GANGA CULTURAL DOCUMENTATION

BHADOHI DISTRICT

[Natural Heritage]

2021

National Mission for Clean Ganga

Indian National Trust for Art and Cultural Heritage

Indian National Trust for Art and Cultural Heritage

71, Lodhi Estate, New Delhi – 110003

Website: www.intach.org

Email: intach@intach.org

Surveyed & Authored by : Abhishek Kumar Upadhyay & Aditya Gopal

Team Headed By : Manu Bhatnagar [Principal Director, NHD] & Dr. Ritu Singh [Director, NHD]

Photo Credits : Aditya Gopal & Abhishek Kumar Upadhyay

Map Credits : Abhishek Kumar Upadhyay & WWF-India

Front Cover : Ganga river as seen from Chaturmukh Ghat, Bhadohi

Background : Ganga River Bank At Sitamarhi Ghat

Back Cover : Urau Tal

Formatting and Design by : Abhishek Kumar Upadhyay

GANGA CULTURAL DOCUMENTATION

BHADOHI DISTRICT

[Natural Heritage]

DECEMBER, 2021

Sponsored By :

NAMAMI GANGE

National Mission for Clean Ganga

Authored By :

Indian National Trust for Art and Cultural Heritage

INTACH

INDIA@75

Azaadi Ke Rang Bharatiya Sanskriti Ke Sang

Contents

List of Images

List of Tables

List of Maps

1.0 Introduction

1.1 Bhadohi District is known for its carpet industry, also referred as the carpet city is situated in south-eastern part of the state of Uttar Pradesh. The District falls in the Middle Gangetic Plains[1] and lies between latitude 250 12'30" N to 250 31'30"and longitude 820 14'50" to 82 0 45'00" E, bordered by Jaunpur District from the north, Varanasi District from the east, Mirzapur District from the south and Prayagraj District from the west [Ref. Map 1]. The geographical area of the District is 1015 sq. km. having a population of 1,578, 213. The District has 3 tehsils, 6 blocks and 3 assembly constituency having Gyanpur as the District's headquarter[2]. Out of 6 blocks, Deegh block and Aurai block constitute the study area.

1.2 The district got its name from Bhar Raj kingdom, where Bhadohi was the capital. Bhadohi District was the part of Varanasi District before 30th June 1994. The District's name Bhadohi was changed to Sant Ravidas Nagar on 4th December, 1997 which was again renamed as Bhadohi on 6th December, 2014.

1.3 The District has an elevation of 85 meters from MSL. Loam, sand and clay are the major soil types. The District has a total forest area of just 1.75 sq. kms. The temperature ranges from 45.7 °C in the summer to 4.7°C in the winters. In the monsoon season the humidity is relatively on the higher side while the lowest humidity is observed in the month of April. The average annual rainfall in the district is 1099 mm.

1.4 The District's geo-morphological characters have been divided into two categories, namely, the uplands and the low land plains. The upland shares the major part of the district and highly unlikely prone to the flood events. The lowland is comprised of silty loam deposits and has frequent flood events in the monsoon[3].

1.5 The River Ganga touches at the south-western edge down flowing from Prayagraj District and forms the south-western boundary of the District. From the south-central boundary the river turns towards the Mirzapur District and returns again to form the extreme south-eastern boundary of the district before flowing down again to Mirzapur District. Throughout its journey, the river covers a distance of approximately 64.5 Km in Bhadohi District.

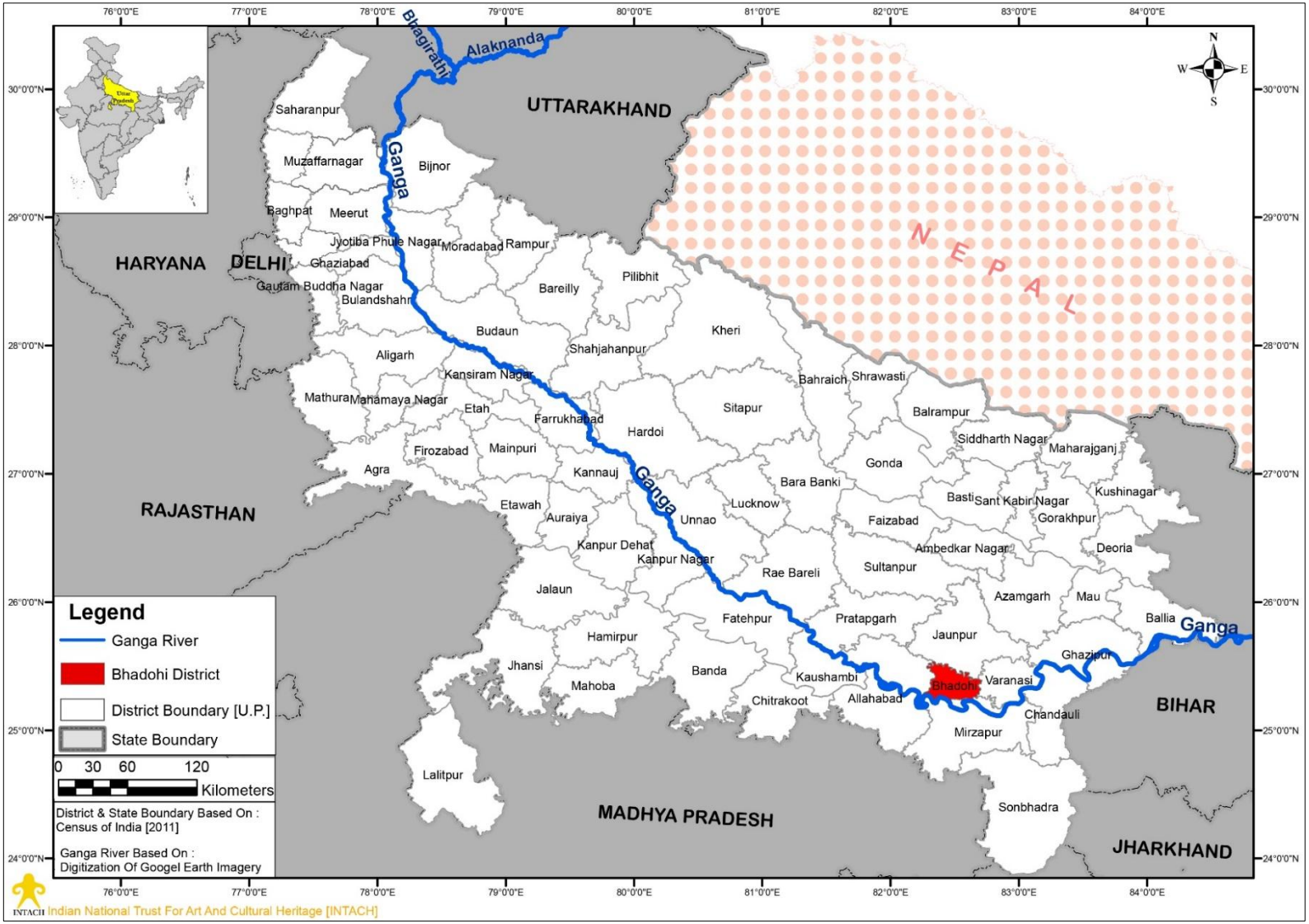
---

[1] River Ganga at a Glance: Identification of Issues and Priority Actions for Restoration
https://nmcg.nic.in/writereaddata/fileupload/33_43_001_GEN_DAT_01.pdf
[2] http://Bhadohi.nic.in
[3] *Ground Water Brochure Of Sant Ravidas Nagar District, U.P.*
http://cgwb.gov.in/District_Profile/UP/Sant%20Ravi%20Das%20Nagar.pdf

According to the Mahabaharata, the Padavas took shelter in Semradhnath which is in Bhadohi after escaping from Lakshyagrah through a tunnel. As per the local belief, Sita wife of Lord Ram, lived here in the ashram of the Sage Valmiki after being abandoned by Lord Ram. She immersed herself in the Earth here at a place presently called Sita Samahit Ashthal in Sitamarhi.

In the 16th Century during the Mughal Emperor Akbar's regime the Bhadohi's carpet industry gain its popularity. Famous for its Persian design, it is believed that the industry was set up way back by the Persian weavers during their visit to India they stopped at the village called Madhosingh, near Khamaria and set up the looms there. The Mirzapur-Bhadohi region is responsible for the employment of 3.2 million people in carpet industry making the region largest handmade carpet-weaving cluster.

Image 1 : Lush Green Vegetation Covering The Statue At Sita Samahit Asthal, Sitamarhi.



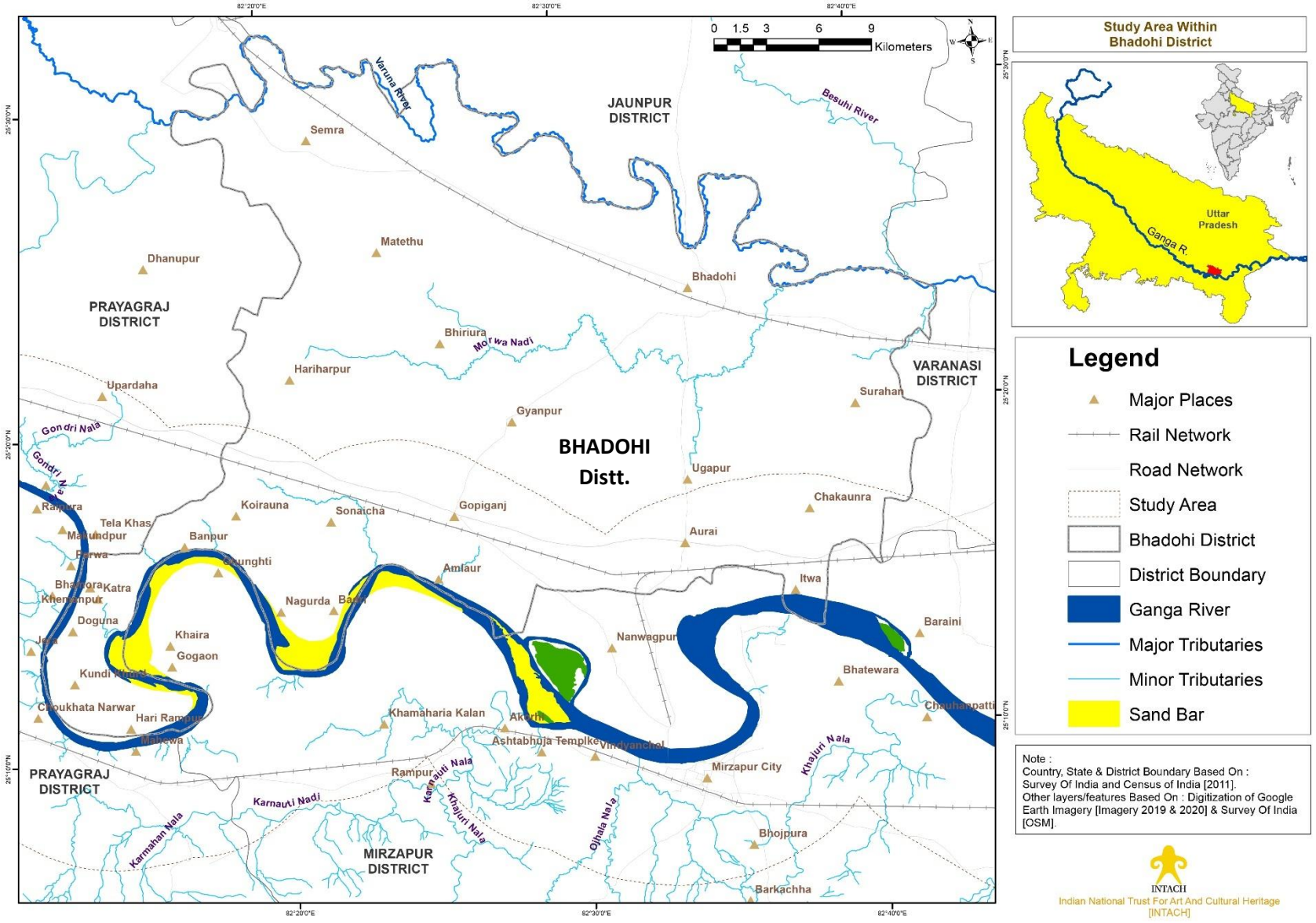
Map 1 : Location Of Bhadohi Distt. On Left Bank of Ganga River

2.0 Ganga River in Bhadohi Distt.

2.1 Bhadohi Distt. is located at the left bank of the river Ganga which enters Bhadohi Distt. near Karaundhia village after crossing Handa Block of Prayagraj Distt. The length of Ganga River in Bhadohi District is approximately 64.5 km, while its width varies between 0.5 Km to 2.2 km. Ganga River stretch of 30 Km of Bhadohi-Mirzapur-Prayagraj is designated as Turtle Sanctuary. Stretch of 15 Km between Arai Karaundhia and Sitamarhi-Baripur of Bhadohi Distt. is under turtle sanctuary. The active floodplain of Ganga River is mainly under cultivation excluding a few patches of scrubland, plantation and settlements.

2.2 The point where Ganga enters the District, it meanders and makes a concave turn north towards left bank [at Chhachhua Village]. The concave turn of the river is named as ***Dakshinvahini Ganga*** by the locals. Moving downwards, the river further meanders and turns between Chhachhua village and Naragda Village. This turn of the river is called ***Uttarvahini Ganga***. The river meanders again towards right bank upto Danipatti Village. In each turn, the river creates huge sand bar which is a suitable habitat for the turtles. After Biraspur village, the river moves straighter and enters the Mirzapur Distt. Here, the river forms a huge riverine island [covered with dense vegetation] named as Majhara/Manjhara which is a suitable habitat for species like wild boar [*Sus scrofa*]. The river again touches Bhadohi Distt. on its left bank near Itwa village and flows upto Dwarkapur [stretch of 2.3 Km] and finally enters Mirzapur near village Agiabir.

Image 2 : View of Ganga River At Chaturbhuj Ghat, Distt. Bhadohi



Map 2 : Study Area In Bhadohi Distt.

3.0 Methodology

3.1 For carrying out surveys, a 7 km buffer zone [study area] of Ganga River in Bhadohi Distt. was marked having a total area of 338 sq. km. [left bank]. The study area was divided into grids of 5 × 5 km for field survey. Before carrying out surveys, the study area was analysed with the help of secondary literature, mythological records, available maps [Google Earth historical satellite data, SOI old toposheets, SOI-OSM sheets]. Based on that, key features were marked in Google Earth Pro and Kml files were generated. The Kml files were further transported to mobile based QGis field survey application. Key features were marked taking consideration of Natural Heritage documentation format.

3.2 The field survey in Bhadohi Distt. was carried out in November 2021. Various sites were visited within the study area wherein field data was collected along with interactions with stakeholders. The co-ordinates of all localities were taken by Garmin handheld GPS eTrex30 and the representative images of various parameters were taken with the help of Sony Digital Camera Cyber-shot DSC-HX300 with 50X optical zoom. Pre-marked Google Earth's Kml files and Google Maps were used for navigation. Scanned maps of the topographic map series of Army Map Services, U.S. Army [Map NG44-11 & ng44-12], Survey of India [SOI] Open Series Maps [OSM] and Google Earth Historical Imagery were obtained and analysed for preparation of Maps.

3.3 Field guides were used for flora and fauna identification. The diversity of avian species was recorded using binoculars and identified using field guides [Salim Ali, 2012; Grimmett et al., 2016]. The conservation status of the species was listed by using IUCN Red Data List. Information regarding groundwater, agriculture, forest and wetland were obtained through informal/formal interviews and discussion with Govt. officials of Forest Department, and farmers, fishermen, boatmen and other stakeholders.

4.0 Tributaries of Ganga River

4.1 Varuna River and its tributary Morwa Nadi are two major rivers found within Bhadohi Distt.. However, both river falls outside the study area. Varuna River originates somehow near Dain Tal in Prayagraj district and joins Ganga at Rajghat in Varanasi district [Refer Image 3]. During its journey of 225 Km [Mishra et al., 2019], it flows approx. 94 Km.s[4] through Bhadohi Distt. and forms the northern boundary of the district with Jaunpur.

Image 3 : Varuna River at Ganga- Varuna Sangam, Rajghat, Varanasi

4.2 Morwa river, the tributary of Varuna River originates from Orau Tal in Bhadohi distt. and inanimate to Varuna River at 82°37'36.73"E, 25°23'34.94"N near Durwa Kukrauthi Village in Bhadohi District. The Orau Tal once a source of drinking water and a major habitat for avian diversity is now shrinking due to increased pressure of anthropogenic activities [Refer Image 4 & 5]. Another tributary of Varuna River called Besuhi Nadi joins Varuna at the trijunction of three districts i.e., Bhadohi, Jaunpur and Varanasi Distt. at 82°41'35.49"E, 25°23'37.87"N.

[4] Based on Survey of India OSM sheet.

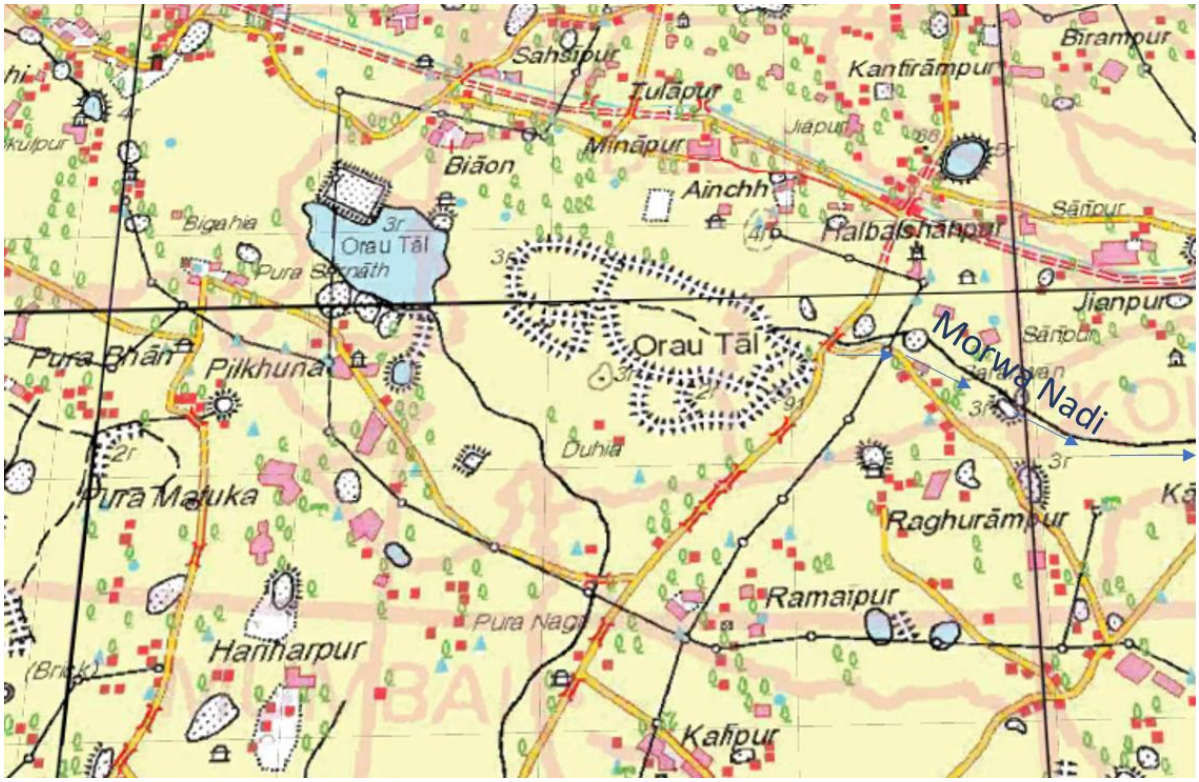


Image 4 : SOI-OSM Sheet Showing Orau Tal - The Origin of Morwa River

[Scale 1:50,000]

Image 5 : Morwa River Near Orau Tal

4.3 There are ten minor streams reported within the study area. Out of which two streams are completely faded and only eight are flowing within the study area. The lengths of these streams range between 2 Km.s to 13 Km.s. Documentation of these small streams is important because dense riparian vegetation is still present along their banks. However, the spread of riparian vegetation is continuously shrinking due to increasing anthropogenic activities. The details of these minor streams are provided in Table 1 [Refer Map No. 3].

