North Bihar is flooded with many types of inland water resources ranging from small ephemeral pools to large perennial lakes, swamps, thermal springs and rivers. These wetlands are formed mainly due to the action of the river Ganga and its tributaries like Kosi, Bhagmati, and Gandak. In South Bihar, rivers like Sone, Damodar and Chandan play the same role. Some of these wetlands are also formed in the low-lying areas where water gets inundated from the catchment areas during monsoon. Many wetlands still exist in north Bihar, in the districts of Kishanganj, Purnea, Katihar, Begusarai, Darbhanga, Madhubani and Chapra. Of these, the Kawar Lake Bird Sanctuary (also known as Kawar Tal) in Begusarai district is of utmost importance.

Kawar Tal, a 7,400-hectare lake about 22 km northwest of Begusarai town, is considered one of South Asia’s largest freshwater lakes. Ecologically, it is one of the most important wetlands in the state, hosting 106 species of resident birds and providing a nesting ground for 59 species of migratory birds. In addition, the wetland supports a large number of flora and fauna round the year. Economically too, the lake is significant because it yields about two tonnes of fish everyday and is the single biggest source of income in the area. The wetland is used simultaneously for rice cultivation, fishing, and many other uses. Agriculture is the most important use of the wetland and the basic source of income in the area.

The Union Government has notified Kawar Tal as a wetland of national importance, the only one with this designation in Bihar. The astonishing natural habitat of this lake and its adjoining areas is mesmerizing with various dimensions of life specially insects, crustaceans, mollusks, birds as well as small mammals. It is a treat to behold when the monsoon is in full swing. The entire lake area offers an ideal habitat for migratory birds in winter. In 2004, more than 41 species of fish were recorded from the lake.

In 1986, Kawar Tal was declared a protected area. The wetland, despite being a proposed Ramsar site since 1987, was not included among the 13 others declared as wetlands of international importance in 2002. The Kawar Tal has been declared as an IBA (Important Bird Area) site of Bihar because of the large number of birds it harbours. An area of 66.13 sq.km of Kawar Tal was declared as a protected area by the government of Bihar in June 1989.

The lake is known to support a rich and diverse aquatic flora. The forest around the lake and adjoining areas consists of thick vegetation of mainly Shisham (Dalbergia sisso), Teak (Tectonia grandis), Silk cotton (Salmalia malabarica), Jamun (Syzygium jambolan), Ajuin (Terminalia arjuna), Peepal (Ficus religiosa) and Banyan (Ficus bengalensis) trees. In addition to these few, wild flowering plants and fruit bearing trees are also present which attract a large number of birds for feeding and roosting.

The lake has a variety of flora such as Phragmites, Hydilla, Nymphaea, Nelumbo, Vallisneria, Bladders and species of algae like Chara and Spirogyra. Organisms like snails, mussels, crabs, shrimps, bugs and beetles, earthworms, frogs, water snakes, breathing fishes like Channa, Anabas, Clarias etc. are also present in large numbers.

The exuberance of variety of food material available in the sanctuary attracts a large variety of birds including both resident and migratory species. In the winter season the lake provides a suitable migratory stopover to numerous avian visitors breeding from farther north. While some resident birds are sedentary throughout the year, others undertake irregular movements either locally or more widely within the region depending upon water condition or food supply. The limnobiotic conditions of Kawar Tal seem to be in accordance with a natural sanctuary having a wide variety of avifaunal species like ducks, geese, cormorants, Asian open bills, darters and other waterfowls.
Paradise Lost?

A thorough survey of Kawar Tal in 2010-2011 by the Mandar Nature Club of Bhagalpur indicated that the lake is now in a very precarious condition and gradually losing its popularity due to continued reduction in the number of migratory birds. There is gradual shrinkage in the wetland area from 6,786 hectares to 6,043 hectares from 1984 to 2002.

Despite the government’s declaration of Kawar Tal as a Bird Sanctuary in 1989 and subsequent prohibitory measures, Kawar Tal continues to be exploited for fodder, fuel, fish, and other resources. There is threat because of reclamation of land for agriculture and excessive removal of biomass by human population. We describe the chief causes of the decline of Kawar Tal from this survey.

