

**BIRD DIVERSITY AND CONSERVATION OF WETLAND HABITATS IN
HARYANA: ECOLOGICAL INSIGHTS AND MANAGEMENT
STRATEGIES****Nidhi¹, Dr. Purnima Shrivastava²****Research Scholar¹, Supervisor²****Bhagwant University****Ajmer, Rajasthan, India****dnidhi126@gmail.com¹, brijpoornima@yahoo.com²****Abstract**

Wetland ecosystems in Haryana, India are important habitats that contain a variety of avian species, which provide vital resources to the birds in terms of breeding, migration, and survival. Nevertheless, these ecosystems are becoming highly endangered by human activities, climate change, and changes in land-use. This research paper will examine the bird life in the wetland ecosystems in the state of Haryana in terms of ecological importance of the wetlands to the resident and migratory birds species. The study finds out the important bird species and their population patterns through field surveys and ecological surveys, highlighting the importance of wetlands in ensuring

biodiversity. The paper also explores the issues wetlands are experiencing because of urbanization, shortage of water and agricultural developments and provides effective management recommendations on how these crucial eco systems can be conserved. The study highlights the importance of combined conservation including habitat restoration, sustainable water management practice and awareness program in order to safeguard the survival of the wetland-dependent bird species in Haryana in the long term.

Keywords: Planned conservation of water fowl, Wetland ecological services, Biological control of invasive species, Monitoring techniques of birds, Wetland degradation.

International Journal of Multidisciplinary Innovations & Studies (IJMIS)

Introduction

The wetlands are a unique and important ecosystem of Haryana, India and they also serve as an essential habitat to a variety of birds. These places are biodiversity-rich and have a significant breeding, nesting and feeding habitat to numerous migratory and non-migratory avian species. The wetlands provide as well a large number of ecological services, such as purification of water, flood control, and carbon sequestration, which are necessary to balance the environment (Ameena et al., 2024). The wetlands however have a number of threats including urbanization, agricultural growth, pollution and water resource depletion. Consequently, Haryana faces a risk in terms of wetland bird species and in this respect, conservation needs to be focused on such ecosystems and birds living in wetlands.

The ecological processes, the species of birds nourished by the wetland habitats, and effects of human activities should be well understood by the management and conservation of the wetlands in Haryana. A successful conservation effort should focus on preserving habitats as well as curbing man-made stressors on these important

<https://ijmis.org/>

ecosystems. Through research into the present situation with bird diversity, the ecological role of wetland habitats, and sustainable management, the given paper will outline major steps on the ways to preserve wetlands in Haryana (Bledy et al., 2024). Community involvement, policy implementation and scientific research are vital in the integration of these useful ecosystems so that they can remain viable in the long run.

1. Ecological Significance of Wetlands in Haryana

Wetlands in Haryana are particularly very important ecologically, being used as a buffer to different environmental issues like flooding and pollution. They reduce the levels of groundwater and help in controlling the local climate too. Wetlands render very important ecosystem services that aid in water purification, enhanced biodiversity, and soil stabilization. Besides these purposes, they serve as carbon sinks, which have reduced the impact of climate change. These ecosystems play a vital role in supporting a large variety of organisms and thus they play an important role in the ecological balance of the region that cannot be replaced.

International Journal of Multidisciplinary Innovations & Studies (IJMIS)

Considering such ecological functions, any form of threat to wetlands has serious impacts on human population and wildlife. Wetlands are very productive ecosystems and they play the role of supporting the species diversity and in this case, the avian species in the area (Ladhar, 2002). They are however being rapidly degraded by human encroachment and climate change which threaten the survival of the local wildlife, including bird species, which rely on the habitats.

2. Avian Diversity in Haryana's Wetlands

The wetlands in Haryana are also key locations to the resident and migratory birds. There are wetlands such as the Haryana Wetland complex and Bhindawas Lake that are home to huge populations of migratory birds such as the Siberian Crane and other types of waders and water fowls. These regions are perfect nesting, feeding and rest areas during migration of these birds. These wetlands play an important role in the migratory patterns of many of the species who migrate out of Central Asia, Europe and Siberia (P. Kumar and Gupta, 1970). Along with migratory species of birds, Haryana wetlands are also home to a number of resident species that are present throughout

<https://ijmis.org/>

the year. The region is very ecologically important as evidenced by the variety of the species of birds present here. Many species of birds cannot sustain their lives without having the health of these wetlands and this makes it important to ensure that these habitats are monitored and preserved.