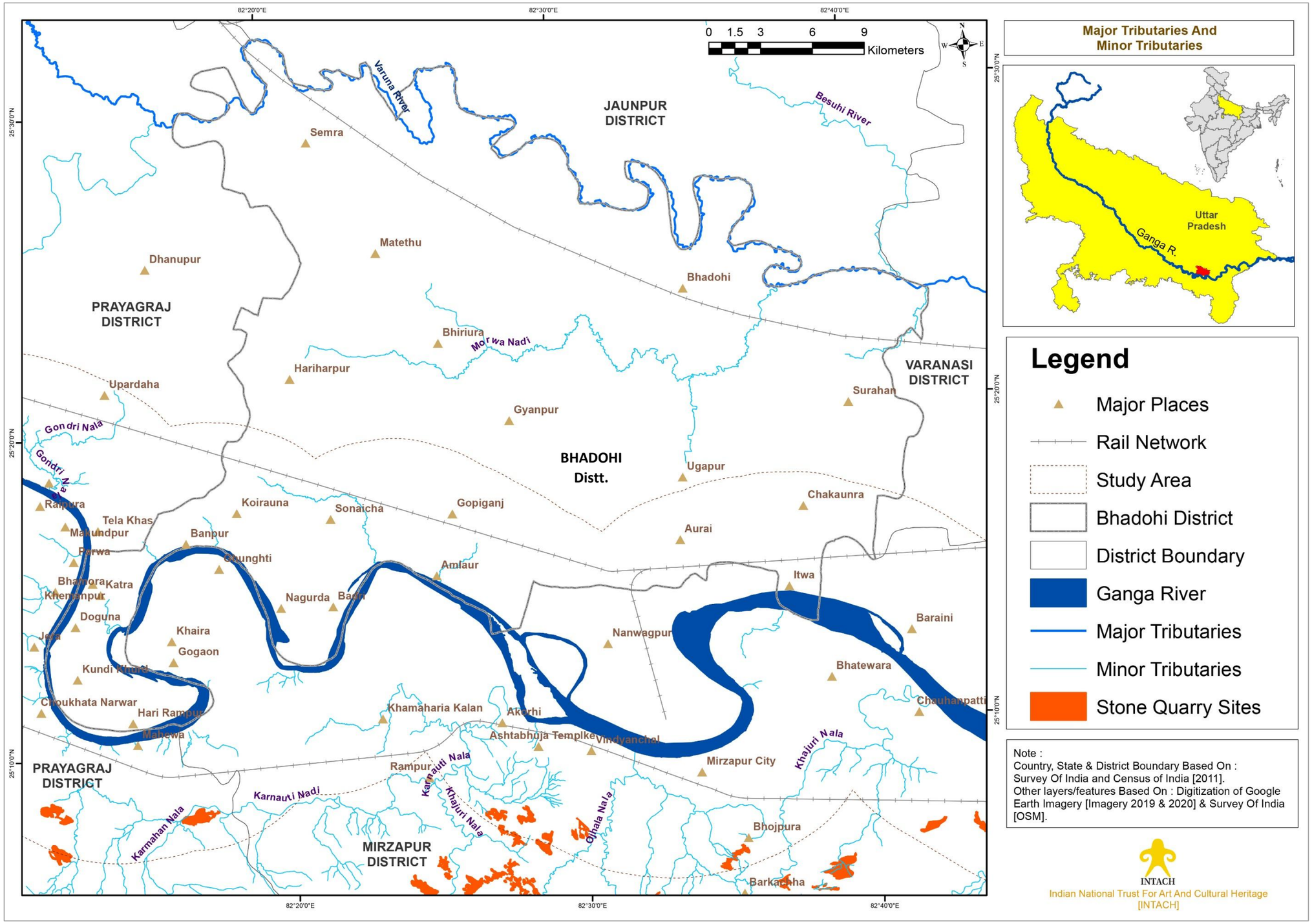
Table 1 : Streams Within The Study Area

Stream	Origin	Confluence	Length and Potential Threat
Nara	Near Village Katra [25°15'11.47"N, 82°14'8.28"E]	Near Village Dig [25°14'5.22"N, 82°14'20.11"E]	Stream Length approximately 4.5 Km. Potential Threat : Extensive Agricultural Practices
Nara	Near Mahkhar Village [25°16'45.41"N, 82°15'24.65"E]	Near Sitamarhi Ghat [25°16'6.75"N, 82°15'42.68"E]	Stream Length approximately 2.0 Km. Potential Threat : Sewage Discharge, Extensive Agricultural Practices
Nara	Near Matha Village [25°17'11.77"N, 82°16'17.38"E]	Near Baripur Village [25°16'28.81"N, 82°16'34.19"E]	Stream Length approximately 2.0 Km. Potential Threat : Extensive Agricultural Practices and Brick Kilns, Loss of riparian vegetation
Nara	Chhendi Tal, Prayagraj Distt. [25°19'32.54"N, 82°16'37.35"E]	Near Kalinjara Village [25°16'25.33"N, 82°17'45.44"E]	Stream Length approximately 7 Km. Potential Threat : Shrinking of Chhendi Tal, Brick Kilns, Loss of riparian vegetation
Binnai Ka Nar	Near Ramkisunpur [25°18'33.86"N, 82°19'17.55"E]	Near Bihrozpur Village [25°15'34.53"N, 82°23'8.94"E]	Stream Length approximately 13 Km. [Ref. Image 6] Potential Threat : Extensive Agricultural Practices and Brick Kilns, Loss of riparian vegetation
Nar	Near Village Anapur [25°16'50.61"N,	Near Village Gulauri [25°15'31.97"N,	Stream Length approximately 4.0 Km. Potential Threat : Extensive

	82°24'42.68"E]	82°24'10.34"E]	Agricultural Practices and Brick Kilns, Loss of riparian vegetation
Rampur Ka Nar	Near Gopiganj [25°16'44.28"N, 82°37'9.03"E]	Near Rampur Ghat [25°14'56.13"N, 82°25'21.87"E]	Stream Length approximately 8 Km. Potential Threat : Encroachment, Sewage Discharge, Extensive Agricultural Practices and Brick Kilns
Nara	Near Itwa Village [25°14'3.94"N, 82°16'27.83"E]	Near Kanspur Village [25°24'57.42"N, 82° 9'56.52"E]	Stream Length approximately 5.0 Km. Potential Threat : Encroachment, Sewage Discharge. **[A canal is constructed between Samdha Tal and Kanspur to remove flood water through Nara]**

Image 6 : Binnai Ka Nar Near Confluence

Image 7 : Nara Stream Near Sitamarhi Temple



Map 3 : Major and Minor Tributaries In Study Area

5.0 Land Use Land Cover [LULC]

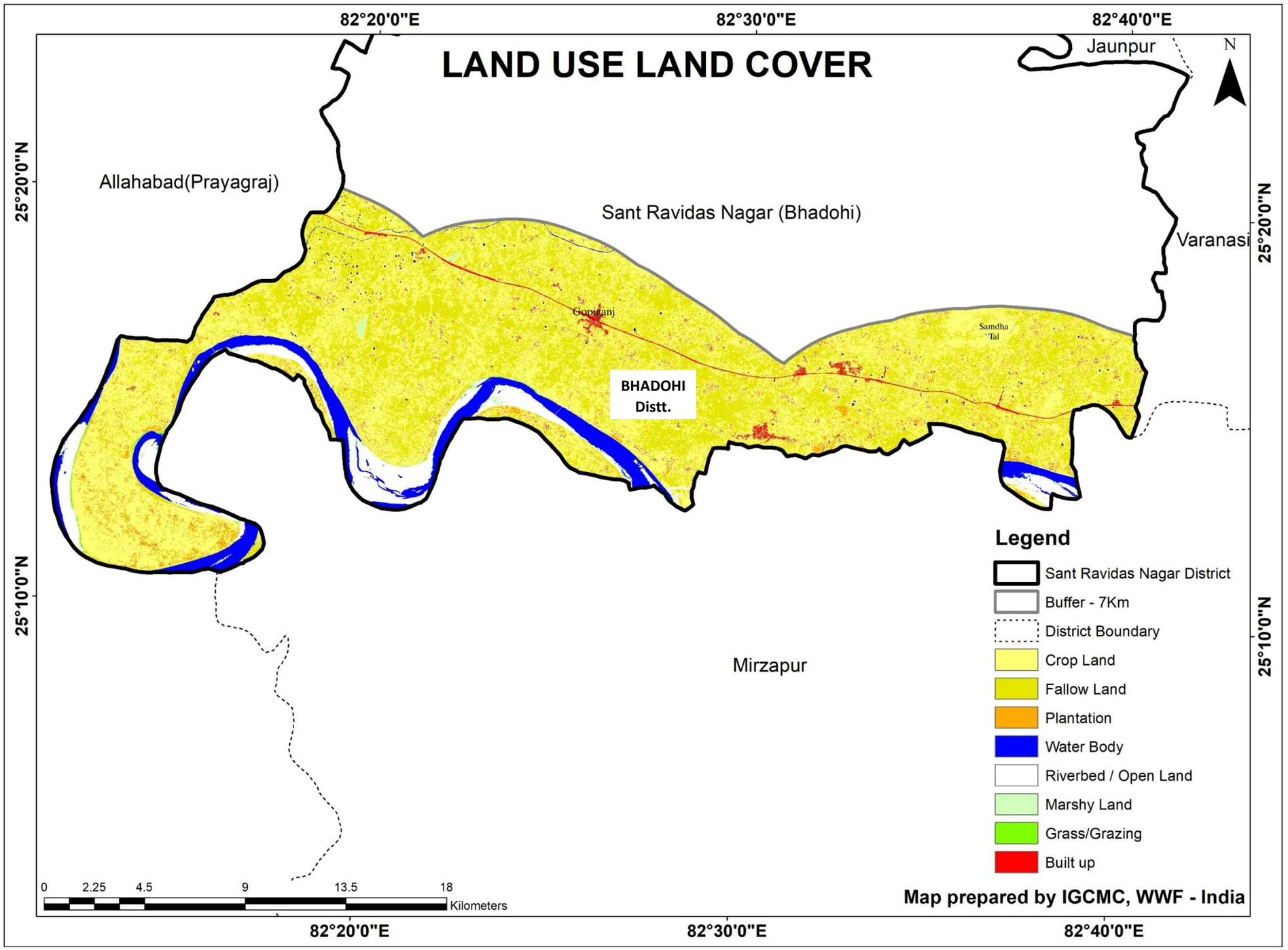
5.1 Land Use Land Cover [LULC] map of the study area has been prepared from Landsat imagery for the year 2020. [Table No. 2] Using supervised classification system, 8 different classes were generated – fallow land, plantation, water body, riverbed/ open land, marshy land, grass/grazing land and built-up area [Refer Map No. 4]. Since agriculture is the primary occupation in the Distt., cropland and fallow land area dominate other classes.

5.2 The total study area constitutes 365.59 sq.km. covering left bank of River Ganga for which the following observations were drawn based on this classification:

- Agricultural land covers 52.39% of the total study area. It dominates the study area. The area of Samdha Tal and Gonda Probans Tal covered under the agricultural land because most of the areas of these wetlands are under cultivation.
- Fallow land has a distribution of 29.13% which also includes agricultural fallow land and brick kiln area.
- Water body [6.4%] and marshy land [0.52] constitutes 6.94% of the study area. It covers lentic and lotic water bodies within the study area.
- Plantation and grass/ grazing land together constitute 4.47% of the total study area. This includes riparian vegetation patches along ganga river and plantation field.
- The built-up land constitutes 1.29% of the total study area. This class covers the area of Gopiganj, Aurai, National Highway-2 and small settlements distributed throughout the study area.

Table 2 : Land Use Land Cover of Study Area In Bhadohi Distt. [2020]

Class	Area (Ha)	Area (%)
Crop Land	19151.6	52.3861
Fallow Land	10650.1	29.1316
Plantation	1610.67	4.4057
Water Body	2354.99	6.4417
Riverbed/ Open Land	2024.61	5.5380
Marshy Land	193.026	0.5280
Grass/Grazing	100.487	0.2749
Built-up	473.053	1.2940
Total	36558.54	100



Map 4 : Land Use Land Cover Map of The Study Area [Bhadohi District]

6.0 Palaeochannels Within Study Area

6.1 Palaeochannels are the remnants or old channels of once active rivers or streams, some of which are lie buried under the cover of younger sediments. They are formed when the river or stream migrate their courses and form new ones. Paleochannels are important to understand area geology, old river routes, sediment deposition and are considered suitable areas for ground water recharge. In Bhadohi Distt. factors such as stone quarrying, mining, encroachment, extensive agricultural practices, brick kilns and loss of vegetation act as a catalyst for the fading of river channels and wetlands. Within these factors, loss of vegetation and extensive agricultural activities are the main reason behind the shrinking and loss of wetlands in the study area. Loss of vegetation allows the soil to erode easily, which finally ends up in filling of the wetlands and accelerate the rate of migration of river.

6.2 In order to identify paleo-channels, paleo-wetlands and threatened river channels in the study region, Survey of India (SOI) toposheets from 1922-1923 to 2005-2006 and Google Imagery upto April, 2021 were analysed [Refer Map 5 & 6]. Further, ground truthing was carried out in November, 2021. It is observed that :

- Between 2005-2006 and 2021 the channel of Ganga River moved northward from Gogaon and Khaira Village [Right Bank]. This migration has resulted in creation of a vast sand bar.
- In recent years it has been observed that a channel of the Ganga River, flowing northward from the Manjhara area [Left Bank] of Mirzapur, has started drying and is navigable only in monsoon season.
- The study of SOI map series, Google Imagery (in time series) and ground survey highlighted that there are two small streams whose courses have faded or disappeared altogether. The disappearing channels are small and seasonal but are equally important because they directly drain in to River Ganga. Streams have faded due, perhaps, to extensive agricultural practices, encroachment and high silt load. Details of faded streams are provided in Table No. 03 and Images 8-11.

Table 3 : Faded Streams Within The Study Area

Stream	Origin	Confluence	Reason for the fading of the stream
Nara	Near Village Chakia [25°15'56.75"N, 82°14'51.75"E]	Near Village Chakia Uparwar [25°15'26.27"N, 82°15'10.36"E]	Extensive Agricultural Practices, encroachment and high silt load.
Nara	Near Village [25°15'32.97"N, 82°19'30.89"E]	Near Gajadharpur [25°15'16.40"N, 82°19'4.52"E]	Extensive Agricultural Practices, encroachment and high silt load.

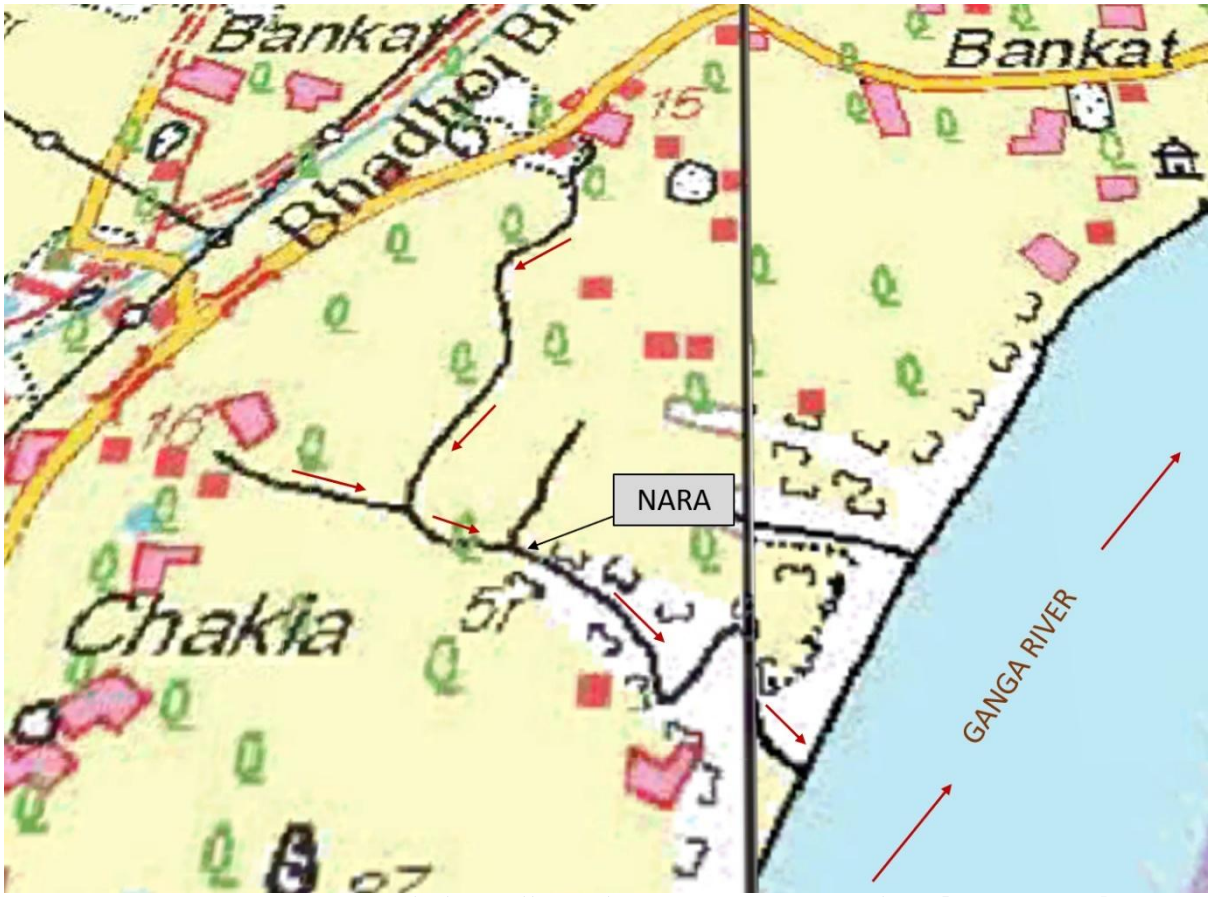


Image 8 : Nara Stream Near Chakia Village Showing in SOI Toposheet [OSM Series], 2005
[Scale 1:50,000]

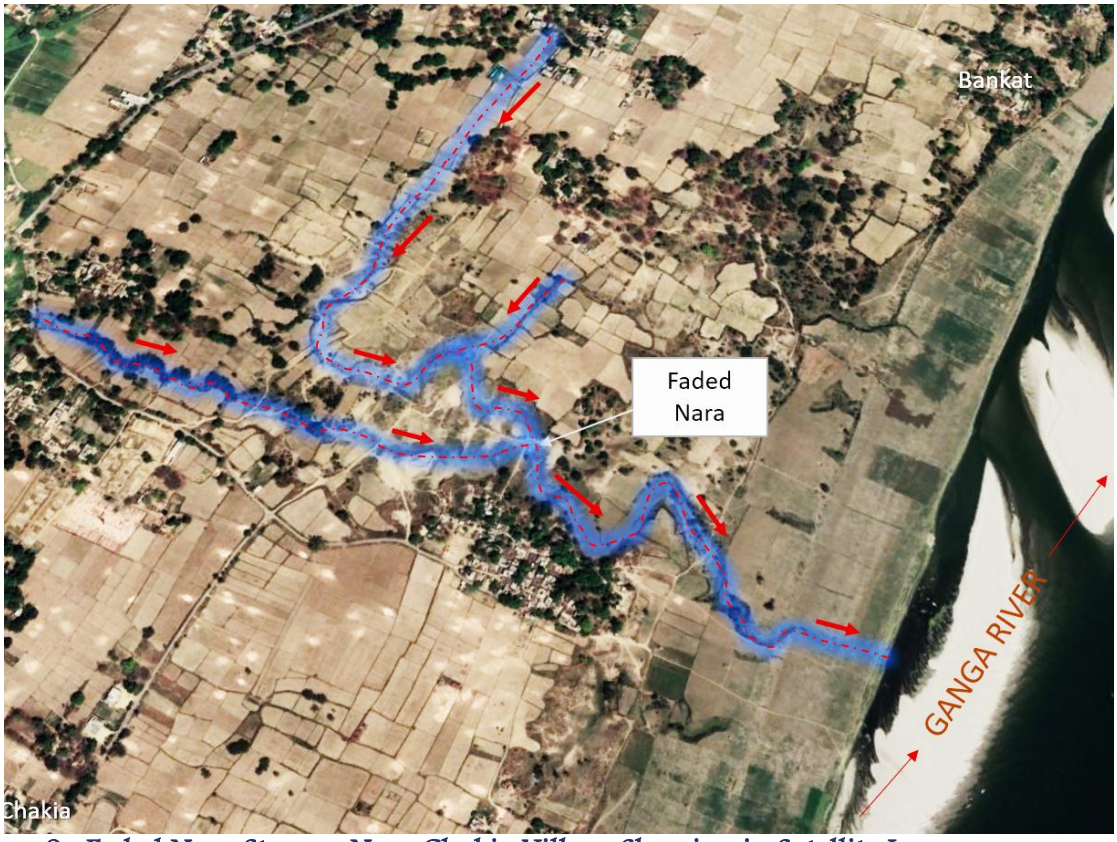


Image 9 : Faded Nara Stream Near Chakia Village Showing in Satellite Imagery
[Source : Google Earth Pro Imagery, April, 2021]

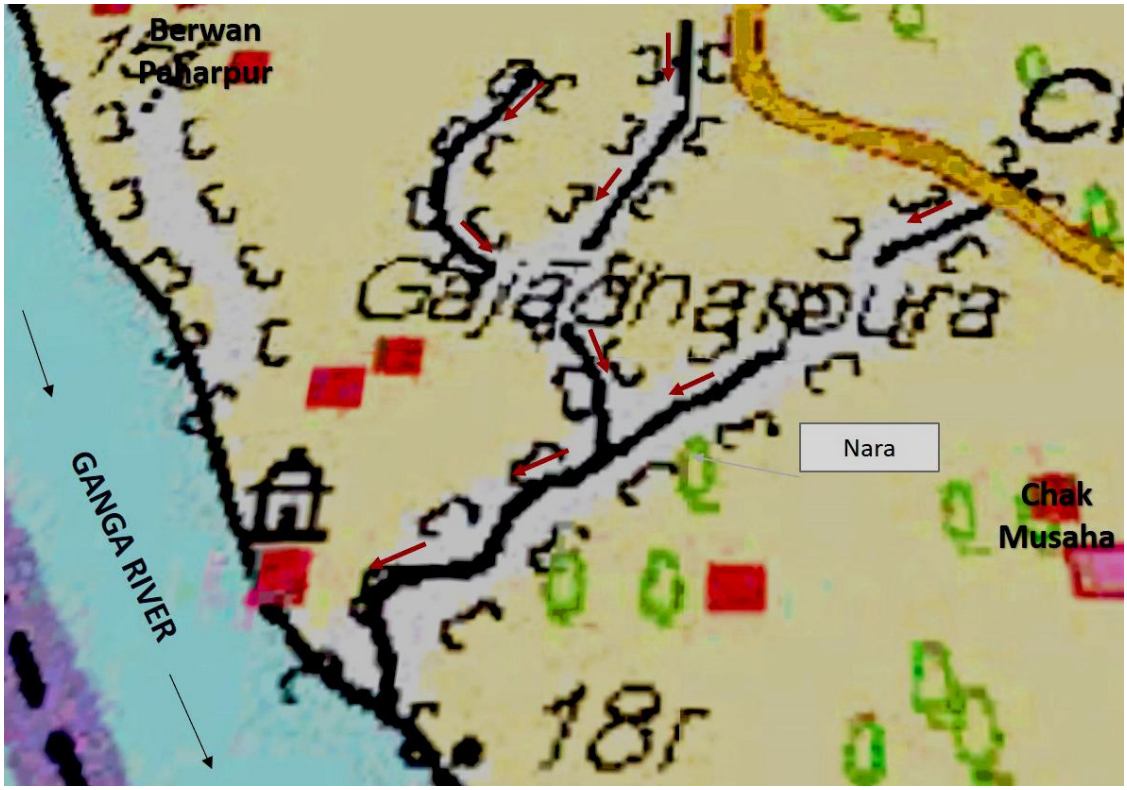
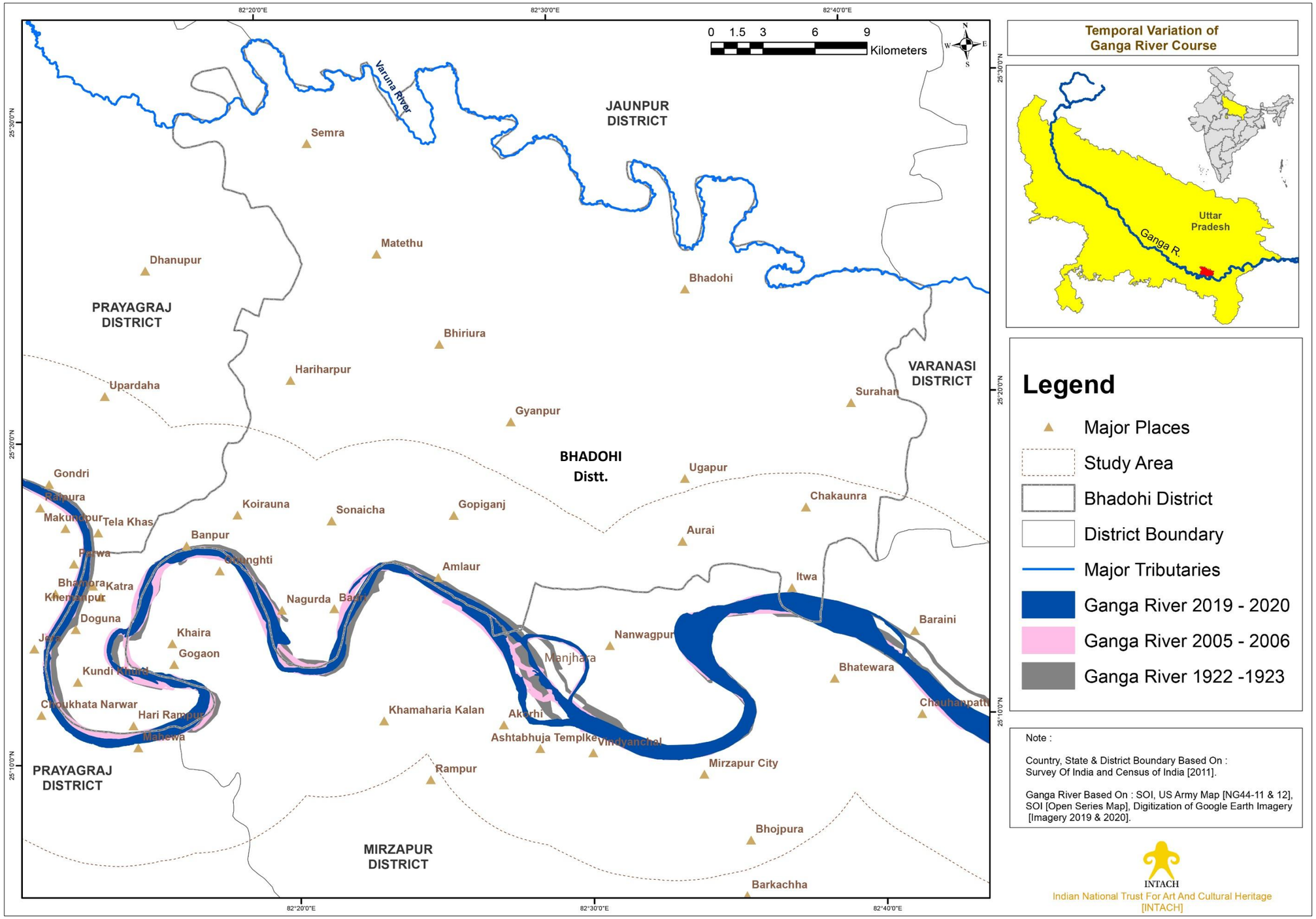


