



BIODIVERSITY

1. What is Biodiversity?

Biodiversity is the various species richness on earth. It is most important to our planet for existence of life. This term was coined in 1985. The biodiversity is important for natural as well as artificial ecosystem. It deals with nature's variety, the biosphere. It refers to the variability between plants, animals and microorganism species.

Biodiversity consists the number of different organisms in an ecosystem and their relative frequencies. It also shows the organization of organisms at different levels.

Biodiversity keeps ecological and economic sustainability. It provides us water, foods, housing, fuel, clothing and several other resources. Good knowledge of biodiversity is essential for sustainable livelihood.

2. What are types of biodiversity?

Types of biodiversity are –

Species Diversity:-

Each ecosystem has a unique species collection that can interact with each other. Some ecosystems may have many more species than other ecosystem. In some ecosystems, one species has grown so abundantly that it predominates over the natural community. Numerous species can help restore an ecosystem from biodiversity loss, even if some species become extinct. For example, species diversity may include presence of 100 different species of fish crustaceans and coral in a certain reef.



Genetic Diversity:-

Genetic diversity traces the diversity of members of a species in a given ecosystem and the diversity of genetic information. If all members of population have many similar genes, the species has less genetic diversity because of their small populations; endangered species may have less genetic diversity due to inbreeding. It can be a threat to a population if it leads to inheritance of undesirable traits and identifies species more susceptible to disease. Having high genetic diversity helps species adapt to unfavorable environmental condition.

Ecosystem Diversity:-

An area may contain more than one ecosystem; a wide area of oceans or deserts can be an example of regions with less ecological diversity and a mountainous region with lakes, trees and grasslands have higher biodiversity, in this sense. A region with more than one ecosystem may be able to provide more resources to help native species survive, especially when one ecosystem is threatened by water scarcity or disease.

Functional Diversity:-

The way species act, obtain food and manage the natural resources of the ecosystem is known as functional diversity. A species is generally considered to have high functional diversity in a rich ecosystem, as different species have different behaviors. Understanding the functional diversity of ecosystems can be effective in the efforts of



ecologists to conserve or restore endangered species, because knowing the behaviors and roles of species can point to gaps in a food cycle or ecological niches that are lacking species.

3. What is the hotspot of biodiversity?

A biodiversity hotspot is a biosphere region that is both a significant reservoir of biodiversity and a threat to extinction. The biodiversity hotspot specifically consists of 25 biologically species rich areas around the world that have lost at least 70 percent of their original habitat. The remaining natural habitat in these biodiversity hotspots amounts only 1.4 percent of the land surface of the planet, yet supports nearly 60 percent of the world's plant, bird, mammal, reptile, and amphibian species.

4. Why biodiversity hotspot important?

The biodiversity is the earth's life support system. We all depended on the biodiversity of planet, the expansion of life on earth, facing a crisis of historic proportions. Development, urbanization, pollution, disease which are all destroying the tree of life. To overcome this crisis, we need to protect the area where our biodiversity lives. However species are not evenly distributed around the planet. Certain areas have large numbers of endemic and endangered species — those found nowhere else. Many of them are heavily threatened by habitat loss and other human activities. These regions are referred to as biodiversity hotspots, 36 regions where success species conservation can have a huge impact in securing our global biodiversity. The hotspot forest and other remaining habitats represent only 2.4 percent of the earth's land surface.



5. Write the importance of biodiversity?

Biodiversity and its maintenance are crucial to sustain life on earth. Some reasons explaining the importances of biodiversity are:

Ecological Stability:-

Each species has an ecological role in an ecosystem. They capture and store energy and also produce and decompose organic matter. The biodiversity of ecosystem supports the services without which people cannot survive. A diverse ecosystem can be more productive and withstand environmental pressures.

Economic Importance:-

Biodiversity is a reservoir of natural resources for the manufacture of food, pharmaceuticals and commercial products. Wild plants such as Cinchona and Foxglove plant are used for medicinal purposes to make medicines. Wood, fibers, perfumes, lubricants, rubber, resins, poison and cork are all products derived from plants. The national parks and sanctuaries are a source of beauty and joy for many people.

