Lec. 1

What Is Environmental Protection?

Environmental protection can be defined as the prevention of unwanted changes to ecosystems and their constituent parts, and This includes:

- the protection of ecosystems and their constituent parts from changes associated with human activities.

- the prevention of unwanted natural changes to ecosystems and their constituent parts.

And the environmental protection is the practice of protecting the natural environment by individuals, organizations and governments. and this through preventing the emission of pollutants or reducing the presence of polluting substances in environmental media. It may consist of:

1- Changes in consumption patterns.
2- Changes in characteristics of goods and services.
3- Changes in production techniques.
4- Recycling.
5- Treatment or disposal of residuals in separate environment protection facilities.
6- Prevention of degradation of the landscape and ecosystems.

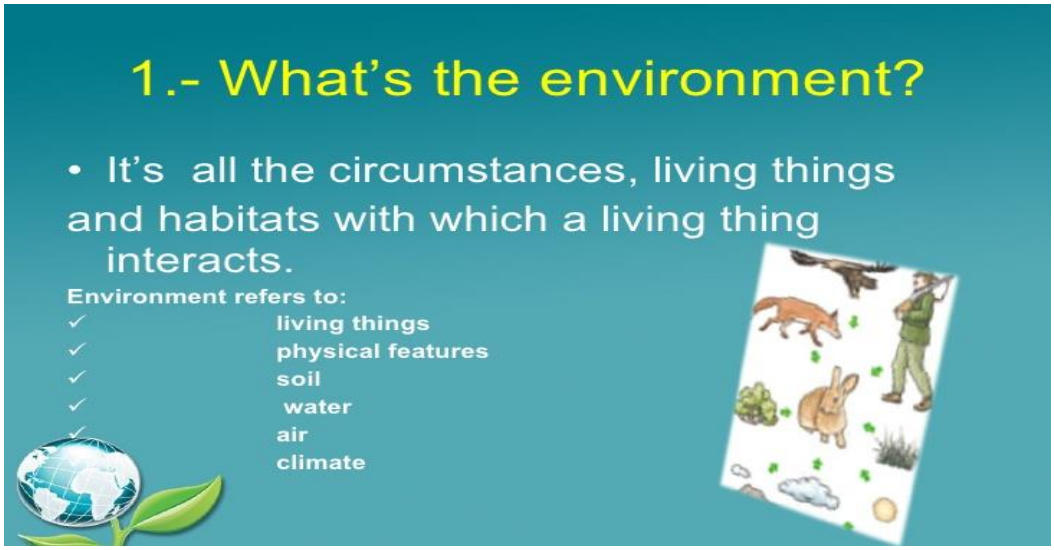
Preservation refers to the protection of an ecosystem or natural environment from change.

Conservation is generally associated with the sustainable use of natural resources.

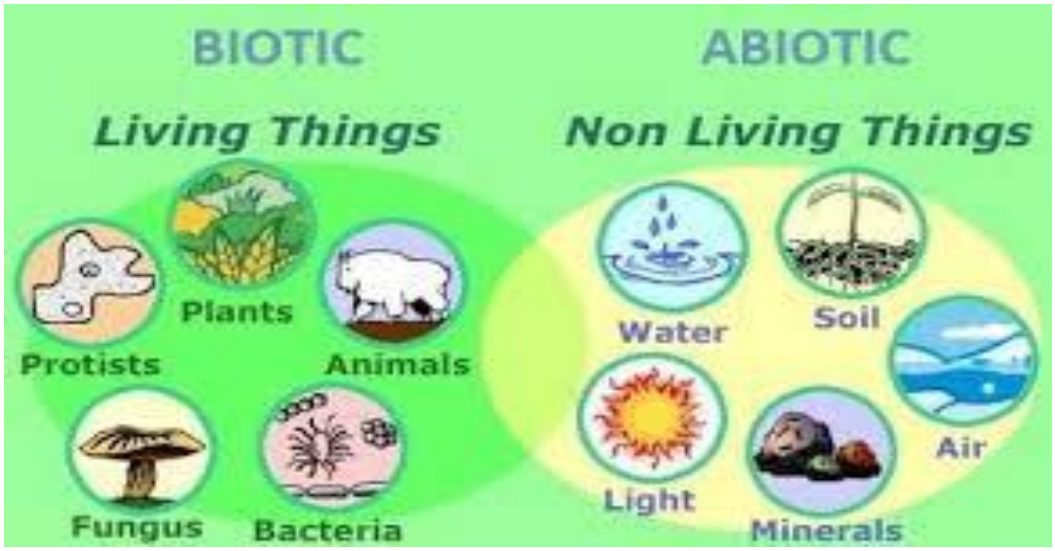
The objective of conservation is to ensure the maintenance of a stock of renewable resources that is being exploited for human purposes rather than the protection of the natural environment from any anthropogenic modifications

Lec. 2

The environment



The **environment** is defined as the whole physical and biological system surrounding man and other organisms along with various factors influencing them. The factors are soil, air, water, light, temperature etc. These are called Abiotic factors. Besides the abiotic factors, the environment is very much influenced by biotic factors which include all forms of life like plants, animals, microorganisms etc.



Ecology

living organisms and their nutrition, It is the science that cares about residential communities or ,ways of life and presence in societies factors such as climate It also includes studying non-living .peoples air) and the properties (heat, humidity, radiation, water gases and .physical and chemical properties of the earth, water, and air

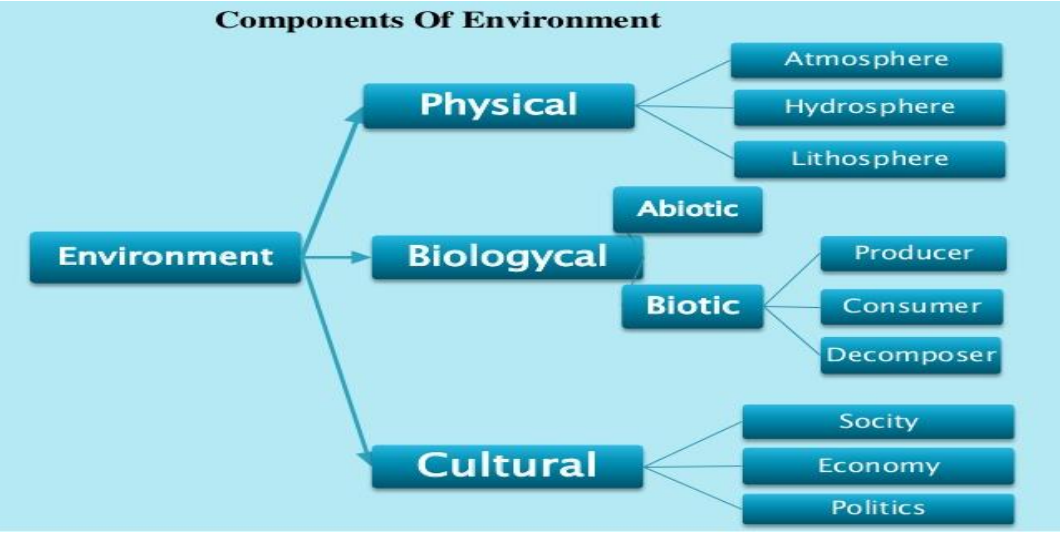
Environmental elements

The environment can be divided into three components:

natural environment : It consists of four closely interconnected systemsthe atmosphere, the hydrosphere, the lithosphere , and the air, soil, minerals, and energy sources in ,biosphere. including water .addition to plants and animals

