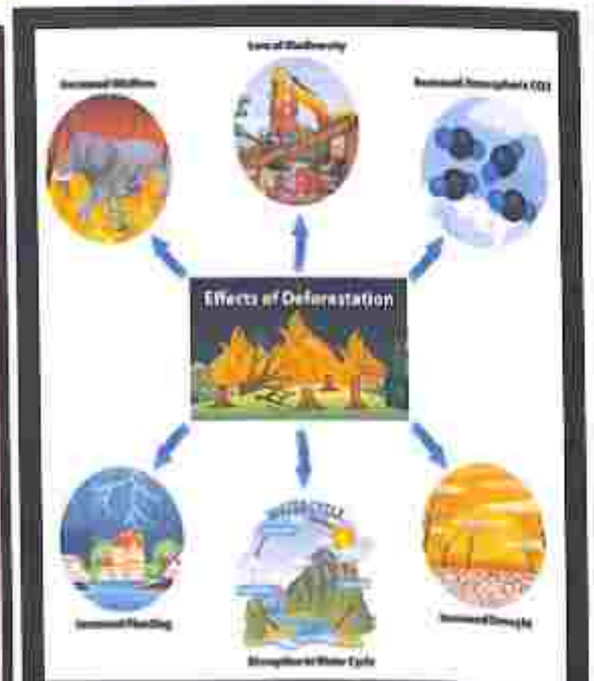

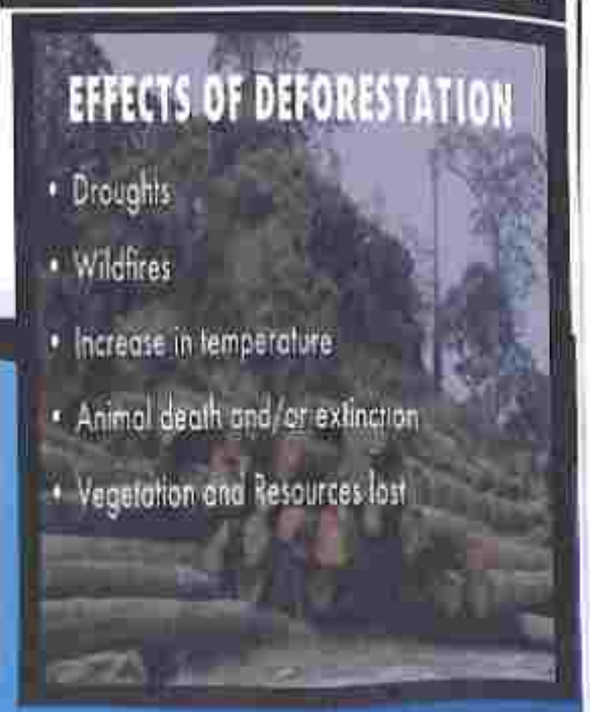

REMEDIAL MEASURES

- PLANT MORE AND MORE TREES
- USE LESS PAPER
- RECYCLE PAPER AND CARDBOARD
- BUY ONLY SUSTAINABLE WOOD PRODUCTS

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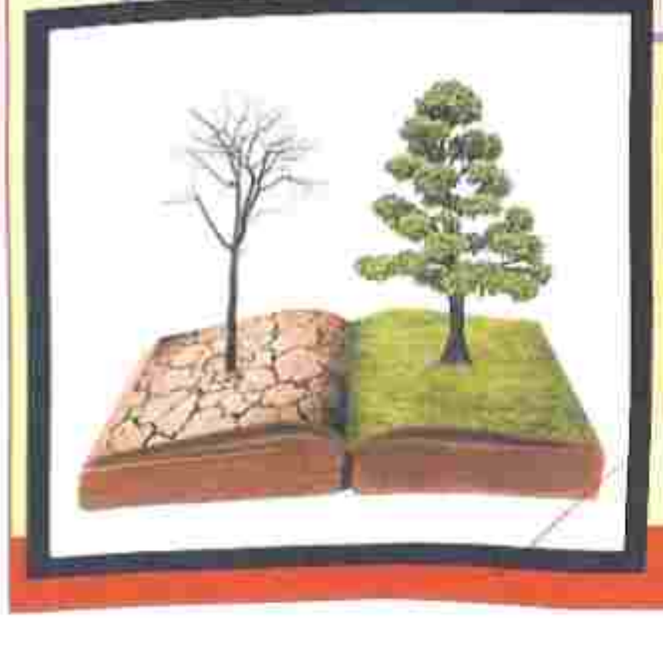
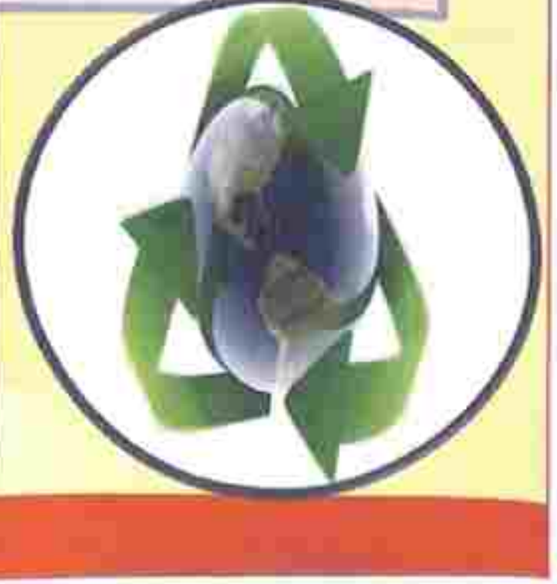




OVER EXPLOITATION OF GROUNDWATER

O The increased extraction of groundwater far in excess of the natural resources led to decreased groundwater level.

O The inadequate rainfall caused reduction in storage of water in reservoirs. This also leads to decrease in ground water.

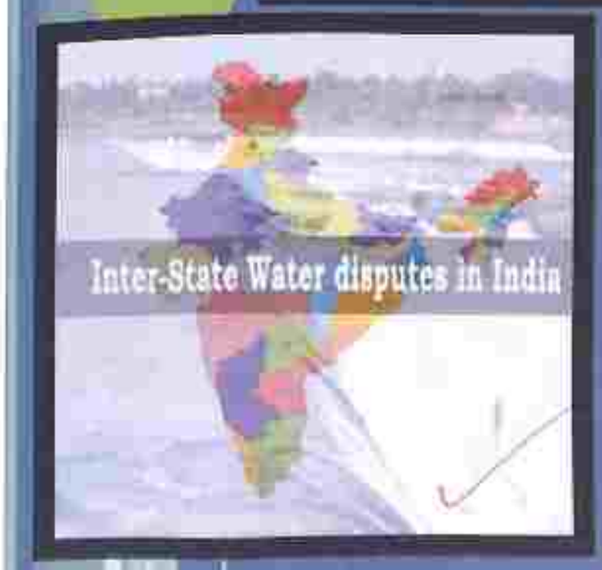
FLOODS

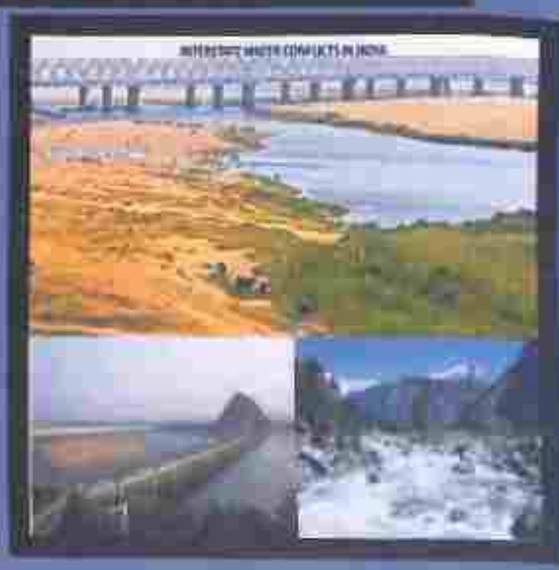
Floods are the most frequent type of natural disester and occures when an overflow of water submerges land that is usually dry.

Floods are often caused by heavy rainfall, rapid snow melt, or a storm surge from a tropical cyclone or tsunami in coastal areas.

CONFLICTS OVER WATER (INTERNATIONAL & INTERSTATE)

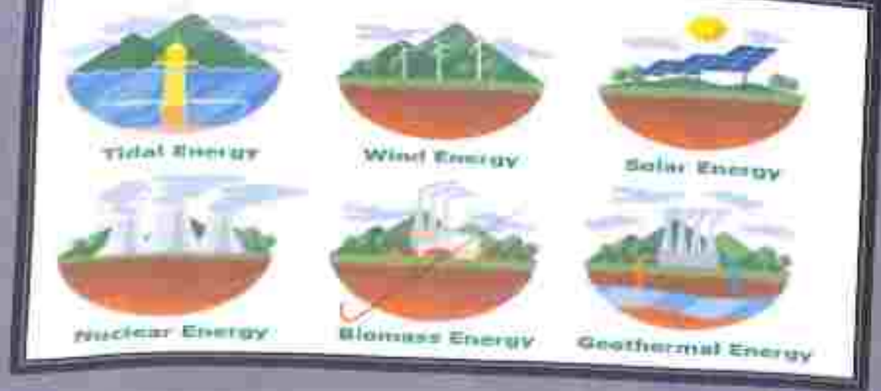
Water conflicts can occure between two or more neighboring countries that share a transboundary water sources, such as a river, sea, or groundwater basin.





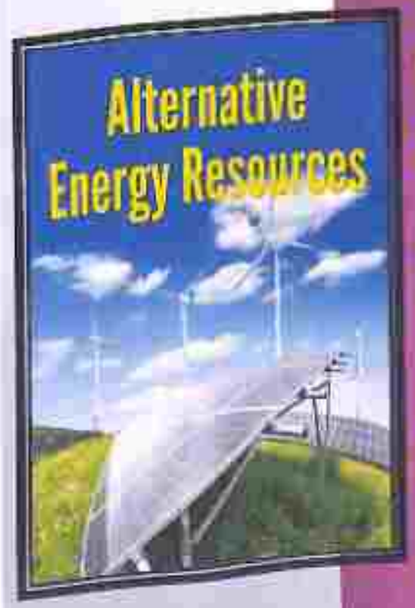
NON CONVENTIONAL ENERGY SOURCES

- Non conventional sources are known as renewable sources of energy.
- Examples of non conventional sources of energy are: solar energy, bio energy, tidal energy, wind energy.



CONCLUSION

- Of all the natural resources used by humans, two stand out as having the biggest impact on human survival and environmental quality.
- Minerals and Fossil fuels resources are largely responsible for moving human civilization from hunter-gatherer societies to heavily industrialized urban ones.



