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Mandar Nature Club

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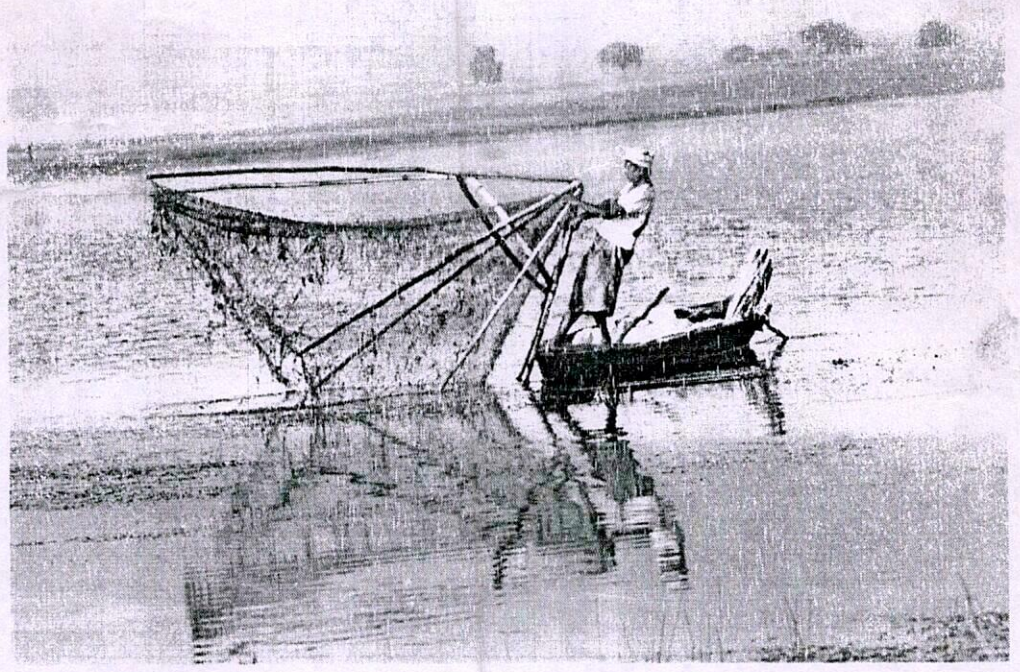
Study Report

MONITORING OF GOKUL JALASHAY, BUXAR AND DARAULI WETLANDS OF KAIMUR, BIHAR: A TOURISM PERSPECTIVE



Study Period: 8-10 February 2022

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The Team:

1. Arvind Mishra, Founder, Mandar Nature Club, Bhagalpur
2. Dr. Naresh Pandit, Plant taxonomist, Tilkamanjhi Bhagalpur University
3. Rishi Verma, Nature photographer
4. Animesh Kar, Wetlands International, South Asia
5. Anurag Banerjee, Wetlands International, South Asia
6. Shailesh Kumar Rai, District Project Officer of Namami Gange

Background:

Shahabad (Bhojpur, Rohtas, Kaimur and Buxar) had been the westernmost district of Bihar bordering Uttar Pradesh was split in to Bhojpur and Rohtas in 1972. Kaimur was carved out from Rohtas in 1991 and Buxar from Bhojpur in 1992. Historically, the whole area was the eastern part of Kasi Mahajanpad kingdom separated from Magadh by the Son River. The parliamentary constituency of Buxar includes four legislative constituencies of Buxar district namely Brahmpur, Buxar, Dumraon and Rajpur and one legislative constituency each from Kaimur and Rohtas districts namely Ramgarh and Dinara.

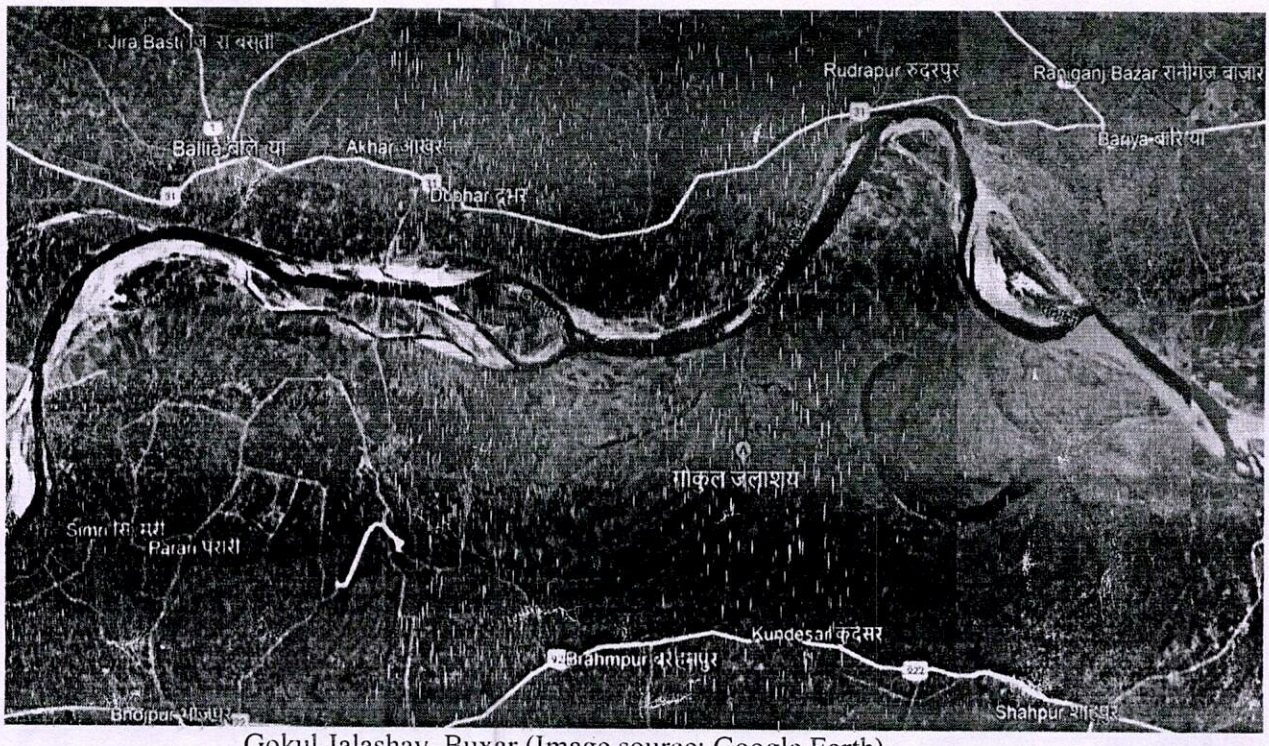
The newly formed district Buxar was probably never studied for its existing and potential biodiversity despite of the presence of Black Buck (*Antilope cervicapra*), a schedule I species protected under the Wildlife Protection Act 1972 and other flora and fauna specially the avifauna.

Looking at the biodiversity potential and the public demand to exhibit this potential to the world and explore the possibilities of developing eco-tourism in the area, honourable Member of Parliament and the Union Minister of State for Environment, Forest and Climate Change Sri Ashwini Kumar Choubey invited the founder of Mandar Nature Club, Bhagalpur, Arvind Mishra, a nature conservationist and the ornithologist, also the member of IUCN Specis Survival Commission and his team to study, document and suggest the possibilities to enhance the status of its biodiversity rich areas and developing eco-tourism with special reference to the huge wetland Gokul Jalashay and the small but potential wetland of Darauli in Kaimur. This team comprised Dr. Naresh Pandit, a plant taxonomist from Tilkamanjhi Bhagalpur University and Rishi Verma, a nature photographer. Honourable minister had also invited the scientists and researchers of Wetlands International, South Asia which was represented by Animesh Kar and Anurag Banerjee. Shailesh Kumar Rai, the District Project Officer of Namami Gange had been the local support to the team other than the officers and staff of the department of Environment, Forest and Climate Change from Bhojpur and Kaimur Division.

Study Background:

The key purpose of this study was the Identification of Management interventions of Gokul Jalashay in Buxar and Darauli Wetlands in Kaimur. Gokul Jalashay spread in an area of about 35 kilometers between Chakki (Block-Chakki) and

Nainijor villages (Block- Barhampur) lying at Latitude: 25° 40.984'N, 25° 39.573'N (estimated), Longitude: 84° 20.065'E, 84° 13.781'E (estimated) and Elevation (above MSL): 52 to 59m (estimated) while Darauli Wetlands at Latitude: 250 18' 46.3" N, Longitude: 830 43' 02.7" E and Elevation (above MSL): 78m (estimated).



Gokul Jalashay, Buxar (Image source: Google Earth).

