JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

BEAUTIFICATION AND IMPROVEMENT OF BAKHIRA BIRD SANCTUARY AND LAKE FOR MIGRATORY BIRDS, AQUATIC PLANT AND ANIMALS. AND ITS DEVELOPMENT TO INCREASE TOURISM IN STATE

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Abstract

From October 2024 to March 2025, the investigation on Bakhira Lake's water quality was carried out using project reports. According to the study, Bakhira Lake's physicochemical parameters were suitable for 45 commercially significant fish species from 32 genera, 17 families, and 7 orders. Temperature, pH, alkalinity, hardness, dissolved oxygen, ammonia, nitrate, nitrite, and phosphate were among the water quality indicators that were measured and determined to be beneficial for aquatic life.

1.Introduction

There are currently 564 wildlife sanctuaries in India, which make up roughly 3.73% of the nation's total land area. Because they offer stability and safeguard the animals' natural habitat, these wildlife sanctuaries are crucial. In addition to animal sanctuaries, India boasts the most Ramsar sites, or wetland sites, of any South Asian nation. Bakhira Wildlife Sanctuary has been added to the list of Ramsar sites, bringing the total to 49. The Union Environment Minister, Bhupendra Yadav, designated it a Ramsar site on February 2, 2022, World Wetland Day. The Uttar Pradesh government's Forest and Wildlife Department declared the Bakhira Wildlife Sanctuary, also called Bakhira Tal, to be arealityin 1990. It is a wetland that is connected by a river in shallow water. It is located 18 km from Khalilabad, 55 km from Basti, 44 km west of Gorakhpur, and west of the Rapti riverside. Located in Sant Kabir Nagar, Eastern Uttar Pradesh, this wildlife sanctuary is the biggest natural floodplain wetland in India. The Bakhira Wildlife Sanctuary serves as an open environment for both migratory birds and the many species of local inhabitants. About 4000 migrating birds from 30 different species travel about 5000 kilometers to visit this wetland in the winter from Tibet, Siberia, China, and Europe. The sanctuary features a diverse range of plants, shrubs, and hydrophytes in addition to the unique bird species.

2.Major Significances

People who live near wetland communities depend on the wetland for their livelihoods, which include farming, fishing, and gathering fuelwood. 15 hectares of Reserve Forest land, 1059 hectares of agricultural land, and 1819 hectares of Gram

Samaj comprise the 2894 hectares of land sanctuary cover. The marsh is home to over 45 fish species and 119 plant species. Labeo rohita and Channa sp. are the two most prevalent fish species. Numerous Serbian bird species travel about 5000 kilometers to this swamp each winter. The Grey-headed swamphen, sometimes known as the Purple Swamphen, is one of the lovely water birds that are commonly found here. There are many water plant species in the sanctuary, however there are very few marine species due to the stony terrain and harsh environment. The average high temperature during the winter months is 23°C, while the average low temperature is 9°C.The government uses the Bakhira Wildlife Sanctuary for tourism and enjoyment in addition to its special features, which also aid in nutrient cycling and food supply. It currently ranks as the 49th Ramsar Site in India and the 10th Ramsar Site in Uttar Pradesh. This sanctuary is important to the global wildlife because it provides a wintering habitat for numerous bird species..

3.Sampling and Method

Five sampling sites (Kotiya,, Terhwa, Badgo, and Dhodhya) were statistically chosen for the assessment of Bkhira Lake's water quality. Standard procedures were used to analyze the lake's water quality parameters, and sampling took place between 9:00 and 11:00 AM. For the purpose of analyzing different physico-chemical characteristics, water samples were immediately collected in wide mouth, previously cleaned plastic bottles. After determining the PH range of a sample using a potentiometer, the samples were brought to the lab for additional parameter measurement under ideal circumstances. by use of experimental fishing at every Bakhira Lake sampling location.

4.Water Quality Test And Its Results

Sample No. 1

Collect the water sample from tehrwa village and find the T.D.S. and P.H. value of the water sample.

Sample No. 2

Collect the water sample form dodhya village, and find the P.H. value and the temperature of the water sample.

