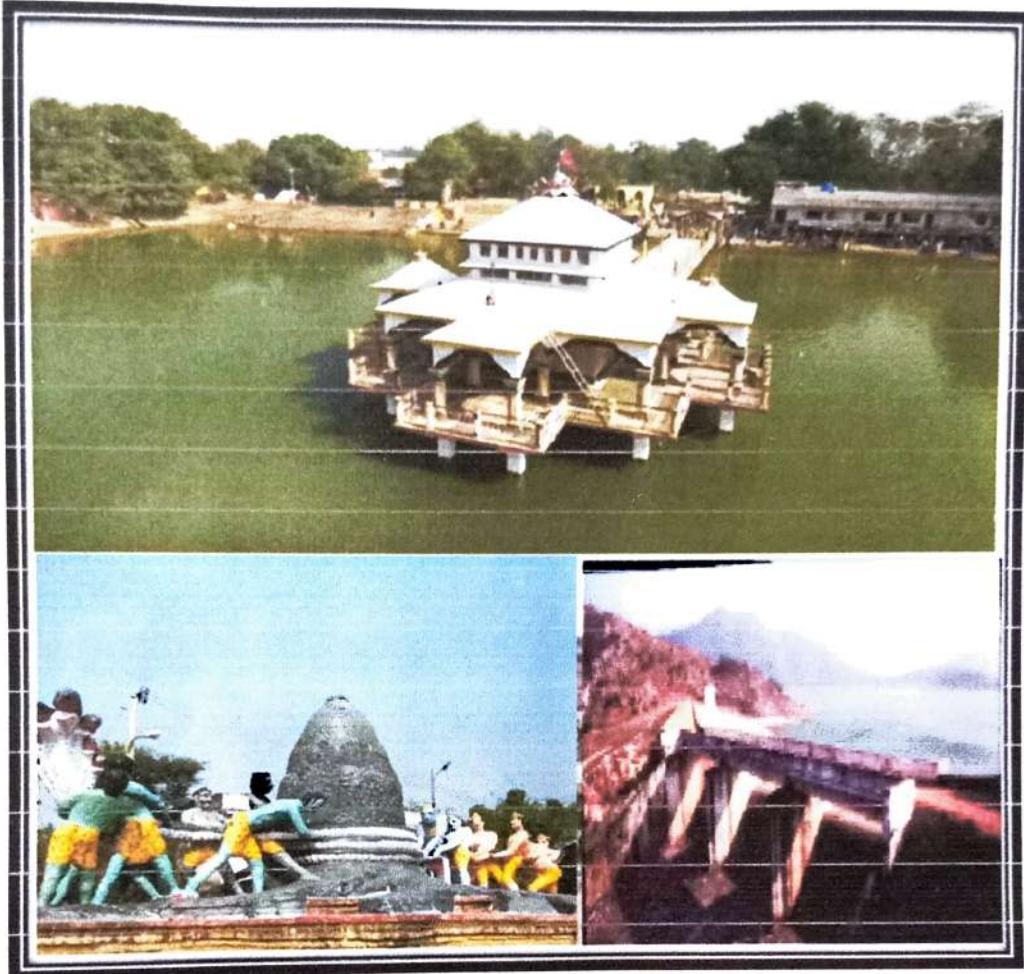


*District Survey Report for Sand Mining of Banka District
Accordance with MOEF&CC Gazette Notification S.O.3611 (E),
dated 25th July 2018, "Sustainable Sand Mining guidelines
2016" And EMGSM - January 2020*



**SUBMITTED TO,
DISTRICT MAGISTRATE BANKA, BIHAR**

PREPARED BY,
SUB - DIVISIONAL COMMITTEES
SUB- DIVISIONAL MAGISTRATE
OFFICER FROM IRRIGATION DEPARTMENT
STATE POLLUTION CONTROL BOARD
FOREST DEPARTMENT
MINING OFFICER

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PREFACE

The District Survey Report (DSR), Banka for sand mineral has been prepared in accordance with the guide line issued by the ministry of Environment, Forest and Climate change (MOEF & CC), Gov. of India vide the notification S.O. 141(E) dated 15th January 2016 and the amended notification S.O. 3611(E) dated 25th July,2018. It also comply SSMG 2016 & EMGSM 2020. In the matter of Pawan Kumar and other etc. Vs. State of Bihar and Others as per Hon'ble Supreme Court order dated 10th November, 2021 in Civil Appeal nos. 3661- 3662 of 2020 for exercise of preparation of DSR for the purpose of mining in state of Bihar in all districts shall be undertaken afresh. The draft DSRs shall be prepared by the Sub divisional committees consisting of the Sub divisional Magistrate, officers from irrigation Department, state pollution control board or committee, Forest department, Geological or Mining Officer prepared by undertaking site visit and also by using modern technology. The said draft DSRs shall be prepared within a period of six weeks from the date of the order. A survey is carried out by the members of Sub divisional committee in the district.

The DSR for sand mineral which is a compendium of available mineral resources, replenishment of minerals geographical set up, environmental and ecological condition of the district and is based on survey made in the district and data of various department like geology & mining, Forets, irrigation, Agriculture, Horticulture Health department; published report & websites. Main purpose of preparation of District Survey Report is to identify the mineral resources and mining activities along with other relevant data of district. This report contains details of Lease, Sand mining and Revenue which comes from minerals in the district.

District Survey Report (DSR) is required to identify the areas of aggradations or depositions where mining can be allowed and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area. Every efforts have been made to cover sand mining locations, areas and overview of Mining activity in the district with all it's relevant features pertaining to geology and mineral wealth in replenishable and nonreplenishable areas of rivers, stream and other sand sources. This report will be a model and guiding document which is a compendium of available mineral resources, geographical set up, environmental and ecological set up of the District and is based on data of various departments, published reports, and websites. The data may vary due to flood, heavy rains and other natural calamities. Therefore, it is recommended that Sub Divisional Level Committee may take into consideration all its relevant aspects / data while scrutinizing and recommending the application for EC to the concerned Authority.

It will no doubt, form the basis of application for environmental clearance, preparation of reports and appraisal of projects. As per guide line the report will be updated in every five years.

In the matter of Pawan Kumar and other etc. Vs. State of Bihar and Others as per Hon'ble Supreme Court order dated 10th November, 2021 in Civil Appeal nos. 3661- 3662 of 2020 for exercise of preparation of DSR , Survey has been carried out by Sub divisional committees consisting of the Sub divisional Magistrate, officers from irrigation Department, state pollution control board or committee, Forest department, Geological or Mining Officer.

DSR has been prepared based on the amendments made by the Ministry of Environment, Forests and Climate Change, Government of India, in the Environment Impact Assessment Notification, 2006 notified an amendment on 15 January 2016, to which the Central Government makes the amendments by Notification dated 25th July 2018. The district survey document has been prepared in accordance with the Appendix-X of the said notifications. The Minerals/riversstreams were studied based on the following parameters excluding the hill slope mining.

OBJECTIVES

The main objective of the preparation of District Survey Report (as per the Sustainable Sand Mining Guideline) is to ensure the following -

- ❖ Identification of areas of aggradations or deposition where mining can be allowed;
- ❖ Identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area;
- ❖ Identification of mineral wealth in the district.

Date:

Place: Banka

GUIDELINES FOR MINING OF MINERALS

The Erstwhile Ministry of Environmental and Forests (MOEF), The government of India, made Environmental Clearance (EC) mandatory through it's Notification of 27th January 1994 under the provisions of Environmental Protection Act, 1986. Keeping in view the experience gained in environmental clearance process over a period of one decade, The Ministry came out with Environmental Impact Notification, S.O. 1533(E) dated 14th September 2006. The Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India had amended the said vide notification S.O. 141(E) dated 15th January 2016, vide S.O. 3611(E) dated 25th July 2018. It has been made mandatory to obtain environmental clearance of different kind of development projects listed in Appendix-X of the notification.

Further in pursuance to the order of Hon'ble Supreme court dated 27th February, 2012 in I.A. No. 12-13 of 2011 in Special Leave Petition © No. 19628-19629 of 2009, in the matter of Deepak Kumar etc vs State of Haryana and others etc; prior environmental clearance has now become mandatory for mining of minor mineral irrespective of the area of mining lease.

The mining operations for minor minerals were carried out in unscientific manner in Bihar since there were no guidelines for extraction of minor mineral.

Identifying this fact In exercise of powers conferred by Section 15 of Mines & Minerals (Development & Regulation) Act, 1957 (67 of 1957) and of all other powers enabling it in that behalf, the Revenue & Forest Department, Government of Bihar framed the Bihar Minor Mineral Bihar Minerals (Concession, Prevention of Illegal Mining, Transportation & Storage) Rules, 2019.

Since prior Environmental Clearance has now become mandatory for mining of minor minerals irrespective of the area of mining lease after the matter of Deepak Kumar etc. Vs. State of Haryana and Others as per Hon'ble Supreme Court dated 27th February, 2012 in I.A No. 12-13 of 2011 in Special Leave Petition (C) No. 19628- 19629 of 2009, Ministry of Environment, Forest & Climate Change (MoEF& CC) had issued Office Memorandum No. L-IIIOII/47/2011-IA.II (M) dated 18th May 2012; henceforth as per this O.M. all mining projects of minor minerals would require prior environmental clearance irrespective of the lease area.

(E) & S.O. 190 (E) dated 15th January, 2016 & 20th January , 2016 in exercise of the powers conferred by sub-section (3) of Section 3 of the Environment (Protection) Act, 1986 (29 of 1986) and in pursuance of the notification of the Government of India in the erstwhile Ministry of Environment and Forest number S.O. 1533 (E), dated the 14th September 2006.

Direction for preparation of District Survey Report for Sand Mining of River Bed Mining of other Minor Minerals was made in the Notification dated 15th January, 2016 and its amendments dated 25th July, 2018 by MoEF&CC along with detailed procedure & format for preparation of District Survey Report.

To make certain identification of areas of aggradations or depositions where mining can be allowed and identifying areas of erosion rate of replenishment and allowing time for replenishment after mining in that area is the foremost objective of the preparation of District Survey Report.

District Survey Report of Banka district for Sand Mining or River Bed Mining Prepared under

- MoEF&CC, GoI notification S.O 141 (E) dated 15.01.2016
- Sustainable Sand Mining Guidelines
- MoEF&CC, GoI notification S.O 3611 (E) dated 25.07.2018
- Enforcement and Monitoring Guidelines for Sand Mining 2020

PART I: DISTRICT SURVEY REPORT FOR SAND MINING OR RIVER BED MINING**1. INTRODUCTION**

Hon'ble Supreme Court of India dated 27th February, 2012 in I.A. No. 12-13 of 2011 in Special Leave Petition (C) No. 19628-19629 of 2009, in the matter of Deepak Kumar etc. Vs. State of Haryana and Other etc., prior environmental clearance has made mandatory for mining of minor minerals irrespective of the area of mining lease. Accordingly, Ministry of Environment, Forest & Climate Change (MoEF&CC) had issued Office Memorandum No. L-IIIOII/47/2011-IA.II (M) dated 18th May 2013; As per this O.M. all mining projects of minor minerals would henceforth require prior Environmental Clearance irrespective of the lease area.

