

MANAGEMENT PLAN
OF
UDHWA LAKE BIRD SANCTUARY
(2021- 22 To 2030– 2031)



Prepared by
Manish Tiwari, IFS

Divisional Forest Officer, Sahibganj
Forest Division Sahibganj

MANAGEMENT PLAN OF UDHWA LAKE BIRD SANCTUARY

EXECUTIVE SUMMARY OF THE UDHWA LAKE BIRD SANCTUARY MANAGEMENT PLAN

Udhwa Lake Bird Sanctuary is extended with a coverage area of 565 ha in the Udhwa village of Rajmahal Subdivision of Sahebganj District of Jharkhand. This bird sanctuary is represented in a perfect blend of the two main delectable lakes that are named as Barhel and Patuara. The Barhel lake is spread over an area of 410 ha whereas the Pataura lake is extended over an area of 155 Ha. Udhwa Lake Bird Sanctuary is one of the natural abodes for a number of different types of birds who reside or migrate here. It includes pratincole, egret, wagtail, plover, lapwing, stork, ibis and heron. Migratory birds reach here from several parts of the world, including Siberia and Europe. This protected area as notified as Wildlife Sanctuary under section 18(1) of the Wildlife(Protection) Act, 1972 on 4th Nov 1991 by the State Govt. of Bihar.

This management plan has been prepared for the year 2021-2022 to 2030-2031. After emergence of new facts and data's, the management plan can be reviewed after 5 years in 2026-27.

This management plan contains the existing situation, vision, objectives of the management, the challenges, and limiting factors along with the prescription and strategy to achieve the objectives outlined in the plan. The plan aims to attain these objectives by incorporating the principle of eco-development with conservation strategy.

This management plan is aimed at conserving natural resources and to develop such facilities that will enhance the non-consumptive utilization of the reserve such as eco-tourism, education, and research. The objectives of management can be briefly summarized below:

- (a) To conserve Biodiversity with emphasis on endangered, threatened, and rare elements of Aquatic flora and fauna.
- (b) To take appropriate measures to control siltation and obnoxious weed infestation problem.
- (c) To study and monitor lake water chemistry and its biotic composition.
- (d) To update the checklist of resident and migratory birds as well as aquatic flora.
- (e) To take immediate steps for integrated habitat development.

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- (f) To promote economic development programmes for deprived fisher folks and local villagers by providing them alternative income generating resources.
- (g) To identify and explore the possibilities for construction of paths/ motorable roads surrounding the sanctuary (wherever possible) and the creation of green belts by planting the favorable species under habitat improvement programs.
- (h) Implementation of the provisions of Eco-Sensitive Zone, to reduce the biotic pressure on the resources of the Sanctuary and to strengthen the protective cover.
- (i) To promote public education, conservation awareness programs and eco-tourism.

The major problems facing the sanctuary management which adversely affect the achievement of these objectives include inadequate staff, lack of basic infrastructural facilities, increasing biotic pressure. The avifauna of the Sanctuary is facing the greatest threat of their elimination from poachers, shooters and bird traders. Poaching is a major threat in the Udhwa Lake Bird Sanctuary. The second most serious problem affecting the avifauna is the biotic interference by the local people, which is anthropogenic interference. Siltation spread of water hyacinth and reed infestation is another threat of the proper management of the Birds. The Sanctuary area is not well demarcated, and a large chunk of the area is still under Raiyats because no compensation has been paid to the Raiyats. So, they cultivate Garma-dhan in post Monsoon seasons in the Sanctuary area; this is also a great threat to the habitat of the Sanctuary. The surrounding of the Sanctuary is devoid of good number of large trees to provide roosting, resting and breeding grounds for a variety of Birds.

The present management plan has been compiled following the Guide book for planning wildlife management in protected areas and managed landscape by Wildlife Institute of India written by V.B. Sawarkar.

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It comprises **three parts**; **Part One** dealing with four chapters: Chapter 1- Introduction to the area, Chapter 2- Background information & attributes, Chapter 3- History of management & present practices, and Chapter 4- The Protected Area & the interface Land use situation. **Part Two** deals with the rest of the eight Chapters namely: Chapter 5- Vision, objectives and problems, Chapter 6- The Strategies, Chapter 7- Eco-Tourism, interpretation and Conservation Education, Chapter 8- Eco-development, Chapter 9 - Research, Monitoring & Training, Chapter 10 - Organization and Administration and Chapter 11- The Budget, Chapter 12- The Schedule of Operations and Miscellaneous Regulations and Chapter 13 plan for getting Udhwa lake bird sanctuary declared as -wetland of international importance. **Part three** comprises of various Annexure and control forms pertaining to the management of the sanctuary. In Chapter 6 (The Strategies), the sanctuary has been divided into two zones namely: core zone and Eco -Sensitive Zone - cum- Eco-Tourism Zone and strategies have been identified for these zones. Chapters 7, 8 & 9 that deal with Eco-Tourism, Eco- development, and Research and Monitoring have proposed various measures for conducting these activities. Chapter-10 deals with the present and proposed organization structure that would be required for effective management of the sanctuary. Chapter-11 deals with the budget that would be required for fulfilling these activities.



Manish Tiwari, IFS
Divisional Forest Officer,
Sahibganj Forest Division,
Sahibganj

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Manish Tiwari, IFS
Divisional Forest Officer,
Sahibganj Forest Division,
Sahibganj

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ABBREVIATION

No.	Short Form	Full Form
1	ACF	Assistant Conservator of Forests
2	CWLW	Chief Wildlife Warden
3	DFO	Divisional Forest Officer
4	DLCC	District Level Co-ordination Committee
5	EDC	Eco-Development Committee
6	FDC	Forest Development Corporation
7	FRI	Forest Research Institute, Dehradun
8	FSI	Forest Survey of India, Dehradun
9	ULBS	Udhwa Lake Bird Sanctuary
10	JFM	Joint Forest Management
11	M & E	Monitoring & Evaluation
12	MFP	Minor Forest Produce
13	MoEF & CC	Ministry of Environment Forest & Climate Change
14	MPO	Management Planning Officer
15	NFP	National Forest Policy
16	NGO	Non-Government Organization
17	NGI	Non-Government Institution
18	NP	National Park
19	NWFP	Non-Wood Forest Produce
20	PA	Protected Area
21	PF	Protected Forest
22	PAM	Protected Area Management/Manager
23	PRA	Participatory Rural Appraisal
24	RF	Reserve Forest
25	TUZ	Traditional Use Zone
26	WII	Wildlife Institute of India, Dehradun
27	WLS	Wildlife Sanctuary
28	WMP	Wildlife Management Planning/Plan
29	WPA 1972	Wildlife (Protection) Act, 1972
30	WPO	Working Plan Officer
31	ZI	Zone of Influence
32	SHG	Self Help Group
33	ESZ	Eco Sensitive Zone
34	WLS	Wildlife Sanctuary
35	PA	Protected Area

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GLOSSARY

Biological diversity:	the variety of life and its processes, including Complexity of species, communities, gene pools and ecological functions.
Den tree:	A standing live tree with cavity/cavities in branches or in the main trunk, in use or having potential for use by wildlife.
Down log:	Trunks and limbs of trees or fashioned / un-fashioned logs in various stages of decomposition on the forest floor.
Indicator species:	A selected species presumed to indicate the welfare of other species or that which represents a specific habitat condition.
Key areas:	Areas that offer key habitat functions for a species such as breeding, foraging, roosting, nesting, or those that have obligate species: biological or geomorphic in nature.
Key species:	In order of priority, generally a small number of species identified as species of conservation importance and might include endangered, endemic, rare or threatened species of plants and animals.
Keystone species:	Animals or plants which, by virtue of their presence or absence, alter the structure of a community.
Limiting factor:	The environmental influence through which the Tolerance limit of an organism is first reached, which acts, therefore, as the immediate restriction in one or

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more of its functions or activities or in its geographic distribution.

Managed forests:

All categories of forests excluding protected area

Managed for multiple use.

Management indicator

Species:

Includes the following: endangered threatened, endemic or rare species on national listing; species with special habitat needs that might be influenced by management; a species whose population changes are believed to indicate effects of management or resource use pressures on other species of a major biological community, habitat structure, composition or condition, or water quality.

Mesic site:

Environmental situations characterized by moderate to Moderately high moist conditions due to the presence of springs, seeps or edaphic character excluding riparian system.

Micro habitat elements: small components of a habitat which by themselves seem insignificant but provide critical life history requirement species and or of one or several support ecological functions snag, den, cave etc.

Obligate species:

Species-habitat relationship on account of which a species almost completely dependent on a specific succession stage, community structure or composition for its existence.

Old growth:

A stand that is past full maturity the last stage in Forest succession.

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Pinch period: A season during which either food or water or both are Minimal in their quantity, quality and distribution causing stress in animal populations. Generally, the term addresses the welfare of herbivorous species.

Prescribed burning: Skillful application of fire to natural fuels under conditions of controlled weather condition, fuel moisture, soil moisture etc. that allow confinement of fire to a predetermined area and produce the intensity of heat and rate of spread to accomplish planned benefits to one or more objectives of silviculture.

Riparian: Situated on the banks of a stream, body of water, or other perennial aquatic environments. The term is also further extended to include seasonal or ephemeral streams having characteristic bank vegetation.

Sensitive site: A site vulnerable to rapid change in its biological attributes or physical character in the face of management activity or resource uses either due to its small size or due to species / communities on that site which are intolerant to change or are exacting in their habitat requirements, or fragile rock / soil formation.

Sensitive species: A species intolerant to any alteration in its habitat, a species which is exacting in its habitat requirements and rapidly exhibit adverse impacts as a consequence to minor disturbance.

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- Snag:** A standing dead tree, whole or broken, at least 1.5 m in height, when broken, with a minimum of 20 cm dia, with or without limbs or bark.
- Species habitat:** A habitat which has a special function not provided by plant communities and successional stages; includes riparian zones, snags, dead and down woody material, and edges. Biological in nature; can be created or altered by management.
- Species richness:** A measure or expression of the number of species of plants or animals present in an area, the more species present, the higher the degree of species richness.
- Stand:** Plant communities, particularly of trees, sufficiently uniform in composition, constitution, age spatial arrangement or condition to be distinguishable from adjacent communities; also, may delineate. A silvicultural or management entity.
- Stand structure:** The configuration of elements, parts, or constituents of a stand.
- Succession stage:** A stage or recognizable condition of a plant community which occurs during its development from bare ground to climax e.g., grass-forbs-shrub seedling-sapling-pole- young- mature - old growth.
- Khal:** It is a local term for pond in valley.
- Unique habitats:** Wildlife habitats of species function not included within plant communities and succession stages or special habitats; geomorphic in natural cliffs, caves, overhangs, shelves, or crevices.

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Wildlife damage problems such as crop raiding livestock

Depredation, destruction of property, injuries to people, man killing by wildlife.

Zone of influence: The extent of area outside the legal PA boundaries over

Which wildlife damage problems occur, excluding damage caused by resident elephant population not necessarily dependent on the PA. It includes the extent of area with people having a traditional PA based resource dependency. This is also considered as the buffer zone.