Sample No. 3

Collect the water sample form river drainage canal form badgo village.

Sample No. 4

Collect the water sample form Kotiya village, and find the water quality of the water sample.

Table of water quality analysis

2021		2022		2024			
Water pH		**Water pH**		**Water pH**			
1.) Acid	(pH<5.5)	Acid	(pH<5.5)	Acid	(pH<5.5)	**Sample No.3**	
2.) Circumneutral	(pH: 5.5-7.5)	Circumneutral	(pH: 5.5-7.4)	Circumneutral	(pH: 5.5-7.4)	Arsenic test	Nil
3.) Alkaline	(Ph>7.4)	Alkaline	(Ph>7.4)	Alkaline	(Ph>7.4)	Cl (mg/L) or PPM	Nil
						Hardness (mg/L)	Nil
Water Salinity		**Water Salinity**		**Water Salinity**		T.D.S	Nil
a.) Fresh	(<0.5 g/l)	Fresh	(<0.5 g/l)	Fresh	(<0.5 g/l)	Iron	Nil
b.) Mixohaline	(0.5-30 g/l	Mixohaline	(0.5-30 g/l	Mixohaline	(0.5-30 g/l	Nitrate	Nil
c.) Euhaline/Eusaline	(30-40 g/l)	Euhaline/Eusaline	(30-40 g/l)	Euhaline/Eusaline	(30-40 g/l)	Fluoride	Nil
d.) Hyperhaline	(>40 g/l)	Hyperhaline	(>40 g/l)	Hyperhaline	(>40 g/l)	Chlorine	Nil
Salinity ranges 0.18-0.20 g/l with highest values		Salinity ranges 0.18-0.20 g/l with highest values		Salinity ranges 0.18-0.20 g/l with highest values			
						Sample No.4	
Dissolved or supsended Nutrients in water		**Dissolved or supsended Nutrients in water**		**Dissolved or supsended Nutrients in water**		Arsenic test	0.01
Eutrophic		Eutrophic		Eutrophic		Cl (mg/L) or PPM	35
Mesotrophic		Mesotrophic		Mesotrophic		Hardness (mg/L)	13 x 15 = 195
Oligotrophic		Oligotrophic		Oligotrophic		T.D.S	84
Chloride	(8.0+0.01 - 19.0+0.01 mg/l)	Chloride	(8.0+0.01 - 19.0+0.01 mg/l)			Iron	Nil
Phosphate	<0.003+0.01 to 0.39+0.01 mg/l	Phosphate	<0.003+0.01 to 0.39+0.01 mg/l	**Sample No.1**		Nitrate	0
Sulphate	2.36+0.09 to 16.20+0.09 mg/l	Sulphate	2.36+0.09 to 16.20+0.09 mg/l	Arsenic test	0.01	Fluoride	0
Nitrate	<1.00+0.06 to 4.25+0.06 mg/l	Nitrate	<1.00+0.06 to 4.25+0.06 mg/l	Cl (mg/L) or PPM	40	Chlorine	0.2
Nitrogen	3.36+0.09 - 10.08+0.09 mg/l	Nitrogen	3.36+0.09 - 10.08+0.09 mg/l	Hardness (mg/L)	16 x 15 = 240		
Fluoride	0.30+0.05 to 1.54+0.09 mg/l	Fluoride	0.30+0.05 to 1.54+0.09 mg/l	T.D.S	184	**Sample No.5**	
				Iron	Nil	Arsenic test	0.1
Water Conductivity (ECD)		**Water Conductivity (ECD)**		Nitrate	0	Cl (mg/L) or PPM	30
Conductivity ranges between	(212.6+4.6-371.7+6.8 uS/cm)	Conductivity ranges between	(212.6+4.6-371.7+6.8 uS/cm)	Fluoride	0.5	Hardness (mg/L)	12 x 15 = 180
				Chlorine	0	T.D.S	107
Features of the surrounding area which may affect the site		Features of the surrounding area which may affect the site				Iron	Nil
i) Broadly similar		i) Broadly similar		**Sample No.2**		Nitrate	0
ii) Significantly different		ii) Significantly different		Arsenic test	0	Fluoride	0
Surrounding area has greater urbanisation or development		Surrounding area has greater urbanisation or development		Cl (mg/L) or PPM	30	Chlorine	0.2
Surrounding area has higher human population density		Surrounding area has higher human population density		Hardness (mg/L)	10 x 15 = 150		
Surrounding area has more intensive agricultural use		Surrounding area has more intensive agricultural use		T.D.S	104		
Surrounding area has significantly different land cover or habitat		Surrounding area has significantly different land cover or habitat		Iron	Nil		
				Nitrate	0		
				Fluoride	0		
				Chlorine	0		