As per the latest amendment S.O. 141 (E) & S.O. 190 (E) dated 15th January 2016 & 20th January in exercise of the powers conferred by sub-section (3) of Section 3 of the Environment (Protection) Act, 1986 (29 of 1986) and in pursuance of notification of Ministry of Environment and Forest number S.O. 1533 (E), dated the 14th September, 2016 the Central Government had constituted the District Level Environment Impact Assessment Authority (DEIAA), for all the districts in the country. But later on Hon. NGT, vide its order dated 13th September, 2018, stated that for 0-5 Ha areas also recommendation of grant EC by SEIAA instead of DEAC/DEIAA.

The MoEF&CC in its Notification dated 15th January 2016 has prescribed Preparation of District Survey Report for Sand Mining or River Bed Mining and Mining of other Minor Minerals. A detailed procedure and format for preparation of District Survey Report is provided in the said Notification.

Further the procedure for preparation of DSR and format is amended vide MoEF&CC Notification S.O. 3611 (E) dated 25.07.2018. The DSR is defined at "Appendix-X (See Paragraph 7 (iii) (a)" of the notification S.O. 141 (E) dated 15.01.2016 and S.O. 3611 (E) dated 25.07.2018.

2. OVERVIEW OF MINING ACTIVITY IN THE DISTRICT

Mainly two types of minor minerals constituents such as sand and stone are required for any type of construction apart from other material like cement and steel. In earlier times, the houses / buildings were constructed in form of small dwellings with walls made up of mud plaster, stone and interlocking provided with wooden frames and there were negligible commercial as well as developmental activities resulting in less demand of building material. However with the passage of time, new vistas of developmental activities were started. The quantity of minor minerals consumption in a particular area is a thermometer to assess the development of the area. Thus with the pace of development activities, the consumption of minor minerals also increased. As such the demand of minor minerals in the district has started an increasing trend. In order to meet the requirement of raw material for construction, the extraction of sand is being carried out exclusively from the river beds.

2.1 Main Objectives of Sustainable Sand Mining:

- ❖ To ensure that sand and gravel mining is done in environmentally sustainable and socially responsible manner.
- ❖ To ensure availability of adequate quantity of aggregate in sustainable manner.
- ❖ To improve the effectiveness of monitoring of mining and transportation of mined out material.
- ❖ Ensure conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system.
- ❖ Avoid aggradations at the downstream reach especially those with hydraulic structures such as jetties, water intakes etc.
- ❖ Ensure that the rivers are protected from bank and bed erosion beyond its stable profile.
- ❖ No obstruction to the river flow, water transport and restoring the riparian rights and in streamhabitats.
- ❖ Avoid pollution of river water leading to water quality deterioration. To prevent depletion of ground water reserves due to excessive draining out of ground water.
- ❖ To prevent ground water pollution by prohibiting sand mining on fissures where it works as filter prior to ground water recharge.
- ❖ To maintain the river equilibrium with the application of sediment transport principles in determining the location, period and quantity to be extracted.
- ❖ Streamlining and simplifying the process for grant of environmental clearance (EC) for sustainable mining.

(Source info :-District Mining Office, Banka).

1. INTRODUCTION

BANKA AT A GLANCE: -

1.1 Location and Geographical Area

The district of Banka is situated in far south - east of the State Bihar. The eastern and southern border of the district coincide with district Godda of the state - Jharkhand. In west and north east it touches Jamui and Munger district respectively. The old district Bhagalpur is situated in the north side of Banka. The district is situated between 24° 32' to 25° 0' North and between 86° 30' to 87° 10' East.

The geographical area of the district is 305621 hectare i.e. 320 Sqkm. The recognition of the district is Mandar Hill (Mandar Parwat) situated at Bounsi Block at about 18 Km from the District Head quarter raising its head since the epic period. The district is industrially not sound. However the availability of food based products and raw materials, there is good future for food processing industries in the district. The main crop of the district is rice. There are mainly sand and stone minerals available in the district. Other mineral sources are not available.

(Source : - District Portal, Banka)

1.2 Administrative Units: -

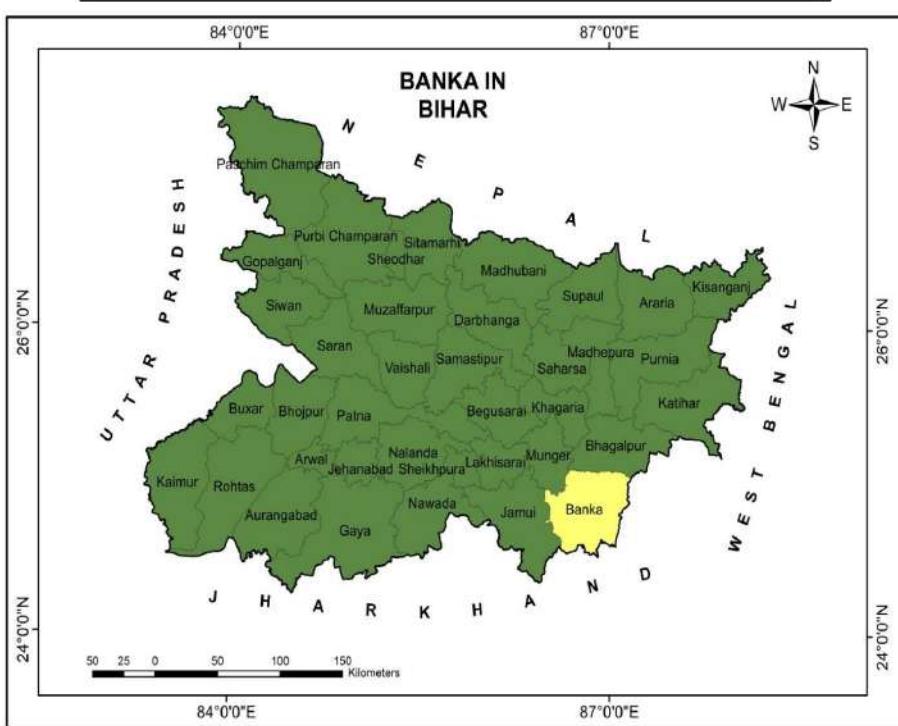
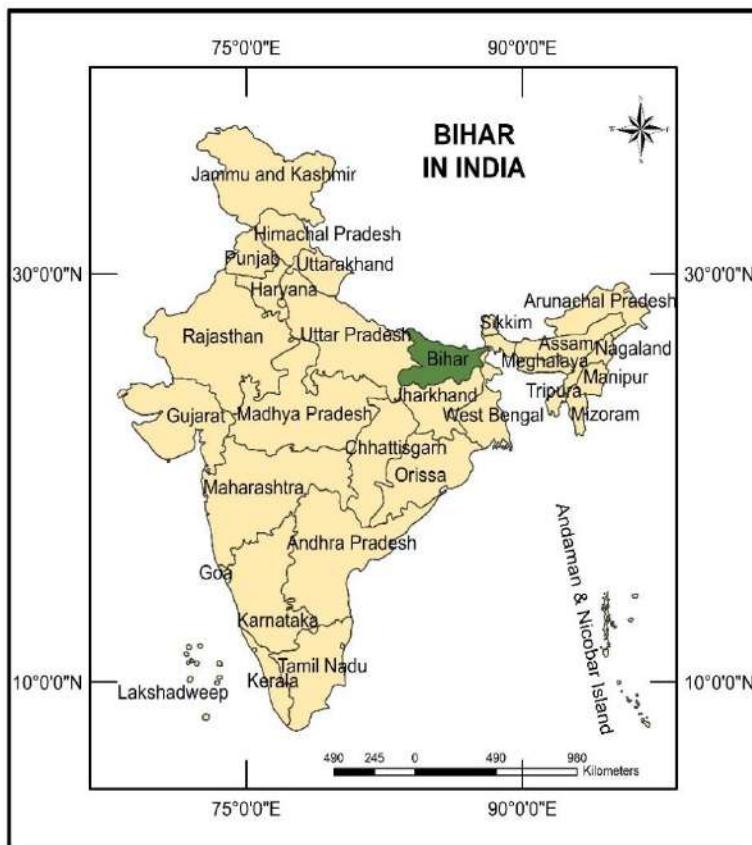
The district head quarter of Banka is situated in Banka town. The district has been established on 21st, February, 1991. Earlier it was a Sub-Division of the district Bhagalpur. The district consists 11 blocks and two towns Banka and Amarpur.

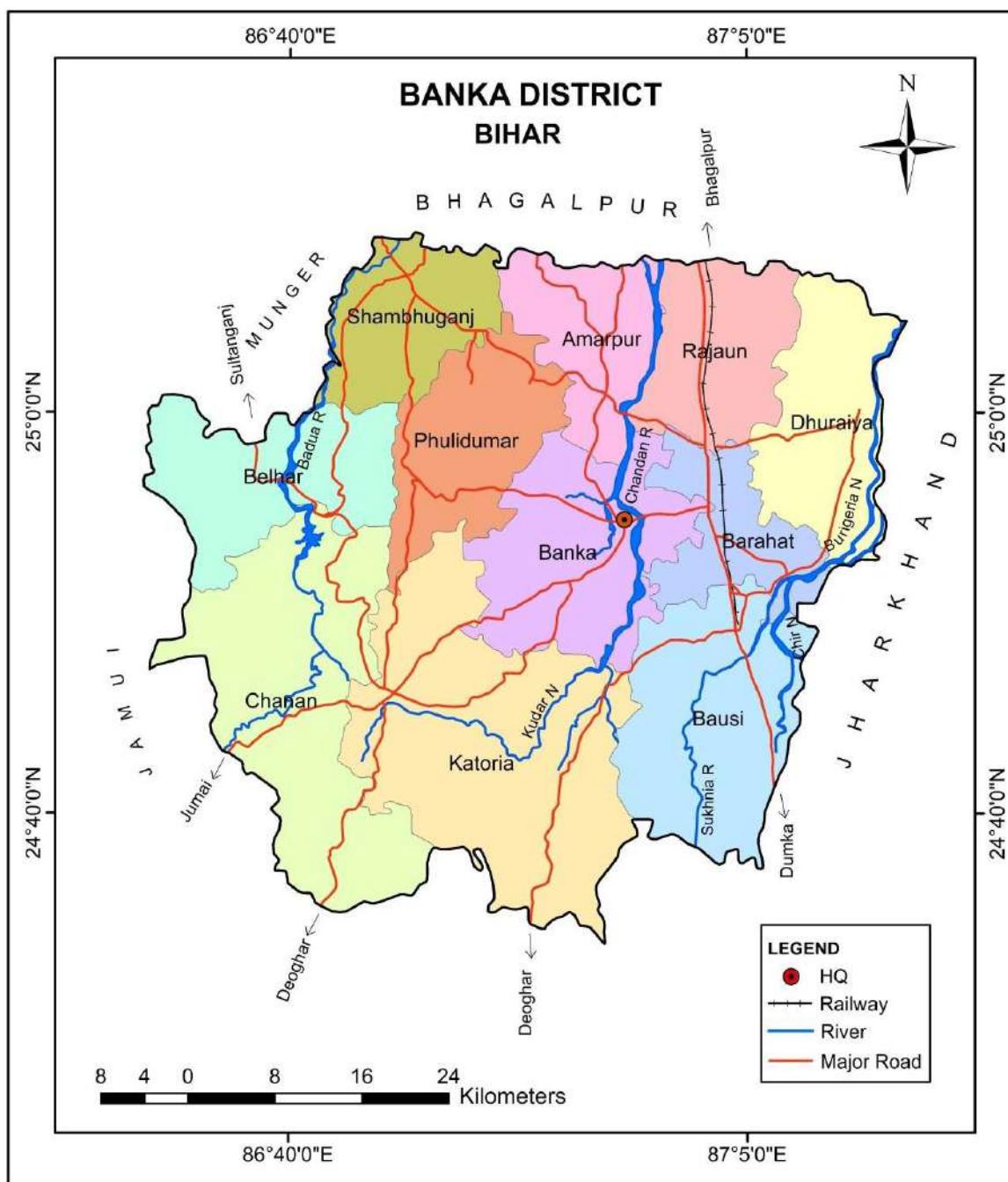
Amarpur, Banka, Barahat, Belhar, Bounsi, Chandan, Dhoraiya, Fullidumar, Katoriya, Rajoun, Shambhuganj. There are 11 subdivisions and 2111 villages in the district.

