GANGA CULTURAL DOCUMENTATION

PRATAPGARH DISTRICT

[Natural Heritage]

May, 2022

National Mission for Clean Ganga

Indian National Trust for Art and Cultural Heritage

Indian National Trust for Art and Cultural Heritage

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Front Cover : Ganga River As Seen From Karenti Ghat, Pratapgarh Distt.

Background : Kalakankar Ghat And Its Environ

Back Cover : Ganga River Bank

Formatting And Design By : Abhishek Kumar Upadhyay & Abhishek Kumar

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NAMAMI GANGE

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1.0 Introduction

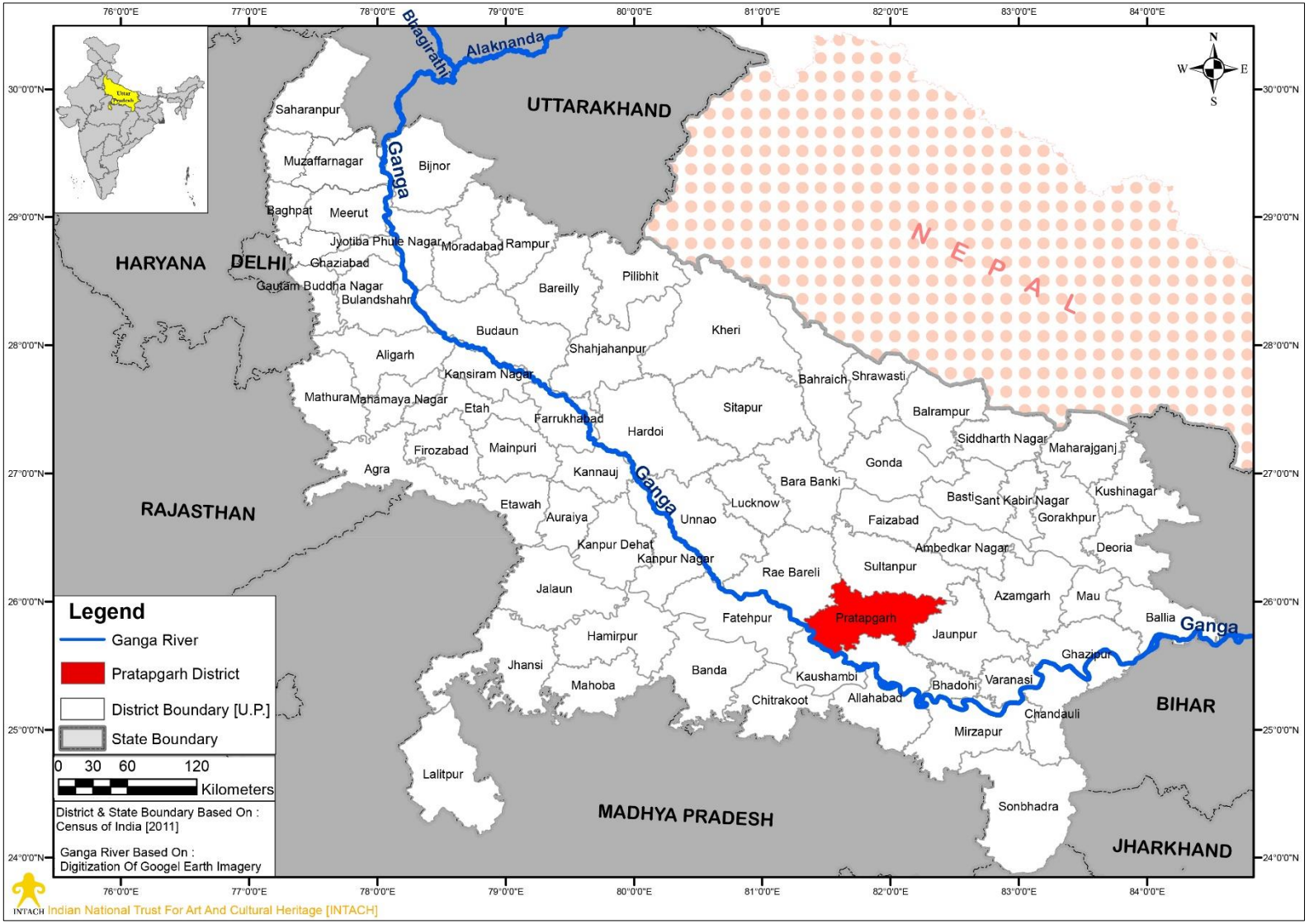
1.1 Pratapgarh Distt. is located between 25°34′ and 26°11′ north latitude and between 81°19′ and 82°27′ east longitude extending for some 110 kilometers from west to east. It is at a height of 137 meter from sea level. Earlier Distt. was part of Faizabad division, but in 1988, it became a part of Allahabad Division. Pratapgarh town is the Distt. headquarter. For administrative purpose the Distt. has been divided into 5 sub divisions, 5 tehsils and 17 blocks. There are 1105 Gram Panchayats and 2182 revenue villages. According to the Central Statistical Organization (Central Statistics Office), India, the Distt. has an area of 3,730 square kilometers.

1.2 Pratapgarh is well connected through Allahabad-Faizabad main road at a distance of 39 km from Sultanpur and 61 Km from Allahabad. It is bounded on the north by the Distt. of Sultanpur, on the south by Allahabad, on the east by Jaunpur, on the west by Fatehpur and north-west by Raebareli. In the south-west the Ganges forms the boundary of the Distt. for about 50 kilometers separating it from Fatehpur and Allahabad and in the extreme north-east the Gomti forms the boundary for about 6 kilometers.

1.3 Pratapgarh is one of the oldest Distt. of Uttar Pradesh, which came into existence in the year 1858. The Distt. is named after Raja *Pratap Bhadur Singh*, a local raja between 1628–1682, located his capital at Rampur near the old town of Aror. There he built a garh (fort) and called it Pratapgarh after himself. Subsequently, the area around the fort became known as Pratapgarh. When the Distt. was constituted in 1858, its headquarters was established at Belha, which came to be known as Belha Pratapgarh, the name Belha presumably being derived from the temple of Belha Bhawani on the bank of river Sai. It is popularly known as "Belha Mai" – meaning Mother Goddess Belha.

1.4 According to the 2011 census, Pratapgarh Distt. had a population of 3,209,141. The Distt. had a population density of 854 inhabitants per square kilometer. Its population growth rate over the decade 2001-2011 was 16.2%. Pratapgarh had a sex ratio of 994 females for every 1000 males, and a literacy rate of 73.1%.

1.5 Most part of the Distt. is covered by plain land which is very fertile. Major crops grown in the Distt. are Wheat, Paddy, Black Gram, Maize and oilseeds in addition to fruits like Amla and Mango.



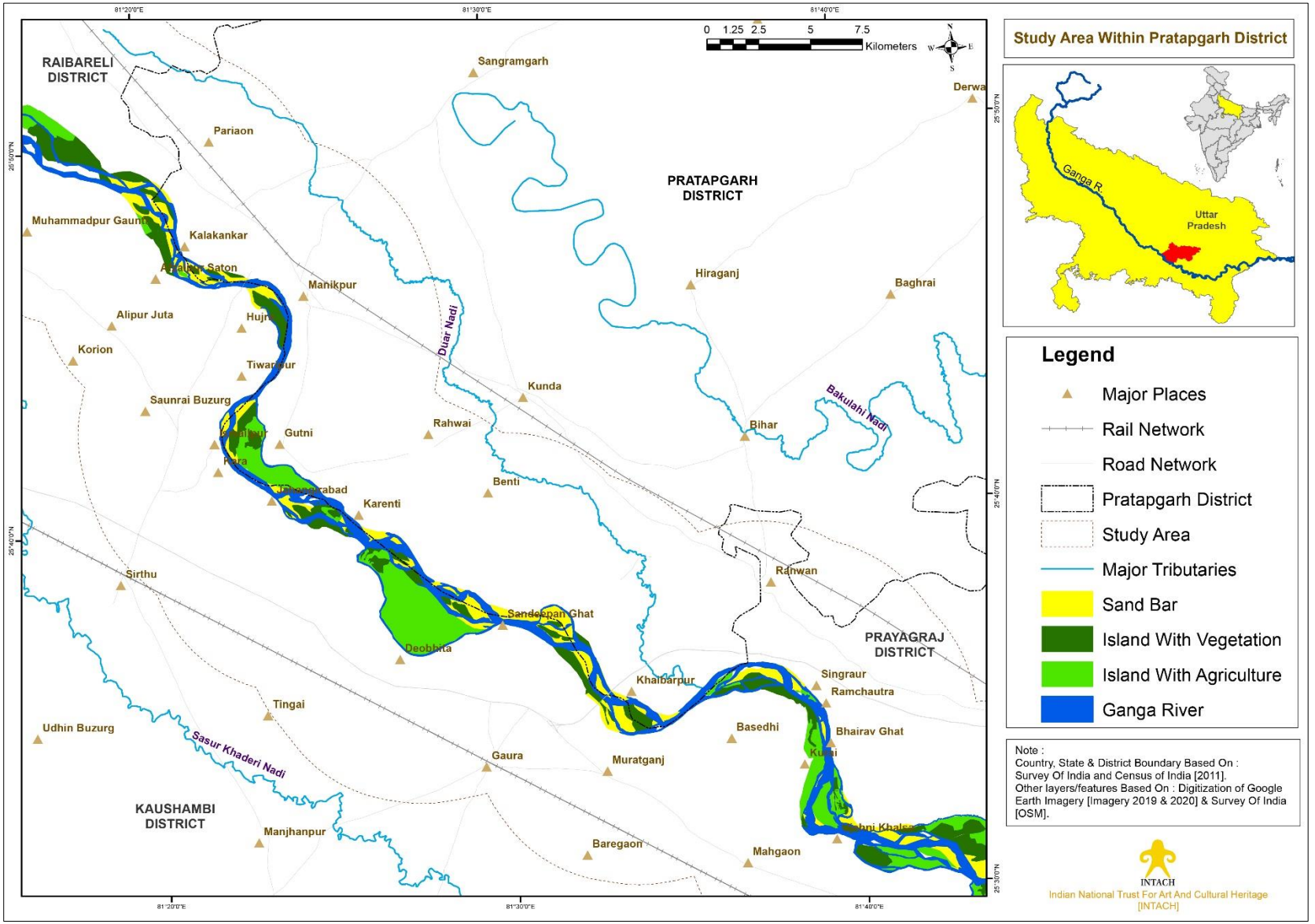
Map 1 : Location Of Pratapgarh Distt. On Left Bank of Ganga River

2.0 Ganga River in Pratapgarh District

2.1 Ganga River enters Pratapgarh Distt. at Latitude 25°49'0.57"N and Longitude 81°20'40.92"E near Murassapur Village (Kalakankar Block) after crossing Raebareli Distt. [Left Bank] and Fatehpur District [Right Bank] [Refer Map No. 1 & 2 and Image No.1]. Length of Ganga River in Pratapgarh Distt. is approximately 49 km, while its width varies between 0.3 Km [near Duar-Ganga confluence] to 3.75 km [near Shahpur]. The active floodplain of Ganga River in Pratapgarh Distt. is under cultivation [mainly *rabi and zaid*] while some areas especially the riverine island is intact having riparian grasses upto 2 metres.

2.2 The river enters the district and flows to a wide bed, within the limits of which it continuously shifting its channel between Kalakankar and Sukhdevpur (Mohaddinagar Kachhar) [30 Km stretch]. In this stretch it forms several riverine islands in which some are under cultivation. The slope of some places is terraced in two-three stages. Approximately 12.5 Km downward from Sukhdevpur Village, a tributary named **Duar Nadi** joins River Ganga. Flowing northward, the river turns between Ibharimpur and Jahanabad of Kunda Block and enters Prayagraj Distt. at Latitude 25°35'54.45"N and Longitude 81°36'39.19"E.

Image 1 : View Of Ganga River From Sami Ghat [Naubasta Village], Pratapgarh Distt.



Map 2 : Study Area In Pratapgarh Distt.

3.0 Methodology

3.1 For carrying out surveys, a 7 km buffer [study area] of Ganga River in Pratapgarh Distt. was marked having a total area of 358.58 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 Pratapgarh Distt. was carried out in March 2022. 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], 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 Major tributaries within the district are – Duar Nadi, Sai Nadi, Bakulahi Nadi, Loni Nadi and Naudiha Nadi. Duar Nadi is only river which flows through the study area. Bakulahi Nadi, Loni Nadi and Naudiha Nadi are the tributaries of Sai Nadi [Refer Map No. 3]. Details of the minor and major tributaries are discussed in this section and its spatial distribution is provided in Map No. 3.

4.2 **Duar Nadi** : Duar is the only tributary of River Ganga in the Distt [Refer Map No. 3 and Image 2 & 3]. It originates as a shallow ravine in the stiff clay soil of the Kalakankar Block and joins River Ganga near Jahanabad Village at latitude 25°35'20.74"N and longitude 81°35'26.89"E. In recent years, a canal has been constructed in Raebareli Distt. which joins the Duar Nadi in Pratapgarh Distt.. Total length of Duar Nadi is around 66 Km.s. The Pratapgarh Gazetteer of 1904[1] describes the Duar Nadi as:

"Duar runs tortuously in a south-easterly direction nearly parallel to the Ganges, joining that river amid a network of ravines at the southern extremity of the district near Jahanabad. Between the Duar and the Ganges is a strip of land consisting of high plateaux bounded by the ravines which lead down to the river."

Image 2 : Duar Nadi As Viewed From AH-1 [Near Samaspur Village]

[1] Pratapgarh - A Gazetteer, District Gazetteers of the United Provinces of Agra and Audh, Volume XLVII, Printed by Govt. Press, United Provinces, 1904.

Image 3 : Duar Nadi Near Ganga-Duar Confluence, Jahanabad Village

[The river turns several times before meeting River Ganga. The Pratapgarh Gazetteer of 1904, mentioned the network of ravines along the river upto Jahanabad village. Such areas have now completely transformed into agricultural fields. The agricultural fields (especially wheat-mustard) along the river are clearly visible in image 3 & 4.]

4.3 Sai Nadi & Its Tributaries

4.3.1 Sai Nadi is a tributary of Gomti River, originates from a pond in village Bijgwan near Pihani of Hardoi Distt., and joins Gomti Nadi after passing through Hardoi, Lucknow, Unnao, Raebareli, Pratapgarh and Jaunpur.[2] The river enters the Pratapgarh Distt. on the west of Mustafabad Village, drains approximately 150 Km and leaves the Distt. near Danva Village. In its journey in Pratapgarh Distt., the river is joined by **Bakulahi Nadi, Sakrani Nadi** and **Loni Nadi** from its right bank and **Naudiha Nadi and Paraya Nala** from its left bank [Refer Map No. 3].

4.3.2 Bakulahi Nadi is a plain-fed river flowing from north-west to south-east direction with about 177-km length and about 841-km^2 catchment area [Shukla and Mishra, 2019. Within its stretch, the river drains mainly in Pratapgarh Distt. (148 Km) and parts of

[2] UPPCB (2018), Action plan for restoration of polluted stretch of river Sai from Unnao to Jaunpur *http://www.uppcb.com/pdf/RIVER-SAI.pdf*

Raibareli (19 Km) and Prayagraj Distt. (10 Km). The river originates from interconnected series of *tals* namely - Khair tal, Barna tal, Gaurhi tal, Panhi tal, Lal tal and Manjhihar tal. The river joins Sai Nadi near village Khajurni at latitude 25°53'4.49"N and longitude 82° 1'20.08"E [Refer Map No.3 and Image No. 4].

