

1. What are biomes and the major types of biomes?

Biosphere is the worldwide sum of the ecosystem or parts of the earth where life exists. This Biosphere can be grouped into a number of biomes. Biomes are large geographical regions in Different parts of the world with characteristic climate and particular organisms. In determining biome type.

There have been many classifications of the different biomes and scientists are still refining their ideas but we can classify the biomes into two main types:

a, Terrestrial &

b, Aquatic

a, Terrestrial

A terrestrial biome is defined by temperature, rainfall, soil type, flora and fauna (plants and animals). This biome consists of

Desert (hot

A Deseret is a region with less than 250 mm of rain per year or with no rain. Has hot temperature with poor soil quality.

Desert (cold)

Has cold temperature with poor soil quality.

Thorn forest (scrub)

They have hot summer and cold winter season with poor soil quality. The thorn forests grow in the regions which receive less than 70 cm of rainfall. The trees present in the thorn forest have long roots which penetrate deeper into the soil in search of water. In these trees, the leaves are thick and also small to minimize evaporation.

Tundra

Has very low rain low rain fall less than 250 mm and water is not available for most of the year because of it is frozen.

Boreal forest (Taiga)

Coniferous forests of northern cold winter climates. Slightly warmer temperate and low rain fall (100 to 350 mm) distinguish taiga from tundra. It is dominated by evergreen trees.

Temperate deciduous forest

It is an area with relatively warm summers and cold winters. The annual rainfall ranges from 750

to 2500 mm.

Tropical montane forest and

They are found in hilly areas having a high altitude. The wet temperate forests are found between 1000-2000 meters. More than 3000 meters give the way to alpine vegetation.

Tropical rainforest

Found on and near the equator all around the world. Rainfall is between 2000 to 4500 mm.

B, Aquatic

The aquatic biome is divided into freshwater and marine regions. Freshwater regions, such as lakes and rivers, have a low salt concentration. Marine regions, such as estuaries and the ocean, have higher salt concentration

We can subdivide the aquatic biomes into two main types:

marine biomes

freshwater biomes

There are several biomes in each category those are:-

Lakes and ponds, rivers and seas, oceans, estuaries, coral reefs, wetlands, mangroves, and intertidal zones.

2. What factors determine the location and characteristics of biomes?

A given biome has its typical plant (flora) and animal (fauna), which are adapted to the environmental conditions, a specific climate, and a specific soil type in similar ways to the abiotic conditions. Within the area **Temperature** and **precipitation (rainfall)** are the most significant climatic factors.

3. What is biodiversity and why is biodiversity important?

Biodiversity is the variety of life forms on earth and the essential interdependence of all living things. This is quite simply the number of different species that are present in an ecosystem. A more useful concept is species diversity. This takes into account, not just how many different species are present, but the success of each species in the ecosystem. An index of diversity can be calculated and this can be used to give a picture of the ecosystem as a whole. A low value for the index of diversity suggests an area dominated by one or just a few species. One index of diversity is Simpson's index of diversity and is calculated from the formula $d = N(N-1) / \sum n(n-1)$

So, biodiversity is a measure of the overall variability of life on the planet (or a local area) and it includes:

- the species richness and species diversity of the planet (or the local area)
- the ecological variability of each species
- the genetic variability of each species

Importance of biodiversity

Ecosystems are linked on a large scale across the Earth. If biodiversity is reduced in one area, the natural balance may be destroyed elsewhere. Healthy biodiversity is important for the health of the planet. The air and water of the Earth is purified by a wide range of organisms. Waste is decomposed and removed by many different organisms. Photosynthesis by plants plays an important part in stabilizing the atmosphere and the world climate. Plants absorb water from the soil which evaporates into the atmosphere through transpiration. This helps determine where rain will fall. Plant roots hold the soil together. This reduces the risk of flooding and makes sure that the soil is not blown away and remains fertile. Plant pollination, seed dispersal, soil fertility and the nitrogen cycle are all needed for natural ecosystems and for farming. They rely on good biodiversity to work properly. Biodiversity also gives us the genetic diversity we need to develop crops to grow in different conditions. Biodiversity matters for the appearance of our country.

4. What are some threats to biodiversity and conservation mechanisms?

Conservation means keeping and protecting a living environment. There are a number of ways in which we can conserve biodiversity. Individual species may be protected, so that it is illegal to capture, kill or harm them. People can reduce pollution and around the world nations are looking at ways in which they can reduce the levels of carbon dioxide in the atmosphere and reduce climate change if possible. The loss of habitats can be reduced – for example, if deforestation is stopped and more forests are replanted biodiversity may be increased again. One of the most effective ways of conserving biodiversity is to protect large areas of habitat so that natural biodiversity is conserved in a very large area.