1.3 Connectivity facilities in Banka District:-

A railway line connecting the existing Bhagalpur-Bounsi line to Rampurhat, which is well-connected to Bhagalpur, is being developed, and further it is connecting Sultanganj to Jasidih through Banka. Banka is also connected to Capital of Bihar through the railway line. Bus facilities are also available in Banka District.

Nearest airport is Lok Nayak Jayprakash Airport, Patna, which is 190 Km away from Banka in North-West direction.





2. Overview of Mining Activity in the District

Banka district has a rich source of minor mineral mainly river bed material, Stone mining and soil mining etc. This has increased the demand in construction industry and various facilities are developed. All developmental activities need different construction material of which sand is basic material used for development of roads, bridges, buildings etc. River bed sand quarries are the only source of supply of sand. The River sand quarries are located at approachable distance from where sand is transported with lease and at low costs.

Thus with the pace of development activities, the consumption of minor minerals also increased. As such the demand of minor minerals in the district has started an increasing trend. In order to meet the requirement of raw material for construction, the extraction of sand is being carried out exclusively from the river beds. In Banka district, the demand of sand (river borne collection) is mainly met by the supply from Chandan river and its tributaries.

3. List of Mining Lease in the District

3.1 LIST OF EXISTING SAND GHATS AS PER DEPARTMENT RECORD:-

CHANDAN RIVER (DISTT-BANKA)

Table 1

S.No	Area in (ha)	Coordinates		Ghat/Village	River	Plot No.	EC REF. No./ Date	EC Validity
1	23	A	N 24° 58' 9.35" E 86° 55' 25.42"	GHAT-MAJHONI VILL- MAJHONI POST- CHILKABAR ANCHAL-RAJON	CHANDAN	PLOT NO. 1	587/16.03.2017	5 Years or till Expiry of Lease Period
		B	N 24° 58' 12.13" E 86° 55' 37.87"					
		C	N 24° 57' 52.55" E 86° 55' 44.77"					
		D	N 24° 57' 52.46" E 86° 55' 31.99"					
2	20	A	N 24° 57' 50.63" E 86° 55' 30.53"	GHAT-PATWE BHORWA VILL-PATWE BHORWA POST-JAITHOR JAMUA ANCHAL- AMARPUR	CHANDAN	326	587/16.03.2017	
		B	N 24° 57' 48.75" E 86° 55' 44.03"					
		C	N 24° 57' 31.29" E 86° 55' 42.82"					
		D	N 24° 57' 32.93" E 86° 55' 29.44"					
3	2.50	A	N 24° 57' 19.08" E 86° 55' 27.10"	GHAT-PATWE BHORWA & MAJHAYARA ARAzi VILL-PATWE BHORWA POST-JAITHOR JAMUA ANCHAL- AMARPUR	CHANDAN	PLOT NO. 326/21	328/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 57' 18.86" E 86° 55' 30.47"					
		C	N 24° 57' 06.10" E 86° 55' 31.89"					
		D	N 24° 57' 8.2" E 86° 55' 29.15"					
4	4.0	A	N 24° 56' 19.86" E 86° 55' 14.10"	GHAT- MAJHAYARA ARAzi VILL-AJHAYARA POST-BANKA ANCHAL- BANKA	CHANDAN	21	324/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 56' 18.07" E 86° 55' 21.39"					
		C	N 24° 56' 12.78" E 86° 55' 17.02"					
		D	N 24° 56' 14.07" E 86° 55' 10.79"					
5	29	A	N 24° 56' 1.42" E 86° 55' 2.50"	GHAT- RAJPUR/KAKNA VILL-KAKNA POST-RAJPUR ANCHAL- BANKA	CHANDAN	1439/521	SEIAA/1/(A)348/1 6 by Feb 2019	5 Years or till Expiry of Lease Period
		B	N 24° 56' 0.82" E 86° 55' 14.92"					
		C	N 24° 55' 33.90" E 86° 55' 10.34"					
		D	N 24° 55' 34.12" E 86° 54' 58.16"					
6	24	A	N 24° 55' 8.32" E 86° 54' 57.94"	GHAT-BAISA VILL-BAISA POST-BANKA ANCHAL- BANKA	CHANDAN	01		5 Years or till Expiry of Lease Period
		B	N 24° 55' 7.84" E 86° 55' 18.29"					

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		C	N 24° 54' 43.47" E 86° 54' 58.75"				588/16.03.2017	
		D	N 24° 54'42.03" E 86° 54'48.35"					
7	1.4	A	N 24° 54'39.50" E 86° 54'52.29"	GHAT- MANJHIRA VILL-MANJHIRA POST-MANJHIRA ANCHAL- BANKA	CHANDAN	01	324/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 54'39.25" E 86° 54'55.53"					
		C	N 24° 54'34.19" E 86° 54'57.29"					
		D	N 24° 54'32.37" E 86° 54'55.83"					
8	12	A	N 24° 54' 12.63" E 86° 55' 5.17"	GHAT- MALDAUN VILL-MALDAUN POST-BANKA ANCHAL- BANKA	CHANDAN	01/02	323/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 54'19.36" E 86° 55'12.83"					
		C	N 24° 54'13.96" E 86° 55'21.79"					
		D	N 24° 54'7.62" E 86° 55'14.14"					
9	20	A	N 24° 53' 24.73" E 86° 56' 3.65"	GHAT- BISUNPUR VILL-BISUNPUR POST-BANKA ANCHAL- BANKA	CHANDAN	616	330/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 53'25.18" E 86° 56'17.76"					
		C	N 24° 53'9.23" E 86° 56'14.62"					
		D	N 24° 53' 10.35" E 86° 56' 0.21"					
10	16	A	N 24° 52'51.72" E 86° 55'49.38"	GHAT- GOVINDPUR VILL- GOVINDPUR POST-BANKA ANCHAL- BANKA	CHANDAN	92	332/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 52' 48.22" E 86° 56' 3.22"					
		C	N 24° 52' 35.58" E 86° 56' 1.15"					
		D	N 24° 52'38.68" E 86° 55'47.55"					
11	2.9	A	N 24° 51'46.50" E 86° 55'51.51"	GHAT- JITARPUR VILL-JITARPUR POST-BANKA ANCHAL- BANKA	CHANDAN	606	329/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 51'47.51" E 86° 55'53.47"					
		C	N 24° 51' 36.57" E 86° 56' 1.18"					
		D	N 24° 51'35.28" E 86° 56'59.16"					
12	2.8	A	N 24° 50' 47.51" E 86° 56' 1.03"	GHAT- SARAN/GODIYA VILL- SARAN,GODIYA POST- ANCHAL- BANKA	CHANDAN	606/172	355/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 50' 47.00" E 86° 56' 3.82"					
		C	N 24° 50' 35.98" E 86° 56' 7.02"					
		D	N 24° 50' 36.31" E 86° 56' 4.18"					
13	4.5	A	N 24° 50'6.50" E 86° 56'9.76"	GHAT-GODIYA VILL-GODIYA POST- ANCHAL- BANKA	CHANDAN	172/173	327/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 50' 5.94" E 86° 56' 13.43"					
		C	N 24° 49' 47.76" E 86° 56' 7.32"					
		D	N 24° 49' 50.11" E 86° 56' 4.65"					
14	18	A	N 24° 49'9.08" E 86° 55'35.51"	GHAT- LAKHNOURI	CHANDAN	01 & 1083 & 1086	14	5 Years or till Expiry of Lease
		B	N 24° 49'8.16"					

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			E 86° 55'46.10" C N 24° 48'48.76" E 86° 55'48.44" D N 24° 48'49.42" E 86° 55'37.79"	VILL-LAKHNOURI POST-BANKA ANCHAL-BANKA			336/04.03.2016	Period
15	20	A	N 24° 48'21.09" E 86° 55'34.79"	GHAT-LAKHNOURI VILL-LAKHNOURI POST-BANKA ANCHAL-BANKA	CHANDAN	1084& 1095& 1096	331/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 48'15.88" E 86° 55'38.98"					
		C	N 24° 47' 58.99" E 86° 55' 8.42"					
		D	N 24° 48'4.34" E 86° 55'4.66"					
16	30	A	N 24° 47'6.63" E 86° 54'36.31"	GHAT- KUNANI VILL-KUNANI POST-MANJHIRA ANCHAL-BANKA	CHANDAN	172/172/01	SEIAA/1/(A)/347/	5 Years or till Expiry of Lease Period
		B	N 24° 47'3.85" E 86° 54'42.57"					
		C	N 24° 46'35.49" E 86° 54'21.90"					
		D	N 24° 46'39.45" E 86° 54'16.85"					
17	2.6	A	N 24° 46'47.65" E 86° 54'17.94"	GHAT-JOGIPAHADI VILL-JOGIPAHADI POST-MANJHIRA ANCHAL-BANKA	CHANDAN	129	16 by 22 Feb. 2019	
		B	N 24° 46'43.42" E 86° 54'20.79"					
		C	N 24° 46'39.47" E 86° 54'16.07"					
		D	N 24° 46'42.72" E 86° 54'13.80"					
18	2.8	A	N 24° 46'20.37" E 86° 54'12.19"	GHAT-DOMUHAN VILL-KHUDBADI POST-MANJHIRA ANCHAL-BANKA	CHANDAN	1185	337/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 46'16.49" E 86° 54'16.20"					
		C	N 24° 46'13.29" E 86° 54'14.20"					
		D	N 24° 46'14.02" E 86° 54'10.01"					
19	3.6	A	N 24° 46'7.24" E 86° 53'47.29"	GHAT-DOMUHAN VILL-DOMUHAN POST-MANJHIRA ANCHAL-BANKA	CHANDAN	1185	326/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 46'5.57" E 86° 53'46.84"					
		C	N 24° 46'6.85" E 86° 53'32.37"					
		D	N 24° 46'9.88" E 86° 53'32.63"					
20	3.9	A	N 24° 45' 57.03" E 86° 53' 15.85"	GHAT- DOMUHAN VILL-DOMUHAN POST-MANJHIRA ANCHAL-BANKA	CHANDAN	129 &1185	550/16.02.2017	5 Years or till Expiry of Lease Period
		B	N 24° 45'53.55" E 86° 53'16.15"					
		C	N 24° 45' 50.68" E 86° 53' 2.56"					
		D	N 24° 45' 52.27" E 86° 53' 2.33"					

BADUA RIVER (DISTT-BANKA)