Image 4 : Bakulahi Nadi As Seen From NH-731A [Near Bihar]

4.3.3 The Pratapgarh Gazetteer of 1904 describes the Sai Nadi and its tributaries as:

*"In the dry season the **Sai** is narrow, shallow and easily fordable, while its tributaries become mere ravines; but in the rains the latter carry a large volume of water into the river, which rises to a considerable height and acquires a great velocity. The zigzag twists of the river, through frequent at intervals along its whole course, are most marked at its entry into the district._The Banks of the Sai are in many places high and are generally well defined. In places they are broken and pierced by ravines which sometimes extend for several hundred yards, while elsewhere they slope down gradually to the river bed in long parallel undulations."*

*"The **Loni** rises in the jhil tract of pargana Rampur, near Dharupur, and flows in an easterly direction along the northern border of Dhingwas and into pargana Pratapgarh, to join the Sai at a point about the middle of its course through the district. The **Sakrani** is a similar stream that drains part of Pratapgarh and falls into the Sai at Bahonchra, some five or six miles east of the junction with Loni."*

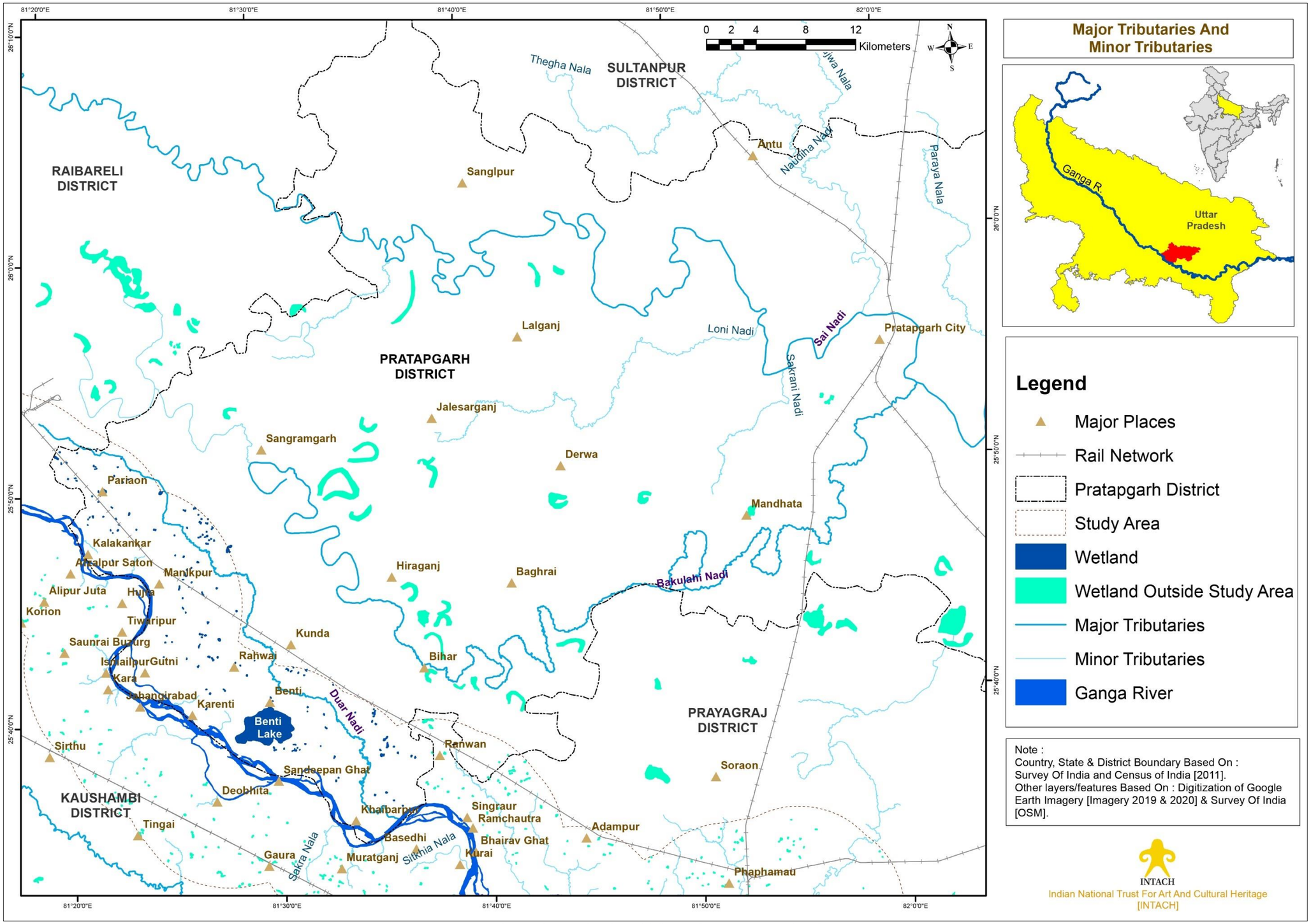
4.4 There are 9 minor streams identified within the study area which drains to river Ganga. Details of minor streams are provided in Table No.1. The lengths of identified streams range between 1.68 Km. to 6.0 Km. Documentation of these small streams is important because these streams serve as breeding ground to fishes. Dense riparian vegetation is still present along their banks and is continuously shrinking due to increasing anthropogenic activities.

Image 5 : Image Showing Nara/Nala Near Kisandaspur [Ref. Table No.1, Sr. 1]

Table 1 : Streams Within The Study Area

Stream	Confluence	Orign	Length and Potential Threat
Nara/ Nala	Near Kalakankar [25°48'1.07"N, 81°21'4.31"E]	Near Kisandaspur [25°47'34.55"N, 81°21'44.16"E]	Stream Length approximately 2.0 Km. Potential Threat : Extensive Agricultural Practices and construction [Refer Image No. 5]
Nara/ Nala	Near Sangrampur [25°46'35.21"N, 81°23'20.35"E]	Near National Highway [25°47'16.66"N, 81°24'0.56"E]	Stream Length approximately 2.84 Km

			Potential Threat : Extensive Agricultural Practices and construction
Nara/ Nala	Near Manikpur [25°46'0.60"N, 81°24'0.76"E]	Near Shahabad [25°46'52.23"N, 81°24'8.28"E]	Stream Length approximately 2.0 Km Potential Threat : Extensive Agricultural Practices and constructions
Nara/ Nala	Near Manikpur [25°45'25.75"N, 81°24'14.25"E]	Near Dandauli [25°45'2.14"N, 81°25'27.03"E]	Stream Length approximately 2.75 Km Potential Threat : Extensive Agricultural Practices
Nara/ Nala	Near Garhi [25°44'21.21"N, 81°23'59.39"E]	Near Bhaktan Ka Purwa [25°43'48.29"N, 81°24'27.26"E]	Stream Length approximately 1.68 Km Potential Threat : Extensive Agricultural Practices
Nara/ Nala	Near Gutni [25°42'22.85"N, 81°23'19.62"E]	Near Kursanda [25°42'55.37"N, 81°24'8.79"E]	Stream Length approximately 2.77 Km. Potential Threat : Extensive Agricultural Practices & Loss of riparian vegetation
Nara/ Nala	Near Maudara [25°40'44.02"N, 81°25'3.14"E]	Near National Highway [25°42'8.17"N, 81°26'52.52"E]	Stream Length approximately 6.0 Km Potential Threat : Extensive Agricultural Practices and loss of vegetation
Dalerganj Nala	Near Dalerganj [25°39'22.26"N, 81°27'6.91"E]	Near Sujauli [25°40'49.84"N, 81°26'55.37"E]	Stream Length approximately 4.0 Km. Potential Threat : Extensive Agricultural Practices
Nara/ Nala	Near Jahanabad [25°35'55.61"N, 81°36'38.75"E]	Near Lachhmanpur [25°34'12.96"N, 81°33'14.30"E]	Stream Length approximately 2.0 Km Potential Threat : Extensive Agricultural Practices and loss of vegetation



Map 3 : Major and Minor Tributaries [Pratapgarh Distt.]

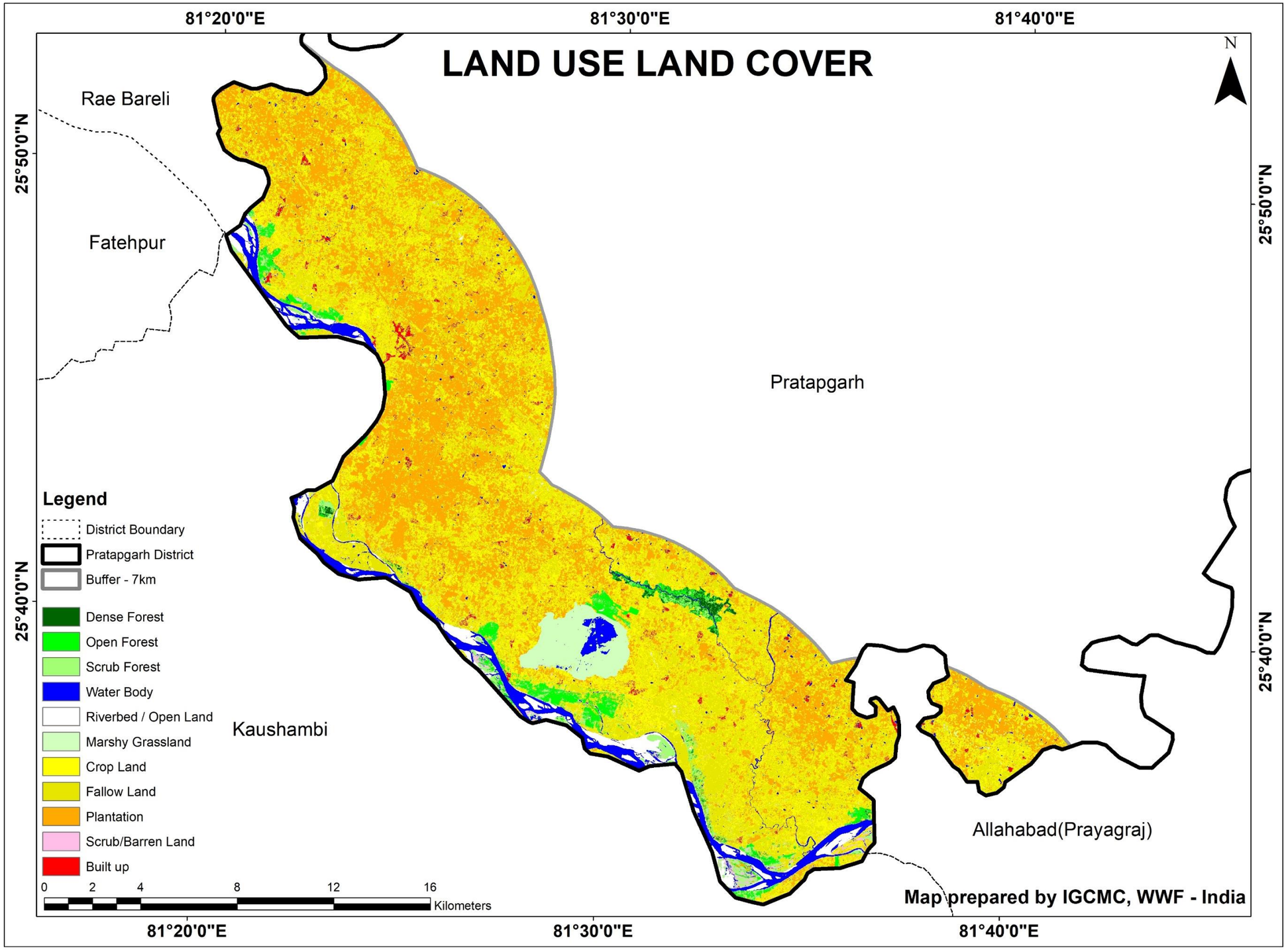
5.0 Land Use Land Cover [LULC]

5.1 Land Use Land Cover [LULC] map of the study area has been prepared from Landsat imagery for the year 2020 [Refer Table No. 2 & Map No. 4]. Using supervised classification system, 11 different classes were generated – Dense Forest, Open Forest, Scrub Forest, Water Body, Riverbed / Open Land, Marshy Grassland, Crop Land, Fallow Land, Plantation, Scrub/Barren Land and Built-up [Refer Map No. 4]. Study area constitutes 358.58 sq.km. covering right bank of River Ganga for which the following observations were drawn based on this classification:

- Forest area constitutes 4.59% of the study area and is classified into Dense Forest, Open Forest and Scrub Forest. Forest area is found in patches along Ganga and Duar River and in Manikpur, Benti and Kalkankar. Fallow land has a distribution of 26.16%, which also includes agricultural fallow land.
- Water body [4.56%] and marshy grassland [2.4%] constitutes 6.96% of the study area. It covers lentic and lotic system of the study area.
- The built-up land constitutes 0.94% of the total study area. This class covers major settlements at Kalakankar, Manikpur and Benti and the villages and settlements along National Highway.

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

Class	Area (Ha)	Area (%)
Dense Forest	157.29	0.4386
Open Forest	782.86	2.1832
Scrub Forest	706.98	1.9716
Water Body	1635.66	4.5614
Riverbed / Open Land	876.48	2.4443
Marshy Grassland	860.59	2.4000
Crop Land	9172.96	25.5810
Fallow Land	9381.07	26.1614
Plantation	11719.9	32.6838
Scrub/Barren Land	224.82	0.6270
Built up	339.87	0.9478
Total	35858.48	100



Map 4 : Land Use Land Cover Map Of The Study Area [Pratapgarh Distt.]

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 geology, old river routes, sediment deposition and are considered suitable areas for ground water recharge. In Pratapgarh Distt. factors such as encroachment, extensive agricultural practices, high silt load and loss of vegetation act as a catalyst for the fading of river channels and wetlands. 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 and threatened river channels in the study region, Survey of India (SOI) toposheets from 1925-1931 to 2005-2006 and Google Imagery upto November 2021 were analysed [Refer Map 5 & 6]. Further, ground truthing carried out in November 2021. Based on that, it has been found that :

- River channel of Ganga in Pratapgarh Distt. has migrated between 1925-1931 to 2005 - 2006 [Ref. Map No. 5].

- Major migration was recorded between Deobhita and Sandeepan Ghat and between Basedhi and Kurai [Refer Map No. 5].

- Just after leaving Pratapgarh Distt. the river has migrated towards Bhairav Ghat, Prayagraj Distt. [Left Bank] i.e. away from Kurai Village, Kaushambi Distt. [Right Bank]. This may be due to lack of inflow and increasing sediment load due to increased number of brick kilns along left bank of the River.

- In recent years it has been observed that channel of Ganga River is fading between Khamsara [25°43'42.32"N, 81°23'30.14"E], Gutni [25°42'9.20"N, 81°23'34.79"E] and Maudara [25°40'52.96"N, 81°24'57.01"E] in Pratapgarh Distt. [Left Bank]. The river channel is navigable only in monsoon season [Refer Image No. 6 & 7]. Also, in Kaushambi Distt. [Right Bank] the river channel is dried between Badanpur and Gauspur [Right bank] and between Sangeti and Sihori [Right bank]. The drying of river channel may trigger lateral erosion towards left bank [Pratapgarh Distt.] Dried channels are showing in Image No. 8 & 9.

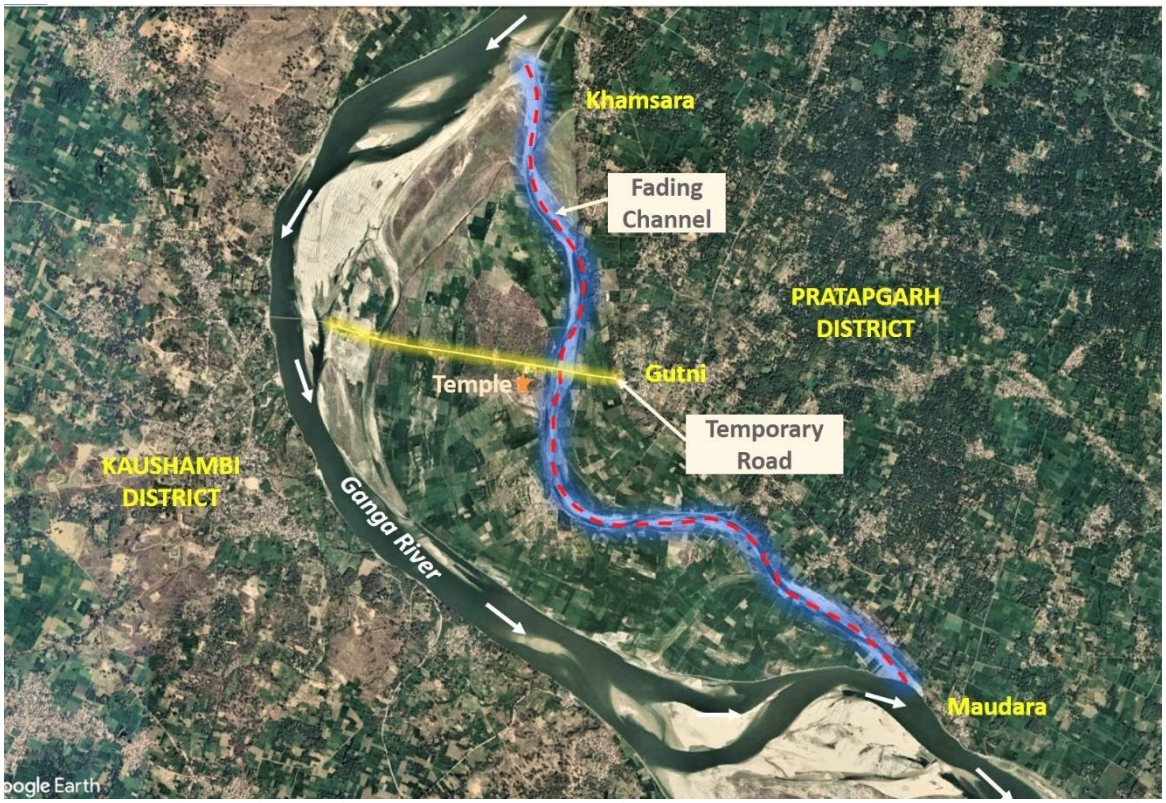


Image 6 : Fading Channel of Ganga Between Khamsara, Gutni and Maudara [Left Bank]

