
Loss of Western Ghats biodiversity and its conservation

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Abstract

The Western Ghats, one of the world's eight "hottest hotspots" of biodiversity, is a globally significant ecological region extending approximately 1,600 km along the western coast of India. It harbours an extraordinary diversity of flora and fauna, including numerous endemic and threatened species that play a crucial role in maintaining ecological balance and supporting human livelihoods. However, the region has experienced an alarming decline in biodiversity due to rapid deforestation, agricultural expansion, urbanisation, mining, infrastructure development, climate change, invasive alien species, and unsustainable exploitation of natural resources. Habitat fragmentation and degradation have severely affected ecosystem resilience, leading to the decline of several endemic plant and animal populations. The loss of biodiversity has also weakened essential ecosystem services such as water regulation, carbon sequestration, soil conservation, and climate regulation, thereby affecting the socio-economic well-being of millions of people dependent on the Western Ghats.

This paper examines the major causes of biodiversity loss in the Western Ghats, analyses its ecological and socio-economic consequences, and evaluates existing conservation initiatives implemented by governmental agencies, local communities, and conservation organisations. Particular emphasis is placed on protected area networks, biosphere reserves, wildlife sanctuaries, restoration ecology, community-based conservation, sustainable forest management, and policy interventions. The study also highlights the importance of integrating scientific research, indigenous ecological knowledge, technological innovations such as GIS and remote sensing, and participatory governance in biodiversity conservation. Strengthening environmental legislation, promoting sustainable livelihoods, enhancing ecological awareness, and improving climate adaptation strategies are identified as essential measures for ensuring the long-term conservation of the Western Ghats. The paper concludes that biodiversity conservation in this globally important hotspot requires coordinated efforts among governments, researchers, local communities, and international organisations to balance ecological sustainability with developmental needs.

Keywords- Western Ghats; Biodiversity Loss; Biodiversity Conservation; Endemic Species; Habitat Fragmentation; Deforestation; Climate Change; Protected Areas; Ecosystem Services; Sustainable Development; Ecological Restoration; Community-Based Conservation.

Introduction

The Western Ghats is an important biodiversity hotspot in India, and its conservation is important at many levels. The region is home to diverse species of plants, animals, and other organisms, many of which are endemic and found only here. Conservation of the Western Ghats is important for preserving India's biodiversity, it helps maintain the ecosystem of the region, and it also preserves the livelihoods and cultural heritage of the people.

Importance of Biodiversity of Western Ghats:

1. One of the biodiversity hotspots of the world:

The Western Ghats is one of the eight most biodiversity hotspots in the world. The Western Ghats are considered one of the largest biodiversity hotspots in the world, renowned for its high level of biodiversity and endemic species. The region is home to more than 9,000 species of plants and animals, many of which are found only here.

1.1 Biodiversity of Western Ghats:

- The Western Ghats are home to over 5,000 flowering plant, 139 mammalian, 508 bird and 179 amphibian species.
- The region is also home to more than 300 globally threatened species.
- Of the 334 butterfly species in the Western Ghats, 316 are found in the Nilgiri Biosphere Reserve.
- The Western Ghats are home to 174 species of odonates (107 dragonflies and 67 damselflies), including 69 endemic species.
- The Western Ghats are home to many rare and endemic species, such as the Nilgiri tahr and the lion-tailed macaque.
- Many endangered and threatened species are also found in the Western Ghats.

2. Home to endemic species:

The area is home to several endemic species, such as the Nilgiri tahr, lion-tailed macaque, Malabar civet and the great Indian hornbill. There are many threats to endemic species in the Western Ghats, such as deforestation, habitat loss and climate change. Conservation efforts are being made to preserve the biodiversity of the Western Ghats, such as the establishment of national parks and maintenance of wildlife sanctuaries. The Western Ghats are home to about 30% of India's flowering plant species, 50% of amphibians and 14% of mammals.

3. Provision of ecological services:

The Western Ghats provide important ecosystem services, such as water supply, carbon sequestration and soil conservation.

3.1 Water Resources:

The Western Ghats are home to several major river systems, which provide vital water supplies for the southwestern coast of India. These rivers provide water for agriculture, industry and domestic use.

3.2 Habitat for vegetation and wildlife:

The Ghats have a diverse range of habitats, including montane forests, grasslands and wetlands. These habitats support a variety of plant and animal species. The Western Ghats are home to 179 amphibians, 157 reptiles and 219 fish species, many of which are endemic.

3.3 Conservation of Biodiversity:

The Western Ghats have a high level of biodiversity, and are home to many endemic species. The Ghats play an important role in the conservation of the biodiversity of vegetation and wildlife.

3.4 Local Approach:

It is important to incorporate local perspectives in the assessment of ecosystem services in the Western Ghats. Incorporating local knowledge and practices helps inform policies and development programmes, and can promote the sustainable use and management of forest resources.

4. Economic Importance:

The region is economically important for a variety of industries such as tourism, agriculture and forest products. Major Economic Importance:

4.1 Water Source: The Western Ghats are an important water source for peninsular India. The rivers originating from here provide water for agriculture, industry and domestic use.