- **Table 1: Bird Species Count Across Major Wetlands in Haryana**

| Wetland Area | Resident Species | Migratory Species | Total Species |
|-------------------------|------------------|-------------------|---------------|
| Haryana Wetland Complex | 25 | 15 | 40 |
| Bhindawas Lake | 18 | 12 | 30 |
| Keshopur-Miani Lake | 20 | 10 | 30 |

Source: Author's compilation

3. Threats to Wetland Ecosystems and Bird Diversity

The wetlands of Haryana have several man-made threats to its bird species endangering

International Journal of Multidisciplinary Innovations & Studies (IJMIS)

its survival. Among the greatest threats, there are urban development, agricultural encroachment, industrial-induced pollution, and diversion of water to irrigation. The degradation of the habitat, water shortage, and pollution are some human processes that interrupt the fragile balance of the wetland ecosystem. Intrusion of invasive species endangers the endemic biodiversity, such as plant and animal life. These are not only threats to the bird species but also to the ecological quality of the wetland as a whole since a number of organisms in the food chain are affected (Butt et al., 2021). Conservation and management practices that would help preserve the diversity of wetland birds should be understood and managed by understanding these threats.

4. Impact of Climate Change on Wetland Habitats and Bird Species

Climate change is changing the Haryanan wetlands hydrology including water levels and seasonal patterns on which a lot of bird species depend on their migration and breeding. Modifications in precipitation trends, temperature increase, and severe weather conditions are causing an increase in droughts and floods, which disrupt the

<https://ijmis.org/>

wetlands habitats balance. This has an impact on the availability of food and nesting grounds of the birds and how they can easily migrate. The species of birds that are dependent on a particular mode of wetland conditions are under the threat as the climate keeps shifting. Wetlands that were once providing stable habitats might no longer be able to do so and give the birds the conditions they require to survive (Dawson et al., 2003). As an example, alterations in the season of monsoons or drying up of wetlands could impact the breeding patterns of migratory species.

5. Conservation Status of Wetlands in Haryana

There are a few wetlands under the Ramsar Convention and are protected under this convention, but many other wetlands are unprotected or are only partially covered by protection due to enforcement. Though the state government has taken up conservation initiatives, tougher policies and better enforcement of such policies will be required in order to conserve these valuable habitats. Haryana has wetlands which are categorized under various classes according to their conservation status. There are those that are

International Journal of Multidisciplinary Innovations & Studies (IJMIS)

being actively controlled and some that are getting more and more pressured by the human action (Chopra et al., 2001). This part will assess the conservation of the important wetland areas, the importance of legal frameworks and address the loopholes in their protection which should be filled to effectively preserve the wetland bird species.

6. Management Strategies for Wetland Conservation

The most viable wetland conservation plans must be aimed at conserving the habitat and involving the community. These include restoration of dwindled wetlands to conserve water quality, increase biodiversity and offer better spaces of breeding and feeding of bird species. They involve eliminating invasive species, enhancing water management systems and having sustainable farming methods. Constant monitoring, such as remote sensing and biodiversity measurements, should also be used in wetland management to monitor the changes in the ecosystem. Such information can be used to inform adaptive management, and it could be used to alleviate the adverse outcomes of human action (Maltby, 1991). Also, the use of local communities in

conservation programs in the form of eco-tourism, education, and livelihood will contribute to the success of the wetlands preservation in the long term.

Figure 1: Wetland Restoration and Management Process



Source: Author's Conceptualization

7. Role of Local Communities in Wetland Conservation

Wetlands are greatly conserved by the local communities. Haryana has many wetlands mostly situated in rural regions where people are relying on the resources of wetlands as their livelihood. Community-based conservation strategies, such as the engagement of the local population in managing, monitoring and eco-tourism activities of wetlands, could be quite successful in bringing about a successful conservation in the long term (Shrestha,

International Journal of Multidisciplinary Innovations & Studies (IJMIS)

2013). Negative impacts on wetlands will be mitigated by empowering the local communities using knowledge, resources and training of sustainable practices, e.g. water management and species monitoring. Moreover, the conservation by the community can create the feeling of ownership, and thus, more successful conservation will be achieved.