S.No	Area in (ha)	Coordinates		Ghat/Village	River	Plot No.	EC REF. No./ Date	EC Validity
1	4.1	A	N 24° 54'5.25" E 86° 38'19.51"	GHAT-MAJHLI DEOGARH ROAD. VILL-MATIHANI POST-MAJHLI MATIHANI ANCHAL-BELHAR	BADUA	659	333/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 54'00.31" E 86° 38'24.41"					
		C	N 24° 53'56.60" E 86° 38'22.00"					
		D	N 24° 54'1.25" E 86° 38'14.96"					
2	3.5	A	N 24° 57'59.02" E 86° 37'24.10"	GHAT-MAJHLI DEOGARH ROAD. VILL-GHODA BHAHIYAR POST-MAJHLI MATIHANI ANCHAL-BELHAR	BADUA	659	220/10.05.2016	5 Years or till Expiry of Lease Period
		B	N 24° 57'5.12" E 86° 37'31.04"					
		C	N 24° 57'2.87" E 86° 37'31.73"					
		D	N 24° 56'57.00" E 86° 37'31.73"					
3	3.1	A	N 24° 57'54.69" E 86° 37'37.56"	GHAT-BAGHAUNIA VILL-BAGHAUNIA POST-BAGHAUNIA ANCHAL-BELHAR	BADUA	609	223/10.05.2016	5 Years or till Expiry of Lease Period
		B	N 24° 57'54.55" E 86° 37'41.92"					
		C	N 24° 57'46.86" E 86° 37'42.28"					
		D	N 24° 57'46.57" E 86° 37'38.60"					
4	4.6	A	N 24° 58'48.65" E 86° 38'29.12"	GHAT-KUMARSAR VILL-CHORA POST-SAHODA ANCHAL-BELHAR	BADUA	818	222/10.05.2016	5 Years or till Expiry of Lease Period
		B	N 24° 58'43.32" E 86° 38'30.59"					
		C	N 24° 58'40.36" E 86° 38'21.15"					
		D	N 24° 58'43.82" E 86° 38'19.27"					
5	2.5	A	N 24° 59'2.02" E 86° 38'58.70"	GHAT-SAHODA VILL-SAHODA POST-SAHODA ANCHAL-SAMBHU GANJ	BADUA	301	221/10.05.2016	5 Years or till Expiry of Lease Period
		B	N 24° 58'57.61" E 86° 38'59.67"					
		C	N 24° 58'54.62" E 86° 38'53.72"					
		D	N 24° 58'57.57" E 86° 38'52.28"					
6	1.1	A	N 25° 0'53.90" E 86° 39'29.96"	GHAT-RANADIH VILL-RANADIH POST-RANADIH ANCHAL-SAMBHU GANJ	BADUA	66	Reject	5 Years or till Expiry of Lease Period
		B	N 25° 00'52.67" E 86° 39'27.28"					
		C	N 25° 0'49.14" E 86° 39'22.37"					
		D	N 25° 0'50.69" E 86° 39'21.22"					

ODHNI RIVER (DISTT-BANKA)

S. No	Area in (ha)	Coordinates		Ghat/Village	River	Plot No.	EC Granted Date	EC Validity
1	2.5	A	N 24° 53'49.42" E 86° 54'25.36"	GHAT-SAIJPUR ROAD NEAR OMAN COLLEGE VILL- BARODHA POST-BANKA ANCHAL- BANKA	ODHNI	2 & 288	379/31.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 53'42.32" E 86° 54'26.88"					
		C	N 24° 53'41.74" E 86° 54'23.41"					
		D	N 24° 53' 48.56" E 86° 54'21.45"					

SUKHNIYA/CHEER RIVER (DISTT-BANKA)

S. No	Area in (ha)	Coordinates		Ghat/Village	River	Plot No.	EC REF. No./ Date	EC validity
1	2.3	A	N 24° 46'41.59" E 87° 01'23.15"	GHAT- SABALPUR VILL- SABALPUR POST- SABALPUR ANCHAL- BARAHAT	SUKHNIYA	77	354/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 46'42.20" E 87° 01'19.47"					
		C	N 24° 46'36.64" E 87° 01'15.12"					
		D	N 24° 46'35.72" E 87° 01'17.81"					

CHEER RIVER (DISTT-BANKA)

S. No	Area in (ha)	Coordinates		Ghat/Village	River	Plot No.	EC Granted Date	EC Validity
1	4.5	A	N 24° 53' 42.33" E 87° 08' 51.24"	GHAT-PAIR VILL-PAIR POST-DHORAIYA ANCHAL- DHORAIYA	CHEER	182 & 158	335/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 53' 41.67" E 87° 08' 46.42"					
		C	N 24° 53'32.95" E 87° 08'51.53"					
		D	N 24° 53' 33.10" E 87° 08' 47.50"					
2	3.9	A	N 24° 52' 0.75" E 87° 07' 35.54"	GHAT- SARBA VILL-RAN GAON POST-DHORAIYA ANCHAL- DHORAIYA	CHEER	353	410/31.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 51'57.05" E 87° 07'37.62"					
		C	N 24° 51' 55.86" E 87° 07' 27.06"					
		D	N 24° 51'59.03" E 87° 07'27.32"					
3	4.1	A	N 24° 51'3.35" E 87° 5'43.84"	GHAT- PANJWARA RD. NEAR	CHEER	387		5 Years or till Expiry of Lease Period17
		B	N 24° 51' 00.88" E 87° 5' 47.43"					

DSR BANKA

		C	N 24° 50' 54.62" E 87° 5' 39.85"	KACHMACHIYA VILL- KACHMACHIYA POST-LAKHPURA ANCHAL- BARAHAT			334/04.03.2016	
		D	N 24° 50' 57.81" E 87° 5' 37.06"					
4	4.89	A	N 24° 50' 40.09" E 87° 4' 3.27"	GHAT-SABALPUR VILL-DOUKI, SABALPUR POST-SABALPUR ANCHAL- BARAHAT	CHEER	1& 105	325/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24° 50' 42.08" E 87° 4' 1.75"					
		C	N 24° 50' 29.13" E 87° 3' 47.98"					
		D	N 24° 50' 30.95" E 87° 3' 46.07"					

3.2 LIST OF NEWLY PROPOSED SAND GHAT(POTENTIAL GHAT) IN THE DISTRICT WITH LOCATION, AREA AND RESERVE

Table 2
STRETCH - 01 (CHANAN RIVER)

SR. NO .	BLOCKS	AREA IN HECT.	GEOLOGICAL RESERVE	MINEABLE RESERVE	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
	BANKA CHANAN 01	75.50	2265000	1812000	A	24°58'3.91"N 86°55'27.14"E	CHANAN	1865	405
					B	24°58'11.49"N 86°55'39.44"E			
					C	24°57'7.43"N 86°55'29.26"E			
					D	24°57'7.89"N 86°55'43.23"E			
	BANKA CHANAN 02	83	2490000	1992000	A	24°57'7.43"N 86°55'29.26"E	CHANAN	2580	332
					B	24°57'7.89"N 86°55'43.23"E			
					C	24°55'47.64"N 86°55'13.55"E			
					D	24°55'48.70"N 86°55'0.53"E			
	BANKA CHANAN 03	82.2	2466000	1972800	A	24°55'48.70"N 86°55'0.53"E	CHANAN	2280	360
					B	24°55'47.64"N 86°55'13.55"E			
					C	24°54'39.36"N 86°55'1.80"E			
					D	24°54'31.41"N 86°54'51.86"E			
	BANKA CHANAN 04	40.7	1221000	976800	A	24°54'7.40"N 86°55'11.72"E	CHANAN	1584	257
					B	24°54'16.45"N 86°55'17.23"E			
					C	24°53'43.46"N 86°55'57.55"E			
					D	24°50'24.91"N 86°56'2.97"E			
	BANKA CHANAN	89	2670000	2136000	A	24°53'20.36"N 86°56'3.07"E	CHANAN	2622	339 ¹⁹

DSR BANKA

					B	24°53'18.31"N 86°56'15.95"E			
					C	24°51'58.95"N 86°55'55.65"E			
					D	24°51'58.49"N 86°55'43.67"E			
	BANKA CHANAN 06	91	2730000	2184000	A	24°51'58.49"N 86°55'43.67"E	CHANDAN	2975	305
					B	24°51'58.95"N 86°55'55.65"E			
					C	24°50'26.15"N 86°56'16.13"E			
					D	24°50'24.91"N 86°56'2.97"E			
	BANKA CHANAN 07	95.1	2853000	2282400	A	24°50'24.91"N 86°56'2.97"E	CHANDAN	2132	446
					B	24°50'26.15"N 86°56'16.13"E			
					C	24°49'21.71"N 86°55'48.34"E			
					D	24°49'30.05"N 86°55'38.58"E			
	BANKA CHANAN 08	92	2760000	2208000	A	24°48'50.27"N 86°55'39.33"E	CHANDAN	3807	241
					B	24°48'50.42"N 86°55'47.90"E			
					C	24°47'33.53"N 86°54'21.79"E			
					D	24°47'33.36"N 86°54'14.91"E			
	BANKA CHANAN 09	95	2850000	2280000	A	24°47'33.36"N 86°54'14.91"E	CHANDAN	2509	378
					B	24°48'50.42"N 86°55'47.90"E			
					C	24°46'14.31"N 86°54'19.97"E			
					D	24°46'24.76"N 86°54'6.43"E			
	BANKA CHANAN 10	97	2910000	2328000	A	24°36'13.81"N 86°38'39.31"E	CHANDAN	13440	72
					B	24°36'15.90"N 86°38'37.89"E			
					C	24°36'32.06"N 86°44'30.49"E			
					D	24°36'29.51"N 86°44'27.63"E			

DSR BANKA

BANKA CHANAN 11	75	2250000	1800000	A	25° 5'10.82"N 86°56'35.83"E	CHANDAN	1862	403
				B	25° 5'14.62"N 86°57'6.09"E			
				C	25° 4'40.03"N 86°57'4.64"E			
				D	25° 4'35.44"N 86°56'46.34"E			

BADUA -01 (STRETCH - 2)

SR. NO .	BLOCKS	AREA IN HECT.	GEOLOGICAL RESERVE	MINEABLE RESERVE	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	46.5	139500	111600	A	25° 1'45.29"N 86°39'23.51"E	BADUA	2551	182
					B	25° 1'42.34"N 86°39'25.90"E			
					C	25° 0'39.48"N 86°39'9.72"E			
					D	25° 0'41.45"N 86°39'4.75"E			
2	BLOCK-02	77.3	231900	185520	A	25° 0'14.06"N 86°39'7.96"E	BADUA	3987	193
					B	25° 0'12.57"N 86°39'12.01"E			
					C	24°58'25.78"N 86°38'11.64"E			
					D	24°58'32.14"N 86°38'4.16"E			
3	BLOCK-03	62	186000	148800	A	24°57'51.36"N 86°37'35.43"E	BADUA	2809	220
					B	24°57'49.20"N 86°37'43.35"E			
					C	24°56'22.61"N 86°37'22.35"E			
					D	24°56'23.52"N 86°37'15.10"E			
4	BLOCK-04	66	198000	158400	A	24°56'23.52"N 86°37'15.10"E	BADUA	1968	335 21
					B	24°56'22.61"N 86°37'22.35"E			
					C	24°55'22.57"N 86°37'10.11"E			
					D	24°55'27.58"N 86°37'2.03"E			