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PART-I

THE PROTECTED AREA: THE
EXISTING SITUATION

CHAPTER-1

INTRODUCTION TO THE AREA

1.1 Name, location, constitution and extent:

The Udhwa Lake Bird Sanctuary lies between Latitude: 24° 57' 51" N to 25°1' 14" N and Longitude: 87°47'40" E to 87°49'27" E in the Rajmahal Sub-Division of Sahibganj District in the state of Jharkhand. The Sanctuary mainly comprises of two large water bodies namely:

- a. Pataura Jheel having an area of 155 ha, and
- b. Brahma Jamalpur Jheel (Commonly known as Berhale Jheel) having an area of 410 Ha.

A total area of 5.65 sq. Km comprising of the above water bodies has been notified as Udhwa Lake Bird Sanctuary by the Government of Bihar in 1991 (Sanctuary Notification Annexed) on account of the exceptional potential of the above water bodies as regards the variety of resident and migratory avifauna to which the above lakes serve as an ideal habitat for their survival, nesting and roosting. The above lakes also support equally good no. of aquatic flora, fish fauna and invertebrates. Both the Pataura Jheel and the Berhale Jheel are connected by the narrow canal with the main Ganges River, which acts as the main source of water supply to these water bodies. The sanctuary has an excellent blend of avifauna ranging from the swamp, woodland, hillock as well as yearly migrants. Of the two, Berhale seems to be rich in density and diversity of birds than Pataura during rainy and winter months. During the summer, Berhale Jheel dries up and water remains only in Pataura Jheel, thus restricting the water birds to Pataura only. The area witnesses a noticeable influx of migrant birds during the winter, though sometimes it starts from early September.

1.2 Approach and access:

Tinpahar and Barharwa railway stations lying on the Kiul-Howrah loop section of Eastern Railway are the two nearest stations from which the

Sanctuary can be approached. Almost all important trains stop at these two junctions. From Tinpahar junction another loop line passes to Rajmahal on which one passenger train frequently moves up and down. Udhwa Bazaar and newly constructed Udhwa Block headquarter is 11 Km south-east to Rajmahal and 18 Km north to Barharwa. A metal road passes from Rajmahal to Barharwa via Udhwa Bazaar, on which buses and auto- rickshaws frequently move and that is the approach to the sanctuary by road. The sanctuary lies at 2 Km distant from the Udhwa Bazaar. Farakka Barrage on river Ganga is 15 Km north-east to Udhwa Lake and is connected to it through Udhwa-Nala which is the main means for transportation to Farakka for the local people and several motor-boats (locally called bhutbhutti) operate from Udhwa Bazaar.

Distance	Udhwa Lake BirdSanctuary
FromHowrah Tinpahar-Rajmahal)	: 326 Km by rail + 13 Km by Road (via:
From Howrah(via: Barharwa)	: 284 Km by rail + 18 Km by Road From
Dumka	: 158 Km by road 42 Km by road
FromSahibganj	: 42 Km by road
FromBhagalpur	: 117 Km by road
FromBarharwa	: 18 Km by road

1.3 Statement of significance

Geographically, Jharkhand constitutes two types of habitats. Chhota-Nagpur highlands extending from Rajmahal hills to Netarhat and adjoining flat top plateaus in west and hills of the northern fringe of the plateau to southern Saranda forest region of Singhbhum. Each of these habitats is floral unique in its diversities. Another important geographical feature of the state is about a 100 km stretch of river Ganga in the district of Sahebganj. The zonal climatic variations within the state along with its different physiographical variations provide numerous habitation conditions for birds and animals. Even today, despite human exploitation of Udhwa Lake Bird Sanctuary still

provides natural conditions for resident as well as migratory birds and other aquatic flora and fauna.

Udhwa Lake Bird Sanctuary has also been identified as IBA (Important Bird and Biodiversity Area (Ranmani et al., 2016). Udhwa Lake Bird Sanctuary is a permanent wetland in the alluvial plains of the river Ganga and supports a rich diversity of resident and migratory birds. Due to its location on the migratory path, the Udhwa Lake enjoys a reputation of being a suitable habitat for a variety of resident and migratory bird species and is perhaps one of the most important existing wetlands of the North-East region of India. Due to its shallow depth, profuse aquatic flora and a variety of fish fauna it supports, the two water bodies provide an excellent place for nesting, breeding and roosting of avifauna. This permanent wetland plays an important role in recharging the underground water regime of the surrounding areas. The wetland helps in regulating the nutrient and water cycle of the area, thus acting as a life supporting system having its natural food-chain and food-web. The Udhwa Lake Bird Sanctuary has a promising capacity for developing eco-tourism and also has a potential of a good deal of scientific exploration regarding avifauna and fishes etc.

Above all, this wetland has been a hunting ground for many poachers who have ruthlessly hunted the resident and migratory birds. Many of the local fishermen and other villagers in the past used to depend upon, and earn their livelihood from, fishing as well as hunting and selling the migratory birds. Lalsar (Red Crested Pochard) used to be the most sought after due to its palate value. Udhwa Bazaar in the past used to be an important market for these birds. Though the practice has been banned after the declaration of the lake as a bird- sanctuary, illegal fishing and stealthy poaching of bird do occur due to a palpable lack of administrative and protective infrastructure as and when poachers find room for their nefarious operation. Declaring the above wetland as a notified sanctuary help in conserving the habitat of the avifauna and protecting them, from being a victim of the poachers.

Historically also this area is of great significance because it was here at Udhwa Nala where after the famously decisive Battle of Palasey Siraj-ud-Daula, the then Nawab of Bengal while trying to escape in a boat, was chased and killed by the forces loyal to Robert Clive.

The Geographical situation of Rajmahal including Udhwa, has always kept it important since the time of Sher Shah, the Afghan ruler, Man Singh, the ablest General of Akbar, Prince Shuja of the Moghul dynasty, the British rulers and Chand Saudagar, the well-known trader of the country. The famous historical monuments and other evidence, witness the importance of Rajmahal, Udhwa Nala and Chand Shahar Lake, another important wetland of this area. The area is surrounded by the Rajmahal Hills and river Ganga on the other side. The Plant Fossils of Jurassic age are still embedded or scattered on the surface of the Rajmahal Hills. Udhwa Nala was the main transport system for these rulers.

Rajmahal was a place of some importance to the English in their early effort to establish their trade in Bengal. According to 18th century records of the East India Company, Rajmahal was the headquarters of the Faujdar or Governor of Akbarnagar. Captain Brooke had founded in 1774 not less than 283 villages between Udhwa and Barkop to rehabilitate the prisoners (Mal-paharias) and thus won the confidence and real sympathy of primitive people.

CHAPTER-2

BACKGROUND INFORMATION AND ATTRIBUTES

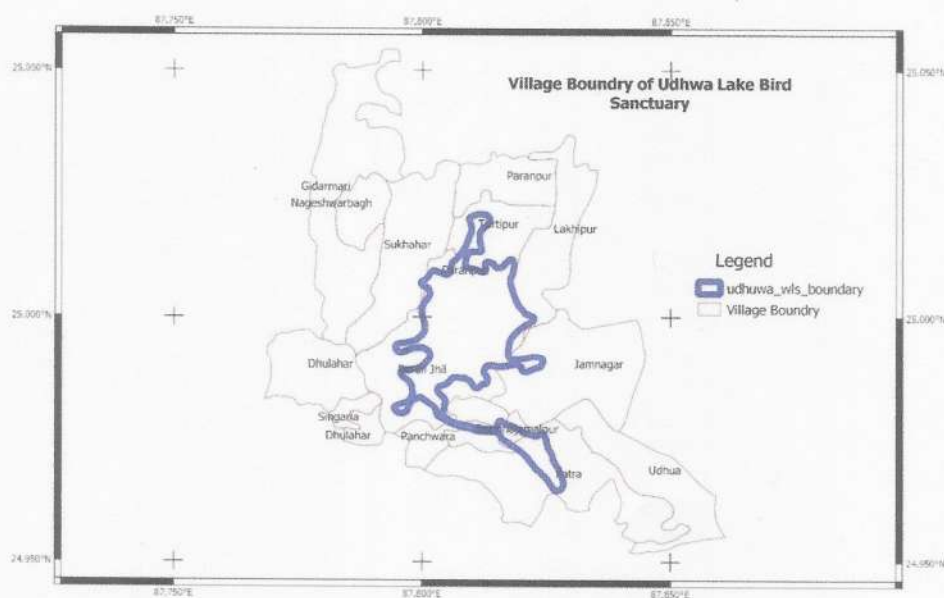
With the division of Jharkhand from Bihar, out of the 8 Bird sanctuaries in erstwhile Bihar, 7 has gone in the state of Bihar and at present, there is only one left in Jharkhand; the Udhwa Lake Bird Sanctuary (565 ha.) in the district of Sahibganj. The part of river Ganga borders West Bengal near Farakka which is known to have lakhs and lakhs of water birds especially during the winter season. Udhwa is connected directly from Farakka through Udhwa Nala (about 25 km. long) which is also used as a water transport system by local people. There is no problem of the availability of water in the sanctuary because it is directly connected with the river Ganga through Udhwa Nala.

2.1 Boundaries:

The Sanctuary is located in Thana no. 104 (i.e., village BrahmaJamalpur) and Thana no. 171 (i.e., village Pataura) of Rajmahal P.S. of Sahibganj District. It is 42 Kms. east of Sahibganj and situated to the south of Udhwa High School. The sanctuary area extends over 565 Hectare, where continuity is hampered by Raiyati Lands, which support paddy. The reason is that the sanctuary comprises a large chunk of these Raiyati lands, which need to be included within the sanctuary, but such lands are yet to be acquired and settled by the Forest Department. Hence, the private land owners taking advantage of this situation generally use some part of the sanctuary for cultivation during part of the year. Similarly, during the summers when the entire area of Berhale Jheel dries up, a constant threat looms large i.e., the adjoining private land owners may use the dried up Jheel for agricultural practices. For this, the people construct bunds (Mud Wall) in between the Udhwa Nala and Berhale Jheel in winter months when the water level is low. As a result, the Berhale Jheel is cut off from its water supply line resulting in untimely drying up of the Jheel. This forces the birds to leave the place early because of unsuitable habitat. Apart

From this the land-owning farmers use the lake as the only access to their paddy fields and also for carrying their paddy harvest home. Consequently, boats leading to and from these paddy fields are a common sight on the lake, which is often used as a cover for laying fishing and sometimes bird-catching nets surreptitiously by unscrupulous elements.

Thus, consolidation of the sanctuary boundaries after the acquisition and settlement of private land holdings falling within the sanctuary limits is of utmost priority in the proper management of the sanctuary. However, given the hard and rigid opposition of the land-owning farmers to any suggestion of parting with their land, this has to be an uphill task. The process of determination of rights and acquisition of rights is still pending and thus the final declaration of the area as a sanctuary under 26 A of Wildlife (Protection) Act. 1972.