Gokul Jalashay, a natural inland permanent oxbow lake located on the southern edges of the river Ganges in Buxar District, Bihar. It is situated on the southern edge of the Ganges which makes its way to the wetland as well as Dharmavati River also joins the Gokul reservoir at a different locations. River Ganga has shifted its course 8-10 km north and at some places 3-4 km only towards Uttar Pradesh during 1952-53 and leaving this oxbow segment known as Gokul Jalashay. This wetland spreads across Chakki, Gaighat, Balua, Dallupur, Sanphi, Chandrapura, Udhura, Mahuar and Nainijor villages. Thousands of villagers depend on this wetland for irrigation, fishing. Nilgai and blackbucks also sighted drinking water during summer days from this wetland. Settled around the wetlands, communities are dependent on irrigation for farming, fishing, water for livestock etc. There are adjoining wetlands at Manipur, Sheopur diar and Bhikampur villages.

Located in the floodplains of river Ganges, this area witnessed severe floods resulting from water level rises during heavy monsoon. Floods mostly affects the

eastern and central parts of the wetland called the Nainijor Diara area. Villages like Dhabi, Gajadhar Dera, Kariman Diara, and Pokhara Diara of Nainjore are more vulnerable to recent floods. In August 2021, flood has disrupted total road connectivity in near areas, hence movement is severely restricted from connecting blocks and district headquarters. Buxar bridge and embankment to Nanijor Dhabi settlement were also affected during a flood. It possesses a threat to the Buxar Koilwar embankment, being very old, there is always a possibility of damages during heavy floods needs attentions. Community remains worried about cattle and their fodder during monsoon and standing crops such as maize, bajra etc.

This preliminary visit aimed to perceive the wetland management, arrangements, threats, and ecosystem services to Gokul Jalashay and to consult the Key Stakeholders like Forest Department, District administrations entrusted for Gokul Jalashay management, PRIs, NGOs, CBOs, Youth Groups, Community, Women, local leaders, Panchayat members, Self Help Groups, Fishermen groups, Farmer groups, Youth Clubs, Wetland Mitra, Media etc. and community interactions to identify threats and services to the wetlands and to collect information on hydrology, biodiversity, and water quality of the wetlands through field observations.

Introduction:

Buxar is famous since the epic period for being the seats of eminent saints, battlefield of Gods and Demons as per Puranas. It is said to be the place where Maharshi Viswamitr had educated lord Rama and his brothers. Lord Rama had killed the demon Taraka here. It is believed that Ahilya, the wife of Gautam Rishi restored her human body from that of stone and got salvation by a mere touch of the feet of Lord Rama.

Buxar is also known to be the battlefields where **Battle of Buxar** was fought between the forces under the command of the British East India Company and the combined armies of an alliance of Indian states including Bengal, Awadh, and the Mughal Empire in 1764 and the **Battle of Chausa** was fought on 26 June 1539 between the Mughal Emperor, Humayun, and the Afghan warlord, Sher Shah Suri. Humayun had escaped from the battlefield to save his life.

Buxar district shows influence of its parent district Bhojpur and has an old and an interesting history. It is located in the south-western part of Bihar, bordering eastern Uttar Pradesh and is primarily an agricultural district.

Observations:

Buxar being a religious place blessed with the mighty Ganga river and on any small occasions, the people rush to take a dip in the holy river and perform religious rituals crowding the whole city leading to the traffic jam in this developing city.

Karmanasa River which is blamed to be the "destroyer of religious merit" and divides Uttar Pradesh and Bihar in Kaimur and Buxar before it merges in Ganga river near Buxar. A local Thora river also confluences in Ganga at Buxar. Sometimes, the National Auatic Animal River Dolphin is sighted at this confluence. Otters and turtles are reported here in the rivers and the associated wetlands including the huge wetland, the Gokul Jalashay. Dharmavati River also joins the Gokul reservoir at a different locations. Flood water enters in the Gokul Jalashay from Udhura Many species of snakes are being reported from the area.

Agriculture and fishing are the main source of economy for the people. Interstate connectivity of this place opens a black door of economy for fetching easy money through the illegal trade or smuggling of Ganja (marijuana) which is also grown in the area.

There are a few brick industries set up close to the Gokul Jalashay.

Gokul Jalashay:

Gokul Jalashay also known as Bhangar is situated at about 10-12 km north west from NH-94 at a distance of over 30 km from Buxar. The shape of the Jalashay looks like the hoof (Gokhur) of a cow and so it is named as Gokhur or Gokul Jalashay.

The main part of jalashay stretches in the form of a small river covering a length of about 20 km east to west from Chakki Bandh to Nainijore Bandh (embankment) and the width measures more or less about 500 meters almost south to north at present. However, the locals claim its width to be 1.5-2 km. It is said to be extended more in length and width occupying the area of about 52 sq. Km. In the northern side of the jalashay, different villages are settled. This northern part is densely cultivated and having more natural vegetation. The water level is deeper on

the southern side of the jalashay. Pucca and brick paths connect the east and west ends of the jalashay. Even the labourers and farmers prefer to cross the jalashay by using boats. The length of about 26 km encompasses many villages like Chakki Bandh _Gaighat_ Hemdapur_ Sanpahee_Dallupur_ Udhra_ Chandrapura_ Nanijore Dam (Bandh) falling in the blocks Brahmpur and Chakki. The villages settled nearby are Chakki, Gaighat, Balua, Nandpur, sanpahi, Dallupur, Udhura, Janwahi, Jagdishpur, Manipur, Chandrapura, Pandepur, Bishupur, Mahuar and Nanijore.

About 60-70 years ago river Ganga was flowing in this left over course which later formed Gokul Jalashay. Now the Ganga river flows about 8-10 km north from Gaighat but much closer may be 3-4 km from Chakki and Nainijore ends of this jalashay. It takes about 26 km travel to cover the southern edges of jalashay but the waterline runs for about 20 km at present. This water reserve still receives water from river Ganga during flood via Suhiya Bhangar and Dharmavati river and returns from the same route in post flood situation. Depth of Gokul Jalashay is 0-8 meters in normal days which raises to up to 10 meters in flood time.

Many villages have shifted from one place to another with the shifting of river and water inundation area.

The wetland services are important in terms to provide sufficient water for irrigation that benefits a large group of farmers and livelihood for hundreds of families of fishermen. Ground water recharge is another major service of this jalashay to maintain ground water level in a widespread area around the Jalashay.

Agriculture:

Agriculture is the main source of economy for the people. They majorly grow wheat, gram, maize, jwar, bajra, mustard, kalaai and also khesari other than chilli and seasonal vegetables. They largely depend upon the vegetable cultivation that is supplied far and wide. The floodplains around 26 km long Gokul Jalashay provides a life support to the farmers. Fertility of this land is renewed every year during flood. The farmers use tractors and oxen for ploughing their fields till Durga Pooja (October) on the highlands and when water in this wetland starts receding, they use Dibbling method locally called Dobhee method or Bhonka method to plant seeds in the soft mud. Holes are made at a definite depth in the seedbeds through a

dibbler, a conical instrument that makes proper holes in the seedbed and the seeds are placed in it. For better yield, the farmers still use the fertilizers.

Fishing:

The largest population of fishermen (about 40 percent) are settled at Gaighat. There are about 500 houses of fishermen at Gaighat. Boats are frequently operated in 80-90% area of the lake for different purposes leaving no scope for the birds to settle here. No fingerlings are introduced in the Gokul Jalashay. They enter in to the waterbody through the flood water of the rivers their own.

The fishes of Gokul Jalashay Bhangar are:

1.	Kauwa	Indian gagata
2.	Rohu	Labeo rohita
3.	Katla	Catla catla
4.	Boari	Wallago attu
5.	Tengra	Tengara mystus
6.	Sauri	Cololabis adocetus
7.	Naini	Cirrhinus mrigala
8.	Chelwa	Chela cachius
9.	Garai	Channa punctata
10.	Baami	Anguilla bengalensis
11.	Singhi	Heteropneustes fossilis
12.	Pothia	Puntius spp.
13.	Farha	
14.	Suhiya	
15.	Dhawai	
16.	Barari	
17.	Kerewa	
18.	Fali (Moi)	
19.	Talwa	

They are sold in the fish markets at Brahmpur, Bhariar, Raghunathpur, Naya Bhojpur, Purana Bhojpur, Karnamepur, Bagen, Chakki and Krishna Brahmpur. Rohu is sold for Rs. 300/kg whereas Garai for Rs. 30/kg. According to the fishermen at Dallupur, large fishes are sold for Rs. 200/kg and small fishes at the rate of about Rs. 70/kg.

