



BIODIVERSITY ASSESSMENT OF KHANWARI POND OF DISTRICT KAUSHAMBI (U.P.)

Shri Prakash¹ and Ashok Kumar Verma^{2*}

¹Department of Zoology, K.A.P.G. College Prayagraj (U.P.)

²Department of Zoology, Govt. P.G. College, Saidabad Prayagraj (U.P.)

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ABSTRACT

The present study is undertaken to assess the biodiversity of naturally occurring Khanwari pond of Kaushambi district of Uttar Pradesh. The said pond is one of the natural fresh water reservoirs of this district. It covers an area of about 1.5 sq km and is rich in faunal and floristic diversity. To assess the biodiversity in and around this pond, a detailed survey of the pond and its tributaries was carried out during the year 2017-2018 which indicate the rich biodiversity of this pond. The notable animal diversity includes 28 species of fishes, 4 types of amphibians, 10 types of reptiles, 15 types of birds and 12 types of mammals. Several species of annelids, butterflies, moths, grass hoppers, ants, termites, lobsters, crabs, gastropods including snails and many types of zooplankton were also available there. The result also shows the occurrence of 44 flowering hydrophytes, 06 pteridophytes, 02 bryophytes, 07 species of green algae, 05 blue green algal genera and several diatoms and other phytoplankton.

Keywords: Biodiversity, Conservation, Fauna, Flora, Khanwari pond, Wetland.

INTRODUCTION

Wetlands constitute one of the most productive ecosystems, corresponding to tropical evergreen forests in the biosphere and play a significant role in the regional ecological sustainability. They have been an essential part of human civilization meeting many crucial needs for life such as drinking water, food, fodder, energy supply, flood storage, transport, recreation, biodiversity, and climate stabilization. The cross cultural, economic and ecological values of wetlands provide a fine blend of past, present and future of human descend, existence, and future perspectives of sustainability. The geomorphologic, climatic, hydrological and biotic diversity across continents has contributed to wetland diversity.

However, they are getting extinct all over the world due to manifold reasons, such as shooting population, escalated human activity, unplanned development, absence of management structure, want of proper legislation, and lack of proper awareness regarding the vital roles played by these ecosystems. The loss of wetlands has led to several ecological disasters in some areas, including large-scale devastation due to inundation.

The major causes of loss of biodiversity in wetland systems include land use patterns, habitat destruction, pollution, exploitation of resources, and invasive species. Wetlands are under increasing stress due to the rapidly growing population, technological development, urbanisation and economic growth.

*Corresponding author: akv.gdcz@gmail.com

Wetland loss may be defined as the loss of wetland area, due to conversion of wetland to non-wetland areas as a result of human activity and wetland degradation is the impairment of wetland functions as a result of human activity. About 50 % of the world's wetlands have been lost in the last century, primarily through drainage for agriculture, urban development and water system regulations. On a global scale, the loss of wetlands can be mainly attributed to natural and anthropogenic activities such as climate change through increased atmospheric temperature, shifting patterns in precipitation, increased frequency of storms, droughts, and floods, and sea level rise etc.

The Ramsar Convention is an international treaty designed to address global concerns regarding the loss and degradation of wetlands. Primary objectives of the treaty are to enlist wetlands of international importance and to promote their wise use, with the ultimate goal of preserving the world's wetlands. Methods include restricting access to the major portion of wetland areas, as well as educating the public that "wetlands are not wastelands". The Convention works closely with five International organizations: Birdlife International, IUCN, International Water Management Institute, Wetlands International and World Wide Fund for Nature. The partner organizations provide technical expertise to facilitate field studies and provide financial support.

Prakash *et al*, (2015a, 2015b and 2016), Verma *et al*, (2016a and 2016b) and Verma (2016a and 2016b) performed the limnological and ichthyological studies of Alwara Lake of Kaushambi (U.P.). As far as Khanwari pond is concerned, it is studied for distribution and conservation of fishes by Verma *et al*, (2017a and 2017b) and Prakash *et al*, (2017a and 2017b) while Verma (2019) studied the chordate diversity of this water body.

Study Area

The pond (photograph 1) under exploration is situated in Khanwari village, which is located in block and tahsil of Sirathu of Kaushambi district of Uttar Pradesh (image 1). This Khanwari village is surrounded by Jiyapur in east, Tulsipur and Admapur in the north, Kaini in the south and Nadin ka pura in the west. The climatic change influences its vast openness, landscape ecology and biodiversity. It covers an area of about 1.5 sq km. This pond is an important resort for the native faunal and plant diversity. Therefore, the

present study was undertaken to assess the pond in terms of its faunal and floral diversity as well as ecological significance for the area.

MATERIALS AND METHODS

Several seasonal periodical surveys of the pond and its tributaries were carried out during the year 2017-2018. Standard survey methods for field work (Moll *et al*, 1986; Burbridge, 1994; Statzner *et al*, 1994) were followed. Fishes were identified using the standard keys of Jhingran (1991) and Srivastava (1998). Dutta (1007) and Dinesh *et al*, (2017) helped to identify amphibians while reptiles with the help of Aengals (2012). Birds were identified with the help of Ali (1988). People of local communities of adjoining areas also assisted the authors in many ways for collection, identification and hospitality.



Image 1: Location of study area of Khanwari pond in Kaushambi.

Standard methods of specimen collection, identification and preservation were followed to record the information. Sedgwick and Rafter plankton counting methods were used for identification of phytoplankton and zooplankton.