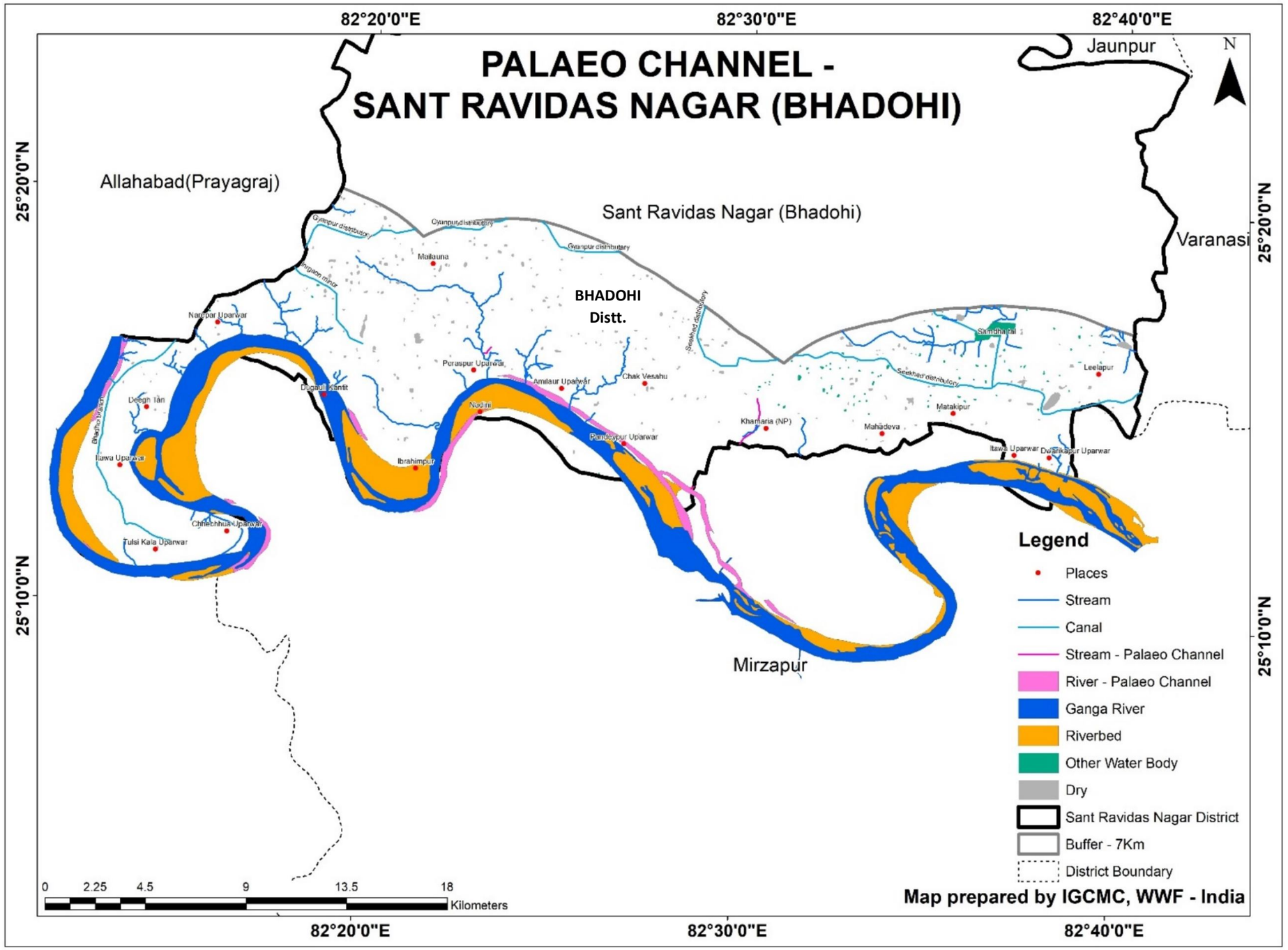
Image 10 : Nara Near Gajadharpura Showing in SOI Toposheet [OSM Series] , 2005
[Scale 1:50,000]

Image 11 : Nara Near Gajadharpura Showing in Satellite Imagery
[Source : Google Earth Pro Imagery, April, 2021]

- The analysis of existing maps and historical Google Imagery reveals that two wetlands located within the study area have completely faded due to the increasing agricultural pressure, high siltation rate and encroachment. The wetlands are located near village Bainbisa and Kansapur at coordinates 25°15'41.39"N, 82°36'32.97"E and 25°16'31.98"N, 82°21'15.80"E respectively. The area of the wetlands was calculated as 11 hectares and 27.6 hectares respectively as per the SoI of 1922-1923. However, their water spread area becomes zero hectare and 12.2 hectares respectively in 2005-2006. As per satellite imagery of May, 2021, both wetlands have completely faded and their area is now under cultivation.



Map 5 : Temporal Variation Map of Ganga River Course [Bhadohi Distt.]



Map 6 : Paleochannels Within Study Area [Bhadohi Distt.]

7.0 Floodplains Of Ganga River In Bhadohi Distt.

7.1 The active flood plain of a river is defined as an area on either side of the river channel with regular flooding on a periodic basis. Maintaining active flood plain of a river is critical for assuring equilibrium in ecosystem. The floodplains harbour rich biodiversity including riparian vegetation as well as many other groups of organisms which help in maintaining fertility of this region. Along with this, the floodplains have been of great cultural and economic importance with many early civilizations having risen in these fertile lands. As the rivers naturally meander through the landscape over a period of time, they deposit sand, silt and other soil forming materials in the floodplain region which make them ideal for agricultural production. Throughout history, people have learned to cultivate in the fertile floodplains and use their rich resources for sustaining livelihoods. Even today, in most of the riverine regions especially in India, the floodplains have been occupied by local farmers for carrying out their agricultural activities especially in the non-monsoon season. Ganga River floodplain is one such important floodplain in India which has been extensively utilized in almost all the Distt.s, where it passes through, for agricultural purposes.

7.2 Ganga River floodplains in Bhadohi Distt. are flat between Karundhia and Dig Village and upland tracts with scattered patches of riparian vegetation are found throughout the floodplain. The upland tracts are seldom inundated by floods while the flat floodplain areas become flooded every monsoon. The study area is predominantly agrarian and agriculture is a main source of livelihood. *Rabi* and *Zaid* crops are mainly cultivated within flat floodplain areas. In recent years, the riparian vegetation at many places is converted into agricultural fields [Refer Image 13]. This has resulted into intrusion of invasive species like *Parthenium hysterophorus* [Refer Image 12] and development of rills and gullies. The upland areas area cultivated with *Rabi, Zaid* and *Kharif* crops. Floodplain produce recorded within the villages in study corridor are provided in the Table No. 4.

Table 4 : Floodplain Agricultural Produce Of Villages In Bhadohi Distt.

Sr. no.	Village	Floodplain produce
1	Gajadharpur	Wheat, Mustard, Gram, Mustard, Green peas, Potato, Maize Jowar, Bajra, Paddy and vegetables in few areas
2	Hari Rampur	

3	Chhachhua village	Wheat and Mustard [cultivated in most of the area], Maize, Bajra, Potato
4	Birahimpur Village	Wheat, Mustard, Gram, Mustard, Potato [few areas], Maize Jowar, Bajra
5	Biraspur Village	
6	Amlaur Village	Wheat, Mustard, Flax seed, Pulses [Arhar, Gram, Lentil, Urad], Barley [Few areas grown mainly for fodder] Maize, Jowar [grown mainly with maize], Potato [few areas],
7	Jahangirabad Village	
8	Bhawanipur Village	
9	Ghamhapur Village	
6	Barji Kalan Village	Wheat, Mustard, Flax seed, Arhar [, Potato and Vegetables [cultivation has declined because of wild boar population], Potato [mainly in Dubeypur]
7	Gangapur Village	
8	Dubeypur Village	
9	Misirpur Village	
10	Derwa Village	
11	Basantpur Village [Near Samdha Tal]	Paddy, Wheat, Barley, Mustard

Image 12 : Invasive *Parthenium histerophorus* At the Bank Near Dubeypur Village
[Provides Habitat and Bank Erosion Control]

Image 13 : A Mustard Field In Newly Reclaimed Riparian Area

Image 14 : A Farmerette Harvesting Bajra

8.0 Wetlands Within Study Area

As per the Wetlands (Conservation and Management) Rules, 2017 - "Wetland means an area of marsh, fen, peatland or water; whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters, but does not include river channels, paddy fields, human-made water bodies/ tanks Specifically constructed tor drinking water purposes and structures specifically constructed for aquaculture, salt production, recreation and irrigation purposes.''

8.1 Wetlands are highly productive ecosystems and help in maintaining ecological balance by providing food and habitat to large number of living organisms. They also help in controlling floods, recharging groundwater, nutrient recycling, climate stabilization and carbon sequestration. According to National Wetland Atlas [Uttar Pradesh], Wetlands constitute 5.16% geographic area of the Uttar Pradesh state and 5.68% area of the Bhadohi district. The majority [59%] area within the wetlands covered by the lotic system i.e., River/stream. The remaining 41% area is covered by lakes, ponds, oxbow lakes/ cut-off meanders, riverine wetlands, tanks and water-logged area.

8.2 In the current exercise, a total of 233 wetlands have been mapped in the study area with the help of Google Earth satellite imagery and available maps. Total area of the mapped wetlands is 395.78 ha i.e. 1.17% of the study area. The area of identified wetlands ranges between 0.10 ha to 77.5 ha. Out of 233 wetlands, the area of 146 wetlands is less than 1 ha, 65 wetlands have area between 1 ha and 2.5 ha and 22 wetlands have area greater than 2.5 ha. The Samdha Tal and Gonda Sobans Tal together constitutes 26.23% of the total study area. The list of mapped wetlands is given in Table No. 5 and their spatial distribution is shown in Map N0. 10.

Table 5 : Wetland Within The Study Area

Sr. NO.	Wetland Name/ Wetland NO.	Coordinates		Area [Hectare]
		Latitude	Longitude	
1	1	25°16'50.70"N	82°40'55.93"E	0.14
2	2	25°15'26.20"N	82°39'48.41"E	0.9
3	3	25°16'10.06"N	82°39'39.76"E	0.88
4	4	25°16'5.68"N	82°39'57.84"E	0.56

5	5	25°16'20.73"N	82°39'38.77"E	0.66
6	6	25°16'20.52"N	82°39'43.88"E	0.63
7	7	25°16'20.40"N	82°40'13.49"E	0.73
8	8	25°16'18.28"N	82°40'21.58"E	0.34
9	9	25°14'0.48"N	82°38'11.04"E	0.7
10	Gonda Sobans Tal	25°15'34.19"N	82°38'13.41"E	26.3
11	11	25°15'49.85"N	82°38'26.31"E	2.1
12	12	25°15'59.15"N	82°38'48.87"E	0.42
13	13	25°15'53.31"N	82°39'10.02"E	0.82
14	14	25°16'19.12"N	82°39'25.22"E	0.83
15	15	25°16'21.78"N	82°39'31.54"E	0.83
16	16	25°16'25.82"N	82°39'35.42"E	1.26
17	17	25°16'29.23"N	82°38'51.93"E	1.58
18	18	25°16'30.05"N	82°39'24.47"E	0.7
19	19	25°16'28.84"N	82°39'17.85"E	0.28
20	20	25°16'53.26"N	82°39'8.13"E	0.58
21	21	25°16'50.71"N	82°39'26.83"E	0.54
22	22	25°17'2.38"N	82°39'42.89"E	11.8
23	23	25°17'19.60"N	82°38'53.18"E	0.56
24	24	25°17'5.82"N	82°38'49.28"E	1.9
25	25	25°16'37.43"N	82°38'17.58"E	0.93
26	26	25°16'9.52"N	82°38'20.58"E	0.75
27	27	25°16'15.80"N	82°38'36.95"E	0.85
28	28	25°15'51.80"N	82°37'22.13"E	6.61
29	29	25°16'10.91"N	82°37'55.40"E	0.63
30	30	25°15'59.91"N	82°38'1.64"E	0.6
31	31	25°15'23.80"N	82°37'29.40"E	1.62
32	32	25°15'5.52"N	82°37'49.84"E	0.31
33	33	25°14'49.71"N	82°37'28.67"E	0.54
34	34	25°14'49.44"N	82°37'22.73"E	0.35
35	35	25°15'15.03"N	82°37'21.09"E	0.85
36	36	25°17'18.13"N	82°38'9.89"E	0.93
37	37	25°17'22.71"N	25°17'18.13"N	0.63

38	38	25°17'41.00"N	82°38'12.86"E	2.33
39	39	25°17'25.92"N	82°37'43.07"E	0.23
40	40	25°17'1.06"N	82°37'43.08"E	0.46
41	41	25°16'48.01"N	82°37'15.52"E	0.78
42	42	25°16'12.56"N	82°37'0.56"E	0.73
43	43	25°15'55.75"N	82°37'2.95"E	0.93
44	44	25°15'52.40"N	82°36'57.14"E	0.32
45	45	25°15'49.65"N	82°36'52.88"E	0.63
46	46	25°15'36.86"N	82°37'7.45"E	1
47	47	25°15'20.52"N	82°36'36.92"E	0.99
48	48	25°14'54.68"N	82°36'5.94"E	1.38
49	49	25°14'56.67"N	82°36'26.76"E	1.71
50	50	25°16'17.67"N	82°37'22.56"E	0.53
51	51	25°16'21.26"N	82°37'24.21"E	0.37
52	52	25°16'19.26"N	82°37'19.02"E	0.42
53	53	25°15'14.16"N	82°35'8.44"E	0.55
54	54	25°15'26.02"N	82°35'50.04"E	0.84
55	55	25°15'30.89"N	82°36'6.38"E	0.55
56	56	25°16'2.20"N	82°35'39.78"E	0.84
57	57	25°15'57.04"N	82°36'21.85"E	0.82
58	58	25°16'34.45"N	82°35'42.85"E	0.52
59	59	25°16'47.70"N	82°36'30.95"E	1.29
60	Samdha Tal	25°17'20.19"N	82°36'38.40"E	77.5
61	61	25°14'52.13"N	82°33'38.07"E	1.41
62	62	25°14'42.53"N	82°33'27.05"E	0.47
63	63	25°14'53.59"N	82°34'27.99"E	1.92
64	64	25°15'21.13"N	82°34'23.82"E	0.32
65	65	25°15'28.95"N	82°34'27.26"E	0.39
66	66	25°15'2.68"N	82°33'40.48"E	0.79
67	67	25°16'3.05"N	82°34'45.74"E	0.33
68	68	25°16'1.03"N	82°34'50.58"E	0.29
69	69	25°16'5.76"N	82°34'47.83"E	0.1
70	70	25°16'30.76"N	82°34'38.34"E	0.94
71	71	25°16'30.84"N	82°34'33.11"E	0.21

72	72	25°16'23.52"N	82°35'13.44"E	0.57
73	73	25°16'40.79"N	82°35'22.95"E	0.49
74	74	25°17'28.43"N	82°35'10.35"E	0.89
75	75	25°17'36.73"N	82°34'43.84"E	0.82
76	76	25°17'31.34"N	82°34'52.96"E	0.61
77	77	25°17'25.60"N	82°34'12.02"E	0.66
78	78	25°16'44.51"N	82°34'1.95"E	0.93
79	79	25°16'1.59"N	82°33'21.35"E	0.81
80	80	25°15'58.12"N	82°33'33.83"E	1.00
81	Aurai Talab	25°15'59.11"N	82°33'39.48"E	1.00
82	82	25°16'13.28"N	82°33'47.21"E	1.57
83	83	25°15'42.62"N	82°33'7.06"E	0.82
84	84	25°15'31.59"N	82°33'14.08"E	0.94
85	85	25°15'19.29"N	82°32'54.81"E	4.00
86	86	25°15'12.71"N	82°33'0.87"E	0.38
87	87	25°15'39.17"N	82°33'23.51"E	1.38
88	88	25°15'27.86"N	82°33'44.47"E	1.26
89	89	25°14'50.30"N	82°32'30.07"E	0.62
90	90	25°14'48.22"N	82°33'18.85"E	0.3
91	91	25°14'54.46"N	82°31'54.41"E	0.43
92	92	25°15'28.04"N	82°32'31.07"E	0.96
93	93	25°15'39.90"N	82°32'18.51"E	1.1
94	94	25°16'29.72"N	82°32'34.71"E	1.31
95	95	25°16'51.88"N	82°32'29.80"E	1.99
96	96	25°16'7.33"N	82°32'2.48"E	2.22
97	97	25°15'52.75"N	82°31'25.33"E	3.10
98	98	25°15'18.32"N	82°31'22.86"E	0.63
99	99	25°15'11.63"N	82°31'3.03"E	0.85
100	100	25°14'41.24"N	82°30'25.10"E	1.28
101	101	25°14'46.29"N	82°30'20.76"E	1.10
102	102	25°16'6.30"N	82°31'38.30"E	1.00
103	103	25°14'58.16"N	82°29'54.67"E	0.33
104	104	25°15'21.32"N	82°29'49.34"E	0.49
105	105	25°15'18.26"N	82°29'35.99"E	0.3
106	106	25°15'36.85"N	82°30'21.97"E	1.52

107	107	25°16'31.06"N	82°30'25.42"E	0.61
108	108	25°16'31.30"N	82°30'31.46"E	0.18
109	109	25°16'40.80"N	82°30'9.68"E	6.85
110	110	25°16'35.29"N	82°29'28.02"E	1.66
111	111	25°16'12.77"N	82°29'29.36"E	1.38
112	112	25°15'37.49"N	82°29'18.48"E	0.64
113	113	25°15'35.63"N	82°29'13.03"E	0.57
114	114	25°15'39.67"N	82°29'37.08"E	0.57
115	115	25°15'22.13"N	82°28'57.33"E	0.49
116	116	25°15'23.16"N	82°28'25.58"E	0.51
117	117	25°15'27.48"N	82°27'53.49"E	0.65
118	118	25°15'18.06"N	82°28'4.91"E	0.20
119	119	25°15'38.56"N	82°28'30.82"E	1.17
120	120	25°15'36.11"N	82°28'42.12"E	0.90
121	121	25°16'3.58"N	82°28'12.58"E	0.63
122	122	25°16'26.21"N	82°28'28.23"E	0.44
123	123	25°16'25.63"N	82°28'39.25"E	0.40
124	124	25°16'37.32"N	82°28'59.27"E	1.4
125	125	25°16'35.00"N	82°29'17.02"E	1.81
126	126	25°16'42.30"N	82°28'47.46"E	1.52
127	127	25°16'32.58"N	82°29'2.59"E	0.31
128	128	25°16'37.24"N	82°29'7.86"E	0.30
129	129	25°17'22.31"N	82°28'44.71"E	0.58
130	130	25°17'1.66"N	82°29'33.62"E	0.26
131	131	25°16'46.14"N	82°29'7.74"E	0.62
132	132	25°17'20.40"N	82°27'42.72"E	1.62
133	133	25°17'14.97"N	82°28'1.78"E	0.50
134	134	25°17'17.63"N	82°28'16.92"E	1.53
135	135	25°17'10.56"N	82°28'18.91"E	0.24
136	136	25°15'55.58"N	82°27'48.23"E	4.95
137	137	25°15'49.08"N	82°27'56.71"E	0.44
138	138	25°15'27.61"N	82°27'26.25"E	0.78
139	139	25°15'34.18"N	82°27'31.22"E	1.43
140	140	25°15'36.36"N	82°27'37.49"E	0.36
141	141	25°15'21.04"N	82°27'3.21"E	0.98

142	142	25°15'0.43"N	82°27'13.63"E	0.46
143	143	25°14'41.22"N	82°27'19.07"E	0.62
144	144	25°18'17.56"N	82°26'56.71"E	3.50
145	145	25°18'13.55"N	82°27'24.56"E	1.78
146	146	25°17'59.78"N	82°27'24.99"E	0.69
147	147	25°17'56.18"N	82°27'8.19"E	0.60
148	148	25°17'56.25"N	82°26'40.39"E	1.30
149	149	25°17'38.09"N	82°26'36.82"E	0.63
150	150	25°16'55.80"N	82°27'2.09"E	1.95
151	Gopiganj Talab	25°17'6.48"N	82°26'9.07"E	2.80
152	152	25°16'38.34"N	82°26'39.22"E	2.56
153	153	25°16'12.68"N	82°26'40.21"E	0.65
154	154	25°16'1.29"N	82°26'46.56"E	0.86
155	155	25°18'0.37"N	82°26'8.21"E	0.93
156	156	25°17'33.60"N	82°25'42.30"E	1.18
157	157	25°17'36.06"N	82°24'58.23"E	0.67
158	158	25°16'55.33"N	82°24'39.92"E	0.84
159	159	25°16'34.27"N	82°25'45.65"E	0.63
160	160	25°16'24.89"N	82°24'34.04"E	0.89
161	161	25°16'27.47"N	82°24'59.74"E	0.48
162	162	25°15'55.27"N	82°23'37.06"E	1.25
163	163	25°15'48.05"N	82°24'10.41"E	3.26
164	164	25°15'51.91"N	82°23'47.20"E	0.33
165	165	25°16'25.38"N	82°24'18.33"E	0.26
166	166	25°17'21.60"N	82°24'38.65"E	0.46
167	167	25°17'29.27"N	82°24'34.56"E	0.94
168	168	25°18'27.59"N	82°24'33.02"E	0.94
169	169	25°18'41.32"N	82°25'6.91"E	1.29
170	170	25°19'0.02"N	82°23'55.39"E	8.62
171	171	25°18'53.88"N	82°23'46.21"E	0.81
172	172	25°18'22.97"N	82°23'58.86"E	2.68
173	173	25°18'19.12"N	82°23'52.11"E	2.36
174	174	25°18'18.96"N	82°24'10.64"E	1.65
175	175	25°16'45.75"N	82°23'39.20"E	1.76
176	176	25°14'51.00"N	82°21'41.21"E	0.51