2.2 Geology, rock and soil

Situated about 22–25 meters above mean sea level, the surrounding area of the PA is rugged, wavy and dotted with a no. of hillocks. Geologically it is on

borderline between the Chhota Nagpur Plateau region and the Gangetic fore deep region. The geological formations belong to Rajmahal formation of Upper Gondwana Group with inter-trappean sandstone, shales and their associated sedimentary and igneous rocks. The Rajmahal Hills in the north-east extremity of Chhota Nagpur plateau is made up of Jurassic volcanic flows. The Gangetic alluvium is quaternary sediment of Recent to Sub-Recent Groups.

2.3 Terrain:

The surface contour of the surrounding area of the PA is rugged and wavy (irregular high and lows) dotting with a number of hillocks. It is about 100-150 m. above mean sea level (MSL)

2.4 Climate:

Climatically Udhwa Lake is the zone of transition between the wet tropical climate of Bengal and the semi-arid or dry climate of the west. Hot westerly winds prevail over the region during April-May. A little later in June, the monsoon sets in the region with heavy rainfall that lasts till September. It is followed by dry cold weather that continues till February. Thus, there are three well differentiated seasons: Summer (March to June), Monsoon (July to September) and winter (November to February). October is a month of transition from monsoon to winter. 80% of the rainfall occurs during monsoon. July is the rainiest month.

2.4.1 Rainfall pattern and Distribution

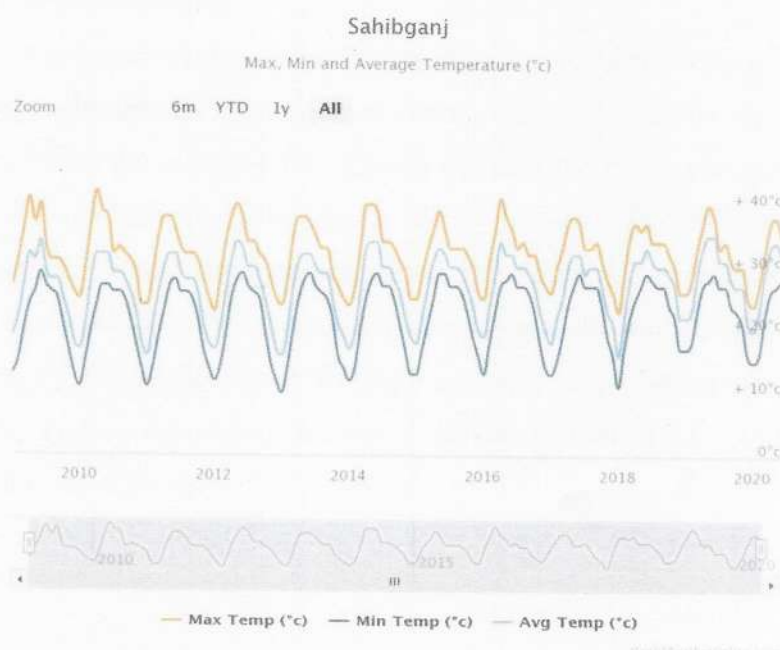
This area experiences about 80% of the rainfall during the monsoon season which extends from mid-June till the end of September. Maximum rainfall has been recorded in the month of July. The average yearly rainfall pattern of the area is as under.

Month	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Average Rainfall (in MM)	9.5	19.6	15.7	29.5	92.5	228.4	310.6	301.2	248.1	93.6	12.3	2.5

2.4.2 Temperature: a summary of a year-round pattern.

The average year-round variation of temperature of this area is given as under

Month	Jan	Feb	March	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Maximum temp. (°C)	23	29	35	37	40	38	33	33	31	30	30	26
Minimum temp. (°C)	11	17	22	25	28	29	27	27	24	23	21	12
Average temp. (°C)	16	22	28	31	35	35	31	31	28	27	27	16



2.4.3 Humidity: a summary of year-round pattern

As the wetland is a zone of transition between the wet tropical climate of Bengal and semi-arid/dry climate of the west, the area witnesses hot westerly winds during the months of April and May. Hence it is only during the monsoon season that the level of humidity is high. Humidity varies from 92% in the rainy season to 20% during summer.

2.4.5 Drought, and its periodicity

As regards the drought situation and its periodicity, this is of not much significance to this wetland area as both Berhale Jheel and Pataura Jheel are fed by a live water channel namely Udhwa Nala which connects the above water bodies with the Ganga river near Farakka. The Berhale Jheel which dries up during the summer season can be prevented from drying by closing the mouth of the Nala after the monsoon to check the backflow of water after the above two lakes have been fed with flood waters through Udhwa Nala during the monsoon.

2.5 Water sources

Udhwa Lake is situated in the alluvial plains of the river Ganga and surrounded by several hillocks of Rajmahal hills. There are two feeder channels to the lake

(a) **Hathida Nala:** It is a rainfed water channel that originates from several hillocks of Tinpahar and drains into Berhale Jheel. In addition to Hathida from the western part of Berhale several small drainage channels are connected to its south western (Jonka and Sithurpara village) and north western (Lakhipur and West Jamnagar village) part. Except for Hathida Nala which is rather deep all other channels generally remain dry during summer and winter,

(b) **Udhwa Nala:** - Udhwa Nala is the main water supply line of the sanctuary lakes throughout the year. It connects the lake with the river Ganga near Farakka Barrage. The water level in the Sanctuary lakes directly depends on the fluctuation of the water level of the river Ganga near Farakka Barrage. So, Udhwa Nala functions as both feeder and drainage channels for the sanctuary lakes.

Pataura Jheel is somewhat dumbbell in shape with its long axis running east to west. It has a maximum length of about 1.5 Km. and breadth about 300 m, the southern and eastern part is surrounded by several hillocks, whereas Berhale Jheel is irregular in shape with a vast surrounding of croplands.

2.6 Range of wildlife, status, distribution and habitat

2.6.1 The bio-geographical classification:

The area falls under the Indo-Malayan realm in the Terrestrial Bio-geographic realms of the world, classified by M.D.F. Udvardy. The present physiography and climate of India (of which this area is a part) together with the great floral and faunal changes that took place during the late Paleocene period have generated a wide variety of habitats, each supporting its distinctive type of flora and fauna. Under the ecological sub-division, this area comes under the lower Indo Gangetic Plain zone.

2.6.2 Vegetation

The area surrounding the sanctuary has scanty green cover consisting of few trees which are sparsely distributed. The surrounding areas of the sanctuary require to be planted with plant species like Mahua, mango, Sal, Pipal, Jamun, etc. which would attract the avifauna for nesting, breeding and roosting. Some plantations have been done in recent years. Apart from the surroundings, the Udhwa Lake is rich in algae, phytoplankton and aquatic macrophytes. The lake contains algae, small floating higher plants, sedges, reeds, thin stemmed grasses and the larger aquatic flowering plants which provide good food potential and provide good nesting and breeding facilities for the birds of the sanctuary.

2.6.3 Algae:

Forty two forms belonging to Cyanophyceae, Chlorophyceae, Bacillariophyceae and Eugleninae were encountered at different sampling sites of the Udhwa Lake (i.e. Pataura and Berhale Jheel). The Chlorophyceae forms outnumber the other groups followed by Bacillariophyceae, Chlorophyceae and Eugleninae respectively. The representation of Eugleninae was poor in distribution and was represented by three forms. The algal phytoplankton of the lake is listed below.

Phytoplankton of Pataura and Berhale Lake

Sl. No.	Phytoplankton Spp.	Family	Major Group
1	<i>Phormidium inundatum</i>	<i>Cholorophyceae</i>	<i>Algae</i>
2	<i>Microcystis Sp</i>		
3	<i>Anabaena constricta</i>		
4	<i>Nodularia sp.</i>		
5	<i>Gloeotrichia sp.</i>		
6	<i>Cylindrosperm urn</i>		
7	<i>Oscillatiria sp.</i>		
8	<i>Merismopedia punctata</i>		
9	<i>Clothrix sp.</i>		
10	<i>Lyngbya Mortensiana</i>		
11	<i>Ulothrix sp.</i>	<i>Chlorophyceae</i>	
12	<i>Spirogyra paludosa</i>		
13	<i>Spirogyra Borgeana</i>		
14	<i>Ankistrodesmus falcatus</i>		
15	<i>Chlorells vulgaris</i>		
16	<i>Closterium calosporum</i>		
17	<i>Closterhim raniformae</i>		
18	<i>Oedogonium sp.</i>		
19	<i>Maugeotia sp.</i>		
20	<i>Vlovox aureus</i>		
21	<i>Eurorina elsgangs</i>		
22	<i>Vaucheria sp.</i>		
23	<i>Sirogonium sp.</i>		
24	<i>Tetraspora sp.</i>		
25	<i>Sphaerocystis sp.</i>		
26	<i>Synedra ulna</i>	<i>Bacitlariophyceae</i>	
27	<i>Cymbella ventricosa</i>		
28	<i>Navicula gracilis</i>		

29	<i>Navicula disjuncta</i>		
30	<i>Navicula inflate</i>		
31	<i>Surirella Splendida</i>		
32	<i>Melosira framulata</i>		
33	<i>Melosira varians</i>		
34	<i>Cyclotella sp.</i>		
35	<i>Nitzschia sp.</i>		
36	<i>Pinmularia sp.</i>		
37	<i>Fragilaria sp.</i>		
38	<i>Diatoma sp.</i>		
39	<i>Euglena acus</i>	<i>Eugleninae</i>	
40	<i>Euglena viridis</i>		
41	<i>Phacus sp.</i>		

2.6.4 Aquatic Macrophytes

Aquatic macrophytes of the sanctuary lakes comprise of 36 species; 6 species free floating; 17 species floating leaved macrophytes, 7 species of submerged and 6 species of emergent types of macrophytes, *Cyperus tagetum* (locally called petali) and emergent perennial reed has dense covering in the entire water area of Berhale Jheel, thereby reducing the open water habitat, and preventing the growth of many submerged and floating vegetation which are vital for the existence of diving ducks and coot but it seems to be suitable habitat for pheasant tailed jacana and heronry. Next to *Syperus tagetum*, *Eichhomia crassipes* — a free floating aquatic weed constitutes the major portion of total biomass in both the water bodies. The prolific growth of aquatic weeds are an indicator of eutrophication; during flood time a huge quantity of water hyacinth mat gets entry into the sanctuary lakes. When flood water recedes, the mat remains in both the water bodies and surrounding crop fields. Local farmers face a major problems in clearing it for preparing the crop fields ready for the next paddy crop. Water hyacinth seems to be suitable habitat for purple

moorhen for nesting, roosting, and breeding. The *Potamogeton crispus*, *P. nodosus*, *Najas minor*, *Vallisneria spirallis*, *Hydrilla verticillata* forms the major submerged vegetation, whereas species of *Ipomoea*, *Nymphia*, and *Nymphoides* are the important level vegetation.