Eutrophication

The waters of Kawar Tal are declining at an alarming rate due to severe eutrophication. The depth of the lake is declining rapidly due to infestation of aquatic weeds such as Phragmites and Hydrilla.

The lake is threatened by pollution and effluents released by the local inhabitants. The water of the lake is turbid and acidic in nature. The dissolved oxygen level in the lake was 7.6 mg/L. The lake is now categorized as a highly eutrophic lake. Due to this, the use of the water by the local people has resulted in skin and digestive disorders among the inhabitants.
As part of its flood control strategy, the State government constructed a canal in the decade of the fifties to drain out the excess floodwaters into the Ganga River during the monsoons. However, in the succeeding decades, lack of maintenance has caused the sediment deposits to choke this outlet. This has resulted in massive inflow of silt in the wetland which is also decreasing the depth of the lake.

**Mindless Massacre of Birds**
The careless attitude of people towards this charismatic heritage of nature is jeopardizing its beauty and, indeed, its very survival. The birds in this sanctuary are currently confronted with a multitude of threats including habitat loss. The causes of loss and damage to habitats are complex and controversial.

Overpopulation in and around the sanctuary area and over exploitation of the sanctuary area is harming and destroying the natural resources. Indiscriminate poaching, hunting and trapping of birds is further decreasing the population of migratory birds. According to Md. Akhtar Hussein, a *mirsikar* (member of bird-trapping community of Manjhaul block) who worked for BNHS for more than a decade, the areas were earlier visited by flocks of cranes and other larger birds in millions, but these birds have now abandoned the site.

From the month of November onward, nights at the Kawar Tal become dangerous for birds. Bird poachers deceive and catch the birds ruthlessly in the night. Nylon nets of varying length stretched with the help of bamboo poles at dusk are used for trapping the birds. At dawn, the bird poachers collect the entangled and entrapped birds in the nets and put them up for sale in the nearby villages and markets. It is estimated that about twenty five thousand birds of different species are caught, trapped and killed every year. Recently, due to the strong protest and reprimands by the members of Mandar Nature Club the government has been forced to step in and stop this massacre of birds.

During the survey, it was found that the bird trappers use poison to capture the water fowls. They use Nymphaea (water lily) leaves to put poisoned food materials that are consumed by the water fowls. The unconscious birds are then picked up by the trappers. The trappers also use insecticides like ‘Furadon’. This poisons the water and also affects the other biota; many birds, pond turtles and water snakes were found dead during the survey due to haphazard use of poisonous toxins.

**Indiscriminate Fishing Activities**
The areas in and around Kawar Lake are inhabited by local fishermen predominantly of the Sahni community. It is noteworthy that sometimes poachers disguise themselves as fishermen and trap migratory birds. Due to the lack of forest guards and proper training to safeguard the sanctuary, hunters take undue advantage. Though some poachers and hunters have been caught...
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red handed, due to weak administration, such illegal operations still continue.

Indiscriminate use of boats for fishing and loading fodder grasses is also proving a hindrance for birds to roost on the water surface. There is also a conflict in respect of socioeconomic conditions of fishermen and the land owners. The moment there is any move to stop hunting of birds and fishes, it invites a severe storm of agitation from the bird poachers.

Malefic Agricultural Practices
Uncontrolled agricultural practices within the sanctuary premises have become significantly intensified in recent years. Poisonous pesticides such as DDT, aldrin etc. have ended up killing birds. These pesticides are also showing adverse effects notably on the birds of prey that have been scarcely seen in the sanctuary during the last few years. Evidence indicates that these noxious elements are causing immature deaths of fish and other lower invertebrates. The indiscriminate use of various pesticides also causes many types of abdominal problems in the local people who ingest the water.

Awareness programmes among the local people for the protection of migratory birds and other wildlife are being carried out. But poverty, lack of political will, weak administration and misguided policies weaken the effectiveness of all such measures. It has to be realized that the Kawar Lake can be saved only when all segments of the society come together on a common platform.

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