177	177	25°14'54.19"N	82°21'35.35"E	0.58
178	178	25°16'20.67"N	82°22'26.56"E	0.61
179	179	25°16'58.46"N	82°22'12.79"E	1.74
180	180	25°17'26.12"N	82°22'33.16"E	0.72
181	181	25°17'30.80"N	82°23'1.32"E	0.90
182	182	25°18'18.86"N	82°22'28.83"E	4.88
183	183	25°18'51.73"N	82°22'56.52"E	1.77
184	184	25°18'33.98"N	82°23'24.48"E	0.39
185	185	25°18'57.58"N	82°22'20.68"E	1.24
186	186	25°18'29.83"N	82°21'29.40"E	5.35
187	187	25°17'32.30"N	82°21'35.95"E	0.80
188	188	25°16'26.51"N	82°21'40.15"E	0.59
189	189	25°16'16.42"N	82°21'42.90"E	0.73
190	190	25°16'19.61"N	82°20'53.24"E	1.53
191	191	25°15'18.69"N	82°21'9.27"E	1.59
192	192	25°14'49.55"N	82°20'10.96"E	0.56
193	193	25°15'17.28"N	82°20'23.74"E	1.53
194	194	25°16'0.49"N	82°20'15.40"E	0.47
195	195	25°16'15.13"N	82°20'7.54"E	1.32
196	196	25°16'42.33"N	82°20'18.61"E	3.49
197	197	25°16'58.05"N	82°20'53.34"E	0.59
198	198	25°17'53.81"N	82°20'46.03"E	1.00
199	199	25°18'13.37"N	82°20'46.40"E	1.68
200	200	25°18'16.80"N	82°20'37.67"E	0.77
201	201	25°18'30.97"N	82°20'37.41"E	2.20
202	202	25°18'33.90"N	82°21'3.73"E	1.89
203	203	25°18'49.72"N	82°21'21.18"E	1.81
204	204	25°19'10.79"N	82°20'13.38"E	2.54
205	205	25°19'13.13"N	82°20'26.26"E	1.10
206	206	25°19'15.65"N	82°20'42.60"E	2.10
207	207	25°18'15.24"N	82°20'20.50"E	0.70
208	208	25°17'36.21"N	82°20'20.23"E	1.28
209	209	25°17'35.91"N	25°17'36.21"N	0.60
210	210	25°17'35.35"N	82°20'7.99"E	0.61
211	211	25°17'34.34"N	82°19'46.94"E	2.00

212	Shivnathpatti Talab	25°16'41.64"N	82°19'46.77"E	15.8
213	213	25°17'7.70"N	82°19'17.57"E	1.90
214	214	25°17'34.88"N	82°18'47.76"E	3.69
215	215	25°17'51.55"N	82°18'44.77"E	3.68
216	216	25°17'51.21"N	82°19'27.70"E	1.00
217	217	25°17'52.58"N	82°19'18.59"E	1.19
218	218	25°18'3.14"N	82°19'26.89"E	1.75
219	219	25°19'41.52"N	82°20'3.22"E	1.69
220	220	25°19'56.62"N	82°19'3.19"E	2.69
221	221	25°19'16.34"N	82°18'31.61"E	0.62
222	222	25°18'37.74"N	82°18'19.80"E	1.42
223	223	25°18'56.32"N	82°18'53.89"E	0.56
224	224	25°17'39.51"N	82°18'14.33"E	0.94
225	225	25°17'30.30"N	82°16'25.03"E	0.96
226	226	25°16'23.79"N	82°15'8.06"E	0.92
227	227	25°16'2.97"N	82°14'42.32"E	0.6
228	228	25°14'53.59"N	82°14'23.75"E	0.64
229	229	25°14'31.50"N	82°14'36.51"E	0.58
230	230	25°12'0.44"N	82°13'39.30"E	0.77
231	231	25°15'10.61"N	82°13'50.37"E	0.51
232	232	25°16'2.36"N	82°14'24.31"E	0.46
233	233	25°18'41.33"N	82°23'19.35"E	0.94
Total Area [Hectares]				395.78

8.3 Among identified wetlands, the Samdha Tal, Gonda Sobans Tal and Shivnathpatti Talab [Village Pond] were selected for sample survey. These three wetlands constitute 30.21% of the total area of wetlands within the study corridor. The identified wetlands are under threat due to encroachment and negligence while wetlands like Gonda Sobans Tal are under threat due to agricultural pressure and high silt load. The details of wetlands surveyed in Bhadohi District are provided below :

8.3.1 **Samdha Tal :** Samdha Tal is a large wetland located near Udaikarnpur, Digwat, Tulapur and Hathiadil village at latitude 25°17'20.19"N and longitude 82°36'38.40"E [Refer Map 7 & Table No. 5 (Wetland No. 60)]. As per the records, the area of Samdha Tal is around 100 hectares. However, as per the satellite imagery of 2020-2021, the water spread area of Samdha Tal is around 75-77.5 hectares only. The depth of the wetland is around 2-3m and is completely covered with wetland grasses including the Water Hyacinth [*Eichhornia crassipes*]. The wetland gets its water from rainfall and runoff from the surrounding areas and outflows to a canal which flows in to River Ganga through a Nara near Itwa village. It also receives sewage runoff from the nearby villages [Refer Image 15 & 16].

The water spread area of wetland is analysed from the U.S. Army Map, Survey of India Toposheet and the recent satellite imagery. It has been found that the area of wetlands in around 1925-1931 is 303 hectares followed by 92.9 hectares and 77.5 hectares in year 2005-2006 and 2020-2021 respectively [Refer Image 17]. This is showing a gradual decrease in the wetland area. This may be due to siltation, lake of riparian vegetation and utilization of wetland area for agricultural purpose. During field visit, it is found that the wetland area is on lease for agricultural activities. It has been also reported that during rabi season farmers uses pump to remove water from the wetland to sow their crops. At present the wetland is intermittent; but it was once a perennial wetland and its water was used for drinking purposes.

The wetland is a major site for the migratory, local migratory and the resident avian species. However, their number and diversity has decreased in recent years due to lack of fish, eutrophication and hunting. The current and potential threats to the wetland include – agricultural runoff, lack of riparian vegetation, lease of wetland area for the agricultural activities, sewage discharge, encroachment and dumping of solid waste and dead bodies of domestic animals. In recent years, the local administration has proposed Samdha Tal for bird sanctuary and is also planning to plant 22 thousand saplings along the wetland.

Image 15 : Samdha Tal [Looking Westward]

Image 16 : Threats to Samdha Tal
[**A.** Carcass At Samdha Tal, **B.** Solid Waste, **C.** Paddy Fields At Samdha Tal]

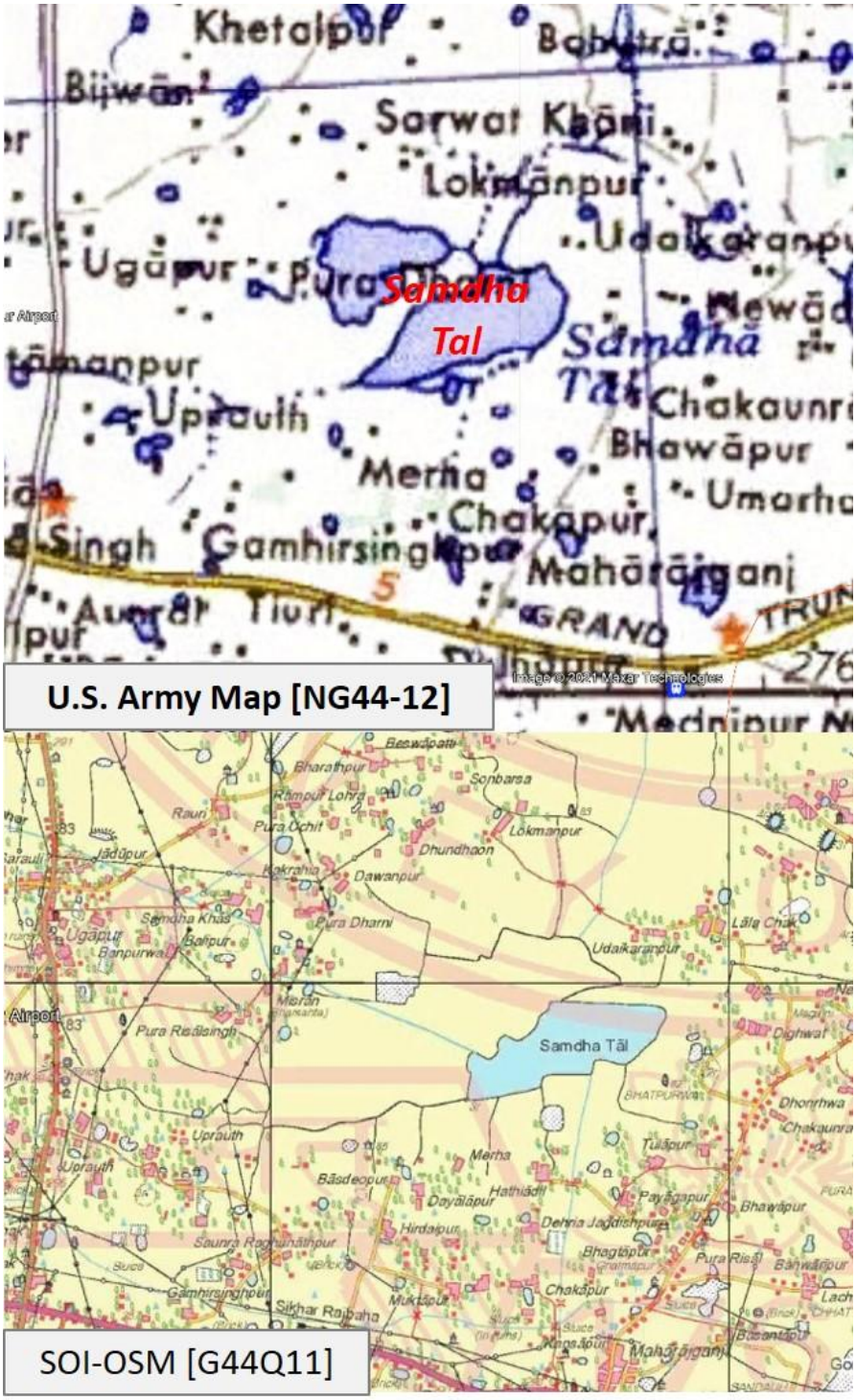
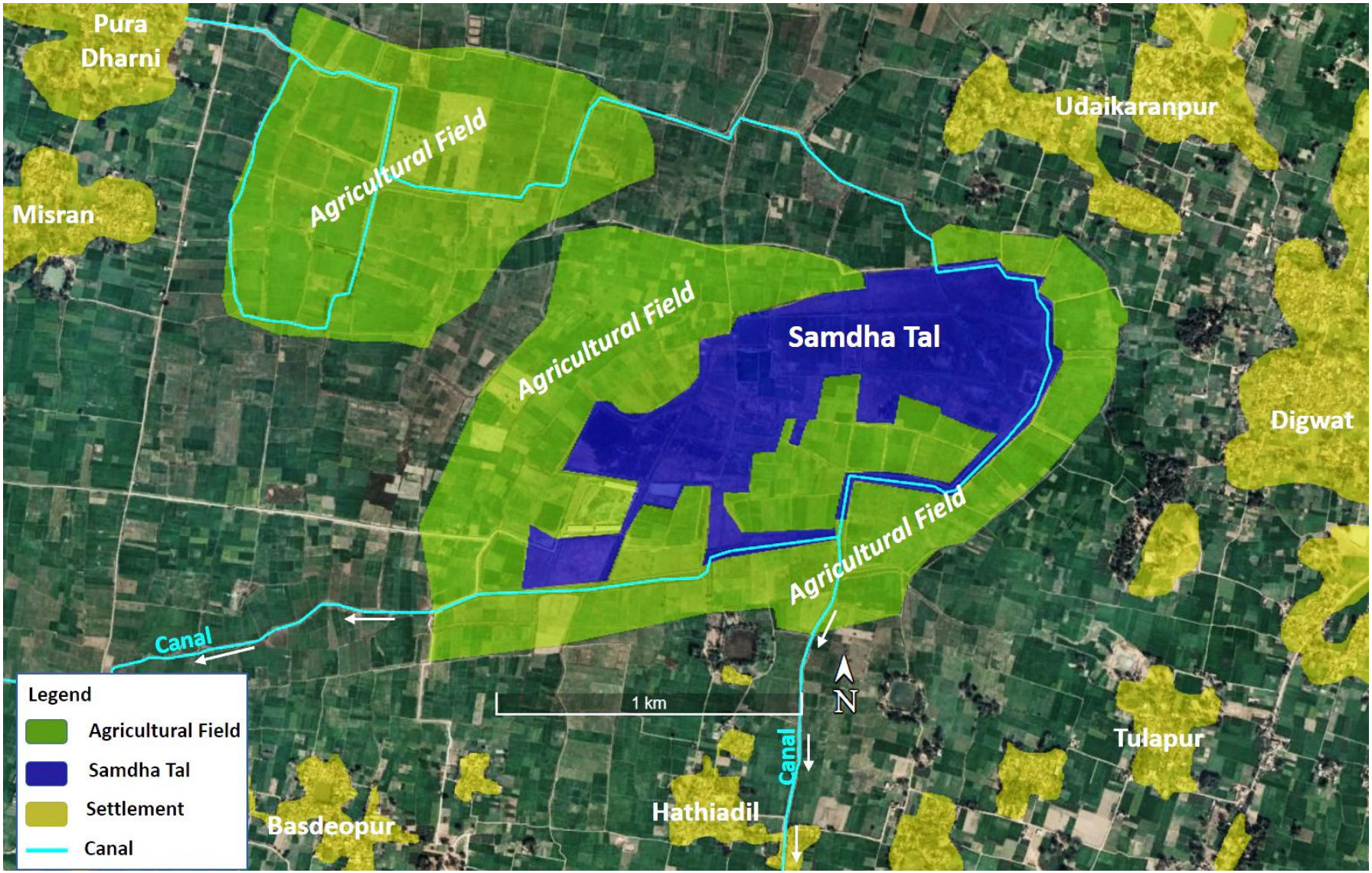


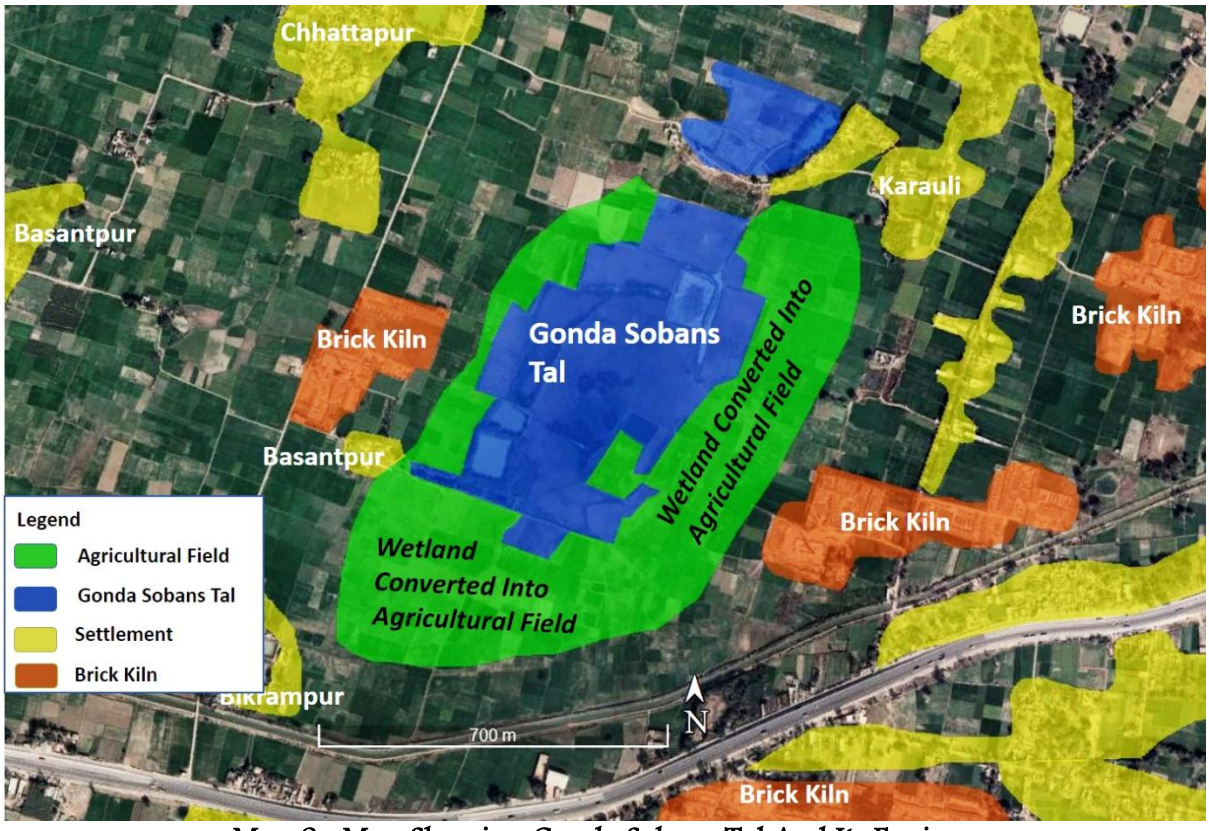
Image 17 : U.S. Army & SOI-OSM Maps Showing Samdha Tal

*Source : Topographic Map series of Army Map Services, U.S. Army [Map NG44-12 Compiled 1955, Based On SOI 1925-1931], Scale – 1:2,50,000. Survey of India [SOI] Open Series Maps [OSM G44Q11] of the year 2010 based on the modern survey 1971-1972 and Major Updates in the year 2005-2006, Scale – 1:50,000



Map 7 : Map Showing Samdha Tal And Its Environ

8.3.2 **Gonda Sobans Tal :** It is located near Karauli, Basantpur and Bikrampur village at latitude 25°15'33.48"N and longitude 82°38'13.18"E [Refer Map 8 & Table No. 5 (Wetland No.10)]. The depth of the wetland is around 2m. A small pond of approximately 1.5 hectares having depth of 20 feet has been constructed at the western side of wetland near Basantpur Village. The wetland is completely covered with wetland grasses including the Water Hyacinth [*Eichhornia crassipes*]. The wetland gets its water from rainfall and runoff from the surrounding areas and sewage discharge from the nearby villages. The water spread area of wetland is analysed from the Survey of India Toposheet and the recent satellite imagery. It has been found that in year 2005-2006 the water spread area of wetland was 32.5 hectare which reduced to 25.2 hectare in year 2020-2021. This is because of the conversion of wetland area into agricultural fields. Like Samdha Tal the wetland area of Gonda Sobans Tal is also on lease for agricultural activities. Villagers of Basantpur reveal that few areas of the wetland are under encroachment. The current and potential threats to the wetland include – Agricultural runoff, lack of riparian vegetation, lease of wetland area for the agricultural activities, sewage discharge, encroachment of the wetland area and the brick kiln along the wetland [Refer Image No. 18 & 19].



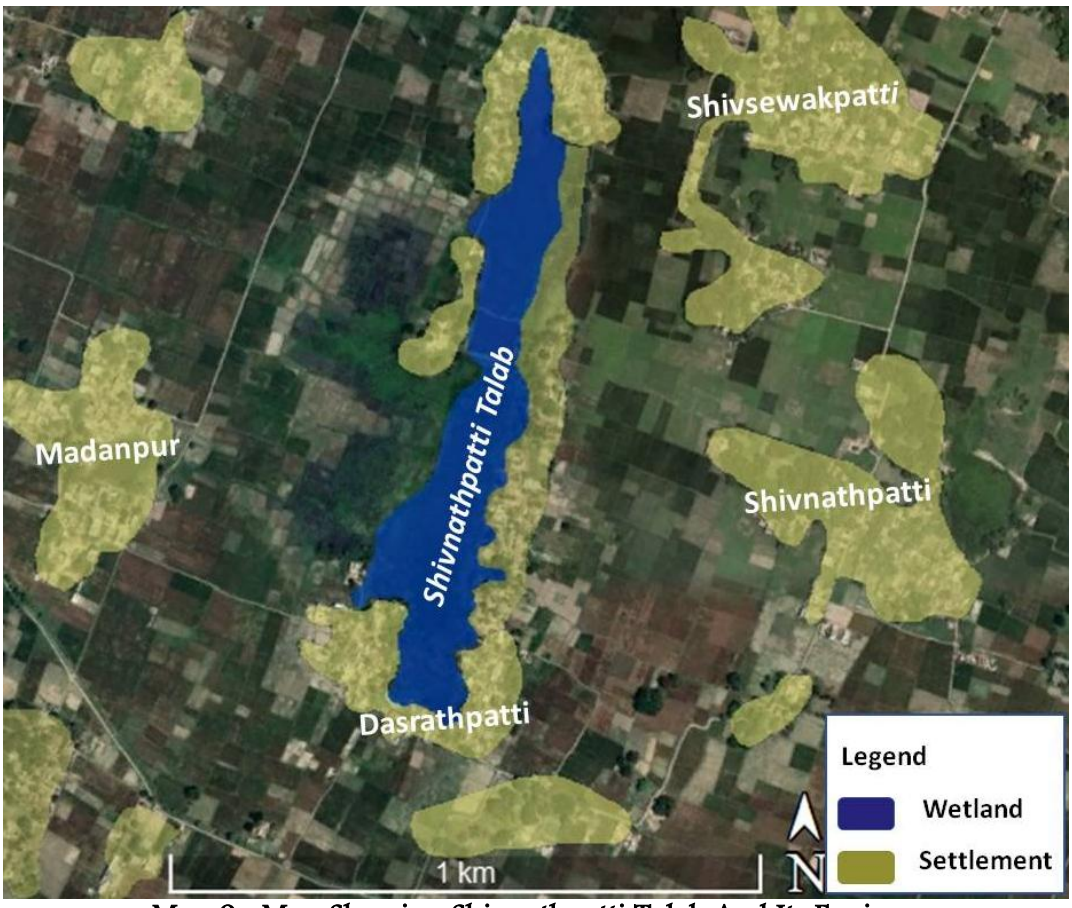
Map 8 : Map Showing Gonda Sobans Tal And Its Environ

Image 18 : Gonda Sobans Tal [Looking Eastward]

Image 19 : Image 14 : Threats to Gonda Sobans Tal

[**A.** Brick Kiln Near Wetland, **B.** Hunted Bird Remains, **C.** Nil Gai Moving Through Paddy Field]

8.3.3 **Shivnathpatti Talab :** The wetland is located near Dasrathpatti, Shivnathpatti and Shivsewakpatti village at latitude 25°16'41.04"N and longitude 82°19'47.89"E [Refer Map 9 & Table No. 5 (Wetland No. 212)]. Currently wetland is under eutrophic condition due agricultural runoff and sewage discharge. The wetland once used for fishing and for the cultivation of *Trapha natans* in now covered with wetland grasses [Refer Image No. 20]. For the last 15 years the wetland is completely abandoned and is encroached from its eastern boundary. The current water spread area of the wetland is 15.5 hectare. From 1925-1931 to 2020-2021, the water spread area of wetland is reduced by 45.32%. This is because of the encroachment, lack of riparian vegetation, agricultural runoff, dumping of solid waste and utilization of wetland area for agricultural activities.