Biological environment: It includes the individual, his family, and his The biological .community, as well as living things in the biosphere .environment is part of the natural environment

Social environment: By this means a framework of relations that s life with others, that 'determines what is the relationship of a person framework of relations which is the basis for organizing any group of groups, whether between their members in one another in an environment, or between different or similar groups together



The concept of environmental pollution

is defined as the undesirable change in physical, chemical and biological characteristics of our air, land and water. As a result of over-population, rapid industrializations, and other human activities like agriculture and deforestation etc., earth became loaded with diverse pollutants that were released as by-products. Pollutants are generally grouped under two classes:

(a) Biodegradable pollutants : Biodegradable pollutants are broken down by the activity of micro-organisms and enter into the biogeochemical cyrcles. Examples of such pollutants are domestic waste products, urine and faucal matter, sewage, agricultural residue, paper, wood and cloth etc.

(b) Non- Biodegradable pollutants: Non-biodegradable pollutants are stronger chemical bondage, do not break down into simpler and harmless products. These include various insecticides and other pesticides, mercury, lead, arsenic, aluminum, plastics, radioactive waste etc.

Table : term used to described pollutant concentration

ppm= parts per milliona
ppb = parts per billion (one thousand times smaller than ppm)
ppt = parts per trillion (1 million times smaller than ppm)
ppq = parts per quadrillion (1 billion times smaller than ppm)
To grasp these concentrations, consider the following:
1 ppm = 1 pound contaminant in 500 tons (1 million pounds)
1 ppb = 1 pound of contaminant in 500 000 tons
1 ppt = 1 pound of contaminant in 500 000 000 tons
1 ppq = 1 pound of contaminant in 500 000 000 000 tons.
For a different perspective, think about periods of time:
1 ppm is equivalent to 1 second in 11.6 days
1 ppb is equivalent to 1 second in 32 years
1 ppt is equivalent to 1 second in 32 000 years
1 ppq is equivalent to 1 second in 32 000 000 years

* ppm, ppb, etc. refer to parts by weight in soil, water, or food. In air, they refer to parts per volume.

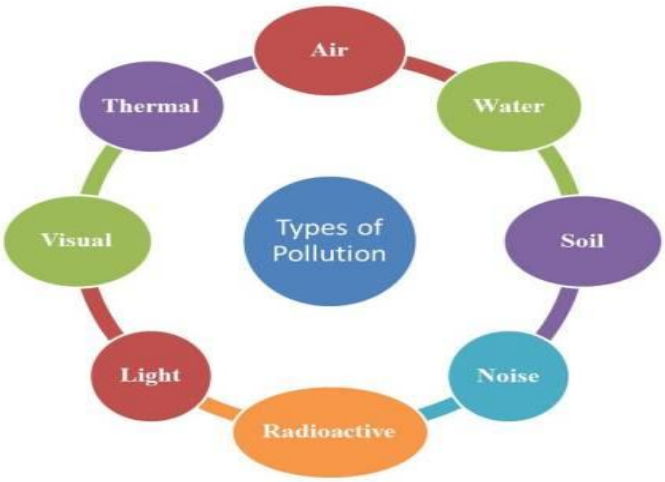
Lec. 3

Types of pollution

Generally , there are several types of pollution, and while they may come from different sources and have different consequences, understanding the basics about pollution can help environmentally conscious individuals minimize their contribution to these dangers. In

total, there are nine recognized sources of pollution in the modern world.These types of pollution are :

Air pollution / Water pollution / Soil pollution / Noise pollution / Radioactive pollution / Thermal pollution / Light pollution / Visual pollution / Personal pollution .



Air Pollution

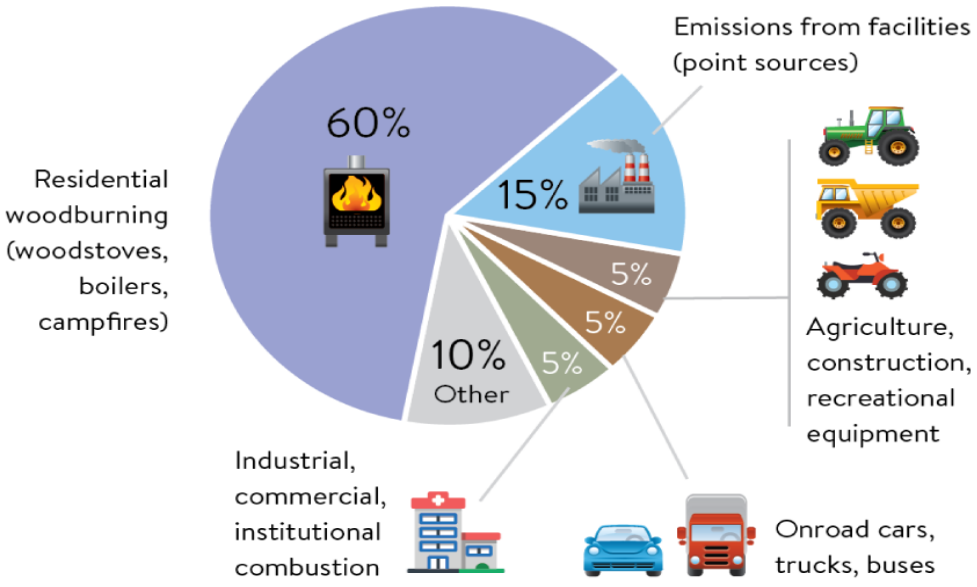
Air is mainly a mixture of various gases such as oxygen, carbon dioxide, nitrogen. These are present in a particular ratio. Whenever there is any imbalance in the ratio of these gases, air pollution is caused. The sources of air pollution can be grouped as under:

* Natural : such as, forest fires, ash from smoking volcanoes, dust storm and decay of organic matters.

*Man-made : due to population explosion, deforestation, urbanization , industrializations , energy production , agriculture.