Fishing in Gokul Jalashay is maintained by Matsyheevi Sahkarita Samiti of Brahmpur block in which at present 301 members are there. This samiti has been established probably in 1976. The wetland has been leased out for fishing recently in eight lakh rupees as reported. During March to July months about 5 quintal fish catch is procured per day from this jalashay which falls down to only 1 quintal per day in rest of the months.

Flora:

Gokul Jalashay is situated at about 10-12 km north west from NH-94. The shape of the Jalashay looks like the hoof (Gokhur) of a cow and so it is named as Gokhur or Gokul Jalashay. Width of the jalashay is about 800 meters. In the east to west stretches from Chakki Bandh to Nainijore bandh, in the northern side of the jalashay, different villages are settled. This northern part is densely cultivated and having more natural vegetation. The water level is deeper on the southern side of the jalashay. Pucca and brick paths connect the east and west ends of the jalashay. Even the labourers and farmers prefer to cross the jalashay by using boats.

Study of Flora:

The floral study in the core as well as the in the buffer zone of jalashay has been taken up by Dr. Naresh Pandit, the plant taxonomist from Tilkamanjhi Bhagalpur University, Bhagalpur, Bihar. The flora studied are:

- Cultivated Crops.
- Natural Vegetation:
- Trees
- Shrubs
- Climbers and creepers
- Aquatic vegetation
- Grasses

Methodology:

For baseline data generation of flora, following methods were adopted:

1. Physical observation of Morphology.
2. Random exploration of green patches, aquatic plants and marginal plants of core and buffer area.
3. Interacting the farmers, fishermen and the senior experienced people from local community.
4. Confirmation and identification of plants was done with the help of available literatures and Flora: H.H.Hains, 1925, Bodding 1925, 1924 and Dicot Flora: Prof. S. K. Verma of TMBU, Bhagalpur.

Table -1 Flora in and around Gokul Jalashay, Buxar and Darauli, Kaimur

LOCAL NAME	BOTANICAL NAME	Local Names	FAMILY
Cereals			
Paddy	*Oryza sativa*	धान	Poaceae
Maize	*Zea mays*	मकई	Poaceae
Wheat	*Triticum aestivum*	गेहूं	Poaceae
Barley	*Hordeum vulgare*	जौ	Poaceae
Pearl millet	Pennisetum glaucum	बाजरा	Poaceae
Indian Millet,	Sorghum bicolor	ज्वार	Panicoideae
Pulses			
Arhar	*Cajanus cajan*	अरहर	Fabaceae
Gram/chana	*Cicer arietinum*	चना	Fabaceae
Masoor	*Lens culinaris*	मसूर	Fabaceae
Mung	*Phaseolus aureus*	मूग	Fabaceae
Khesari	*Lathyrus sativus*	खेसारी	Fabaceae
Kalai	*Phaseolus mungo*	कलाई, उड़द	Fabaceae
Oil yielding Crops			
Mustard	*Brassica camprestris*	सरसों	Brassicaceae
Castor	*Ricinus communis*	अंडी	Euphorbiaceae
Sunflower	*Helianthus annus*	सूर्यमुखी	Asteraceae
Til	*Sesamum orientale*	तिल	Pedaliaceae
Tisi	*Linum usitatissimum*	तीसी	Linaceae
Spices			
Chilly	*Capsicum annum*	मिर्च	Solanaceae
Adrak	*Zingiber officinale*	अदरक	Zingiberaceae

Onion	*Allium cepa*	प्याज़	Liliaceae
Garlic	*Alium sativum*	लहसुन	Liliaceae
Turmeric	*Curcuma longa*	हल्दी	Zingiberaceae
Coriander	*Coriandrum sativum*	धनिया	Umbelliferae
Fennel	*Foeniculum vulgare*	सौंफ	
Vegetables			
Potato	*Solanum tuberosum*	आलू	Solanaceae
Brinjal	*Solanum melongena*	बैगन	Solanaceae
Tomato	*Lycopersicum esculentum*	टमाटर	Solanaceae
Cauliflower	*Brassica oleracea var. botrytis*	गोभी	Brassicaceae
Cabbage	*Brassica oleracea*	पत्ता गोभी	Brassicaceae
Pumpkin	*Cucurbita pepo*	कद्दू	Cucurbitaceae
Kadima	*Legenaria sineraria*	कदीमा	Cucurbitaceae
Sahjan	Moringa oleifera	सहजन	Moringaceae
Lady's finger	*Abelmoschus esculentus*	भिंडी	Malvaceae
Radish	*Raphanus satius*	मूली	Brassicaceae
Parol	*Luffa cylindrica*	परवल	Cucurbitaceae
Pointed Gourd	*Trichosanthes dioica*	परवल	Cucurbitaceae
Jhinga	*Luffa acutangula*	झींगा	Cucurbitaceae
Kundri	*Coccinia grandis*	कुंडरी	Cucurbitaceae
Kohara	*Cucurbita maxima*	कोढ़ा, पेठा	Cucurbitaceae
Karela	*Mimordica charantia*	करैला	Cucurbitaceae
Seem	*Lablab purpurius*	सेम	Fabaceae
Bean	*Phaseolus vulgaris*	फ्रेंच बीन	Fabaceae

Guar Gum	*Cyamopsis tetragonoloba*	ग्वारफली	Fabaceae
Fruit Plants			
Mango	*Mangifera indica.*	आम	Anacardiaceae
Papaya	Carica papaya	पपीता	Caricaceae
Banana	*Musa paradisiaca*	केला	Musaceae
Jamun	*Syzygium cumini*	जामुन	Myrtaceae
Bel	*Aegle marmelos*	बेल	Rutaceae
Amra	*Spondias pinnata*	आमड़ा	Anacardiaceae
Ber	*Zizyphus mauritiana*	बेर	Rhamnaceae
Khajur	*Phoenix syvestris*	खजूर	Arecaceae
Tad	*Borassus* flabellifer	ताड़	Arecaceae
Sarifa	*Anona squamosa*	शरीफा	Annonaceae
Amla	*Embelica officinalis*	आंवला	Euphorbiaceae
Imli	*Tamarindus indicus*	इमली	Fabaceae
Gular	*Ficus glomerata*	गुलर	Moraceae
Kathal	*Artocarpus integrifolia*	कटहल	Moraceae
Guava	*Psidium guajava*	अमरुद	Myrtaceae
Trees			
Babool	*Acacia nilotica*	बबूल	Mimosaceae
Kadam	*Anthocephalus indicus*	कदम्ब	Rubiaceae
Neem	*Azadirachta indica*	नीम	Meliaceae
Sirish	*Albiza lebbeck*	शिरीष	Mimosaceae
Semul	*Bombax ciba*	सेमल	Bombaceae
Green Semul	*Cieba pentandra*	हरा सेमल	Bombaceae
Palash	*Butea monosperma*	पलाश	Fabaceae

Amaltas	*Cassia fistula*	अमलतास	Caesalpinaceae
Shishum	*Dalbergia sissoo*	शीशम	Fabaceae
Banyan tree/Bargad	*Ficus bengalensis*	बरगद	Moraceae
Peeple	*Ficus religiosa*	पीपल	Moraceae
Gular	*Ficus glomerata*	गुलर	Moraceae
Mahua	*Madhuca longifolia*	महुआ	Sapotaceae
Junjle Jalebi	*Pithecellobium dulce*	जलेबी	Fabaceae
Arjun	*Terminalia arjuna*	कहुआ	Combretaceae
Imli	*Tamarindus indicus*	इमली	Fabaceae
Teak	*Tectona grandis*	सागवान	Verbenaceae
Kachnar	*Bauhinia purpurea*	कचनार	Caesalpinaceae
Chilbil	*Holoptelea integrifolia*	चिलबिल	Ulmaceae
Subabool	*Leucaena leucocephala*	सुबबूल	Mimosaceae
Australian Babool	*Acacia auriculiformis*	केसिया, बबूल	Mimosaceae
Bamboo	*Bambusa tulda*	बांस	Poaceae
Bamboo	*Bambusa nana*	डोमी बांस	Poaceae
Gamhar	*Gmelina arborea*	गम्हार	Verbenaceae
Eucalyptus	*Eucalyptus sp.*	सफेदा	Myrtaceae
Bakin	*Melia azedarachta*	बकेन	Meliaceae
Karanj	*Pongamia pinnata*	करंज	Fabaceae
Chhatban	*Alstonia scholaris*	छतवन	Apocynaceae
Ashok	*Polyanthia longifolia*	अशोक	Annonaceae
Shrubs and Climbers			
Bera/Besaram	*Ipomoea carnea*	बेहाया, बगरी	Convolvulaceae
Chakora	*Cassia tora*	छोटा चकोरा	Caesalpinaceae
Anant mul	*Hemidesmus indicus*	अनंतमूल	Asclepiadaceae

