

PROTECTING THE WESTERN GHATS: CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT

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Abstract

The Western Ghats, also known as the Sahyadri Hills, is a mountain range that runs parallel to the western coast of India. It is one of the most important geographical features of the Indian subcontinent, known for its rich biodiversity and significant influence on the climate of the region. The Western Ghats play a crucial role in influencing the climate of the region, particularly the monsoon patterns. They act as a barrier to the southwest monsoon winds, causing heavy rainfall on the western side of the range and creating a rain shadow effect on the eastern side. The Western Ghats are recognized as one of the world's eight "hottest hotspots" of biological diversity. They are home to numerous endemic species of flora and fauna, many of which are not found anywhere else in the world. The range is the source of many major rivers in peninsular India, including the Godavari, Krishna, and Kaveri rivers. These rivers are vital for the agriculture, water supply, and overall livelihoods of millions of people. The Western Ghats are not just a geographical feature but a critical environmental and ecological zone that supports a wide range of life and sustains the regional climate and water systems. The Western Ghats face numerous environmental challenges due to a combination of natural and human-induced factors. Protecting the Western Ghats is vital for preserving biodiversity, ensuring water security, mitigating climate change, and sustaining the cultural and economic well-being of millions.

Keywords

Western Ghats, Environment, Species, Conservation and Ecosystem

Introduction

The Western Ghats, a UNESCO World Heritage Site, is one of the most significant biodiversity hotspots in the world. Stretching along the western coast of India, this mountain range plays a crucial role in maintaining the ecological balance. The Western Ghats stretch for approximately 1,600 kilometers (990 miles) from north to south. The width of the range varies from about 48 kilometers to 210 kilometers. The Western Ghats cover an area of about 160,000 square kilometers (61,776 square miles). The Western Ghats traverse six Indian states namely Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu. The northernmost point of the

Western Ghats is near the border of Gujarat and Maharashtra. The range ends near Kanyakumari, the southern tip of the Indian peninsula. The Western Ghats slope down towards the Deccan Plateau to the east. The range is bordered by the narrow coastal plains of the Arabian Sea to the west.

The Western Ghats region continues to be one of the most important ecological hotspots in the country, though it has experienced notable loss and fragmentation of forest cover over the decades (State of Forest Report, 2021). The Western Ghats are one of the world’s eight 'hottest hotspots' of biological diversity, and their ecological health is crucial for the well-being of peninsular India (WGEEP Report, 2011). This mountain range, which runs along the western coast of India, is home to a staggering variety of flora and fauna, with many species found nowhere else on Earth. However, this ecological treasure faces threats that endanger its unique biological wealth. Issues such as habitat loss from human activities, climate change, and agricultural expansion severely impact biodiversity. The time to act is now, employing data-driven approaches to safeguard this vital region.

Environmental Issues in the Western Ghats- Confronting Biodiversity Loss

The Western Ghats host over 7,402 species of flowering plants, 139 mammal species, 508 bird species, and 620 butterfly species. According to the IUCN Red List, around 1,800 species are threatened. Notably, 68 species of mammals are listed as vulnerable, endangered, or critically endangered (IUCN, 2021). This indicates a troubling trend in species conservation. Habitat fragmentation is a major threat. As of 2020, over 30% of the Western Ghats have been fragmented, impacting wildlife movement and biodiversity. Maps from the Forest Survey of India depict this change vividly. The loss of habitat leads to isolated populations, making recovery and survival difficult.

Table No: 1 Key Biodiversity Indicators of the Western Ghats

Indicator	Data/Statistics
Endemic Plant Species	2,500+
Endemic Animal Species	300+
Total Protected Areas	39 (including wildlife sanctuaries, reserves, etc.)
Annual Rainfall	2,000-7,500 mm
Carbon Sequestration	Approx. 4 million tons of CO ₂ annually

Source: UNESCO Western Ghats Dossier, MoEFCC Reports

The Western Ghats, a UNESCO World Heritage Site, is one of the world's eight "hottest hotspots" of biological diversity. This mountain range spans over 1,600 kilometres along the western coast of India, boasting a wealth of flora and fauna. However, recent decades have shown alarming trends in biodiversity loss, propelling this crisis to the forefront of environmental discussions. Understanding the magnitude of this decline is vital for future conservation efforts. Over the past 50 years, the Western Ghats have witnessed significant reductions in forest cover.

Table No: 2 Forest Cover Change in Western Ghats (1970-2020)

Year	Forest Cover (hectares)	Percentage Change
1970	70,150,000	-
1980	65,000,000	-7.3%
1990	60,500,000	-6.9%
2000	57,000,000	-5.8%
2010	53,500,000	-6.1%
2020	48,000,000	-10.4%

Source: Forest Survey of India (FSI) Reports (1970–2020)

The forests of the Western Ghats have suffered extensive degradation due to a combination of commercial exploitation, agricultural expansion, and changes in land use patterns introduced during colonial and post-colonial times (*Gadgil & Guha, 1992*). The table highlights a continuous and serious forest loss in the Western Ghats over five decades, with the rate of decline accelerating in recent years.