[Source : Google Earth Pro, Imagery Dated, December 2021]

Image 7 : Temporary Road Between Gutni And Riverine Island

[Looking South, Image Dated : 30th March 2022]

[Channel of River Ganga is Navigable in Monsoon Only]

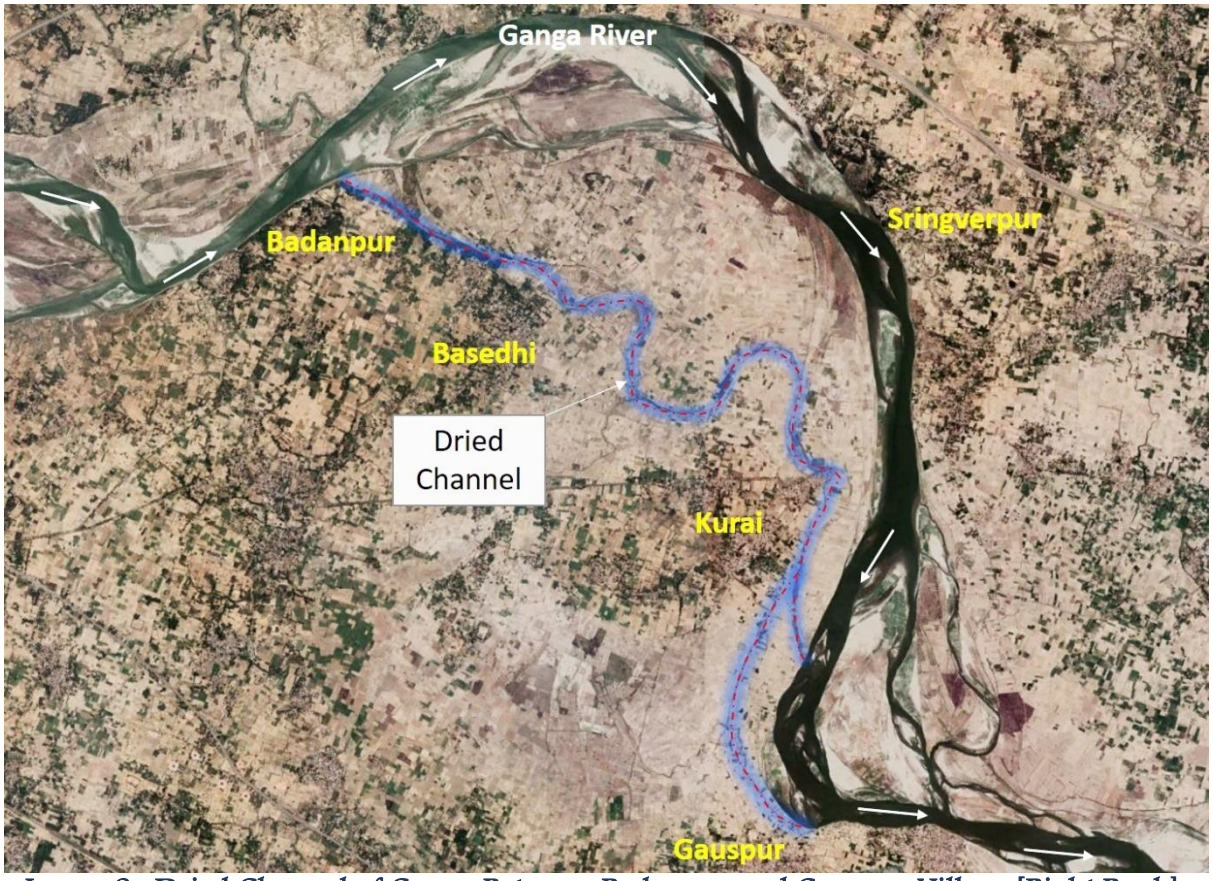


Image 8 : Dried Channel of Ganga Between Badanpur and Gauspur Village [Right Bank]
[Source : Google Earth Pro, Imagery Dated, April 2021]

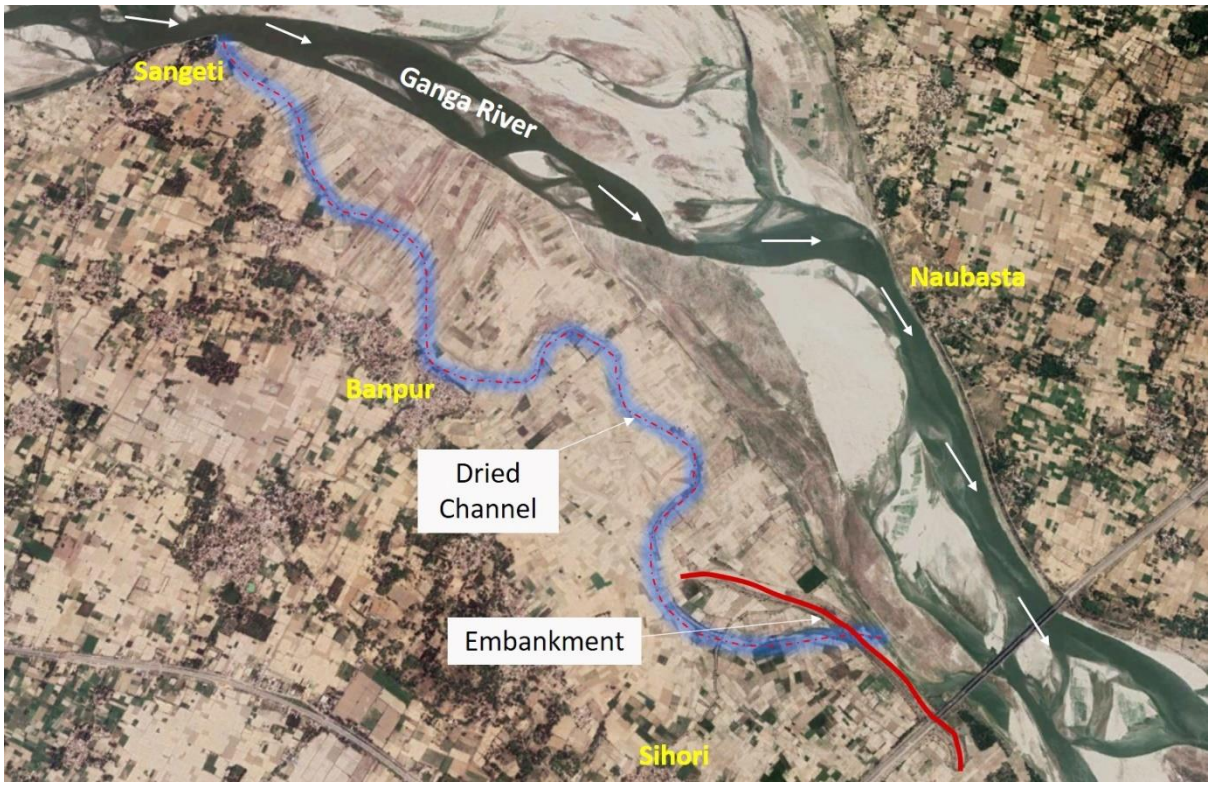
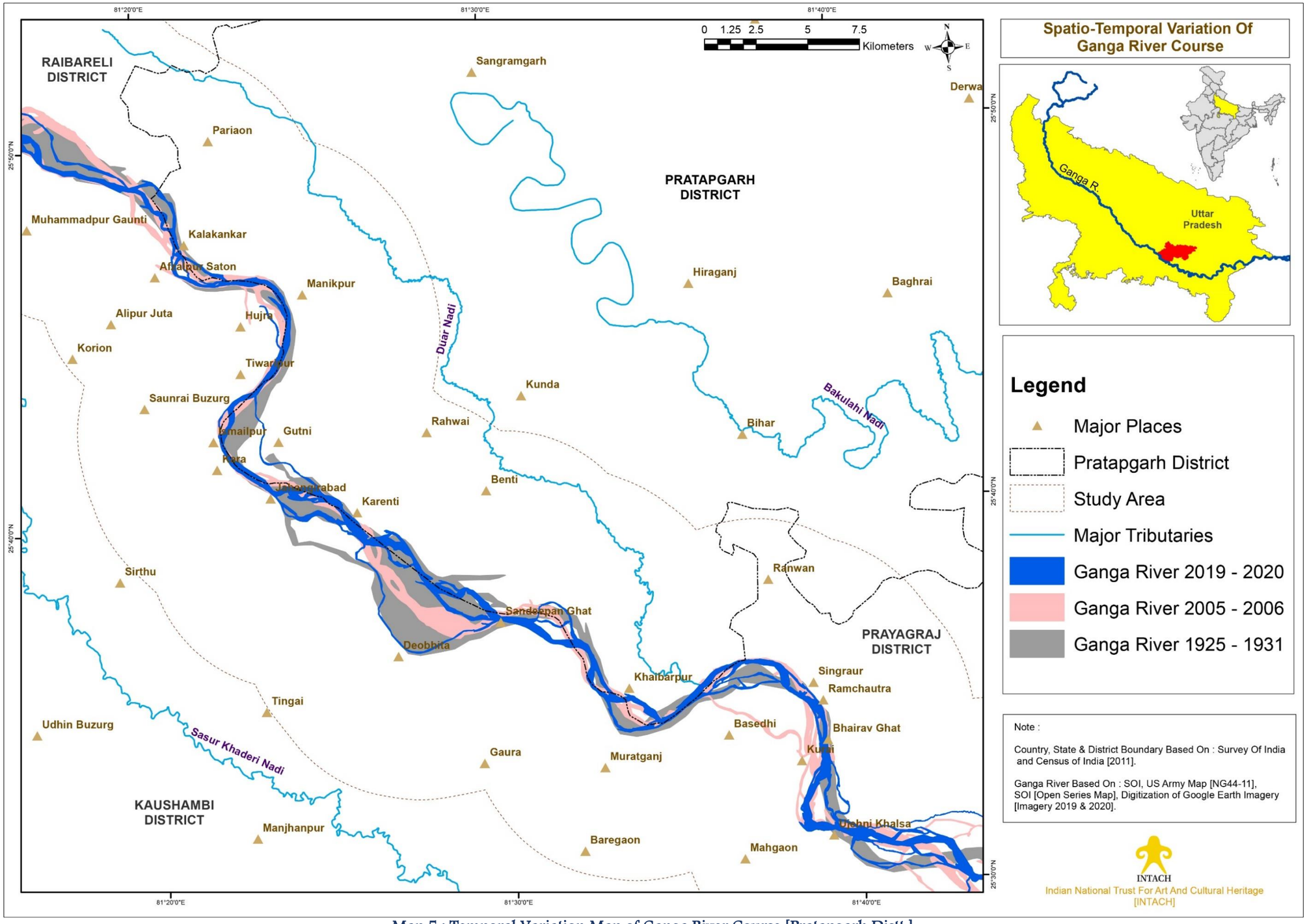
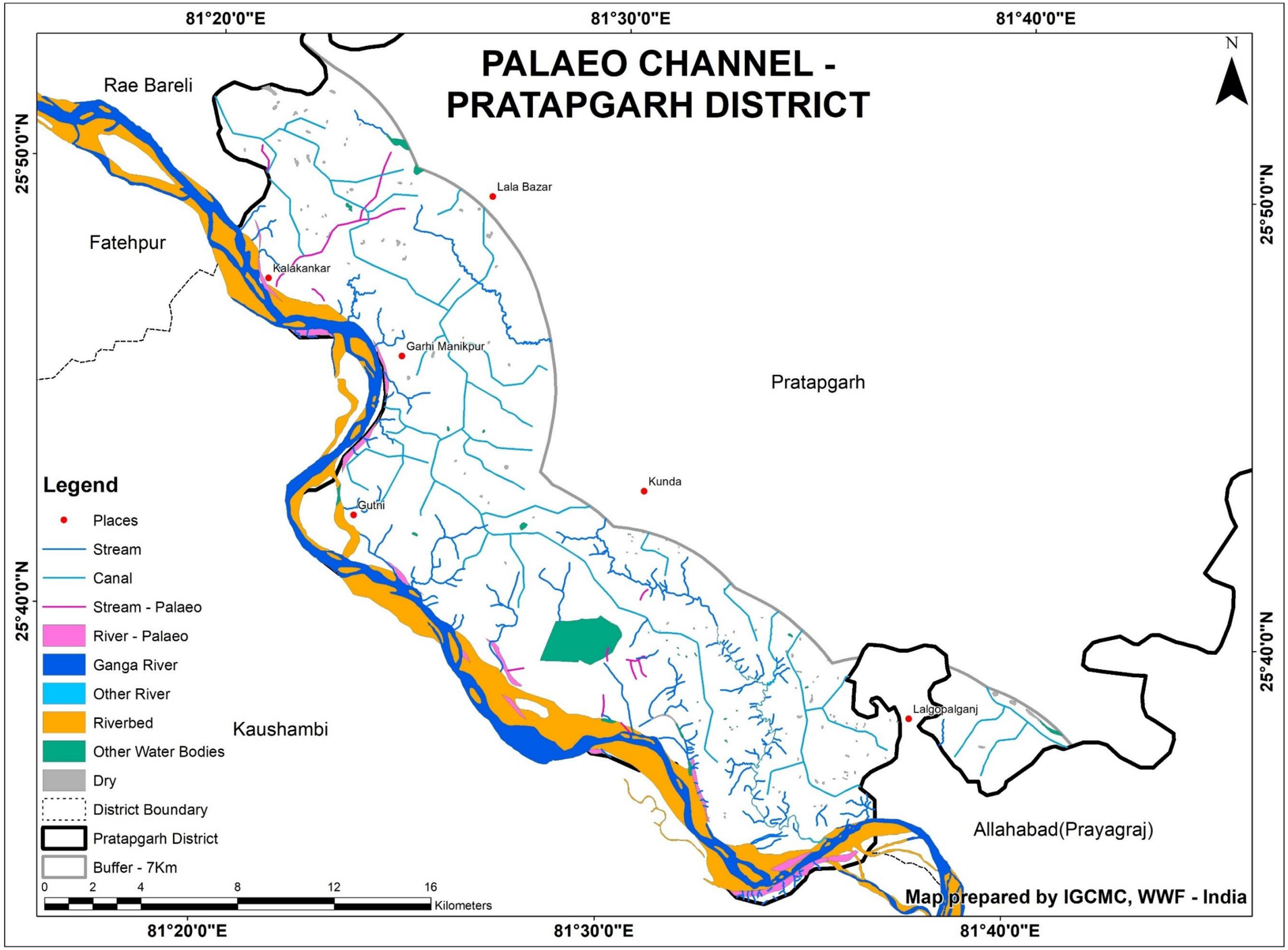


Image 9 : Dried Channel of Ganga River Between Sangeti and Sihori Village [Right Bank]
[Source : Google Earth Pro, Imagery Dated, April 2021]



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



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

7.0 Floodplain Of Ganga River In Pratapgarh District

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 floodplain 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, 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 Pratapgarh Distt. is part of Upper Indo-Gangetic Plains and physiographically, it represents a fairly level plain, of which nearly every part is equally fertile and well cultivated. The study area is predominantly agrarian and agriculture is a main source of livelihood. Geo-morphologically, the study area in Pratapgarh Distt. has been characterized into Younger alluvial plain [Active floodplain] and older alluvial plain [Older floodplain]. Active floodplain covers most of the area within the study corridor except the Manikpur. The general slope of older floodplain is 0-1% while active floodplain has slope between 1-3%. *Rabi* and *Zaid* crops are mainly cultivated within active floodplain areas [Refer Image No. 10].

7.3 The Pratapgarh Gazetteer of 1904 describes the Khadar or Khadir [Young alluvium Plain] area along Ganga River as :

"From Gutni onwards for some twelve or fifteen miles there is a rich Khadir of varying breadth; in places it is very narrow, but elsewhere it extends inland for nearly four miles. This lowlying tract is partly covered with thick Jhau or tamarisk jungle, which affords a refuge for wild pigs and nilgai; part of it cultivated and part forms an excellent grazing-ground for cattle. Most of this Khadir land is leased by the proprietors to cultivators, who pay ahigh rent for the right of tillage and pasture."

Image 10 : Agricultural Activities In Active floodplain Of Ganga River Near Parsipur
[Looking Southward]

[The image was taken from Krishna Van Kuti Temple Complex (25°37'23.86"N, 81°32'10.06"E, Near Parsipur), which is located 0.57 Km from Ganga River. ***Pratapgarh Gazetteer of 1904 mentioned this region as Khadar area covered under thick Jhau or tamarisk jungle. Currently this region has been altered and is used for agricultural purpose. There is cluster of small patches of vegetated area mostly dominated by perennial grasses (Saccharum spp.), Acacia and Prosopis spp.****]*

[Image showing Rabi crops mainly wheat, barley, linseed and mustard. Zaid crops are mainly grown at Sand bars and river bank. Utilization of chemical fertilizers in floodplain (Urea and DAP) is major environmental concern.].