5. What is the role of vegetation and wildlife in ecosystems?

Vegetation refers to a plant community which has grown naturally without human aid & has been left undistributed by humans for a long time. This is termed as a virgin vegetation. Thus, cultivated crops and fruits, orchards form part of vegetation but not natural vegetation. Plants are of great importance to human beings all around the world. We use them in many different ways. We use them for food, for example, teff, sorghum, anchote and beans. We use them to make drinks such as tella, and coffee (bunna). The coffee plant is not only used in our homes for drinks, it is very important in our economy as coffee is one of our main exports too. Plants are used for building materials – wood is used to build our homes and plants are used to thatch the roofs.

Wildlife refers to living organisms (flora and fauna) in their natural habitats. Wildlife includes any animal, bees, butterfly, crustacean, fish and moth and aquatic or land vegetation, which form part of any habitat. The wildlife of Ethiopia is some of the richest in the world. We have 242 listed mammalian species, which range from huge elephants to tiny elephant shrews. There are around 862 species of birds as well. Some of the wildlife acts as a genetic bank for our domestic animals and can be used as a source of genetic diversity. However, one of the most important uses of wildlife in Ethiopia is to generate income from tourism.

6. What is the impact of human activities on vegetation and wild

Impact on Vegetation flora, fauna, and microbes are slowly degrading and disappearing due to human activities such as deforestation, intensive use, inappropriate forest management, agriculture, encroachment of forest land, slash burn practices, forest fires, urbanization, overharvesting, environmental deterioration, etc.

Impact on wild life Habitat destruction, fragmentation, and modification caused by human-led activities (i.e., industrial and residential development, logging, crop farming, livestock grazing, mining, road and dam building, and pesticide use) have taken an extreme toll on threatened and endangered wildlife populations at an alarming rate.

7, What are some strategies for protecting vegetation and wildlife?

Protecting vegetation :-indiscriminate deforestation should be prohibited. Wastage of timber and firewood should be avoided. Forest fires should be prevented. Reforestation of deforested areas should be undertaken. And we can protect by ;

Water your plants in the morning. ...

Use a light mulch. ...

Use shade covers. ...

Avoid over-watering your garden. ...

Weed your garden regularly. ...etc

protecting wildlife:- One of the easiest and most effective ways to help wildlife is to preserve the environment in which the animals live. Volunteer with organizations in your area to restore native forests, grasslands, and coastal ecosystems by planting native species, manually removing invasive plant species, and taking out old fences. And

Habitat conservation.

Sustainable land-use practices.

Research and monitoring.

Public education and awareness.

Creating wildlife areas.

Recycling Plant trees.

8, What are global warming and the impacts of global warming?

Global warming is the long-term heating of Earth's surface observed since the pre-industrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere.

So as a result of human activities the amount of carbon dioxide (and methane) in the air is continuing to increase. This build-up acts like a blanket and traps heat close to the surface of our earth. This causes the temperature at the surface of the Earth to rise. This in turn may have many effects on our climate and health – and it is also thought to contribute to the increased hurricane activity which has affected some areas of the world in recent times.

impacts of global warming Climate change encompasses not only rising average temperatures but also extreme weather events, shifting wildlife populations and habitats, rising seas, and a range of other impacts. All of these changes are emerging as humans continue to add heat-trapping greenhouse gases to the atmosphere and there are so impacts;

Temperature extremes.

Extreme weather.

Ice melt.

Sea levels and ocean acidification.

Plants and animals.

Social effects.

Further reading.

Additional resources

9, What are air pollution and the impacts of air pollution?

Air pollution is:- comes in various forms, each of which has serious implications for our health and well-being as well as for the whole environment. One type of air pollution is smoke produced by burning fuel for energy. Much of the fuel we use is fossil fuel – coal, oil or gas, or electricity produced by burning them. Fossil fuels contain chemicals known as hydrocarbons. When these fuels are burnt, tiny particles of unburnt hydrocarbons are released into the air. Diesel smoke is a good example of this. The particles are very small pieces of matter. This type of pollution is sometimes referred to as 'black carbon' pollution. The exhaust from burning fuels in cars, homes and industries is a major source of pollution in the air

Impacts of air pollution:- is the result for formation of acid rain and this acid rain have some Impacts those are:-

Harmful to aquatic life

Increased acidity in water bodies

Stops eggs of certain organisms (e.g. fish) to stop hatching

Changes population ratios

Affects the ecosystem

Harmful to vegetation

Increased acidity in soil

Leeches nutrients from soil, slowing plant growth

Leeches toxins from soil, poisoning plants

Creates brown spots in leaves of trees, impeding photosynthesis

Allows organisms to infect through broken leaves

The impact of air pollution and global warming is acid rain and

solution to reduce acid rain we reduce in this way:-

Use cleaner fuels

Remove oxides of Sulphur and oxides of nitrogen before releasing

Flue gas desulphurization

Use renewable energy like wind power, solar panels, tidal power

Limit the number of vehicles on the roads and increase public transport.