Certain activities of human beings release several pollutants in air, such as carbon monoxide (CO), sulfur dioxide (SO2), hydrocarbons (HC), oxides of nitrogen (NOx), lead, arsenic, asbestos, radioactive matter, and

dust. The major threat comes from burning of fossil fuels, such as coal and petroleum products. Thermal power plants, automobiles and industries are major sources of air pollution as well. Due to progress in atomic energy sector, there has been an increase in radioactivity in the atmosphere. Mining activity adds to air pollution in the form of particulate matter. Progress in agriculture due to use of fertilizers and pesticides has also contributed towards air pollution. Indiscriminate cutting of trees and clearing of forests has led to increase in the amount of carbon dioxide in atmosphere. Global warming is a consequence of green house effect caused by increased level of carbon dioxide (CO2). Ozone (O3) depletion has resulted in UV radiation striking our earth.



Types and sources of Air Pollution

that together contribute about 90 percent

There are five primary pollutants

of the global air pollution. These are carbon

oxides (CO and CO2), nitrogen oxides, sulfur

(oxides, volatile organic compounds (mostly hydrocarbons

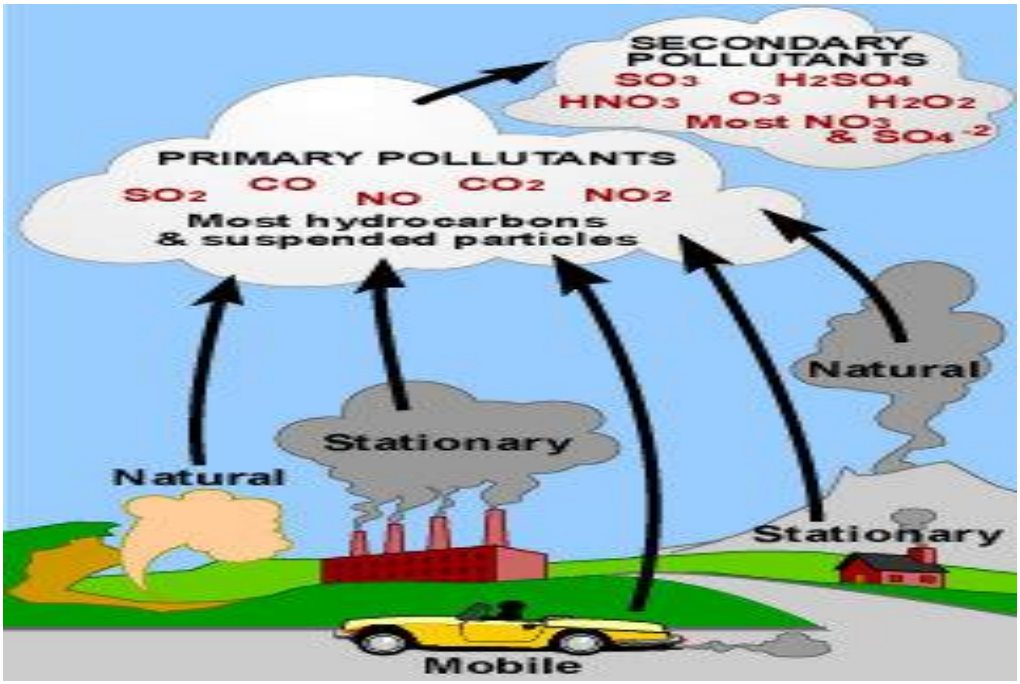
and suspended particulate matter

Pollutants that are produced in the atmosphere

when certain chemical reactions take place

among the primary pollutants are called secondary

pollutants. Eg: sulfuric acid, nitric acid, carbonic



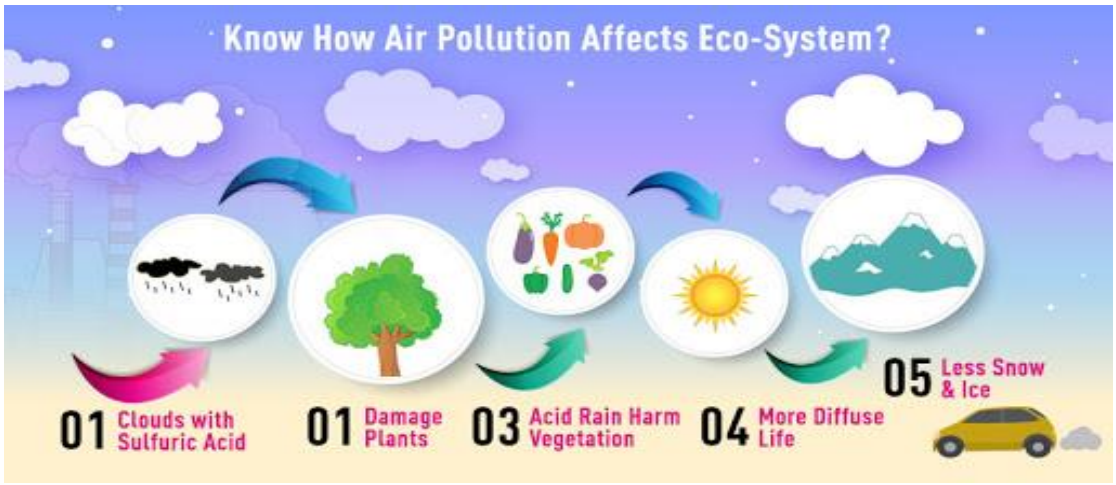
Harmful Effects of air pollution :

(a) It affects respiratory system of living organisms and (a) causes bronchitis, asthma, lung cancer, pneumonia etc. Carbon monoxide (CO) emitted from motor vehicles and cigarette smoke affects the central nervous system.

(b) Due to depletion of ozone layer, UV radiation reaches the earth. UV radiation causes skin cancer, damage to eyes and immune system.

(c) Acid rain is also a result of air pollution. This is caused by presence of oxides of nitrogen and sulfur in the air. These oxides dissolve in rain water to form nitric acid and sulfuric acid respectively. Various monuments, buildings, and statues are damaged due to corrosion by acid present in the rain. The soil also becomes acidic. The cumulative effect is the gradual degradation of soil and a decline in forest and agricultural productivity.

(d) The green house gases, such as carbon dioxide (CO2) and methane (CH4) trap the heat radiated from earth. This leads to an increase in earth's temperature.



Indoor air pollution

Air pollution in the human living environment – living rooms and workplaces – are affect the human health considerably.

Room ventilation also affects the air pollution level.

Ventilation should be balanced with the need to maintain the optimum temperature in dwelling premises

main sources of the indoor air pollution

- Kitchens stoves / furniture domestic / Animals / Painted surfaces / Polymers

Lec. 4

water pollution

What is water pollution?

Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a stream, river, lake, ocean, aquifer, or other body of water, degrading water quality and rendering it toxic to humans or the environment.

What Are the Causes of Water Pollution?

