Kanwar Wetland, North Bihar – It's situation and threats

1. Introduction

Wetlands are considered to be an important linkage between the water bodies and land. Different definitions being used to define wetlands as lands transitional between the terrestrial and the aquatic eco-systems where the water table is usually at or near the surface (Mitsch and Gosselink 1986). The wetlands are the areas of fen, marsh, water or peatland, either natural or artificial, perineal or seasonal, with water that is flowing or static, fresh and include the areas of marine water (Ramsar Convention, 1971).

Wetlands remain the most important source for survival of different flora and fauna. It has been estimated that about 6 percent of the land surface of the world has wetlands which are distributed in all climatic zones of the earth except the Antarctica region. India with its vast geographical extent supports large and diverse wetland classes, among which some are very unique. Wetlands, variously estimated to be occupying 1-5 percent of the geographical area of India, support about a 5th of the known biodiversity (National Wetland Atlas, 2011). At present, according to the Ramsar Convention, India has a total of 37 protected wetlands distributed in different sites of India.

1.1 Wetlands and its importance

Wetlands remain the home of major flora and fauna and also remain an important part of the environment. A single wetland performs many important functions of ecological services and maintains the natural functioning of the nearby area as well as environmental and social services. It maintains food web, provides nursery and protection for the development of many small birds, mammals, amphibians, reptiles, fishes, insects, etc. whose survival not possible in general conditions. It remains home to migratory birds, helps in the filtering of sediments and nutrients caused due to pollution in water. Most importantly, it acts as a flood-control system, recharges groundwater, maintains nutrient cycling, provides drinking water, helps in aquaculture, acts as a carbon sink, helps in climate change, fodder, fuel and in providing a source of livelihood and recreation to local people.

Table 01: As per the Millennium Ecosystem Assessment (2005) the ecological services provided by wetlands:

	Services	Components
1.	Provisioning	Food, Fresh water, Fibre and fuel, Biochemical (medicine), Genetic materials
2.	Regulating	Climate regulation, Water regulation (hydrological flows), Water purification and waste treatment, Erosion regulation, Natural hazard regulation, Pollination
3.	Cultural	Spiritual and inspirational, Recreational, Aesthetic, Educational
4.	Supporting	Soil formation, Nutrient cycling

1.2 Wetlands in Bihar

The wetlands with a total of 4,416 major and 17,582 small wetlands with less than 2.25 ha, have been found (National Wetland Atlas: Bihar, 2011). The state has 4.4% with a total of 4,03,209 ha of its geographical area under wetlands (Fig 1). The total wetlands in all the districts include lakes/ ponds, ox-bow lakes/cut-off meanders, riverine wetlands, waterlogged areas, river/stream, tanks/ponds, and wetland (<2.25 ha). River Ganga also passes through the middle of the state from west to east, which remains the suitable site for wetland formation in Ganga's flood plain. Altogether 12 districts come in flood plains of Ganga viz. Begusarai, Bhagalpur, Buxar, Katihar, Khagaria, Lakhisarai, Munger, Patna, Purnia, Saran, Sheikhpura, and Vaishali. According to the National Plan for Conservation of Aquatic Eco-systems' (NPCA) for holistic conservation of lakes and wetlands, Bihar is identified to have 3 major wetlands: Kabar lake, Barilla, and Kusheshwar Asthan.