Siyalkanta	*Argemone mexicana*	पीला कंटैया	Papaveraceae
Lalbariala	*Sida rhombifolia.*	बरियार	Malvaceae
Bhatkantya	*Solanum surattense*	कटरंगनी	Solanaceae
Kasal	*Saccharum spontaneum*	कगान	Poaceae
Aak	*Calotropis gigantea*	अकवन	Apocynaceae
Titbhat/Bharangi	*Clerodendrum indicum*	टिटभांट	Verbenaceae
Sinwaar	*Vitex negundo*	निसवार	Verbenaceae
Dodder Plant	*Cuscuta reflexa*	अमरबेल	Cuscutaceae
Ban Angoor	*Caryota trifolia*	बन अंगूर	Vitaceae
Ban Kachho	*Colocasia esculenta*	बन कच्चू	Araceae
Putus	*Lantana camara*	लैंटाना	Verbenaceae
Bakas	*Adhtoda vasaca*	बकास, अड़ुसा	Acanthacae
Urkusi	*Mucuna prurienas*	उरकुसी	Fabaceae
Chichiri	*Achyranthus aspera*	चिरचिरी	Acanthacae
Dhatoora	*Datura metal*	धतूरा	Solanaceae
Polygonum	*Polygonum babatum*		Polygonaceae
Khas	*Vetiveria Zizanioides*	खस	Poaceae
	Abutilon indica	कंघी	Malvaceae
Van Tulsi	*Anisomeles indica*	बन तुलसी	Lamiaceae
Phragmites	*Phragmites karka*	नरकट	Poaceae
Herbs			
Acalypha	*Acalypha indica*		Euphorbiaceae
Ban kulthi	*Atylosia scarabaeoides*	बन कुलथी	Fabaceae
Fulki	*Gnaphalium lutea - album*		Asteraceae
Mahkawa	*Ageratum conyzoides*	महकावा	Asteraceae

	Vernonia cinerea		Asteraceae
Shankhaphuli	*Evolvulus nummularius*	शंख पुष्पी	Convolvulaceae
Dub Grass	*Cynodon dactylon*	दूब	Poaceae
Motha	*Cyperus rotundus*	मोथा	Cyperaceae
Imperata	*Imperata cylindrica*		Poaceae
Parthenium	*Parthenium hysterophorus*	गाजर घास, कांग्रेस घास	Asteraceae.
Bhang	*Cannabis sativa*	भांग	Cannabaceae
Marijuana	*Cannabis indica*	गांजा	Cannabaceae
Anagallis	*Anagallis arvensis*		Primulaceae
Aquatic Plants			
Water Hyacinth	*Eichhornia crassipes*	जलकुम्भी	Pontederiaceae
Chhoti Jalkumbhee	*Pistia stratiotes*	छोटा जलकुम्भी	Araceae
Hydrilla	*Hydrilla verticillata*		Hydrocharitaceae
Arrow head	Sagittaria sagtifolia		Alismaceae
Scirpus	*Scirpus articulatus*	चिनोरा	Cyperaceae
Duck weed	*Lemna minor*		Lemnaceae
Shushni	*Marsilea minuta*	शुशनी साग	Marsileaceae
Hornwort	*Ceratophyllum demersum* L.		Ceratophyllaceae
Potamagetone	*Potamogeton crispus*		Potamogetonaceae
	Potamogeton pectinatus		Potamogetonaceae
Aponogetone	*Aponogeton natans*		Aponogetonaceae
Pond Silk	*Spirodela polyrhiza*		Araceae
Pond Silk	*Spirogyra porticalis*		Zygnemataceae
Vallesnaria	*Vallisnaria spiralis*		Hydrocharitaceae

	Cyperus rotundus		Cyperaceae
	Cyperus deformis		Cyperaceae
Bladderwort	*Utricularia sp.*		Lentibulariaceae
Chara	*Chara globularis*	कारा	Characeae
Nitella	Nitella mucronata		Characeae
	Ipomea aquatica		Convolvulaceae
	Typha angustifolia		Typhaceae
	Commelina benghalensis		Commelinaceae
Mosquito Fern	*Azolla pinnata*		Salviniaceae
	Ranunculus Scleratus		Ranunculaceae
Water lily	*Nymphoides cristata*		Menyanthaceae
	Nymphaea nouchali	भेटमास	Nymphaeaceae
Nelambo	*Nelumbo nucifera*	कमल / पुरैन	Nelumbonaceae

The crops like cereals, pulses, Oil yielding plants and vegetables show the high fertility of this floodplains which is due to the fertile soil brought every year by the fresh flood.

Trees like Palash, Imli, Mahua and Tad show the old formation of land representing plateauic character. The ficus species of plants and the plants like Kadamb, Semul Gamhar, Arjun and Babool are suitable for the breeding of birds and harbour diverse animal life on it. Bamboos specially are the wonderful species of plants supporting small birds like flycatchers, warbles etc. and give shelter to the valuable species of snakes, lizard monitor, mongoose, porcupine etc. Fruit plants of course support the life of all forms of biodiversity.

Shruby plants like Aak, Chirchiri, Dhatura, Niswar, Titbhant, Kanghee and many more have high medicinal value. Some herbs like Shankh Pushpee, Van Tulsi, Doob and Bhang have the mesdicinal value whereas the Parthenium (Gajar Grass) is highly obnoxious and cause health hazards. Eradication of such species including Lantana are our challenges.

Some dominant grasses like Kasal, Imperata, Motha are the soil binders and play a vital role to check soil erosion.

Aquatic Plants:

In the aquatic ecosystem, both the species of Jalkumbhee, Eichhornia and Pistia are the great threat to the survival of our wetlands everywhere in the state. On the other hand they provide the breeding habitat and shelter to many bird species.

The presence of submerged plants like *Ceratophyllum, Hydrilla, Potamagetone* are preferred by fishes for laying eggs.

The algal bloom specially the Blue Green Algae in the stagnant waterpools and ponds indicate the pollution in water and hinder the growth of the fishes causing them difficulty in breathing.

The overgrowth of free floating plants like Azolla, Lemna and Spirodella may also affect the availability of oxygen to the aquatic animals but they are being used to prepare organic manure.

Fauna:

The National Aquatic Animal River Dolphin is sighted in Ganga river. Otters and turtles are the precious sightings in the rivers Ganga, Dharmavati and Thora and their associated wetlands including the huge wetland, the Gokul Jalashay. Many species of snakes are being reported from the area and some people are engaged in the rescue of snakes to save our precious biodiversity.

Blackbucks, Bluebulls are frequently encountered in the area and as reported by the villagers, Spotted Deer, Wild Boar, Mongoose, Jackal are also seen..

Many species of snakes are being reported from the area like Cobra, Python, Russel's Viper, Sand Boa, Rat Snake and checkered keelback etc.

Blackbuck:

While visiting Buxar and Kaimur, the first desire of any wildlife lover is expressed as to see the Blackbucks. The conviction of superstar Slman Khan in the Blackbuck hunting made the species superstar in India. A big win for the Bishnoi community which refused to buck under any pressure and fought a 20-year battle for this justice. This must have boosted the moral of the communities of Buxar and

Kaimur where these fainthearted lovely animals hop and run in the grassy plains, croplands and lightly forested areas. Eight years after Salman Khan and Saif Ali Khan accused in the blackbuck hunting case, Mansur Pataudi was also charged with killing these threatened animals.

The local communities regard and protect them by culture and tradition. The blackbuck is variously described as the vehicle (vahana) of Vayu (the wind god) and Chandrama (the Moon god).

This species is categorised as threatened in the International Union for Conservation of Nature Red List. There is, however, no official record of the actual number of blackbucks and no survey has been done to count their population in Buxar but it is supposed that about a thousand of these wild animals could be surviving in and around Buxar, Bhojpur and Kaimur districts.other than the hunting by some opportunists, they are also threatened and injured by dogs, hyena, wolf and likely animals. They are regularly threatened by destructive floods in Ganga and Sone rivers.

For the injured animals, a Rescue Center has recently been established at Jaldaha in the Mohania Range of Ramgarh block in Kaimur district on a 1 acre land as the first Rescue Centre of the state. This centre is situated by the side of the Karmnasha river dividing Bihar and Uttar Pradesh and being taken care by an experienced forest official ACF, Raj Kumar. The visitors and specially the local community will be provided training here to protect and conserve these wild animals. A mass public awareness will be generated through this establishment. Another rescue centre is proposed in the Navanagar block of Buxar district on 12 acre of land.