Known as a “universal solvent,” water is able to dissolve more substances than any other liquid on earth. It’s the reason we have brilliant blue waterfalls. It’s also why water is so easily polluted. Toxic substances from farms, towns, and factories readily dissolve into and mix with it, causing water pollution.

Types of water pollution

There are many types of water pollution because water comes from many sources. Here are a few types of water pollution:

1. Surface water pollution

Surface water includes natural water found on the earth's surface, like rivers, lakes, lagoons and oceans. Hazardous substances coming into contact with this surface water, dissolving or mixing physically with the water can be called surface water pollution

2. Ground water pollution

When humans apply pesticides and chemicals to soils, they are washed deep into the ground by rainwater. This gets to underground water, causing pollution underground.
This means when we dig wells and bore holes to get water from underground, it needs to be checked for ground water pollution.

3.Agriculture

Agriculture plays a major role in water pollution around the world. Everyday, farms release large quantities of organic matter, agrochemicals, sediments, drug residues, and saline drainage into bodies of water. Nitrate from manure, fertilizers, ammonia, and waste is one of the most common contaminants found in groundwater aquifers. These toxins can harm fish and other animals. Nitrates also soak into the ground and can end up in drinking water

4.Wastewater and Sewage and Urban development

Wastewater and Sewage is any type of water that is used for industrial, agricultural, or commercial activities.

Rapid urban development can have a direct impact on water pollution. Factories are often guilty of dumping chemical waste into bodies of water causing water pollution. Runoff from roads and highways that are covered in harmful chemicals like brake fluids, spilled fuels, and exhaust emissions, can also be washed into rivers and lakes. Simply pouring chemicals down the drain or flushing detergents down the toilet can contribute to water pollution.

5. Nutrients Pollution

Some wastewater, fertilizers and sewage contain high levels of nutrients. If they end up in water bodies, they encourage algae and weed growth in the water. This will make the water undrinkable, and even clog filters. Too much algae will also use up all the oxygen in the water.

6.Microbiological

In many communities in the world, people drink untreated water (straight from a river or stream). Sometimes there is natural pollution caused by microorganisms like viruses, bacteria and protozoa. This natural pollution can cause fishes and other water life to die. They can also cause serious illness to humans who drink from such waters.

7. Oil Pollution

Everyday, oceans are heavily polluted with oils derived from oil spills, dumping, run-offs, and routine shipping. In fact, an estimated 706 million gallons of waste-oil enters the ocean each year. As the oil is not able to dissolve in water, it develops into a thick sludge that harms fish, affects marine birds, and blocks light to aquatic plants. These oils can also contaminate water for drinking and other purposes. As oil cleanup can be a long and expensive process, cleaning water that has been .contaminated with oil is simply not an option

8. Plastics

trash in an ocean as one of the types of water pollution Today, plastics are used in all types of manufacturing ranging from the production of clothing to car parts. As plastic is lightweight, it is often washed away into rivers and oceans. Plastic is also non-biodegradable, meaning it can last for decades while presenting a danger to marine animals. Modern plastics also contain harmful chemicals such as bisphenol A (BPA), a chemical that can have direct health effects on the brain and children, ,infants, and even fetuses

Effects of Pollution of Water

1- Diseases: In humans, drinking or consuming polluted water in any way has many disastrous effects on our health. It causes typhoid, cholera, hepatitis and various other diseases.

2- Destruction of Ecosystems: Ecosystems are extremely dynamic and respond to even small changes in the environment. Water pollution can cause an entire ecosystem to collapse if left unchecked.

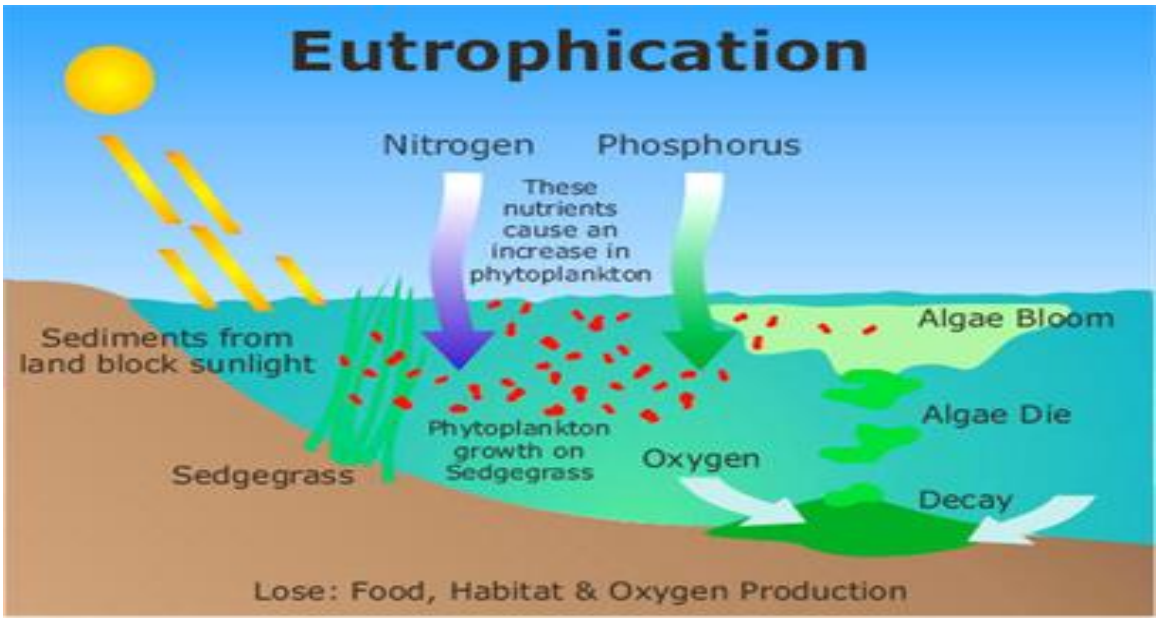
3- Effects the food chain: Disruption in food chains happens when toxins and pollutants in the water are consumed by aquatic animals (fish, shellfish etc) which are then consumed by humans.

4- Eutrophication: **Nutrients** in a water body, encourage the growth of algae. These algae form a layer on top of the pond or lake. Bacteria

feed on this algae and this decreases the amount of oxygen in the water body, severely affecting the aquatic life there.

Eutrophication

the gradual increase in the concentration of phosphorus, nitrogen, and other plant nutrients in an aging aquatic ecosystem such as a lake. The productivity or fertility of such an ecosystem naturally increases as the amount of organic material that can be broken down into nutrients increases. This material enters the ecosystem primarily by runoff from land that carries debris and products of the reproduction and death of terrestrial organisms. Water blooms, or great concentrations of algae and microscopic organisms, often develop on the surface, preventing the light penetration and oxygen absorption necessary for underwater life. Eutrophic waters are often murky and may support fewer large animals, such as fish and birds, than non-eutrophic waters.