7.4 Agricultural produce of the Distt. include-

- **Cereals and Millets :** Bajra (Spiked Millet), Barley, Jowar (Great Millet), Maize, Ragi (Finger Millet), Paddy, Sawan, Wheat [Refer Image No. 11].
- **Pulses :** Arhar (Tur), Cowpea (Lobia), Gram (Chikpea), Masoor (Lentil), Moong (Green Gram), Peas, Beans, Urad (Black Gram).
- **Oilseeds :** Groundnut, Linseeds (Flaxseed), Mustard and Sesamum.
- **Vegetables :** Ash Gourd (Petha/Bhatua), Bitter Gourd, Bottle Gourd, Brinjal, Cabbage, Carrot, Couliflower, Green Chillies, Guar Seed, Jhigni or Tori (Ridge Gourd), Okra, Onion, Parwal, Pumpkin, Tomato and Potato.

- Gooseberry (Amla), Lemon, Banana, Guava, Jackfruit, Muskmelon, Watermelon, Ber, monkey jack (Badhar), Papaya and Mango [Refer Image No. 12].

Image 11 : Ready To Harvest Wheat In Ganga River Floodplain

Image 12 : Mango Plantation In Gutni Village

8.0 Wetlands Within Study Area In Pratapgarh District

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 4.42% area of the Pratapgarh district. The majority [41.81%] area within the wetlands covered by the lotic system i.e., River/stream. The remaining 58.19% area is covered by Lakes/Ponds [13.55%], Ox-bow lakes/ Cut-off meanders [9.88%], Riverine wetlands [0.04%], Waterlogged [22.05%] and Tanks/Ponds [1.42%],

8.2 In the current exercise, 157 wetlands have been mapped in the study area with the help of Google Earth satellite imagery and SOI-OSM available maps. Total area of the mapped wetlands is 1042.1 ha i.e., 2.90% of the study area. The area of identified wetlands ranges between 0.21 ha to 895 ha. Out of 157 wetlands, the area of 116 wetlands is less than 1 ha, 31 wetlands have area between 1 ha and 2.5 ha and 10 wetlands have area greater than 2.5 ha. Area of the five largest wetlands constitutes 88.18% of the total study area. The list of identified wetlands is provided in Table No. 3 and their spatial distribution is shown in Map No. 7.

Table 3 : Wetland Within The Study Area

Sr. NO.	Wetland Name/ Wetland NO.	Coordinates		Area [Hectare]
		Latitude	Longitude	
1	1	25°51'41.60"N	81°19'57.36"E	3.90
2	2	25°51'55.42"N	81°20'9.94"E	0.78
3	3	25°51'25.46"N	81°20'11.42"E	0.69

4	4	25°51'51.23"N	81°20'58.86"E	0.56
5	5	25°51'27.88"N	81°20'27.11"E	0.67
6	6	25°50'45.52"N	81°20'28.76"E	0.58
7	7	25°50'40.05"N	81°20'53.36"E	0.44
8	8	25°50'45.90"N	81°20'49.85"E	0.58
9	9	25°51'54.95"N	81°21'53.83"E	0.58
10	10	25°51'7.92"N	81°21'50.97"E	0.70
11	11	25°51'13.23"N	81°21'49.93"E	0.30
12	12	25°51'15.23"N	81°21'44.56"E	0.60
13	Dhamokra Pond	25°49'57.51"N	81°21'36.07"E	0.47
14	14	25°48'43.55"N	81°21'19.08"E	0.23
15	15	25°48'57.56"N	81°21'20.92"E	0.27
16	15A	25°49'2.88"N	81°21'25.88"E	0.35
17	16	25°49'3.62"N	81°21'34.98"E	1.19
18	17	25°49'41.58"N	81°21'53.30"E	0.50
19	18	25°50'0.89"N	81°21'58.28"E	2.0
20	19	25°50'8.70"N	81°21'54.47"E	0.59
21	20	25°50'9.36"N	81°22'13.22"E	3.70
22	21	25°50'47.97"N	81°22'42.18"E	0.48
23	22	25°51'9.71"N	81°22'54.04"E	0.51
24	23	25°51'30.99"N	81°23'3.77"E	0.32
25	24	25°50'30.16"N	81°23'5.43"E	0.89
26	25	25°49'25.89"N	81°22'31.62"E	0.78
27	26	25°50'36.47"N	81°23'21.50"E	0.32
28	27	25°50'59.58"N	81°23'28.75"E	0.52
29	28	25°48'55.68"N	81°22'40.76"E	0.84
30	29	25°48'26.82"N	81°22'24.10"E	0.36
31	30	25°48'20.03"N	81°22'29.82"E	0.21
32	31	25°48'25.60"N	81°22'45.21"E	1.10
33	32	25°48'38.49"N	81°22'49.56"E	0.54
34	33	25°49'5.57"N	81°23'19.32"E	1.38
35	34	25°49'57.59"N	81°24'53.61"E	5.19
36	35	81°22'24.99"E	81°22'24.99"E	0.54

37	36	25°48'24.50"N	81°23'38.30"E	0.51
38	37	25°49'7.82"N	81°26'0.25"E	1.53
39	38	25°49'12.92"N	81°26'28.08"E	1.55
40	39	25°48'5.18"N	81°25'26.84"E	0.53
41	40	25°48'43.25"N	81°27'5.51"E	0.48
42	41	25°48'34.17"N	81°26'43.46"E	2.10
43	42	25°48'54.81"N	81°26'38.48"E	0.49
44	43	25°48'44.62"N	81°26'46.82"E	0.59
45	44	25°47'13.30"N	81°25'25.95"E	O.41
46	45	25°45'59.12"N	81°24'40.27"E	1.15
47	46	25°47'8.00"N	81°25'50.22"E	0.85
48	47	25°47'58.77"N	81°26'41.31"E	0.46
49	48	25°48'3.00"N	81°26'47.96"E	0.48
50	49	25°48'10.10"N	81°26'59.38"E	0.48
51	50	25°48'18.61"N	81°27'16.51"E	1.72
52	51	25°47'59.37"N	81°27'0.30"E	1.10
53	52	25°47'56.05"N	81°26'54.03"E	0.34
54	53	25°47'39.82"N	81°27'0.45"E	1.52
55	54	25°47'48.02"N	81°27'5.73"E	0.54
56	55	25°47'51.12"N	81°27'11.76"E	0.60
57	56	25°47'46.37"N	81°27'19.88"E	0.56
58	57	25°46'9.10"N	81°25'44.97"E	0.44
59	58	25°46'52.33"N	81°26'29.75"E	1.20
60	59	25°46'38.64"N	81°26'10.30"E	0.44
61	60	25°46'20.38"N	81°25'51.85"E	1.84
62	61	25°45'47.19"N	81°25'32.87"E	1.58
63	62	25°45'49.21"N	81°26'1.85"E	0.23
64	63	25°46'20.58"N	81°26'42.94"E	0.67
65	64	25°47'23.71"N	81°27'57.29"E	9.40
66	65	25°46'19.92"N	81°27'2.34"E	0.32
67	66	25°45'21.23"N	81°25'41.57"E	0.75
68	67	25°45'42.42"N	81°27'20.72"E	0.94
69	68	25°44'54.78"N	81°25'41.06"E	0.69
70	69	25°44'42.75"N	81°25'47.95"E	0.28

71	70	25°44'13.37"N	81°26'50.00"E	0.83
72	71	25°44'40.58"N	81°28'14.25"E	0.94
73	72	25°43'45.02"N	81°24'49.67"E	0.70
74	73	25°43'27.57"N	81°24'45.49"E	0.61
75	74	25°43'28.78"N	81°25'4.52"E	0.30
76	75	25°43'45.48"N	81°26'25.38"E	0.74
77	76	25°43'37.73"N	81°26'30.05"E	0.43
78	77	25°43'44.13"N	81°26'31.64"E	0.80
79	78	25°43'40.80"N	81°26'40.61"E	0.99
80	79	25°43'27.89"N	81°27'21.73"E	2.93
81	80	25°43'14.42"N	81°26'22.27"E	1.20
82	81	25°42'44.81"N	81°26'49.12"E	1.47
83	82	25°42'36.33"N	81°26'59.89"E	1.95
84	83	25°42'42.22"N	81°25'44.65"E	0.63
85	84	25°42'29.52"N	81°28'59.26"E0.	0.21
86	85	25°42'18.42"N	81°28'18.30"E	0.46
87	86	25°42'25.60"N	81°28'4.02"E	0.42
88	Bade Talab	25°42'9.34"N	81°27'56.36"E	1.76
89	88	25°41'52.60"N	81°28'35.11"E	0.82
90	89	25°41'20.86"N	81°26'37.09"E	0.49
91	90	25°41'8.94"N	81°26'46.75"E	0.97
92	91	25°41'15.42"N	81°27'29.46"E	1.25
93	92	25°41'52.21"N	81°31'2.87"E	0.62
94	93	25°41'56.88"N	81°31'26.22"E	1.53
95	94	25°41'44.46"N	81°31'19.11"E	0.50
96	95	25°40'29.31"N	81°26'33.78"E	0.82
97	96	25°41'16.37"N	81°32'41.34"E	0.44
98	97	25°40'51.24"N	81°29'40.31"E	0.47
99	98	25°40'41.91"N	81°29'45.33"E	0.32
100	Benti Lake	25°39'37.36"N	81°29'17.97"E	895
101	100	25°40'21.11"N	81°31'25.11"E	0.69
102	101	25°40'10.07"N	81°31'23.76"E	0.27
103	102	25°40'0.48"N	81°32'10.49"E	1.00
104	103	25°38'32.81"N	81°29'43.05"E	0.28
105	104	25°38'34.36"N	81°29'47.18"E	0.37

106	105	25°38'38.16"N	81°29'43.33"E	0.38
107	106	25°38'40.88"N	81°29'42.27"E	0.43
108	107	25°38'36.32"N	81°30'11.53"E	0.51
109	108	25°39'25.37"N	81°32'14.78"E	0.87
110	109	25°40'1.79"N	81°33'40.64"E	0.52
111	110	25°39'49.26"N	81°34'32.87"E	0.66
112	111	25°39'55.27"N	81°34'34.06"E	2.51
113	112	25°39'59.08"N	81°34'36.15"E	1.13
114	113	25°40'6.62"N	81°34'34.01"E	0.36
115	114	25°38'46.19"N	81°31'12.92"E	0.69
116	115	25°38'45.85"N	81°30'42.94"E	0.81
117	116	25°38'30.30"N	81°30'36.71"E	0.37
118	117	25°38'29.88"N	81°30'42.68"E	0.55
119	118	25°38'31.42"N	81°30'45.33"E	0.32
120	119	25°38'31.48"N	81°30'55.98"E	0.34
121	120	25°38'34.71"N	81°30'41.44"E	0.21
122	121	25°38'37.31"N	81°30'50.07"E	0.36
123	122	25°38'38.74"N	81°31'56.96"E	0.23
124	123	25°39'36.33"N	81°34'27.83"E	0.84
125	124	25°39'28.58"N	81°34'38.36"E	1.14
126	125	25°38'8.30"N	81°32'35.08"E	1.14
127	126	25°38'52.61"N	81°35'7.20"E	1.39
128	127	25°38'46.80"N	25°38'46.80"N	2.10
129	128	25°37'6.69"N	81°32'36.23"E	0.98
130	129	25°38'11.18"N	81°35'37.14"E	0.95
131	130	25°37'59.79"N	81°36'15.47"E	0.89
132	131	25°37'56.26"N	81°36'26.01"E	0.86
133	132	25°36'24.51"N	81°34'25.94"E	0.99
134	133	25°36'28.69"N	81°34'58.60"E	1.15
135	134	25°38'6.85"N	81°37'16.35"E	1.16
136	135	25°36'7.81"N	81°35'19.35"E	0.64
137	136	25°35'52.81"N	81°35'43.77"E	0.42
138	137	25°38'29.91"N	81°35'8.57"E	4.88
139	138	25°38'7.33"N	81°34'52.09"E	4.49
140	139	25°38'27.27"N	81°35'26.41"E	0.72

141	140	25°38'21.01"N	81°34'47.04"E	0.74
142	141	25°37'14.19"N	81°32'43.85"E	0.47
143	142	25°41'57.12"N	81°30'42.75"E	0.57
144	143	25°42'0.37"N	81°30'34.33"E	0.64
145	144	25°42'3.25"N	81°30'31.12"E	0.99
146	145	25°42'6.10"N	81°30'49.51"E	0.51
147	146	25°42'21.38"N	81°26'16.35"E	0.99
148	147	25°42'42.44"N	81°27'13.46"E	0.78
149	148	25°42'50.05"N	81°24'38.94"E	0.31
150	149	25°45'28.27"N	81°26'39.16"E	1.27
151	150	25°46'0.94"N	81°26'9.53"E	0.46
152	151	25°46'33.90"N	81°25'58.10"E	0.42
153	152	25°47'56.43"N	81°26'35.83"E	0.40
154	153	25°48'31.35"N	81°27'2.83"E	1.30
155	154	25°48'23.36"N	81°26'3.87"E	0.63
156	155	25°48'22.11"N	81°24'30.97"E	1.87
157	156	81°22'5.34"E	81°22'5.34"E	0.49
Total Area [Hectares]				1042.1

8.3. **Pariawan Village Ponds :** There are two wetlands located in Pariawan village at 25°50'1.37"N, 81°21'59.44"E and 25°50'9.43"N, 81°22'12.55"E respectively [Refer Map 7 & Table No. 3 (Wetland No. 18 & 20)]. Both wetlands get its water from rainfall and runoff from the surrounding areas and sewage from the Pariawan village. Maximum depth of the Wetland No. 18 is aroun 8-10 feet while depth of Wetland No. 20 is 15-17 feet. Both wetlands are used for fish farming. Fish species found in the wetland includes – Rohu [*Labeo rohita]*, Catla [*Labeo catla]*, Brigid, Silver carp, Padhina, Bhakur and Tengra [*Mystus tengara].*

The edges of Wetland No. 18 are somehow encroached for agricultural activities and construction [Refer Image No. 13 & 14]

Image 13 : Satellite Image Of 2006 Showing Wetland No. 18

[Source : Google Earth Pro, Imagery Dated, April 2006]

Image 14 : Satellite Image Of 2022 Showing Wetland No. 18

[Source : Google Earth Pro, Imagery Dated, March 2022]

Image 15 : Wetland No. 18 In Pariawan Village

8.4 Benti Lake or Benti Tal : Wetland is one of the major floodplain lake of River Ganga [Left Bank] located in Benti Village of Pratapgarh Distt. at Latitude 25°39'37.36"N and Longitude 81°29'17.97"E [Refer Map 7 & Table No. 3 (Sr. No 100)]. Wetland receives inflow from rainfall and runoff from the surrounding areas and from River Ganga during flood. Outflow goes to River Ganga through two drains constructed in south-west and south-east of the wetland [Refer Image No. 16 & 17].