Black Buck are commonly seen in Chakki, Navanagar, Rajpur, Itahri, Simri and other areas but during our field visits for three days, we have seen about 20 of them in Bikrampur, about a doxen in Gokul Jalashay near Gaighat and 50s in the Ramgarh block of Kaimur while heading towards Jaldaha Rescue center. In the croplands they are easily sighted between Jan March and otherwise take shelter in the light forested area. They are not supposed to be the massive crop destroyer like the Bluebulls. Non has shown the serious concern of the bluebulls raiding their crops.

Local communities are friendly to them and never attempt to hurt them for damaging standing crops due to religious beliefs. They also protect them from hunters. Common people's perception is that they are co-existing with us since generations and this hardly matters if they feed a little of their crop and ravage some.

Blackbuck are commonly, almost every time seen in Jangalchhera of Ramgarh block. They are sometimes killed or injured in road accidents and also when attacked by dogs and other animals as reported. The signage with warning to keep the speed limit of vehicles and take precaution for the wildlife should be erected in this zone at various sensitive places. This zone may be declared as a safari for Blackbuck, Bluebull and other deers and antelopes found here. Such Blackbuck Safari will not only attract the tourists but will generate revenue for both government and the local community. This will also create awareness for their conservation.

Birds:

Gokul Jalashay, a well expanded left over channel of river Ganga comprises the diverse habitat from deep and open water gradually sloping towards north to a shallow zone, marshy land, mudflats and the cultivable land growing small plants and shrubs on its margin. Aquatic free floating, bottom rooted, submerged and at places emergent macrophytes sufficiently provide food and hide to the foraging and roosting birds and shelter to our resident breeding birds. This habitat is most suitable for the swimming and diving birds like anatids (ducks) to the runners like jacanas and grebes and the waders like sandpipers and the species from similar groups. Specially the shallow zone near Nanijore is the classic habitat for diverse bird species. Moreover this part of Jalashay is found to comparably less interfered for fishing activities. However, boats are in general operative to cross the channel for the labourers and farmers working in the fields on the northern bank. Ample food for both plant eating and flesh eating birds is available apparently in the jalashay and its satellite wetlands including the course of Dharmavati river connected to it. This availability of food supports the birds taking fish, crabs, reptiles, amphibians, molluscs, crustaceans, and other invertebrates and the hunting birds like raptors and kingfishers. The aquatic and terrestrial habitat in the surrounding supports the birds feeding on seeds, fruits, berries, flowers, buds and leaves, shoots, grains, nectar, algae and other macrophytes.

We could observe about 48 species of birds comprising 31 families in and around the Gokul Jalashay numbering total to about 850 birds to count and if the species and count of birds of sewage marsh in Buxar near Laxmipur in Chausa route are added, it comes to around 51 species and 992 birds. Fifty one species may look like a small number but representing 31 families within this small number of species shows the remarkable diversity and potential of avifauna of the region. Out of 51 bird species, 11 are migratory, 1 having both resident and migratory status and 2 are known to be the local migratory and rest are our resident bird species. Only two species are falling under the threatened category, Lesser Adjutant as vulnerable and Black-headed Ibis as near threatened. Rest are considered as the least concerned species by IUCN. Absence of raptors even the kites is a big surprise. But sighting of Eastern Orphean Warbler on the shrub along the margin of Gokul Jalashay was very exciting as it has been reported for the first time in Bihar. We spent hardly three days in exploration but the findings are encouraging.

The study of birds had never been taken before in this area of Buxar. For the first time, its present census during the study has been included in the Asian Waterbird Census 2022 through the Bihar State Coordinator of AWC, Wetlands International Arvind Mishra. Waterbird Census report has been submitted to the department which further will be sent to the Wetlands International. For the first time, the department of Environment, Forest and Climate Change, Govt. of Bihar has taken lead in conducting this AWC in about 70 wetlands of Bihar. At Brahmpur nursery of the forest department, the ground staff were given brief introduction aabout birds, their census and monitoring and identification by Arvind Mishra. The forest guards of Bhojpur division were highly interested and sincere to learn about birds. a training programme may be organised for them

Gokul Jalashay may be at present notified as a Community Reserve on the private land and Conservation Reserve on thegovernment land under the provision of Wildlife Protection Act 1972 to get a legal status. Gogabeel Lake in Katihar is the only Community Reserve and Conservation Reserve of Bihar notified by the state government in 2019. This jalashay may qualify for being designated as an Important Bird Area of India under the IBA programme through Indian Bird Conservation Network (IBCN): Bombay Natural History Society (BNHS), BirdLife International, UK and Royal Society for the Protection of Birds (RSPB), UK. or for being designated as a Ramsar Site. But some criteria needed to be fulfilled like Globally threatened species, Restricted-range species, Biome-restricted species and

critera A4i of holding more than 1% of total biogeographic population of a particular species and A4iii of the congregation of ≥20,000 waterbirds in these lakes.

Having all suitable conditions and high potential of habitat, count and diversity of birds were seen very less. The reason could be the intense human interference for fishing and agriculture and extensive boat operations for the same purposes. Hunting of birds is also being reported on considerably a large scale. The birds poachers, hunters, trappers use catapult, trapping nets and even guns to hunt them. This is the main factor of diminishing the number of birds in the area. Till recent time about five years ago, about 20,000 resident and migratory birds were visiting this wetland. As reported, the fishermen are also involved in killing the birds which are sold in the market in a covered way. The migratory ducks are sold for rupees 500 to up to 1,000.

A group of local youth and the ground staff of the forest department need to be trained in birds identification and its monitoring.

A study is required to understand the availability of food material for birds in the wetland such as the reptiles, amphibians, molluscs, crustaceans, and invertebrates other than insects and also the small animals. Exclusive study of flora of the wetland is needed to be assessed for macrophytes and the microphytes including algae and the planktons.

The team had visited the Ram-Janki Naulakhha Temple at Udhura and requested the sage of the temple to convey the message to the people for protecting birds religiously.

Birds of Buxar and Kaimur:

					Gokul Jalashay, Buxar 08.02.2022	Sewage Marsh Laxmipur, Chausa, Buxar 10.02.2022	Darauli Wetlands, Kaimur 10.02.22	Status	IUCN status
1.	White-throated Kingfisher	*Halcyon smyrnensis*	Alcedinidae	टिटकी, कौड़िल्वा, किलकिला	2		2	R	LC
✓2.	Gadwall	*Mareca strepera*	Anatidae	मैना			2	M	LC
✓3.	Garganey	*Anas querquedula*	Anatidae	पैना			1	M	LC
4.	Red-crested Pochard	*Netta rufina*	Anatidae	लालसर				M	LC
5.	Lesser Whistling Duck	*Dendrocygna javanica*	Anatidae	[illegible]	300		135	R	LC
6.	Indian Pond Heron	*Ardeola grayii*	Ardeidae	[illegible]	15		2	R	LC
7.	Intermediate Egret	*Ardea intermedia*	Ardeidae	[illegible]	15			R	LC
8.	Little Egret	*Egretta garzetta*	Ardeidae	[illegible]	10		2	R	LC
9.	Grey Heron	*Ardea cinerea*	Ardeidae	[illegible]	1			R / M	LC
10.	Purple Heron	*Ardea purpurea*	Ardeidae	[illegible]	1			R / M	LC
11.	Indian Grey Hornbill	*Ocyceros birostris*	Bucerotidae	[illegible]	2			R	LC
12.	Red-wattled Lapwing	*Vanellus indicus*	Charadriidae	[illegible]	4	7	6	R	LC
13.	Asian Openbill	*Anastomus oscitans*	Ciconiidae	घोंघिल	57			R	LC
14.	Lesser Adjutant	*Leptoptilos javanicus*	Ciconiidae	छोटा गरुड़	1 rescue pic.			R	VU
15.	Plain Prinia	*Prinia inornata*	Cisticolidae	दुम फुदकी	4			R	LC
16.	Common Pigeon	*Columba livia*	Columbidae	कबूतर	50			R	LC
17.	Spotted Dove	*Spilopelia chinensis*	Columbidae	चितोखा फाख्ता	3			R	LC
18.	Indian Roller	*Coracias benghalensis*	Coraciidae	नीलकंठ	6			R	LC
19.	House Crow	*Corvus splendens*	Corvidae	देसी कौवा	43		2	R	LC
20.	Large-billed Crow	*Corvus macrorhynchos*	Corvidae	जंगली कौवा	2		2	R	LC
21.	Rufous/Treepie	*Dendrocitta vagabunda*	Corvidae	मझलत, मलरी	1			R	LC
22.	Greater Coucal	*Centropus sinensis*	Cuculidae	मढ़ोला	1			R	LC
23.	Black Drongo	*Dicrurus macrocercus*	Dicruridae	भलगा	7	3	2	R	LC