Map 9 : Map Showing Shivnathpatti Talab And Its Environ

Image 20 : Shivnatpatti Talab [Looking Northward]

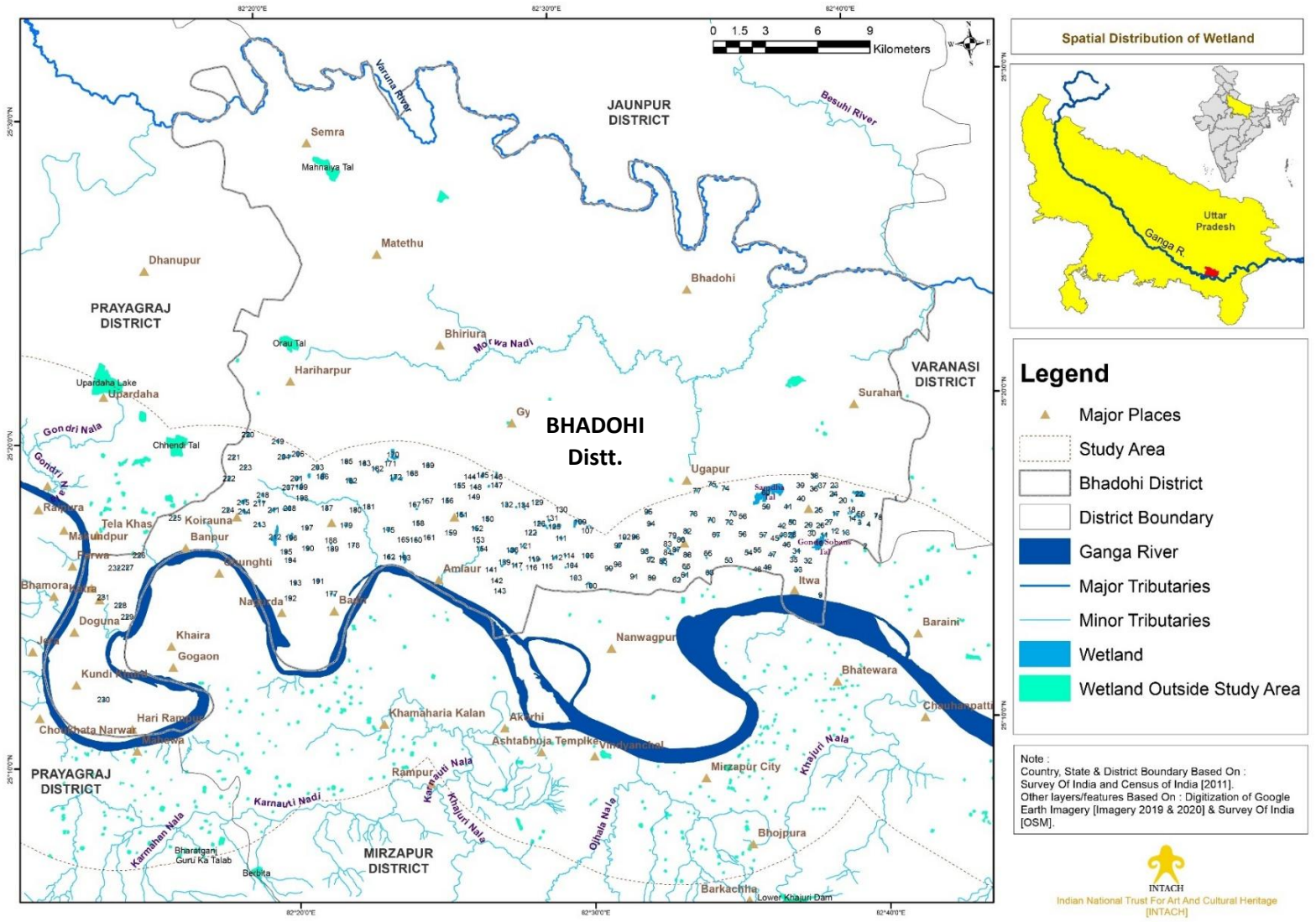
8.4 Apart from the wetlands within study area there are 8 major wetlands identified throughout the Bhadohi District. The Urau Tal is a major habitat for the avian diversity and is an emergence site for the Morwa river is under threat due to increasing anthropogenic activities [Refer Image No. 21 & 22]. The location of identified wetland provided in Table No. 6.

Table 6 : Major Wetland Outside Study Area

Sr. No	Wetland Name/ Wetland Number	Coordinates	
		Latitude	Longitude
1	1	25°20'36.21"N	82°37'48.30"E
2	2	25°25'24.82"N	82°30'45.09"E
3	Urau Tal	25°22'33.70"N	82°20'46.54"E
4	Urau Tal	25°22'24.64"N	82°21'52.27"E
5	5	25°26'54.42"N	82°26'12.43"E
6	6	25°28'4.58"N	82°21'26.85"E
7	Mahnaiya Tal	25°27'53.04"N	82°22'30.02"E
8	8	25°18'1.82"N	82°41'22.02"E

Image 21 : Urau Tal

Image 22 : Group Of Brick Kilns Near Urau Tal



Map 10 : Spatial Distribution Of Wetlands In The Study Area

9.0 Riparian Flora Along Ganga River In Bhadohi Distt.

9.1 The riparian areas, lying between the aquatic and the terrestrial habitats, serve as functional interfaces within the landscapes, mediating energy and matter between these two ecosystems. With dynamic environmental conditions and ecological processes, these areas tend to harbour rich biodiversity. A major component of this biodiversity is the plant communities growing along the river bank which are interacting with both terrestrial and aquatic ecosystems. The riparian vegetation is significant in the overall ecology and environmental aspects of the region owing to its important roles in soil conservation, harbouring faunal diversity and providing livelihood resources [Groffman et al., 1990; Castelle al., 1994].

9.2 Till some time ago, no proper systematic sampling had been undertaken or record had been maintained for the riparian plant diversity all along Ganga River. There are however, some scattered but significant works of Auden [1941], Gupta [1960], Bhattacharyya and Goel [1982], Groffman et al. [1990], Krishanmurti [1991], Castelle al. [1994], Shyam [2008], Gangwar and Joshi [2006] and Gangwar and Gangwar [2011] which have explored the biodiversity of Ganga River basin. Also, a detailed study published in the form of a book titled: "The Ganga – A Scientific Study" edited by Krishnamurti [1991] documents 475 riparian plant species from Rishikesh to Chinasura [Bengal].

9.3 The pattern of riparian vegetation in Bhadohi distt. is similar to the Kaushambi and Prayagraj and Mirzapur District. Major riparian sites are found between Kundi Khurd and Hari Rampur and Barji Kalan and Ghamhapur and along the stream/ Nara. There are 45 riparian plant species recorded within the study area. The list of species provided in table no. 7. The flat floodplain of Ganga River usually gets flooded and is dominated by *Saccharum spontaneum* [Kaas/ Kans], *Saccharum munja* [Munj], *Desmostachya bipinnata* [Kusha] and *Ziziphus nummularia* [Wild Ber]. *Ipomoea spp.* and *Polygonum spp.* found in patches throughout the stretch. The canopy cover of upland tracts is formed mainly by the *Acacia nilotica* [Babool], *Dalbergia sissoo* [Siso] and *Prosopis juliflora* [Bilaiti Kikar]. Species like *Azadirachta indica* [Neem], *Ficus benghalensis* [Bargad], Ficus *religiosa* [Peepal], *Ficus virens* [Pakad] and *Mangifera indica* [Aam], are found to be associated with temples, Ashrams built at the river bank. Herbaceous layer of the riparian patch is covered with *Cynodon dactylon* [Doob], *Dichanthium annulatum, Xanthium strumarium [Chota Dhatura], Parthenium histerophorus* [Congress Grass] and *Lantana camara* [at few sites].

Image 23 : Riparian Vegetation Along Ganga River In Dubeypur
[*Acacia nilotica* covering the canopy while the herbaceous layer covered with *Xanthium strumarium, Parthenium histerophorus* and *Cynodon dactylon*]

Table 7 : Recorded Riparian Plant Species Within Study Area

Sr. No.	Botanical Name	Family	Common Name
1.	*Acacia nilotica* (L.) Delile	Fabaceae	Babool
2.	*Aegle marmelos* (L.) Corrêa	Rutaceae	Bel or sirphal
3.	*Azadirachta indica* A. Juss.	Meliaceae	Neem
4.	*Bombax ceiba* L.	Bombacaceae	Semal
5.	*Dalbergia sissoo* DC.	Fabaceae	Shisham
6.	*Delonix regia* (Hook.) Raf.	Fabaceae	Gulmohar
7.	*Ficus benghalensis* L.	Moraceae	Banyan
8.	*Ficus religiosa* L.	Moraceae	Peepal
9.	*Ficus virens* Aiton	Moraceae	Pakad
10.	*Holoptelea integrifolia* Planch.	Ulmaceae	Chilbil

11.	*Madhuca longifolia var. latifolia* (Roxb.) A.Chev.	Sapotaceae	Mahua
12.	*Peltophorum pterocarpum* (DC.) K.Heyne	Fabaceae	Peela Gulmohar
13.	*Polyalthia longifolia* (Sonn.) Thwaites	Annonaceae	False Ashok
14.	*Tectona grandis* L.f.	Lamiaceae	Teak
15.	*Calotropis gigantea* (L.) Dryand.	Apocynaceae	Safed Aak
16.	*Calotropis procera* (Aiton) Dryand.	Apocynaceae	Aak
17.	*Lantana camara* L.	Verbenaceae	-----
18.	*Malvastrum coromandelianum* (L.) Garcke	Malvaceae	False Mallow
19.	*Psidium guajava*	Myrtaceae	Guava
20.	*Carica papaya* L.	Caricaceae	Papaya
21.	*Phyllanthus emblica*	Phyllanthaceae	Amla or Awla
22.	*Magnifera Indica*	Anacardiaceae	Mango
23.	*prosopis julifora*	Fabaceae	Vilayti Keekar
24.	*Ocimum tenuiflorum L.*	Lamiaceae	Tulsi
25.	*Polygonum glabrum* Willd.	Polygonaceae	Common marsh buckwheat
26.	*Ricinus communis* L.	Euphorbiaceae	Arandi
27.	*Ziziphus nummularia* (Burm.f.) *Wight &Arn.*	Rhamnaceae	Wild Ber
28.	*Achyranthes aspera* L.	Amaranthaceae	Chirchira
29.	*Amaranthus spinosus* L.	Amaranthaceae	Prickly Amaranth
30.	*Croton bonplandianus* Baill.	Euphorbiaceae	Ban Tulsi
31.	*Justicia* sp.	Acanthaceae	-----

32.	*Parthenium hysterophorus* L.	Asteraceae	Congress grass
33.	*Rumex dentatus* L.	Polygonaceae	Jungli Palak
34.	*Solanum xanthocarpum* Schrad. & H. Wendl.	Solanaceae	Kateli
35.	*Tephrosia purpurea* (L.) Pers.	Fabaceae	Sharpunkha
36.	*Tridax procumbens* (L.) L.	Asteraceae	-----
37.	*Xanthium strumarium* L.	Asteraceae	Chhota Dhatura
38.	*Cyperus difformis* L.	Cyperaceae	-----
39.	*Cyperus rotundus* L.	Cyperaceae	Nut grass
40.	*Dicanthium annulatum*	Poaceae	-----
41.	*Saccharum spontaneum* L.	Poaceae	Kaans
42.	*Saccharum munja* Roxb.	Poaceae	Munj
43.	*Butea monosperma (Lamb.) Taub.*	Fabaceae	Palash
44.	*Desmostachya bipinnata*	Poaceae	Kusha
45.	*Ziziphus nummularia (Burm.f.) Wight & Arn.*	Rhamnaceae	Wild Ber

9.6 Some riparian grasses are economically valuable in the district. *Saccharum spontaneum* and Saccharum *munja* are used for making huts, basket and ropes. Small sized baskets are locally called daliya and larged sized baskets are called Dala. A large sized basket costs around 150 and is sold at local market in Gopiganj. Ropes [locally called Baadh] made of Saccharum *spontaneum* are more durable. A bundle of rope of nearly 1.5 Kg weight costs around 40-50 rupees and is also sold at local market. Many fishermen families [apart from fishing activities] are depended on *Saccharum spp.* for their livelihood. Conversion of riparian vegetation into agricultural fields may destroy the livelihood opportunities.

Image 24 : Riparian Vegetation Dominated By *Saccharum spontaneum*
[*Madhuca longifolia, Mangifera Indica* and *Tectona grandis* covering the canopy]

Image 25 : Riparian Vegetaion Along Nara At Sitamarhi [Looking Northward]

10.0 Faunal Diversity Along Ganga River In Bhadohi Distt.

10.1 Forest area within the Bhadohi Distt. is 175 Hectare only and is covered under reserved, protected, private and unclassified forests[5]. According to India State of Forest Report [2019], 3.12% geographical area of the district is under open forest. Very dense forest and moderately dense forest is not present in the district[6]. Few patches of riparian vegetation are found along the river and it provides the habitat to Fox [*Vulpes bengalensis*], Hare [*Lepus ruficaudatus*], Indian Porcupine [Hystrix leucura], Golden Jackal [*Canis aureus*], Nilgai [*Boselaphus tragocamelus],* Indian wild boar [*Sus scrofa*], Monkey [*Rhesus macaque*] and Langur [*Semnopithecus spp.*].

10.2 Nilgai [*Boselaphus tragocamelus*] and Monkey [*Rhesus macaque*] are also found in variable numbers across the district and known to destroy crops. Manjhara and its surrounding areas are habitat to the Indian Wild Boar [*Sus scrofa*] population. Local communities mentioned that they have stopped sowing potatoes and vegetation due to damage caused by Wild Boar population. Herd of Monkeys [*Rhesus macaque*] can be seen in agricultural fields during the sowing period for picking of seeds. Langurs [*Semnopithecus spp.*] are less sighted species in the study area.

10.3 Major instream fauna recorded within study area are - Gangetic Dolphin [*Platanista gangetica*], Indian soft-shell Turtle [*Nilssonia gangeticus*] and Indian-roofed Turtle [*Pangshura tecta*]. Gangetic Dolphin is commonly known as 'sos or sus' and is categorised as Endangered under the IUCN Red List of Threatened Species. During survey period, the Gangetic Dolphin was sighted at Dubeypur, Chaturbhuj Ghat and at Sita Marhi Ghat. A member of fishermen community at Sita Marhi Ghat mention that around 10-12 number of *sus* [dolphin] is present between Dubeypur and Birahimpur Ghat. Population of turtle species are in good numbers at the trijunction of Prayagraj, Badohi and Mirzapur district. This is because of the presence of two huge sand bars. This year [2021] administration has shifted the Ramnagar Turtle Sanctuary of Varanasi to a 30 Km stretch of Ganga River in Prayagraj, Mirzapur and Bhadohi Distt. Around 15 Km of the turtle sanctuary falls within the Bhadohi Distt. between Village Arai Karaundhia

[5] District Industrial Profile of Sant Ravidas Nagar (Bhadohi)
http://dcmsme.gov.in/old/dips/Distt.%20Industrial%20Profile%20of%20Bhadohi.pdf
[6] India State of Forest Report [Uttar Pradesh], 2019
https://fsi.nic.in/isfr19/vol2/isfr-2019-vol-ii-uttar-pradesh.pdf

and Sitamarhi-Baripur[7]. The Sarnath Turtle Breeding Centre will be Relocated to Kothri Ghat of Prayagraj District. The location of Turtle Sanctuary is provided in Image No.

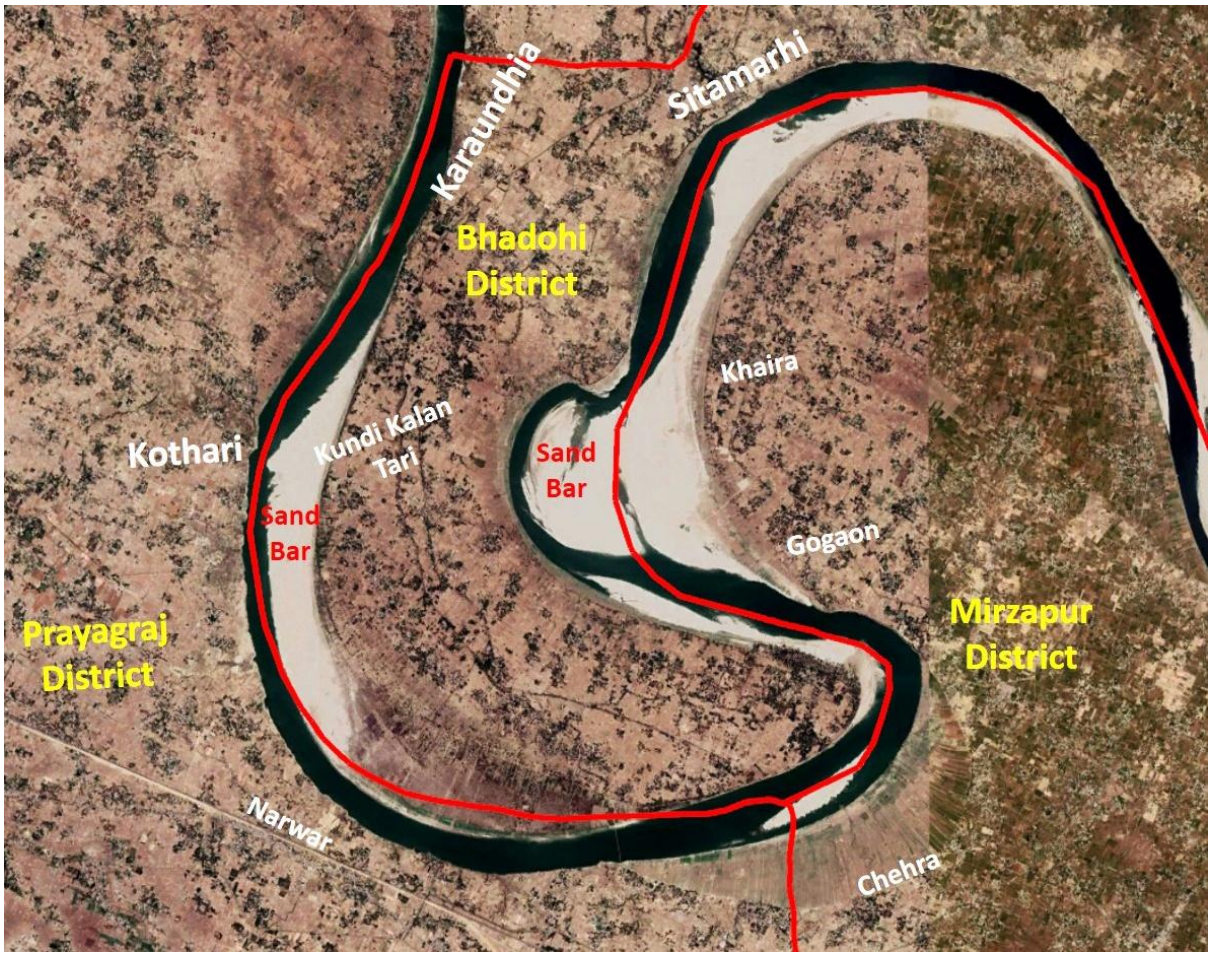


Image 26 : Satellite Imagery Showing Location Of The Turtle Sanctuary

10.8 Avian Diversity: India falls within the Central Asian Flyway [CAF] and is utilized by 307 species of migratory avian species, most of them coming from region of Central and North Asia. The migratory species are the indicators of well-connected ecosystems and structural diversity of aquatic vegetation and the abundance of benthic and emerging invertebrates. Bhadohi Distt. has a rich diversity of avian species yet is relatively understudied. Avian fauna is recorded throughout the study corridor during the field survey in November 2021. Major survey sites are – Samdha Tal, Gond Sobans Tal, Urau Tal [Outside the study area] and the river bank. A total of 80 species of birds were sighted during the field visits in the district of which, 24 were wetland species. The

[7] Amar Ujala [27th July 2021, accessed dated 24 December 2021]
https://www.amarujala.com/uttar-pradesh/bhadohi/15-km-area-of-district-turtle-century-reserve-bhadohi-news-vns6028201166

remaining 56 were species of grassland and forest community including 2 species of raptors. Based on the identified species, following observations were made:

- White throated kingfisher, Little Egret, Cattle Egret, Indian Pond Heron, House Sparrow, Jungle Crow, Common Myna, Bank Myna, Asian Pied Starling, Common Pigeon, Common Babbler, Spotted Dove, Eurasian Collared Dove and White Wagtail were the most frequently sighted species.
- **Alexandrine Parakeet** and **River Lapwing** which have been listed in **Near Threatened** category of IUCN's Red Data List were also sighted.
- **Black-headed Gull**, **Common Greenshank**, **Black Redstart**, **White Wagtail**, **Grey Wagtail**, **Yellow Wagtail** and **Common Stonechat** are the winter visitors, migrate from the north-western areas of the Indian Sub-Continent and Northern Himalayas, sighted along the river in the district. **Indian Cormorant** and **Common Sandpiper** are the local winter migrants to the Gangetic Plains. (Birds of Indian Subcontinent: Richard Grimmett, Carol Inskipp and Tim Inskipp).

Table 8 : List Of Recorded Avian Species Within Bhadohi District

Sr. No.	Common Name	Scientific Name	Conservation Status
1.	White throated Kingfisher	*Halcyon smyrnensis*	Least Concern
2.	Pied Kingfisher	*Ceryle rudis*	Least Concern
3.	Cattle Egret	*Bubulcus ibis*	Least Concern
4.	Little Egret	*Egretta garzetta*	Least Concern
5.	Intermediate Egret	*Ardea intermedia*	Least Concern
6.	Great Egret	*Ardea alba*	Least Concern
7.	Indian Pond Heron	*Ardeola grayii*	Least Concern
8.	Grey Heron	*Ardea cinerea*	Least Concern
9.	Purple Heron	*Ardea purpurea*	Least Concern
10.	Common Sandpiper	*Actitishypoleucos*	Least Concern
11.	Asian Openbill	*Anastomus oscitans*	Least Concern
12.	Little Cormorant	*Microcarbo niger*	Least Concern
13.	Indian Cormorant	*Phalacrocorax fuscicollis*	Least Concern
14.	White breasted - Waterhen	*Amaurornis phoenicurus*	Least Concern
15.	Common Moorhen	*Gallinula chloropus*	Least Concern
16.	Lesser Whistling-duck	*Dendrocygna javanica*	Least Concern

17.	Little Grebe	*Tachybaptus ruficollis*	Least Concern
18.	Black-headed Gull	*Larus ridibundus*	Least Concern
19.	Purple Swamphen	*Porphyrio porphyrio*	Least Concern
20.	River Tern	*Sterna aurantia*	Vulnerable
21.	Eurasian Coot	*Fulica atra*	Least Concern
22.	Common Greenshank	*Tringa nebularia*	Least Concern
23.	Black-winged Stilt	*Himantopus himantopus*	Least Concern
24.	Bronze-winged Jacana	*Metopidius indicus*	Least Concern
25.	**River Lapwing**	***Vanellus duvaucelii***	**Near Threatened**
26.	Red-wattled Lapwing	*Vanellus indicus*	Least Concern
27.	Black Drongo	*Dicrurus macrocercus*	Least Concern
28.	Common Myna	*Acridotheres tristis*	Least Concern
29.	Bank Myna	*Acridotheres ginginianus*	Least Concern
30.	Asian Pied Starling	*Gracupica contra*	Least Concern
31.	Brahminy Starling	*Sturnia Pagodarum*	Least Concern
32.	Paddyfield Pipit	*Anthus rufulus*	Least Concern
33.	Common Stonechat	*Saxicola torquatus*	Least Concern
34.	Pied Bushchat	*Saxicola caprata*	Least Concern
35.	Indian Bushlark	*Mirafra erythroptera*	Least Concern
36.	Oriental Skylark	*Alauda gulgula*	Least Concern
37.	Common Babbler	*Argya caudata*	Least Concern
38.	Jungle Babbler	*Argya striata*	Least Concern
39.	Large Grey Babbler	*Argya malcolmi*	Least Concern
40.	White Wagtail	*Motacilla alba*	Least Concern
41.	Grey Wagtail	*Motacilla cinerea*	Least Concern
42.	White-browed Wagtail	*Motacilla maderaspatensis*	Least Concern
43.	Yellow Wagtail	*Motacilla flava*	Least Concern
44.	Indian Silverbill	*Euodice malabarica*	Least Concern
45.	Common Tailorbird	*Orthotomus sutorius*	Least Concern
46.	**Alexandrine Parakeet**	***Palaeornis eupatria***	**Near Threatened**
47.	Rose-ringed Parakeet	*Psittacula krameri*	Least Concern
48.	House Sparrow	*Passer domesticus*	Least Concern
49.	Indian Jungle Crow	*Corvus culminatus*	Least Concern
50.	House Crow	*Corvus splendens*	Least Concern

51.	Oriental Magpie Robin	*Copsychus saularis*	Least Concern
52.	Indian Robin	*Saxicoloides fulicatus*	Least Concern
53.	Common Pigeon	*Columba livia*	Least Concern
54.	Streak throated Swallow	*Petrochelidon fluvicola*	Least Concern
55.	Asian Plain Martin	*Riparia chinensis*	Least Concern
56.	Brown-headed Barbet	*Psilopogon zeylanicus*	Least Concern
57.	Coppersmith Barbet	*Psilopogon haemacephalus*	Least Concern
58.	Ashy Prina	*Prinia socialis*	Least Concern
59.	Plain Prinia	*Prinia inornata*	Least Concern
60.	Asian Koel	*Eudynamys scolopaceus*	Least Concern
61.	Greater Coucal	*Centropus sinensis*	Least Concern
62.	Red-whiskered Bulbul	*Pycnonotus jocosus*	Least Concern
63.	Red-vented Bulul	*Pycnonotus cafer*	Least Concern
64.	Common Kaestral	*Falco tinnunculus*	Least Concern
65.	Black-winged kite	*Elanus caeruleus*	Least Concern
66.	Green Bee-eater	*Merops orientalis*	Least Concern
67.	Scaly-breasted Munia	*Lonchura punctulata*	Least Concern
68.	Indian Peafowl	*Pavo cristatus*	Least Concern
69.	Spotted Dove	*Spilopelia* chinesis	Least Concern
70.	Eurasian Collared Dove	*Streptopelia decaocto*	Least Concern
71.	Laughing Dove	*Spilopelia senegalensis*	Least concern
72.	Red Turtle Dove	*Streptopelia tranquebarica*	Least concern
73.	Yellow-crowned Woodpecker	*Leiopicus mahrattensis*	Least concern
74.	Black Redstart	*Phoenicurus ochruros*	Least concern
75.	Grey Fancolin	*Ortygornis pondicerianus*	Least concern
76.	Yellow-footed Green-pigeon	*Treron phoenicopterus*	Least concern
77.	Rufous Treepie	*Dendrocitta vagabunda*	Least concern

78.	Purple Sunbird	*Cinnyris asiaticus*	Least concern
79.	Indian Roller	*Coracias benghalensis*	Least concern
80.	Indian Grey Hornbill	*Ocyceros birostris*	Least Concern

Image 27 : Herd Of Nilgai *[Boselaphus tragocamelus]* Sighted Near Misirpur Village

Image 28 : Flocks Of Little Cormorant And Indian Cormorant With Pond Heron

Image 29 : Eurassian Collared Dove

11.0 Ganga Riverine Islands In Bhadohi Distt.

The riverine fluvial islands are present in many major rivers and are defined as 'land masses within a river channel that are separated from the floodplain by water on all sides and exhibiting some kind of stability' [Osterkamp, 1998]. Islands may not be permanent on the geologic time scale owing to the river meandering, climate change, etc. but can remain in place over decadal or century time scales and hence exhibit stability [Wyrick & Klingeman, 2011].