The surrounding area is full of barred hillocks and paddy fields. Few Babul trees are present on the banks of Udhwa Nala and very few trees remain on the hills on the western side of the Pataura Lake which is far from adequate for providing cover and for nesting and roosting purpose. So, tree planting of suitable species of plants should be taken on war footing to provide the birds with cover and food. Besides this, the creation of a green belt around the sanctuary is also the need of the hour. This will attract both tourists as well as birds. At present, the weeds such as water hyacinth are being used by birds for nesting and roosting purpose.

2.7 Fauna Of Udhwa Lake Bird Sanctuary:

2.7.1 Status of Avifauna:

Dutta et al. (2004) reported a total of 465 species and subspecies of birds in Bihar and Jharkhand. However, the avifauna of Jharkhand state carved out of Bihar in 2000, is least studied (Islam and Rahmani 2004; Narwade et al., 2006). The avifauna of Udhwa Lake Bird Sanctuary (ULB) has not been studied in detail in almost the past two decades. A survey of literature revealed that the last report on the avifauna of this only bird Sanctuary of Jharkhand state was published by Ghosh et al., in 1993 which reports 83 species of birds. A total of 128 species of birds has been reported in the management plan (2005-06 to 2015-16).

A recent report published after two decades (Prakash et al. 2012) based on the survey conducted during 2009-2012 reveals a total of 107 species of birds belonging to 83 genera, 38 families and 15 orders. This avian diversity of 107 species from the Sanctuary represents 8.15% of the known Indian bird diversity

of 1313 species (Grimmett et al., 2011). Of the total recorded species, 46 (42.99%) are waterbirds, 14 (13.08%) wetland dependent birds and 47 (43.93%) are other birds. Further, out of 107 bird species, 24 are migrant, 55 residents and 28 are resident migrant species. Thus, the resident species (51.40 %) dominates the area, followed by resident migrants (26.17 %) and the migrants (22.43%). Udhwa Lake Bird Sanctuary has also been identified as IBA (Important Bird and Biodiversity Area, Ranmani et al., 2016).

Further, a compilation of study conducted (2009 to 2018) by Neo Human Foundation, Hazaribag, Jharkhand and Mandar Nature Club, Bhagalpur, Bihar with the support of Wildlife Division, Hazaribagh reveals the presence of 146 species of birds belonging to 45 families including both resident and migratory species. Among these 61 species were waterbirds, 19 species were wetland dependent birds and 66 species were other birds. Further out of total 146 species of birds 79 species were residents; 39 species were migrant and 28 species were resident migrants. A detailed checklist with their status as per IUCN Red List/Wildlife Protection Act (1972) is enclosed in the annexure.

A total of 15 threatened birds recorded as per the IUCN Red List/Wildlife Protection Act (1972) with their present status is listed below.

2.7.2 Threatened avifauna recorded in Udhwa Lake Bird Sanctuary (2009-2018).

Sl. No.	Common Name	Scientific Name	Wildlife Protection Act, 1972	IUCN Status (2018)
1	Oriental Darter	<i>Anhinga melanogaster</i>	IV	NT
2	Woolly-necked Stork	<i>Ciconia episcopus</i>	IV	Vu
3	Lesser Adjutant-Stork	<i>Leptoptilos javanicus</i>	IV	Vu
4	Black-necked Stork	<i>Ephippiorhynchus Asiaticus</i>	IV	NT
5	Oriental White Ibis	<i>Threskiornis melanocephalus</i>	IV	NT
6	Large Whistling Duck	<i>Dendrocygna bicolor</i>	I	LC

7	Ferruginous Duck	<i>Aythya nyroca</i>	IV	NT
8	Common Pochard	<i>Aythya ferina</i>	IV	Vu
9	Pallas's Fish-Eagle	<i>Haliaeetus leucoryphus</i>		Vu
10	Osprey	<i>Pandion haliaetus</i>	I	LC
11	Eurasian Curlew	<i>Numenius arquata</i>	IV	NT
12	Long-tailed Prinia	<i>Prinia burnesii</i>	IV	NT
13	Rufous-vented Prinia/Long-tailed Grass Babbler	<i>Laticilla burnesii</i>	IV	NT
14	Alexandrine Parakeet	<i>Psittacula eupatria</i>	IV	NT
15	River Tern	<i>Sterna aurantia</i>	IV	NT

NT-Near Threatened Vu –

Vulnerable

LC – Least Concern

Asian Waterbird Census (AWC) 2009 to 2018)

Asian Waterbird Census (AWC), which is part of a global waterbird monitoring programme i.e. the International Waterbird Census (IWC), is being coordinated by Wetlands International. Asian Waterbird Census (AWC) at Udhwa Lake bird Sanctuary is being conducted as per Wetlands International guideline regularly since 2009 till date by IBCN, BNHS and Bird watcher of Jharkhand and Bihar, represented by Neo Human Foundation-Jharkhand, Mandar Nature Club-Bhagalpur, Bihar & Adhikari Foundation for Nature Conservation, and Jharkhand with the support of Wildlife Division, Hazaribag. The details of the census report are enclosed in the annexure.

Note:- Recently (30 August, 2018) guideline has been issued by Ministry of Environment, Forest and Climate Change under the chairmanship of Dr. Soumitra Dasgupta, IGF (WL), India's National Action Plan for Conservation of

Migratory Birds and their Habitats along Central Asian Flyway (2018-2023), has recommended to follow AWC programme as a standardized guideline.

2.7.3 Other Animals: Apart from a large number of birds, both migratory and resident, this bird sanctuary is rich in wetland aquatic life-forms. An updated checklist of fishes is enclosed in the annexure. Other animals like frogs, monitor lizard, water-snakes, snail, crabs etc. are also common. Further study is required for a detail investigation.

Fishing cat: - Fishing cats have also been recorded in the vicinity of the area, the latest being In 2018 from the eco sensitive zone area of the sanctuary.

CHAPTER-3

HISTORY OF MANAGEMENT AND PRESENT PRACTICES

3.1 General:

Prior to 26.11.2002; the area was managed by the Divisional Forest Officer, Social Forestry Division, Sahibganj and it was put under general forest administration. This sanctuary was under Udhwa Sub-beat of Rajmahal Damin Forest Range and this sub-beat was spread over other forest areas also besides this sanctuary. The most part of the area being Raiyati land, which is declared as a sanctuary, the development of this bird sanctuary is greatly jeopardized because the Raiyats who have not yet been compensated at all, find themselves completely alienated from the scheme of the sanctuary development and avifauna preservation. Besides, the development of the infrastructure for the efficacious management of this sanctuary still remains an unrealized concept. On 26.11.2002 Government of Jharkhand through the Notification No. 5467 created the Wildlife Division, Hazaribagh and this sanctuary is now under Giridih Wildlife Range of the Wildlife Division, Hazaribagh. Now the sanctuary is under the direct control of the special wildlife wing of the Forest Department of Jharkhand under the Chief Wildlife Warden, Jharkhand. The administrative control of the sanctuary has been transferred to Sahibganj forest division vide notification no- 3026 dated 22-10-2021 citing difficulties in proper management of the sanctuary due to distance from Wildlife Division Hazaribagh forest division.

3.2 Timber Operation including Bamboo and Firewood Harvest:

The wetlands of Udhwa Lake Bird Sanctuary are interspersed and surrounded by non-forest private land. No likelihood is therefore there for any practice of regulated timber operation, bamboo or firewood-harvest. However, when the Raiyati land within the sanctuary limits are acquired and the compensation paid to the owners, such land may be planted up with suitable species of trees and bamboos which may in some future stages require some regulated harvest or collection. No silvicultural system or tending operation is in vogue, because no such forest-crop is there

3.3 Bamboo harvesting:

All the bamboo clumps, though few and far found in the vicinity of the PA on privately owned land and is worked by the owners as per their requirement and preferences. No regulated working of bamboos is in place.

3.4 Firewood Extraction:

The agricultural waste and residue being largely insufficient, most of the surrounding village households depend on firewood for their domestic energy requirements. The villagers, mostly women folks collect firewood from trees standing in the vicinity on private forest or G.M. land or those along the road sides. There is no system in place for regular collection and supply of firewood to them. However, the sanctuary management can hardly be perceived to do anything significant towards ensuring regular supply of firewood to the villagers, though alternative energy sources like solar cooker etc. have to be tried.

3.5 Non-wood Forest products (NWFP):

No NWFP worth mention is presently available in the immediate surrounds of the sanctuary.

3.6 Leases:

Prior to June 1994 the Sanctuary area was being annually leased off by the district fisheries department for fishing purpose but after getting a complaint from different pressure groups the then CCF cum Chief Wildlife Warden, Bihar, Sri P.K. Sen requested the DC to stop the practice of annual fishing lease granted to Udhwa Fishermen Cooperative Society and thereafter DC, Sahibganj by ordering canceled the lease which was being granted in violation of the Wildlife (Protection) Act, 1972 (as amended in 1991). At present, there is no lease granted in the Sanctuary to any individual for any purposes.

3.7 Forest Protection:

3.7.1 Legal Status:

The total area of Udhwa Lake Bird Sanctuary is notified as Wildlife Sanctuary under section 18(1) of the Wildlife (Protection) Act, 1972 vide Bihar Govt. notification S.O. 544 dated 4th Nov 1991. The details of the land are

mentioned in the notification, which is enclosed in the annexure.

3.7.2 Hunting:

Hunting of birds is done especially in winter and to check this menace intensive patrolling has to be done throughout the winter by boat. Besides this fishing by local people throughout the year is also done and to prevent this; at least one beat officer with two Forest Guards under him must be put in the exclusive charge of patrolling.

3.7.3 Poaching:

Illegal poaching of birds, combined with illegal fishing in the sanctuary lakes, constitutes the most potent and the greatest threat to the scheme of conservation and protection of the Sanctuary. The local villagers, Santhals and Pahadias among them, are having a long tradition of catching the bird, particularly during nights, even after the declaration of the lakes as a sanctuary. The problem is compound by the fact that many of these birds stray out into the paddy fields surrounding the lakes, where the poachers find it a lot easier to hunt them.

Local fishermen, driven by the lack of other fishing avenues, are also often involved in collusion with the local farmers and in the guise of farming activities in surreptitiously laying out extensive fishing nets and harvesting the catch.

3.7.4 Illicit Felling of trees:

The trees planted along the sanctuary area by forest department faces the greatest threat of its elimination by local people for firewood. Previously the womenfolk of mainly Pahar Gaon of Pataura Panchayat and Murpur, Lalbathan used to cut the young plants for firewood but after a series of meeting with the womenfolk and their male counterparts, the practice has been considerably reduced.

3.7.5 Illegal removal of NWFP:

No such specific activities have been noticed around the sanctuary.

3.7.6 Encroachment:

Though this area has been declared as Sanctuary U/S 18 of Wildlife (Protection) Act 1972, a large chunk of the area is still Raiyati and no compensation has yet been given to the Raiyats. So, people of this area do cultivate the Sanctuary land for raising Garma-dhan during the summer season. Thus, the top priority must be given to adequately compensating the local farmers for the inclusion of their land in the sanctuary, without which no development work is likely to hold the promise of success.

3.7.7 Domestic livestock grazing:

The area surrounded by paddy fields has no threat of grazing.