The Pratapgarh Gazetteer of 1904 describes the Benti Lake as :

"This (Benti Lake) is a flat and low lying expanse of land about seven square miles in area; bounded on the North, west and east by the old high bank and the uplands above it, which rise more or less steeply to a height varying from ten to thirty feet. On the south side there is a narrow strip of land separating the lake from the Ganges Khadir, with which the lake formerly communicated by a narrow channel. Originally the flood water of the Ganges used to rush in through this channel, filling the lake to a depth of 15 or 20 feet : when the floods subsided, much of the water was imprisoned, as the outlet was higher than the bed of the lake. ***The Benti Lake was clearly an ancient bed of the river at one period."***

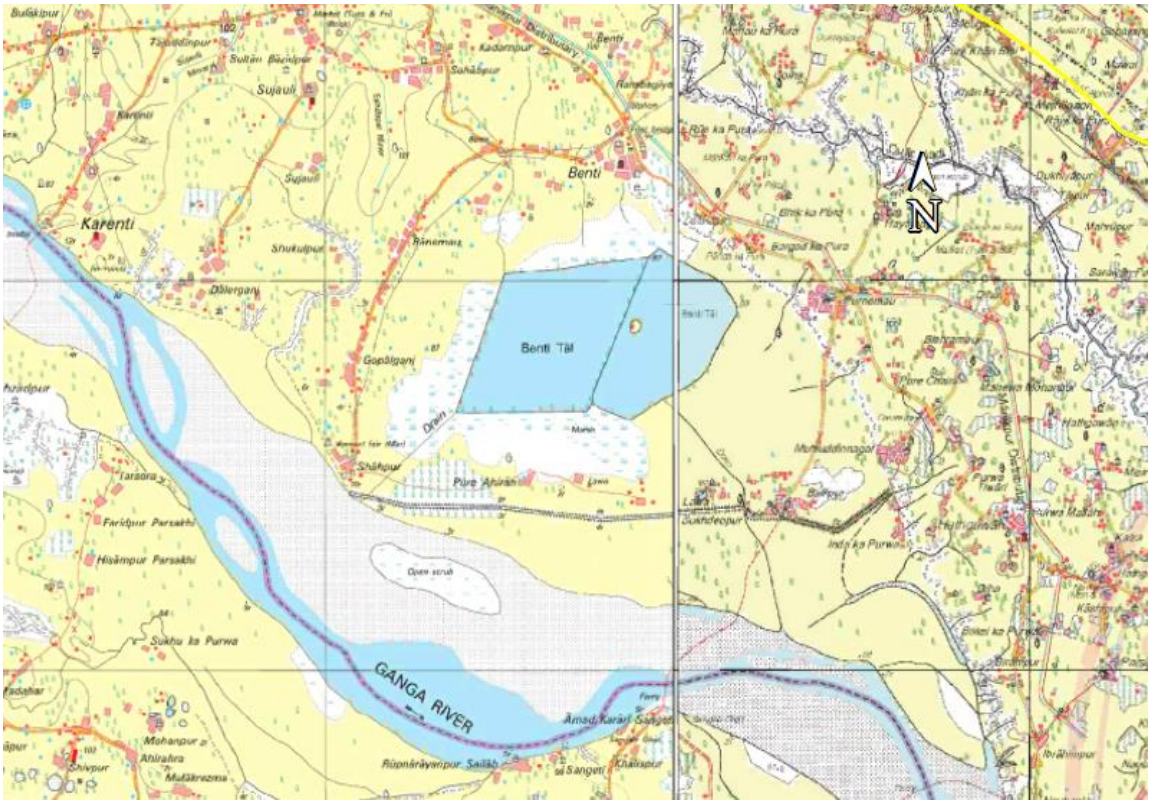


Image 16 : SOI-OSM Toposheet [G44P6 & G44P10] Showing Benti Lake

[Source : Survey of India, Open Series Maps, Scale : 1:50,000]

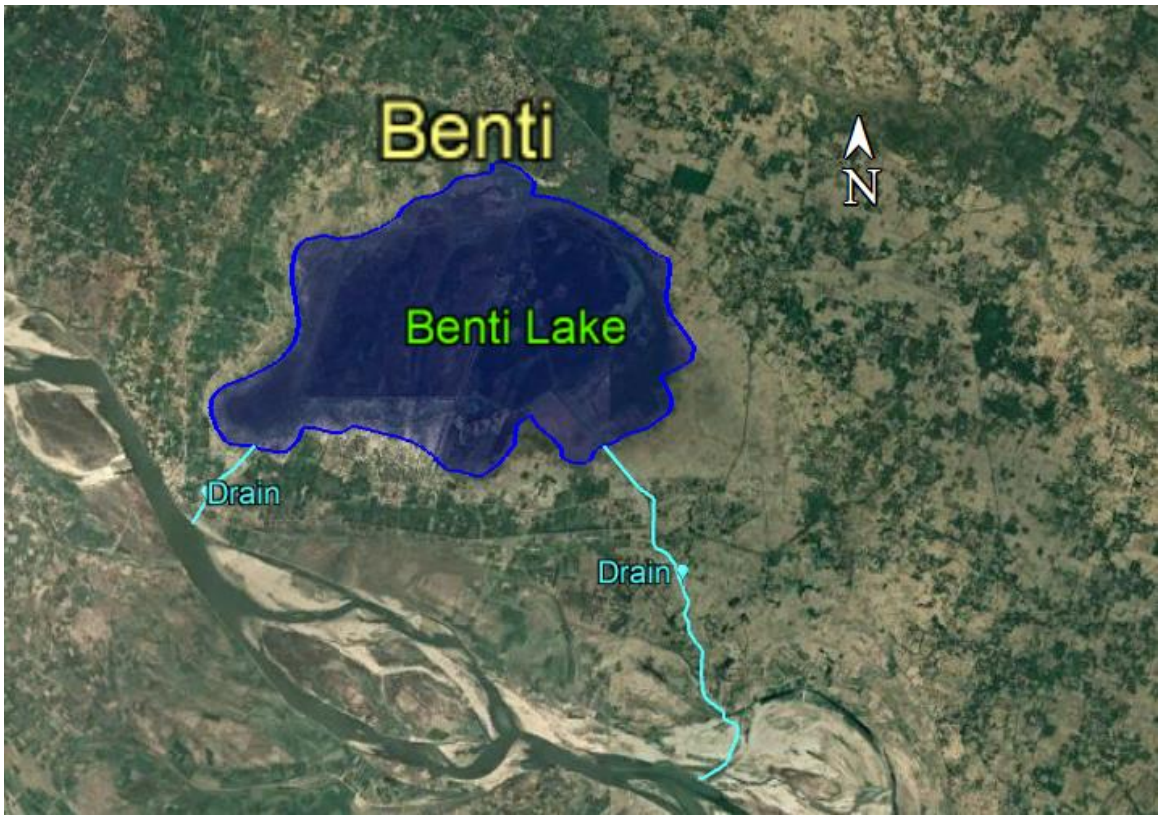
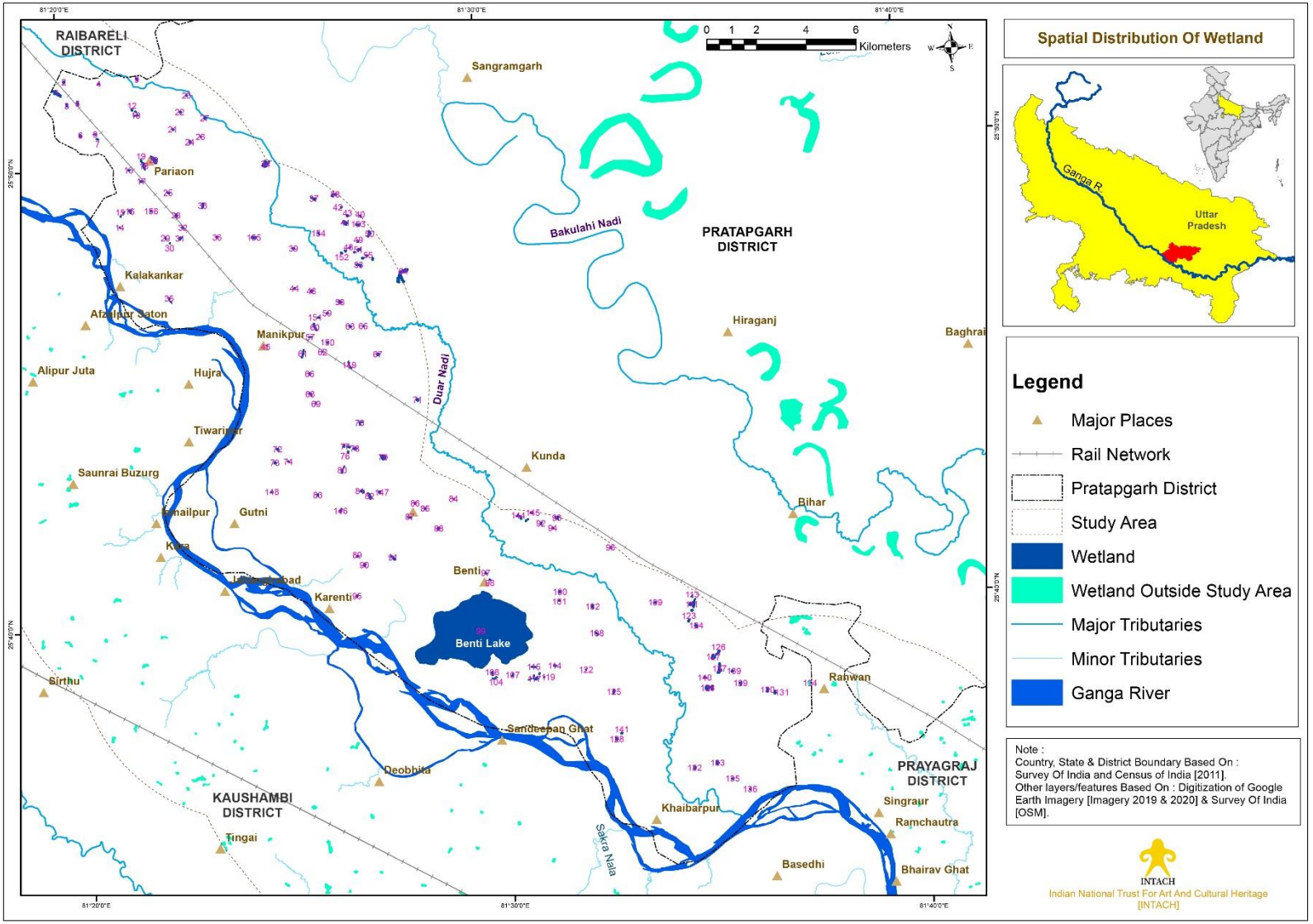


Image 17 : Satellite Image Showing Benti Lake

[Source : Google Earth Imagery, Dated February, 2022]



Map 7 : Spatial Distribution Of Wetlands [Pratapgarh Distt.]

9.0 Riparian Flora Along Ganga River In Pratapgarh District

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. In addition, 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 Pratapgarh distt. is similar to the adjoining districts – Fatehpur, Raebareli, Kaushambi and Prayagraj. The Pratapgarh Gazetteer of 1904 describes the Vegetation within the study area as –

- *"Patches of jungle land chiefly covered with the dhak tree and nowhere very extensive. In former days the jungle area was very much larger, but in the peaceful times following on the British annexation large stretches of Dhak jungle have been cleared, and those that remain are confined to the worst soils. They are only found on level land and sometimes stretch in belts across usar plains or elsewhere skirt the cultivated fields. These jungles form the principal grazing-grounds of the district."*

- *"In the broken and unfertile ground along the banks of the rivers and streams the babool is often to be seen. The other indigenous jungle trees call for little remark. The most common are the pipal, bargad, pakar, amaltas, Kachnara and bakain."*

- *"There is a certain amount of good grazing land covered with rich grass alon the banks of the Ganges, but this supplies a small portion of the district."*

9.4 Currently the *Dhak* and *Jhau* dominated jungle has been mostly transformed into the agricultural fields and plantation area. The existing patches of riparian vegetation are now dominated by *Saccharum spontaneum* L, *Saccharum munja* Roxb., Babool [*Acacia nilotica*], Wild Ber [*ziziphus mauritiana]* and opportunistic & invasive species like *Prosopis juliflora* and *Lantana camara*. The plantation area mainly dominated by – Mango [Mangifera indica], Mahua [*Madhuca longifolia], Emli [Tamarindus indica], Neem* [*Azadirachta indica*], Banyan [*Ficus benghalensis*] and Peepal [*Ficus religiosa*]. *Existing* riparian sites are located in Nawabganj [25°48'28.46"N, 81°21'6.20"E], Kalakankar [25°47'40.17"N, 81°21'7.56"E], Raheti [25°47'3.30"N, 81°23'28.45"E], East to the Manikpur [25°45'6.19"N, 81°24'20.80"E], Khamsara Uperhar [25°43'41.44"N, 81°23'30.26"E], Shahpur [25°39'38.80"N, 81°27'6.28"E], Krishna Van Kuti [25°37'30.02"N 81°32'11.27"E], Naubasta [25°35'55.74"N, 81°32'41.15"E] and Jahanabad [25°35'53.79"N, 81°36'28.13"E]. During the survey, total 48 species were recorded throughout the study corridor and is provided in Table No. 4 and Image 18-21.

Image 18 : A patch of Wild Ber [*Ziziphus nummularia*] In Ibrahimpur Village

Image 19 : Dhak or Palas [*Butea Monosperma*]

[*Butea Monosperma* withstands heat, frost, waterlogging, drought and poor soils, including heavy clay and salinity. Historically, the region has a jungle of *Dhak* associated with Jhau and Kans. But, during British *period large stretches of Dhak jungle have been cleared].*

9.5 Some riparian grasses are economically valuable in the district. *Saccharum spontaneum* and Saccharum *munja* are used for making huts, basket and ropes. Ropes [locally called Juda] made of Saccharum *spontaneum* are more durable. A bundle of rope of nearly 1.5 Kg weight costs around 30 rupees and is sold at local market.

Table 4 : Recorded Riparian Plant Species Within Study Area

Sr. No.	Botanical Name	Family	Common Name
01	*Acacia nilotica* (L.) Delile	Fabaceae	Babool
02	*Aegle marmelos* (L.) Corrêa	Rutaceae	Bel Patra
03	*Azadirachta indica* A. Juss.	Meliaceae	Neem
04	*Bombax ceiba* L.	Bombacaceae	Semal
05	*Dalbergia sissoo* DC.	Fabaceae	Shisham
06	*Delonix regia (Hook.)* Raf.	Fabaceae	Gulmohar
07	*Ficus benghalensis* L.	Moraceae	Banyan

08	*Ficus religiosa* L.	Moraceae	Peepal
09	*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	*Lippia alba* (Mill.) N.E.Br. ex Britton &P.Wilson	Verbenaceae	~~~~~
19	*Malvastrum coromandelianum* (L.) Garcke	Malvaceae	False Mallow
20	*Ocimum tenuiflorum* L.	Lamiaceae	Tulsi
21	*Polygonum glabrum* Wild.	Polygonaceae	Common marsh buckwheat
22	*Ricinus communis* L.	Euphorbiaceae	Arandi
23	*Ziziphus nummularia* (Burm.f.) Wight &Arn.	Rhamnaceae	Wild Ber
24	*Achyranthes aspera* L.	Amaranthaceae	Chirchira
25	*Amaranthus spinosus* L.	Amaranthaceae	Prickly Amaranth
26	*Ammania baccifera* L.	Lythraceae	~~~~~
27	*Croton bonplandianus* Baill.	Euphoriaceae	Ban Tulsi
28	*Justicia* sp.	Acanthaceae	~~~~~
29	*Leucas aspera* (Willd.) Link	Lamiaceae	~~~~~

30	*Parthenium hysterophorus* L.	Asteraceae	Congress grass
31	*Rumex dentatus* L.	Polygonaceae	Jungli Palak
32	*Solanum xanthocarpum* Schrad. & H. Wendl.	Solanaceae	Kateli
33	*Tephrosia purpurea* (L.) Pers.	Fabaceae	Sharpunkha
34	*Tridax procumbens* (L.) L.	Asteraceae	~~~~~
35	*Xanthium strumarium* L.	Asteraceae	Chhota Dhatura
36	*Cyperus difformis* L.	Cyperaceae	~~~~~
37	*Cyperus rotundus* L.	Cyperaceae	Nut grass
38	*Dicanthium annulatum*	Poaceae	~~~~~
39	*Saccharum spontaneum* L.	Poaceae	Kaans
40	*Saccharum munja* Roxb.	Poaceae	Munj
41	*Cynodon dactylon*	Poaceae	Dhoob/Durva grass
42	*Ipomea aquatica Forsk.*	Convolvulaceae	Water Morning Glory
43	*Butea monosperma*	Fabaceae	Pal
44	*Cassia fistula*	Fabaceae	Amaltas
45	*Bauhinia variegata*	Fabaceae	Kachnar
46	Tamarix gallica var. indica *(Willd.) Ehrenb*	*Tamaricaceae*	*Jhau or Tamarisk*
47	*Tamarindus indica*	Fabaceae	Emli
48	*Melia azedarach*	Meliaceae	Bakain

Image 20 : A patch Of Riparian Vegetation

Image 21 : Riparian Vegetation Dominated By Saccharum spontaneum

[*The area is mainly used as pasture land*]

10.0 Faunal Diversity Along Ganga River In Pratapgarh District

10.1 Patches of riparian vegetation and interconnected saccharum dominated areas along Ganga and Duar Nai 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*], Indian mole rat [*Bandicota bengalensis],* Common mongoose [*Herpestes edwardsii*], *Rhesus macaque* [*Macaca mulatta*] and Langur [*Semnopithecus spp.*].

10.2 Details of faunal species sighted within the study corridor are provided below :

10.2.1 **Turtles:** River Ganga is home to 13 freshwater turtle species of total 24 species found in the freshwaters of India. Turtles are unique reptilian creatures having distinct ecological niche, adapted to specialized environmental conditions, slight alteration in the habitat can make the species extinct from the region. Poaching, habitat loss, pollution and over fishing are major threats to the turtles. During the survey **Indian Roofed Turtles** [*Pangshura tecta*] (approx 50 in numbers) which is listed in "**Vulnerable**" category of IUCN's Red List of Threatened Species was sighted at riverine islands near Sangrampur Kachar. The **Brown Roofed Turtle** [*Pangshura smithi*] which falls under "**Near Threatened**" Category and **Indian Soft-shell Turtle** [*Nilssonia gangetica]* under **"Endangered"** by IUCN are randomly sighted species in the region.