11.1 Riverine Island is not present in full in Bhadohi District. However, a huge island [named Manjhara] with pristine vegetation is shared with Mirzapur District near village Barji Kalan of Bhadohi District at Latitude 25°12'12.35"N and Longitude 82°29'13.59"E. The riparian species – *Saccharum spontaneum*, Saccharum munja and Ziziphus spp. dominates the island. Island provides habitat to avian species and Indian wild boar (*Sus scrofa* L.). Currently the edge of the island is under cultivation due drying of Ganga River channel [Refer Image No. 30]

Image 30 : Image Showing Manjhara Island And Agricultural Field At Its Edges

11.2 Apart from the riverine island there are two huge sand bars located at coordinate 25°13'2.73"N, 82°20'45.71"E and 25°13'13.12"N, 82°14'41.50"E respectively. The nearest settlement to the sand bar is Dig and Itahra [Left Bank], Khaira and Gogaon [Right Bank] and Biharimpur and Muhammadpur [Left Bank] and Gaura Khas and Jhiwar [Right Bank] respectively. Both islands are located within newly designated turtle

sanctuary. There are few sand mining sites located at both sites. Recently, sand mining is banned at few sites in Bhadohi District [Refer Section 15 of this report].

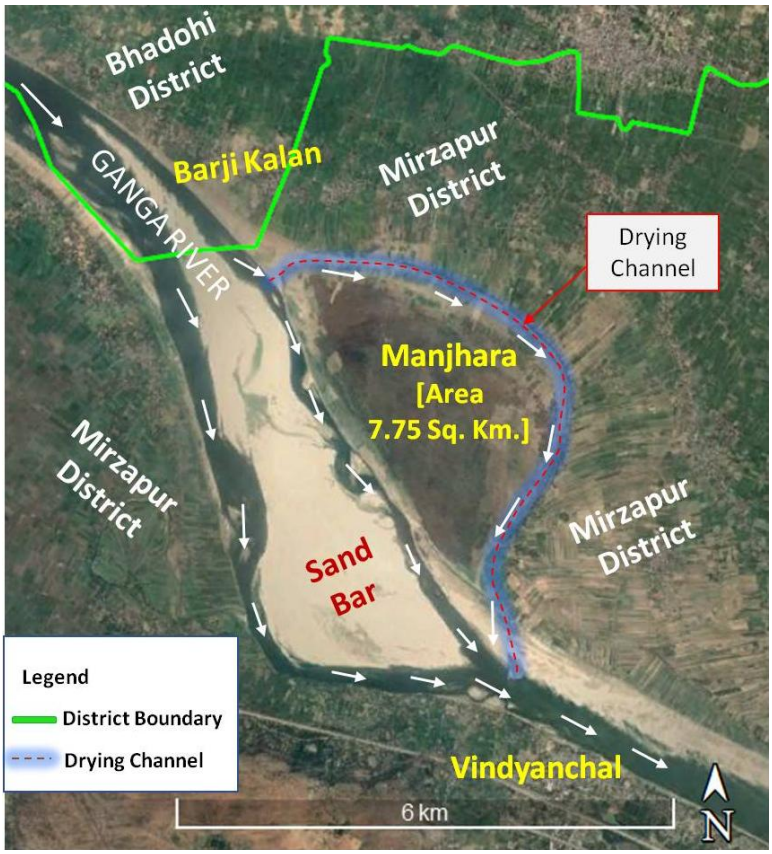


Image 31 : River Islands Named Manjhara Near Barji Kalan

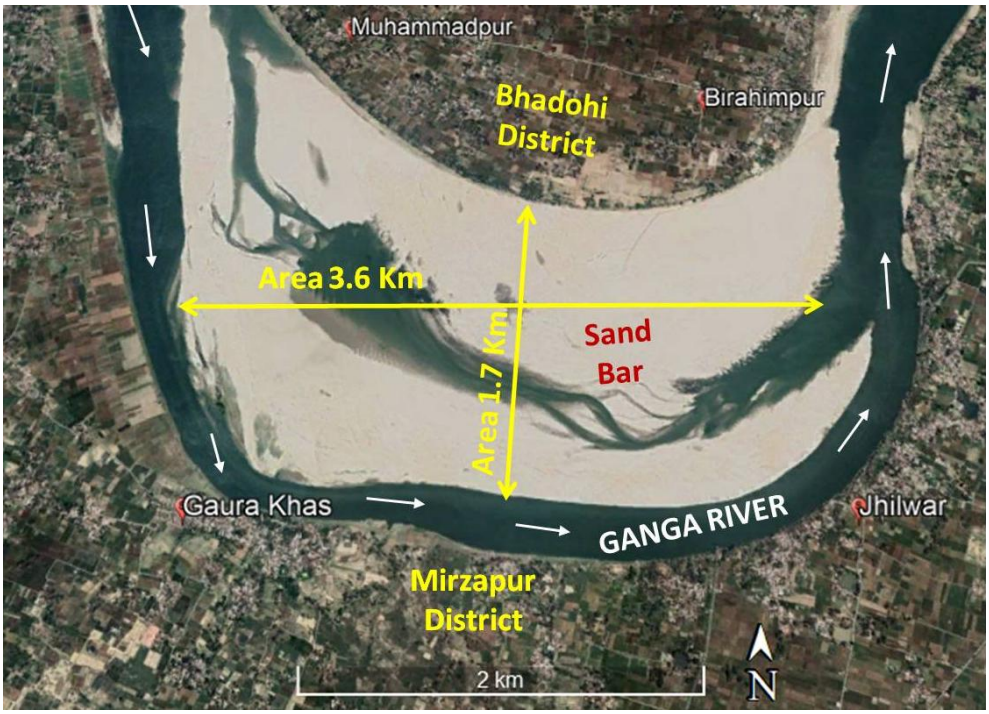


Image 32 : Satellite Imagery Showing Sand Bar Located at 25°13'2.73"N, 82°20'45.71"E
[Source : Google Earth Imagery, March 2020]

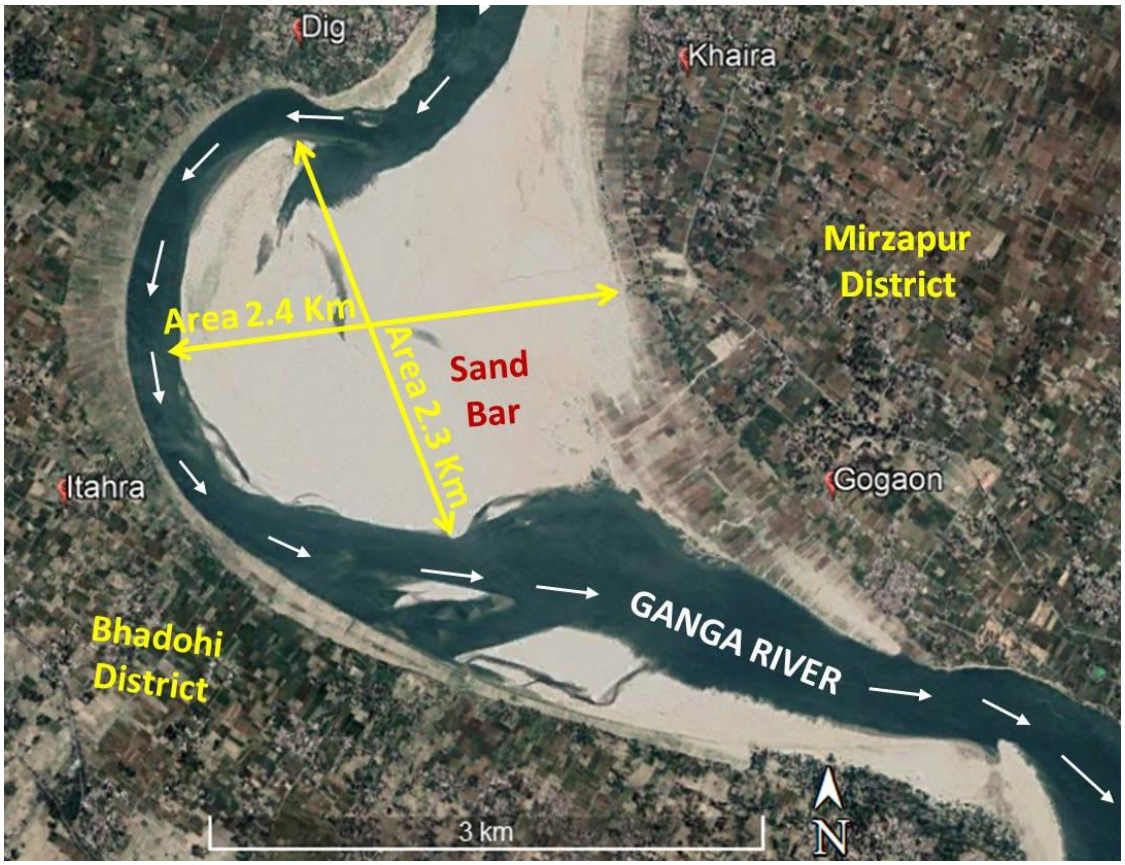


Image 33 : Satellite Imagery Showing Sand Bar Located at 25°13'2.73"N, 82°20'45.71"E

[Source : Google Earth Imagery, March 2020]

Image 34 : Sand Bar Near Birahimpur Village

12.0 Fishing In Bhadohi Distt.

12.1 Fish resources of Ganga River have been an important source of livelihood and food security for millions of people residing along its banks. Ganga river supports a diverse fish fauna with about 260 species reported for Indian waters (Sinha and Khan, 2001) among which about 35 species have been identified as having highest commercial value including carps (*Cyprinidae*), snakeheads (*Channidae*) and catfish (*Siluriformes*) (Islam et al., 2006). In recent years, the diversity and population of the fish resources have declined due to various anthropogenic factors. The factors are – deterioration of water quality, damming, introduction of exotic species, alternation in migratory routes of fishes and use of small mesh sizes of fishing nets.

12.2 In Bhadohi Distt. Mallah community is mainly involved in the fishing activity throughout the Ganga stretch. The hook and line, drag net and cast net is common fishing gears among fishermen in Bhadohi Distt.. According to fishermen community they get a good catch in post- monsoon season. During that period, gill nets and seine nets were kept overnight in waters and removed early in the morning. There are 15 fish species recorded during the site visit. The details are provided in the Table No. 09.

12.3 In last 15-20 years, the fish catch has reduced by 50-70%. Fisherman at Chaturmukh Ghat mentioned that they are hardly getting 3-4 Kg of catch after working 5-6 hours a day. Out of 15 recorded species, the common carp (*Cyprinus carpio) and Tengara (Mystus tengara)* forms the major portion of the catch. Old fishermen near Gulauri Ghat mention that the size of fishes has also reduced. This may be due to use of small mesh size fishing nets. Mallah community near Sitamarhi Ghat, reveal that during monsoon season fishes generally migrate to the small stream/Nara and return after 2-3 months with juvenile population. Some fishermen use nets at the confluences to catch the fish. Fishing of juvenile fish population may be one of the reasons behind the decline in fish catch within the District.

Table 9 : List of Fish Species RecordedIn Ganga Stretch In Bhadohi District

Sr. No.	Scientific Name	Common Name
1	*Labeo rohita*	Rohu
2	*Labeo catla*	Catla/Bhakur
3	*Wallago attu*	Buari/Barari
4	*Mystus tengara*	Tengara

5	*Puntius sp.*	Sidhari
6	*Cyprinus carpio*	Common/Chinese carp
7	*Channa punctata*	Garai
8	*Eutropiichthys vacha*	Bachwa
9	*Anguilla bengalensis*	Baam
10	*Cirrhinus mrigala*	Naini
11	*Mastacembelus armatus*	Gaichi
12	*Cabdio morar*	Chepua
13	*Heteropneustes fossilis*	Singhi
14	*Bagarius yarrelli*	Goonch
15	*Puntius chola*	Pothiya

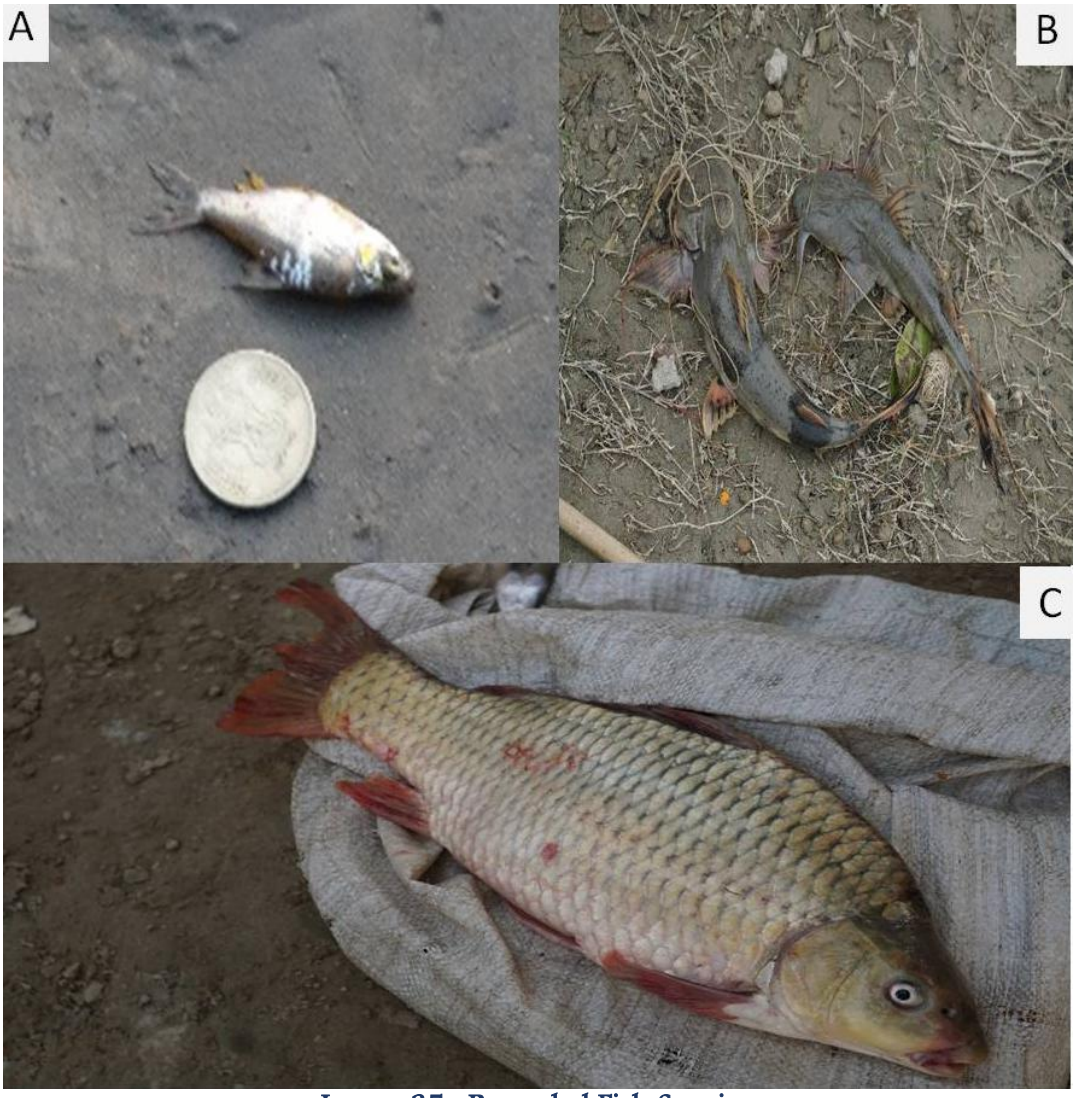


Image 35 : Recorded Fish Species
[A. *Puntius chola* (Pothiya), B. *Bagarius yarrelli* (Goonch), C. *Cyprinus carpio* (Common Carp)]

13.0 Groundwater Condition Bhadohi District

13.1 Ground water characteristics of a particular area are subject to several natural factors like precipitation, drainage, topography, lithology and hydrogeological conditions of the region. It is also influenced by human induced factors like groundwater withdrawal and changes in land use pattern. Bhadohi district is divided into two broad units, namely, the upland and the low land plains. Major part of the district is occupied by upland plains of the older alluvium. The older alluvium with Reh deposits, found along the main river course and depressions, are prone to frequent floods during the rainy season. The silty loam deposits are found in low land plains over the flood plains[8]. The Major soil types of the study area are – the Dumar or Loam soil, Matiyar or Clay soil and the Bhur or Sand. Deegh Developmental Block and Aurai Developmental Block of Bhadohi District are located within the study area. The major depressions within the study area include – the area along Samdha Tal, Gonda Sobans Tal and Tal Gird Bargaon in Aurai Developmental Block.

13.2 On the basis of groundwater resource utilization, Central Ground Water Board (CGWB) has assessed the block wise ground water resource throughout the country. According to 2017 and 2020 assessment, both Deegh and Aurai Developmental Block fall within Semi-Critical category. The remaining four blocks of the districts are under Semi-Critical and Critical category as per 2017 assessment and are under Semi-Critical category in 2020 assessment. As per 2017 ground water resource assessment, stage of ground water extraction of Deegh and Aurai Developmental Block is 74.94% and 88.04% respectively. According to partially ground water contaminated area study of CGWB, ground water of Bhadohi districted is affected by lead (above 0.01 mg/l) contamination[9].

13.3 During field visits, the survey team has interacted with local communities throughout the study corridor. It has been observed that the use of dug wells has decreased in last 15-20 years. One major cause of this decline is drying of dug wells in summer season and lack of their maintenance. In almost every village dug well is still in use and some are found to be associated with village temple. It has also been observed that ground water table of the study area is declining. This situation is similar to the ground water

[8] Ground Water Brochure of Sant Ravidas Nagar District, Uttar Pradesh [2012-2013]
[9] States Wise Details of Partly Affected Districts with Select Contaminants in Ground Water of India. http://cgwb.gov.in/WQ/Districts%20contamination.pdf

conditions of study area within adjoining districts [Prayagraj, Mirzapur and Varanasi Distt.].

13.4 Major interaction sites for groundwater observations are – Dighwat, Tulapur, Hathiadil, Basantpur, Bikrampur, Pandeypur, Bhawanipur, Chaturmukh Ghat, Birhanpur, Sitamarhi, Dasrathpatti, Shivnathpatti and Shivsewakpatti. The groundwater observations were noted and are presented in Table No. 10.

Table 10 : Water Levels In Dug Wells (Based on interactions with local communities)

Sr. No.	Location	Coordinates	GW Level (in feet)	
			Post-Monsoon	Pre-Monsoon
1	Dighwat Village	25°17'16.49"N, 82°37'32.93"E	30-32	35-38
2	Hathiadil Village	25°16'39.18"N, 82°36'30.38"E	30-35	40
3	Pandeypur Village	25°14'9.22"N, 82°27'17.62"E	40	40-45
4	Bhawanipur Village	25°14'25.95"N, 82°26'31.31"E	40	40-45
5	Basantpur Village [Near Gonda Sobans Tal]	25°15'31.67"N, 82°37'57.50"E	20-22	25
6	Chaturmukh Ghat [Near Ganga River]	25°14'50.80"N, 82°25'37.06"E	70-80	-----
7	Birhanpur Village	25°15'44.82"N, 82°23'15.25"E	100-110	120-140
8	Sitamarhi Village	25°16'23.64"N, 82°15'31.36"E	75-80	---
9	Dasrathpatti Village	25°16'28.44"N, 82°19'48.32"E	130-140	150-160
10	Sivnathpatti Village	25°16'52.90"N, 82°20'7.10"E	130-140	----
11	Shivsewakpatti	25°17'2.55"N,	130-140	----

	Village	82°20'10.66"E		

Image 36 : An Old Well In Basantpur Village [25°15'31.67"N, 82°37'57.50"E]

Image 37 : An Old Well In Birhanpur Village [25°15'44.82"N, 82°23'15.25"E]

14.0 Ganga River Bank In Bhadohi Distt.

14.1 Ganga River bank in Bhadohi district may be classified on the basis of land use and land cover. The possible classes could be – Built-up area [Settlements, Temple Complexes and cremation and burial ground], Vegetation [Plantation and riparian vegetation patches] and agricultural fields. Out of three classes, the vegetation area especially the riparian vegetation area along the River Ganga and streams/ Nara are decreasing day by day due to conversion of riparian zone into the agricultural fields and cutting of trees and shrubs for cremation. During field visits, it has been observed that the river bank area which have riparian vegetation, is stable compared to the agriculture dominated area [Refer Image No. 38 & 41]. River bank area which has recently converted into agricultural fields are prone to lateral erosion. Rills and gullies may also develop in such areas [Refer Image No. 45].

