Environmental Science

* The word environment is derived from the French word "environ", meaning surroundings in which we are living.

* The environment creates favourable conditions for the existence and development of living organisms.

* The environment includes all those things on which we are directly or indirectly dependent for our survival, whether it is living components like animals, plants or non-living things like soil, water, air.

The elements of environment —

(1) Physical Elements — Space, landforms, water bodies, climate, soils, rocks and minerals.

(2) Biological Components — Plants, animals, microorganisms, and human beings.

Cultural elements – Economic, social and political elements are manmade features. constitute the cultural elements.

* Functions of environment :—

① Provides the supply of resources which ~~not~~ includes renewable and non-renewable resources.
example — Wood, soil, land etc.

② environment sustains life. The environment includes sun, soil, water and air, which are essential for sustaining life providing genetic and biodiversity.

③ Assimilates waste. The production and consumption activities generate waste. The environment helps in getting rid of garbage.

④ Enhances the quality of life. The human beings enjoy the beauty

of nature that includes rivers, mountain -s, deserts etc. These add to the quality of life.

Components of Environment —

In general, the environment consists of the following major components —

① Biological / Biotic components

② Physical / Abiotic components.

① ⇒ The biological component of the environment includes all living things. These components are classified into groups — such as ① producers [auto-trophs (green plants, cyanobacteria, algae), Chemotrophs]

② Consumers (herbivores, carnivores, omnivores and detritivores).

③ Decomposers.

(2) ⇒ The physical components refers to the nonliving part which include air, water, soil, climate. These components are classified in 3 groups — Lithosphere, Hydrosphere and Atmosphere.

Additionally scientists also use the term 'biosphere' to describe the zone of life. from plants to bacteria to ~~multicellular~~ multicellular organisms.

Scope of environmental studies

1. The study creates awareness among the people to know about resources of the environment.

2. It provides necessary information about environmental problemes.

3. Developing an attitude of concern for the environment and motivating public to participate in environment protection.

④ The study enables environmentally literate citizens to make appropriate judgements and decisions for the protection and improvement of the earth.

5. The study tries to identify and develop appropriate and indigenous eco-friendly skills and technologies to various environmental issues.

6. It teaches the citizens the need for sustainable utilization of resources as these resources are inherited from our ancestors.

Importance of environmental study:

The natural resources of the earth ~~is limited~~ has a limit. But unplanned exploitation of these resources lead to pollution. The pollution and degradation of the environment seriously affect the health of all living things. So environmental education is needed

to save the biodiversity. So the environmental science is becoming important in present situation. We can summerise the importance as,

1. To clarify the concept of how to conserve biodiversity.
2. To know the more sustainable way of living.
3. To use natural resources more efficiently.
4. To know the behaviour of organism under natural conditions.
5. To know the interrelationship between organisms in populations and communities
6. To aware and educate people regarding environmental issues and problems at local, national and international levels.

Climate Change :—

Climate change refers to long term shifts in temperature and weather patterns. Such shifts can be natural, due to changes in the Sun's activity or large volcanic eruptions. But since industrial revolution since 18th century, due to the burning of fossil fuels like coal, oil and gas ~~climate is~~. our climate is changing. Burning fossil fuels generates greenhouse gas emissions that act like a blanket wrapped around the earth, ~~the~~ trapping the sun's heat and raising temperature. The main greenhouse gases that are causing climate change are carbon dioxide, methane Nitrous oxide, Hydrofluorocarbons etc.

Natural Causes of climate change —

Some amount of climate change can be attributed to natural phenomena. Over the course of Earth's existence, volcanic eruptions, fluctuations in solar radiation, tectonic shifts have observable effects on planetary warming and cooling patterns. But climate records show that today's global warming is happening much faster than ever before. ~~Climate~~

Climate scientists suggested that human activity is primarily responsible for this change.

Human driven causes of climate change —

Humans are responsible for ~~with~~ virtually all global heating over the last 200 years. Our ways of generating power for electricity, heat and transportation industries etc; are drivers of climate change.

① Transportation — The cars, trucks, ships and planes that we use for transportation are major sources of global green-house gas emissions. Burning petroleum based fuels releases massive amounts of carbon dioxide into atmosphere.

② Electricity generation — In some sectors electricity is generated through burning of coal, natural gas and other fossil fuels. We have to take steps to substitute these fossil fuels by renewable energy sources.

③ Agriculture — The widespread adoption of chemical fertilizers and certain crop-management practices accounts for nearly three quarters of the nitrous oxide found in our atmosphere. Burning of crop residues also contribute to the methane production.

④ Deforestation Another way we are injecting more greenhouse gas into the atmosphere is through the clearcutting of the

world's forests and the degradation of its wetlands. These activities contribute to global warming and climate change because plants release the stored carbon into the atmosphere as carbon dioxide when they are cutting down. Also vegetation and soil store carbon by keeping it at ground level or underground — Through logging and other forms of development we are cutting down or digging up vegetative biomass and ~~real~~ releasing the stored carbon into the air.

Societal impact of climate change ?—

Climate change impacts our society by disrupting the natural, economic and social systems we depend on. This disruption will affect food supplies industry supply chains and financial markets, damage infrastructure and cities and harm human health and global development.

Some impacts are already witnessed by us. The global sea levels have risen 19 cm since the beginning of the twentieth ~~or~~ century, increasing the risk of flooding for coastal cities : As glacial ice melts during summer, it will cause floods in the coastal areas.

Heatwaves and droughts are becoming more common and more intense in many parts of the world, causing harm to human health and more heat related deaths. Climate change is also affecting food securities

as rain and heat patterns change.

How we can reduce climate change or Mitigation —

We can reduce the amount of climate change by reducing the flow of heat trapping greenhouse gases into the atmosphere, either by reducing sources of these gases (for example, the burning of fossil fuels) or enhancing the sinks that accumulate and store these gases (such as oceans, forests and soil).

We have to stabilize the greenhouse gas levels in a timeframe sufficient to allow ecosystems to adapt naturally to climate change.

Sustainable development and living:

Climate change is presently a major global issue that impacts the environment and society. Sustainable development aims to reduce the impacts of climate change. The negative impacts of climate change are land degradation, disease, death and mental health issue.

Sustainable development is a means of maintaining development to ensure the needs of society are met presently, but also in future.

Environmental sustainibility includes conserving natural environment as a whole, including resources within nature such as clean air, clean water as well as wild life for our future generations.

In this ~~[illegible]~~,

Sustainable development can be achieved if we follow the following points.

① Save energy at home : Much of our electricity and heat are powered by coal, oil and gas. We have to ~~decrease this~~ use less energy by reducing our energy use, switching to LED lights, energy efficient electric appliances.

② Change our home's source of energy — If possible we can switch to renewable energy sources such as wind or solar. We can install solar panels on our roof tops to generate energy for our home.

~~③ Walk or take pu~~

③ Walk, ride bicycles or take public transport — Walking or riding a bicycle instead of driving will reduce greenhouse gas emmisions. For longer distances we can take public transport systems like train or bus.

④ Switch to an electric vehicle It may help in reducing greenhouse gas emission.

(5) Reduce, reuse, repair and recycle — electronics, clothes, plastics, and other items we buy cause carbon emissions at each point in production, from the extraction of raw materials to manufacturing and transportation. To protect the climate, buy fewer things, shop second hand, and repair what we can.