Lec. 5

Soil pollution

is defined as the presence of toxic chemicals (pollutants or contaminants) in soil, in high enough concentrations to pose a risk to human health or the ecosystem. In the case of contaminants which occur naturally in soil, even when their levels are not high enough to pose a risk, soil pollution is still said to occur if the levels of the contaminants in soil exceed the levels that should naturally be present.

All soils, whether polluted or unpolluted, contain a variety of compounds (contaminants) which are naturally present. Such contaminants include metals, inorganic ions and salts (e.g. phosphates, carbonates, sulfates, nitrates), and many organic compounds (such as lipids, proteins, DNA, fatty acids, hydrocarbons, alcohols, etc.). These compounds are mainly formed through soil microbial activity and decomposition of organisms (e.g., plants and animals). Additionally, various compounds get into the soil from the atmosphere, for instance with precipitation water, as well as by wind activity or other types of soil disturbances, and from surface water bodies and shallow groundwater flowing through the soil. When the amounts of soil contaminants exceed natural levels (what is naturally present in various soils), pollution is generated.

Types of Soil Pollutants:

1-BIOLOGICAL AGENTS

Biological agents work inside the soil to introduce manures and digested sludge (coming from the human, bird and animal excreta) into the soil.

2-AGRICULTURAL PRACTICES

The soil of the crops is polluted to a large extent with pesticides, fertilizers, herbicides, slurry, debris, and manure.

3-RADIOACTIVE POLLUTANTS

Radioactive substances such as Radium, Thorium, Uranium, Nitrogen, etc. can infiltrate the soil and create toxic effects.

4-URBAN WASTE

Urban waste consists of garbage and rubbish materials, dried sludge and sewage from domestic and commercial waste.

5-INDUSTRIAL WASTE

Steel, pesticides, textiles, drugs, glass, cement, petroleum, etc. are produced by paper mills, oil refineries, sugar factories, petroleum industries and others as such..

6-DEFORESTATION

Deforestation increases soil erosion, thus valuable agricultural land is lost.

7- Erosion , loss of organic carbon, increased salt content acidification and chemical pollution

The Effects of Soil Pollution

1-Damage to health

Soil pollutants enter our body through the food chain, causing illnesses to appear. Moreover, the spread of antibiotics in the environment .increases the pathogens' resistance to these drugs

2-Poorer harvests

Soil pollution agents jeopardise world food security by reducing the .amount and quality of harvests

3-Climate change

In the first decade of the 21st century, soil degradation released .between 3.6 and 4.4 billion tonnes of CO2 into the atmosphere

4-Water and air pollution

Soil degradation affects the quality of air and water, particularly in .developing countries

5-Population displacement

Soil degradation and climate change will have driven between 50 and .700 million people to emigrate by 2050

6-Species extinction

Soil contamination is one of the main causes that could trigger the mass extinction the population of land vertebrates fell by 38 % between 1970 and 2012.

7-Desertification

The number of inhabitants in the most arid areas of the earth could account for 45 % of the world's population in 2050, while world wetland areas have decreased in size by 87 % over the last three centuries.

8-Economic impact

Global economic losses caused by soil degradation are expected to exceed 10 % of the world's annual Gross Domestic Product (GDP).

Noise pollution

unwanted or excessive sound that can have deleterious effects on human health and environmental quality. Noise pollution is commonly generated inside many industrial facilities and some other workplaces, but it also comes from highway, railway, and airplane traffic and from outdoor construction activities.

Radioactive pollution

is defined as the physical pollution of living organisms and their environment as a result of release of radioactive substances into the environment during nuclear explosions and testing of nuclear weapons, nuclear weapon production and decommissioning, mining of radioactive ores, handling and disposal of radioactive waste, and accidents at nuclear power plants. Nuclear tests are carried out to determine the effectiveness, yield, and explosive capability of nuclear weapons. Radionuclides are the main sources of pollution, they emit beta particles and gamma rays, radioactive substances.

thermal pollution

is when an industry or other human-made organization takes in water from a natural source and either cools it down or heats it up. They then eject that water back into the natural resource, which changes the oxygen levels and can have disastrous effects on local ecosystems and communities.

Lec. 6

Environmental Law

What is Environmental Law?

Environmental law is the collection of laws, regulations, agreements and common law that governs how humans interact with their environment. The purpose of environmental law is to protect the environment and create rules for how people can use natural resources. Environmental laws not only aim to protect the environment from harm, but they also determine who can use natural resources and on what terms.

Objectives of the law and the manner of their achievement

1- Preservation, protection, restoration and improvement of the environment

2- Protection of human life and health.

3- Protection of biological diversity .

4- Rational and sustainable utilization of natural resources .

5- Implementation and improvement of measures aimed at addressing . regional and global environmental problems

Characteristics of the Environmental Protection Law

1- The Environmental Protection Law is characterized by modernity, and it is a branch of the general law

2- The Environmental Protection Law is of an administrative and compulsory nature

3- The Environmental Protection Law is multidisciplinary

4- It is characterized by a combination of the legislative and institutional aspects

International Environmental Law (IEL)

Is concerned with the attempt to control pollution and the depletion of natural resources within a framework of sustainable development. It is a branch of public international law - a body of law created by states for states to govern problems that arise between states.

IEL covers topics such as population, biodiversity, climate change, ozone depletion, toxic and hazardous substances, air, land, sea and transboundary water pollution, conservation of marine resources, desertification, and nuclear damage.

Iraqi Law of Protection and Improvement of the Environment, No. 27 of 2009.

This Law aims to improve and to protect the environment by handling the damages, protecting the public health and the natural resources. The Law establishes a Council for the protection and improvement of the environment referring to the Ministry of Environment and cooperating with other Ministries. It also defines its duties and responsibilities. Smaller Councils will be established in the different provinces of the country.
The Law sets forth provisions for the protection of the environment. The regions responsible for environmental pollution have to use clean technologies and set up a suitable environmental policy. The use of sensors for pollution monitoring and control is recommended as well as the renewable energy technologies. An environmental impact assessment shall be done for any new project held in the country.

The Law concerns also the protection of water from pollution. It regulates the discharge of effluents whether they are of domestic, industrial or agricultural origin.
This Law covers as well the following subjects: regulation of air pollution and noise reduction; earth protection; biodiversity protection;

management of hazardous waste; protection of the environment from pollution resulting from exploration and extraction of oil wealth and natural gas; establishment of an environmental protection fund; rewards; compensation for damages; and penal provision

What do environmental laws regulate?