8. Policy Framework for Wetland and Bird Conservation

There are a number of policies and legal frameworks in Haryana to regulate the conservation of wetlands, and there are gaps in the implementation, though. Being a member of the Ramsar Convention, which is a very important document on wetland protection, India is not managed by the local policies in terms of the support needed to protect and restore the wetlands. To make wetland ecosystems sustainable, it is necessary to strengthen the policies connected with the wetland management, enhance enforcement of the existing policy, and make sure that conservation efforts are considered in the form of the broader environmental policies (Sinthumule, 2024). This part will touch on the current legal

<https://ijmis.org/>

system and policy frameworks and their efficacy and where they need enhancement.

9. Monitoring and Research in Wetland Conservation

Monitoring the health of wetland ecosystems and the bird species that depend on them is essential for guiding conservation efforts. Advances in technology, such as the use of satellite imagery and automated bird counting systems, are helping researchers gather data more efficiently. Regular surveys of bird populations, vegetation health, and water quality can provide valuable insights into the condition of wetlands and guide management decisions. The research community also plays a crucial role in studying the ecological dynamics of wetland systems, identifying emerging threats, and developing innovative conservation strategies (Gilvear & Bradley, 2000). Collaborations between researchers, policymakers, and conservationists can help develop more effective solutions for wetland protection.

10. Ecotourism and Its Role in Wetland Conservation

International Journal of Multidisciplinary Innovations & Studies (IJMIS)

Ecotourism is one such promising approach to the conservation of wetlands in Haryana, as it will give a twofold advantage of conserving the crucial ecosystems and at the same time, offer economic avenue to the local people. Through nature-based tourism, ecotourism enables people to explore the beauty and biodiversity of the wetlands in Haryana, which will make them appreciate more nature wetlands. This is a financial incentive to the local people to conserve the wetland areas and not use them to develop sustainably. Besides this, ecotourism is capable of providing revenue that can be plowed back into conservation exercises, like habitat restoration programs, environmental education courses, and monitoring wildlife population. Ecotourism should be well controlled in order to avoid excessive use and environmental degradation. Otherwise, it may cause habitat disruption and contamination and disturbance of natural behavior of wildlife. These measures of sustainable tourism practices, such as the restrictions in the number of people visiting, promoting the idea of responsible observation of wildlife, and educating tourists about the value of wetland

ecosystems are necessary (Das & Syiemlieh, 2009). With a balance between conservation and tourism development, ecotourism can help in the long-term conservation of the wetland habitats and the species reliant on the habitats of Haryana.

11. Sustainable Agriculture Practices to Protect Wetlands

One of the biggest threats to wetland habitats in Haryana is agriculture where intensive irrigation, land reclamation and use of pesticides have direct effects on the integrity of the ecosystem. Sustainable agricultural practices are essential in order to reduce these effects. Irrigation processes such as drip irrigation, sprinkler irrigation are wetland-friendly methods which reduce the amount of water used and do not result in large amount of water being flowing into the wetlands leading to soil erosion as well as pollution of the wetlands. Agro forestry that combines forest and farm crops can also ensure that soil is fertile, water consumption is minimized, and more wildlife habitat is made available, thereby contributing to the overall well-being of wetland ecosystems. The pollution of wetlands and the conservation of water quality can be greatly reduced by adopting

International Journal of Multidisciplinary Innovations & Studies (IJMIS)

organic farming production methods that do not use any hazardous and polluting chemicals. It is important to align agricultural policies with conservation activities of wetlands to attain sustainable development (Rijsberman and De Silva, 2006). Efforts to provide subsidies to organic farmers or educate them about the advantages of wetland conservation can be very important in making sure that the activities of agriculture do not threaten the ecological value of the wetlands in Haryana.

