



BIODIVERSITY IN MADHYA PRADESH

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Introduction

Madhya Pradesh is located on the genetic highway that connects two biodiversity hotspots in India, i.e. the Western Ghats and the North-East regions of India. The Biodiversity of Madhya Pradesh has great biological diversity. The Biodiversity of Madhya Pradesh includes the diversity of ecosystems, including plateaus, ravines, ridges, valleys and flat plains.

Madhya Pradesh has one of the richest faunal and floral diversity. The biodiversity of Madhya Pradesh comprises about 5000 plant species, 500 bird species and 180 fish species. The agro-diversity includes thousands of rice cultivars, a diversity of minor millets, indigenous cattle and poultry such as Kadaknath chicken, etc.

Madhya Pradesh is the home to six tribes with distinct customs, practices and diverse cultures. The biodiversity of Madhya Pradesh sustains livelihoods and ensures food security for tribal populations. Indigenous health systems nurtured by rich traditional knowledge woven around over 1000 medicinal plants contributed significantly to health security in rural areas.

Ecological Diversity

Ecological diversity refers to the differences in habitats found within a given geographic area, as well as their overall effect on human life and the climate. It also refers to the interaction of biotic (biodiversity) and abiotic (complexity) properties in a system (geodiversity). It refers to the diversity of ecosystems found in a given area or around the entire world. The term "ecological diversity" refers to the diversity of both terrestrial and marine ecosystems.

Ecological diversity may also account for differences in a biological community's complexity, such as the number of different niches, trophic levels, and other ecological processes. Ecosystem diversity, such as deserts, forests, grasslands, lakes, and oceans, is an indicator of biological diversity on a global scale. Ecological diversity is the broadest measure of biodiversity, and there is a great deal of both species and genetic diversity within each ecosystem.

Different level of biodiversity

Genetic Diversity

Genetic diversity describes the variety of unique genetic features found in a species.

There would be many individuals with a wide range of diverse characteristics in a species with significant genetic diversity. For a population to adapt to changing surroundings, genetic diversity is essential. A population's capacity to adjust to changes will be lowered if a highly selected and low diversity strain, such as fish populations raised for aquaculture, is introduced. Those individuals tend to survive to have offspring with that allele (a variant of a given gene). The success of these people will allow the population to continue for long generations.

Species Diversity

The number of different species found in a given area is referred to as species diversity. In nature, species do not interbreed because they differ genetically from one another. However, closely related species share a lot of their inherited traits. For example, 98.4% of the genes in humans and chimps are similar. It is the proportion of a species' total population to all the species' combined total number of organisms in a given biome. "One" denotes the presence of just one species, while "zero" would indicate infinite diversity.

Ecosystem / Community Diversity

Community diversity, also called ecosystem diversity, defines a community of interacting groups from different species living in a single habitat. The combination of a region's climate, vegetation, and terrain makes up a habitat. There are many different types of habitats on the earth. Examples of habitats in an environment include corals, grasslands, wetlands, deserts, mangroves, and tropical rain forests. Every species adjusts to a specific type of environment. The species that are most adapted to a changing environment become more prevalent. As a result, the ecosystem's features influence the variety or diversity of species present.

Benefits of Biodiversity

Biodiversity ensures that living things are able to thrive here on Earth. Biodiversity loss is more than just the extinction of rare species, an idea that may sound remote and so removed from our everyday lives. What many do not realise is that it directly affects humans as well. Loss of biodiversity disrupts the essential mechanisms needed for food production, health maintenance, and climate regulation. To better understand its importance for human life, here are the main benefits of biodiversity:

1. Disease Resistance

Genetically diverse populations have better chances of surviving a catastrophe like a pandemic. Diverse populations carry genetic codes that make certain members of their group less vulnerable. When those carrying these genetic codes reproduce, disease resistance is passed along and the species' survival is ensured.

2. Carbon Sequestration

Carbon sequestration is the process of capturing and storing carbon dioxide from the atmosphere. It reduces atmospheric carbon dioxide and its ultimate goal is to reduce climate change. Vegetation and soil in ecosystems like forests, peatlands, grasslands, seabeds, wetlands, and kelp beds act as carbon sinks, removing carbon dioxide from the atmosphere.

3. Storm, Flooding, and Coastal Erosion Regulation

Coastal sea levels are rising and the World Economic Forum says that as many as 410 million people could be affected by the end of the century. While 59% of sea level rise is expected to be in tropical Asia, countries such as China, France, Senegal, Nigeria, and the United States are also

at risk. Restoration and protection of coastal ecosystems such as salt marshes and mudflats will be an important aspect of flood prevention for low-lying coastal communities. Saltmarsh plants and microbes stabilise and bind soil together. Coupled with greater root biomass, these ecosystems can provide better resistance to soil erosion.

Ecosystems like coral reefs, seagrass, and soft-bottom ecosystems work as buffers against waves or storms, protecting coastal communities that are prone to typhoons.

4. Food Security

Our food system and agriculture are strongly linked to biodiversity. Millions of species work together to supply us with a variety of grains, vegetables, fruits, and animal products. Food production relies on many “services” that biodiversity provides. This includes pollination, maintenance of soil fertility, resistance to pests and diseases, climate maintenance, and water filtration. Losing pollinators like bees could cost the UK’s agricultural industry up to £700 million (US\$812 million) annually and could compromise the country’s food supply.