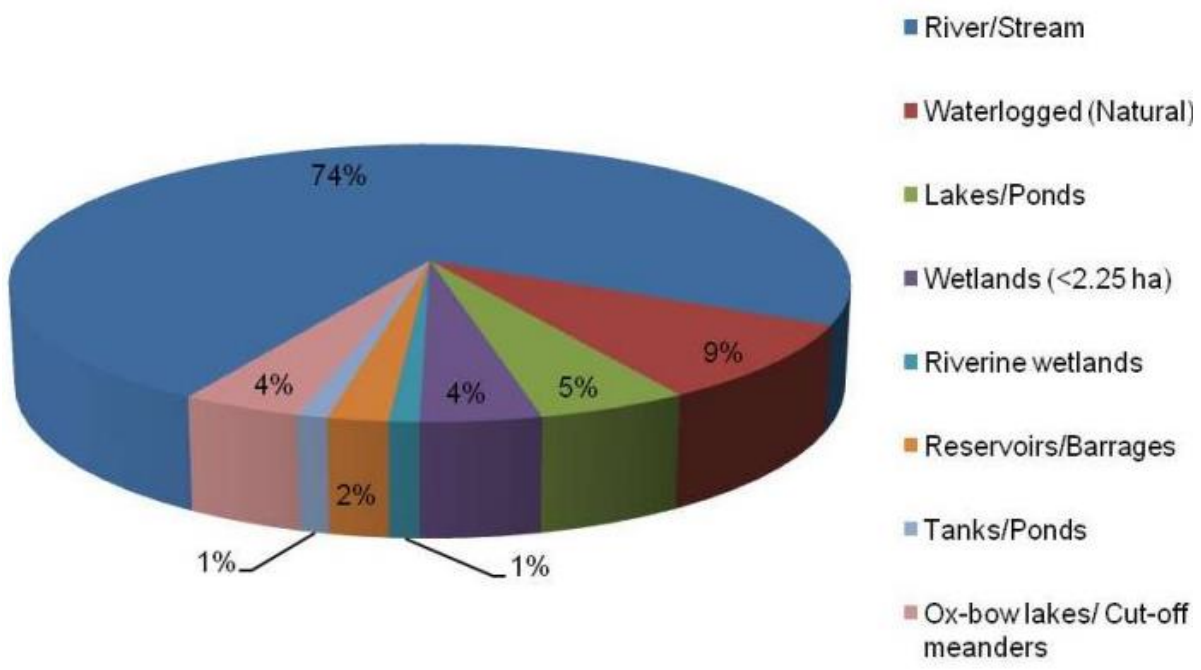

***Fig.1**: Types of wetland distribution in Bihar*

Source: National Wetland Atlas: Bihar, 2011

But with time and improper management of wetlands, the condition of wetlands is deteriorating due to anthropogenic activities like encroaching lands for agriculture, pollution, etc. Such activities are not only degrading the wetland, rather also affecting those species which are completely dependent on it for their survival. One of such deteriorating wetlands is Kabar Taal or Kanwar Lake in North Bihar.

1.3 Scenario of the Kanwar lake

Kanwar Lake or Kabar Taal/Jheel/Wetland is a recognized bird wildlife sanctuary, located 22 km north-west of Begusarai in North Bihar. It is Asia's largest freshwater ox-bow lake which is residual, formed due to meandering of the Gandak river, a tributary of Ganga, in the geological past. Once it was a heaven for migratory birds, but today it is a dying wetland ecosystem (Figure 02).

Fig.2: *A view of Kanwar Wetland*

Source : http://birderPics.com

Once the wetland covered about 6,786 ha in 1984, which reduced to 6,043.825 ha in 2004 (Ghosh et al. 2004). In a similar manner in 2012, the lake area had reduced to a mere 2,032 ha (Kumar & Pandey, 2017). The area has been notified under the Wildlife (Protection) Act of 1972 to control poaching of birds, and has also been declared a protected zone by the Bihar government in 1986, and later the Government of India declared it a bird sanctuary in 1989. The authorities had also notified 15,000 acres in the area as a wetland, which makes it six times bigger than the Keoladeo National Park in Bharatpur, Rajasthan. For revival, legal protection has been provided to this wetland, which is still not enough as the shrinking paces fast.

A study conducted to determine the land cover change of Kanwar wetland for the period of 1990, 2010 and 2015 clearly showed the changes occurring within the area in Fig.3 (Ranjan & Priyanka, 2018). A drastic change is visible in the analysis of open water present within the wetland area.