SUMMARY

The green economy is an aspiring but controversial way to go in meeting the Sustainable Development Goals. Although it provides some viable means of attaching the economic, environmental and social goals, its success would be determined by how far the structural change that it facilitates is carried. The issue with new green economy rhetoric being superficially adopted without solving the underlying inequalities and governance issues is that the SDGs have the potential to transform the world, but this can be undermined. To be an effective driver of sustainable development, the green economy needs to be institutionalized in purposeful <https://ijmis.org/>

and inclusive, transparent, and accountable institutions that do not evaluate economic benefits based on the short-term but long-term ecological and social viability.

References

- Ameena, M., Deb, A., Sethulakshmi, V., Sekhar, L., Susha, V., Kalyani, M., & Umkhulzum, F. (2024). Weed Ecology: Insights for Successful Management Strategies: A review. *Agricultural Reviews*, Of. <https://doi.org/10.18805/ag.r-2661>
- Bledý, M., Vacek, S., Brabec, P., Vacek, Z., Cukor, J., Černý, J., Ševčík, R., & Brynychová, K. (2024). Silver Fir (*Abies alba* Mill.): Review of Ecological Insights, Forest Management Strategies, and Climate Change's Impact on European Forests. *Forests*, 15(6), 998. <https://doi.org/10.3390/f15060998>
- Ladhar, S. S. (2002). Status of ecological health of wetlands in Punjab, India. *Aquatic Ecosystem Health & Management*, 5(4), 457–465. <https://doi.org/10.1080/14634980290002002>
- Kumar, P., & Gupta, S. (1970). Diversity and Abundance of Wetland Birds around

**International Journal of Multidisciplinary Innovations & Studies
(IJMIS)**

Kurukshetra, India. *Our Nature*, 7(1), 212–217. <https://doi.org/10.3126/on.v7i1.2574>

Butt, M. A., Zafar, M., Ahmed, M., Shaheen, S., & Sultana, S. (2021). Threats to Biodiversity of Wetland. In * (pp. 117–133). https://doi.org/10.1007/978-3-030-69258-2_7

Dawson, T. P., Berry, P. M., & Kampa, E. (2003). Climate change impacts on freshwater wetland habitats. *Journal for Nature Conservation*, 11(1), 25–30. <https://doi.org/10.1078/1617-1381-00031>

Chopra, R., Verma, V. K., & Sharma, P. K. (2001). Mapping, monitoring and conservation of Harike wetland ecosystem, Punjab, India, through remote sensing. *International Journal of Remote Sensing*, 22(1), 89–98. <https://doi.org/10.1080/014311601750038866>

Maltby, E. (1991). Wetland management goals: wise use and conservation. *Landscape and Urban Planning*, 20(1–3), 9–18. [https://doi.org/10.1016/0169-2046\(91\)90085-z](https://doi.org/10.1016/0169-2046(91)90085-z)

Shrestha, U. (2013). Community participation in Wetland conservation in <https://ijmis.org/>

Nepal. *Journal of Agriculture and Environment*, 12, 140–147. <https://doi.org/10.3126/aej.v12i0.7574>

Sinthumule, N. I. (2024). An analysis of policy and legal framework on wetland conservation and management in South Africa. *Watershed Ecology and the Environment*, 6, 63–69. <https://doi.org/10.1016/j.wsee.2024.03.001>

Gilvear, D., & Bradley, C. (2000). Hydrological monitoring and surveillance for wetland conservation and management; a UK perspective. *Physics and Chemistry of the Earth Part B Hydrology Oceans and Atmosphere*, 25(7–8), 571–588. [https://doi.org/10.1016/s1464-1909\(00\)00068-x](https://doi.org/10.1016/s1464-1909(00)00068-x)

Das, N., & Syiemlieh, H. J. (2009). Ecotourism in Wetland Ecology. *Anatolia*, 20(2), 445–450. <https://doi.org/10.1080/13032917.2009.10518920>

Rijsberman, F., & De Silva, S. (2006). Sustainable agriculture and wetlands. In *Ecological studies* (pp. 33–52). https://doi.org/10.1007/978-3-540-33187-2_3