The Western Ghats experienced a significant reduction in forest cover, decreasing from approximately 73.1% of the geographical area in the 1920s to 47.1% in 2013. This translates to a loss of about 33,579 km², accounting for 35.3% of the total forest area. (Reddy et al. 2016)

The large-scale emigration and remittance-driven development have influenced land use, resource consumption, and ecological degradation. The migration has improved household incomes and living standards, it has also accelerated urbanization, leading to deforestation, groundwater depletion, and increased construction activities. The influx of remittances in Kerala economy has fueled the conversion of agricultural land into residential and commercial spaces, reducing green cover and affecting local biodiversity (Irudaya Rajan and Zachariah, 2010)

Conservation efforts are crucial to protect these species from extinction. Strategies include habitat preservation, sustainable harvesting practices, and legal protection under environmental laws. Raising awareness and involving local communities in conservation initiatives can also play a significant role in safeguarding these unique plant species.

Table No: 3 Levels of endemism among various categories

Taxonomic Group	Total Species	Endemic Species	Percentage Endemic
Angiosperms	4,000	1,500	38%
Butterflies	330	37	11%
Fishes	289	118	41%
Amphibians	135	101	75%
Reptiles	156	97	62%
Birds	508	19	4%
Mammals	120	14	12%

Source: Exploring Biodiversity and Ecology of Central Western Ghats

The table illustrates the remarkable biodiversity of the Western Ghats, with particularly high levels of endemism among angiosperms, fishes, amphibians, and reptiles. Conservation efforts are crucial to protect

these unique species and their habitats from ongoing threats such as deforestation, habitat fragmentation, and climate change.

Sustainable Development Efforts in Western Ghats

Sustainable development in the Western Ghats is essential due to the region's ecological significance. To ensure sustainable development, eco-friendly practices are key. In agriculture, approximately 70% of the population in the Western Ghats depends on agriculture. However, conventional farming methods have led to soil degradation and overexploitation of water resources. Moving towards organic farming and agroforestry is crucial for maintaining soil health and conserving water.

Forest conservation is also central to maintaining sustainability. The Western Ghats have an estimated 60,000 km² of forest cover, which plays a critical role in maintaining the region's biodiversity and mitigating climate change. However, from 1970 to 2020, forest cover has declined by about 30% (from 70.15 million hectares in 1970 to 48 million hectares in 2020), mainly due to deforestation and land conversion for agriculture and infrastructure. Aiming to reverse this trend, the government and local NGOs have launched programs like the Green India Mission, which aims to increase forest cover by 5 million hectares by 2030.

The Western Ghats also play a critical role in the water supply. The region feeds major rivers like the Krishna, Godavari, and Kaveri, which are lifelines for over 250 million people across southern India. Ensuring sustainable water management is vital for both agricultural practices and domestic needs. A 10% decrease in forest cover can result in a significant decline in river water quality, affecting millions of people.

Promoting eco-tourism is another avenue for sustainable development. The Western Ghats attract a large number of eco-tourists annually. For example, in Kerala, eco-tourism contributes approximately 2.5% to the state's GDP and generates over 2 million jobs. Eco-tourism not only provides an alternative livelihood to local communities but also raises awareness about the need for conservation. Tourists visiting protected areas like Periyar Wildlife Sanctuary help fund conservation efforts while preserving the natural environment. Additionally, renewable energy projects, such as solar and wind energy initiatives, can reduce the dependency on fossil fuels. This can significantly reduce the carbon footprint of development activities in the region.

Conclusion

The protection of the Western Ghats requires a multi-faceted approach that balances conservation with sustainable development. Collaboration between government agencies, local communities, NGOs, and researchers is essential to ensure the long-term preservation of this critical ecological region. Effective implementation of these measures will not only safeguard the biodiversity and ecological functions of the Western Ghats but also enhance the well-being of the millions of people who depend on its resources. The Western Ghats' ecosystem is at risk, but urgent conservation efforts can make a difference. The study highlights the critical need for immediate action to protect these endangered species and their habitats.

Supporting local conservation initiatives and participating in citizen science can empower individuals to safeguard this biodiversity hotspot.

A balanced approach, integrating environmental considerations with the livelihood and developmental aspirations of the local communities is needed in the Western Ghats. Approximately 37% of the Western Ghats as ESAs, where high-impact industrial and mining activities would be restricted while promoting eco-friendly and sustainable practices in agriculture, tourism, and other sectors (Kasturirangan, K, 2013)

References

1. Gadgil, M., & Guha, R. (1992). *This Fissured Land: An Ecological History of India*. Oxford University Press.
2. Kasturirangan, K. (2013). *Report of the High-Level Working Group on Western Ghats*. Ministry of Environment and Forests, Government of India.
3. Western Ghats Ecology Expert Panel (WGEEP) Report (2011).
4. Government of India. (2021). *State of Forest Report 2021*.
5. Irudaya Rajan, S., & Zachariah, K. C. (2010). Migration and its impact on Kerala's environment. *Economic and Political Weekly*.
6. Reddy, C. S., Jha, C. S., Dadhwal, V. K., Hari Krishna, P., Murthy, M. S. R., & Rajashekar, G. (2016). Assessment and monitoring of long-term forest cover changes (1920–2013) in Western Ghats biodiversity hotspot. *Journal of Earth System Science*, 125(1), 103–114
7. International Union for Conservation of Nature (IUCN). (2021). *The IUCN Red List of Threatened Species: Summary statistics*. IUCN.



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