Image 22 : Indian Roofed Turtles [*Pangshura tecta*] At Riverine Island Near Sangrampur Kachar

10.2.2 **Nilgai :** Nilgai [*Boselaphus tragocamelus*] or Blue bull has become one of the major threats in crop production, leading to human-wildlife conflict in various regions of the country. Usually prefer open grasslands, open scrublands, woodlands and agricultural fields as habitat. The population of Nilgai has increased drastically over the years due to prolonged breeding activity and lack of potential predators and has become locally overabundant in states of Gujarat, Bihar, Uttar Pradesh, Haryana, Punjab, Rajasthan, Madhya Pradesh and Delhi (Meena, 2017). The entire Gangetic plain is prone to crop raiding by the animal creating human-wildlife conflict across the region. During the survey, significant population was spotted across the district [Refer Image No. 23].

Image 23 : Nilgai (Female) [*Boselaphus tragocamelus*] Sighted In A Riparian Patch

10.2.3 **Gangetic Dolphin** : Declared as National declared as the National Aquatic Animal by the Govt. of India in 2010, the Gangetic Dolphin [*Platanista gangetica*] is one of the three fresh water dolphins found in the world. Found in Ganga-Brahmaputra- Meghna and Sangu–Karnaphuli river systems in India, Nepal, and Bangladesh. The Gangetic Dolphin falls under "Endangered" category of IUCN's Red Data List, the population of these species has been decreased since the last century due to habitat loss, habitat fragmentation, diversion of water, over fishing and hunting (Sinha & Kannan, 2014; Abdul Wakid, 2005). During the survey, we did not have any direct sighting of the mammalian

creature. Upon interaction with the mallah community, it is found that there is a sparse population of dolphin present in the stretch. Major sighting area includes – Duar-Ganga confluence and confluence of Nala in Jahanabad Village.

10.2.4 **Wild Boar :** Wild Boars [*Sus scrofa* L.] are one of the most widely distributed species in the world. Their highly adaptive behaviour and wide range of habitat have led the species' population to flourish. In recent years, wild boar has become a regular menace for farmers, causes crop damage right from planting till the maturity of the crop [Vasudeva Rao et. al., 2015]. Famous for attacks on human, the wild boars are usually nocturnal species. During the survey, the locals stated that the boars are responsible for destroying the Zaid crops at river bank. The tall riparian grasses serve as habitat for them, during the night the wild boars use to come out and feed on the crops and vegetables. Historically the *Dhak* and *Jhau* dominated Jungles along the river were reported as habitat of wild boars.

10.3 **Avian Diversity :** Pratapgarh Distt. has a rich diversity of avian species yet is relatively understudied. The avian diversity survey was conducted in March-April 2022. The diversity 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. List of recorded avian species is provided in Table Below -

Table 5 : List Of Recorded Avian Species Within Pratapgarh Distt.

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	*Actitishy poleucos*	Least Concern
11.	Asian Openbill	*Anastomus oscitans*	Least Concern
12.	Little Cormorant	*Microcarbo niger*	Least Concern

13.	Indian Cormorant	*Phalacrocorax fuscicollis*	Least Concern
14.	Great Cormorant	*Phalacrocorax carbo*	Least Concern
15.	White breasted - Waterhen	*Amaurornis phoenicurus*	Least Concern
16.	Black-headed Gull	*Larus ridibundus*	Least Concern
17.	Brown-headed Gull	*Larus brunnicephalus*	Least Concern
18.	Purple Swamphen	*Porphyrio porphyrio*	Least Concern
19.	**River Tern**	***Sterna aurantia***	**Vulnerable**
20.	Whiskered Tern	*Chlidonias hybrida*	Least Concern
21.	Common Greenshank	*Tringa nebularia*	Least Concern
22.	Black-winged Stilt	*Himantopus himantopus*	Least Concern
23.	Bronze-winged Jacana	*Metopidius indicus*	Least Concern
24.	**River Lapwing**	***Vanellus duvaucelii***	**Near Threatened**
25.	Red-wattled Lapwing	*Vanellus indicus*	Least Concern
26.	Black Drongo	*Dicrurus macrocercus*	Least Concern
27.	Common Myna	*Acridotheres tristis*	Least Concern
28.	Bank Myna	*Acridotheres ginginianus*	Least Concern
29.	Asian Pied Starling	*Gracupica contra*	Least Concern
30.	Brahminy Starling	*Sturnia Pagodarum*	Least Concern
31.	Paddyfield Pipit	*Anthus rufulus*	Least Concern
32.	Common Stonechat	*Saxicola torquatus*	Least Concern
33.	Pied Bushchat	*Saxicola caprata*	Least Concern
34.	Oriental Skylark	*Alauda gulgula*	Least Concern
35.	Common Babbler	*Argya caudata*	Least Concern
36.	Jungle Babbler	*Argya striata*	Least Concern
37.	Large Grey Babbler	*Argya malcolmi*	Least Concern
38.	White Wagtail	*Motacilla alba*	Least Concern
39.	White-browed Wagtail	*Motacilla maderaspatensis*	Least Concern
40.	Indian Silverbill	*Euodice malabarica*	Least Concern
41.	Common Tailorbird	*Orthotomus sutorius*	Least Concern

42.	**Alexandrine Parakeet**	***Palaeornis eupatria***	**Near Threatened**
43.	Rose-ringed Parakeet	*Psittacula krameri*	Least Concern
44.	House Sparrow	*Passer domesticus*	Least Concern
45.	Indian Jungle Crow	*Corvus culminatus*	Least Concern
46.	Oriental Magpie Robin	*Copsychus saularis*	Least Concern
47.	Indian Robin	*Saxicoloides fulicatus*	Least Concern
48.	Common Pigeon	*Columba livia*	Least Concern
49.	Barn Swallow	*Hirundo rustica*	Least Concern
50.	Asian Plain Martin	*Riparia chinensis*	Least Concern
51.	Brown-headed Barbet	*Psilopogon zeylanicus*	Least Concern
52.	Coppersmith Barbet	*Psilopogon haemacephalus*	Least Concern
53.	Ashy Prina	*Prinia socialis*	Least Concern
54.	Plain Prinia	*Prinia inornata*	Least Concern
55.	Asian Koel	*Eudynamys scolopaceus*	Least Concern
56.	Greater Coucal	*Centropus sinensis*	Least Concern
57.	Red-whiskered Bulbul	*Pycnonotus jocosus*	Least Concern
58.	Red-vented Bulul	*Pycnonotus cafer*	Least Concern
59.	Shikra	*Accipiter badius*	Least Concern
60.	Common Kaestral	*Falco tinnunculus*	Least Concern
61.	Black-winged kite	*Elanus caeruleus*	Least Concern
62.	Green Bee-eater	*Merops orientalis*	Least Concern
63.	**Pallas's Fish Eagle**	***Haliaeetus leucoryphus***	**Endangered**
64.	Scaly-breasted Munia	*Lonchura punctulata*	Least Concern
65.	Indian Peafowl	*Pavo cristatus*	Least Concern
66.	Spotted Dove	*Spilopelia chinesis*	Least Concern
67.	Eurasian Collared Dove	*Streptopelia decaocto*	Least Concern
68.	Laughing Dove	*Spilopelia senegalensis*	Least concern

69.	Red Collared Dove	*Streptopelia tranquebarica*	Least concern
70.	Yellow-crowned Woodpecker	*Leiopicus mahrattensis*	Least concern
71.	Black Redstart	*Phoenicurus ochruros*	Least concern
72.	Grey Fancolin	*Ortygornis pondicerianus*	Least concern
73.	Yellow-footed Green-pigeon	*Treron phoenicopterus*	Least concern
74.	Rufous Treepie	*Dendrocitta vagabunda*	Least concern
75.	Purple Sunbird	*Cinnyris asiaticus*	Least concern
76.	Indian Roller	*Coracias benghalensis*	Least concern
77.	Indian Grey Hornbill	*Ocyceros birostris*	Least Concern
78.	Oriental white ibis	*Threskiornis melanocephalus*	~~~~~~~
79.	Red Naped Ibis	Pseudibis papillosa	Least Concern

Image 24 : Flock of Asian Openbill [*Anastomus oscitans]* And Oriental white ibis [*Threskiornis melanocephalus*]

Image 25 : River Lapwing [*Sterna aurantia*], Vulnerable Sighted At Kalakankar Ghat

Image 26 : Red Naped Ibis [*Pseudibis papillosa*]

11.0 Ganga Riverine Islands In Pratapgarh District

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 present throughout the stretch of River Ganga Within Pratapgarh Distt.. There are four major islands identified and documented within the district. Jurisdiction of the riverine islands lies in Pratapgarh and Kaushambi Distt.. The species – *Saccharum spontaneum*, Saccharum munja and Ziziphus spp. dominates the riparian flora of the island. Details of the riverine island are provided in Table No. 6.

Table 6 : Details Of The Riverine Island Within Pratapgarh District

Sr. No.	Nearest Settlement	Coordinates		Status
		Latitude	Longitude	
1	Near Kalakankar [Left Bank] [Refer Image No. 28 & 29]	25°46'35.95"N	81°21'37.11"E	Area approx. 1.40 Sq. Km. Jurisdiction : Pratapgarh and Kaushambi Distt. Land Use : Agriculture Vegetation: Mainly *Saccharum spontaneum*, Saccharum munja
2	Near Manikpur [Left Bank] [Refer Image No. 30]	25°45'17.36"N	81°23'54.62"E	Area approx. 1.93 Sq. Km. Jurisdiction : Pratapgarh and Kaushambi Distt. Land Use : Agriculture has recently started. Vegetation : Mainly *Saccharum spontaneum*, Saccharum munja
3	Karenti [Left Bank]	25°40'25.93"N	81°24'44.83"E	Area approx. 1.68 Sq. Km. A bridge is under construction at eastern end of the island

	[Refer Image No. 31 & 32]			Jurisdiction : Pratapgarh and Kaushambi Distt. Land Use : Agriculture Vegetation : Mainly *Saccharum spontaneum*, Saccharum munja
4	Shahpur Kachar [Left Bank] [Refer Image No. 33]	25°37'32.55"N	81°27'30.61"E	Area approx. 12.7 Sq. Km. Jurisdiction : Pratapgarh and Kaushambi Distt. Land Use : Most of the area is utilized for agricultural activities, Cremation and Burial ground Vegetation : Riparian vegetation is shrinking and is mainly *Saccharum spontaneum*, Saccharum munja

11.2 Apart from the identified islands there are several sand bars and emerging islands present within the district [Refer Image No. 34]. These islands are not stable and changes continuously. Area of most of the sand bar is under cultivation for *Zaid crops* and vegetables and wheat [in few areas]. Sand bar located near Kanthua village and Jahangirabad village is found as major turtle habitat within the district. Some sand bar located near settlements is utilized as burial grounds.

Image 27 : Emerging Island [As Seen From NH-19]

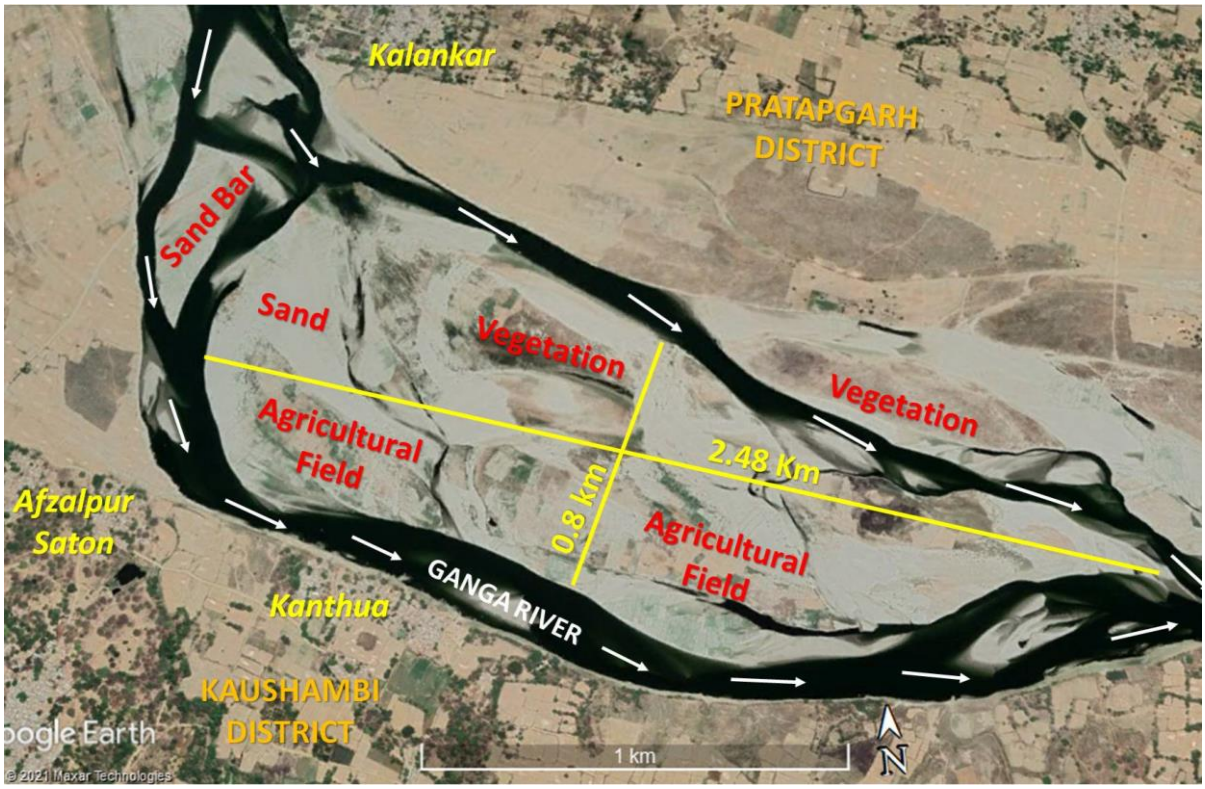


Image 28 : Satellite Imagery Showing Riverine Island Near Kalakankar Village

[Source : Google Earth Imagery, May 2021]

Image 29 : Riverine Island Near Kalakankar Village

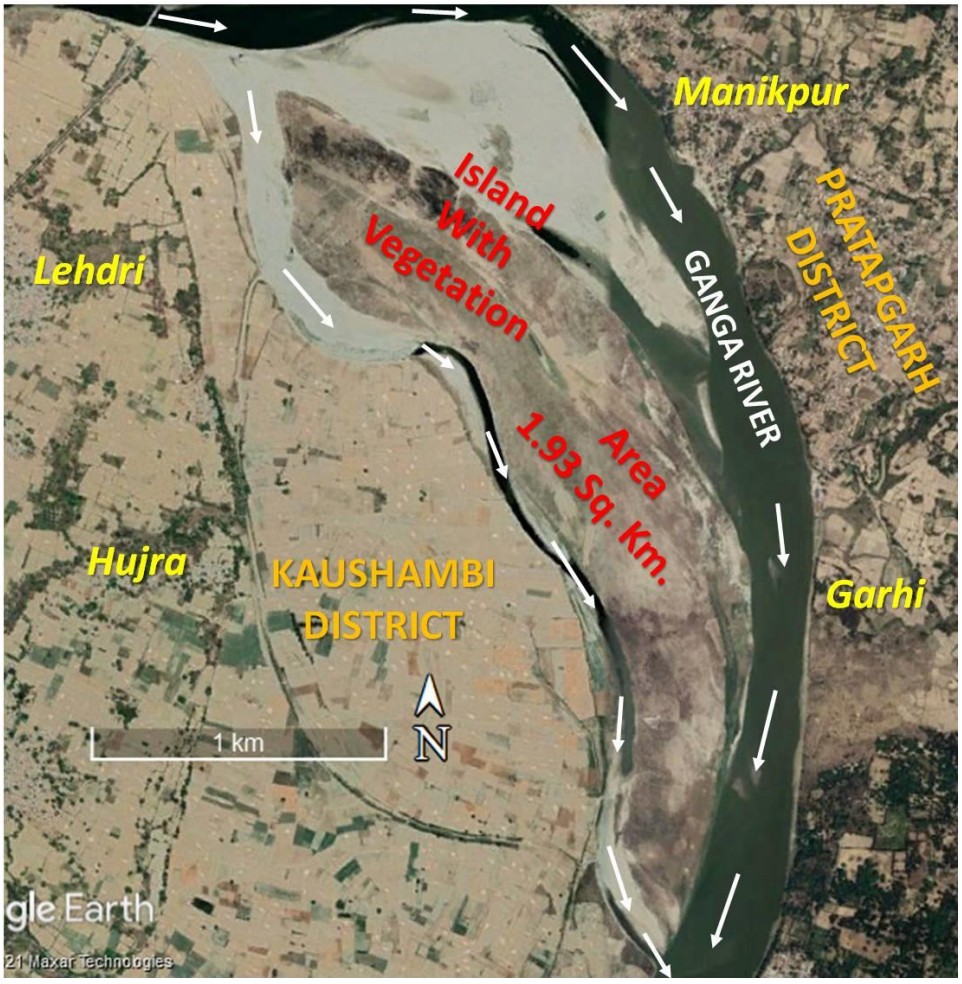


Image 30 : Riverine Islands Near Manikpur

[Source : Google Earth Imagery, May 2021]

