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WETLAND CONSERVATION AND REGULATION

~ARSHMEET KAUR

I. INTRODUCTION

Urban centers act as magnets for population growth, drawing people from surrounding rural and semi-urban areas in search of employment, education, healthcare, and better living conditions. This rapid urbanization significantly increases the demand for land to accommodate housing, industry, transportation networks, and public infrastructure. As cities expand, natural landscapes—such as forests, grasslands, wetlands, agricultural lands, and floodplains—are increasingly transformed into urbanized areas. Also building cities often changes the way rivers, streams and underground water move. This happens because people take much water change the path of rivers and take over land. This affects the amount and quality of water. More people living in cities also puts a lot of pressure on how cities deal with waste and dirty water. In large cities, there are no adequate wastewater treatment facilities or proper waste disposal systems. Consequently, untreated waste from households, factories, and landfills ends up in rivers, lakes, ponds, and wetlands. This pollution degrades water quality, destroys aquatic habitats, reduces oxygen levels in the water, and endangers fish, birds, and other aquatic animals. Invasive species and many nutrients speed up this damage and cause long-term problems for the environment.

Wetlands are essential for sustainable cities, as they act as natural water filters. They use chemical and biological processes to purify water: removing pollutants, absorbing nutrients such as nitrogen and phosphorus, capturing heavy metals, and breaking down pollutants. This purification improves the quality of water before it reaches rivers, lakes, or groundwater; later, the clean water can be used in lakes, ponds, or artificial reservoirs. These areas promote urban biodiversity, restore water quality, and provide water for agriculture. In addition, wetlands help

prevent urban flooding by storing rainwater, regulating local climate, and providing habitat for many plants, birds, fish, and insects. Therefore, protecting and restoring wetlands is not only essential for protecting wildlife, but also for enabling communities to adapt to climate change, ensure water security, and grow in an environmentally sustainable manner.

II. ABOUT WETLAND

Wetlands are environments that maintain their own balance through the movement and removal of waste. They act as natural water purifiers, although human intervention can sometimes enhance their functioning. They operate as self-regulating systems. As polluted water flows through a channel, waste is separated out. To purify the water, it flows over a bed of rocks that trap small particles. It then passes through a network of plants that feed on specific nutrients. Finally, the clean water empties into a lake or pond teeming with diverse forms of life.

Wetlands can help prevent flash floods in cities by acting as a barrier. They also contribute to groundwater recharge. There are various types of wetlands; however, in urban areas, we generally observe only two types:

- **Natural wetlands:** These include features such as large high-mountain lakes, areas near major rivers, arid zones subject to occasional flooding, and coastal wetlands. Examples include lagoons, abandoned river channels, areas where rivers meet mangrove forests, and coral reefs.
- **Artificial wetlands:** These are constructed for purposes such as agricultural water storage, fish farming, or recreation. Examples include drinking water reservoirs, fish farms, salt pans, ponds, small retaining walls for artificial ponds, water storage facilities, and old municipal ponds.

III. INDIA'S WETLAND & ECOSYSTEMS CONSERVATION

Wetlands are among the most valuable places on earth. They provide benefits to nature by protecting plants and animals, maintaining water quality, regulating climate, and improving human well-being. Problems such as habitat destruction, pollution, inappropriate land use, overexploitation of natural resources, the presence of invasive species, and climate change. Destruction of wetlands leads to the extinction of plants and animals, pollutes water, and disrupts the natural systems that keep the earth in balance.

India is home to a variety of wetland types, including freshwater, brackish and saltwater, coastal, and elevated wetlands. These include rivers, lakes, floodplains, wetlands, peatlands, mangroves, tidal flats, lagoons, coral reefs, and salt marshes. The country's topography, climate, and water features have given rise to a rich and diverse ecosystem, which serves as a habitat for a wide range of resident and migratory species. Some wetlands, such as the Sundarbans, Chilika Lake, Loktak Lake, Keoladeo National Park, and Kolleru Lake, are renowned for their ecological and historical significance to India.