DSR BANKA

5	BLOCK-05	30.3	90900	72720	A	24°53'54.73"N 86°38'7.32"E	BADUA	1116	271
					B	24°53'56.48"N 86°38'5.39"E			
					C	24°53'45.75"N 86°38'27.94"E			
					D	24°53'45.49"N 86°38'35.73"E			

BADUA -02 (STRETCH -2)

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE	MINEABLE RESERVE	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	16.6	498000	398400	A	24°50'10.14"N 86°37'37.55"E	BADUA	2503	66
					B	24°50'10.73"N 86°37'39.36"E			
					C	24°49'39.63"N 86°38'44.42"E			
					D	24°49'39.07"N 86°38'43.24"E			
2	BLOCK-02	38	1140000	912000	A	24°49'14.97"N 86°38'52.93"E	BADUA	5578	68
					B	24°49'16.01"N 86°38'54.32"E			
					C	24°47'8.43"N 86°39'5.83"E			
					D	24°47'5.72"N 86°39'2.38"E			
3	BLOCK-03	50.2	1506000	1204800	A	24°46'45.91"N 86°39'4.27"E	BADUA	7088	70
					B	24°46'43.93"N 86°39'6.43"E			
					C	24°44'43.07"N 86°37'46.96"E			
					D	24°44'44.79"N 86°37'47.88"E			
4	BLOCK-04	5.36	160800	128640	A	24°44'18.61"N 86°37'16.87"E	BADUA	1102	48
					B	24°44'21.84"N 86°37'18.56"E			
					C	24°44'0.55"N 86°37'27.69"E			
					D	24°44'1.26"N 86°37'26.75"E			
5	BLOCK-05	27	810000	648000	A	24°43'35.71"N 86°37'12.24"E	BA DU A	3931	68 ²²

DSR BANKA

					B	24°43'32.91"N 86°37'12.12"E		
					C	24°43'12.88"N 86°35'31.39"E		
					D	24°43'15.44"N 86°35'30.41"E		
6	BLOCK-06	15.7	471000	376800	A	24°43'12.85"N 86°35'24.19"E	BADUA	1772 88
					B	24°43'9.37"N 86°35'25.97"E		
					C	24°42'47.45"N 86°34'49.03"E		
					D	24°42'49.83"N 86°34'48.28"E		
7	BLOCK-07	24	720000	576000	A	24°42'54.61"N 86°34'41.68"E	BADUA	2125 112
					B	24°42'51.03"N 86°34'40.85"E		
					C	24°42'1.65"N 86°34'9.30"E		
					D	24°42'3.45"N 86°34'2.07"E		

DARBHASHAN RIVER (STRETCH 3)

SR. NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE	MINEABLE RESERVE	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	12	360000	288000	A	24°43'47.79"N 86°45'22.94"E	DARBHASHAN	2045	58
					B	24°43'50.85"N 86°45'23.71"E			
					C	24°43'33.65"N 86°46'29.99"E			
					D	24°43'31.90"N 86°46'29.53"E			
2	BLOCK-02	5.76	172800	138240	A	24°43'22.47"N 86°46'53.36"E	DARBHASHAN	1352	42
					B	24°43'22.05"N 86°46'51.62"E			
					C	24°43'29.79"N 86°47'29.64"E			
					D	24°43'30.83"N 86°47'29.48"E			
3	BLOCK-03	5.91	177300	141840	A	24°43'33.02"N 86°47'37.95"E	DARBHAN SHAN	1667	35 23
					B	24°43'34.23"N 86°47'37.83"E			

DSR BANKA

					C	24°42'52.19"N 86°48'6.04"E		
					D	24°42'53.24"N 86°48'4.16"E		
4	BLOCK-04	12.5	375000	300000	A	24°42'46.63"N 86°48'8.21"E	DARBHANSAN	3525 35
					B	24°42'45.46"N 86°48'9.26"E		
					C	24°41'50.68"N 86°49'21.26"E		
					D	24°41'52.15"N 86°49'20.48"E		
5	BLOCK-05	6	180000	144000	A	24°41'50.94"N 86°49'31.40"E	DARBHANSAN	1807 33
					B	24°41'52.10"N 86°49'30.86"E		
					C	24°41'44.36"N 86°50'13.94"E		
					D	24°41'43.27"N 86°50'13.93"E		

ODHNI RIVER (STRETCH - 4)

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE	MINEABLE RESERVE	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	15	450000	360000	A	24°54'16.61"N 86°54'21.27"E	ODHNI	1042	143
					B	24°54'15.31"N 86°54'23.09"E			
					C	24°53'42.93"N 86°54'27.04"E			
					D	24°53'41.65"N 86°54'20.27"E			
2	BLOCK-02	25.5	765000	612000	A	24°52'30.96"N 86°54'34.62"E	ODHNI	2822	90
					B	24°52'31.58"N 86°54'37.67"E			
					C	24°51'42.65"N 86°53'24.84"E			
					D	24°51'45.78"N 86°53'22.54"E			
3	BLOCK-03	28.8	864000	691200	A	24°51'31.72"N 86°52'49.67"E	ODHNI	2240	128
					B	24°51'29.26"N 86°52'51.03"E			
					C	24°50'34.34"N 86°52'2.31"E			

DSR BANKA

					D	24°50'35.84"N 86°51'59.67"E			
4	BLOCK-04	7.1	213000	170400	A	24°50'14.70"N 86°52'2.08"E	ODHNI	1264	56
					B	24°50'15.00"N 86°52'4.32"E			
					C	24°49'55.67"N 86°51'29.70"E			
					D	24°49'56.84"N 86°51'27.75"E			
					KURAR RIVER (STRETCH -5)				

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE	MINEABLE RESERVE	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	13.7	411000	328800	A	24°46'12.71"N 86°53'40.09"E	KURAR	820	167
					B	24°46'3.49"N 86°53'42.67"E			
					C	24°45'55.29"N 86°53'17.88"E			
					D	24°45'57.97"N 86°53'15.64"E			
2	BLOCK-02	18.5	555000	444000	A	24°45'54.66"N 86°53'6.36"E	KURAR	2617	70
					B	24°45'50.53"N 86°53'8.04"E			
					C	24°44'54.80"N 86°52'16.14"E			
					D	24°44'55.08"N 86°52'13.68"E			
3	BLOCK-03	9.16	274800	219840	A	24°44'47.60"N 86°52'11.71"E	KURAR	1062	86
					B	24°44'44.54"N 86°52'14.85"E			
					C	24°44'30.77"N 86°51'44.76"E			
					D	24°44'34.49"N 86°51'43.83"E			

CHIR RIVER (STRETCH -6)

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE	MINEABLE RESERVE	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	26	780000	624000	A	24°54'15.29"N 87° 8'41.33"E	CHIR	2385	109 25

DSR BANKA

					B	24°54'15.70"N 87° 8'43.58"E		
					C	24°53'5.89"N 87° 8'27.80"E		
					D	24°53'7.13"N 87° 8'25.05"E		
2	BLOCK-02	11.7	351000	280800	A	24°52'48.09"N 87° 8'6.82"E	CHIR	1195 97
					B	24°52'46.92"N 87° 8'8.78"E		
					C	24°52'22.46"N 87° 7'38.03"E		
					D	24°52'23.22"N 87° 7'32.94"E		
3	BLOCK-03	48.2	1446000	1156800	A	24°52'2.14"N 87° 7'39.44"E	CHIR	3259 147
					B	24°52'1.97"N 87° 7'45.74"E		
					C	24°51'16.24"N 87° 6'6.38"E		
					D	24°51'21.28"N 87° 6'3.04"E		
4	BLOCK-04	67.8	2034000	1627200	A	24°51'4.33"N 87° 5'42.54"E	CHIR	1780 380
					B	24°50'58.14"N 87° 5'47.52"E		
					C	24°50'42.44"N 87° 4'50.32"E		
					D	24°50'55.14"N 87° 4'40.08"E		
5	BLOCK-05	34	1020000	816000	A	24°50'31.29"N 87° 4'17.64"E	CHIR	2301 147
					B	24°50'30.58"N 87° 4'23.12"E		
					C	24°49'18.63"N 87° 4'11.23"E		
					D	24°49'19.00"N 87° 4'8.33"E		
6	BLOCK-06	35.7	1071000	856800	A	24°49'12.88"N 87° 3'49.69"E	CHIR	2165 164 26
					B	24°49'12.28"N 87° 3'52.72"E		
					C	24°48'26.74"N 87° 3'34.33"E		
					D	24°48'27.75"N 87° 3'28.27"E		
					E	24°48'58.16"N 87° 3'58.18"E		

DSR BANKA

					F	24°49'2.61"N 87° 4'3.22"E		
					G	24°49'1.39"N 87° 4'5.01"E		
7	BLOCK-07	34	1020000	816000	A	24°48'2.88"N 87° 3'26.23"E	CHIR	1657 205
					B	24°48'2.32"N 87° 3'30.93"E		
					C	24°47'21.99"N 87° 4'4.82"E		
					D	24°47'16.73"N 87° 3'54.59"E		

SUKHANIYA RIVER (STRETCH 7)

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE	MINEABLE RESERVE	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	11.9	357000	285600	A	24°49'22.56"N 87° 3'10.97"E	SUKHANIYA	1538	77
					B	24°49'21.41"N 87° 3'13.40"E			
					C	24°48'36.60"N 87° 3'8.22"E			
					D	24°48'37.41"N 87° 3'7.08"E			
2	BLOCK-02	13.7	411000	328800	A	24°48'17.81"N 87° 2'46.58"E	SUKHANIYA	2109	64
					B	24°48'16.72"N 87° 2'47.64"E			
					C	24°47'12.60"N 87° 2'20.46"E			
					D	24°47'15.20"N 87° 2'18.11"E			
3	BLOCK-03	11.8	354000	283200	A	24°46'54.50"N 87° 1'51.61"E	SUKHANIYA	1748	67
					B	24°46'53.07"N 87° 1'51.97"E			
					C	24°46'19.67"N 87° 1'3.51"E			
					D	24°46'22.15"N 87° 1'2.29"E			
4	BLOCK-04	13.9	417000	333600	A	24°46'0.21"N 87° 0'18.82"E	SUKHANIYA	1285	108 27
					B	24°45'57.26"N 87° 0'19.65"E			
					C	24°45'48.44"N 86°59'45.76"E			

					D	24°45'49.35"N 86°59'41.63"E			
5	BLOCK-05	20	600000	480000	A	24°45'21.71"N 86°59'37.99"E	SUKHANIYA	2842	70
					B	24°45'21.22"N 86°59'40.15"E			
					C	24°44'2.90"N 86°59'20.11"E			
					D	24°44'2.88"N 86°59'18.61"E			

Conclusion Table

Name of River	Total length of River in District (in m)	Avg Width of River(in m)	Total Area of River in District (in Hect.)	Total Area of Sand Blocks (In Hect.)	% of Area Mineral Extraction
CHANDAN	60000	275	1650	915.5	55.48
BADUA	50000	155	775	458.96	59.22
DARBHASHAN	19000	50	95	42.17	44.39
ODHNI	30000	100	300	76.4	25.47
KURAR	24000	90	216	41.36	19.15
CHIR	30000	145	435	257.4	59.17
SUKHANIYA	18000	125	225	71.3	31.69