4.2 Plantation Agriculture: Because of high rainfall and moderate temperatures, the Western Ghats are ideal for cultivation of coffee, tea, cardamom, spices and other plantation crops.

4.3 Mineral Resources: Iron, manganese, bauxite and other mineral ores are found here, which are important for mining and industrial activities.

4.4 Forest products: The Western Ghats are also the source of a number of forest products such as timber, medicinal plants, honey and other products.

4.5 Tourism: Due to the natural beauty and biodiversity of the Western Ghats, it is a popular tourist destination. Tourism boosts economic activities in the region.

4.6 Community Development: Initiatives such as sustainable coffee and tourism provide employment opportunities and livelihoods for local communities in the region.

5. Cultural and Social Significance:

The Western Ghats are culturally and socially significant to the local communities who have lived here for centuries and their livelihoods depend on the region. The Western Ghats are also culturally and socially significant. It is home to many indigenous communities who are deeply connected with the biodiversity of the region. The culture, livelihood and traditions of these communities depend on the ecosystem of the Western Ghats.

Cultural significance:

5.1 Indigenous communities: The Western Ghats are home to many indigenous communities, such as the Adivasis, who are deeply connected to the ecosystem of the region.

5.2 conventional wisdom: These communities have traditional knowledge and practices that play an important role in preserving the biodiversity of the region.

5.3 Religious places: The Western Ghats are home to many shrines and sacred forests, which play an important role in the culture and religious beliefs of the region.

5.4 cultural diversity: The Western Ghats have diverse languages, customs and traditions, reflecting the cultural diversity of the region.

Social significance:

5.5 Livelihood: Many indigenous communities of the Western Ghats depend on the biodiversity of the region for their livelihoods, such as fishing, hunting, and agriculture.

5.6 local economy: The biodiversity of the Western Ghats promotes tourism and other businesses, which contribute significantly to the local economy.

5.7 water supplies: Many rivers originate from the Western Ghats, which supply water to the people in peninsular India.

5.8 Social relations: The Western Ghats is an important social and cultural centre for indigenous communities, where they maintain social ties with their family and community.

6. Human-wildlife conflict

Human-wildlife conflict in the Western Ghats has many negative effects on biodiversity, including:

6.1 Habitat loss: Human activities like agriculture, urban development, and tourism expand into wildlife habitats, reducing the size and isolation of forest patches. This drives wildlife into closer contact with humans, increasing the likelihood of conflict.

6.2 Population decline: Human-wildlife conflict can cause injuries, deaths, and population decline or extinction of wildlife species.

6.3 Genetic erosion: Human-wildlife conflict can lead to genetic erosion or inbreeding.

6.4 Economic damages: Human-wildlife conflict can lead to direct economic damages, such as loss of livelihoods and exacerbation of poverty. For example, villagers near Bhadra Wildlife Sanctuary in Karnataka lose about 11% of their annual grain production to raiding elephants.

6.5 Spread of disease: Human-wildlife conflict can lead to the spread of zoonotic diseases to humans or livestock.

The states of Karnataka, Kerala, and Tamil Nadu are most affected by human-wildlife conflict in the Western Ghats. These states are home to many national parks, wildlife sanctuaries, and tiger reserves.

As one of the world's "hottest biodiversity hotspots" and a UNESCO World Heritage Site, the Western Ghats is on the conservation watch-list for being a rich but highly vulnerable region in urgent need of biodiversity conservation efforts. Despite the negative effects of human activity and climate change, new species continue to be added to the endemic list of species that are recorded here including 16 birds, 124 reptiles, 159 amphibians, 16 mammals, 189 fishes, 69 odonates, 36 butterflies, and 1,600 flowering plants.

IMPORTANCE OF CONSERVATION OF WESTERN GHATS:

1. Preserving Biodiversity: Conservation of the Western Ghats helps preserve the plant and animal species found in the region. Conservation of biodiversity in the Western Ghats requires an integrated approach that incorporates conservation efforts, sustainable development and community participation.

2. Maintaining Environmental Services: This helps maintain the ecosystem of the area, which provides important ecological services such as water supply, carbon sequestration and soil conservation. To maintain environmental services in the Western Ghats, threats such as deforestation, habitat loss, mining, and excessive livestock grazing need to be addressed. These threats can be mitigated by implementing the notification of Ecologically Sensitive Areas (ESA) designated by the Central Government, covering six states – Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu.

3. Preserving livelihoods and cultural heritage: This helps preserve the livelihoods and cultural heritage of the local communities of the region, which depend on the area.

4. Environmental Safety: Conservation of the Western Ghats can help mitigate the effects of climate change in India. To protect the environment in the Western Ghats, some necessary steps must be taken, such as expanding and managing protected areas, regulating development activities, and empowering local communities. Besides, it is important to pay special attention to the conservation of biodiversity.

5. Steady progress: Sustainability is key to the conservation of the Western Ghats, which includes resource management, community participation and environmental education.

Conclusion: The Western Ghats is an important region whose biodiversity and natural resources need conservation. Its conservation will help preserve India's biodiversity, maintain ecosystems and improve the quality of life of local communities.

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