24.	Barn Swallow	*Hirundo rustica*	Hirundinidae	अबाबील	10		20	M	LC
25.	Bronze-winged Jacana	*Metopidius indicus*	Jacanidae	जलपीपी, कट्टाई	36		50	R	LC
26.	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	Jacanidae	पिहो	30			R	LC
27.	Brown Shrike	*Lanius cristatus*	Laniidae	भूरा लहटोरा, केरगेला	2			M	LC
28.	Long-tailed Shrike	*Lanius schach*	Laniidae	काजल लहटोरा	1			R	LC
29.	White Wagtail	*Motacilla alba*	Motacillidae	धोबन, खंजन	3			M	LC
30.	Black Redstart	*Phoenicurus ochruros*	Muscicapidae	सिरधिरा	2			M	LC
31.	Taiga Flycatcher	*Ficedula albicilla*	Muscicapidae	सिपिया मक्षिरिका			1	M	LC
32.	Red breasted Flycatcher	*Ficedula parva*	Muscicapidae	लाल सिपिया मक्षिरिका	1			M/PM	LC
33.	Oriental Magpie Robin	*Copsychus saularis*	Muscicapidae	दयाल	1			R	LC
34.	Brown Rock or Indian Chat	*Cercomela fusca*	Muscicapidae	दीमा, पथरुवा पिद्दो			1	R	LC
35.	Purple Sunbird	*Nectarinia asiatica*	Nectariniidae	फुदगुपी	2			R	LC
36.	Eurasian Golden Oriole	*Oriolus oriolus*	Oriolidae	पीलक	1			RM/V/SM	LC
37.	Little Cormorant	*Microcarbo niger / Phalacrocorax niger*	Phalacrocoracidae	छोटा पनकौवा	130		16	R	LC
38.	Grey Francolin	*Francolinus pondicerianus*	Phasianidae	गफर तीतर	1			R	LC
39.	Little Grebe	*Tachybaptus ruficollis*	Podicipedidae	[illegible]	1			R	LC
40.	Red vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	[illegible]	3			R	LC
41.	Eurasian Coot	*Fulica atra*	Rallidae	[illegible]			1	M	LC
42.	White breasted Waterhen	*Amaurornis phoenicurus*	Rallidae	[illegible]	2			R	LC
43.	Common Moorhen	*Gallinula chloropus*	Rallidae	[illegible]	1	6	90	R	LC
44.	Black-winged Stilt	*Himantopus himantopus*	Recurvirostridae	[illegible]		100		R	LC
45.	Common Sandpiper	*Actitis hypoleucos*	Scolopacidae	[illegible]	1			M	LC
46.	Green Sandpiper	*Tringa ochropus*	Scolopacidae	[illegible]	1			M	LC
47.	Common Greenshank	*Tringa nebularia*	Scolopacidae	[illegible]		25		M	LC
48.	Spotted Redshank	*Tringa tetanus*	Scolopacidae	बड़ा गुरमा-चौबाहा		1		M	LC
49.	Asian Pied Starling	*Sturnus contra*	Sturnidae	अबलक / सिरोली मैना	30			R	LC
50.	Common Myna	*Acridotheres tristis*	Sturnidae	देसी मैना	20			R	LC
51.	Bank Myna	*Acridotheres ginginianus*	Sturnidae	गंग मैना	2			R	LC

52.	Eastern Orphean Warbler	*Curruca crassirostris*	Sylvidae		1			M	LC
53.	Red-naped Ibis	*Pseudibis papillosa*	Threskiornithidae	लाल गर्दन वाला ibis	1			R	LC
54.	Black-headed Ibis	*Threskiornis melanocephalus*	Threskiornithidae	काले सर वाला ibis	12			R	NT
55.	Jungle Babbler	*Turdoides striata*	Timaliidae	कलचीचवा, सतभैया	25			R	LC
56.	Common Hoopoe	*Upupa epops*	Upupidae	हुदहुद	1			R	LC
57.	Oriental White-eye	*Zosterops palpebrosus*	Zosteropidae	बबूना	5			R	LC
	Total birds in Buxar-Kaimur 1320				850	142	335		

R – Resident, M – Migratory, RM – Resident and migratory both, LM – Local Migratory, PM – Passage Migrants, SM- Summer Migrant,

V- Vagrant.

VU – Vulnerable, NT – Near Threatened, LC – Least Concern. (IUCN Red List 2015)

People's Expectations:

Lot of public demands and media articles about Gokul Jalashay are coming up and have drawn the attention of the local Member of Parliament and Union Minister of State for Environment, Forest and Climate Change Sri Ashwini Kumar Choubey. This newly formed district is lacking large industries, handicrafts and other valuable source of economy but largely depends on agriculture and fishing. People want proper identity of their district using its all potential and possibilities.

Their hope is lying now in eco-tourism through Gokul Jalashay, religious tourism and the wildlife forms existing here. They wish, Gokul Jalashay to be designated as a Ramsar Site, the wetland of global importance and the priority site for conservation.

Local people demand the crossing bridges over the jalashay near the populous village settlements.

Issues, threats and conflicts:

. Gokul Jalashay receives water from river Ganga during flood via Suhiya Bhangar and Dharmavati river and returns from the same route of about 10 km. in post flood situation via Gaighat. This inlet is intersepted by fine fishing nets at various points and blocks the movement of fishes and fingerlings in to it. This affects the livelihood of the fishermen. The fisherman, Shiv Shankar Sahni, Mantree, Matsyheevi Sahkarita Samiti, Brahmpur block says, the inlet of water in this wetland is blocked at Buxar-Koilwar embankment (constructed some 40 years back) and thus water as well as the fishes and fingerlings are not entering in it. If both the inlets at Chakki and Nainijor are opened or controlled by a sluice gate, this problem can be solved. This will also maintain the water level here and help in beautification of Gokul Jalashay.

But such actions may create a severe flood situation and might submerge many villages and the croplands in the area. The embankment gets either damaged sometimes or its gap is not filled properly. As a result, flood affects more than two lakh lives of people. People say, this becomes the annual problem for them that got to be solved permanently for saving their life.

However, the farmers say it does not benefit them and engulfs their highly fertile cultivable land. The fishermen are enjoying benefits and government generates

revenue through leasing the waterbody for fishing from their own inundated land. The farmers also mention their concern that during the flood season this wetland overflows to its capacity, spreads in a large area and their cropland merges under water causing them a huge loss of their crops and troubles to their cattle too. At present, they have a few options to cross the jalashay to reach their agricultural farms and they are Visheshwar Dera (Chakki) bridge, unmetalled road of Sanpahi (Brahmpur), Dallupur-Udhura (Brahmpur) and the Bishupur bridge (Brahmpur). These means to cross the jalashay are not convenient to the farmers and so they use boats to cross the water. Eighty percent boats are used for the fishing purposes and rest for the farmers, labourers and to transport the goods. Many of the farmers claim that in this jalashay, they have their own land and they have its receipts and documents. It is yet to be decided how much land of this jalashay is in private ownership and how much belongs to the government. This issue needs to be addressed on priority by the district administration.

Located in the floodplains of river Ganges, this area witnessed severe floods resulting from water level rises during heavy monsoon. Floods mostly affects the eastern and central parts of the wetland called the Nainijor Diara area. Villages like Dhabi, Gajadhar Dera, Kariman Diara, and Pokhara Diara of Nainjore are more vulnerable to recent floods. In August 2021, flood has disrupted total road connectivity in near areas, hence movement is severely restricted from connecting blocks and district headquarters. Buxar bridge and embankment to Nanijor Dhabi settlement were also affected during a flood. It poses a threat to the Buxar Koilwar embankment which being very old is likely to be damaged during heavy floods and needs attention. Community remains worried about cattle and their fodder during monsoon and also the standing crops such as maize, bajra etc.

Some stone minded people don't want any water in the jalashay and ready to go for deep boring for irrigation purposes. They are insubstantially and negatively dream that after ten years there will be no water in the jalashay. This will benefit to the farmers. They claim that the ground water level here is at the depth of 30 feet while further south to the jalashay, it is available at 15 feet only.

We tried to convince them during the conversations to think positively and realistically. We pointed that if eco-tourism is developed, it will bring development of the area and employment to thousands of people including their own children in various ways. Buxar will also emerge as a place of attraction at national level

through tourism. They agreed that birds are helpful for the growth of the fishes. Their guano is consumed by the fishes and increase the fertility of the aquatic flora through which the fishes survive and grow well.

The fishermen say, there is not much use of the aquatic grasses instead it creates some problem in fishing.

The farmers looked little confused. They think their cultivable land is submerged in this Bhangar giving no benefit to them. On the other hand the same group hopes that this wetland should be beautified for recreation and tourism.