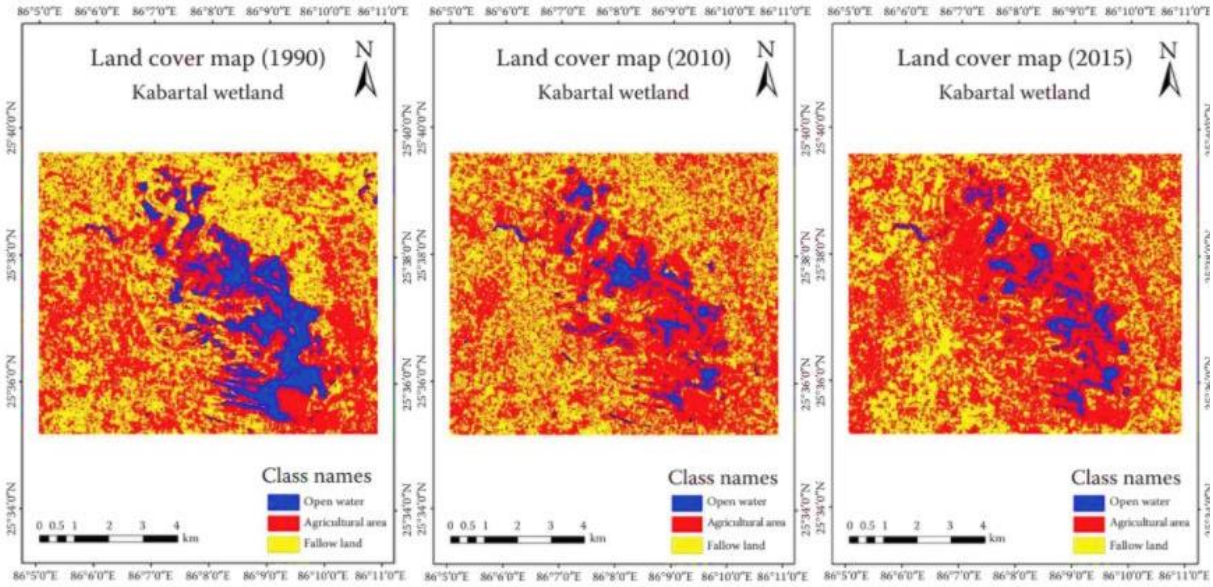

***Fig.3**: Change occurred in Kanwar wetland in 1990, 2010, 2015 via Land cover map*

Source : Ranjan & Priyanka, 2018

1.4 Impact on birds

Kanwar wetland is also the habitat for many critically endangered bird species like Oriental White-backed Vulture, which belongs to vulnerable category and other bird species like Long-billed Vulture, Greater Adjutant stork, Greater Spotted Eagle, Lesser Kestrel, Sarus Crane, Painted Stork, Black-bellied Tern, etc. belongs to near-threatened category.

Till the 1980s, the wetland was one of the largest breeding grounds for migratory birds. But now, due to poaching and trapping activities, a steep decline in the bird population has been observed in this area. The use of poisonous pesticides in farming also poses a major threat to the birds in the area.

Besides all these, this area is once known to host 106 species of resident birds and 59 species of migratory birds, besides 41 species of fish. But now all of this is in trouble as the wetland is gradually dying.

Fig.4*: (a) & (b) degrading condition of Kanwar wetland.*

(Source : DownToEarth)

1.5 Emerging challenges to the Wetland

- The excessive agricultural practices result in land encroachment of wetland and reduce its area. And such practices use pesticides/ chemical fertilizers, which during monsoon season lead to runoff from land to water by increasing the nutrient (nitrogenous and phosphate) content in the water body and called eutrophication of wetland.
- The process of eutrophication will not only degrade the open water body, but it will also shrink the total land area of the wetland.
- In addition, the depth of the wetland is also declining rapidly due to an infestation of aquatic weeds such as Phragmatis and Hydrilla due to high nutrient content (Ranjan & Priyanka, 2018).
- According to Saviour Alluvial Ecological Establishment (SAEE) Society, a massive inflow of silt is also decreasing the depth of the lake, and about every year 3.8 cm of silt is deposited in the lake.
- Due to anthropogenic activities along with agriculture, the excessive discharge of Sulphate in the water body from municipal is also affecting the biogeochemical cycle occurring within the lake (Ghosh et al., 2004).
- Continuous extensive deforestation, overgrazing, and overexploitation of biomass for fuel, fodder, and timber have stripped the land of its natural vegetation cover, resulting in erosion (Ghosh et al., 2004).
- The illegal encroachment of lake beds by farmers and local people has reduced the size of the wetland.

2. Conclusions

Wetlands are one of the most important naturally occurring inland water bodies. It maintains the biodiversity of an area. But they need to be protected from anthropogenic activities with proper conservation, restoration, and management plan. Not only the government and non-government organizations, even the local people should be made aware of the need to protect and conserve the wetlands and their ecosystem. Because once they degraded, it would be very tough to bring them back to their naturally occurring form.

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