3.7.8 Wildfires: The Sanctuary being wetland has no fire hazard.

3.7.9 Pathological problems: No such problems have come to notice so far.

However, regular observation and vigilance have to ensure against any such threat. Fish is an important food component of fish dependent avifauna. In fish, a bacterial disease *Columnaris* (*Fin and Tail Rot*) has been observed this requires further investigation.

3.8 Tourism: This is the only Bird Sanctuary of Jharkhand, it is located near the metropolitan city of Kolkata and Farakka Barrage, thus having a great tourism potential.

3.9 Research monitoring and training: No facilities presently exist for research, monitoring and training. These however have to be created in order to ensure a healthy habitat for the avifauna, both resident and migratory.

3.10 Research & Monitoring: A research and monitoring cell has to be created and equipment such as binocular, video camera, computers, projectors etc. have to be provided to willing ornithologists and also to the local forest staff for maintaining observation records.

3.11 Training: Local people will be scrutinized and short listed and

3.13 Summary of threats to Wildlife:

The avifauna of the Sanctuary is facing the greatest threat of their elimination from poachers, shooters and bird traders. Poaching is a major threat to the Udhwa Lake. The poachers are having a well- organized network in the area and they used to become very active particularly during winter months when thousands of migratory birds visit the Sanctuary lakes and adjoining area. In addition to the threat by poachers, traders and local people of the adjoining villages as well as visitors had also been hunting birds in the Sanctuary area and this practice, though somewhat reduced. Still continues by stealth, particularly during nights, after the declaration of the area as Udhwa Lake Bird Sanctuary which is a protected area under Wildlife (Protection) Act 1972.

The second most serious problem affecting the avifauna is biotic interference by the local people, which is anthropogenic interference. The local people cross the sanctuary waters for transporting their agricultural products as well as for fishing and in the course of fishing and passing through the Sanctuary water they do collect the eggs of the water birds and sometimes hunt them also. Fishing is one of the greatest threats of the Udhwa Lake Bird Sanctuary.

Siltation spread of water hyacinth and reed infestation is another threat of the proper management of the Birds. The Sanctuary area is not well demarcated and a large chunk of the area is still under Raiyats .They cultivate Garma-dhan in post Monsoon seasons in the Sanctuary area. This is also a great threat to the habitat of the Sanctuary. The surrounding of the Sanctuary is devoid of a good number of large trees to provide roosting, resting and breeding grounds for a variety of Birds.

CHAPTER-4

THE PROTECTED AREA AND INTERFACE LAND USE SITUATION

4.1 The existing situation in the zone of influence:

4.1.1 The location, extent, boundaries and natural attributes of the ZI: The sanctuary is surrounded by paddy fields. From decades the local people have been used to fishing practices and they were also indulged in the hunting of Wild Birds in the Sanctuary. This practice greatly influenced the habitat in a bad manner. The local people, besides roaming in the Sanctuary in the name of transport of agricultural implements and usufructs, also run diesel pump sets to lift water from the lake for irrigation purposes during post monsoon season. Though this practice does not deplete the water table in the lake because this lake is connected to Farakka Barrage throughout the year, the practice greatly disturbs the serenity of the habitat of birds and that is why sensitive birds do not flourish in this lake. So, the problem of the irrigation of local people must also be solved.

4.1.2 Villages inside and outside the P.A. Ethnic identities, traditions, customs, relationship between a distinct group of the people, relationship with forests:

The socio-economic condition of the people being very poor, most of the people live out of daily manual labor and are engaged in either agriculture or stone mining works, where employment is very irregular. Bidi making is also common. Migration, in search of employment to megacities, is a regular feature. Due to the paucity of fuel wood a large no. of people depends on illegal tree-cutting and that is why the hills are mostly devoid of tree cover. Local people largely depend on the fish of Sanctuary lakes for food and trade-purpose & also depend on the Sanctuary water for irrigation purposes. A list of the villages fall in the zone of influence of the PA is given in the annexure.

4.1.3 The State of the people's economy, Vocations, land use, use of forest and non-forest based natural resources by people and seasonal patterns: The economy being predominantly agricultural one, ravaged by alternative floods and droughts, people hardly get employment for a part of the year, therefore the people in the zone of influence migrating to cities for employment as laborer's or earning a livelihood out of stone-mining, fishing, bidi-making or other small trades. The economy of a considerable number of farmers having their raiyati lands within and around the sanctuary largely depends on irrigation with the lake-water besides passage to and from their fields across the lake.

4.1.4 Implications of the land use and resource dependency for the conservation of P.A.: **The dependency of local people on Sanctuary resources:** The exploitation of fish, birds and water badly affects the conservation efforts of the P.A. The dependency for water doesn't directly affect the conservation efforts but indiscriminate use of diesel pump sets throughout the post monsoon season badly disturbs the habitat.

4.1.5 Forest/ P.A. management practices and their implications for people: No sincere and scientific management practice was ever introduced during the previous years prior to the creation of the Wildlife Division, Hazaribagh; hence no study of the implications of management practices could be made. However, the restrictions of fishing and catching or hunting of birds, though only partially effective so far. It is required to compensate the local people through the employment and bring them on the board for the conservation-efforts.

4.2 The development programs and conservation issues:

While on one hand the avifauna, both resident and migratory, have to be rigidly protected and fishing in the sanctuary waters has to be eliminated, the local fishermen and other villagers have to be provided an alternate source of livelihood. The lake habitat has to be improved by the removal of undesirable weeds, regulating the water inlet in

Berhale Jheel. So that it does not dry up in the lean season, creation of a healthy green belt around the sanctuary, development of infrastructure for effective management and inducing tourist influx. The raiyati lands within the existing limits of the sanctuary have either to be acquired on payment of adequate compensation, or at least an alternate approach has to be provided to the farmers to and from their agriculture fields, so that they don't have to navigate through the sanctuary-lake.

4.2.1 An evaluation of Govt, and Non Govt, agency programs for development, Implications for P.A., people and ZI : After the creation of the Wildlife Division, Hazaribagh in November, 2002, the management of the sanctuary was handed over to Wildlife Division Hazaribagh by Sahibganj Social Forestry Division in July, 2003, since then several proposals for development and protection of the sanctuary were submitted to the Govt. of Jharkhand for quite a few of which allotments were made available under State Plan. A Forest Guard's quarter has been constructed at Udhwa, an old dilapidated construction known as Lohia Bhawan has been remodeled as a Forest Rest House, two six-seater fiber-glass boats have been provided, eight earthen bunds have been raised along the banks and two rows of mixed panting have been done on the bunds. Besides, under 75:25 Centrally Sponsored Schemes, 100 concrete pillars have been installed.

Two fishing ponds have also been dug, away from the sanctuary, in the villages under the State Plan.

The above described measures, while contributing to the development and protection of the sanctuary, have also created alternate fishery opportunities however modest, for the local people, thus facilitating, though to a small extent only, weaning a few of them away from dependence on the sanctuary lake.

4.2.2 The interplay of market forces and their impact on the sustenance economy of the local people: Lack of sustained gainful employment forces local people to migrate to megacities for employment purposes.

4.2.3 A summary of problems faced by people that affect the management of the P.A. and the ZI: *The problem of raiyati lands within the sanctuary has not been settled. Ample alternate resources have not been created for the employment and livelihood of the local people as also to wean them away from total or partial dependence on the sanctuary-waters. Intensive agriculture around the sanctuary resulting in huge anthropogenic pressure.*

**MANAGEMENT
PLAN OF
UDHWA LAKE BIRD SANCTUARY**

PART-II

PROPOSED MANAGEMENT

CHAPTER-5

PLAN OBJECTIVES AND PROBLEMS

Inline of the National Wildlife Action Plan (2017-32) that is to (i) Strengthening and promoting the integrated management of wildlife and their habitats, (ii) Promoting eco-tourism, nature education and participatory management, (iii) Strengthening wildlife research and monitoring of the development of human resources in wildlife conservation and (iv) Landscape approach in conservation of wildlife, the following objectives are set for the management of the Sanctuary: -

5.1 Objectives of management:

- (a) To conserve Biodiversity with emphasis on endangered, threatened, and rare elements of Aquatic flora and fauna.
- (b) To take appropriate measures to control siltation and obnoxious weed infestation problem.
- (c) To study and monitor lake water chemistry and its biotic composition.
- (d) To update the checklist of resident and migratory birds as well as aquatic flora.
- (e) To take immediate steps for integrated habitat development.
- (f) To promote economic development programs for deprived fisher folks and local villagers by providing them alternative income generating resources.
- (g) To identify and explore the possibilities for the construction of paths/ motorable roads surrounding the sanctuary (wherever possible) and the creation of green belts by planting the favorable species under habitat improvement programs.
- (h) Implementation of the provisions of Eco-Sensitive Zone, to reduce the biotic pressure on the resources of the Sanctuary and to strengthen the protective cover.
- (i) To promote public education, conservation awareness programs and eco- tourism.

5.2 Problems in achieving objectives:

1. Firstly, the most important problem in achieving the plan objective is the settlement of the problem related to raiyati lands and payment of compensation without which no development activity will be adequately effective for conservation, management and protection of the sanctuary.
2. Lack of manpower and trained staffs.
3. Lack of infrastructure facilities and communication.
4. Land demarcation issue: - The local circle office is still issuing land revenue challans to local farmers despite notification of plot no's as protected area.
5. Reduction in catchment area due to encroachment and large-scale construction activity taken up around the protected area. The ever-increasing population pressure is also changing the land use pattern and increasing pressure on groundwater reserves.

CHAPTER-6

THE STRATEGIES

6.1 Boundaries:

The sanctuary boundary is surrounded by privately owned paddy fields and gairmajarua lands. Most parts of the boundaries remain underwater during most part of the year, which restricts the movement of patrolling parties. Due to the low-lying sanctuary area, the plantation activities will also be cumbersome and expensive too. The construction of roads surrounding the sanctuary is also a difficult task. The whole area of the sanctuary will be surveyed and after demarcation, pillars shall be erected all around the periphery also watch towers need to be constructed at strategic locations. Inclusion of adjoining gairmajarua lands and the adjoining forest lands is also needed for the proper development of the sanctuary.

6.1.1 Zonation and zone plans:

The sanctuary can be divided into various zones to effectively manage the area. Suggestively the sanctuary can be divided into two zones e.g.

- Core zone:
 - Ever-wet Pataura Lake
 - Drought-prone Brahma Jamalpur Lake
 - Udhwa Nala
- Eco-sensitive Zone cum Eco-Tourism Zone.

The core zone of the sanctuary is further sub-divided into three zones one is ever-wet Pataura Lake and the second is drought-prone Brahma Jamalpur Lake/Barhel Jheel. The Udhwa Nala which does not fall under the sanctuary area shall be integrated to the part of core management because this is a lifeline of Udhwa Lake Bird Sanctuary. This nala shall be declared as a conservation reserve under section 36A of the Wildlife (Protection) Act, 1972.