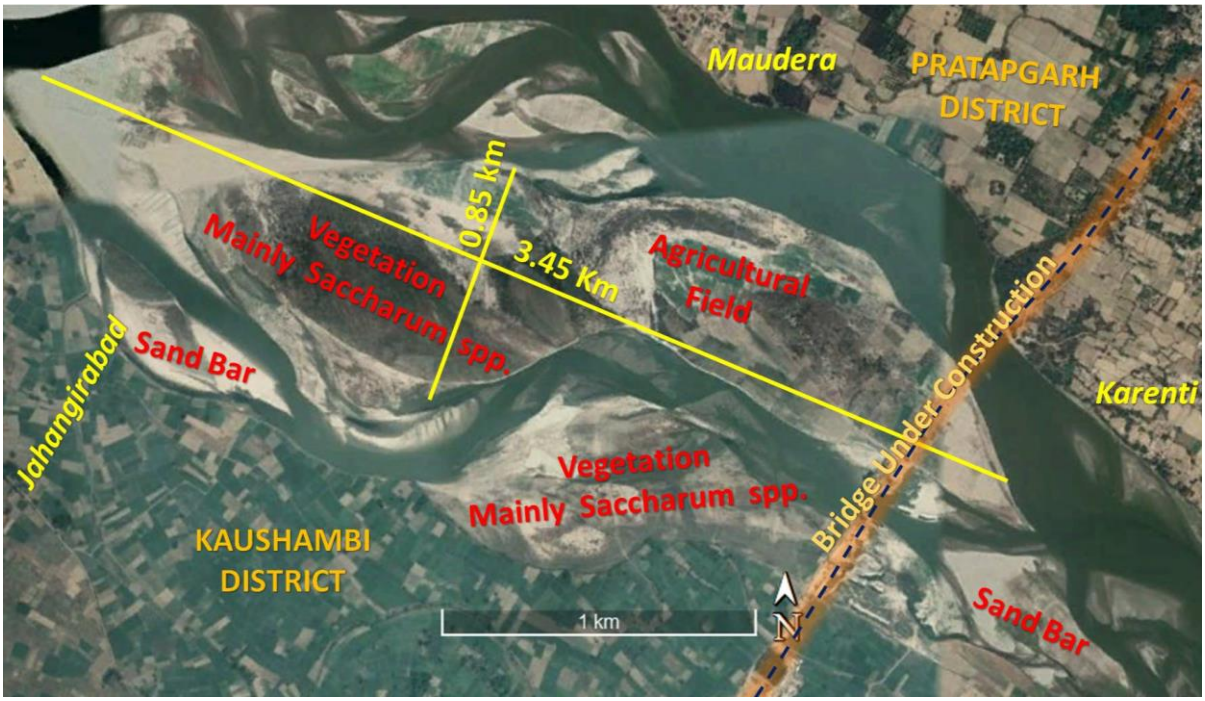


Image 31 : Satellite Imagery Showing Riverine Island Near Karenti Village

[Source : Google Earth Imagery, November 2021]

Image 32 : Riverine Island Near Karenti Village

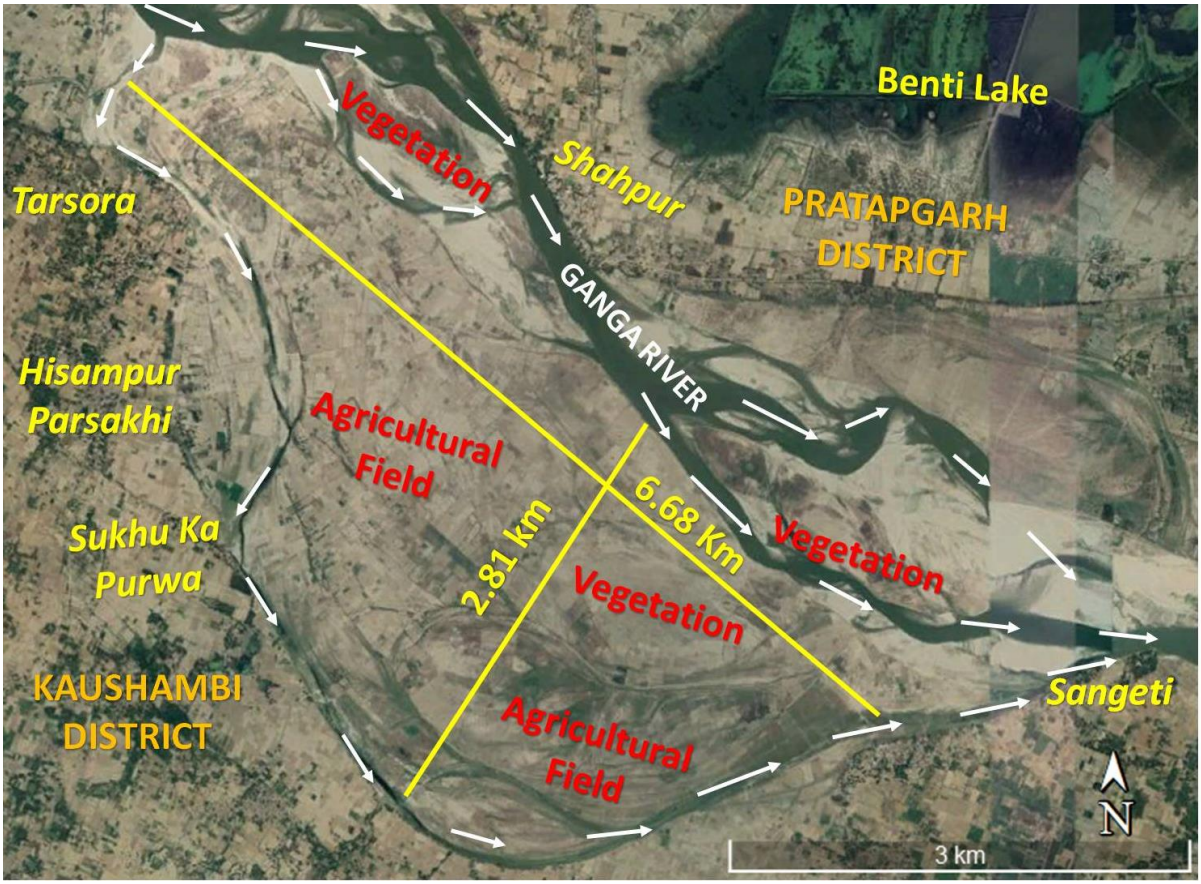


Image 33 : Satellite Imagery Showing Riverine Island Near Tarsora And Sangeti

[Source : Google Earth Imagery, November 2021]

12.0 Fishing In Pratapgarh District

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 The boats used for fishing are small sized and hand-rowed made usually from 'Sakhua/Sal' wood [*Shorea robusta*] and sometimes from 'Jamun' wood [*Syzygium cumini*] as well. These boats were earlier mainly constructed using the raw materials available in the villages by local Mallah community members. However, currently only

some natives construct these boats by themselves while majority are dependent upon 'Mistry' [carpenters] from other villages for this.

12.3 In the district, the Mallah community is mainly involved in the fishing activity throughout the Ganga stretch [Refer Image No. 34 & 35]. The hook and line, drag net and cast net is common fishing gears among fishermen in the district. 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.

12.4 As stated by the local fishermen, the fish population in the district has decreased drastically in the last 15-20 years by 60% to 70%. This significant decrease in fish population has adversely affected the livelihood of the Mallah community forcing them to seek alternate source of income. During the survey total 15 species of fishes were recorded which are listed below. Singhi [*Heteropneustes fossilis*], Common/Chinese carp [*Cyprinus carpio*] and Rohu [*Labeo rohita*] were the most common caught species by the fishermen.

Table 7 : List of Fish Species Recorded In Stretch Of Ganga River Falls In Jurisdiction Of Pratapgarh-Kaushambi Distt.

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

15.	*Sperata seenghala*	Singhara

Image 34 : Fishing In Ganga River Near Manikpur Ghat

Image 35 : Fishing In Stretch Of Ganga River Between Shahzadpur [Right Bank] & Karenti [Left Bank]

13.0 Groundwater Conditions In Pratapgarh 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. Pratapgarh Distt. occupies a part of Indo-Ganga Plain and is underlain by Quaternary sediments consisting of clays, silt, kankar and sands of different grade. The thickness of the quaternary sediments throughout the distt. increases gradually towards the North. According to Groundwater Brochure of Pratapgarh (2013), there are three tier aquifer system in the distt. namely – 1) Shallow Aquifer, 2) Middle Aquifer and 3) Deeper Aquifer. These aquifers along Ganga alluvial plain [Study Area] forms good repository of groundwater.

13.2 Based on groundwater resource utilization, Central Ground Water Board (CGWB) has assessed the block wise ground water resource throughout the country. The assessment for year 2009, 2011, 2013, 2017, and 2020 for the blocks of Pratapgarh district, which lies within study area is provided in the Table No.8. According to partially ground water contaminated area study of CGWB, ground water of Pratapgarh distt. is contaminated with Fluoride having values above 1.5 mg/l[3].

Table 8 : Block Wise Groundwater Resource Assessment [Study Area Only]

Block Within Study Area	2009 Assessment[4]	2011 Assessment[5]	2013 Assessment[6]	2017 Assessment[7]	2020 Assessment[8]
Kunda	Safe	Safe	Safe	Safe	Safe
Kalakankar	Safe	Semi-Critical	Safe	Safe	Safe
Vihar	Safe	Safe	Safe	Safe	Safe

[3] States Wise Details of Partly Affected Districts with Select Contaminants in Ground Water of India, CGWB http://cgwb.gov.in/WQ/Districts%20contamination.pdf
[4] Dynamic Ground Water Resources of India, CGWB (As on 31 March 2009).
[5] Dynamic Ground Water Resources of India, CGWB (As on 31 March 2011).
[6] Dynamic Ground Water Resources of India, CGWB (As on 31 March 2013).
[7] Dynamic Ground Water Resources of India, CGWB (As on 31 March 2017).
[8] Dynamic Ground Water Resources of India, CGWB (As on 31 March 2020).

13.3 During field visits, the survey team has interacted with local communities throughout the study corridor. The situation is similar to the ground water conditions of study area within adjoining districts [Raebareli, Kaushambi and Prayagraj Distt.]. It has been observed that the use of dug well is declined in last 15-20 years. One major cause of this decline is drying of dug wells in summer season and lack of maintenance and increase in number of hand pumps. The abandoned dug wells should be restored and may be used for groundwater recharge. Major interaction sites for groundwater observations are – Pariawan Village, Nawabganj Village, Kalakankar, Parsipur, Gutni and Jahanabad Village. The groundwater observations were noted and are presented in Table No. 9.

Table 9 : Water Levels In Dug Wells (Based on interactions with local communities)

Location	Coordinates	GW Level (in feet)	
		Post-Monsoon	Pre-Monsoon
Pariawan Village	25°50'04.3"N 81°22'02.4"E	25-30	40-45
Pariawan Village	25°50'05.0"N 81°22'03.0"E	25-30	40-45
Nawabganj	25°48'55.70"N, 81°21'31.51"E	40	50
Kalakankar	25°47'22.16"N, 81°21'16.73"E	50-60	---
Parsipur	25°37'24.49"N, 81°32'23.70"E	40	60-70
Gutni	25°42'10.35"N, 81°23'32.39"E	40-50	50
Jahanabad	25°35'48.15"N, 81°36'1.76"E	50-60	60-65

Image 36 : Dugwell In Pariawan Village Pratapgarh Distt.

14.0 Ganga River Bank In Pratapgarh District

14.1 Ganga River bank in Pratapgarh district may be classified on the basis of land use and land cover. The possible classes could be – Built-up area [Settlements, Temple Complexes, cremation sites 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 fuel wood and for cremation. During interaction with the local communities, it has been observed that the river bank area which has riparian vegetation is now provided by the local administration to the farmers on lease [locally called patta] for agricultural activities. Illegal occupation is also a major concern. The newly developed agricultural fields can be easily seen along Ganga River Near Manikpur, Kalakankar, Gutni and Parsipur Village [Near Krishna Van Kuti]. River bank area, which has recently converted into agricultural fields, is prone to lateral erosion. Rills and gullies may also develop in such areas. The river bank between Murassapur and Nawabganj is stable [Refer Image No. 37].

Image 37 : Stable Bank Near Nawabganj Ghat

14.2. The river bank and surrounding environ of Parsipur has been considered as sacred due to its association with events related to Lord Krishna and his friend Sudama [Refer Image No. 38 & 39]. There is a sacred Pond and a grove in the village called *Sudama Taliar* [Sudama Tal] and a jungle [*babool* and *ber* dominated patch] named *Krishna Van*. As per the Mythology, the area was a dense jungle where Krishna and his friend used to visit to collect fuel wood. District Gazetteer of Pratapgarh (1904) mentioned this place as a *jhau, babool* and *Dhak* dominated jungle. The area was also used as pasture ground. Currently, most of the area of the sacred grove has been converted into agricultural fields and the riparian patch has been decreased from what it has been mentioned in the Distt. Gazetteer of 1904. The analysis of satellite imagery and ground truthing [and interaction with local communities including priest of Krishna Van Kuti] reveals the decrease in area of riparian patch. There is a small patch of *ber* in *Krishna Van* which goes upto Naubasta Ghat. Between Naubasta and Jahanabad the bank of River Ganga is somehow elevated and is mostly dominated by Saccharum spp. [Refer Image No. 40]. Here, sand bar is used for burials. After Jahanabad, the mighty Ganga flows towards Sringverpur in Prayagraj Distt.

14.3 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 and

ghats along the river bank which play a vital role in the bank stability as there are several trees found to be associated with these temples.

Image 38 : Krishna Van Kuti

Image 39 : Sacred Krishna Van

Image 40 : River Bank In Naubasta Village

14.4 Cremation Ground Along Ganga River Bank In Pratapgarh District

14.4.1 Ganga River Banks are used for cremation and burial ground for generations. There are seven major cremation sites identified within distt. along the river. Out of that, four are cremation sites, two are cremation and burial sites and one is burial ground. Burial in Hindu religion is common in Pratapgarh District [Major site at Sami Ghat], Kaushambi District [Afzalpur Saton], Prayagraj District, [Sringverpur] and Bhadohi District. During field visits it has been observed that burial ground is not restricted to particular site and can been done at any sand bar of the Ganga River [Refer Image No. 41]. This is because Ganga River and its active floodplain is considered as sacred and burial within the region is equivalent to the cremation.

14.4.2 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.