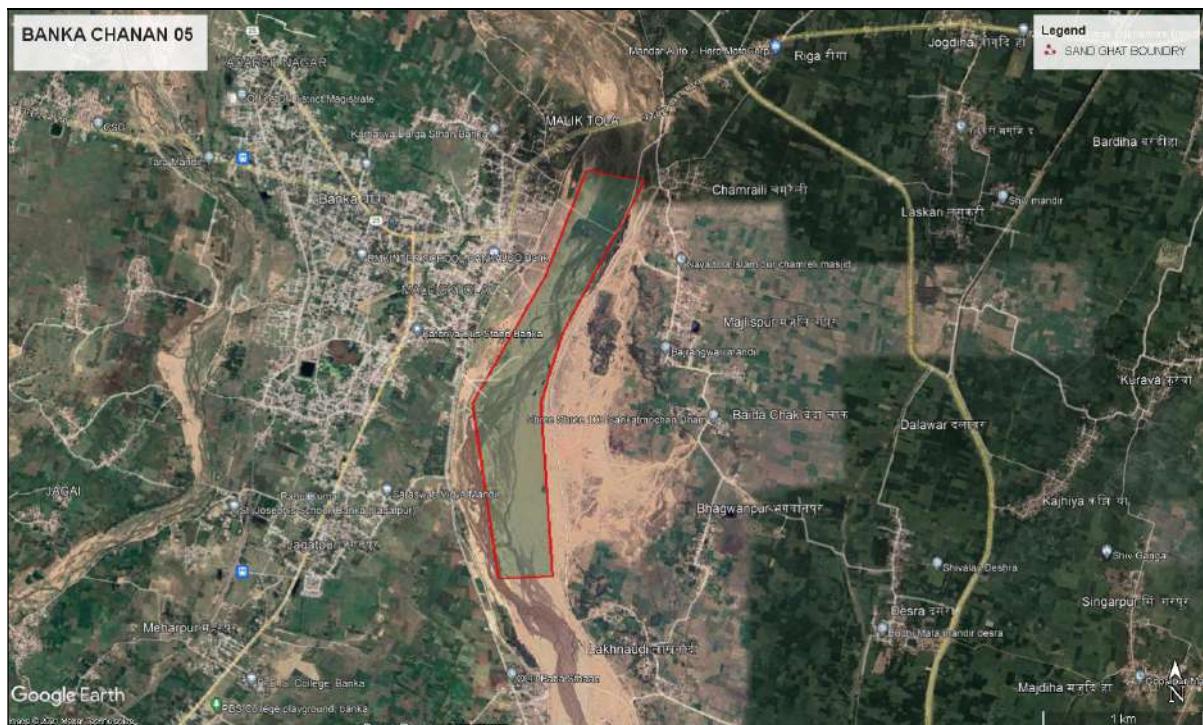
3.3 GOOGLE KML SNAPSHOT OF NEWLY PROPOSED SAND GHAT(POTENTIAL GHAT)