Core Zone:

- **Core Zone I: Ever-wet Pataura Lake:** This zone is spread in 155 hec. In this zone natural ecological processes shall be allowed to continue with minimal management interventions.
- **Core zone II (Drought prone Bram Jamalpur Lake/ Barhale Jheel):** This area is flooded with water only during monsoon season.

6.1.2 Objective of Core Zone:

- (a) To protect and Conserve aquatic flora and fauna.
- (b) To protect and conserve fish and other invertebrates.
- (c) To create an ideal habitat for avifauna.
- (d) To control siltation and obnoxious weed infestation problem.
- (e) To study and monitor lake water chemistry.

problem in achieving objectives:

- (a) Firstly, lack of manpower and trained staffs.
- (b) Lack of infrastructure facilities and communication is also a major threat.
- (c) The dependency of people in the zone of influence upon the resources of the lake ecosystem.
- (d) Rampant use of pesticides and agriculture fertilizers around the agriculture field of the lake.
- (e) Temporary encroachment during the summer season for the purpose of paddy cultivation.

6.1.3 Strategies: The following guidelines shall be enforced by the implementing officer for habitat improvement:-

- (a) Biotic interference shall not be allowed in this zone.
- (b) Strict vigil shall be maintained to protect against fishing, poaching, vandalism and other violations.
- (c) De-silting shall be done as per requirement, deepening will be done wherever felt necessary.
- (d) This zone will be kept free of overgrowth of aquatic weeds such as *Oryza*, *Sesbania*, *Nelumbium*, sps. These species tend to overrun the entire open water surface, removal of these sps. shall be undertaken in the month of April every alternate year. If required removal is done soon after the monsoon, so that clear water is available for migratory birds that arrive with the onset of winter. *Eichhornia* shall be collected and burnt.
- (e) Bathymetric survey and depth-profiling of the total area needs to be undertaken so that water at various depths is available for different species.
- (f) Earthen mounds need to be created at different suitable locations to help the aquatic birds to nest.
- (g) Catchment area treatment needs to be undertaken in the whole area so as to provide uninterrupted rain water accumulation in the lakes from the adjoining areas of higher elevation.

(h) The area lacks in high rising tree varieties which provide suitable nesting places for some varieties of bird species. Artificial tree like structures need to be constructed at various places in the sanctuary area which will provide nesting place temporarily also plantation scheme must be undertaken in large scale in and around the area.

(i) Construction of bird rescue centers at few locations within the sanctuary area so as to provide a haven to sick/injured birds.

(j) Construction of oxidation ponds at various points where the waste water from local inhabited area enters the sanctuary so as to catch the slurry and increase the amount of available oxygen in the water being accumulated in the sanctuary areas.

6.1.4 Wireless communication system : for effective monitoring in the sanctuary and to keep a constant watch on the activities of staffs a wireless communication system is must in the sanctuary. For this effort must be made for obtaining necessary permission from wireless division. Towers , base station and repeaters can be installed at appropriate place. Sanctuary area being small , the wireless communication system would not be much costly.

Following guidelines shall be enforced by implementing officer.
In this zone deepening and disiltation shall be done so that the water level of the wetland/ Sanctuary can be uniformly maintained throughout the year.

(a) The provision of the sluice gate at the entry point of Barhale is immediately needed. Also sluice gates need to be constructed in udhwa nala to maintain the water level in the Berhale Lake during the lean period.

(b) Controlled deweeding should be done in the Berhale Lake so that even the far ends of the lake can be reached by boat. This will help in the study of the lake and controlling the trapping of birds through nets.

6.1.5 Core zone III (Udhwa Nala): In this zone specially between Pataura and Brahm- Jamalpur lakes the deepening of the Nala shall be done to facilitate the easy flow of water during monsoon season. At Udhwa Nala near Kacheri Ghat (24° 58.287' N and 87° 51.401' E) is the place where the Mughal Emperor, Shuja was killed. In this 25 km long Udhwa Nala, the ferry system has been

discontinued because of the heavy siltation. A sluice gate / Check Gate at Udhwa Nala or at the point from where the Udhwa Nala is divided into two channels to regulate the inflow and outflow of water to and from Pataura and Berhale lakes of the sanctuary should be considered. The siltation of Udhwa Nala should be removed at the points where it is interrupting the inflow of water in the sanctuary

from Ganga River at Farakka and maintain the connectivity with the lake and the Ganga River the said Udhwa Nala shall be declared as the Conservation Reserve under section 36A of the Wildlife (protection) Act, 1972.

6.1.6 Eco-sensitive Zone cum Eco-Tourism Zone: Eco-Sensitive Zone of Udhwa Lake Bird Sanctuary has been notified by the Govt. of India, the notification is enclosed in the annexure. The provisions mentioned in the ESZ notification shall be implemented so that it provides the shock absorber to the protected area and Eco-Tourism has been dealt in chapter 7.

6.1.7 Buffer Areas:- There are few large water-bodies around and nearby Udhwa lake bird sanctuary like – Sukhahar, Gunihari, Bistupur, etc. These water-bodies act as satellite roosting centers for the birds. Due to lack of any prominent protection heavy fishing takes place in these water-bodies affecting the bird habitats. Moreover as many of the water-bodies are spatially connected so heavy fishing in these areas affect the sanctuary too, and in some cases results in illegal fishing along the boundaries of the sanctuary.

Efforts must be made to declare those water-bodies as buffer area of the Udhwa lake bird Sanctuary, which are large, submerged for most part of the year and near to the sanctuary. Initially government lands can be brought into this fold. For this purpose compensatory land provisions under forest conservation act can be utilized.

CHAPTER-7

Tourism, Interpretation and Conservation education

7.1 General Introduction:-

Eco-tourism is defined as **'responsible travel to natural areas that conserves the environment and improves the well-being of local people'** (ITES). Forests and wildlife are elements of nature and inseparable parts of the environment. Because of the intricate nature of the interface between nature and human beings, nature conservation must entail the participation of people as a non-negotiable component. The participation in this endeavor includes not only the forest fringe dwellers but also those who may be living away from the forests.

Appreciation of the various elements of nature, their direct and indirect impact on our survival and intangible services provided by those are of paramount. Visitation to such pristine areas would facilitate direct appreciation and understanding of nature. Eco-tourism, when practiced appropriately, besides educating the visitors can also provide livelihood opportunities for the local communities. Thus, there is felt a need to develop a model of eco-tourism that is responsible and compatible with the sensitivities of the management objectives of the protected area. However, the objectives primarily being for preservation and conservation.

Udhwa Lake Bird Sanctuary is an ideal site for Eco-Tourism. This is the only bird sanctuary of Jharkhand state connected to the holy river Ganges through a Canal which links the river at Farraka Barrage, in core area water remains throughout the year, so this wetland is the hot spot for avifauna throughout the year, different species of resident and migratory birds can be sighted here. This sanctuary has excellent potential to attract wildlife lovers. For Eco-tourism following character prescribed by IUCN should be demonstrated by Eco-tourism activity: -

- (a) It promotes positive environmental ethics and fosters preferred behavior in its participants.

- (b) It doesn't degrade the resource.
- (c) It concentrates on intrinsic rather than extrinsic values.
- (d) It is oriented around the environment in question and not around the man.
- (e) It must benefit the wildlife and environment.
- (f) It provides a first-hand encounter with the natural environment.
- (g) It actively involves the local communities in the tourism process.
- (h) Its level of gratification is measured in terms of education and appreciation.
- (i) It involves considerable preparation and demands in-depth knowledge on the part of both leaders & participants.

7.2 Objectives

- To bring the sanctuary on the tourism map on the country.
- To provide informed and rich wilderness experience to visitors by enabling them to view a cross-section of PA values and also to spread awareness about the importance of biodiversity conservation.
- To involve local people in the tourism, interpretive and conservation education programme.
- To develop an excellent infrastructure for tourists such as F.R.H, Youth Hostels, Tourist Cottages, Nature Interpretation Centre, etc.

7.3 Problem in achieving the Objectives:

- Most part of the sanctuary is still Raiyati Land, the compensation of the said lands has not yet been paid to the concerned Raiyats. Without settlement of the rights of the Raiyats no development work can be undertaken on the land which is still Raiyati in nature and non-forest activities on that land cannot be stopped and if stopped force-fully it will lead to widespread resentment among the masses which will be highly undesirable for the betterment of the sanctuary.
- Lack of manpower will also hinder the management of tourism activities,

7.4 Strategies:

7.4.1 Identification of zone: Already dealt in chapter- 6

7.4.2 Development of Infrastructure:

- (a) At present, there is no infrastructure except the Lohia Bhawan

which was constructed by District Administration and handed over to the Forest Department. It is having two rooms with a lack of basic facilities.

- (b) A well-organized tourist complex should be constructed to facilitate accommodation for tourists. Such as five (5) well-furnished cottages (Van - Kutir's) and thirty (30) beds Dormitory (youth hostel) shall be constructed in a tourist complex area.
- (c) Another Guesthouse across the Pataura on Chatra Pahari is scenic and picturesque which may be developed to attract tourists.
- (d) A Visitor's center or Nature Interpretation Centre has been constructed, this needs further maintenance, which will be done from time to time and a library is essential for research and education.
- (e) The provision of solar plates, Batteries and Invertors should be made at the Rest House as an alternate source of electricity to avoid the sound and air pollution caused by the generator.
- (f) Watchtowers, signage's, visitors track, roads all around the sanctuary and boats will be provided to facilitate tourism and conservation education.
- (g) Theme based children parks can be constructed in the area to increase the popularity of sanctuary among kids.

7.4.3 Nature Interpretation Centre: Already a Nature Interpretation Centre has been made for tourists. This center needs further modification and enhancement. One auditorium/amphitheater is required for organizing meetings and workshops with facilities for audiovisual programs for eco-awareness films, wildlife films for tourists/department, and other nature lovers. The upper story will have a library along with an open front portion to have a view of Sanctuary from the top, in the winter season, the tourist influx will increase. The space on the ground floor will also have a canteen for the tourist. It is a fairly specialized task and here assistance of a specialized agency shall be sought by the implementing officer. The light and sound programme including historical facts as well as biological metrics shall be developed and all exhibits may include maps, pictures of birds, wild animals, snakes, other reptiles etc.

live specimen, life-size exhibits, models, dioramas, interactive materials, information about wetland eco-system etc.

7.4.4 Publicity material: To enhance understanding and appreciation of various values of the sanctuary, management policies and programs to promote thoughtful minimum impact use of the area and its resources, appropriate publicity material will be prepared.

- (a) A website of Udhwa Lake Bird Sanctuary needs to develop with photographs of flora and fauna specially birds. This website can be used for online booking facilities.
- (b) Information related to the sanctuary shall be available in the shape of multi- color brochure and pamphlet printed on good quality paper. Those shall be in both Hindi & English languages. Other publicity material such as posters, pictures, postcards, calendar stickers etc. to be designed and published.
- (c) A Field guide book on avifauna and also on other flora and fauna of ULBS shall be published from time to time with the support of experts from BNHS/IBCN/Wetlands International etc. which shall be available at a reasonable price to the tourist.
- (d) The reference books like the 10 volumes by Ali & Ripley, the books by Grimmett & Ins keep, other guide books and the books and magazines in which the articles on Udhwa have been published shall be purchased and kept in a library at Udhwa. Besides books on Wildlife Protection Act, Forest Act etc. should also be kept in the library.
- (e) Pamphlets with basic information, map and regulations will be supplied free to the visitors.