For proper coverage, the study area was divided into four transects;

Transect – I: Including village Jiyapur, situated on the eastern side of the pond.

Transect – II: Including Admapur and Kamasin villages, situated on the northern side of the pond.

Transect – III: Including Nadin ka pura, Jagdhapar and Gambhira villages, situated on the western side of the pond.

Transect – IV: Including Khanwari, Kaini and Nara villages, situated on the southern side of the pond.



Photograph 1: A view of Khanwari pond, district Kaushambi (U.P.).

RESULTS AND DISCUSSION

A. Faunal Diversity:

The pond studied has rich diversity of fishes, reptiles, birds and mammals as following:

1. Fishes:

The said pond has rich fish diversity including 28 species (Prakash *et al*, 2017a) of fishes represented by *Catla catla*, *Labeo rohita*, *Labeo calbasu*, *Cirrhinus mrigala*, *Puntius (Pethia) ticto*, *Puntius chola*, *Mystus seenghala*, *Mystus cavasious*, *Mystus vittatus*, *Mystus (Sperata) aor*, *Mystus gulio*, *Wallago attu*, *Ompak pabda*, *Clarias batrachus*, *Clarias gareipinous*, *Heteropneustes fossilis*, *Ailia coila*, *Channa punctatus*, *Channa marulius*, *Glossogobius giuris*, *Anabas testudeni*, *Colisa fasciatus*, *Notopterus notopterus*, *Notopterus chitala*, *Gudusia chapra*, *Setipinna phasa*, *Xenentodon cancila*, *Mastacembelus armatus*.

2. Amphibians:

Notable amphibians reported from the said pond are Indian bull frog, Common Indian toad, Caecilian and Tree frog.

3. Reptiles: Ten types of reptiles are represented as: Indian narrow-headed soft shell turtle, Tortoise, Gecko, Garden lizard, The spiny tailed lizard, Indian monitor lizard, Azgar, Red sand Boa, Krait and Indian Cobra.

4. Birds: The Khanwari pond has rich avian diversity represented by 15 type of birds namely Peacock, Koel, Common myna, Sparrow, Parrot, Pigeon, Sarus crane, Bulbul, Woodpecker, Hornbill, Spoonbill, Owl, Crow, Egret, Vulture.

5. Mammals: 12 types of mammals are represented there such as Otter, Mole, Mongoose, Fox, Jackal, Rabbit, Shrew, Rat, Mouse, Squirrel, Nilgai and Pig.

Besides, several species of annelids, crabs, butterflies, moths, grasshoppers, ants, termites, lobsters, snails, other gastropods and several zooplankton have also been observed in and around the pond.

B. Floristic diversity:

The rich growths of angiospermic hydrophytes in and around the pond include 5 categories with total 44 species as under:

1. Free floating: *Eichhornia crassipes*, *Hygrorhiza aristata*, *Lemna perpusila*, *Nymphoides cristata*, *Pistia siriotes*, *Spirodela polyrhiza*, *Wolffia arhiza* etc.

2. Rooted floated: *Ipomoea aquatic*, *Ludwigia adscendens*, *Nelumbo nucifera*, *Nymphaea stillata* *Sagittaria loppula* etc.

3. Rooted Submerged: *Hydrilla verticillata*, *Najas graminea*, *Potamogeton crassipes*, *Vallisneria spiralis* etc.

4. Suspended hydrophytes: *Ceratophyllum demersum*, *Utricularia stellaris* etc.

5. Rooted amphibians: *Alternanthera sessilis*, *Apluda mutica*, *Blepharis repens*, *Boerhaavia diffusa*, *Canscora decurrens*, *Centella asiatica*, *Cyperus spp.*, *Eleocharis dulcis*, *Evolvulus assenoides*, *Fimbristylis littoralis*, *Glinus lotoides*, *Heliotropium spp.*, *Hygrophyla auriculata*, *Juncus bufonius*, *Limnophila indica*, *Lindernia ciliate*, *Monocharia vaginalis*, *Peristrophe bicalyculata*, *Polygonum spp.*, *Sagittaria trifolia*, *Sonchus arvensis*, *Tephrosia pumila*, *Trianthema portulacastrum*, *Typha angustifolia*, *Veronica anagallis-aquatica*, *Veteveria zizanoides* etc.

Besides, the flowering plants 06 species of pteridophytes such as; *Marsilea*, *Equisetum*, *Lygodium*, *Dryopteris*, *Salvinia*, *Azolla* etc. 2 bryophytes such as; *Riccia* and other mosses etc. 7 green algal genera like; *Chlamydomonas*, *Chlorella*, *Oedogonium*, *Chara*, *Nitella*, *Spirogyra*, *Ulothrix* and 5 blue green algae like: *Oscillatoria*, *Anabaena*, *Spirulina*, *Nostoc* and *Rivuleria* along with several members of diatoms, and phytoplankton have been recorded.

Considering the importance, causes, and consequences of loss of this highly productive ecosystem with rich biodiversity, it seems better to protect and conserve the Khanwari pond. The conservation is necessary because loss of a regional wetland not only accounts for the loss of biodiversity but also disturbs the biotic constitution and geo-climatic balance of the region. All these finally may lead to non-sustainability and natural disasters.

CONCLUSION

The survey report therefore, suggests the importance for the conservation and sustainable utilization of the Khanwari pond of district Kaushambi in the greater interest of nature and humanity. Looking on the biodiversity of the pond, it is urgently needed to preserve this pond so as to offer a natural abode to the animals, a beautiful habitat to the plants and ecological gift to the environment.

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