Wetlands play a vital role in providing benefits to people, the environment, and the economy. They purify water by removing pollutants, restore water quality, regulate runoff, mitigate floods and droughts, protect coastlines, and store carbon, thereby helping to combat climate change. They also support fisheries, agriculture, tourism, and cultural activities, while providing habitat for wildlife. These services help protect nature and human well-being, strengthen the ecosystem's resilience to change, and support the livelihoods of millions of people.

Despite their importance, India's wetlands face significant threats from urban sprawl, industrialization, intensive agriculture, pollution, land use, and overexploitation of resources. The conversion of wetlands to residential areas, industrial facilities, or roads disrupts their ecological functions and destroys wildlife habitats. Furthermore, the lack of treatment for wastewater, industrial waste, and sewage is degrading water quality. Climate change is exacerbating these problems by disrupting water systems and altering the natural environment. This situation highlights the urgent need to protect wetlands.

Recognizing the importance of these ecosystems, India has enacted laws and created dedicated agencies for their protection. As a signatory to the Ramsar Convention, India has designated several important wetlands around the world and is committed to their conservation. The 2017 Act, titled "The Wetlands (Conservation and Management) Act", is part of a series of laws for environmental protection. Other measures include the National Environment Protection Scheme, a dedicated state body for wetland management, mangrove and coral reef conservation programmes, and ecosystem restoration projects.

Conserving wetlands in India requires a comprehensive approach that combines scientific rigor, law enforcement, land use planning, ecosystem restoration, citizen participation, and ongoing environmental monitoring. Ensuring compliance with the law, preventing pollution, managing land properly, promoting public awareness, and using nature-based solutions are key elements for protecting these areas. Conserving wetlands is crucial for conserving biodiversity, ensuring access to clean water, maintaining ecological balance, and promoting sustainable urban development for the future.

IV. WETLAND REGULATION

According to the framework of Constitution of India the law regarding the use of natural resources and environmental protection are clear. The country has laws and regulations for the management of wetlands. India has enacted various laws and regulations for the protection of these ecosystems. Some of these laws are:

- Biodiversity Act, 2002: This Indian law seeks to conserve the biodiversity of living organisms, ensure the sustainable use of living resources, and establish the fair and equitable sharing of benefits arising from biological resources and related knowledge. India is a signatory to various international agreements, such as the Rio Convention.

- National Water Conservation Programme: A programme launched by the Indian central government between 1985 and 1986, which aims to protect, restore, and manage vulnerable aquatic ecosystems.

- Water Resources (Conservation and Management) Act, 1986: An Act enacted by the Ministry of Environment, Forest and Climate Change under the Environment (Conservation) Act, 1986.

- National Plan for Natural Resources Conservation (NPNC): A central government programme of India focused on the comprehensive protection and restoration of lakes and wetlands. It was implemented by the Ministry of Environment, Forest and Climate Change to improve water quality, biodiversity, and environmental health by combating pollution and degradation. Environmental concerns remain a major concern in the regulation and protection of wetlands.

V. CONCLUSION

Wetlands are important resources that support biodiversity, regulate water levels, mitigate floods, and mitigate climate change. Singapore's rapid urbanization, pollution, land degradation, and climate change continue to threaten the integrity of its ecosystems. Whereas in India, where relevant legislation and regulations – the Water Resources (Conservation and Management) Act 2017 and the National Plan for the Conservation of Wildlife – are in place, community participation and governance are still essential. Integrating wetland conservation with local communities, strengthening environmental stewardship, and raising awareness of the issues are essential to ensure the sustainable management of these ecosystems. Wetland conservation is essential for ecological balance, water conservation, and the sustainability of future generations. sure the rules are followed and helping people learn more are all needed to take care of these places. Keeping wetlands is important for making sure nature stays balanced water is safe and cities can grow in a way, for the future.

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