7.4.5 Transport Facilities

- (a) 2 nos. of multi-seater fiber boats shall be purchase for tourists.

One 16- seater diesel minibus or a tourist open jeep shall be bought to bring tourists from Sahibganj Railway Station to Udhwa Lake Bird Sanctuary in peak season. This can be also used as vehicle for awareness generation.

7.4.6 Signage's:

- (a) Large size digital signboards/hoardings welcoming people to the sanctuary are to be developed and put up at main entry gate/Barharwa and Sahibganj Railway station and also at important locations on approach routes.
- (b) Directional signage's along with the attractive colorful bird's photographs shall be put up inside the tourist complex and wherever felt necessary in limited numbers.

7.4.7 Equipment: Following equipment's will be procured of branded quality: -

- (a) Such as 10-nightvision binoculars.
- (b) One Digital Camera.
- (c) One overhead projector,
- (d) Audio-Visual equipment including. Projector and Color T.V.

7.5 Regulations, monitoring and evaluation:

Following regulations shall apply: -

- i. All buildings in the sanctuary area shall be painted in a uniform light green color.
- ii. Cottage and various buildings of tourist complexes are to be given name of birds and its photograph will be painted at the entrance.
- iii. Canteen facilities shall be there, this will be constructed inside the tourist complex.
- iv. Tourism activities should not be allowed to hinder the core zone.
- v. Tourist complex & rest house shall be equipped with first aid kit.
- vi. To regulate tourist traffic following regulation shall apply: -
 - (a) The system for booking of tourist accommodation shall be done by the Divisional Forest Officer, Wildlife Division, Hazaribagh/ Range Forest Officer, Giridih.
 - (b) The period and timing of the visit to the sanctuary shall be adjusted according to the existing condition.

- (c) Pitching of tents shall not be allowed in any case around the wetland.
- (d) Visitors shall be obliged to carry back the non-biodegradable litters.
- (e) Visitors shall be charged for various facilities and services as fixed by the state government.
- (f) Private vehicles shall not be allowed in any case to move around the sanctuary area.
- (g) Do's & don't shall be written on signboards in the tourist complex at various points.
- (h) A visitor register shall be kept in a tourist complex,
- (i) The tourist management shall be done through the active participation from the Eco-Development Committee.

7.6 Other tourist place of ecological importance:

Other places of ecotourism can be tied up like Moti-Jharna, Rajmahal, Mandro Fossil Park, exploration in river Ganga etc. and scope of ecotourism can be promoted.

CHAPTER-8

Eco-Development

8.1 General:

Eco-development is an important strategy for Biodiversity Conservation. It essentially envisages the conservation of biodiversity by addressing both the inputs of the local people on the protected area and the protected area on the local people.

8.2 Objectives:

The Eco-development programme shall have the following objectives: -

- (a) To reduce the dependencies of the local people on the Udhwa Lake Bird Sanctuary for fishing and hunting wild birds, by providing them suitable alternatives for income generation.
- (b) To ensure peoples participation in biodiversity conservation.
- (c) To improve sanctuary management capabilities and enhance the protection of sanctuary resources.
- (d) To develop capacity in villagers to plan and implement sustainable modes of development.
- (e) Promote organic farming by the promotion of organic manure, vermicompost etc.
- (f) To promote land-use practices compatible with the objectives of biodiversity conservation around wetlands.
- (g) Promote awareness for water conservation to sustain habitat for water birds.

8.3 Specific issues and Problems:

The local people depend on the lake water for their irrigational needs which has to be solved amicably. The compensation for the Raiyati lands declared as a sanctuary is yet to be paid. This should be paid immediately.

8.3.1 Problem:

- a. Lack of field staffs. Daily wages and a handful of staff can't implement programmes properly.

- b. Lack of constant flow of funds.
- c. Village level micro-planning based on the assessment of the people needs for the formulation and implementation of village level eco- development micro plans is generally not done and without PRA the eco development work is not fruitful.

8.4 Strategies: The following strategies shall be used to attain the objectives enunciated above.

8.4.1 Eco-development zone:-

Eco-development activities shall be taken up in an eco-sensitive zone as per the Zonal Master Plan of the Udhwa Lake Bird Sanctuary.

8.4.2 Eco-development through village level micro-planning

Eco-development as a participatory programme through village level micro-planning shall be taken up in a phased manner.

Staffs have to be trained in micro plan formulation by doing PRA, RRA and its implementation. Training, workshop and meetings at various levels along with field visits have to be organized regularly so as to build capabilities and also to boost morale.

The capacity of the villagers has to be developed to plan, implement and carry forward the programme. The NGO's may be able to play an important role in this regard and their active participation is essential. The manager needs to promote/facilitate NGOs and other stakeholders working in this field. To reduce dependency on the Udhwa Lake Bird Sanctuary the following activities shall also be undertaken.

8.4.3 Construction of Artificial ponds: At least 10 artificial ponds in each of the 10 neighboring villages will be drugged in a phased manner for fish culture and other purposes so that their dependency on the lake shall be minimized. The scheme of the State Government can be promoted through convergence for pisciculture. This project can be promoted through EDC.

8.4.4 Modern Agriculture Practice. A large group of the farmers around

Berhale Lake needs more availability of water in the lake for the crops on the upland. This situation may be exploited by uniting such deprived farmers to get their support in maintaining the water level inside the Berhale lake.

The farmers shall be encouraged to practice sprinkling/dripping water irrigation system; this practice shall conserve water in the lake. This can be promoted with the support of the concerned department.

Awareness programmes should be launched to restrict the use of chemical-based pesticides and fertilizers and the use of biopesticides and biofertilizers should be promoted to check the release of toxic chemical present in pesticides and fertilizers.

8.4.5 Distribution of alternatives: This will reduce dependency on the sanctuary such as solar light, Solar Cooker etc. shall be provided to the Villagers Community, Bio Gas plants, facilities for pure drinking water shall be provided in each village adjoining to the sanctuary area. Sustainable resource generating activities shall be encouraged by giving assistance to the local people.

8.4.6 SHG: Self help groups shall be created in each village adjoining the sanctuary area so that their economic conditions may improve in due course of time.

Activities like basket weaving, backyard poultry farming, piggery, fisheries and other vocational activities shall be introduced through self help group.

8.5 Monitoring & Evaluation:

Monitoring and evaluation of eco-development schemes shall be done by forest officials with an active association of the beneficiaries and the eco-development committees (EDC) of the concerned villages. Apart from EDCs, Local Youth Committee at the village level should be formed for the monitoring of Udhwa Lake Bird Sanctuary. The NGO's shall also be associated in a formulation, monitoring and evaluation of the schemes.

CHAPTER-9

Research, Monitoring and Training

9.1 General:

Research and monitoring are very important for improving the management of PA's. They tell the manager about the nature and status of the resources of the reserve and provide valuable information for improved management, which leads to better Bio-diversity conservation. They also generate information about the effects of managerial interventions and form the basis for deciding the future course of action. In Udhwa Lake Birds Sanctuary at present no research facilities exist and also lacks a proper monitoring system. Sanctuary management is a little ahead of the incipient stage. After notification of the sanctuary and permanent delineation of its boundaries. A regular census of resident and migratory birds has been undertaken once in a year but this needs to be done at least in three seasons. Research, as well as monitoring facilities, have to be created with all types of equipment and instruments. Regular research is important throughout the year.

Those activities which do not require specialized training like a sighting of animal, arrival and departure of migratory birds, a sighting of any fauna can be undertaken by the staff posted with formal training. Those activities which require specialized study like a census of birds, nesting, breeding behavior of birds etc. can be under by experts or NGOs working in this field.

9.2 Training:

Local interested people will be scrutinized and short-listed candidates shall be given training on eco-tourism and bird watching and they may also be employed as a guide.

9.2.1 On the Job Training: The specialized training in wetland management shall be given to the field officers as well as staffs. Field staff shall be provided training regarding identification, behavior and their conservation importance. Training regarding prosecution and other legal

aspects and collection of data regarding the migration trend of the migratory birds shall be given to field staffs.

9.2.2 Formal Training Courses: Formal short-term training courses regarding wetland management shall also be imparted to the field officers from time to time.

9.2.3 Strategies:

The following strategies are proposed:-

- ♦ In-house Research.
- ♦ Research by external agencies.

9.3 Monitoring:

One research station may be set up near Lohia Bhawan in a tourist complex area and the following data shall be recorded.

9.3.1 Recording of Metrological Data: Data on rainfall, relative humidity, temperature, wind velocity shall be recorded by staff at the research station. The following types of equipment shall be procured at the research station.

- ♦ Maximum-Minimum thermometer - For recording Max., Min. temperature.
- ♦ Dry & wet bulb thermometer - For recording relative humidity
- ♦ Anemometer - For recording Wind velocity.
- ♦ Rain gauge - For recording rainfall data.
- ♦ Aneroid Barometer - For recording general weather conditions daily.

The field staff shall be given appropriate training for handling the equipment and recording data in the prescribed register every day. Range Forest Officer shall be responsible to get the data recorded every day and to ensure that the equipment is maintained and utilized properly.

9.3.2 Monitoring of Lake Water:

- ♦ Lake water chemistry and its biotic composition may be studied and monitored; a sample of water shall be sent to the nearest Govt. research lab at regular intervals.
- ♦ Rate of siltation and erosion may be studied and monitored regularly with

the assistance of an external agency.

♦ To maintain the water level of the wetland, Farraka Authority must be requested by the Forest Department, so that they should help in maintaining the level of water of Udhwa Lake throughout the year,

9.3.3 Monitoring of flora and fauna:

♦ Photographic record of identified/unidentified flora and fauna shall be done by the field staff.

♦ First sighting/ last sighting etc. and details of arrivals/ departure of migratory birds species are to be recorded regularly.

♦ In case of the death of birds both migratory and resident, the sample shall be sent to SACON, Coimbatore or other Govt. Agency for investigation.

♦ In case of unusual death of any other fauna, the sample shall be sent to WII or other research institution for investigation.

♦ Training of Officer and field staff shall be organized with the assistance of W.I.I., Dehradun, or other research institutions.

♦ Photography/video-graphy shall be used as a monitoring tool.

9.4 Research:

To study species diversity, census of avifauna, an ecology of wetland migration trends of migratory birds, feeding habits of different birds species shall be studied and monitored with the assistance of Scientists/ Research Scholars of Wildlife Institute of India, Dehradun, B.N.H.S, SACON, Coimbatore, Wetlands International, experts and NGOs working in this field.

♦ Periodic Census of migratory and resident avifauna shall be done in three seasons.

♦ Special census of migratory birds shall be done in the winter season for winter migrants and summer for summer migrants.

♦ Study of population dynamics of avifauna.

♦ Study of roosting, nesting and breeding biology of resident birds.