Image 38 : Satellite Imagery Showing Riparian Vegetation and Agricultural Fields Along Ganga River In Bhadohi Distt. (Left Bank), [Source : Google Earth Imagery (May 2019)]

14.2 Riparian vegetation on the upland tracts in the Kaushambi, Prayagraj, Mirjapur and Bhadohi Distt. are site of penance for generations. Several sacred caves of sages are found within these riparian patches. Within Bhadohi district a sacred cave of around 100 years associated with Haridas Baba is located near the Chaturmukh Ghat [Refer Image No. 40]. The mouth of the cave is believed to be open to Ganga River. Strong local beliefs and rituals act as catalyst for the protection of riparian patches in some

areas. Apart from the riparian patches there are several temple complexes [like Jogirababa Temple near Rampur Ghat] along the river bank. These temples also play a vital role in the bank stability as there are several trees found to be associated with these temples.

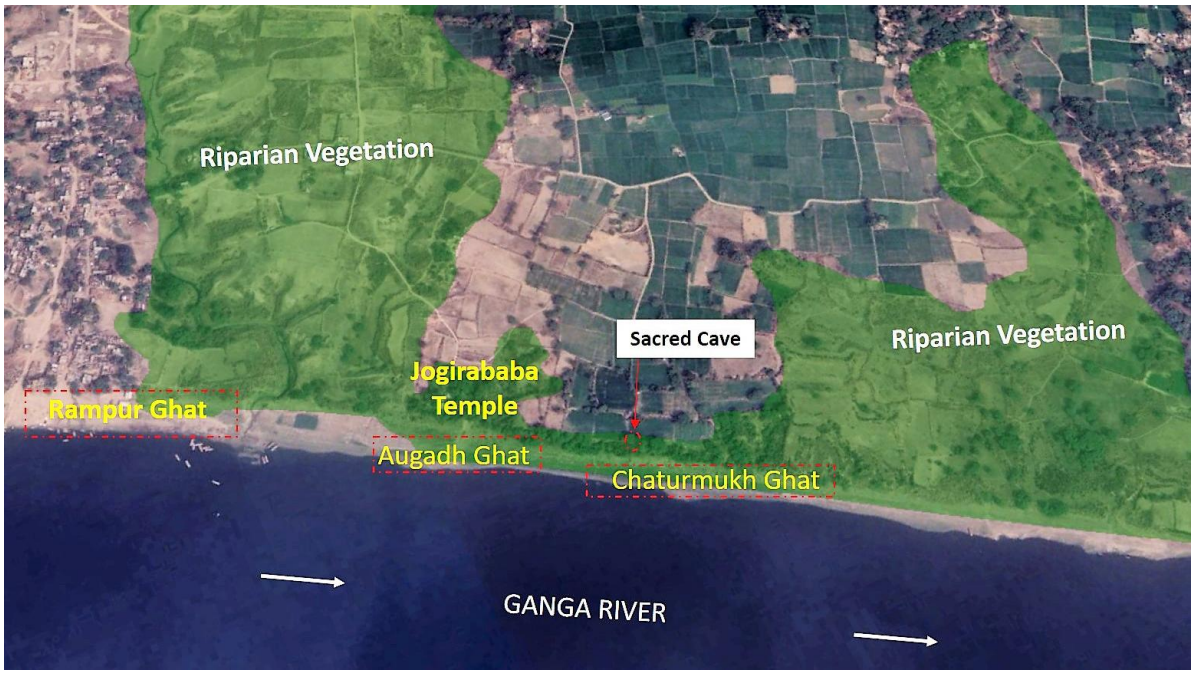


Image 39 : Satellite Image Showing Location Of Ghats, Temple And Sacred Cave
Source : Google Earth Imagery [May 2019]

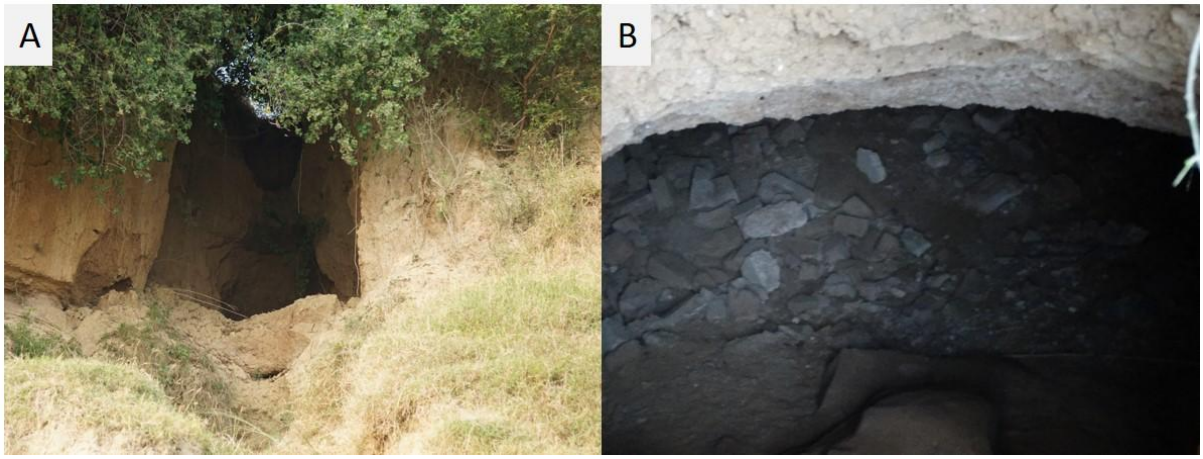


Image 40 : Abandoned Cave Near Chaturmukh Ghat (Once Used For Penance)

[**A.** Mouth of Cave towards Ganga Ghat, **B.** Mouth of Cave at Temple Near Chaturmukh Ghat]

Image 41 : Stable Bank of River Ganga Between Rampur Ghat And Augadh Ghat [left Bank]

14.3 Cremation Ground Along Ganga River Bank

14.2.1 Ganga River Banks are used as cremation and burial ground for generations. There are 9 major cremation sites identified within Distt. along the river. Few Hindu burial sites are found near Birhimpur and Ibharimpur in Bhadohi Distt.. Rampur ghat and Gulauri Ghat is only dedicated ghats for the Cremation. Ghats like Chaturmukh ghat and Augadh Ghat used for both bathing and the cremation.

14.2.2 Upon interaction with the local communities, it has been found that people prefer to cremate as per their convenience at any Ganga ghat. It has been found that cremation infrastructure has been created at Rampur Ghat, Ibrahimpur Ghat and the Gulauri Ghat, still people prefer to cremate at the river edges as "it is easy to mix body ashes to Ganga River when bodies are burnt at the edges." Also, the cremation infrastructure is limited and not in proper condition.

14.2.3 For cremation of a body requires approximately 250-300 kg wood depending on the body weight. The wood of mango *[Mangifera indica]* is preferred for the

cremation. During unavailability of mango wood use of *acacia nilotica, prosopis juliflora, saccharum munja saccharum spontaneum, Desmostachya bipinnata* and cow dung cake is common. Depending upon the availability other riparian grasses are also used to cremate. The cost of the wood ranges Rs. 300-400 per quintal. The overall cost of each cremation goes upto 1500-2000 rupee. The cost of cremation maybe higher for the poor families belongs to local communities. Thus, some of them prefer to go for burial rather than cremation. Burials are also done to the dead bodies of kids, teens and sages. Burials are usually done at Ganga River sand at a depth of 5-6 feet. Burial in Hindu religion is common in Kaushambi District [major site near Afjalpur Saaton], Pratapgarh District Prayagraj District, [major site at Sringverpur] and Bhadohi District.

Image 42 : Cremation At The Edge of River Ganga At Augadh Ghat [Near Rampur Ghat]

Table 11 : Cremation And Burial Sites In The Study Area

Site	Location		Burial Site/ Cremation Site
	Latitude	Longitude	
Birhimpur	25°13'47.30"N	82°21'33.19"E	Burial and Cremation Site
Biraspur	82°22'49.55"E	82°22'49.55"E	Cremation site

Bihrozpur	25°15'42.10"N	82°23'21.56"E	Cremation site
Dwarkapur	25°13'50.13"N	82°38'14.62"E	Cremation Site
Rampur Ghat	25°14'56.95"N	82°25'23.19"E	Cremation Site
Augadh Ghat	25°14'52.18"N	82°25'29.87"E	Cremation Site
Chaturmukh Ghat	25°14'49.14"N	82°25'36.02"E	Cremation Site
Gulauri Ghat	25°15'19.96"N	82°24'29.81"E	Cremation Site
Ibrahimpur	25°13'36.25"N	82°21'34.49"E	Cremation and Burial Site

Image 43 : Abandoned Cremation Infrastructure At Ibrahimpur Ghat

14.4 Ganga Bank Erosion In Bhadohi Distt.

14.4.1 Weathering of soils by natural forces is both constructive and destructive. Erosion is the chief agent responsible for the natural topographic cycles as it wears down higher elevations, banks (lateral erosion) and deposits sediments in the plains. However, erosion gets aggravated due to human interventions through land use change, excessive grazing and farming, deforestation and removal of riparian vegetation along river banks. It is well known that exposed soil may erode rapidly (Singh et al., 2004).

14.4.3 Depending on the intensity and severity of erosion, the study area [7km Buffer] maybe grouped under slight erosion category. However, increasing number of brick kilns, decrease in riparian vegetation and extensive agricultural activities may increase the rate of erosion. The lateral erosion of the banks occurs under intense rainfall accompanied by torrential flow in rivulets generating vast quantities of sediment transported downstream.

14.4.4 There are 43 lateral erosion sites marked within the study area with the help of satellite imagery [2020] and is provided in Table 11. Few selected erosion prone sites were assessed during field visit. Major eroded sites are found near village – Karaundha, Dig Village, Bankat Village, Banpur Village, Bankat Village, Gopalpur Village, Berwan Pahar, Nagarda Village, Behrozpur Village and Itwa Village.

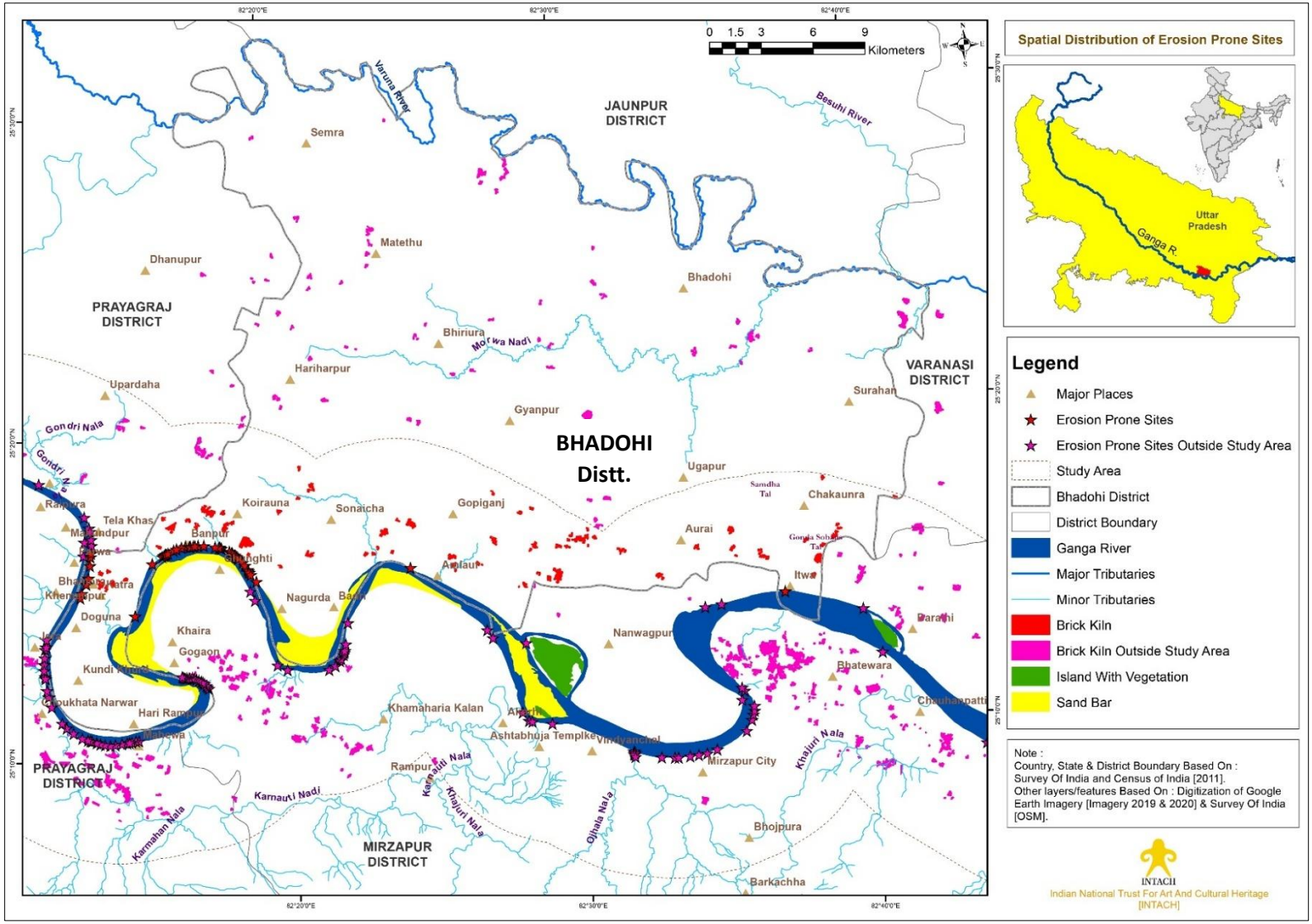
Table 12 : Erosion Prone Sites

Sr. No.	Latitude [N]	Longitude [E]	Nearest Settlement
1	25°16'25.98"N	82°13'25.95"E	Between Karaundha and Khemanpur [Left Bank]
2	25°16'19.05"N	82°13'24.54"E	
3	25°16'2.68"N	82°13'22.17"E	
4	25°15'39.30"N	82°13'17.80"E	
5	25°15'28.48"N	82°13'12.80"E	
6	25°15'11.59"N	82°13'2.78"E	
7	25°15'3.29"N	82°12'58.56"E	
8	25°14'23.99"N	82°14'49.48"E	Near Dig Village [Left Bank]
9	25°15'59.82"N	82°15'30.50"E	Near Bankat Village [Left Bank]
10	25°16'12.21"N	82°15'52.50"E	Between Sitamarhi Ghat, Banpur and Kurhwa Village [Left Bank]
11	25°16'14.11"N	82°15'55.79"E	
12	25°16'16.02"N	82°15'58.24"E	
13	25°16'16.60"N	82°16'0.49"E	
14	25°16'17.65"N	82°16'4.42"E	
15	25°16'22.77"N	82°16'15.80"E	
16	25°16'25.32"N	82°16'22.31"E	
17	25°16'27.66"N	82°16'32.72"E	
18	25°16'29.09"N	82°16'40.90"E	
19	25°16'28.53"N	82°16'48.94"E	
20	25°16'28.32"N	82°16'50.92"E	

21	25°16'28.58"N	82°16'57.03"E	
22	25°16'28.86"N	82°17'0.50"E	
23	25°16'29.13"N	82°17'6.75"E	
24	25°16'28.78"N	82°17'18.83"E	
25	25°16'25.20"N	82°17'41.61"E	Between Phulwaria and Gopalpur Village [Left Bank]
26	25°16'23.98"N	82°17'50.04"E	
27	25°16'23.35"N	82°17'52.16"E	
28	25°16'22.21"N	82°17'54.73"E	
29	25°16'15.52"N	82°18'10.28"E	
30	82°18'15.04"E	25°16'13.13"N	
31	25°16'10.62"N	82°18'17.32"E	
32	25°16'7.61"N	82°18'21.28"E	
33	25°16'5.47"N	82°18'23.62"E	
34	25°16'3.59"N	82°18'25.29"E	
34	25°16'0.97"N	82°18'27.37"E	
35	25°15'53.12"N	82°18'36.18"E	Between Berwan Pahar and Nagarda Village [Left Bank]
36	25°15'47.38"N	82°18'41.05"E	
37	25°15'39.67"N	82°18'46.40"E	
38	25°15'37.17"N	82°18'47.56"E	
39	25°15'33.85"N	82°18'48.84"E	
40	25°15'29.72"N	82°18'51.71"E	
41	25°15'16.46"N	82°19'2.58"E	
42	25°15'26.52"N	82°24'21.33"E	Near Behrozpur Village [Left Bank]
43	25°14'3.71"N	82°37'8.94"E	Near Itwa Village [Left Bank]

Image 44 : Erosion Prone Bank At Chaturmukh Ghat

Image 45 : Gully Erosion Site Near Hari Rampur



Map 11 : Spatial Distribution Of Erosion Prone Sites In The Study Region

15.0 Mining And Brick Kilns Within Study Area

15.1 **Sand Mining** : Sand is one of the major minor minerals extracted from the Ganga River, especially in its middle and lower stretch. The demand is ever increasing due to rapid expansion of settlements and their upgradation across the country. Often carried out illegally and excessively to earn large profits, sand mining is altering rivers' overall health. Excessive sand mining results in the destruction of aquatic and riparian habitats and also poses threat to bridges, river banks and nearby structures[10].

15.2 Sand mining sites at river in Bhadohi District is located between Kundi Kalan Tari and the Ibharimpur Village [Moving downwards]. Around 6.6-hectare land is under sand mining. In August 2021 local administration has removed the E-Tender of sand mining for Kundi Kalan Tari taking cognizance of Turtle sanctuary [Refer Annexure 1]. Sand mining at the right bank of River Ganga in Mirzapur District is still going on. There are 8 sites of sand mining at right bank of River Ganga. Location Of sand mining sites on left and right bank of River Ganga are provided in the Table below :

Table 13 : Location of Sand Mining Sites

Sr. No.	Village	Area [Hectare]
1	Kudi Kalan Tari [Left Bank]	2.023 [Mining Banned]
2	Ibharimpur [Left Bank]	4.047
3	Gogaon [Right Bank]	5.0
4	Khaira [Right Bank]	5.0
5	Khaira [Right Bank]	5.0
6	Baisukia [Right Bank]	5.0
7	Nadini [Right Bank]	10.0
8	Ghughuti [Right Bank]	5.0
9	Barsatpur [Right Bank]	4.0
10	Barsatpur [Right Bank]	9.0

Source : E-Tender of Sand Mining, Bhadohi and Mirzapur District [Ref. Annexure 1 & 2]

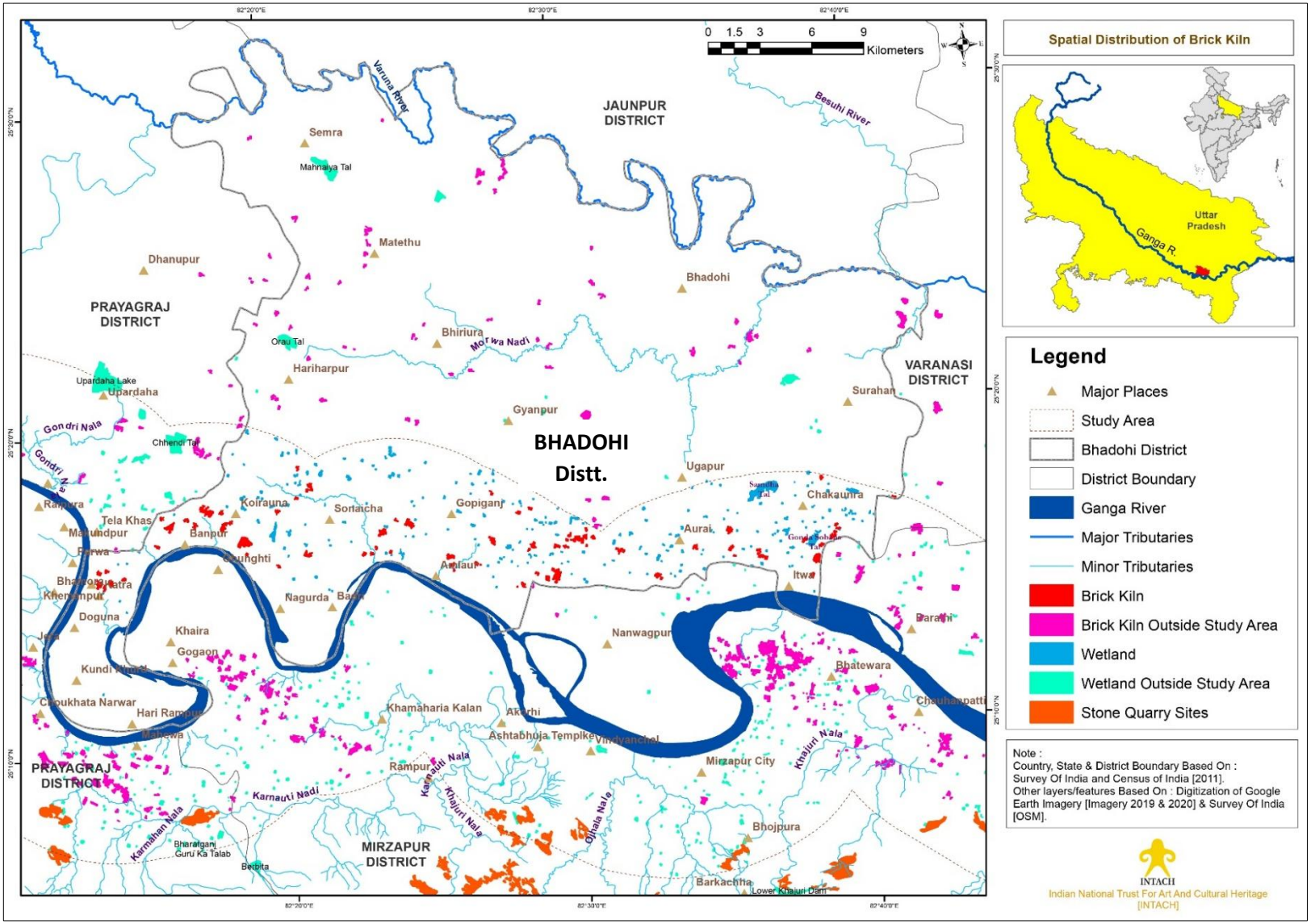
[10] Impacts of Sand Mining. ENVIS Centre on Environmental Problems of Mining, IIT Dhanbad, Jharkhand

Image 46 : Mining Site At Ibharimpur [25°13'10.53"N, 82°20'53.94"E]

15.3 **Brick Kilns:** With rapid development bricks have become one of the important building materials for construction activities. Brick kilns in the study area provide livelihood opportunity to the local community. However, this industry has posed current and potential future threats to the soil, air, biota and water system of the region. The clay digging process deteriorates the soil quality and productivity of the soil because the bricks are made from the top soil. It has been found that brick kiln sites in flood plain areas increases the rate of soil erosion. Brick kiln number within study area in Bhadohi District is less compared to the Mirzapur and Prayagraj Distt.s. Most of the brick kilns are located in the Aurai Developmental Block compared to Deegh Developmental Block within the study area. This is because of easy availability of the soil from the Samdha Tal, and Gonda Sobans Tal and adjoining areas. According to 'The Uttar Pradesh Brick Kilns (Siting Criteria from Establishment) Rules 2011' there is a distance obligation for establishment of brick kilns from roads, railways, villages, mango orchards etc. but there is no mention of distance from river, floodplains or a waterbody in these rules.