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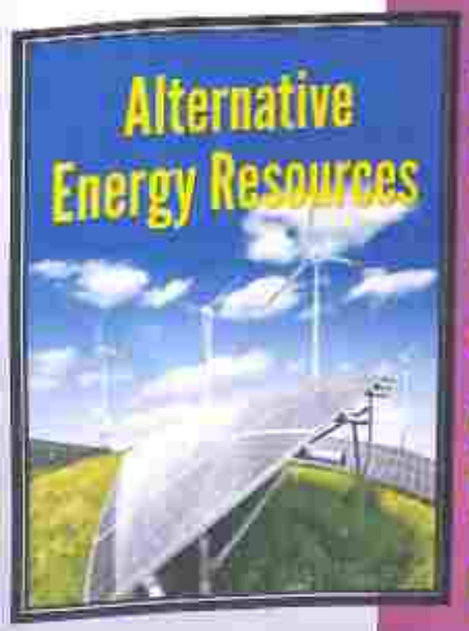

REFERENCES

The following websites helped me with researching for my subject and completing this project:-

https.//en.wikipedia.org

http//www.world.nuclear.org

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TextBook for Environmental Studies
by Erach Barucha

Samanta
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Name: Humairah Rehman

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I would like to express my special thanks of gratitude and appreciation to my Professor for providing me with his able guidance and constant support, which has made it possible for me to work dedicatedly for the project. Secondly, I would like to thank my parents who helped me a lot in completing the project within the stipulated time. Last but not the least, I would like to thank my classmates who have helped me a lot in completing the project.

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CONTENTS:

TOPIC:

NATURAL

DISASTERS.

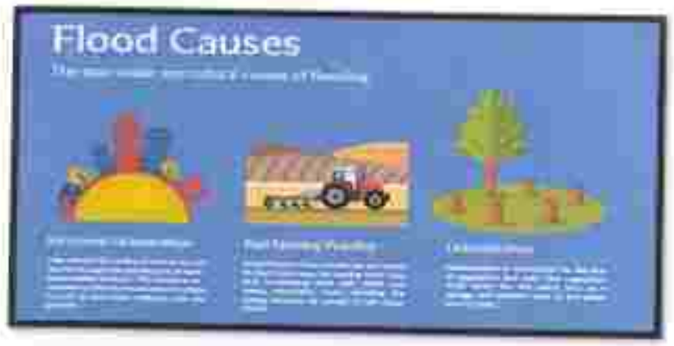
INTRODUCTION:

Natural disasters are catastrophic events with atmospheric, geological, and hydrological origins (e.g., droughts, earthquakes, floods, hurricanes, landslides) that can cause fatalities, property damage and social environmental disruption. A natural disaster is a major adverse event resulting from natural processes of the Earth; examples include firestorms, duststorms, floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis, storms, and other geologic processes. A natural disaster is a major adverse event resulting from natural processes of the Earth. A natural disaster can cause loss of life or damage property, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience and on the infrastructure available. Natural disasters are the result of a hazard overwhelming highly vulnerable community, often resulting in mortality and morbidity. Over the past decade, over 300 natural disasters occur yearly around the world affecting millions and cost billions. Natural disasters kill on average 60,000 people per year and are responsible for 0.1% of global deaths. Between 1995 and 2015, according to the UN's disaster-monitoring system, the greatest number of natural disasters occurred in America, China and India. In 2012, there were 905 natural disasters worldwide, 93% of which were weather-related disasters. 2012 was a moderate year. 45% were meteorological (storms), 36% were hydrological (floods), 12% were climatological (heat waves, cold waves, droughts, wildfires) and 7% were geophysical events (earthquakes and volcanic eruptions). Between 1980 and 2011 geophysical events accounted for 14% of all natural catastrophes. According to 2019 WHO report countries with the highest share of disability-adjusted life years (DALY) lost due to natural disasters are Bahamas, Haiti, Zimbabwe and Armenia.

FLOODS:

A flood is an overflow of water that submerges land that is usually dry. In the sense of "flowing water", the word may also be applied to the inflow of the tide. Floods are an area of study of the discipline hydrology and are of significant concern in agriculture, civil engineering and public health. Human changes to the environment often increase the intensity and frequency of flooding, for example land use changes such as deforestation and removal of wetlands, changes in waterway course or flood controls such as with levees, and larger environmental issues such as climate change and sea level rise. In particular climate change's increased rainfall and extreme weather events increases the severity of other causes for flooding, resulting in more intense floods and increased flood risk. Flooding may occur as an overflow of water from water bodies, such as a river, lake, or ocean, in which the water overtops or breaks levees, resulting in some of that water escaping its usual boundaries, or it may occur due to an accumulation of rainwater on saturated ground in an areal flood. Floods can also occur in rivers when the flow rate exceeds the capacity of the river channel, particularly at bends or meanders in the waterway. Floods often cause damage to homes and businesses if they are in the natural flood plains of rivers. While riverine flood damage can be eliminated by moving away from rivers and other bodies of water, people have traditionally lived and worked by rivers because the land is usually flat and fertile and because rivers provide easy travel and access to commerce and industry. Flooding can lead to secondary consequences in addition to damage to property, such as long-term displacement of residents and creating increased spread of waterborne diseases and vector-borne disease. The World's most catastrophic floods include China Flood, Johnstown Flooding, and Mississippi River Flood.

CAUSES:



Some of the prominent causes of flood are as follows:

Heavy Rainfall: When it rains heavily, the water doesn't drain nearly as quickly as it needs to. In short, the drainage systems back up, and the water rises sometimes into homes thereby leading to floods. This happens in cases of sustained heavy rains over a long period.

Overflowing Of The Rivers: Rivers can overflow their banks to cause flooding. This happens when there is more water upstream than usual, and as it flows downstream to the adjacent low-lying areas (also called a floodplain), underwater volcanic eruptions. As these waves there is a burst and water gets into the land.

Snowmelt: At the time of the high melting of snow due to heavy precipitation and other factors, the situation of flooding arises. The warmer temperatures increase melt rate of snow thereby causing floods.

Deforestation: Due to deforestation, the water holding capacity of the soil decreases. The roots of the trees get dried after they're cut down. The movement of water through trees into the soil slows down. The water of the rainfall collects on the surface which results in flood.

Storm Surge And Tsunamis: Storm surge and Tsunamis also cause flooding. Storm surges from hurricanes and other tropical systems can cause sea levels to rise and cover normally dry coastal areas in several feet of water. Tsunamis, on the other hand are giant waves caused by earthquakes or move inland, they build height and can push a lot of water inland in coastal areas.

EFFECTS:

Some of the prominent effects of flood are as follows:

Loss Of Lives: The gravest effect of flooding is death. Floods have claimed thousands of lives throughout history. Floods kill by carrying people away in fast moving water or drowning them.

Health Impacts: Flood can have a huge effect on health. The immediate health impacts of floods include drowning, injuries, hypothermia, and animal bites. Health risks are also associated with the evacuation of patients, loss of health workers, and loss of health infrastructure including essential drugs and supplies.

Economic Impacts: The economic impact of flooding can be devastating to a community. Flooding hinders economic growth and development because of the high cost of relief and recovery associated with floods. In frequently flooded areas, there is less likely to be any investment in infrastructure and other developed activities.

Property Damage: Flooding can also cause great loss of property. Flooding causes property damage to buildings by blowing out windows, sweeping away doors, corroding walls and foundations, and sending debris into infrastructure at a fast pace.

Mass Migration: People may be compelled to leave a place if there is a regular occurrence of devastating floods in an area. There can be a mass migration to higher or safer areas. Often, people move to the cities which cause much congestion in these areas and further economic challenges.

CONTROLS:

Some of the prominent methods to control flood are as follows:

Green Roofs/Rooftop Gardens: Green roofs (roofs that are covered with vegetation), by their very nature, absorb rainwater and help to mitigate flooding. It's a stormwater management tool for the community, it reduces stormwater runoff; and for the environment, it prevents combined sewer overflow, neutralizes the acid rain effect and removes nitrogen pollution from the rainwater.

Backflow Prevention Check Valves: Install backflow prevention check valves to stop floodwater from entering at vulnerable points where utility and sewer lines meet the building.

Flood Shield: Install watertight barriers, known as flood shields, to prevent the passage of water through doors, windows, ventilation shafts, or other openings.

Create Flood Plains And Overflow Areas For Rivers: Floodplains protect us from flood. When a river floods, water spread across the floodplain and slowdown. If floodplains are connected to rivers, they can hold water when flood causes a river bank's to overflow. This can prevent flood water from reaching homes.

Dams: Many dams and their associated reservoirs are designed completely or partially to aid in flood protection and control. Many large dams have flood-control reservations in which the level of a reservoir must be kept below a certain elevation before the onset of the rainy/summer melt season to allow a certain amount of space in which floodwaters can fill.

EARTHQUAKE:

An earthquake is the sudden shaking of the ground caused by the passage of seismic waves through Earth's rocks. Seismic waves are produced when some form of energy stored in Earth's crust is suddenly released, usually when masses of rock straining against one another suddenly fracture and "slip." Earthquakes occur most often along geologic faults, narrow zones where rock masses move in relation to one another. The major fault lines of the world are located at the fringes of the huge tectonic plates that make up Earth's crust. Earth's major earthquakes occur mainly in belts coinciding with the margins of tectonic plates. This has long been apparent from early catalogs of felt earthquakes and is even more readily discernible in modern seismicity maps, which show instrumentally determined epicentres. The most important earthquake belt is the Circum-Pacific Belt, which affects many populated coastal regions around the Pacific Ocean. It is estimated that 80 percent of the energy presently released in earthquakes comes from those whose epicentres are in this belt. A second belt, known as the Alpide Belt, passes through the Mediterranean region eastward through Asia and joins the Circum-Pacific Belt in the East Indies. The energy released in earthquakes from this belt is about 15 percent of the world total. At the Earth's surface, earthquakes manifest themselves by shaking and displacing or disrupting the ground. When the epicenter of a large earthquake is located offshore, the seabed may be displaced sufficiently to cause a tsunami. Earthquakes can also trigger landslides and, occasionally, volcanic activity. In its most general sense, the word earthquake is used to describe any seismic event whether natural or caused by humans that generates seismic waves. The deadliest earthquakes include The Indian Ocean Earthquake, The Kashmir Earthquake and The Great Tangshan Earthquake.

CAUSES:

Some of the prominent causes of earthquake are as follows:

Volcanic Eruptions: The main cause of the earthquake is volcanic eruptions. When boiling lava tries to break through the surface of the earth, with the increased pressure of gases, certain movements caused in the earth's crust causing damage.