5. Overall Health and Happiness

Whether it is strolling in a park in the city, going to the mountains, or swimming in the sea, being in contact with nature has a host of benefits for humans. Exposure to green and blue spaces outdoors improves our working memory, attention control, and cognitive flexibility. Researchers also found that aside from cognitive improvements, contact with nature is associated with increased positive social interactions, happiness, having a sense of meaning in life, as well as decreases in mental stress.

Conservation Of Biodiversity

Conservation of biological diversity is essential for the survival of the human race. Objectives and advantages of biodiversity conservation Conservation of biological diversity leads to conservation of essential ecological diversity to preserve the continuity of food chains. The genetic diversity of plants and animals is preserved. It ensures the sustainable utilisation of life support systems on earth. It provides a vast knowledge of potential use to the scientific community. A reservoir of wild animals and plants is preserved, thus enabling them to be introduced, if need be, in the surrounding areas. Biological diversity provides immediate benefits to the society such as recreation and tourism. Biodiversity conservation serves as an insurance policy for the future. Types of conservation Ex situ conservation Conserving biodiversity outside the areas where they naturally occur is known as ex situ conservation. Here, animals and plants are reared or cultivated in areas like zoological or botanical parks.

Reintroduction of an animal or plant into the habitat from where it has become extinct is another form of ex situ conservation. For example, the Gangetic gharial has been reintroduced in the rivers of Uttar Pradesh, Madhya Pradesh and Rajasthan where it had become extinct.

Seedbanks, botanical, horticultural and recreational gardens are important centres for ex situ conservation. In situ conservation Conserving the animals and plants in their natural habitats is known as in situ conservation. This includes the establishment of National parks and sanctuaries Biosphere reserves Nature reserves Reserved and protected forests Preservation plots Reserved forests Agrobiodiversity conservation After the introduction of cotton, tobacco, sugarcane, sunflower, soyabean and so on, farmers became victims of monocultures in their



greed for money. Therefore many of the indigenous varieties of crops were lost. Moreover, the hybrid varieties of fruits and vegetables (e.g. tomatoes), introduced for pulp are more susceptible to disease and pests. Though hybrid varieties are preferred, traditional wild varieties of the seeds should be conserved for future use in the event of an epidemic which would completely wipe out the hybrids.

Botanical gardens, agricultural departments, seed banks etc., alone should not be given the responsibility of agrobiodiversity conservation. Every farmer, gardener and cultivator should be aware of his role in preserving and conserving agrobiodiversity.

Cause Of Biodiversity Loss

Loss of biodiversity occurs when a specific species is extinct or the habitat required for its survival is damaged. The latter is more common because habitat destruction is an unavoidable byproduct of development. Species extinction occurs when they are exploited for economic gain or hunted for sport or food. Extinction of species may also occur due to environmental factors such as ecological substitutions, biological factors, and pathological causes caused by either nature or man. The excessive population is one of the causes of biodiversity loss, which has resulted in rampant resource exploitation and deforestation. The destruction of tropical regions has resulted in the loss of natural habitats, which has been disastrous for the entire biosphere. Natural disasters such as forest fires, droughts, floods, volcanic eruptions, earthquakes, and others harm both the earth's flora and fauna. Pesticides and other pollutants, such as toxic heavy metals and hydrocarbons, kill weak and vulnerable species.

The loss of biodiversity in a given area may result in:

Decrease of plant production Reduction in resistance to environmental perturbations Increase in variability in specific ecosystem developments, such as water use, plant productivity, disease cycles, and pests. Biodiversity Loss – Causes Natural causes floods Earthquakes Landslides Species rivalry Lack of pollination and diseases Man-Made causes Habitat destruction Uncontrolled commercial exploitation Hunting and poaching Conversion of a bio-diversity-rich area for human settlement and industrial development Pollution Extension of agriculture Wetland filling Coastal devastation Causes of Biodiversity Loss Causes of Biodiversity Loss Solutions For Biodiversity Loss

1. Recycle, recycle, recycle

The adage to reduce, reuse, and recycle is excellent, but at this point, we're just going to focus on the last part — Purchase products made with recycled materials. Plastic, paper, wood, and metal can all be recycled, so start there to make a difference. On the other side of the coin, recycle as much as you can—campaign for recycling programs in your area. Make recycling cool again.

2. Buy sustainably

We all love a well-cooked salmon filet or swordfish steak, but before you start stocking up on seafood, make sure you're buying fish that has been sustainably harvested. Avoid endangered fish, like Bluefin tuna, and only purchase seafood labeled with the Marine Stewardship Council logo.

**3. Drive green**

Everyone talks about reducing their carbon footprint, and the easiest way you can do this is to give up your gas guzzler in favor of a hybrid or electric car. These low- to no-emission vehicles have much less of an impact on the environment. If buying a new car isn't an option, try carpooling, public transportation, riding a bike, or walking where you can.

4. Protect local habitats and make wildlife welcome where possible

We might not be able to save the world, but we can help improve our local areas. Take the time to clean up animal habitats, like beaches, forests, and other undeveloped areas. Make your area welcoming for wildlife. Birdhouses, bat houses, and other housing can be great, as can planting local flora and turning your backyard into your wildlife sanctuary.

5. Go package-free

Plastic packaging is one of the biggest wastes we experience daily. If you have one, shop at a packing-free grocery store. These allow you to bring your bags, jars, and other reusable packaging to buy dry ingredients in bulk.

6. Compost as much as you can

The average American generates roughly 4.4 pounds of garbage daily, much organic. Instead of tossing your vegetable peelings or coffee grounds, set up a compost pile for your organic waste. Not only does it keep your trash out of landfills, but it also makes killer natural fertilizer for flowers and plants — no chemicals needed.

Reference -

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