Sri Mihir Kumar Jha, the recently retired DFO, Bhojpur convinced them that they have not yet tasted the economical and developmental benefits of tourism. It is more valued economical source of income than the agriculture and fishing. They can ripe the benefit of it simultaneously continuing their agriculture and fishing together with little change in the mindset.

Comments: Land of the farmers is submerged in this jalashay since the formation of the wetland. But even prior to the formation of Gokul Jalashay, it must have remained submerged in the Ganga river which was flowing through this course. At present, the farmers are getting no benefit from their submerged land and hardly any chance is there that their so claimed land will emerge from inundation in future. So, better to go for its other uses in developing eco-tourism.

A scheme Rs. 3.711 crore was forwarded to the state government through the department of fisheries in 2012 for the development of tourism in and around Gokul Jalashay. Probably a provision for introducing boating for recreation and sports in 20 km long and 300 m wide area was included in the scheme but nothing could be brought in reality.

Such schemes may further increase the level of human interference and increase the activities manyfold in the Jalashay leaving no scope for developing the site for birds nor it will qualify to be notified as the Community Reserve/Conservation Reserve or proposing for the designation of a Ramsar Site.

During peak summer, the jalashay dries up at many places in its spread and becomes fragmented. This could be due to the siltation leading to shallowness of the lake. If this continues, the jalashay will loose its water holding capacity and will be threatened to vanish. Its desilting is needed to maintain the water level.

Siltation of jalashay, Idol emersion, disposal of solid waste, agricultural run off in the form of fertilizers, insecticides and pesticides are the common threats here. Tourists are the important tools of monitoring and reporting the health and happenings of the site but there is no influx of tourists here.

Recommendations:

1. Land ownership in Gokul Jalashay should be decided first as how much land belongs to the government and how much lies under the private ownership. This is important to plan and implement any strategy or the scheme.
2. This jalashay supports the livelihood of thousands of fishermen families and useful in agricultural activities for local farmers. Its greater part can be declared as a Conservation Reserve on the government land and a Community Reserve on private land and rest should be left for local livelihood of fishermen and farmers. For Community Reserve, consent of local community specially the land owners is mandatory. The drive among the villagers is needed from now. They should be convinced that their land ownership and other rights will not be changed if it is declared as a Community Reserve and the management will be lying in the hands of the community. Gogabeel Lake in Katihar is the only Community Reserve and Conservation Reserve of Bihar notified by the state government in 2019.
3. The Fishermen and farmers should be made Wetland Mitras and their support should be taken for the development of this wetland.
4. Eco Development Committees should be activated and be involved in developing Gokul Jalashay.
5. Designation of Ramsar Site can give it a global identity. But for that some criteria needed to be fulfilled like Globally threatened species, Restricted-range species, Biome-restricted species and critera A4i of holding more than 1% of total biogeographic population of a particular species and A4iii of the congregation of ≥20,000 waterbirds in these lakes. This Jalashay has all potential to be designated as a Ramsar Site but not under present situations prevailing here. There is a need of management intervention before proposing it for the designation of Ramsar Site.
    a. We should demark the proposed area in this huge wetland leaving a specified area for the livelihood of fishermen and farmers. Without

support and acceptance of the community, no area can be protected or conserved.

b. All disturbing factors to the birds should be eliminated. This should be insured that in this demarcated area, there is least human interference, no hunting of birds, minimum possible boat operations and other anthropogenic activities at least for coming two years and then the status of avifauna should be monitored again.

c. To avoid boating operations in this specified area, the facilities of bridges to cross the channel may be provided to the farmers.

d. The proposed area should be selected in the zone where diverse habitat like deep water zone, shallow zone, marshy land and mudflats are there. We have observed the area of suitability towards Namijore, where fishing dependency is less and habitat is also suitable for birds.

6. A seasonal study for two years is needed under a project to study the status and ecology of birds.
7. Fishing operation area should be kept separated away from the intact habitat of birds. The area of Gaighat may be left for fishing exclusively where most of the fishing communities are concentrating.
8. Some important species of fishes (not exotic) may be introduced in the jalashay which have been lost in past.
9. Apparently it looks that the jalashay is shallowing due to siltation year by year. This must be causing more area of submergence increasing gradually. Its deepening may reduce the damage to the cultivable land of the farmers and also favour the fishermen. This is important to safeguard the interests of the fishermen and farmers both as far as practicable.
10. The jalashay should be desilted to retain more water and to ensure that its water is not flushed out beyond optimum level after flood. For this sufficient down level from its inlet should be maintained.
11. There is a need to survey the number of families of fishermen and farmers depending on this jalashay or are associated with it.
12. Beautification of a natural habitat is often disastrous to the biodiversity specially to the indigenous species. This care must be taken.
13. Suitable plantations of non-exotic species should be done on the margins and around Gokul Jalashay. Specially those species should be selected which are suitable for breeding, roosting and feeding of birds and other small creatures.

14. A good Biodiversity habitat (not beautified) should be maintained to attract nature and wildlife lovers to promote eco-tourism.
15. For developing eco-tourism, creating infrastructure and facilities are the basic needs. A resort cum well developed guest house is needed to provide basic facility to the eco-tourists and their families including the children.
16. Nainijor may be considered as the tourist point where fishing pressure and other human interferences are observed comparably less and it seem to be a secluded place away from crowd.
17. Nature Interpretation Centre will be the source of their engagement and learning about nature and wildlife in general and unique local biodiversity.
18. Let the site develop as a birding spot after complying with the suggestive efforts and then publicised through media, social media and websites like Kawar Lake, Begusarai, the only Ramsar Site of Bihar and Gogabeel, the only Community and Conservation Reserve of the state.
19. Information has been gathered that birds are hunted, poached, trapped by various methods including poisoning to them and sold on a large scale. This is the main factor of diminishing the number of birds in the area their non-stay in the wetland which seems the perfect habitat to support a large number of birds in many many thousands. There is a need of constant patrolling and surveillance from Chakki to Nanijor specially during the migratory season of birds from October to March if we hope the development of Buxar in to a hotspot for eco-tourism.
20. River front trails can be developed alongside the lake for the visitors. This will also be convenient for the birdwatchers.
21. Water sports like rod fishing, swimming competitions, boat races etc. may be introduced by organising festivals. But such activities may not be suggested in the prioritised bird habitat where migratory birds stay during winter and resident birds breed in other months from March to September.
22. Training programmes for pisciculture, pearl culture, prawn culture may be organised here to generate employment for youth other than the trainings for swimming and disaster management.
23. The forest guards of Bhojpur and Kaimur divisions are found highly interested and sincere to learn about birds. a training programme may be organised for them
24. Watch towers can be constructed for dolphin, birds and blackbuck sightings at suitable locations.

25. The villagers and common people should be made aware about the value of eco-tourism that is the great potential source of economy and can change the status of the district. People should change their thought and perception to look beyond. Traditional practices of agriculture and fishing are our secured base of life but additionally we can do much more.
26. Buxar is a city of religious beliefs. The messages should be parted to the people by the sages to protect the Birds, Blackbuck and other biodiversity of the area including the sanctity of Gokul Jalashay.
27. The programmes like Jal Aarti can be organised at Gokul Jalashay inviting people even from outside to motivate the people for protecting the wetland and is biodiversity.
28. Garbage and other solid waste should not be dumped in the wetland and if possible, a provision of charging fine may be enforced against doing so.
29. A scheme of Rs. 3.711 crore was prepared in 2012 for the development of tourism in and around Gokul Jalashay but it could be brought in reality. Such schemes may be refreshed to support the development of Gokul Jalashay but care should be taken that the birds and biodiversity of the area is not disturbed through the activities proposed in the scheme.
30. Blackbucks of Buxar can charm a large segment of tourists. Sighting of Blackbucks can be arranged for tourists on the tune of sighting of tigers organised in the national parks or the tiger reserves. There are the places where Blackbuck are sighted regularly hopping and running in the fields. Their sighting can be tracked by the guides on day to day basis and tourists can be taken over there for sighting maintaining the wildlife ethics.
31. Sewage Marsh of Laxmipur, Buxar-Chausa, can be maintained by allowing the treated sewage water before being drained in to it. IOC, Barauni Eco-Park may be an example how the ponds created in the treatment plant attract a good number of resident and migratory birds and the garden and other terrestrial birds around it for their roosting, feeding and breeding.
32. Around this marshland, the tree species suitable for breeding of birds can be planted.
33. This report may be edited and published in the public interest. A Hindi version is also recommended.