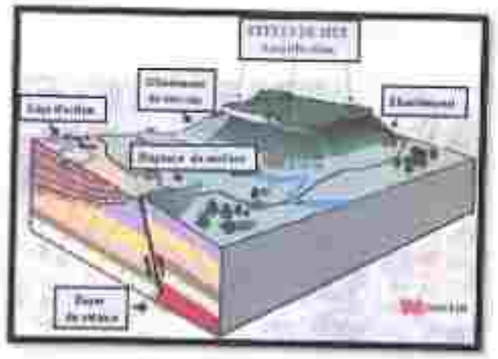
Tectonic Movements: The surface of the earth consists of some plates, comprising of the upper mantle. These plates are always moving, thus affecting the earth's crust. These movements categorized into three types: constructive, destructive, and conservative. Earthquake of this kind can be really dangerous.

Geological Faults: A geological fault is known as the displacement of plates of their original plane. The tectonic plates are always moving, but they get stuck at their edges due to friction. When the stress on the edge overcomes the friction, there is an earthquake.

Man-Made Causes: The interference of man with nature can also become a cause of the earthquake. The disturbance of crustal balance due to heavy clubbing of water in dams can cause earthquakes. Mining can also cause disturbance due to the extensive removal of rocks from different areas.

Minor Causes: Some minor causes such as landslides, avalanches, the collapse of heavy rocks, etc. can also cause minor shockwaves. All these factors correspond to minor earthquakes, but sometimes these can also vary to severe earthquakes.

EFFECTS:



Some of the prominent effects of earthquake are as follows:

Surface Rupture & Ground Displacement: The primary earthquake hazard is surface rupture. It can be caused by vertical or horizontal movement on either side of a ruptured fault. Ground displacement, which can affect large land areas, can produce severe damage to structures, roads, railways and pipelines.

Landslides: Earthquakes can trigger landslides and mudslides, especially in areas with water-soaked soils. Landslides may result in falling rocks and debris that collide with people, trees, animals, buildings and vehicles. They also can block roads and disrupt utility lines.

Liquefaction: The shaking from an earthquake can turn loose soil into a liquid during an earthquake. Liquefaction can undermine the foundations and supports of buildings, bridges, pipelines, and roads, causing them to sink into the ground, collapse or dissolve.

Tsunamis: An earthquake generated within the Pacific Ocean floor will generate a tsunami, which is actually a series of very long waves. Large tsunamis which travel to the ocean floor to the surface are dangerous to human health, property, and infrastructure. Long lasting effects of tsunami destruction can be felt beyond the coastline.

Fires: Earthquake damage facts show fires caused by earthquakes are the second most common hazard. Earthquake fires start when electrical and gas lines are dislodged due to the earth's shaking. Gas is set free as gas lines are broken and a spark will start a firestorm.

CONTROLS:

Some of the prominent methods to control earthquake are as follows:

Structural Mitigation: Structural mitigation improves the capacity of a building to resist seismic forces. Structural measures include improving the building elements that hold up a building and resist lateral forces from winds and earthquakes, including foundations, columns, load bearing walls, floor diaphragms, roof diaphragms and the connections between these structural elements.

Nonstructural Mitigation: Nonstructural mitigation measures to restrain, brace, anchor or otherwise improve the seismic resistance of nonstructural building components such as parapets, chimneys, non-load bearing suspended ceilings and lights, windows, water heaters, furnaces, air conditioners and emergency generators.

Seismic Retrofitting: Seismic retrofitting is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes.

Pre-Disaster Preventive Measures: Some pre-disaster measures include re-framing buildings codes, making all public utilities like water supply systems, communication networks, electricity lines earthquake-proof etc.

Post-Disaster Preventive Measure: Some Some post-disaster measures include evacuation of people, supply of food and drinking water, repairing lines of communication and information, restoring transport routes, cordoning off severely damaged structures that are liable to collapse during aftershocks etc.

CYCLONE:

A cyclone is a large air mass that rotates around a strong center of low atmospheric pressure, counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere. Cyclones are characterized by inward-spiraling winds that rotate about a zone of low pressure. The largest low-pressure systems are polar vortices and extratropical cyclones of the largest scale (the synoptic scale). Warm-core cyclones such as tropical cyclones and subtropical cyclones also lie within the synoptic scale. Mesocyclones, tornadoes, and dust devils lie within smaller mesoscale. Upper level cyclones can exist without the presence of a surface low, and can pinch off from the base of the tropical upper tropospheric trough during the summer months in the Northern Hemisphere. Cyclones have also been seen on extraterrestrial planets, such as Mars, Jupiter, and Neptune. Extratropical cyclones begin as waves in large regions of enhanced mid-latitude temperature contrasts called baroclinic zones. These zones contract and form weather fronts as the cyclonic circulation closes and intensifies. Later in their life cycle, extratropical cyclones occlude as cold air masses undercut the warmer air and become cold core systems. A cyclone's track is guided over the course of its 2 to 6 day life cycle by the steering flow of the subtropical jet stream. Cyclogenesis is the development or strengthening of cyclonic circulation in the atmosphere. Cyclogenesis is an umbrella term for several different processes that all result in the development of some sort of cyclone. It can occur at various scales, from the microscale to the synoptic scale. There are different types of cyclones depending upon the size, nature as well as the setting in which they occur, namely tropical cyclone, extra tropical cyclone, hurricane, typhoon, anti cyclone and anticyclone. The speediest and deadliest cyclones in the world include Great Bombay Cyclone, Bhola Cyclone and Hooghly River Cyclone.

CAUSES:

Some of the prominent causes of cyclone are as follows:

Atmospheric Instability: In unstable conditions, the parcel of air will be warmer than the surrounding air at altitude. Because it is warmer, it is less dense and is prone to further ascent. Effects of atmospheric instability in moist atmospheres include thunderstorm development, which over warm oceans can lead to tropical cyclogenesis.

Increased Humidity: For cyclone formation, there needs to be warm ocean water and moist, humid air in the region. When humid air is flowing upward at a zone of low pressure over warm ocean water, the water is released from the air as creating the clouds of the storm.

Low Level Disturbances: Low-level disturbance are the seeds of cyclones in the form of easterly wave disturbances in the Inter-Tropical Convergence Zone. Small local differences in the temperature of water and of air produce various low pressure centers of small size. Then, because of the rising warm humid air, a true cyclonic vortex may develop very rapidly.

Coriolis Force: They are irregular wind movements involving closed circulation of air around a low pressure center. This closed air circulation (whirling motion) is a result of rapid upward movement of hot air which is subjected to Coriolis force. The low pressure at the center is responsible for the cyclone.

Warm Temperature At Sea Surfaces: Cyclone is caused by the rising of warm air above the surface of sea. When the warm air rises, the cold air rushes to the empty space. Then the cold air gets heated up and again rises in the atmosphere. This process takes place continuously. This process of rapid rising of hot air creates an eye at the centre of the cyclone. Similarly, the low pressure area gets filled by the high pressure winds, thereby leading to cyclone.

EFFECTS:

Some of the prominent effects of cyclone are as follows:

Rainfall and Flooding: The thunderstorms produced in a cyclone system produce intense rainfall causing massive flooding, mudslides and landslides. This flooding tends to be more severe and destructive inland due to poor preparedness. This rainfall can be very destructive and cost millions of dollars in damage.

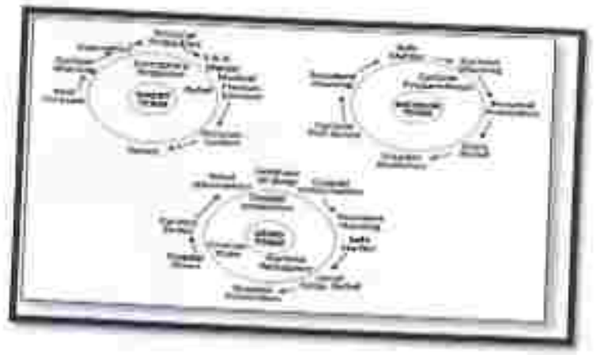
Loss Of Biodiversity: Cyclonic hazards kills biodiversity. Cyclones alter the dynamics of invasive plant and animal species on islands. Impacts on island forests will threaten endemic and forest-dependent bird species. Increases in cyclone intensities will disproportionally threaten island biodiversity. They can either kill organisms directly or destroy their habitats so that they are no longer able to live in the area where the hazard occurred.

Loss Of Lives And Property: Immediate impacts of flooding include loss of human life, damage to property, destruction of crops, loss of livestock, and deterioration of health condition. Flash floods, with little or no warning time, cause more deaths than slow-rising riverine floods.

Mass Migration: Frequent flooding, resulting in loss of livelihoods, production and other prolonged economic impacts and types of suffering can trigger mass migration or population displacement. Migration to developed urban areas contributes to the overcrowding in the cities.

Hindering Economic Growth And Development: The high cost of relief and recovery may adversely impact investment in infrastructure and other development activities in the area and in certain cases may cripple the frail economy of the region.

CONTROLS:



Some of the prominent methods to control cyclone are as follows:

Engineered Structures: Cyclone proof structures withstand the wind forces and prove to mitigate the losses. For example, houses can be strengthened to resist wind and flood damage, and houses should be constructed on stilts or on earth mounds.

Cyclone Sheltering: At national, state and regional level, the construction of cyclone shelters should be taken up to help the vulnerable community from cyclones. The shelters should be built considering the population density, transportation and communication, distance from the affected areas of the past, and the areas' topography

Retrofitting Non-Engineered Structures: The settlements in non-engineered structures should ensure that they are aware of their houses' resistance to the wind or certain disastrous weather conditions. For example, construction of a steep-slope roof to avoid the risk of being blown away.

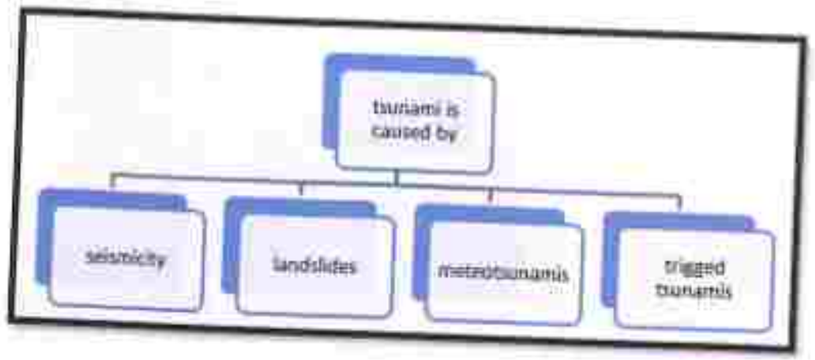
Flood Management: As the cyclonic storms lead to heavy rainfall that further lead to flooding in various areas; important should be given to the flood management. The drainage systems should be well-designed to mitigate flooding.