5.Water And Its Sources

A. Inlet:- Water from nearby villages flow down into the lake through gulleys/nallas. Various other nallas drain their water into the Bakhira lake viz. Ghaghara nallah, Nevas (26°52'36.4"N;
083°08'46.2"E), Baraka Ghaghra nallah, Govindpur (26°52'12.7"N; 083°09'05.8"E), Baraipar nallah
(26°54'40.9"N; 083°05'39.3"E), Vandah nallah, Bakhira (26055'41.9"N; 083005'16.4"E) and Van Rakshak Chauki, Dhaurapar (26°56'36.7"N; 083°06'05.0"E). The major water source for the lake use to be the nearby River Rapti. Historically, there was connection between Rapti and a portion of river stretch got disconnected and became an oxbow lake i.e. Bakhira.

B. Outlet:- DPR of Bakhira Bird Sanctuary Bakhira lake drains into River Rapti (near Pali Block, Gorakhpur) through the Eastern Chorma nala (26°50'00.1"N; 083°13'25.4"E). The excessive water in the rainy season is drained into the River through a gate situated at Chorma Nala by irrigation department established in 1980. Furthermore, the water is also drained out through two canals and Nevas and Dhodha for irrigation of agricultural crops. Bakhira lake as a rich water resource to support local communities.

C. **Drainage System**:- As the lake is adjacent to River Rapti, during monsoon surplus water due to rain is drained out into the river and in turn helps local agricultural land in better crop production. Additionally, the Bakhira lake is also drained by the Eastern Chorma nala (26°50'00.1"N; 083°13'25.4"E) into Rapti near Pali Block, Gorakhpur. The water is also drained out through two canals at Newas and Dhodhya for irrigation of agricultural crops. The drainage follows the general slope and relief features of the region.

The Ami and Rapti river basins are the sanctuary's two primary river systems. They together make up the Greater Gangetic System in the end.

D. **The Rapti**: Drainage System:- As the lake is adjacent to River Rapti, during monsoon surplus water due to rain is drained out into the river and in turn helps local agricultural land in better crop production. Additionally, the Bakhira lake is also drained by the Eastern Chorma nala (26°50'00.1"N; 083°13'25.4"E) into Rapti near Pali Block, Gorakhpur. The water is also drained out through two canals at Newas and Dhodhya for irrigation of agricultural crops. The drainage follows the general slope and relief features of the region.

E. **The Ami**: On the Rapti's right bank, it is one of the main tributaries. The Ami is a river that rises in
Sohanara and flows for almost 125 km until joining Rapti Sohagaura close to Kauriram in the Gorakhpur district. In addition to several small-scale inductries, the paper mill in Khalilabad is the main source of the industrial effluents that are currently causing significant pollution pressures on the river.

6.Vision

The ecologically useful wetland known as "Bakhira Bird Sanctuary" is a significant piece of Uttar Pradesh's biodiversity legacy that should be preserved. It also serves as a premier destination for ecotourism and conservation education, as well as for determining whether the water quality is acceptable for aquatic plants and animals.

7. Conclusion

According to a water quality test conducted at Bakhira Lake in Uttar Pradesh, the lake's water has acceptable physicochemical criteria, making it appropriate for aquatic life. Temperature, pH, alkalinity, hardness, dissolved oxygen, ammonia, nitrate, nitrite, and phosphate are some of these variables. There are 45 species of fish in the lake that are significant to the economy.

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