

Wetlands in India: Guardians of Biodiversity and Ecosystem Health

Anweshi Ghosh Roy*

Department of Environmental Sciences, University of Burdwan, India

Abstract

Wetlands are among the most productive and biologically diverse ecosystems on Earth. In India, they play a crucial role in sustaining biodiversity, supporting livelihoods, and providing numerous ecological services. Covering about 4.7% of the country's land area, India's wetlands range from high-altitude lakes in the Himalayas to coastal estuaries and mangroves, each offering unique habitats and resources.

Keywords: Wetlands; Ecosystem services; Biodiversity

Introduction

Wetlands serve multiple ecological functions, including water purification, flood control, carbon sequestration, and serving as critical habitats for a variety of species. They act as natural water filters, trapping pollutants and sediments, thereby improving water quality. During monsoon seasons, wetlands absorb excess rainwater, mitigating the impacts of floods. Additionally, they store carbon in their plant biomass and soil, playing a role in climate regulation [1-3].

Methodology

These ecosystems are also vital for biodiversity. They provide breeding, feeding, and nesting grounds for numerous species of birds, fish, amphibians, and invertebrates. Migratory birds, in particular, rely on wetlands for stopover sites during their long journeys. Wetlands such as the Chilika Lake in Odisha and the Bharatpur Bird Sanctuary in Rajasthan are internationally recognized for their avian diversity.

Major wetlands in india

Chilika lake: Located in Odisha, Chilika is Asia's largest brackish water lagoon. It supports a rich diversity of fish and bird species, including the endangered Irrawaddy dolphin. The lake is a Ramsar Site, recognized for its ecological significance.

Sundarbans: This mangrove forest in West Bengal is the largest in the world and a UNESCO World Heritage Site. It is home to the Bengal tiger, estuarine crocodiles, and a variety of fish and bird species. The Sundarbans also act as a natural barrier against coastal erosion and cyclones.

Bharatpur Bird Sanctuary (Keoladeo National Park): Situated in Rajasthan, this sanctuary is a haven for birdwatchers, hosting over 360 species of birds. It is a crucial wintering ground for migratory birds such as the Siberian crane.

Loktak lake: The largest freshwater lake in northeastern India, located in Manipur, is known for its phumdis (floating islands). It supports various species of fish and birds and is central to the local culture and economy [4-6].

Wular lake: One of the largest freshwater lakes in Asia, located in Jammu and Kashmir. It plays a significant role in flood control and supports diverse fish and bird populations.

Threats to wetlands

Despite their importance, India's wetlands face numerous threats. Urbanization and industrialization have led to the drainage and reclamation of many wetlands for development projects. Pollution from agricultural runoff, industrial discharges, and untreated sewage degrades water quality, harming aquatic life and reducing the ecological health of wetlands [7-9].

Encroachment and land conversion for agriculture and real estate development have drastically reduced wetland areas. For instance, in the past few decades, Hyderabad's Hussain Sagar Lake has shrunk due to encroachment and pollution. Additionally, climate change poses a significant threat by altering precipitation patterns and increasing the frequency of extreme weather events, which can disrupt wetland hydrology and biodiversity.

Invasive species are another concern. Non-native plants like water hyacinth can outcompete native vegetation, altering habitat structures and reducing biodiversity. Overfishing and the extraction of wetland resources further strain these ecosystems.

Conservation efforts

India has undertaken several initiatives to protect and restore its wetlands. The Ramsar Convention on Wetlands of International Importance provides a framework for the conservation and wise use of wetlands. As of 2024, India has 75 Ramsar Sites, covering an area of over 1.3 million hectares.

The National Wetland Conservation Programme (NWCP) aims to identify and prioritize wetlands for conservation, promote research, and enhance community participation. The Wetlands (Conservation and Management) Rules, 2017 provide legal protection and guidelines for wetland management, emphasizing the involvement of local communities.