Vegetation Cover Improvement: To increase the water infiltration capacity, improving vegetation cover is of high importance. Planting trees in rows, coastal shelterbelt plantations, etc can help break the wind force and mitigate the severe losses.

TSUNAMI:

A Tsunami is a series of ocean waves that sends surges of water, sometimes reaching heights of over 100 feet (30.5 meters), onto land. These walls of water can cause widespread destruction when they crash ashore. These awe-inspiring waves are typically caused by large, undersea earthquakes at tectonic plate boundaries. When the ocean floor at a plate boundary rises or falls suddenly, it displaces the water above it and launches the rolling waves that will become a tsunami. Most tsunamis–about 80 percent–happen within the Pacific Ocean's "Ring of Fire," a geologically active area where tectonic shifts make volcanoes and earthquakes common. Tsunamis are caused by earthquakes, landslides, volcanic explosions, glacier calvings, and bolides. They cause damage by two mechanisms: the smashing force of a wall of water travelling at high speed, and the destructive power of a large volume of water draining off the land and carrying a large amount of debris with it, even with waves that do not appear to be large. While everyday wind waves have a wavelength (from crest to crest) of about 100 metres (330 ft) and a height of roughly 2 metres (6.6 ft), a tsunami in the deep ocean has a much larger wavelength of up to 200 kilometres (120 mph). Such a wave travels at well over 800 kilometres per hour (500 mph), but owing to the enormous wavelength the wave oscillation at any given point takes 20 or 30 minutes to complete a cycle and has an amplitude of only about 1 metre (3.3 ft). The waves have two parts- the crest and the trough. The trough usually reaches the shore first followed by the crest approximately 5 minutes later. The deadliest tsunamis include the Indian Ocean Tsunami, Vajont Dam Tsunami and Lituya Bay Mega Tsunami.

CAUSES:



Some of the prominent causes of tsunami are as follows:

Landslides: A landslide that occurs along the coast can force large amounts of water into the sea, disturbing the water and generate a tsunami. Underwater landslides can also result in tsunamis when the material loosened by the landslide moves violently, pushing the water in front of it.

Volcanic Eruption: Violent volcanic eruptions represent impulsive disturbances, which can displace a great volume of water and generate extremely destructive tsunami waves in the immediate source area. According to this mechanism, waves may be generated by the sudden displacement of water caused by a volcanic explosion, thereby leading to severe tsuanmis.

Earthquake: Most tsunami are caused by large earthquakes on the sea floor when slabs of rock move past each other suddenly, causing the overlying water to move. The resulting waves move away from the source of the earthquake event, leading to tsunamis.

Seamount Collapse: As the seamount ages, the possibility of one side (flank) of it collapsing increases, and this has been suggested to cause landslides that have the potential to generate massive tsunamis.

Meteorological Conditions: The tsunami caused due to meteorological changes is called a Meteotsunami. Rapid changes in barometric pressure, such as those seen when a front passes through, can displace bodies of water enough to cause trains of waves with wavelengths similar to seismic tsunamis. They can be strong enough to cause localised damage and loss of life on shorelines where they can be intensified by resonance.

EFFECTS:

Some of the prominent effects of tsunami are as follows:

Environmental Impacts: Tsunamis have a devastating effect on insects, animals, plants, and natural resources. A tsunami changes the landscape. It uproots trees and plants and destroys animal habitats such as nesting sites for birds. The impact of a tsunami on the environment relates also to the man-made aspects of the environment. Solid waste and disaster debris are the most critical environmental problem faced by a tsunami-hit country.

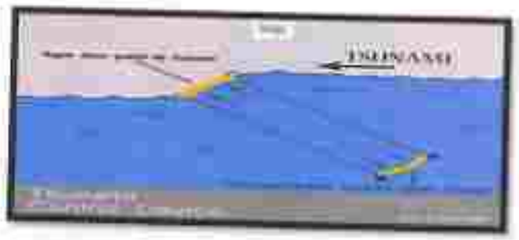
Destruction: The amount of energy and water contained in a huge tsunami can cause extreme destruction when it strikes land. It is the power behind the waves, the endless rushing water that causes devastation and loss of life. When the giant breaking waves of a tsunami batter the shoreline, they can destroy everything in their path.

Death: One of the biggest and worst effects of a tsunami is the cost to human life because unfortunately escaping a tsunami is nearly impossible. Hundreds and thousands of people are killed by tsunamis. The violent force of the tsunami results in instant death.

Disease: Tsunami waves and the receding water are very destructive to structures in the run-up zone. The areas close to the coast are flooded with sea water, damaging the infrastructure such as sewage and fresh water supplies for drinking. Flooding and contamination of drinking water can cause disease to spread in the tsunami hit areas.

Psychological Impacts: Natural disasters such as the tsunami can have a devastating impact on the psychological and social well-being of anyone exposed to them. Studies in the tsunami affected areas showed increases in the prevalence of posttraumatic stress disorder, anxiety, and depression.

CONTROLS:



Some of the prominent methods to control tsunami are as follows:

Defence Structures: Defence structures reduce the damaging effects of tsunamis. They include tsunami control forest belts; tsunami resistant buildings; others (sea walls, tsunami breakwaters, tsunami tide gates, river dikes, etc.). These defence structures can be effective by blocking floating debris thereby controlling tsunamis.

Transportation And Urban Infrastructure: In building community-based tsunami preparedness, road and rail networks and maritime routes will serve as evacuation and emergency supply routes and should consequently be strategically placed. Planning should be geared towards strengthening the safety of ports because following a tsunami they may function as rescue and reconstruction centres.

Telecommunications: Telephone and communication infrastructures are vital during and after a tsunami. Protect cables and switchboards by placing them in safe locations and building secure configurations. Those already located in hazardous areas must be buried underground or reinforced against tsunamis.

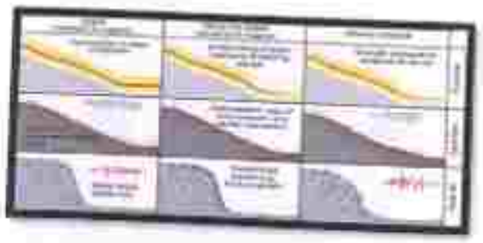
Evacuation Routes: During a tsunami, a rapid, safe evacuation saves lives. Planning evacuation routes from residential districts must take into account public daily life to ensure that the evacuation can be carried out smoothly.

Hazardous Materials: Hazardous materials, such as spills of oil and gasoline, cause secondary damage during a tsunami. Great care should therefore be taken to ensure they are protected and safely stored. Storage tanks should be buried and steps to prevent spills should be taken in order to make them less susceptible to tsunamis.

LANDSLIDE:

Landslides, also known as landslips, are several forms of mass wasting that may include a wide range of ground movements, such as rockfalls, deep-seated slope failures, mudflows, and debris flows. Gravity is the primary driving force for a landslide to occur, but there are other factors affecting slope stability that produce specific conditions that make a slope prone to failure. The term landslide has at one time or another been used to cover almost all forms of mass movement of rocks and regolith at the Earth's surface. Under this classification, six types of movement are recognized namely fall, topple, slide, spread, flow and slope deformation. A fall is a movement of isolated blocks or chunks of soil in free-fall. The term topple refers to blocks coming away by rotation from a vertical face. A slide is the movement of a body of material that generally remains intact while moving over one or several inclined surfaces or thin layers of material in which large deformations are concentrated. Slides can occur catastrophically, but movement on the surface can also be gradual and progressive. Spreads are a form of subsidence, in which a layer of material cracks, opens up, and expands laterally. Flows are the movement of fluidised material, which can be both dry or rich in water (such as in mud flows). Flows can move imperceptibly for years, or accelerate rapidly and cause disasters. Slope deformations are slow, distributed movements that can affect entire mountain slopes or portions of it. Some landslides are complex in the sense that they feature different movement types in different portions of the moving body, or they evolve from one movement type to another over time. Some of the deadliest landslides in recorded history are Khait Landslide, North India Landslide and Haiyuan Landslide.

CAUSES:



Some of the prominent causes of landslide are as follows:

Climate: Long-term climatic changes can significantly impact soil stability. A general reduction in precipitation leads to lowering of water table and reduction in overall weight of soil mass and reduced solution of materials. If there is absence of mechanical root support, the soils start to run off, thereby leading to landslides.

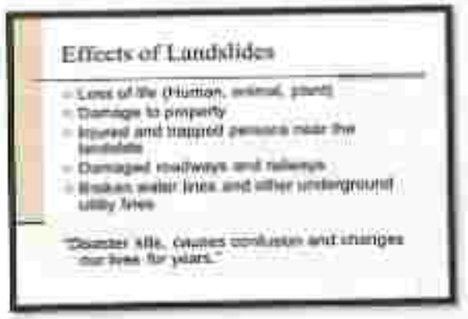
Deforestation: When there are a lack of plants on a hillside, the strong and deeply-planted roots wither away until they are detritus. This soil is very weak and cannot support certain weights, unlike the tightly held soil with the plants. This gives a higher risk for landslides to occur. When trees are cut down, their roots are no longer available to hold the soil together. A heavy rainfall is sufficient to make the rocks and boulders come hurtling down.

Earthquakes: Earthquakes have always been a main cause of landslides throughout the world. When earthquakes occur on areas with steep slopes, many times the soil slips causing landslides. Furthermore, ashen debris flows caused by earthquakes can also trigger mass movement of soil, thereby leading to landslides.

Mining: Mining is a key human cause of landslides because of its different operations that produce a huge amount of vibrations, especially blasting techniques and its vibrations that can reach hundreds of meters under the soil surface which causes landslides.

Heavy Rainfall: Heavy rainfall can trigger landslides because it alters the pressure within the slope, which leads to slope instability. Consequently, the heavy water laden slope materials (soil, rock, etc.) will succumb to the forces of gravity. When sloped areas become completely saturated by heavy rainfall many times landslides can occur.

EFFECTS:



Some of the prominent effects of landslide are as follows:

Economic Impacts: If the landslide is significant, it could drain the economy of the region or country. After a landslide, the area affected normally undergoes rehabilitation. This rehabilitation involves massive capital outlay, thereby leading to a drain on the economy resources of the country.

Decimation Of Infrastructure: The force flow of mud, debris, and rocks as a result of a landslide can cause serious damage to property. Infrastructure such as roads, railways, leisure destinations, buildings and communication systems can be decimated by a single landslide.

Impacts River Ecosystems: The soil, debris, and rock sliding downhill can find way into rivers and block their natural flow. Many river habitats like fish can die due to interference of natural flow of water. Communities depending on the river water for household activities and irrigation will suffer if flow of water gets blocked.