Sewage Marsh, Buxar:

The sewage water of Buxar city is drained towards a low land area near Laxmipur on way to Chausa at a distance of about 5 km from Buxar at 25° 32' 53.1" N and 83° 56' 15.7" E forming a beautiful marshland in an area of about 40 acre. Chausa is about 12 km from Buxar. The sewage management is the look out of the local municipal corporation and may be causing some nuisance value for the people residing around it. But it seemed to be a much potential site for the birds. Close by are the paddy fields too and they also provide habitat to the diverse species of avifauna. We have observed a large flock of Black-winged Stilt, a pollution indicator species numbering to about 100 but the presence of about 25 Common Greenshank and a Spotted Redshank, both being the migratory species that usually prefer the fresh water and riverine habitat. This good number of birds here might be indicative of the disturbance caused them in their main aquatic habitat including Gokul Jalashay and Ganga river course closeby. May be for this reason, they are settling in this probably no disturbance zone away from the city of Buxar and Chausa. This site is close to the river Ganga and the local river Thora as well. These river courses may be explored for more interesting bird species. This marshland can be maintained by allowing the treated sewage water before being drained in to it. IOC, Barauni Eco-Park may be an example how the ponds created in the treatment plant attract a good number of resident and migratory birds and the garden and other terrestrial birds around it for their roosting, feeding and breeding.

Darauli (Nuaon), Kaimur:

Village Darauli once ruled by Chero Kharwar lies at a distance of about 45 km SW of Buxar at 25° 18' 46.3" N and 83° 43' 02.7" E in the district of Kaimur. There are presently two ponds at Darauli adjacent to each other. Pond I on the western side measures 8 acres with a depth of about 6 ft. and Pond II on the eastern side measures 21 acre with a depth of about 4 ft. 20-30 percent area of both of the ponds is covered by aquatic free floating, bottom rooted, submerged and emergent macrophytes with an algal bloom. Hydrological parameters need to be studied for these two ponds.

These ponds had been choked with vegetation like water hyacinth and residents of the area had started dumping garbage. These were supposed to be encroached like

three other ponds existing earlier. The vegetation was cleared at the panchayat level and now surviving.

Both the ponds are manmade and its present source of water is rain water, ground recharge and the Garra Choubey Canal which is fed by the Son river. These ponds are Soorykoniy सूर्यकोणिय and said to be the biggest ponds of old Shahabad district which is now split in to Buxar, Kaimur, Rohtas and Ara. This may or may not be true. There was a cluster of five ponds here. Other three were existing in its surrounding. These two ponds earlier were used for people and its water was used for drinking. Other three were used for cattle and Blackbucks and Bluebulls too specially in summer days.

Lot of temples are there around this place. Rituals are performed in the eastern pond and the festivals like Chhath Pooja are celebrated. Idol emersion also takes place. Ma Durga temple is here. Maa Kamakhya Mandir is about 20-25 km, Maa Mundeshwari Temple is 40 km and Varanasi is 90 km away from this place. A Guptkalin temple is found here where the old stone statues of Lord Shiva and other deities bearing archaeological value are preserved, protected and worshipped in the space without having shades and roofs. Some encryptions in ancient language are there on the stone in this temple. Nature of land of these ponds is अनावाद सर्व साधारण. Depth of the ponds is decreasing gradually. In 2003-04, under the scheme of Jal Chhajan, its depth was increased and tried to be restored. People demand to protect these ponds and develop this place as a tourist center. A four lane road is proposed to cross close to the village will bring some prosperity to the place.

The local community comprises Pal, Muslim, Baniya, Bind, Mahadalit (Chamaar and Paswan), Ati Pichhda (Prajapati). It neighbours the village of Brahmins where Yadav and Rajpoot are also there.

As reported by the local people, Blackbucks and Bluebulls, Spotted Deer, Jackal, Mongoose, Lizard Monitor, Hares, Jungle Cat, among the snakes Cobra, Krait, Python, Burmese Python, King Cobra, Sand Boa, Rat Snake, etc. Turtles are found during fishing and fishes. Among the birds are the Barn Owl, Himalayan Vultures etc.

Seasam, Kadamb and Jamun are the main plant species. Our floral assessment is combined in the table flora of Goukul Jalashay and Darauli.

Two years back, honourable central minister and local MP Sri Ashwini Kumar Choubey had visited this place along with the District Magistrate. A developmental project proposal had been prepared. Its copy is probably available with the honourable minister which needed to be procured and pursued.

These ponds are perennial but occasionally dry up when its water is used for irrigation. Cremation is not done besides the ponds but idol emersion takes place and garbage including solid waste is disposed in to the ponds by the people. People say that chemicals and fertilizers do not affect the quality of water of these ponds that may not be true.

A local villager says, large number of birds used to visit in these ponds. But their number has gone down with the increase of fishing activities since last 15-16 years. The ponds are cleaned only when the lease holder fishermen come to harvest fishes from it. Twice or thrice fish is harvested in a year. Grass, briket, nain, rohu, roopchanda.

Lotus flowers bloom here in the ponds and are collected for the purpose of worship. Hunting of birds was a practice here but now has been stopped. Few people from Uttar Pradesh and the bordering area approach here to hunt the animals like Blackbuck. These timid animals get injuries and for such injured animals a Rescue Center has recently been established at Jaldaha in Ramgarh block of Kaimur district on a 1 acre land. Another rescue center is proposed in the Navanagar block of Buxar district on 12 acre of land.

Locals suggest that fishing lease should be abolished in these ponds and trees like Jamun, Babool and Bamboo should be planted around for retaining its biodiversity and beautification to attract tourists from Varanasi, the big city close to the place.

Blackbuck are commonly, almost every time seen in Jangalchhera of Ramgarh block. We observed 50s of them while heading towards Jaldaha Rescue center. They are sometimes killed or injured in road accidents and also when attacked by dogs and other animals as reported. Hoardings should be placed at different places to further attract the tourists and safeguard these lovely animals by keeping speeds limit of their vehicle and drive with precaution. This zone may be declared as a safari for Blackbuck, Bluebull and other deers and antelopes found here. Such Blackbuck Safari will not only attract the tourists but will generate revenue for both government and the local community. This will also create awareness for their

conservation. Rescue centre may not be a place for tourism, but can be an education point for the wildlife lovers and visitors.

As such there is no NGO active in the area. But 28 men are active in Sri Mahaveer Hitarth Samooh, a farmer's organisation and 51 members of Yuva Mandal Samooh from Nehru Yuva Kendr are also active. There are about five groups of Jivika Didi Samooh.

According to the people, much of unused land is available here. Some land around the pond may be acquired and a big Biodiversity Park can be established like one at Madhopur in Jamui. These ponds could be the part of attraction of such park.

Recommendations:

1. Hydrological parameters need to be studied for these two ponds.
2. Water level at these two ponds should be maintained and if needed, the silt should be removed periodically but avoiding the migratory season of birds and the breeding season of resident birds.
3. Controlled deweeding of these ponds is needed to be done. Removing the weeds or the marginal vegetation completely would destroy the breeding habitat of many waterbird species.
4. Possibility should be explored to restore the three ponds vanished in past or some more ponds may be excavated to support the wildlife specially deers and antelopes during summer.
5. Catchment area of these ponds and other sources of water should be monitored regularly if they are not obstructed or blocked with the developmental works or due to the encroachment.
6. Fishing lease should be abolished.
7. Blackbuck Safari
8. Rescue centre may not be a place for tourism, but can be an education point for the wildlife lovers and visitors.
9. Religious and archeological tourism
10. Biodiversity Park

Conluding Remarks:

The present assessment though first visit for a brief duration suggests that the three dimensional approach of tourism can be launched here in Buxar and part of Kaimur. The set up for Wildlife or eco-tourism is already existing here. Blackbucks alone can attract lot of tourists in the area. The religious tourism can very well be

announced far and wide. Only Bird Tourism needs some preparatory works to ensure the undisturbed habitat, minimum human interference and boating operations for fishing and crossing the Jalashay and no hunting, trapping, shooting, poisoning and trade of birds in the region. Patrolling and strict surveillance from Chakki to Nanijor for this purpose will decide the future of Bird Tourism in the area and possibility of designating the status of Community Reserve, Conservation Reserve, Important Bird Area (IBA) and the Ramsar Site to this extremely potential and deserving Gokul Jalashay.

A Blackbuck Safari in Buxar and Kaimur, watchtowers for observing River Dolphin at the banks of River Ganga, for Blackbuks in Ramgarh block in the area of Junglechhera, and for the birds in the stretch of Gokul Jalashay can immediately be initiated. The suggestions shared above in recommendations may start implementing for establishing the glorious avian world.

People should not only raise their expectations but exert and cooperate heartily with the implementing agencies in the government administration, the scientific experts and the promoters like the popular and sensitive leader Sri Ashwini Kumar Choubey, local Member of Parliament and the Union Minister of State for Environment, Forest and Climate Change, Govt. of India.

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