Community-based conservation has proven effective in several regions. For example, the local communities around Loktak Lake have implemented sustainable fishing practices and habitat restoration projects. Similarly, in Chilika Lake, a participatory management approach has helped in the sustainable use of the lake's resources, benefiting both the ecosystem and local livelihoods [10].

*Corresponding author: Anweshi Ghosh Roy, Department of Environmental Sciences, University of Burdwan, India, E-mail: anweshi76@yahoo.com

Received: 01-May-2024, Manuscript No: EPCC-24-136106, Editor Assigned: 03-May-2024, pre QC No: EPCC-24-136106 (PQ), Reviewed: 17-May-2024, QC No: EPCC-24-136106, Revised: 20-May-2024, Manuscript No: EPCC-24-136106 (R), Published: 27-May-2024, DOI: 10.4172/2573-458X.1000395

Citation: Anweshi GR (2024) Wetlands in India: Guardians of Biodiversity and Ecosystem Health. Environ Pollut Climate Change 8: 395.

Copyright: © 2024 Anweshi GR. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Citation: Anweshi GR (2024) Wetlands in India: Guardians of Biodiversity and Ecosystem Health. Environ Pollut Climate Change 8: 395.

Future directions

To ensure the long-term health of India's wetlands, integrated management approaches are essential. This includes:

Strengthening legal frameworks: Enhancing the enforcement of existing laws and policies to prevent wetland degradation.

Promoting sustainable land use practices: Encouraging agricultural and urban planning that considers wetland conservation.

Increasing public awareness: Educating communities about the importance of wetlands and involving them in conservation efforts.

Enhancing scientific research: Supporting studies on wetland ecology, hydrology, and the impacts of climate change to inform management practices.

Restoration projects: Implementing large-scale wetland restoration initiatives to rehabilitate degraded areas.

Conclusion

Wetlands in India are invaluable ecosystems that support biodiversity, provide essential ecological services, and sustain local communities. Despite facing significant threats, concerted conservation efforts and sustainable management practices can safeguard these natural treasures. By fostering a deeper understanding and appreciation of wetlands, India can ensure their protection for future generations, maintaining the balance of nature and enhancing the quality of life for all.

References

- 1. Veeck G, Veeck A, Yu H (2020) Challenges of agriculture and food systems issues in China and the United States. Geogr Sustain 1:109-117.
- Hamilton SE (2020) Mangroves and Aquaculture. A five Decades Remote Sensing Analysis of Ecuadors Estuarine Environments. Springer 33: 1-40.
- Ogrinc N, Tamše S, Zavadlav S, Vrzel J, Jin L (2019) Evaluation of geochemical processes and nitrate pollution sources at the Ljubljansko polje aquifer (Slovenia): A stable isotope perspective. Science Total Environ 646: 1588-1600.
- Chattopadhyay S, Chattopadhyay D (2020) Coal and other mining operations: role of sustainability. Fossil Energy 1: 333-356.
- Magana-Arachchi DN, Wanigatunge RP (2020) Ubiquitous waterborne pathogens. Waterborne Patho 2: 15-45.
- Khosrovyan A, Casillas TA (2022) Advance in studies of CO2 acidification in freshwater ecosystems: sources, impacts, etc. Elsevier 11: 183-198.
- Wurtsbaugh WA, Paerl HW, Dodds WK (2019) Nutrients, eutrophication and harmful algal blooms along the freshwater to marine continuum. Wiley Interdis Rev 6: 1373.
- Maxcy-Brown J, Elliott MA, Krometis LA, Brown J, White KD, et al. (2021) Making waves: Right in our backyard-surface discharge of untreated wastewater from homes in the United States. Water Research 190: 116647.
- Nanda S, Berruti F (2021) Municipal solid waste management and landfilling technologies: a review. Environmental Chemistry Letters 19: 1433-1456.
- Trávníček P, Kotek L, Junga P, Koutný T, Novotná J, et al. (2019) Prevention of accidents to storage tanks for liquid products used in agriculture. Process Saf Enviro Prot 128: 193-202.