Loss Of Life: Communities living at the foot of hills and mountains are at a greater risk of death by landslides. A substantial landslide carries along huge rocks, heavy debris and heavy soil with it. This kind of landslide has the capacity to kills lots of people.

Impact On Agriculture: One of the most damaging effects of landslides is the destruction of agricultural land. Debris spread over farms, cultivation and pastures, covering important agricultural land. They destroy seeds, plants, food stocks and grazing land. These lands can remain inaccessible for years ultimately impacting on farmers' livelihoods.

CONTROLS:

Some of the prominent methods to control landslide are as follows:

Geosynthetics: Landslides can be prevented in a number of ways using geosynthetics. Firstly, by performing a barrier function and/or a filter function which prevents the effects of water seepage. Secondly, using geosynthetics to reinforce the soil, thus making stable even very steep slopes. Thirdly, by holding topsoil in place, preventing slippage.

Vegetation On Slopes: One of the quickest and easiest ways to prevent landslide is by planting vegetation. The presence of plants on the slopes will lead to excess water being absorbed, lessening the chance of rain infiltrating any cracks in the soil and causing a landslide.

Retaining Walls: Retaining walls should be made of sturdy construction material, whether it's stone, brick or steel. Drainage materials located behind the wall will also help to increase its stability and keep the construction stable even if a landslide does occur.

Building Diverting Debris Pathways: Another option for preventing landslides is through creating dedicated debris pathways. With the help of the retaining walls, these will help to divert the flow of landslide debris away, reducing the chances of it becoming damaged.

Altering The Gradient Of The Slope: Slope gradient is probably the most sophisticated solution to preventing a landslide and also one of the most effective. Altering the angle of the slope involves taking some of the material from the upper part and relocating it towards the base, which reduce the chances of a landslide.

CONCLUSION:

Natural disasters can create profound disruption for communities that extends far beyond the geographic boundaries of the event. Natural disasters are the result of a hazard overwhelming highly vulnerable community, often resulting in mortality and morbidity. Over the past decade, over 300 natural disasters occur yearly around the world affecting millions and cost billions. The disaster cycle is a framework used to base a coordinated plan to respond, recover, prevent, and prepare for a disaster. Psychological and behavioral responses create the most significant public health burden following a disaster. An understanding of community responses and the cultural and contextual factors that influence their development and evolution are critical for effective response and recovery efforts. Community response to extreme events show phases; an understanding of these optimizes timing and resourcing of recovery efforts. Interventions should be evidence-based, tailored to community needs, and serve to enhance the essential elements of safety, calming, self and community efficacy, social connectedness, and hope or optimism. Risk and crisis communication can shape community behaviors and influence perception of risk with trust and health promoting behaviors being heavily influenced by thoughtful public health messaging. Effective leadership involves communication with community members, being present, honest, and trustworthy, modeling self-care, addressing community challenges such as grief and loss, and is essential for community.

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25/05/2022

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ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to Mr. Shantanu Srivastava for his able guidance and support in completing my project. I would also like to extend by gratitude to our Principal Ma'am Dr. Akashi Karpa for providing me with all the facility that was required.

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AIR POLLUTION

Air pollution is the contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the climate or to materials. There are many different types of air pollutants, such as gases (including ammonia, carbon monoxide, sulfur dioxide, nitrous oxides, methane, carbon dioxide & chlorofluorocarbons), particulates & biological molecules. Air pollution is a significant risk factor for a number of pollution-related diseases, including respiratory infections, heart disease, COPD, stroke and lung cancer.

Growing evidence suggests that air pollution exposure may be associated by with reduced IQ scores, impaired cognition, increased risk for psychiatric disorders such as depression and detrimental perinatal health. The human health effects of poor air quality are far reaching, but principally affect the body's respitory system and the cardiovascular system.

Outdoor air pollution alone causes 2.1 to 4.21 million deaths annually, making it one of the top contributors to human death.

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Overall, air pollution causes the deaths of around 7 million people worldwide each year, on a global mean loss of life expectancy of 2.9 years and is the world's largest single environmental health risk. Indoor air pollution & poor urban air quality are listed as two of the world's worst toxic pollution problems in the 2008 Blacksmith Institute World's Worst Polluted places report.

Productivity losses and degraded quality of life caused by air pollution are estimated to cost the world economy $5 trillion per year, but, along with health & mortality impacts, are an externality to the contemporary economic system and most by human activity, albeit sometimes being moderately regulated and monitored.

Various pollution control technologies and strategies are available to reduce air pollution, both international and national legislation & regulation have been implemented to regulate air pollution.

At the international level, some of these efforts have been successful - for example the Montreal Protocol was successful at reducing release of harmful ozone depleting chemicals as the 1985 Helsinki protocol which reduced Sulfur emissions, while other attempts have so far been less successful in implementation

WHAT CAUSES AIR POLLUTION?

Air pollution happens when solid and liquid particles - called - aerosols - and certain gases end up in our air. These particles and gases can be bad for the planet and for our health, so keeping track of them is important.

Where do aerosols come from? :-

Any particle that gets picked up into the air or is formed from chemical reactions in the air can be an aerosol. Many aerosols enter the atmosphere when we burn fossil fuels - such as coal and petroleum - and wood. These particles can come from many sources, including car exhausts, factories and even wildfires. Some of the particles and gases come directly from these sources, but others form through chemical reactions in the air.

Certain gases in the atmosphere can cause air pollution. For example, in cities, a gas called ozone is a major cause of air pollution. Ozone is also a greenhouse gas that can be both good and bad for our Environment. It all

Industrial activities emit several pollutants in the air that affects the air quality more than we can even imagine. Particulate matter 2.5 & 10, Nitrogen dioxide, Sulfur dioxide, and Carbon monoxide are key pollutants that are emitted from industries that use coal and wood as their primary energy source for production of their goods.

Industrial pollution effects associated with your health can range from irritation in your eyes and throat to breathing issues, at times can even lead to chronic illness.

Use of toxic products also called as volatile Organic Compounds (VOCs), inadequate ventilation, ~~even~~ uneven temprature, and humidity level can cause indoor air pollution, whether you are in office, school or at your comfortable home.

Climate change is not just increasing wildfires but also spiking air pollution. Burning Stubble & farm residue is also a major contribution to wildfire. It causes increased PM2.5 in the air which collides with other harmful substances like chemical

gas and pollen creating Smog. Smog makes the air hazy & people find it difficult to breathe.

Manufacturing, chemical, and textiles industries release a large number of carbon monoxides, hydrocarbons, chemicals and organic compounds which contaminate our environment. Bacteria & fungi play a fundamental role in the biogeochemical cycles in nature. They are the key indicators of abnormal environmental conditions.

How To Control Air Pollution?

1. Using Public transports :- Using Public transport is a sure short way of contributing to less air pollution as it provides with less gas & energy, even Carpools contribute to it. In addition to less release of fuels & gas, using a public transport can also help in saving money.

2. Turn off the lights when not in use :- The energy that the lights take also contribute to air pollution, thus less consumption of electricity can save energy. Use energy saving fluorescent lights to help the environment.

3. Recycle and Reuse :- The concept on recycle & reuse is not just conserve resources and use them judicially but also is helpful for air pollution as it helps in reducing pollution emissions. The recycled products also take less power to make other products.

4. No to Plastic bags :- The use of plastic products could be very harmful to the environment as they take a very long time to decompose, due to their material made up of oil. The use of paper bags instead is a better alternative as they decompose easily and are recyclable.

5. Use of Fans instead of Air Conditioner :- The usage of Ac's takes a lot of energy and emits a lot of heat which is bad for the environment. Ac's also take a lot of power and energy to work as compared to fans.

6. Use filters for chimneys :- The gas that is emitted from fireplaces in homes and factories are extremely dangerous for air pollution and harms the air quality severely. The use of filters should be used at least if the consumption couldn't be lessened, this will help to reduce the effect of harmful gases absorbing in the air.

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CONCLUSION

In conclusion, air pollution challenges have been felt globally because life Processes have been interfered with. The government and citizens have a collective responsibility in the prevention and Control of air pollution. The effects of air Pollution will reduce upon the reduction of air pollution.

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ENVIRONMENTAL SCIENCE PROTECT

TOPIC:- AIR, WATER, SOIL, NOISE AND MARINE POLLUTION – CAUSES, EFFECTS AND CONTROL.

SUBMITTED BY:-
NAME - ANWESHA CHAKRABORTY
DEPARTMENT - POLITICAL SCIENCE HONOURS
SEMESTER - 2
COLLEGE ROLL No.- 21/BAH/0168
UNIVERSITY REGISTRATION No.- 013-1211-0062-21
COLLEGE NAME - GOKHALE MEMORIAL GIRLS' COLLEGE

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ACKNOWLEDGEMENT:-

I would like to express my special thanks of gratitude to my Environmental Science Professor who gave me the opportunity to do the project on the topic "Environmental Pollution".

This project also helped in doing lot of research on different types of pollution and I came to know about air, water, soil, noise and marine pollution and their causes, effects and control of the pollution.

This project helped me in increasing the knowledge about our Environment and the hazardous effect of the environment from the different types of pollution.

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INTRODUCTION:-

Pollution is the introduction of contaminants into the natural environment that cause adverse change. Pollution can take the form of any substance (solid, liquid or gas) or energy (such as radioactivity, heat, sound or light). Pollutants the components of pollution can be either foreign substance/energies or naturally occurring contaminants. Although environmental pollution can be caused by natural events, the word pollution generally implies that the contaminants have an anthropogenic source - that is a source created by human activities.

Major forms of pollution include air pollution, water pollution, soil pollution, marine pollution, noise pollution etc.

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AIR POLLUTION :-

Air pollution is the contamination of air due to the presence of substance in the atmosphere that are harmful for health of human and other human beings or cause of damage to the climate. Air pollution can cause diseases like allergies, and even death to humans. It can also cause harm to other living organisms such as animals and food crops and may damage the natural environment.

CAUSES OF AIR POLLUTION :-

- Burning of Fossil Fuels :-

The combustion of fossil fuels emits a large amount of sulphur dioxide. Carbon monoxide released by incomplete combustion of fossil fuels also results in air pollution.

- Automobiles :-

The gases emitted from vehicles such as jeeps, trucks etc. pollute the environment. There are the major sources of greenhouse gases and also result in diseases among individuals.

- Agricultural Activities :-

Ammonia is one of the most hazardous gases emitted during agricultural activities. The insecticides, pesticides and fertilisers emit harmful chemicals in the environment and contaminate it.