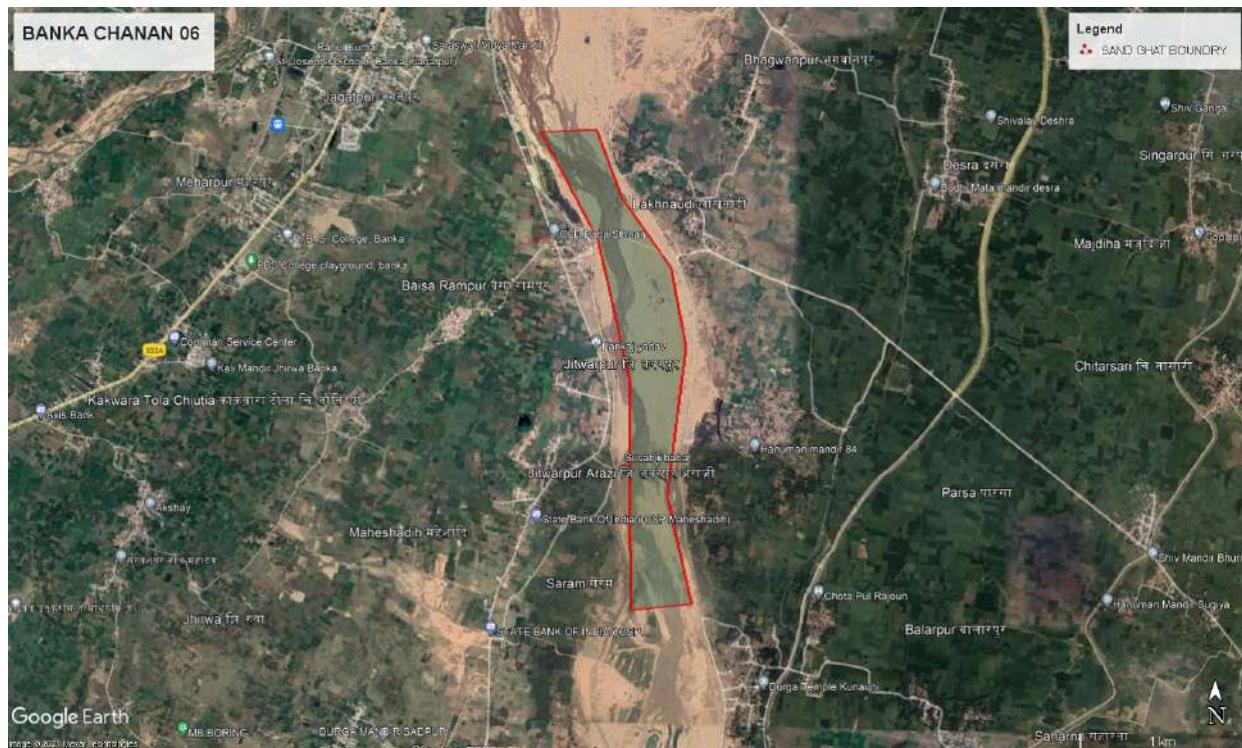








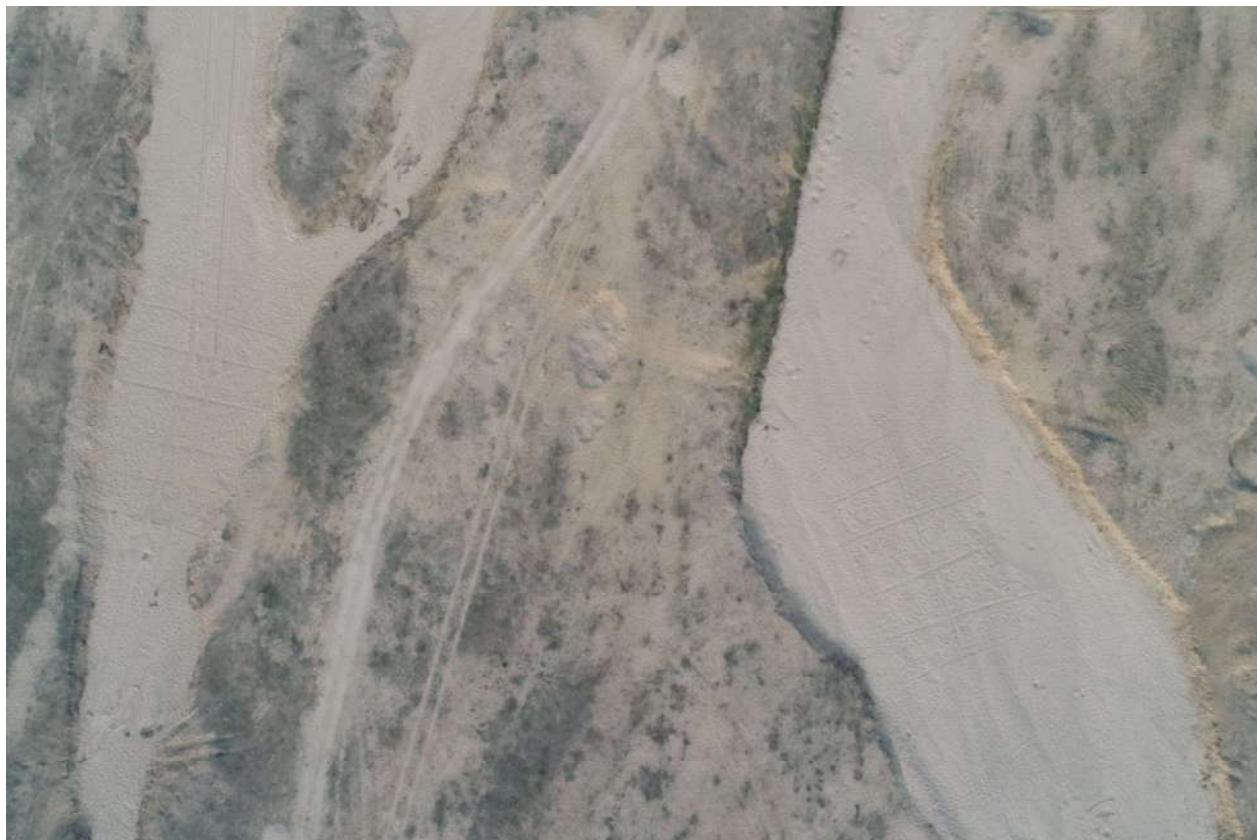


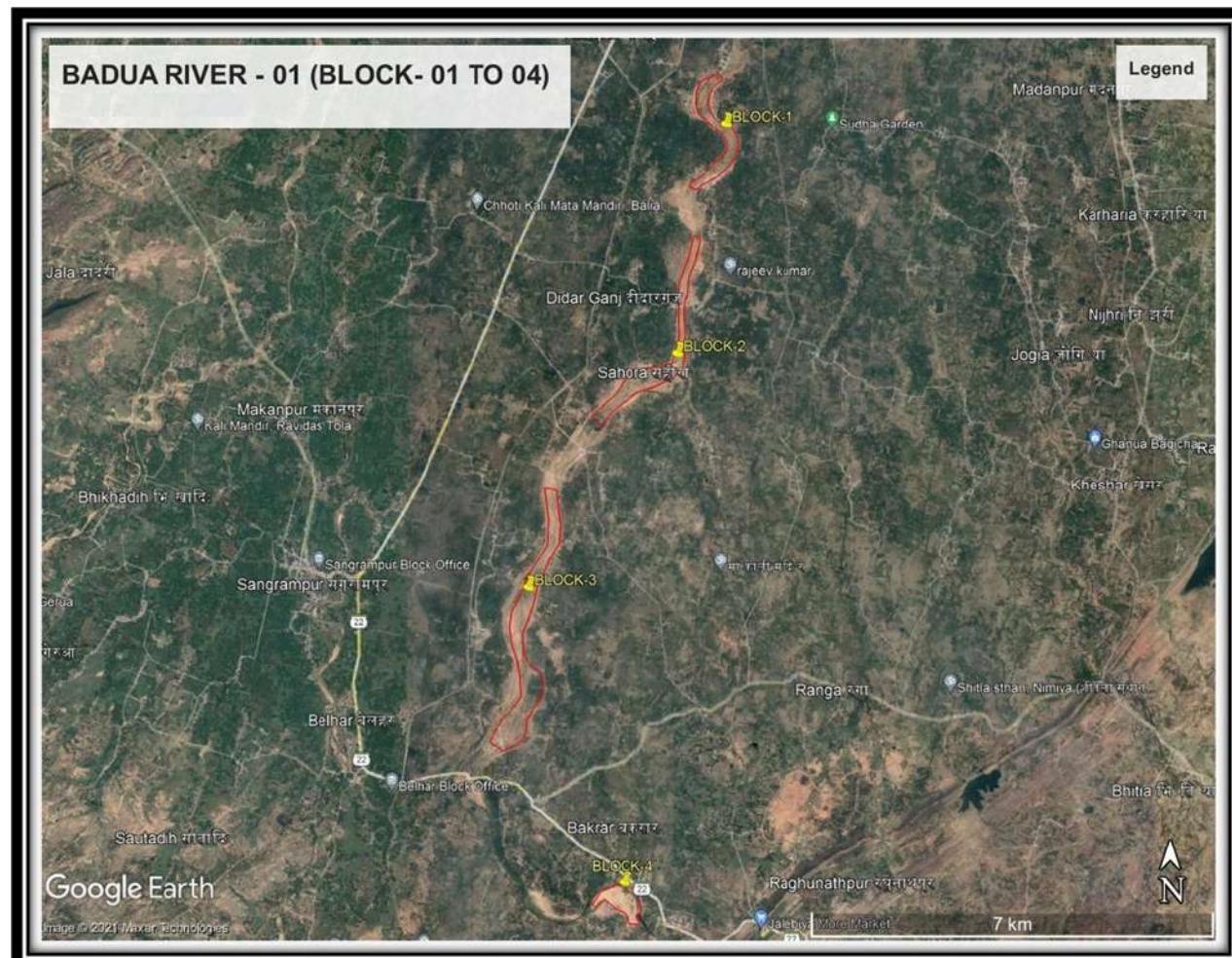


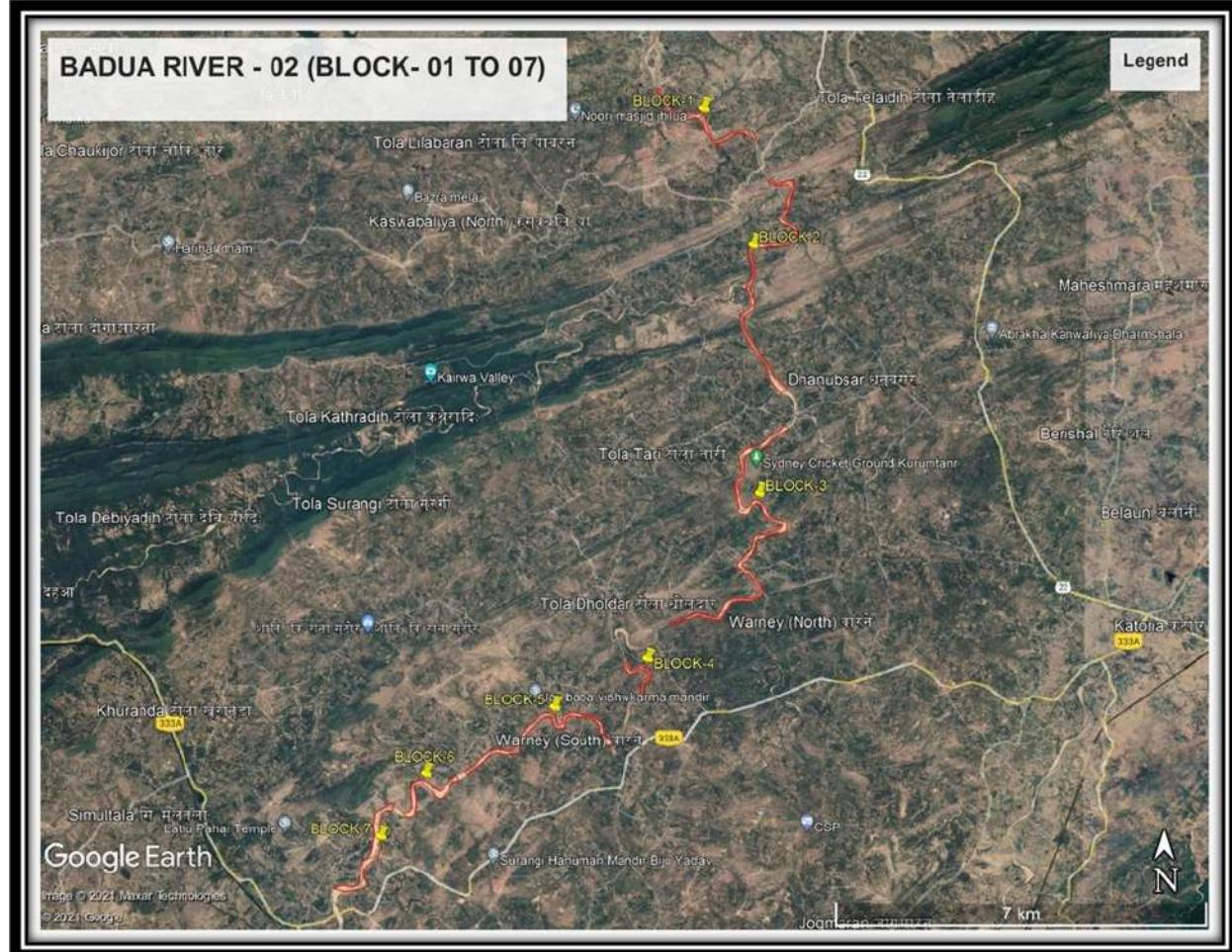


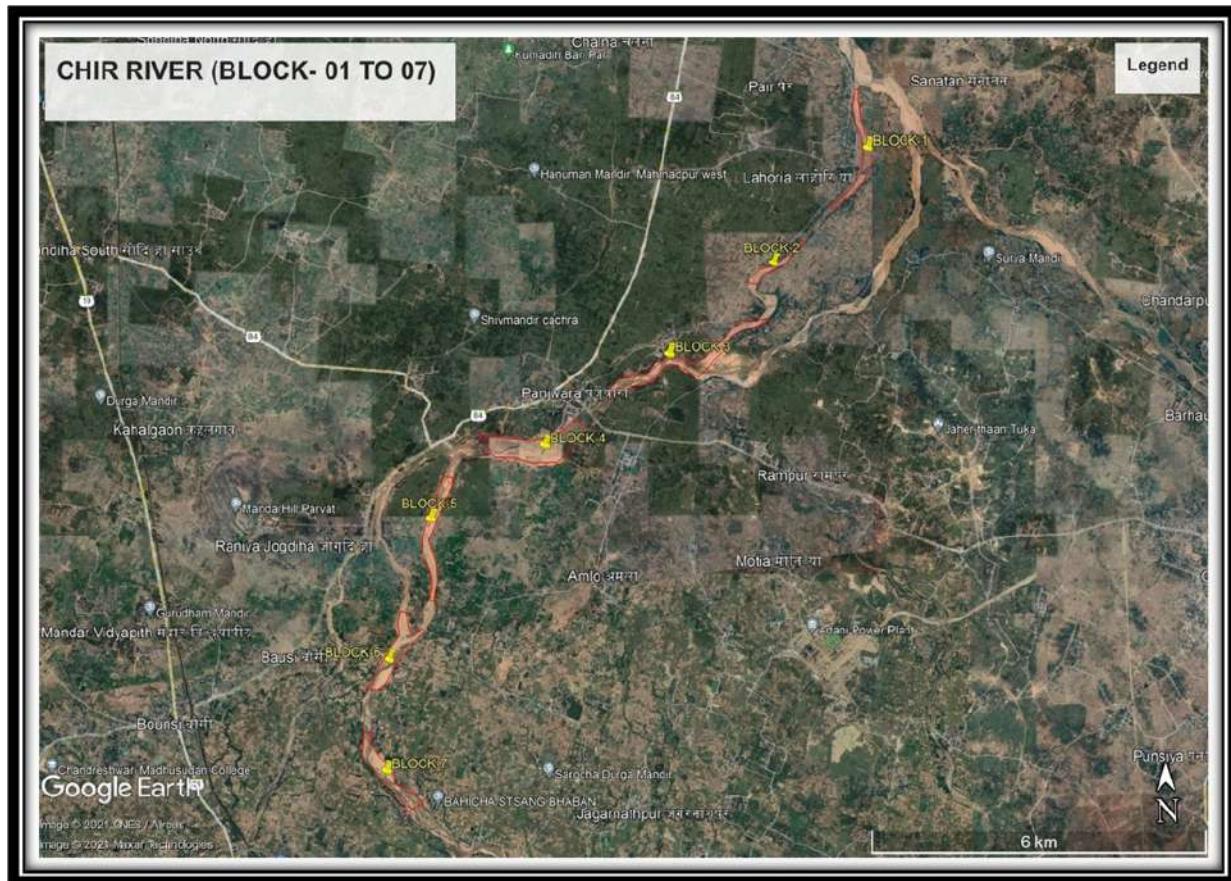


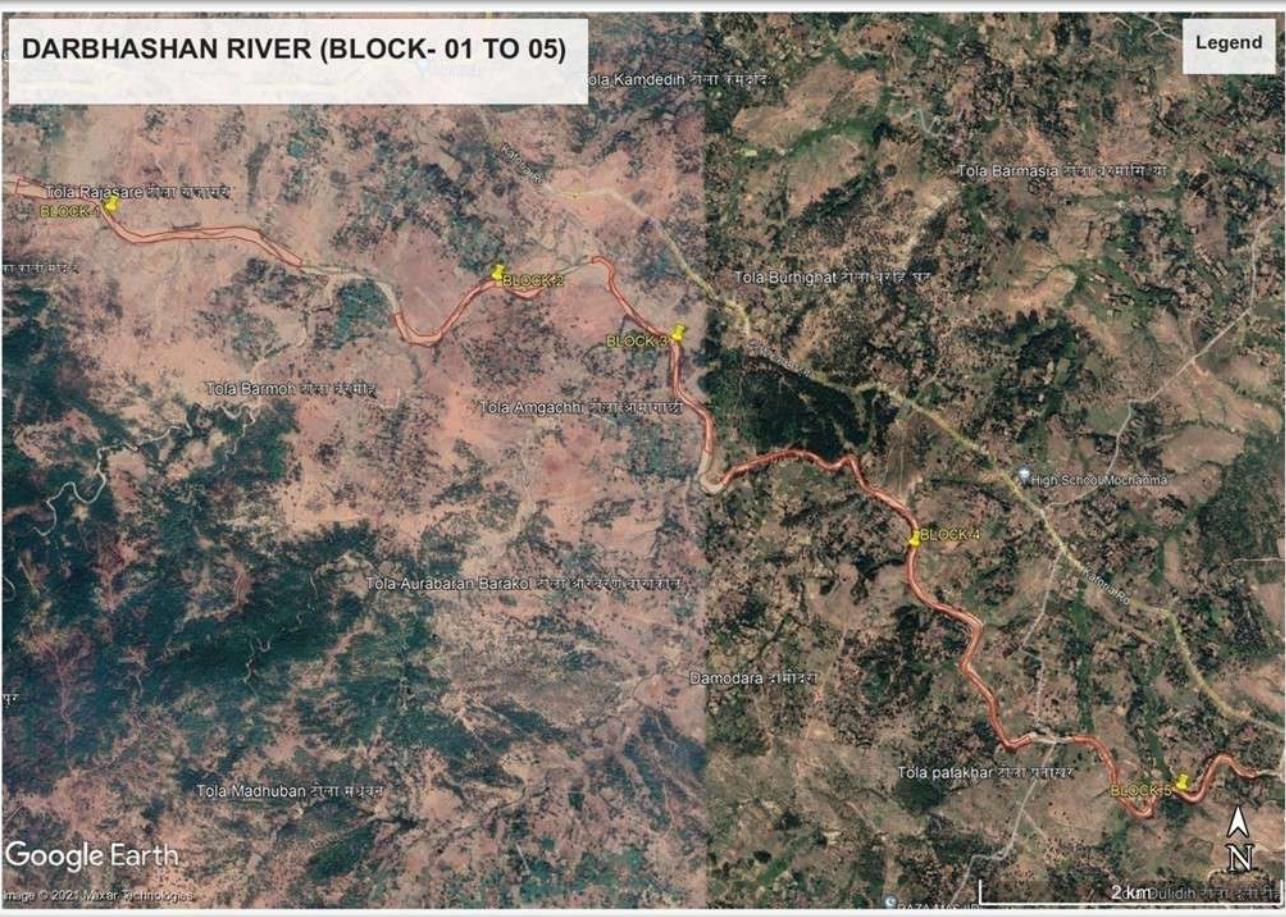




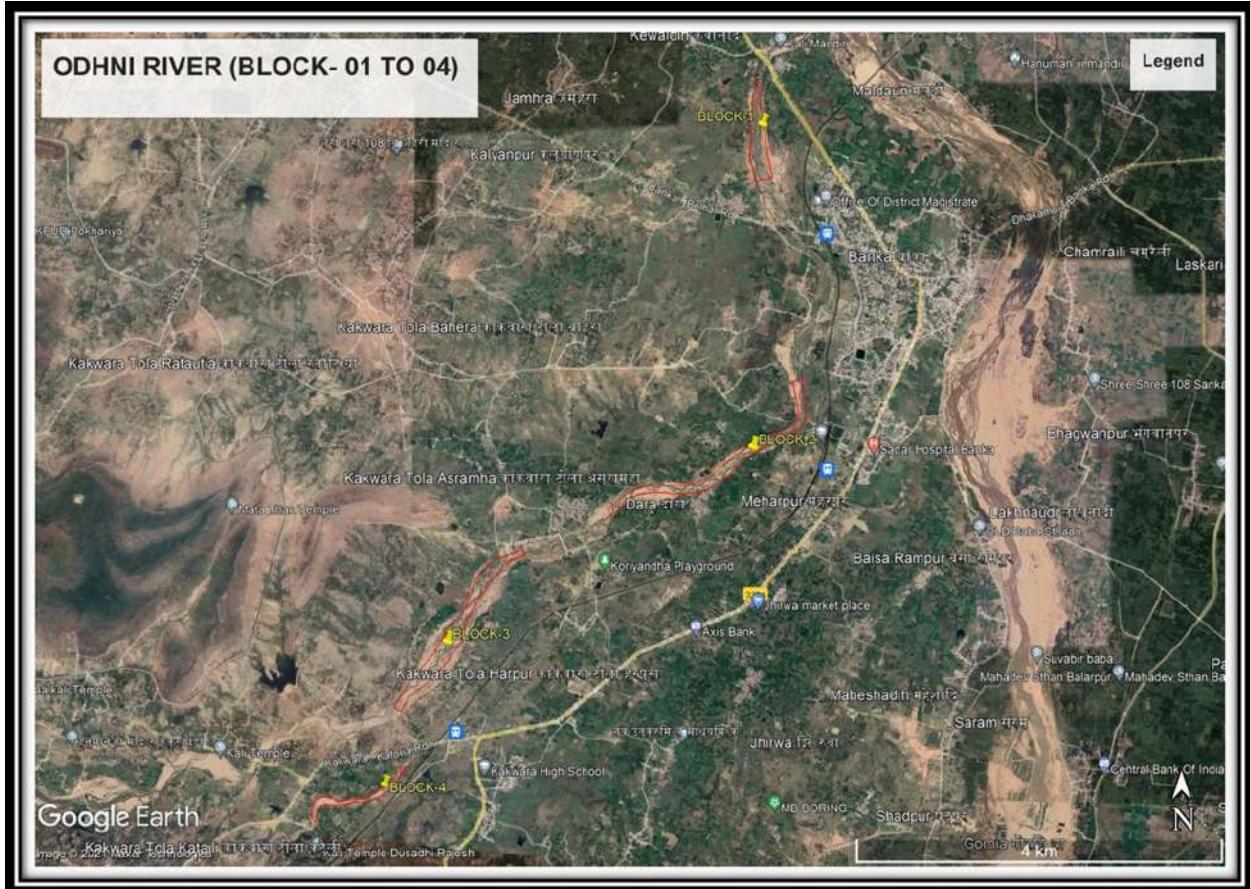


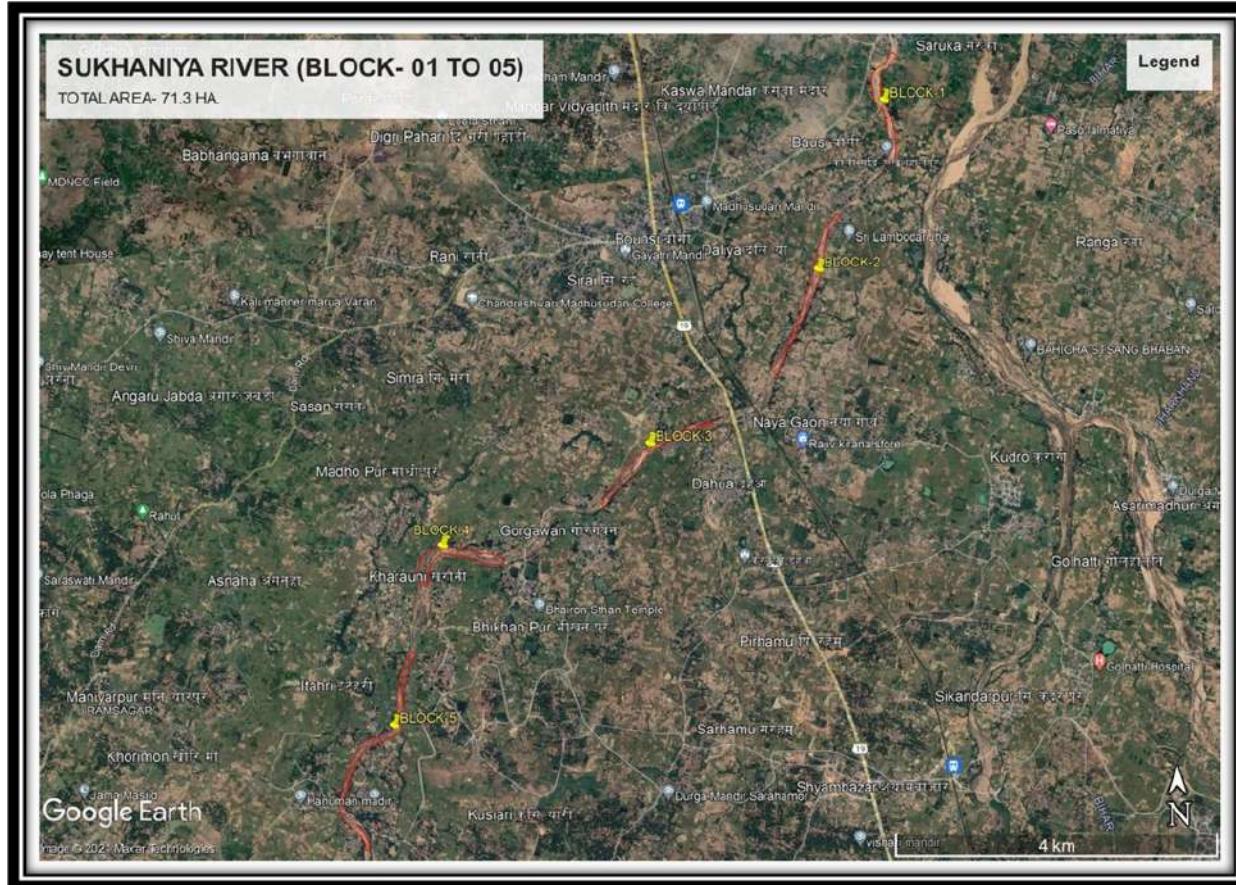












4. Detail of Royalty or Revenue Received in last three years

Table 3

Year wise Total Revenue Collection (in Rupees Lakhs)				
S. No.	District	2018-19	2019-20	2020-21
1	Banka	6967.87	7515.83	7519.28

Source:- Mines & Geology Department, Patna, GoB

5. Details of Production of Sand or Minor Mineral In Last Three Years

Table 4

SAND				
Sl. No.	Year	Permitted quantity in MT (AS per EC & Approved Mine Plan)	Actual Production in MT	Actual Production in cft
1	2018-19	6986026	3536132.14	88403303.50
2	2019-20	9253119	3723483.94	93087098.50
3	2020-21	9253119	1784979.66	44624491.50

Source : Mines & Geology Department, Patna, GoB

6. Process of Deposition of Sediments in the Rivers of the District

Replenishment of Sand :

The deposition in a river bed is more pronounced during rainy season although the quantum of deposition varies from stream to stream depending upon numbers of factors such as catchment, lithology, discharge, river profile and geomorphology of the river course where annual deposition is one meters, but it is noticed that during flood season whole of the pit so excavated is completely filled up and as such the excavated area is replenished with new harvest of minerals.

In order to calculate the mineral deposits in the stream beds, the mineral constituents have been categorized as clay, silt, sand, bajri and boulder. However, during present calculation, the waste material i.e silt which vary from 10 to 20% in different streams has also been included in the total production. Further the Survey of India Topo- Sheets are used as