Environmental laws cover a wide range of topics including the following:

1- Air Quality – Air quality laws protect the air from pollution and may include measures to protect the air from things like ozone depletion

2- Water Quality – Environmental laws may protect water from pollution. They may also determine who can use water and how to handle potential problems like treating waste water and managing surface run off

3- Contaminant Cleanup – Not all environmental law focuses on preventing pollution. Contaminant cleanup deals with addressing pollution after it happens. Laws may include protocols for cleanup as well as civil and criminal punishment for polluters.

4- Chemical Safety – Chemical safety regulations manage things like pesticide use and chemicals in products like plastic bottles

Major Federal Laws

federal environmental legislation include

Endangered Species Act (ESA): This Act protects endangered species in order to prevent their extinction.

Resource Conservation and Recovery Act (RCRA): This Act governs the disposal of solid and hazardous waste.

Comprehensive Environmental Response Compensation and Liability Act (CERCLA): Also known as the "Superfund," this Act is aimed at cleaning up areas which are already polluted. This statute assigns broad liability to parties associated with the improper disposal of hazardous waste. The statute also provides funding for cleaning up the impacted areas.

Clean Air Act (CAA): The CAA is designed to protect air quality by regulating stationary and mobile sources of pollution.

Clean Water Act (CWA): The CWA protects water by preventing discharge of pollutants into navigable waters from point sources.

Two major declarations on international enviromental law are:

1- The Declaration of the United Nations Conference on the Human Environment (the 1972 Stockholm Declaration) (UN Doc. A/CONF/48/14/REV.1 (1972). This declaration represented a first major attempt at considering the global human impact on the environment, and an international attempt to address the challenge of preserving and enhancing the human environment. The Stockholm Declaration espouses mostly broad environmental policy goals and objectives rather than detailed normative positions.

2- The Rio Declaration on Environment and Development (UN Doc. A/CONF.151/26 (vol. I)) was a short document produced at the 1992 United Nations Conference on Environment and Development (UNCED), known as the Rio Earth Summit. The Rio Declaration consists of 27 principles intended to guide future sustainable development around the world.

International Environmental Law Treaties and Convention :

1- Vienna Convention for the Protection of the Ozone Layer, 1985, and Montreal Protocol on Substances that Deplete the Ozone Layer, 1987

2- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989

3- Convention on Biological Diversity, 1992, and Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 2000

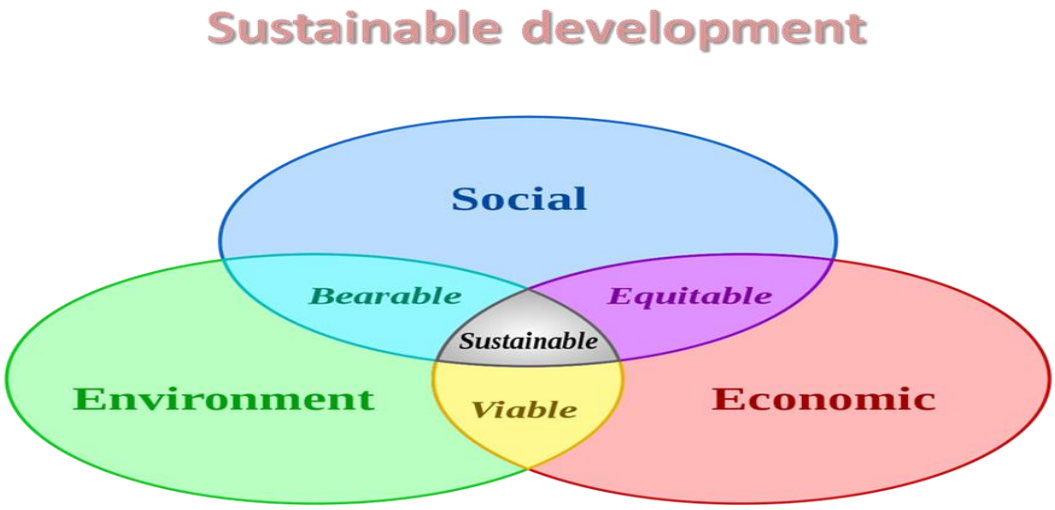
4- United Nations Framework Convention on Climate Change, 1992

5- Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1997

6- United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, 1994

7- Convention on the Law of the Non-Navigational Uses of International Watercourses, 1997

Lec. 7



Sustainable development

is the idea that human societies must live and meet their needs without compromising the ability of future generations to meet their own needs. The “official” definition of sustainable development was developed for the first time in the Brundtland Report in 1987.

Specifically, sustainable development is a way of organizing society so that it can exist in the long term. This means taking into account both the imperatives present and those of the future, such as the preservation of the environment and natural resources or social and economic equity.

Environmental Protection Agency (EPA)

What Is the Environmental Protection Agency (EPA)?

The Environmental Protection Agency (EPA) was established in December 1970 by the executive order of President Richard Nixon. It is an agency of the United States federal government whose mission is to protect human and environmental health. Headquartered in Washington, D.C., the EPA is responsible for creating standards and laws promoting the health of individuals and the environment.

Examples of EPA Programs:

The EPA oversees a number of programs intended to promote energy efficiency, environmental stewardship, sustainable growth, air and water quality, and pollution prevention. These programs include:

1- The EPA Safer Choice program—formerly Design for the • Environment—a product-labeling program that allows consumers to select the chemically safest products available, without sacrificing function or quality

2- The Energy Star program, which helps consumers choose energy-efficient appliances

3- The Smart Growth program, which supports sustainable community development

4- WaterSense, which encourages efficiency in water use via high-efficiency toilets, faucets, and irrigation equipment

5-The National Pollutant Discharge Elimination System, which regulates the discharge of pollutants into U.S. waters

EPA also runs programs to :

- Prevent, control, and respond to oil spills

- Control air pollution and forecast air pollution levels

-Foster the manufacturing of more fuel-efficient vehicles

The EPA works to enforce laws such as the Clean Air Act, the Safe Drinking Water Act, the National Environmental Education Act, and the Clean Water Act, some of which predate the formation of the agency itself.

The EPA is also responsible for the detection and prevention of environmental crimes, monitoring pollution levels, and setting standards for the handling of hazardous chemicals and waste.

And tracking the transport of hazardous compounds, registering insecticides and similar chemical treatments, and generally providing regulatory guidance to industry and other federal agencies. Although the EPA encourages voluntary compliance with federal environmental laws, it has authority to enforce regulations where violations occur. It maintains regional offices in 10 major U.S. cities in an effort to cooperate with state and local authorities in carrying out its mission

Environmental Impact Assessment (EIA)

is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.

UNEP defines Environmental Impact Assessment (EIA) as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers.

Importance of EIA:

1- EIA links environment with development for

environmentally safe and sustainable development.

2- EIA provides a cost effective method to eliminate or minimize the adverse impact of developmental projects.

3- EIA enables the decision makers to analyse the effect of developmental activities on the environment well before the developmental project is implemented.