- Mining Activities :-

In the mining process, the minerals below the Earth are extracted using large pieces of equipment. The dust and chemicals released during the process not only pollute the air, but also deteriorate the health of the workers and people living in the nearby areas.

- Factories and Industries :-

Factories and Industries are the main source of carbon monoxide, organic compound, hydrocarbons and chemicals. These are released into the air, degrading the quality.

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EFFECT OF AIR POLLUTION:-

- Diseases:- Air pollution has resulted in several respiratory disorders and heart diseases among humans. The cases of lung cancer have increased in last few decades.

- Global Warming:- Due to the emission of greenhouse gases, there is an imbalance in the gaseous composition of the air. This increase in Earth's temperature is known as Global warming.

- Acid Rain:- The burning of fossil fuels releases harmful gases such as nitrogen oxides and sulphur oxides in the air. The water droplets combine with these pollutants and become acidic and fall as acid rain.

- Ozone layer depletion:- The release of chlorofluorocarbons and hydrochlorofluorocarbons in the atmosphere is the major cause of ozone layer depletion. The depleting ozone layer does not prevent the harmful UV rays coming from the sun and causes skin diseases.

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CONTROL OF AIR POLLUTION:-

- Avoid using vehicles:-
  People should avoid using vehicles for shorter distances. Rather they should prefer public mode of transport to travel from one place to another.

- Energy Conservation:-
  A large number of fossil fuels are burnt to generate electricity. Therefore do not forget to switch off the electrical appliances when not in use.

- Use of Clean Energy Resources:-
  The use of solar, wind and geothermal energies reduce air pollution at a larger level. Various countries, including India, have implemented the use of these resources as a step towards a cleaner environment.

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WATER POLLUTION:-

The poisoning of oceans, seas, lakes, rivers, aquifers and groundwater is known as water pollution. This is generally the result of human activity. Water pollution causes changes in the physical, chemical and biological changes in the characteristics of water that are harmful to any living creature. Drinking water is defined as water that is deemed safe for human and animal consumption. This water is often utilised for drinking, cooking, washing, agriculture irrigation and other purposes. However, chemicals, germs and other contaminants are already contaminating our drinking water. When water becomes contaminated, it harms all life forms that rely on it whether directly or indirectly.

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CAUSES OF WATER POLLUTION:-

- Industrial Waste:-

Many industries dump industrial waste, such as hazardous chemicals, into bodies of water before treatment. It eventually pollutes the water. The dumping of hazardous substances reduces the oxygen levels in the water, resulting in pollution.

- Pathogens:-

Pathogens or disease causing bacteria are among the most serious contaminants. Bacteria, viruses and protozoa are the most common pathogens. water borne micro-organisms cause a variety of illnesses, including diarrhoea, gastrointestinal sickness and others.

- Sewage:-

One of the primary cause of water pollution is the disposal of sewage in bodies of water. Sewage discharged into the sea discharged from both houses and industry can pollute the ocean.

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• Radioactive Waste :-

Disposal of radioactive wastes into the sea is another major source of water pollution in today's globe. Heavy metals like mercury, lead, cadmium as well as solvents from industries are examples of chemical pollutants. They are toxic to aquatic life forms causing infertility and death.

• Dumping Solid Waste :-

Dumping of solid waste is another important source of water pollution. Dumping solid trash such as plastics, cardboard etc. contaminates water and renders it unfit for human consumption.

• Organic Waste :-

Food trash, detergents, leaves, grass and other organic pollutants are examples of organic water pollutants. They are caused by residential sewage, discharge from food processing plants and farm wastes which pollute water sources by run off.

EFFECTS OF WATER POLLUTION :-

• Affects aquatic life :-

Water contamination has a significant impact on aquatic life. It affects their metabolism and behaviour as well as causing disease and death. Dioxin is a toxin that causes a variety of issues, ranging from reproductive issues to uncontrolled cell development and cancer.

• Affects food chain :-

water contamination may have a significant influence on the food chain. Cadmium and lead are two hazardous chemicals via animals which enters into the food chain and can continue to disturb at greater levels.

• Ground water contamination :-

Pesticides and fertilisers used in agricultural production pollute ground-water as well as our ecology. If this ground-water is delivered to our home via tube wells, it will cause a multitude health issues.

- Affects human health :-

Pollution affects human and faecal matter in water resources can cause illness such as hepatitis. Poor drinking water treatment and contaminated water can always lead to an epidemic of infectious illness like cholera.

- High TDS in water :-

Water is the best solvent since it quickly dissolves a wide range of compounds. TDS in drinking water should be less than 500 mg/litre. The presence of a high level of TDS in water can cause a variety of health issues in humans.

CONTROL OF WATER POLLUTION

Water pollution can be controlled by a variety of methods. Rather than releasing sewage waste into water bodies, it is better to treat them before discharge. Practising this can reduce the initial toxicity and the remaining substances can be degraded and rendered harmless by water body itself.

A very special plant, the Water Hyacinth can absorb dissolved toxic chemicals such as cadmium and other elements. Establishing these in regions prone to such kinds of pollutants will reduce the adverse affects of water pollution. Some chemical methods that help in the control of water pollution are precipitation, the ion exchange process, reverse osmosis and coagulation.

SOIL POLLUTION:-

Soil pollution refers to the contamination of soil with anomalous concentrations of toxic substances. It is a serious environmental concern since it causes many health hazardous. For example, exposure to soil containing high concentrations of benzene increases the risk of contracting leukemia.

CAUSES OF SOIL POLLUTION:-

Manmade Pollutants:-

- Accidental spills and leaks during storage, transport or use of chemicals.
- Foundry activities and manufacturing processes that involve furnaces.
- Mining activities involving the crushing and processing of raw material.
- Construction activities.
- Transportation activities, releasing toxic vehicle emissions.
- Chemical waste dumping
- Diffusion of insecticides, pesticides and fertilizers.

NATURAL POLLUTANTS:-

- Natural accumulation of compounds in soil due to imbalances between atmospheric deposition and leaking away with precipitation water.
- Natural production in soil under certain environmental conditions.
- Leaks from sewer lines into subsurface (ex- adding chlorine which could generate trihalomethanes such as chloroform).

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EFFECTS OF SOIL POLLUTION :-

• EFFECTS ON HUMAN BEINGS :-

Soil contaminants can exist in all three phases (solid, liquid and gas). Therefore, these contaminants can find their way into human body via several channels such as direct contact with the skin or through the inhalation of contaminated soil dust.

The short term effects of human exposure to polluted soil include:

- Headache
- Irritation of the skin and the eyes.
- Fatigue and weakness.
- Coughing and chest in the pain.

The long term effects of human exposure to polluted soil include:-

- exposure to high level lead can led to permanent damage to nervous system.
- Damage to vital organs such as the kidney and liver.
- High risk of developing cancer
- Depression of CNS (Central Nervous system).

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EFFECTS ON PLANTS AND ANIMALS :-

Since Soil pollution is often accompanied by a decrease in the availability of nutrients, plant life ceases to thrive in such soils. Soils contaminated with inorganic aluminium can prove toxic to plants. Also, this type of pollution often increases the salinity of the soil, making it unsuitable for the growth of plant life.

EFFECTS ON ECOSYSTEM :-

- Since the volatile contaminants in the soil can be carried away into the atmosphere by winds. Soil pollution can be direct contributor to air and water pollution.
- It can also contribute to acid rain.
- Acidic soils are unsuitable to several microorganisms that improve soil texture and help in decomposition of organic matter.
- Crop yield is greatly affected by this form of pollution.

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CONTROL OF SOIL POLLUTION:-

- Excavation and subsequent transportation of polluted soils to remote and uninhabited locations.

- Bioremediation or phytoremediation involves the use of microorganisms and plants for the decontamination of soil.

- Mycoremediation involves the use of fungi for the accumulation of heavy metal contaminants

- Extraction of pollutants via thermal remediation.

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NOISE POLLUTION:-

The word 'noise' is derived from the latin word "Nausea" which means sickness in which one feels the need to vomit. Noise is the unpleasant and undesirable sound which leads to discomfort in human beings. The intensity of sound is measured in decibels (dB).

TYPES OF NOISE POLLUTION:-

- Transport Noise:-
  It mainly consists of traffic noise which has increased in recent years with increase in number of vehicles.

- Neighbourhood Noise:-
  The noise from gadgets, household utensils etc. Some of the main sources are musical instruments, transistors, loudspeakers etc.

- Industrial Noise:- It is the high intensity sound which is caused by industrial machines.

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CAUSES OF NOISE POLLUTION:-

- Industrialisation:
  It has led to an increase in noise pollution as the use of heavy machinery such as generators, mills, huge exhaust fans are used resulting in the production of unwanted noise.

- Vehicles: Increased the number of vehicles on the roads are the second reason of noise pollution.

- Events: Weddings, public gatherings involve loudspeakers to play music resulting in the production of unwanted noise in the neighbourhood.

- Construction sites: Mining, construction of buildings etc. add to the noise pollution.

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EFFECTS OF NOISE POLLUTION:-

- Hypertension:-
  It is a direct result of noise pollution which is caused due to elevated blood levels for a longer duration.

- Hearing Loss:-
  Constant exposure of human ears to loud noise that are beyond range of sound that human ears cannot withstand and causes damage of ears.

- Sleeping disorders:- Lack of sleep might result in fatigue and low energy level throughout the day affecting everyday activities. Noise pollution hampers the sleep leading to irritation and uncomfortable state of mind.

- Cardio vascular issues:-
  Heart related problems such as blood pressure level, stress and cardio vascular diseases might come up in a normal person and a person suffering from any of these diseases might feel a sudden shoot up in the level.

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CONTROL OF NOISE POLLUTION:-

- Honking in public places like teaching institutes, hospitals should be banned.
- In commercial, hospital and industrial buildings, adequate sound proof should be installed.
- Musical instruments sound should be be controlled to desirable limits.
- Dense tree cover is useful in preventing noise pollution.
- Explosives should not be used in forest, mountainous and mining areas.

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MARINE POLLUTION :-

Marine pollution occurs when substances used or spread by humans, such as industrial, agricultural and residential waste, particles, noise, excess carbondioxide or invasive organisms enter the ocean and cause harmful effects there. The majority of the waste comes from land based activity, although marine transportations significantly contributes as well.

Since most inputs come from land, either via the rivers, sewage or the atmosphere, it means that continental shelves are more vulnerable to pollution. Air pollution is also a contributing factor by carrying off iron, carbonic acid, nitrogen, silicon, sulfur, perticides or dust particles into the ocean.

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CAUSES OF MARINE POLLUTION:-

The marine environment becomes polluted and contaminated through various sources and forms. Major Sources of marine pollution are the inflow of chemicals, solid waste, discharge of radioactive elements, industrial and agricultural effluents, man-made sedimentation, oil spills and many such factors.