Image 47 : Brick Kiln Near Gonda Sobans Tal

Image 48 : Brick Kiln Site In Baikunthpatti Village



Map 12 : Spatial Distribution Of Brick Kilns

16.0 Boatmaking In Bhadohi Distt.

16.1 Boat making is not a popular or a profit-making profession in Bhadohi or nearby districts. Small sized boats (locally known as *Dongi*) are common for fishing activities. Medium sized boats having capacity of 15-20 people are used for ferry services and for carrying sand from river to ghats. Boats are mainly made up of Sal (locally known as Sekhua) wood (*Shorea robusta*) as it is very durable. However, the smaller *dongis* were also made from Babool (*Acacia nilotica*) and mango (*Mangifera indica*) wood which was readily available throughout the Distt. Nowadays, iron boats are taking place of traditional boats as they are cheaper than traditional boats and are leak proof and easy to repair.

16.2 Boat making expenditures are same in Kaushambi, Prayagraj, Mirjapur and Bhadohi District. Small boats [*Dongi*] made from wood costs around Rs.70,000/-. Similar sized iron boats with motor propulsion costs around average Rs. 1,30,000/-. Medium sized tradition boats with motor propulsion cost around Rs.8,00,000/-.

Image 49 : Boats Under Construction At Sitamarhi Ghat

17.0 Inland Navigation Within Study Area In Bhadohi District

16.1 The stretch of Ganga River in Bhadohi Distt. is a part of 1620 km long National Waterway [NW-1]. The waterway covers approximately 64.5 km within Bhadohi District. Ganga-Bhagirathi-Hooghly River system from Allahabad to Haldia was declared as National Waterway No.1 vide National Waterway (Allahabad-Haldia stretch of the Ganga Bhagirathi-Hooghly River) Act 1982. It became operative from 27th October, 1986 after the formation of the Inland Waterways Authority of India (IWAI)[11].

16.3 Ferry Services : Ferrying is a crucial livelihood activity of the Mallah community living in the villages on the banks of river Ganga. People of Mallah community in Bhadohi District have been ferrying passengers for generations. There are 14 sites reported in the study area where ferry services are available. Out of 14 sites, there are 3 sites where pontoon bridge has been constructed and ferry service is operated only during removal of pontoon bridge [Monsoon season]. There are two sites where ferry services were once operated but have ceased owing to development of sand bar. Details of Ferrying sites are provided in the table no.13.

Table 13 : Details of Ferry Sites And Status Within The Study Area

Sr. No.	Latitude	Longitude	Nearest Settlements	No. of Boat & Ferry Season
01	25°14'32.01"N	82°26'7.09"E	Between Jahangirabad and Bishanpur Village	Four Boats (October to June)
02	25°15'0.21"N	82°25'15.48"E	Between Rampur Ghat and Jaunpa Village **[Pontoon bridge constructed]**	Four Boats. **Ferry service operates only during removal of pontoon bridge**
03	25°13'46.74"N	82°21'41.50"E	Between Birahimpur and Adampur/ Naugaon Ghat	Two-four Boats (October to June)
04	25°14'16.23"N	82°19'46.16"E	Between	Two Boats (October

[11] Inland Waterways Authority of India [Website Accessed December 2021]
https://iwai.nic.in/waterways/national-waterways/national-waterways-1?id=2523

			Semradhinath and Kathra Mishran	to June)
05	25°14'17.85"N	82°14'36.30"E	Between Dig and Khaira Village	Two- four Boats (October to June)
06	25°12'2.30"N	82°16'5.03"E	Between Chhachhua and Gogaon Village	Two Boats (October to June)
07	25°11'31.81"N	82°16'36.81"E	Between Chhachhua and Kashipatti	Ferrying has stopped in recent years
08	25°11'8.28"N	82°16'6.35"E	Between Bhurra and Chehra Village	Ferrying has stopped in recent years
09	25°10'46.85"N	82°14'41.82"E	Between Hari Rampur and Mahewa Ghat **[Pontoon bridge constructed]**	Four Boats. **Ferry service operates only during removal of pontoon bridge**
10	25°11'58.70"N	82°11'43.51"E	Between riverine Island [Puradukha] and Narwar Chaukatha	Two Boats (October to June)
11	25°13'39.50"N	82°11'40.75"E	Between Doguna and Jera Village	Ferrying has stopped in recent years
12	25°15'15.58"N	82°12'30.17"E	Between Bhamora and Khemanpur	Two Boats (October to June)
13	25°15'36.84"N	82°13'17.21"E	Between Arai Village and Parwa Village	Two Boats (October to June)
14	25°16'6.86"N	82°15'42.80"E	Between Sitamarhi Ghat and Misharpur via Sand Bar **[Pontoon bridge constructed]**	Two Boats. **Ferry service operates only during removal of pontoon bridge**

Image 50 : Ferrying In Ganga River From Hari Rampur and Mahewa Ghat

Image 51 : Ferrying In Ganga River From Sitamarhi Ghat And Misharpur Village

18.0 Old And Sacred Trees In Bhadohi District

18.1 Plant species *Ficus benghalensis* [Bargad], Ficus *religiosa* [Peepal], *Ficus virens* [Pakad] *Mangifera indica* [Aam], *Azadirachta indica* [Neem], *Aegle marmelos* [Bel], *Phyllanthus emblica* [Awla] are considered as sacred. These species are found in every village either associated with old temples or at ghats. Out of all sacred trees Ficus *religiosa* [Peepal] is most sighted species found to be associated with temple or used to perform different rituals. Apart from the sacred trees there are several old trees present at ghats and villages. A five hundred years old banyan tree [*Ficus benghalensis*] was recorded in Shivnathpatti village [Refer Image 52].

Table 14 : List of Sacred And Old Trees Recorded Within The Study Area

Plant Species	Location and Nature of Tree	Coordinates	
		Latitude	Longitude
Peepal *[Ficus religiosa]*	Pandeypur Sacred tree associated with Hanuman Temple	25°14'2.89"N	82°27'5.58"E
Peepal *[Ficus religiosa],* *Neem [Azadirachta indica],* Aam [*Mangifera indica]*	Parwa Village Group of Sacred trees associated with Shitla Mata Temple	25°13'57.48"N	82°27'16.02"E
Peepal *[Ficus religiosa],*	Ghamhapur ***200 years old sacred tree used to perform rituals after cremation.***	25°14'22.90"N	82°26'30.60"E
Bel *[Aegle marmelos]*	Ghamhapur *Sacred tree associated with Chaura Mata Temple*	25°14'24.26"N	82°26'29.84"E
Peepal *[Ficus religiosa],* *Neem [Azadirachta indica],*	Bhawanipur Group of sacred trees associated with Hanuman Temple	25°14'25.41"N	82°26'24.14"E
Peepal *[Ficus religiosa]*	Bhawanipur ***100-150 years old tree associated with***	25°14'31.95"N	82°26'18.69"E

	Hanuman Temple		
Peepal *[Ficus religiosa],* *Neem [Azadirachta indica],* Aam [*Mangifera indica]*	Hari Das Baba Ashram Group of Sacred Trees	25°14'53.15"N	82°25'40.29"E
Peepal *[Ficus religiosa],* *Neem [Azadirachta indica],* Aam [*Mangifera indica],* Bargad *[Ficus benghalensis],* Awla *[Phyllanthus emblica],* *Ficus virens* [Pakad]	Jogira Baba Ashram Group of sacred trees	25°14'54.55"N	82°25'30.03"E
Peepal *[Ficus religiosa]*	Near Rampur Ghat 100-120 years old tree	25°15'8.43"N	82°25'16.97"E
Neem [Azadirachta indica]	Hanuman Ashram Sacred Tree	25°15'33.23"N	82°24'13.79"E
Peepal *[Ficus religiosa]*	Bihrozpur Sacred tree associated with temple	25°15'44.67"N	82°23'16.10"E
Peepal *[Ficus religiosa]*	Biraspur Sacred tree associated with Shiva Temple	25°15'37.24"N	82°22'55.41"E
Peepal *[Ficus religiosa]*	Ibharimpur 100 Years old tree	25°13'36.55"N	82°21'30.42"E
Neem [Azadirachta indica], Bargad *[Ficus benghalensis],* *Neem [Azadirachta indica],* Awla *[Phyllanthus emblica],* *Ficus virens* [Pakad]	Sitamarhi, Sita Samahit Asthal complex Group of old and sacred tree	25°16'23.18"N	82°15'28.25"E
Peepal *[Ficus religiosa*	Sitamarhi Gaht Sacred Tree	25°16'11.38"N	82°15'45.19"E
Peepal *[Ficus religiosa]*	Shivnathpatti Village *500 Years old tree*	25°16'46.60"N	82°19'53.30"E
Peepal *[Ficus religiosa]*	Basantpur old Tree	25°15'31.94"N	82°37'57.17"E

Image 52 : A 500 Years Old Banyan Tree In Shivnathpatti Village

Image 53 : A Sacred Tree Associated With Shiva Temple In Biraspur

Image 54 : Group Of Sacred Trees At Sita Samahit Asthal, Sitamarhi

Image 55 : A Sacred Peepal Tree Associated With Chaura Mata Temple

19.0 Recommendation

19.1 **Fading of Stream/Nara and conversion of riparian vegetation into agricultural fields :** Small stream/ Nara which directly drain to River Ganga are under threat due removal of riparian vegetation, agriculture activities on stream bank and encroachment. Due to mentioned threats two streams have faded completely while 9 are under threat. Stream/Nara holds the vulnerable riparian zone within the district, protects from erosion, provides habitat to riparian fauna and migratory routes to fish species in monsoon season. Products and finished products prepared from riparian flora are source of income to the local communities. The riparian vegetation area is under revenue department while the total area of forest within the district is a 175 Hectare only. It may be solution to transfer the riparian vegetation area to forest department for proper management. Awareness programmes should be organised in villages focusing on importance of streams and riparian vegetation.

19.2 **Paleo-streams and Wetlands :** Paleo-streams and wetlands are currently under cultivation. The study area is under semi-critical category. In order to recharge the groundwater, the depression areas may be restored. Proper demarcation of such areas is required. Plantation of native species on such area may increase the overall forest area in the district. It will provide the addition habitat to fauna to the area and will further lower the man-animal conflict.

19.3 **Threats to Wetlands :** Wetland like Samdha Tal, Gonda Sobans Tal, Tal Gird Bargaon and Shivnathpatti Talab is facing serious threat due to loss of riparian vegetation, high silt load, encroachment, conversion of wetland area into agricultural field and dumping of solid waste. Area of Samdha Tal, Gonda Sobans Tal and Tal Gird Bargaon has shrunk by more than 60% in last 90-95 years. The shrinking of wetland area is still in progress due to mentioned threats. Below-mentioned points may be a path for the conservation of the wetlands in the study area :

- Inventory of wetlands should be maintained with the details highlighting the current land use, ownership and values of the wetland.
- Currently, most of the wetlands are under revenue department and are on lease for agricultural activities. There is a need to transfer those wetlands to Uttar Pradesh State Wetland Authority constituted under the provisions of the Wetlands (Conservation and Management) Rules, 2017.

- ❖ A Comprehensive Management and Action Plan (CMAP) should be prepared for each wetland or group of wetlands. CMAP should focus on the ecological, hydrological, social, and economic and tourism aspects of the wetland.
- ❖ Local communities should be encouraged and their participation in wetland conservation should be fixed.
- ❖ Lease of wetland to fishermen community maybe an alternative to maintain water level.
- ❖ Forest department and concerned agencies should plant native riparian flora along the wetland.
- ❖ Developmental activities may be restricted at least 500 m from the wetland area.

19.4 **Protection for River Islands :** The Manjhara Island area of Mirzapur district is adjacent to Bhadohi district. This area is a habitat to the Wild Boar. Conflicts with Wild Boar population have been reported during field visit. Also, it has been found the edges of Manjhara area and the riparian patch within the Bhadohi districts has been altered due to human interventions. Edges have been gradually converted to agricultural fields. This may be a reason behind increasing conflicts. A joint effort of local administration and the Gram Panchayat required managing such areas.

19.5 **Cremation :** Cremation of dead bodies and immersion of their remains is reported throughout the stretch. Lack of cremation infrastructure, their maintenance and lack of awareness are reason behind such ongoing practices. Proper cremation Infrastructure including the modern crematoria is required for at least two ghats – Rampur Ghat and Gulauri Ghat. Burial at sand bar maybe restricted and Hindu burial sites should also be provided nearby the cremation sites.

20.0 References

Ali, S. (2012). The Book of Indian Birds—13th Edition. Bombay Natural History Society.

Auden, J.B. (1941). An excursion to Gangotri. Himalayan Journal, 7:96-102.

Bhattacharyya, U.C. and Goel, A.K. (1982). Studies on the vegetation of Tehri dam and some rare plants in Garhwal Himalayas. B.S.I., Howrah. pp. 1-38.

Bhargava, A.K., (2012-13), Ground Water Brochure of Sant Ravidas Nagar District, U.P. [http://cgwb.gov.in/District_Profile/UP/Sant%20Ravi%20Das%20Nagar.pdf]

Grimmett, R., Inskipp, C., & Inskipp, T. (2016). Birds of the Indian Subcontinent: India, Pakistan, Sri Lanka, Nepal, Bhutan, Bangladesh and the Maldives. Bloomsbury Publishing.

Castelle, A.J., Johnson A.W. and Conolly, C. (1994). Wetland and stream buffer size requirements: A review. Journal of Environmental Quality, 23:878-882.

Gangwar, R.S and Gangwar,K.K. (2011). Taxonomic and riparian floral diversity along river Ganga in Garhwal. Researcher, 3 (4): 5-14

Gangwar, R.S.; Joshi, B.D. Some medicinal flora in the riparian zone of river Ganga at Saptrishi, Haridwar, Uttaranchal. Himal. J. Environ. Zool. 2006, 20, 237–241.

Grimmett, R., Inskipp, C., & Inskipp, T. (2016). Birds of the Indian Subcontinent: India, Pakistan, Sri Lanka, Nepal, Bhutan, Bangladesh and the Maldives. Bloomsbury Publishing.

Groffman, P.M., Gold, A.J., Husband, T.P., Simmons R.C. and Eddleman W.R. (1990). An investigation into multiple uses of vegetated buffer strips. RI: University of Rhode Island, Kingston.

Gupta, R.K. (1960). On a botanical trip to the source of the rive Ganga in Tehri Garhwal Himalayas. Indian Forester, 86:547-552

Islam Md.S., Rahman M.M., Halder C.G. & Tanaka M. (2006), Fish assemblage of a traditional fishery and seasonal variation in diet of its most abundant species Wallago attu (Siluriformes: Siluridae) from a tropical floodplain. Aquatic Ecology, 40: 263-272

Krishen, P. (2013). Jungle Trees of Central India: A Field Guide for Tree Spotters. Penguin Books.

Krishanmurti, C.R. (1991). The Ganga: A Scientific Study. Ganga Project Directorate Report, New Delhi, India.

Mishra, M., Dugesar, V., Prudhviraju, K. N., Patel, S. B., & Mohan, K. (2019). Precision mapping of boundaries of flood plain river basins using high-resolution satellite imagery: A case study of the Varuna river basin in Uttar Pradesh, India. Journal of Earth System Science, 128(4).

Osterkamp WR. 1998. Processes of fluvial island formation, with examples from Plum Creek, Colorado and Snake River, Idaho. Wetlands 18(4): 530–545.

Singh S.P., Ram Jagat., Walia C.S., Sachdev C.B., Dhankar R.P., Rana K.P.C., Sehgal J., Velayutham M. and Gajbhiye (2004), Soils of Uttar Pradesh for Optimizing Land Use. NBSS Publ.68. National Bureau of Soil Survey and Land Use Planning, Nagpur

Sinha M. & Khan M.A. (2001) Impact of environmental aberrations on fisheries of the Ganga (Ganga) River. Aquatic Ecosystem Health and Management Society, 4: 493-504.

Wyrick, J.R. & Klingeman, P.C. (2011) Proposed fluvial island classification scheme and its use for river restoration. *River Research and Applications*. 7 (7). p.814-825.

List of Websites

https://bhadohi.nic.in

https://prayagraj.nic.in

https://vedas.sac.gov.in/en/home.html

https://moef.gov.in

http://www.fishbase.in

https://cgwb.gov.in/index.html

21.0 Annexure

1.0 Removal E-Tender of Sand Mining In Badohi District.

कार्यालय जिलाधिकारी, भदोही
(खनिज अनुभाग)

संख्याः 365/खनन लिपिक/2021 दिनांक- 16 अगस्त, 2021

शुद्धि पत्र

सर्वसाधारण को सूचित किया जाता है कि जनपद भदोही के तहसील ज्ञानपुर स्थित गंगा नदी के तल में उपलब्ध साधारण बालू के रिक्त खनन क्षेत्रों ग्राम कुड़ीकला तरी गाटा संख्या- 59 रकबा 2.023 हेक्टे. एवं ग्राम इब्राहिमपुर गाटा संख्या- 103 रकबा 4.047 हेक्टे. को नियमानुसार रिक्त घोषित करते हुये शासनादेश के अनुरूप एम.एस.टी.सी. लखनऊ के माध्यम से ई-निविदा सह ई-नीलामी हेतु विज्ञप्ति करायी गयी थी। जिसकी प्रकाशन तिथि दिनांक 26.07.2021 थी एवं प्रथम चरण की ई-निविदा (ई-टेण्डर) की अवधि दिनांक 25.08.2021 से 31.08.2021 तक है एवं उक्त ई-निविदा (ई-टेण्डर) खोले जाने के अवधि दिनांक 01.09.2021 को अपरान्ह 12.00 बजे से 05.00 बजे तक थी में

प्रभागीय वनाधिकारी भदोही वन प्रभाग भदोही के पत्रांक 344 (1)/ज्ञानपुर/26-1, दिनांक ज्ञानपुर, अगस्त 13, 2021 द्वारा ग्राम कुड़ीकला तरी, इब्राहिमपुर में से ग्राम कुड़ीकला तरी, कछुआ वन्य जीव विहार के अन्तर्गत आने के कारण वन अनापत्ति निरस्त की जाती है।

उपरोक्तानुसार तहसील ज्ञानपुर स्थित ग्राम कुड़ीकला तरी गाटा संख्या- 59 रकबा 2.023 हेक्टे. पर लिये जाने वाले ई-निविदा सह ई-नीलामी को वन आपत्ति निरस्त होने के कारण निरस्त किया जाता है एवं ग्राम इब्राहिमपुर गाटा संख्या- 103 रकबा 4.047 हेक्टे. हेतु तिथि व समय यथावत रखते हुये अपने निर्धारित समय पर ई-निविदा सह ई-नीलामी लिया जायेगा एवं खोला जायेगा।

(आर्यका अखौरी)
जिलाधिकारी
भदोही

2.0 E-Tender of Sand Mining, Mirzapur District

कार्यालय जिलाधिकारी मीरजापुर

(खनिज अनुभाग)

पत्रांक2122/खनिज/ई–निविदा सह ई–नीलामी/बालू/2021 दिनांक13 अक्टूबर, 2021

ई–निविदा सह ई–नीलामी आमन्त्रण हेतु सूचना

सर्वसाधारण को सूचित किया जाता है कि जनपद मीरजापुर में नदी तल में साधारण बालू (गंगा नदी) के निम्न विवरण के अनुसार रिक्त खनन क्षेत्रों को उ0प्र0 उप खनिज (परिहार) नियमावली 1963 के नियम–23 के उप नियम–(1) के प्राविधानों के अन्तर्गत उपलब्ध घोषित किया जाता है।

उत्तर प्रदेश उप खनिज (परिहार) (सैतालिसवाँ संशोधन) नियमावली 2019 के अनुक्रम में उत्तर प्रदेश शासन, भूतत्व एवं खनिकर्म अनुभाग के निर्गत शासनादेश संख्या–2168/86–2019–57(सा0)/2017 टी.सी.1 दिनांक 09/10/2019 में दिये गये निर्देशानुसार उक्त नियमावली–1963 के अध्याय–4 के प्राविधानों के अन्तर्गत ई–निविदा सह ई–नीलामी प्रणाली के माध्यम से खनन पट्टे पर स्वीकृत किये जाने हेतु निम्नलिखित क्षेत्र उपलब्ध है :–

1. क्षेत्र का विवरण

क्र0 सं0	क्षेत्र का विवरण					Latitude (N)	Longitude (E)	नियमावली 1963 के अनुसूची के अनुसार रायल्टी दर (रु0 प्रति घनमीटर)	खनन योग्य आंकलित उप खनिज का भण्डार (घनमी0 प्रतिवर्ष)	प्रथम वर्ष में आकलित भण्डार की कुल रायल्टी रूपयों में। (कालम 10 में अंकित घनमी0 प्रतिवर्ष को कालम 9 में अंकित रायल्टी से गुणा करने पर उपलब्ध सकल धनराशि)	अर्नेस्ट मनी (कालम 11 में अंकित सकल धनराशि का 25 प्रतिशत)
	नदी का नाम	तहसील	ग्राम	गाटा सं0 / खण्ड सं0 / जोन सं0	क्षेत्रफल (हे0 में)						
1	2	3	4	5	6	7	8	9	10	11	12
1.	गंगा	सदर	गोगांव	03मि./1	5.00	A- 25°13'08.30" B- 25°13'03.50" C- 25°12'58.40" D- 25°13'02.72"	A- 82°15'08.50" B- 82°15'13.70" C-82°15'07.50" D-82°15'01.81"	65/–	100000	6500000	1625000
2.	गंगा	सदर	खैरा	9घ/1	5.00	A- 25°14'10.40" B- 25°14'13.00" C- 25°14'06.50" D- 25°14'03.60"	A- 82°15'06.70" B- 82°15'15.20" C-82°15'15.10" D-82°15'07.00"	65/–	100000	6500000	1625000
3.	गंगा	सदर	खैरा	9घ/3	5.00	A- 25°13'57.10" B- 25°13'59.60" C- 25°13'53.00" D- 25°13'51.10"	A-82°15'06.40" B- 82°15'15.20" C- 82°15'16.50" D-82°15'07.70"	65/–	100000	6500000	1625000
4.	गंगा	सदर	बैसुकिया	494ग/1	5.00	A- 25°13'13.00" B- 25°13'12.00" C- 25°14'04.70" D- 25°13'05.40"	A-82°34'24.70" B- 82°34'32.77" C- 82°34'28.80" D-82°34'21.66"	65/–	100000	6500000	1625000
5.	गंगा	सदर	नदिनी	2/4 व 5	10.00	A- 25°15'08.02" B- 25°15'09.46" C- 25°15'01.39" D- 25°14'59.72"	A-82°23'20.60" B- 82°23'34.68" C- 82°23'34.00" D-82°23'20.09"	65/–	200000	13000000	3250000
6.	गंगा	सदर	घुघुटी	1क/1	5.00	A- 25°15'58.40" B- 25°15'51.10" C- 25°15'47.45" D- 25°14'54.97"	A-82°17'59.04" B- 82°18'11.50" C- 82°18'08.85" D-82°17'56.94"	65/–	75000	4875000	1218750
7.	गंगा	चुनार	बसारतपुर	140/1	4.00	A- 25°09'26.88" B- 25°09'27.12" C- 25°09'18.84" D- 25°09'19.38"	A-82°52'54.96" B- 82°52'59.58" C- 82°52'58.74" D-82°52'51.60"	65/–	80000	5200000	1300000
8.	गंगा	चुनार	बसारतपुर	140/3 व 4	9.00	A- 25°09'11.17" B- 25°09'10.83" C- 25°08'54.48" D- 25°08'55.26"	A-82°52'51.02" B- 82°52'58.04" C- 82°52'52.62" D-82°52'46.62"	65/–	180000	11700000	2925000

Indian
National Trust
for Art and
INTACH Cultural Heritage

INDIA@75

Azaadi Ke Rang Bharatiya Sanskriti Ke Sang

NAMAMI GANGE