Image 41 : Burials Along River Ganga At Sami Ghat

Table 10 : Cremation And Burial Sites In The Study Area

Site	Location		Burial Site/ Cremation Site
	Latitude	Longitude	
Nawabganj Ghat	25°48'34.71"N	81°20'59.21"E	Burial and Cremation Site
Near Riverine Island	25°47'11.44"N	81°20'51.78"E	Cremation Site
Ganga Bridge Ghat	81°22'54.89"E	81°22'54.89"E	Burial and Cremation Site
Rajghat	25°45'30.22"N	81°24'14.30"E	Cremation site
Karenti Ghat	25°40'19.20"N	81°25'30.93"E	Cremation Site
Naubasta Gaht	25°36'34.80"N	81°32'20.32"E	Cremation Site
Sami Ghat	25°36'19.19"N	81°32'26.47"E	Burial Site

Image 42 : Cremation Site At The Edge of River Ganga, Nawabganj Ghat
[Site Lacking Cremation Infrastructure]

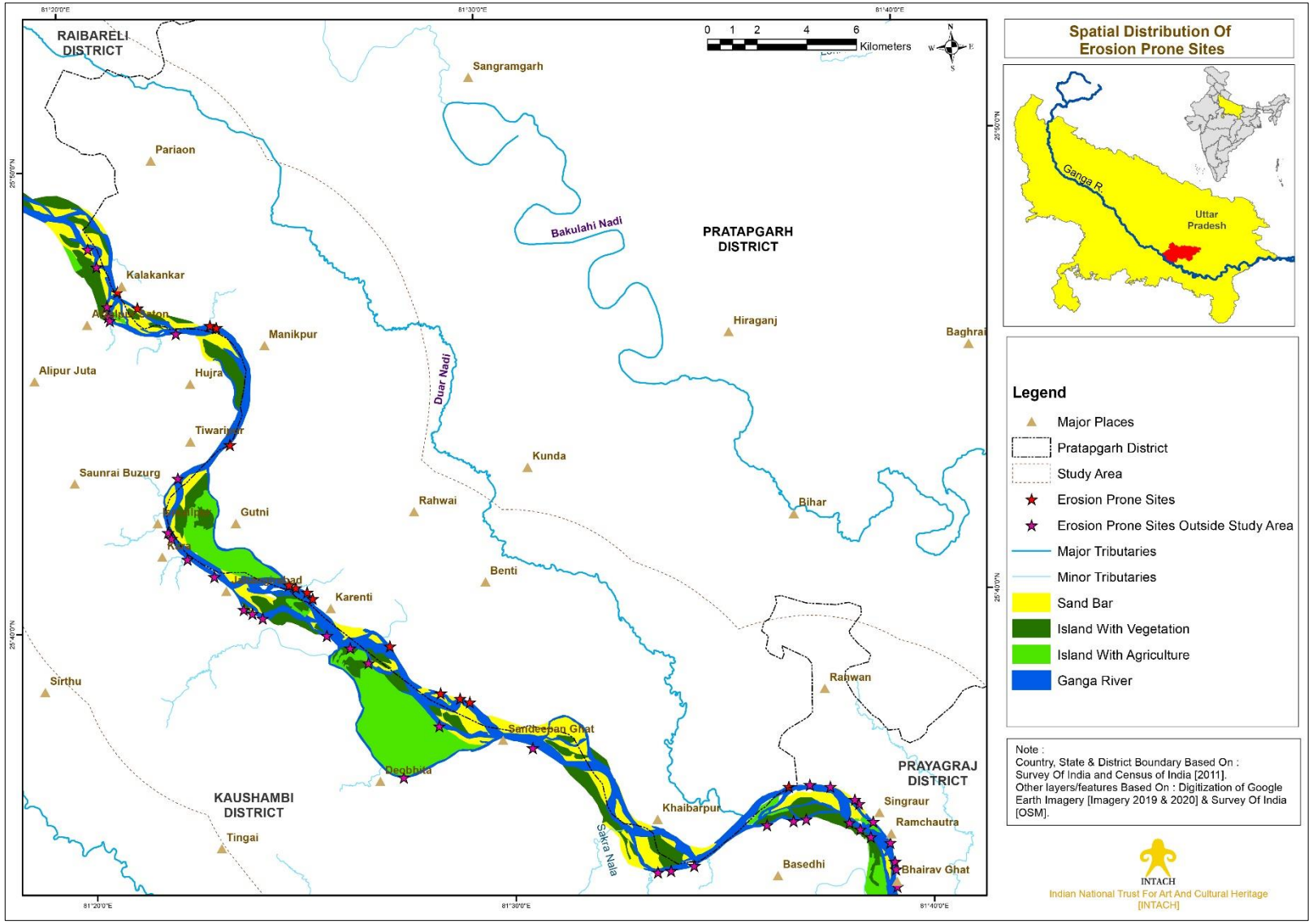
Image 43 : Abandoned Cremation Infrastructure Near Sami Ghat

14.5 Ganga Bank Erosion In Pratapgarh Distt.

14.5.1 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, removal of riparian vegetation and construction brick kilns in flood plain area. It is well known that exposed soil may erode rapidly (Singh et al., 2004).

14.5.3 There are 14 lateral erosion sites marked within the study area with the help of satellite imagery [2020-2021]. Major eroded sites are found near - Kalakankar, Manikpur [25°46'30.47"N, 81°23'19.61"E [Refer Image No. 44], Khamsara, Near Karenti [25°40'37.37"N, 81°25'20.39"E], Near Sukulpur [25°39'21.99"N, 81°27'15.61"E], at 25°38'4.17"N, 81°29'6.52"E and Jahanabad [25°35'53.89"N, 81°36'38.19"E].

Image 44 : Erosion Prone Bank At Manikpur



Map 8 : Spatial Distribution Of Erosion Prone Sites [Pratapgarh Distt.]

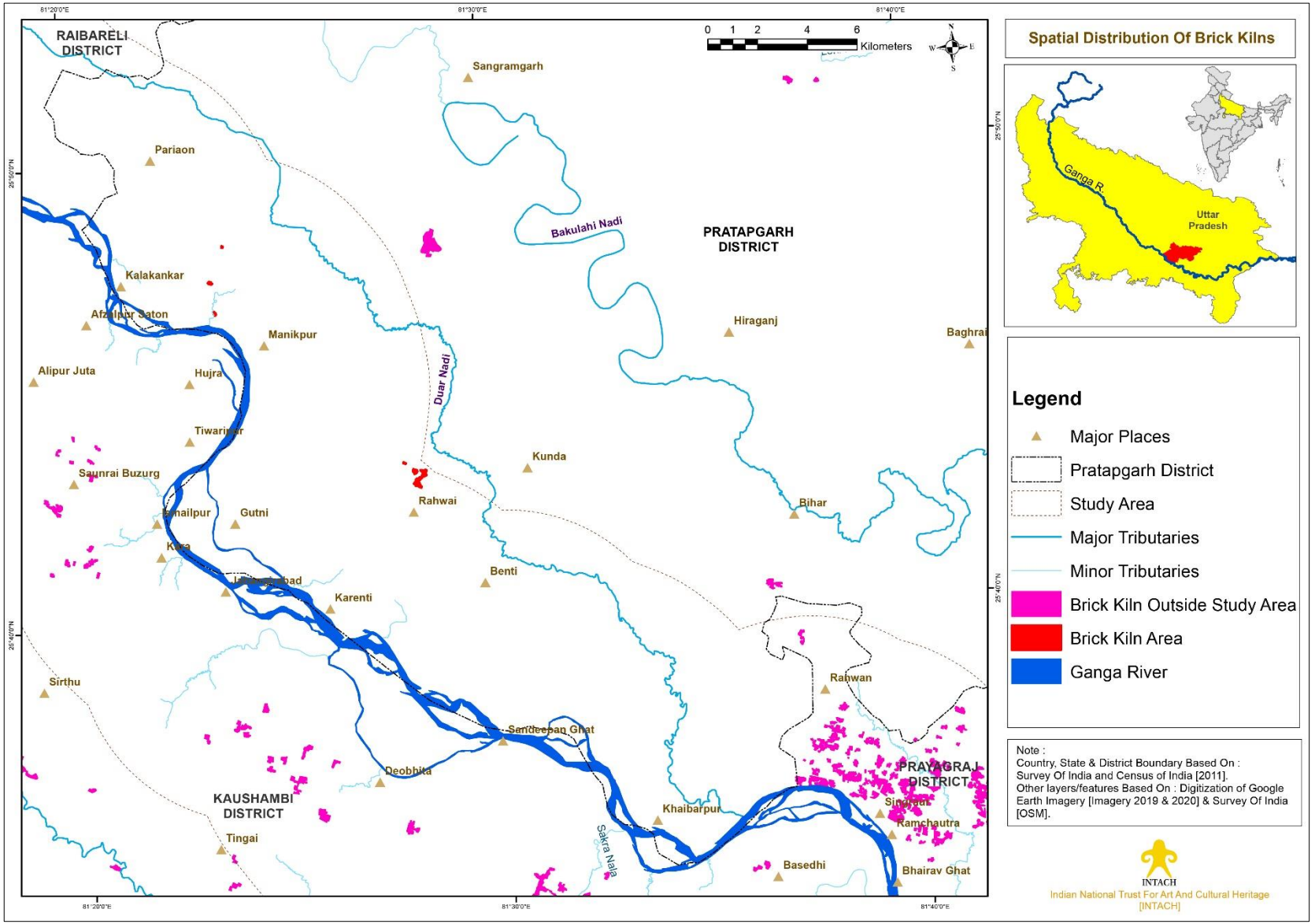
15.0 Sand Mining And Brick Kilns Within Study Area

15.1 **Sand Mining :** Sand is one of the major minerals resource extracted from the Ganga River and its tributaries. 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 poses threat to bridges, river banks and nearby structures[9]. Sand mining from Ganga River within the district is not reported during the field visit.

15.2 **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 floodplain areas increases the rate of soil erosion.

15.3 Brick kiln sites within study area in Pratapgarh Distt. are few compared to sites within Prayagraj and Kaushambi district. Brick kiln sites within study area are located in – Retahi Village, Bariawan Village, Bahragalpur, Chaunsa and Makoiya Village. At Pratapgarh-Prayagraj border there is a cluster of brick kiln sites located within active floodplain area [Refer Map No. 9]. These sites increase the silt load and triggers lateral erosion. Brick kiln sites is also a reason behind shrinkage of riparian vegetation in the region. Spatial distribution of brick kiln sites along Ganga River are depicted in Map No. 9.

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



Map 9 : Spatial Distribution Of Brick kiln Area [Pratapgarh Distt.]

16.0 Boatmaking In Pratapgarh District

16.1 Boat making is not a popular or a profit-making profession in Pratapgarh or nearby districts. Small sized boats (locally known as *Dongi*) are common for fishing activities. Medium sized boats having capacity of 10-15 people are used for ferry. 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. Now these days, iron boats are taking place of traditional boats. This is because iron boats area cheaper than traditional boats and are leak proof and easy to repair.

16.2 Boat making expenditures are same in Pratapgarh, Fatehpur, Raebareli, Kaushambi and Prayagraj District. Small boats [Dongi] made from iron costs around 60,000-70,000 and Similar sized iron boat with motor costs around 1,00,000-1,50,000. Traditional Dongi without motor costs around 2,00,000-2,50,000. Medium sized tradition boats cost around 7,00,000-8,00,000.

17.0 Inland Navigation Within Study Area In Pratapgarh District

17.1 National Waterway [NW-1] is restricted upto Prayagraj District. The river is not navigable for major boats. However, ferrying is a crucial livelihood activity of the Mallah community within the distt.. People of Mallah community in Pratapgarh District have been ferrying passengers for generations. There are 7 ferry sites reported between different villages of Pratapgarh and Kaushambi Distt.. Out of 7 sites, there is 1 site where pontoon bridge has been constructed and ferry service is operated only during removal of pontoon bridge [Monsoon season]. Apart from 7 sites, ferry is once available between Muhammadpur and Naubasta of Pratapgarh District. It has been stopped due to construction of bridge on Ganga River near Sihori village. Details of Ferrying sites are provided in the table no. 11.

Table 11 : Details of Ferry Sites And Status Within The Study Area

Latitude	Longitude	Nearest Settlements	No. of Boat & Ferry Season
25°47'17.62"N	81°21'10.40"E	Between Kalakankar and Afzalpur Saton	Two Boats (October to June)

25°47'17.62"N	81°21'10.40"E	Between Kalakankar and Riverine Island **Purpose : Agricultural activities**	Two Boats (October to June)
25°42'10.83"N	81°22'3.25"E	Between Gutni and Kaldhah Ghat [Near Kara] **[Pontoon bridge constructed]**	Four Boats **Ferry service operates only during removal of pontoon bridge**
25°41'20.56"N	81°22'37.49"E	Between Ghutni and Akbarpur via riverine Island	Two Boats (October to June)
25°39'48.19"N	81°25'18.17"E	Between Karenti and Shahzadpur	Two Boats (October to June)
25°37'15.87"N	81°29'53.69"E	Between Ballipur and Sangeti [Sandeepan Ghat]	Two Boats (October to June)
25°34'53.44"N	81°35'19.55"E	Between Badanpur and Manthan and Jahanabad	~~~~~~~

Image 45 : Ferrying Between Karenti And Shahzadpur

18.0 Old And Sacred Trees In Pratapgarh Distt.

18.1 Plant species *Ficus benghalensis* [Bargad], Ficus *religiosa* [Peepal], *Ficus virens* [Pakad] *Mangifera indica* [Aam] and *Azadirachta indica* [Neem] are considered as sacred and is found in association with ashrams, ghats, cremation sites and temple complexes across the study corridor. Out of all sacred trees, Ficus *religiosa* [Peepal] is most sighted species, generally found to be associated with temple. Peepal tree is also used to perform different rituals after cremation. Apart from this there are two sacred grove named ***Krishna van*** and ***Sudama Taliyar*** or Talaria located at 25°37'23.73"N, 81°32'9.82"E and 25°37'17.08"N, 81°32'25.59"E respectively [Refer Imagre No. 46 & 47. list of sacred and old trees recorded within the study area are provided in Table No. 12.

Image 46 : Bargad *[Ficus benghalensis]* In Krishna Van

Image 47 : Sacred Trees In Sudama Talaria

Image 48 : Sacred Trees At Kalakankar Ghat

Table 12 : List of Sacred And Old Trees Recorded Within The Study Area

Plant Species	Location and Nature of Tree	Coordinates	
		Latitude	Longitude
Peepal *[Ficus religiosa] and* Mango *[Mangifera Indica]*	Trees associated with temple, Nawabganj Ghat	25°48'34.93"N	81°20'59.36"E
Peepal *[Ficus religiosa]*	Sacred Tree Associated With Village Temple, Pariawan Village	25°49'59.70"N	81°22'1.27"E
Peepal *[Ficus religiosa]*	Peepal Tree, Kalakankar Ghat	25°47'20.75"N	81°21'14.86"E
Peepal *[Ficus religiosa]*	Sacred Peepal Tree, Rampur Garauli	25°48'49.8"N	81°23'46.0"E
Peepal *[Ficus religiosa]*	Three Sacred Peepal Tree, Manikpur Ghat	25°46'5.27"N	81°24'0.25"E
Peepal *[Ficus religiosa]*	Sacred Peepal Tree	25°45'44.6"N	81°24'47.9"E
Peepal *[Ficus religiosa]*	Sacred Peepal Tree	25°45'16.0"N	81°24'40.5"E
Peepal *[Ficus religiosa], Neem [Azadirachta indica],* Bargad *[Ficus benghalensis],* Pakad *[Ficus virens]*	Sudama Talaria	25°37'17.6"N	81°32'25.1"E
Neem [Azadirachta indica], Peepal *[Ficus religiosa],* Bargad *[Ficus benghalensis],* [Pakad] *Ficus virens,* Babool *[Acacia nilotica], Ziziphus spp.*	Krishna Van	25°37'24.1"N	81°32'10.0"E
Peepal *[Ficus religiosa],* Bargad *[Ficus benghalensis],*	Badanpur Ashram	25°34'51.8"N	81°35'19.0"E

19.0 Key Observation & Recommendation

19.1 Fading of Stream/Nara : Small stream/ Nara which directly drain to River Ganga are under threat due to removal of riparian vegetation, agriculture activities on stream bank and encroachment. Minor streams in the region holds the vulnerable riparian zone, which protect from erosion, provides habitat to riparian fauna and serve as migratory routes to fish species in monsoon season. Disappearing of streams may damage local biota.

19.2 Conversion of riparian vegetation into agricultural fields : Products and finished products manufactured from Saccharum spp. are sources of income to the local communities. During the field visits, it has been reported that local administration provides riparian land to local communities for agricultural activities. The newly developed agricultural fields accelerate the runoff and trigger lateral erosion. There are some sacred groves with certain religious beliefs. The vegetation within these groves has gradually removed for agricultural activities [Refer Image No.49].

Image 49 : Satellite Image Showing Removed Vegetation From Krishna Van

19.3 Paleo-streams and Wetlands of Bakulahi River : Paleo-streams and wetlands are currently under cultivation. It has been reported that the paleo-channel of Bakulahi river has been encroached for agricultural and construction activities. 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 cover in the district. It will provide the addition habitat to fauna of the region and will further decrease the man-animal conflict.

19.4 Groundwater Conditions : The study area exhibits declining trend in groundwater level. To arrest the decline of water level, artificial recharge technique and watershed management (from hill to valley approach) should be adopted at large scale. Some area of the distt. has higher level of TDS. There is urgent need of Quality assessment of shallow and deeper groundwater and its relationship with the lithological behaviour.

The study area is going through fluoride contamination. It is required to install community-based fluoride removal plant to tackle the menace. Nalgounda technique may also a simple and effective technique to tackle fluoride contamination.

19.5 Protection for River Islands : Riverine Island is present throughout the stretch of River Ganga Within Pratapgarh Distt.. Jurisdiction of the riverine islands lies in Kaushambi & Pratapgarh Distt.. Emerging islands under cultivation are mainly susceptible to erosion. Agricultural activities at the edge of stable islands erode the banks. There is requirement of comprehensive management plan [CAMP] for conservation, management and sustainable utilization of riverine islands.

19.6 Cremation and Burial : 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 atleast at Nawabganj Ghat and Sami Ghat. Burial at sand bar is common. Proper site should be provided and area should be demarcated.

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