The majority portion of the land contribute to the marine pollution. Air pollution also carries pesticides from farms and dusts into the marine waters. Air and land pollution is a major contributor to the growing marine pollution that is not only hampering the acquatic ecology but also affecting the life on land. The non-point sources like wind blown debris, agricultural runoff and dust become the major source of pollution.

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EFFECTS OF MARINE POLLUTION:-

The contamination of water by excessive nutrients is known as nutrient pollution, a type of water pollution that affects life under water. When excess nutrients like nitrates, phosphates get dissolved with the water it causes the eutrophication of surface waters, as it stimulates the growth of algae due to excess nutrients. Most of Benthic animals and plankton are either feeders or deposit feeders take up the tiny particles adhere to potentially toxic chemicals.

When the marine ecosystem absorbs the pesticides, they are incorporated into the food webs of the marine ecosystem. After getting dissolved in the marine food webs, these harmful pesticides causes mutations, and also results in diseases which can damage the entire food web and cause harm to the humans.

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CONTROL OF MARINE POLLUTION:-

We have to stop using plastic and littering garbage that they not only choke the drains but also released into the oceans.

For farmers, they need to switch from chemical fertilizers and pesticides and move towards the usage of organic farming methods.

Use public transport and reduce the carbon footprint by taking small and substantial measures that will not help in reducing the pollution from the environment but will ensure a safe and healthy future for the upcoming generations.

Prevent from any oil or chemical spill in the oceans and if in case there is an oil or chemical spill and help in cleaning out in ocean water.

Volunteer or initiate beach can clean up activities and spread awareness about the same in the nearby vicinity.

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CONCLUSION:-

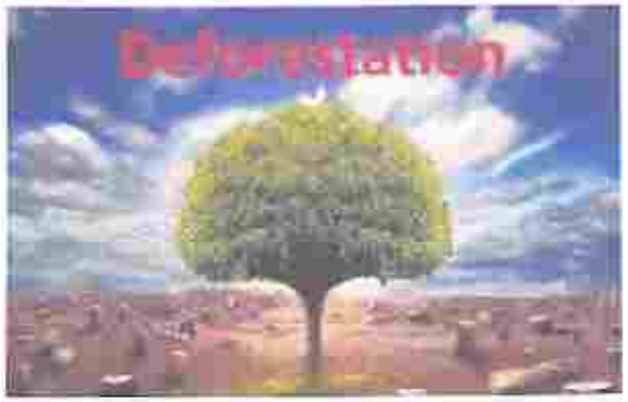
Environmental Pollution is causing a lot of distress not only to humans but also to animals, driving many animal species to endangerement and extinction. The transboundary nature of environmental pollution makes it even more difficult to manage it. Everything in our planet is interconnected and while the nature supplies us with valuable environment services without which we cannot exist, we all depend on each other's actions and the way we treat natural resources.

It is widely recognized that are hugely overspending our current budget of natural resources at the existing rates of its exploitation, there is no way for environment to recover in good time and continue performing well in the future.

Samanta
25/05/2022

Teacher's Signature

DEFORESTATION



NAME- RITIKA MAJUMDAR

ROLL NO- 21/BAH/0178

UNIVERSITY REGISTRATION NUMBER- 013-1211-0068-21

DEPARTMENT- POLITICAL SCIENCE

SEMESTER- 2ND SEMESTER

CONTENT

INTRODUCTION-

Deforestation is the permanent removal of trees to make room for something besides forest. Deforestation can include clearing the land for farming or livestock, or using the timber for fuel, construction or manufacturing, urbanisation.

Forests are an important natural resource, but humans have destroyed substantial quantities of forested land.

Today, most deforestation is happening in the tropics. Areas that were inaccessible in the past are now within reach as people build new roads through the dense forests. The world has lost about 10% of its tropical tree cover since 2000, and nearly 47,000 square miles.

Causes of deforestation-

1. Agricultural Activities

Agricultural activities are one of the significant factors affecting deforestation. According to the FAO, agriculture leads to around 80% of deforestation.

Due to the overgrowing demand for food products, a huge number of trees are felled to grow crops, and 33% of agriculture-caused deforestation is because of subsistence agriculture.

2. Livestock Ranching

Livestock is believed to be responsible for about 14% of global deforestation. Farmers often clear the land by cutting down trees and burning them to raise livestock and grow food. They continue to use the property until the soil is completely degraded and repeat the same process on new woodland.

3. Illegal Logging

Apart from this, wood-based industries like paper, match-sticks, furniture, etc. also need a substantial amount of wood supply. Wood is used as fuel, both directly and indirectly.

Therefore, trees are chopped for meeting the demand for supplies. Firewood and charcoal are examples of wood being used as fuel. Some of these industries thrive on illegal wood cutting and felling of trees.

4. Urbanization

Further, to gain access to these forests, the construction of roads is undertaken; here again, trees are chopped to build roads. Overpopulation too directly affects forest covers, as with the expansion of cities, more land is needed to establish housing and settlements. Therefore, forest land is reclaimed.

5. Mining

Oil and coal mining requires a considerable amount of forest land. Apart from this, roads and highways have to be built to make way for trucks and other equipment. The waste that comes out from mining pollutes the environment and affects the nearby species.

6. Forest Fires

Another valid example would be forest blazes; hundreds of trees are lost each year due to forest fires in various portions of the world. It

happens due to extreme warm summers and milder winters. Fires, whether caused by man or nature, results in a massive loss of forest cover.

7. Paper

According to the Environment Paper Network, the paper that's thrown away each year accounts for approximately 640 million trees. **America, China, Canada, Japan, constitute more than that of the world's paper production,** and that is 400 million tons a year.

If we recycled, that could save 27.5 million tons of carbon dioxide from going into the atmosphere. We allow the forests to continue to remain as a favourable ecosystem and wildlife habitat if we use recycled paper.

8. Overpopulation

The overpopulation requires more land to establish housing and settlements. It generates a significant need for food and farmland to grow food and raise livestock. It automatically requires many more

roads and highways for transport and communication—all these results in deforestation. Logging industries cut down trees for furniture, paper, building materials, and many more products.

Moreover, the growing human population is directly linked to deforestation. Therefore, it becomes almost essential to purchase from sustainable companies that actively work against deforestation.

Consequences of deforestation-

1. Climate Imbalance and Climate Change

Deforestation also affects the climate in many ways. Forests are the lungs of our planet. Trees take in carbon dioxide and release oxygen and water vapor in the air, and that is why tropical rainforests are extremely humid.

Trees also provide shade that keeps the soil moist. All these are compromised with the lack of trees. It leads to the imbalance in the

atmospheric temperature, drier climate, further making conditions for the ecology difficult that leads to climate change.

Several animals and plant species that form the flora and fauna across the world are vastly accustomed to their natural habitat. Therefore, haphazard clearance of forests would make it very difficult for them to survive or to shift from their native environment or adapt to new habitats.

When a forest is cut down, the humidity levels come down and cause the remaining plants to dry out. The drying out tropical rainforests increases fire damage that destroys forests rapidly and harms wild animals as well as humans.

2. Increase in Global Warming

Trees play a major role in controlling global warming. The trees utilize greenhouse gases, restoring the balance in the atmosphere. With constant deforestation, the ratio of greenhouse gases in the atmosphere has increased, adding to our global warming woes.

3. Increase in Greenhouse Gas Emissions

Forests help to mitigate carbon dioxide and other toxic greenhouse gas emissions. However, once they're cut, burned, or otherwise removed, they become carbon sources.

It's estimated that deforestation is responsible for around 20 percent of greenhouse gas emissions, and due to tropical deforestation, 1.5 billion tons of carbon is released every year in the atmosphere.

4. Soil Erosion

Trees are also crucial for our local water cycles as they keep on returning water vapor to the atmosphere. The soil remains moist as the rainwater percolates within the soil.

The fertile soil is held in place by intricate root structures of many layers of trees. With the clearance of tree cover, the land is directly exposed to the sun, making it dry.

Without trees, erosion often occurs and sweeps the land into nearby rivers and streams. Forests serve as nature's water purification plants. Soil erosion makes soil exposed to contaminants that leach into the

water supply, which damages the quality of our drinking water.

5. Floods

When it rains, trees absorb and store a large amount of water with the help of their roots. When they are cut down, the flow of water is disrupted, and the soil loses its ability to retain water. It leads to floods in some areas and droughts in others.

6. Wildlife Extinction & Habitat Loss

Due to the massive felling down of trees, various animal species are lost. They lose their habitat and also forced to move to a new location. Many of them are even pushed to extinction.

Our world has lost innumerable species of plants and animals in the last couple of decades. A study of the Brazilian Amazon forecasts that up to 90% of predicted extinctions will occur until the next 40 years.

7. Acidic Oceans

The increased levels of carbon dioxide in the atmosphere due to deforestation and burning fossil fuels make our oceans more acidic. Since the Industrial Revolution, beaches are already 30 percent more acidic, posing ocean species and ecosystems at extreme risk.

8. The Decline in Life Quality of People

People in millions all over the world depend on forest for hunting, small-scale agriculture, gathering, and medicine. Everyday materials we use, such as latex, cork, fruit, nuts, natural oils, and resins are found in the tropical forests.

Deforestation disrupts the lives of millions of people. In Southeast Asia, deforestation has contributed to social conflict and migration. Poor people from Brazil have been lured from their villages to soy

plantations where they are abused and forced at gunpoint to work under inhumane conditions.

9. Food Insecurity in the Future

Deforestation for food may result in food insecurity in the future. Currently, 52% of all the land used for food production is moderately or severely impacted by soil erosion. In the long term, the lack of fertile soil can lead to low yields and food insecurity.

10. Loss of Biodiversity

Deforestation leads to a huge loss of biodiversity About 80% of the global biodiversity is located in tropical rainforest Forests not only provide habitats for wildlife but also foster medicinal conservation.

The forest acts as a critical medium to preserve the wide variety of species. It also destroys the microbial community that is responsible for the production of clean water, the removal of pollutants and the recycling of nutrients.

Remedial measure-

1. Government Regulations

The best solution to deforestation is to **curb the felling of trees by enforcing a series of rules and laws to govern it**. Deforestation in the current scenario may have reduced; however, it would be too early to assume.

The money-churner nature of forest resources can be tempting enough for deforestation to continue.

2. Banning Clear-Cutting of Forests

This will curb the total depletion of the forest cover. It is a practical solution is very feasible.

3. Reforestation and Afforestation

Land skinned of its tree cover for urban settlements should be urged to plant trees in the vicinity and replace the cut trees. Also, the cutting must be replaced by planting young trees to replace the older ones that were cut.