♦ Study of pollution on flora and fauna.

♦ Study of habitat occupied by different species of birds.

- ♦ A study on wetland shall be done for species diversity and ecological variability.
- ♦ Consultation should be done with the hydrologist to understand the water regulation system and seek suggestions regarding the availability of water in both the lakes of Udhwa throughout the year.

9.4.1 Checklist: Checklist of macro and micro flora, avifauna and other wild animal found in an around the sanctuary area shall be prepared and updated regularly. Studies and monitoring of, Amphibians, Reptiles, Invertebrates, Algae and other lower plants shall be done with the assistance of W.I.I., Dehradun, B.N.H.S, SACON, Coimbatore, Wetlands International, experts and NGOs working in this field.

CHAPTER-10

Organization and Administration

10.1 GENERAL:

The administrative structure is based on the existing structure of the Forest Department. At present, there is no sanctioned post for either Forest Guard or Forester. At present Range Forest Officer, Wildlife Range, Giridih is in the charge of the Sanctuary and he is responsible for the Sanctuary Management. But it becomes very difficult for him to bear that responsibility as the PA is more than 300 K.M. from the Range Quarter and more than 450 K.M. from the Divisional Headquarter. This Giridih Wildlife Range is one of the Range of Wildlife Range Division, Hazaribagh and it becomes very difficult for Divisional Forest Officer to look after this sanctuary from such a far distance. So, it is suggested to transfer this PA to the Sahibganj Forest Division then the only biodiversity of this sanctuary shall be conserved and protected in the right spirit.

10.2 OBJECTIVES:

- (a) To provide efficient administration.
- (b) To develop and maintain infrastructural facilities.
- (c) To provide staff amenities.

10.3 PROBLEMS:

The problems in attaining objectives are as follows:

- (a) There is no sanctioned post for the front-line staff, even one forest guard for this sanctuary.
- (b) Lack of infrastructure and basic amenities.
- (c) Range Headquarters and Forest Division Headquarters are far away from Udhwa Lake Bird Sanctuary.

10.4 STRATEGIES:

Following strategies are proposed:

1. A separate Forest Range shall be created with the headquarter at Udhwa and there should be a Range Forest Officer, One Forester and Four Forest Guards post shall be created for better management.
2. For the better management of the PA, it is advisable that administrative control of the PA shall be transferred to the Sahibganj Forest Division.
3. There shall be a mechanism in place to reward the good performing front line staff.

The sanctioned strength, working strength, and the required strength are shown in the following table: -

Sl.	Name of Post	Present sanctioned post/s	Present Working Strength	Required strength	Remarks/Justification
1	Range Forest officer	0	1	1	Rajmahal Range Forest Officer is in-charge of Udhwa Lake Bird Sanctuary. To manage this PA in the right spirit, it is desirable that there should be a dedicated RFO for the Udhwa Lake Bird Sanctuary.
2	Forester	0	1	2	Two Forester are required, one in the charge of Pataura Beat and Udhwa Nala and another will be in the charge of Barhel Beat.

3	Forest Guard	0	0	4	1 Forest guard will be in the charge of Pataura Sub Beat, 2 in the Charge of the Barhel Sub Beat and one in the Charge of Udhwa Nala.
4	Driver	0	0	1	One Driver is required for the Range Forest Officer, as the separate range has been proposed in this Management Plan.
5	Computer Technician	0	0	1	He shall be posted on a contract basis for the data entry.
6	Range Clerk	0	0	1	Since the separate Forest Range is proposed in this plan and with increasing load at the Range Level, the Range Clerk is required.
7	Trackers	0	5	20	5 trackers each for pataura, barhale eco-sensitive zone and to oversee ecotourism activities. They shall be used for various activities ranging from foot patrolling, conservation, manning watch towers etc.

CHAPTER-11

11.1 The Plan and Non-Plan Budget

11.1.1 Source of funding:

Both state and central government funds would be utilized for different activities of the plan. This will also include funding from the CAMPA and other agencies.

11.1.2 Implementation of the Plan:

Sahibganj forest Division, Sahibganj, through the sanctuary authorities shall implement the plan over a period of 10 years, beginning with 2021-22.

11.1.3 Budget:

The requirement of funds for various activities to achieve the objectives of this Management Plan spread over the plan period of 10 years will be prepared in upcoming years and proposed indicative activities to be taken up are summarized below. Component wise break up is enclosed in the annexure

23(a)&(b)

Management Plan Components	Core Activities	Non-core activities
Wetland boundary delineation and demarcation	<ul style="list-style-type: none"> Wetlands boundary survey and mapping Wetlands demarcation using geotagged pillars 	<ul style="list-style-type: none"> Fencing of wetlands boundary Development of promenade for urban wetlands
Catchment conservation	<p>Afforestation and aided regeneration within direct catchments</p> <p>Small scale engineering structures (such as gully plugging, check dams, gabion structures, silt traps)</p> <p>Monitoring pilot watersheds to assess degree of reduction in siltation and improvement of moisture regimes</p>	<ul style="list-style-type: none"> Large engineering structures within wetlands direct or indirect catchment

Catchment conservation	<ul style="list-style-type: none"> • Assessment of water requirements of wetlands and aligning operational rules for hydraulic structures for achieving the desired regime. • Dredging of critically silted up wetlands areas based on consideration of bathymetric profiles and impacts on ecosystem components and processes. • Dredging of inflowing channels to improve water availability in the wetland • Constructed wetlands to treat pollution from diffuse sources • Construction of Sewage Treatment Plants 	<ul style="list-style-type: none"> • Procurement of machinery • Construction of toilets and bathing ghats • Operation and maintenance expenses
Biodiversity conservation and habitat management	<ul style="list-style-type: none"> • Assessment of habitat quality and species interactions • Population assessment of wetlands dependent species • Enforcement of regulation • Animal disease surveillance • Regulating species invasion by biological and habitat manipulation • Economic use of harvested biomass of invasive species 	<ul style="list-style-type: none"> • Construction of rescue centers • Mechanical removal of invasive species biomass
Sustainable resource development and livelihood improvement	<ul style="list-style-type: none"> • Sustainable capture fisheries within carrying capacity of the wetland • Wetlands vegetation based micro-enterprise • Community based eco-tourism linked with wetlands • Conservation of cultural heritage linked with wetlands • Micro-enterprise development for wetlands dependent communities to diversify livelihoods 	<ul style="list-style-type: none"> • Aquaculture • Promotion of organic agriculture in wetlands catchments • Promotion of water efficient agriculture systems in wetlands catchments • Promotion of ornamental fisheries based culture • Development of fish nurseries and seed banks • Development of tourism related infrastructure

Management Plan Components	Core Activities	Non-core activities
		<ul style="list-style-type: none"> • Development of water, sanitation and health infrastructure for wetland communities • Micro-enterprise development for communities not-directly dependent on wetlands
Institutional development	<ul style="list-style-type: none"> • Wetlands monitoring and assessment • Research addressing specific wetlands management needs • Construction of wetlands interpretation center • Organization of World Wetlands Day and other events to enhance appreciation of wetlands values and functions • Publication of Ecosystem Health Report Cards or any other assessment of wetlands condition 	<ul style="list-style-type: none"> • Construction of laboratories • Refurbishing of existing wetlands interpretation centers • Infrastructure development for Wetlands Authorities • Meetings of State Wetlands Authority

CHAPTER-12

The schedule of operations and miscellaneous regulations

12.1 The schedule

All the actions suggested in this plan shall be undertaken over a period of 10 years, beginning with 2020-21 to achieve the physical and financial targets. Cost calculation is on average, i.e. L.S. basis; works would be executed as per availability of fund. Works done after the lapse of the previous Management Plan will automatically be construed to have been executed as per this Management Plan and will be incorporated in it.

12.2 Record of deviations and implemented targets

A book called Sanctuary Book will be maintained to record any of the deviations from the planned strategies and targets. This record of deviations shall always be placed before CWLW with the management plan, as this needs to be referred to during the revision of the plan. Further, a separate record shall be maintained for each category of the strategy proposed and undertaken, for recording the physical targets, achievements, operational problems, if any, etc. For example, a record for water management, a record for Eco-development, a record for wildlife census, etc.

12.3 The record of employment potential

A record shall be maintained depicting the actual no. of man-days created each year under different plan strategies.

12.4 The control forms

For the purpose of evaluation of management prescriptions, impacts, and problems, a set of control forms prescribed by (Wildlife Institute of India) shall be used. At the end of each financial year, all the relevant information shall be posted in these forms and thus proper documentation will be ensured for efficient management of the sanctuary and also facilitate the Management Plan Officer (Divisional Forest Officer, Sahibganj forest division, Sahibganj) in revising the plan.

12.5 Pocket field guide for plan implementers.

A pocket field guide both in Hindi and English with the schedule of operations for the implementation of a management plan shall be developed and made available to the staff in the sanctuary.

CHAPTER-13

Plan for getting udhwa lake bird sanctuary declared as — Wetland of international importance

Udhwa lake Bird sanctuary has been declared protected area by government legislation.

For increasing popularity among tourists and researchers this site is being developed

so as to get it declared as a wetland of international importance under Ramsar convention. For this an extensive study is being conducted on criterions outlaid by Ramsar authority. The Ramsar convention lays a set of 9 criterions for any site to be declared as Ramsar site Udhwa lake bird sanctuary's proposal can be under Group-B

(Sites of international importance for conserving biological diversity) since it fulfills the following criteria's

SL.NO	CRITERION AS PER RAMSAR AUTHORITY	EXPLANATION
1 (CRITERION 2)	A wetland should be considered internationally important if it supports vulnerable, endangered or critically endangered species or threatened Ecological communities	As per IUCN Vulnerable birds: - Wolly-necked stork, Lesser adjutant-stork Common pochard Pallas's fish-Eagle Near-threatened birds: - Oriental darter Black-necked stork Oriental White Ibis Ferruginous Duck Eurasian curlew River tern Alexandrine parakeet Rufous-vented prinia /long-tailed grassbabbler

2 (CRITERION3)	A wetland should be considered internationally important if it supports population of plant and/or animal species important for maintaining the biological diversity of a particular Bio-geographic region	Udhwa lake is rich in algae, phytoplankton and aquatic macrophytes, the lake contains algae small floating higher plants , sedges, reeds, thin stemmed grasses and large aquatic flowering plants which is important for feeding and nesting various water birds and water-dependent birds residing in flood plain of Ganges and also migratory birds in eastern region.
3 (CRITERION4)	A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provide refuge during adverse condition	Udhwa lake birds sanctuary lies in the central Asian Flyway (C.A.F) and Supports a total of 107 bird species (Prakash et.al 2012) of which 15 threatened birds as per IUCN red list Reside/migrate at this bird sanctuary . The wetland flora provides ample Support to these birds providing food and And safe breeding spots in winter season.

For designation of any site as **“wetland of international importance”**

by Ramsar authority a Ramsar information sheet (RIS) needs to be compiled and submitted to the Ramsar authority the data that needs to be compiled are enlisted in the Annexure – 22

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