4- EIA encourages the adaptation of mitigation strategies in the developmental plan.

5- EIA makes sure that the developmental plan is environmentally sound and within the limits of the capacity of assimilation and regeneration of the ecosystem.

Green Tech

What Is Green Tech?

Green Technology is an umbrella term that describes the use of technology and science to create products and services that are environmentally friendly. Green tech is related to cleantech, which specifically refers to products or services that improve operational performance while also reducing costs, energy consumption, waste, or negative effects on the environment

The goal of green tech is to protect the environment, repair damage done to the environment in the past, conserve natural resources and preserve the Earth's natural resources. Green tech has also become a burgeoning industry that's attracting enormous amounts of investment capital.

Examples of Green Technology ⊡

-Recycling ⊡

Green technology is used in the recycling process, as well as in ⊡ waste incineration. Recyclable material can be used when manufacturing plastics, fertilizer, and fuel. Green technology can also be a part of the production process, such as processes to recycle water or waste in the manufacturing process.

-Clean Water ⊡

Green tech is used to purify water resources around the world. In parts of the world where there are scarce water resources, green technologies can be employed to purify dirty water or remove salt from seawater in order to increase the availability of clean drinking water.

-Clean Air

Green tech is used in processes that purify the air by reducing carbon emissions and gases that are released into the air from manufacturing plants.

-Energy

Green tech can be used in processes intended to conserve energy, such as energy-efficient light fixtures. Green technology is also used to create alternative fuel sources that are more environmentally friendly than fossil fuels. Fossil fuels typically create waste as a byproduct of their production. Solar, wind, and hydroelectric dams are all examples of green technology because they are safer for the environment and don't produce fossil fuel waste by-products. Besides the environmental benefits of these alternative energy sources, they can also be used to power a home or a utility power plant.

Lec. 8

ENVIRONMENTAL CRIMES

Mary Clifford proposed a definition of environmental crime in her 1998 book *Environmental Crime,* as "an act committed with intent to harm or with a potential to cause harm to ecological and/or biological systems" as well as with the purpose to increase business or personal gain. According to Clifford, an environmental crime "is any act that violates an environmental protection statute [law]."

The Impact of Environmental crime

Environmental crime is characterised by its impact on the natural environment. This impact manifests in：

1- increasing levels of pollution

2- a degradation of wildlife

3- a reduction in biodiversity

4- the disturbance of ecological balance.

5- the risk of disease

6- environmental disaster

7- irreversible climate change

8- the contamination of the food chain

9- reduced life expectancy

10- the death of human beings

Major environmental crimes

1. Wild animal traffic:

Regarded by the Interpol as the third largest illegal business in the world –after drug and arms trafficking –wild animal traffic raises a serious threat for the world´s biodiversity survival. We can find several actors involved in this crime, but consumers are among the most important ones as this crime would disappear if supply and the high prices that people get to pay for them on the black market ceased to exist. As a creepy side-note, the more endangered the species is, the higher the price is for it. The most requested species are tropical birds (parrots) reptiles (serpents, crocodiles, etc.), arachnids (some types of tarantulas), monkeys

(capuchins, chimpanzees, lemurs), and so forth. But animal trafficking does not only intend to sell them as company animals; we also find such serious cases like the sale of elephants´ or rhinoceroses´ ivory on the black market, used to make decoration items and/or in traditional Chinese medicine.

2. Indiscriminate logging:

Main cause of deforestation. The Amazon destruction (the largest rainforest in the world) ,The uncontrolled logging to get wood for furniture or other goods –or even for farm lands –is the most serious cause of this environmental crime. Other lands –like the Indonesian forests –disappear because of excessive palm oil cultivations.

3- Illegal fishing:

that illegal fishing occurs worldwide within both exclusive economic zones of countries and in international waters.

4. Electronic waste mismanagement:

In the so-called developed countries there are up to 50 million tonnes of electronic waste every year (computers, TV sets, mobile phones, appliances, etc.). to be illegally exported to Africa, China or India. It is the case of Ghana´s rubbish dump, a large electronic waste dump coming from the West. Even though the export of this dangerous waste,, is banned in some places,like for example in the EU since 1992, a very good deal of this rubbish, which should be treated, ends up in these remote places polluting it all. We can thus work by demanding governments that they should take recycling measures adjusted to our production and consumption rate, so that they will not end up as polluting rubbish dumps anywhere in the world. also production, importation, exportation, marketing or use of ozone-depleting substances. ex:

The illegal chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs).

5. Finning:

A hundred million sharks are captured every year by specialised ships and up to 70 million of them are captured to only have their fins cut off alive on the ship and then be thrown back into the sea. This practice involves a slow and painful death, and it has been banned in the EU since 2003. Knowing that a kilogramme of a shark fin is worth 600 euros in the Asian market, the finning trade is patently obvious. Besides from being beautiful and strong creatures, sharks are essential animals for the trophic chain in oceans and therefore essential for their survival.

6- Illegal mining:

Illegal mining is prevalent in Africa, Latin America and parts of Asia, where it is increasingly becoming an issue of major public concern. It has severe environmental impacts, most notably mercury pollution from artisanal gold mining, destruction of natural flora and fauna, pollution, landscape degradation and radiation hazards.

7. Dumping in rivers and aquifers:

This kind of environmental crime is most often caused by companies, factories and Public Administrations. toxic waste coming from factories is usually dumped in a controlled way, but this is not always the case. In these cases waste is uncontrollably released into the environment, while at the same time polluting rivers, lakes aquifers, etc. This is a very serious crime because not only does it cause the local wildlife to die or get ill but also, as a result of the water leaking into the soil, it finds its way to pollute the surrounding flora as well, affecting the food chain.

At present there are also other kinds of very serious crimes which have recently emerged, like those related to the carbon

emission trading, and both the new and the old crimes are to be watched in order to attain a more sustainable future.

organised crime

The definition of organised crime is used in the context of the Annual European Union Organised Crime Situation Report , In order to speak about organised crime at least six of the following characteristics need to be present:

1. Collaboration of more than 2 people.

2. Each with own appointed tasks.

3. For a prolonged or indefinite period of time (refers to the stability and (potential) durability).

4. Using some form of discipline and control.

5. Suspected of the commission of serious criminal offences

6. Operating at an international level.

7. Using violence or other means suitable for intimidation.

8. Using commercial or businesslike structures

9. Engaged in money laundering.

10. Exerting influence on politics, the media, public administration, judicial authorities or the economy.

11. Determined by the pursuit of profit and/or power.

UNEP-INTERPOL report, (2016):

Environmental crimes are widely recognized as among some of the most profitable forms of transnational criminal activity. Their

monetary value was estimated in 2016 at between US$91-259 billion annually, most likely the fourth largest criminal area in the world after drugs, counterfeits and human trafficking. This estimate corresponds to a 26 per cent increase compared to 2014, with rates of such crimes expected to further increase by 5-7 per cent annually

Environmental crime is highly lucrative – it can be as profitable as illegal drug trafficking – but the sanctions are much lower, and it is harder to detect. These factors make it highly attractive for organised crime groups.