Ethical Importance:-

All the species have a right to exist and humans cannot be the cause of their voluntary extinction. Biodiversity conserve information of different cultures and spiritual heritage. Therefore, it is very important to protect the biodiversity.



6. Write about the threats of biodiversity and its management.

a. Habitat loss and deforestation –

Dramatic changes in habitat directly threaten biodiversity.

Deforestation and human activities result in loss of habitat, the respective environments are unable to provide shelter, food, water, or breeding grounds for the living organisms.

This leads to unhealthy and unbalanced ecosystems that result in the loss of biodiversity and extinction. Deforestation is associated with the destruction of about 18 million acres of forest habitats annually, destroying the ecosystems on which a large number of various species depend for survival.

Management:-

Prevention of deforestation and habitat loss depends on policy and law enforcement.

Awareness should be raised so that consumers refrain from supporting companies or manufacturers that use wood and paper to make their products. Governments and regulators agencies should also take the lead in ensuring strengthening forest protection laws and policies. Individuals and organizations can also participate in supporting environmental protection through charities and creating environmental awareness.

b. Climate change –

Throughout the history of plants, global climate change has certainly change life and ecosystems on earth. As a result, important habitats have been destroyed and species are on the verge of extinction. If the global temperatures continue to change drastically, especially due to human ctivities that accelerate the process, the threat of biodiversity will continue to spread and species in the ecosystem will not be able to adapt.



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For example, the decreasing Arctic sea ice and rising ocean temperatures are responsible for the changes in vegetation zones and degrading marine wildlife.

Management:-

If effective steps are taken to reduce carbon footprint, the world can be assured of a better tomorrow and less worries about climate change. Individuals, organizations and industrial companies need to reduce their carbon footprints and participate equally in creating awareness.

c. Overexploitation of resources

Due to the growing human population, high demand of manufactured products and necessities increases, leading to overfishing, overhunting, over-harvesting and excessive mineral resource extraction which has greatly contributed to loss of biodiversity And extends the risks of species extinction. It has also changed natural habits so it destroys food chains and interferes with the ecological balance.

Management:-

Continued awareness creation and conservation are the main strategies for managing overexploitation, particularly pertaining to overfishing, over-harvesting and poaching. Relevant environmental protection agencies and governments also need to implement rules to reduce the overexploitation of resources.

d. Environmental pollution –

Environmental Pollution continues to harm the biosphere by releasing and accumulating toxic chemicals in the atmosphere, terrestrial and marine systems. With high levels of pollution each year, it is slowly disrupting the Earth's ecosystem as the chemicals released



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potentially affect habits and ecosystems. Pollution has also depleted ozone levels, acid rains created dead zones in marine habitats and even killing many species due to oil spills or plastic and other toxic substances.

Management:-

There are several ways to prevent pollution. Anti-pollution laws and policies at the local, state and international level are most effective in preventing pollution because they play an important role in controlling pollution. Awareness can be done through the media, online educative forums, and in various organizations for people to understand the causes and consequences of environmental pollution.

e. Invasive species

Invasive species are the non-native species that that can adapt easily and threaten the survival of the native species either by attacking them or competing for nutrition with other native species. They disrupt the native biota and ecosystems causing extinctions and massive threats to biodiversity.

According to the Green Facts Foundation, nearly 40% of all animal extinctions since the 17th century are associated with invasive alien species. Besides, the report emphasizes that the cumulative environmental biodiversity losses of more than \$100 billion in the UK, US, South Africa, Brazil, India, and Australia are because of invasive pests.

Management:-

Invasive species is a major problem worldwide and therefore, it requires intervention at the local, state and international levels. Local authorities and states need to establish systems for managing and preventing invasive species through risk assessments as a



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strategy to predict the likelihood of species becoming invasive. The assessments should also aim to determine potential environmental damages and take effective preventive measures to address potential environmental impacts.

Therefore, the most efficient strategies are to stop the invasive alien species before they occur, to quickly eliminate newly identified invasive species and to effectively monitor new attacks. International organizations and scientist can help with research and data measurement using more creative ways such as Google street view and other advanced technological techniques.

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(All the information is collected from above references and will be used only for teaching and learning purposes)