Trees are being planted under several initiatives every year, but they still don't match the numbers of the ones we've already lost.

4. Reduce Consumption of Paper-

Your daily consumption of paper includes printing paper, notebooks, napkins, toilet paper, etc. Try to reduce consumption, reduce waste of paper and also opt for recycled paper products.

Make life simple such as printing/writing on both sides of the paper, using less toilet paper, avoiding paper plates, and napkins and wherever possible, go paperless.

5. Educate Others

Still, many are entirely unaware of the global warming problem we're facing. Educate your friends, family, and community by sharing the deforestation facts, and its causes and effects. You can make an impact!

7. Purchase from Sustainable, Forest-Friendly Companies

Try to purchase from companies that are committed to reducing deforestation. Asian Pulp and Paper, Disney, L'Oreal, Hershey, Unilever, Willmar International are deforestation-free.

8. Reduce Consumption of Deforestation Prone Products

Palm oil is a common ingredient in absolutely everything we see around us. Make it a simple habit to get a quick peek at the ingredients. Soybeans are another deforestation hotspot.

Try finding ways to reduce consumption or opting for organic, local soy products and, if possible, avoid it completely.

Conclusion-

Educating people around us would create awareness about the negative effects of deforestation. Planting more and more trees and using renewable wood resources can be of great help. Eating less meat or turning vegan would protect the forest from livestock ranching. Reduce and recycle the use of paper. The government must have forest-friendly policies. It shall ban the cutting down of forests.

If each one of us pledges today to follow the above steps, then together we can ensure a better future for us and our planet.

Samanta
25/05/2022

NAME:SHAILJA GAUTAM

ROLL:21/BAH/0182

DEPARTMENT:POLITICAL SCIENCE

COURSE:BA HONOURS

COLLEGE:GOKHALE MEMORIAL GIRLS' COLLEGE

COORDINATOR:MR.SANTANU SAMANTA

SEMESTER:2

DATE:24/05/2022

REGISTRATION NUMBER: 013- 1211-0071-21

CU ROLL NUMBER:212013-11-0053

TOPIC: AIR POLLUTION

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I would like to thanks my professor Mr. Santanu Samanta my principal DR(MRS)Atashi Karpha for giving me a golden oppourtunity to do tutorial on topic"Air pollution" .It helped me alot to know about it.

Secondly,I would like to thanks my parents who helped me in completing this tutorial on time.

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INTRODUCTION

Air pollution is the contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the climate or to materials. There are many different types of air pollutants, such as gases (including ammonia, carbon monoxide, sulfur dioxide, nitrous oxides, methane, carbon dioxide and chlorofluorocarbons), particulates (both organic and inorganic), and biological molecules. Air pollution can cause diseases, allergies, and even death to humans; it can also cause harm to other living organisms such as animals and food crops, and may damage the natural environment (for example, climate change, ozone depletion or habitat degradation) or built environment (for example, acid rain). Both human activity and natural processes can generate air pollution.

Air pollution is a significant risk factor for a number of pollution-related diseases, including respiratory infections, heart disease, COPD, stroke and lung cancer.Growing evidence suggests that air pollution exposure may be associated with reduced IQ scores, impaired cognition,increased risk for psychiatric disorders such as depression and detrimental perinatal health.The human health effects of poor air quality are far reaching, but principally affect the body's respiratory system and the cardiovascular system. Individual reactions to air pollutants depend on the type of pollutant a person is exposed to, the degree of exposure, and the individual's health status and genetics.

SOURCES OF AIR POLLUTION

Smoke stacks of fossil fuels and biomass power stations (see for example environmental impact of the coal industry)

burning of traditional biomass such as wood, crop waste and dung. (In developing and poor countries, traditional biomass burning is the major source of air pollutants

Mobile sources include motor vehicles, trains (particularly diesel locomotives and DMUs), marine vessels and aircraft.

Controlled burn practices in agriculture and forest management. Controlled or prescribed burning is a technique sometimes used in forest management, farming, prairie restoration or greenhouse gas abatement. Fire is a natural part of both forest and grassland ecology and controlled fire can be a tool for foresters. Controlled burning stimulates the germination of some desirable forest trees, thus renewing the forest.

Fumes from paint, hair spray, varnish, aerosol sprays and other solvents. These can be substantial; emissions from these sources was estimated to account for almost half of pollution from volatile organic compounds in the Los Angeles basin in the 2010s.

Waste deposition in landfills, which generate methane. Methane is highly flammable and may form explosive mixtures with air. Methane is also an asphyxiant and may displace oxygen in an enclosed space. Asphyxia or suffocation may result if the oxygen concentration is reduced to below 19.5% by displacement.

Military resources, such as nuclear weapons, toxic gases, germ warfare and rocketry.

Agricultural emissions contribute substantially to air pollution.

Fertilized farmland may be a major source of nitrogen oxides.Dust from natural sources, usually large areas of land with little vegetation or no vegetation

Methane, emitted by the digestion of food by animals, for example cattle

POLLUTANTS

An air pollutant is a material in the air that can have adverse effects on humans and the ecosystem.The substance can be solid particles, liquid droplets, or gases. A pollutant can be of natural origin or man-made. Pollutants are classified as primary or secondary. Primary pollutants are usually produced by processes such as ash from a volcanic eruption. Other examples include carbon monoxide gas from motor vehicle exhausts or sulfur dioxide released from factories. Secondary pollutants are not emitted directly. Rather, they form in the air when primary pollutants react or interact. Ground level ozone is a prominent example of a secondary pollutant. Some pollutants may be both primary and secondary: they are both emitted directly and formed from other primary pollutants.

Pollutants emitted into the atmosphere by human activity include:

Carbon dioxide (CO2): Because of its role as a greenhouse gas it has been described as "the leading pollutant" and "the worst climate pollutant".Carbon dioxide is a natural component of the atmosphere, essential for plant life and given off by the human respiratory system.

Sulfur oxides (SOx): particularly sulfur dioxide, a chemical compound with the formula SO2. SO2 is produced by volcanoes and in various industrial processes. Coal and petroleum often contain sulfur compounds, and their combustion generates sulfur dioxide.

Nitrogen oxides (NOx): Nitrogen oxides, particularly nitrogen dioxide, are expelled from high temperature combustion, and are also produced during thunderstorms by electric discharge. They can be seen as a brown haze dome above or a plume downwind of cities. Nitrogen dioxide is a chemical compound with the formula NO2. It is one of several nitrogen oxides. One of

HEALTH EFFECTS

Even at levels lower than those considered safe by United States regulators, exposure to three components of air pollution, fine particulate matter, nitrogen dioxide and ozone, correlates with cardiac and respiratory illness. In 2020, pollution (including air pollution) was a contributing factor to one in eight deaths in Europe, and was a significant risk factor for pollution-related diseases including heart disease, stroke and lung cancer.The health effects caused by air pollution may include difficulty in breathing, wheezing, coughing, asthma and worsening of existing respiratory and cardiac conditions. These effects can result in increased medication use, increased doctor or emergency department visits, more hospital admissions and premature death. The human health effects of poor air quality are far reaching, but principally affect the body's respiratory system and the cardiovascular system. Individual reactions to air pollutants depend on the type of pollutant a person is exposed to, the degree of exposure, and the individual's health status and genetics. The most common sources of air pollution include particulates, ozone, nitrogen dioxide, and sulfur dioxide. Children aged less than five years who live in developing countries are the most vulnerable population in terms of total deaths attributable to indoor and outdoor air pollution.

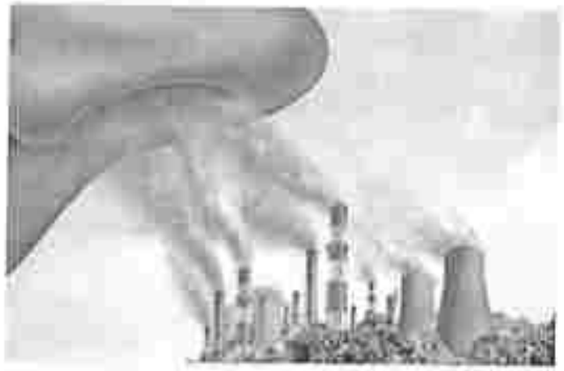
Agricultural effects

In India in 2014, it was reported that air pollution by black carbon and ground level ozone had reduced crop yields in the most affected areas by almost half in 2011 when compared to 1980 levels.

HISTORICAL DISASTER

The world's worst short-term civilian pollution crisis was the 1984 Bhopal Disaster in India.[157] Leaked industrial vapours from the Union Carbide factory, belonging to Union Carbide, Inc., U.S.A. (later bought by Dow Chemical Company), killed at least 3787 people and injured from 150,000 to 600,000. The United Kingdom suffered its worst air pollution event when the 4

December Great Smog of 1952 formed over London. In six days more than 4,000 died and more recent estimates put the figure at nearer 12,000. An accidental leak of anthrax spores from a biological warfare laboratory in the former USSR in 1979 near Sverdlovsk is believed to have caused at least 64 deaths.The worst single incident of air pollution to occur in the US occurred in Donora, Pennsylvania, in late October 1948, when 20 people died and over 7,000 were injured.



Reduction and regulation

Pollution prevention seeks to prevent pollution such as air pollution and could include adjustments to industrial and business activities such as designing sustainable manufacturing processes (and the products' designs) and related legal regulations as well as efforts towards renewable energy transitions.

Efforts to reduce particulate matter in the air may result in better health.

Pollution control

Various pollution control technologies and strategies are available to reduce air pollution. At its most basic level, land-use planning is likely to involve zoning and transport infrastructure planning. In most developed countries, land-use planning is an important part of social policy, ensuring that land is used efficiently for the benefit of the wider economy and population, as well as to protect the environment.

Pollution-eating nanoparticles placed near a busy road were shown to absorb toxic emission from around 20 cars each day.

CONCLUSION

The health of the public, especially those who are the most vulnerable, such as children, the elderly and the sick, is at risk from air pollution, but it is difficult to say how large the risk is. It is possible that the problem has been over-stressed in relation to other challenges in the field of public health.

As we have seen, there are considerable uncertainties in estimating both exposures and effects and their relationships. It may be, for example, that the effects of long-term exposure to lower concentrations of air pollutants could be more damaging to public health than short-term exposure to higher concentrations. For this reason alone, local authorities could take action to assess and improve local air quality. It is not sufficient to wait for an episode of severe air pollution and then try to deal with its effects.

Another reason for action on air pollution is that we do not know the contribution which exposure to air pollutants may make to deaths from, for example, heart disease. In many countries heart disease is a leading cause of death and even a small contribution from air pollution could mean a significant and important effect on public heath.

Samanta
25/05/2022