Involvement in the illegal trafficking of waste and in endangered species of animals and plants is now routine for many organised crime groups. And there are indications that proceeds from these activities are also used to finance terrorism.

According to a 2011 study, 3 out of the 12 most financially rewarding transnational criminal activities are linked to

environmental crime.

These include the illicit trafficking in:

_ wildlife (estimated annual value: USD 7.8 to 10 billion)

_ timber (estimated annual value: USD 7 billion);

_ fish (estimated annual value: USD 4.2 to 9.5 billion).

Overall, the annual value of transnational environmental crime is estimated to be worth USD 70 to 213 billion annually.

Lec. 9

Environmental protection from an Islamic perspective

The word “environment” is not mentioned in the holy Qur’an, but its significance has always been related to the word earth in the Qur’an. Instead, the holy Qur’an used the term “environment” to refer to the ocean or the place in which a person lives, including mountains and plains, and the plants and animals , And the planets and bodies around them.

The word “earth” has appeared in the Qur’an approximately (545) times, including :

قوله تعالى :

"وَإِذَا قِيلَ لَهُمْ لاَ تُفْسِدُواْ فِي الأرض قَالُواْ إنما نَحْنُ مُصْلِحُونَ"

"هُوَ أَنشَأَكُم مِّنَ الأرض وَاسْتَعْمَرَكُمْ فِيهَا"

"هُوَ الَّذِي خَلَقَ لَكُم مَّا فِي الأرض جَمِيعاً"

"كُلُوا وَاشْرَبُوا مِنْ رِزْقِ اللَّهِ وَلَا تَعْثَوْا فِي الْأَرْضِ مُفْسِدِينَ "

"وَلَا تُفْسِدُوا فِي الْأَرْضِ بَعْدَ إِصْلَاحِهَا وَادْعُوهُ خَوْفًا وَطَمَعًا إِنَّ رَحْمَتَ اللَّهِ قَرِيبٌ مِنَ الْمُحْسِنِينَ "

"ظَهَرَ الْفَسَادُ فِي الْبَرِّ وَالْبَحْرِ بِمَا كَسَبَتْ أَيْدِي النَّاسِ لِيُذِيقَهُم بَعْضَ الَّذِي عَمِلُوا لَعَلَّهُمْ يَرْجِعُونَ "

"أَفَلَمْ يَنظُرُوا إلى السَّمَاء فَوْقَهُمْ كَيْفَ بَنَيْنَاهَا وَزَيَّنَّاهَا وَمَا لَهَا مِن فُرُوجٍ * وَالأرض مَدَدْنَاهَا وَأَلْقَيْنَا فِيهَا رَوَاسِيَ وَأَنبَتْنَا فِيهَا مِن كُلِّ زَوْجٍ بَهِيجٍ "

"وَتَرَى الأرض هَامِدَةً فَإِذَا أَنزَلْنَا عَلَيْهَا الْمَاء اهْتَزَّتْ وَرَبَتْ وَأَنبَتَتْ مِن كُلِّ زَوْجٍ بَهِيجٍ "

-Islam urges us to ponder and reflect on the universe

-Islam urges us to reconstruct the earth

-Islam urges us to forbid corruption and corruptors

-Islam prohibits extravagance

The concept of environmental protection in Islamic law:

Islamic law has paid great attention to the environment, in terms of protecting it and preserving it from any harm or harm to it, and has established strict rules and provisions to prevent attacks on it in order to benefit from its resources.

The idea of protecting the environment in Islamic law is based on a doctrinal basis. God Almighty linked the world and its reform with the hereafter, including preserving the environment and caring for it and making it a devotional act in which the goodness of the country and the pleasure of God, and in that God says:

"وَابْتَغِ فِيمَا آتَاكَ اللَّهُ الدَّارَ الْآخِرَةَ وَلَا تَنْسَ نَصِيبَكَ مِنَ الدُّنْيَا وَأَحْسِنْ كَمَا أَحْسَنَ اللَّهُ إِلَيْكَ وَلَا تَبْغِ الْفَسَادَ فِي الْأَرْضِ إِنَّ اللَّهَ لَا يُحِبُّ الْمُفْسِدِينَ "

Rather, the link between preserving the environment, protecting it and believing in God has occurred, and

this is evident in :

قول رسول الله صلى الله عليه وسلم : "الْإِيمَانُ بِضْعٌ وَسَبْعُونَ أَوْ بِضْعٌ وَسِتُّونَ شُعبَةً، فَأَفْضَلُهَا قَوْلُ لَا إِلَهَ إِلَّا اللَّهُ، وَأَدنَاهَا إِمَاطَةُ الْأَذَى عَنْ الطَّرِيقِ "

Prophet Muhammad (PBUH) and Environmentalism

Prophet Muhammad (pbuh) left a noble example of being eco-friendly and going green in his life. He spent his entire life in an eco-friendly effort, helping humankind, caring for other creatures of God, preserving the earth, planting trees and protecting the environment. Right from his young age, he was inclined towards preservation of trees.

And he has many sayings about that, including:

قال رسول الله صلى الله عليه وسلم " :المسلمون شركاء في ثلاث: في الماء والكلأ والنار، وثمنه حرام "

يقول صلى الله عليه وسلم ": ما من مسلم يغرس غرساً أو يزرع زرعاً، فيأكل منه طير أو إنسان أو بهيمة إلا كان له به صدقة "

يقول " :إِنْ قَامَتْ السَّاعَةُ وَبِيَدِ أَحَدِكُمْ فَسِيلَةٌ فَإِنْ اسْتَطَاعَ أَنْ لَا يَقُومَ حَتَّى يَغْرِسَهَا فَلْيَفْعَلْ

According to the Islamic Educational, Scientific and Cultural Organization (ISESCO), water appears in

The Holy Quran in more than 50 "verses" and 40 "surahs". Surat Al-Nahl said verse 65

(وَاللَّهُ أَنْزَلَ مِنَ السَّمَاءِ مَاءً فَأَحْيَا بِهِ الْأَرْضَ بَعْدَ مَوْتِهَا ۚ إِنَّ فِي ذَٰلِكَ لَآيَةً لِقَوْمٍ يَسْمَعُونَ)

The Qur'an emphasizes the rationale for water use. If the water dries up, life will end because water is the most important element in the life of the organism

In Islam, water means life, and among the principles of water in Islam:

One of the principles of water in Islam is that ownership of water is not limited to some people but is shared.