base map to know the extent of river course. The mineral reserves have been calculated only upto 3.00 meter depth although there are some portions in the river beds such as channel bars, point bars and central islands where the annual deposition is raising the level of river bed thus causing shifting of the rivers towards banks resulting in to cutting of banks and at such locations, removal of this material upto the bed level is essential to control the river flow in its central part to check the bank cutting. While calculating the mineral potentials, the mineral deposits lying in the sub- tributaries of that particular stream/river has not been taken into consideration. Since these mineral deposits are adding annually.

Surface runoff

Also known as overland flow is the flow of water that occurs when excess storm water, meltwater, or other sources flows over the Earth's surface. This might occur because soil is saturated to full capacity, because rain arrives more quickly than soil can absorb it, or because impervious areas (roofs and pavement) send their runoff to surrounding soil that cannot absorb all of it. Surface runoff is a major component of the water cycle. It is the primary agent in soil erosion by water.

Runoff that occurs on the ground surface before reaching a channel is also called a nonpoint source. If a nonpoint source contains man-made contaminants, or natural forms of pollution (such as rotting leaves) the runoff is called nonpoint source pollution. A land area which produces runoff that drains to a common point is called a drainage basin. When runoff flows along the ground, it can pick up soil contaminants including petroleum, pesticides, or fertilizers that become discharge or nonpoint source pollution.

In addition to causing water erosion and pollution, surface runoff in urban areas is a primary cause of urban flooding which can result in property damage, damp and mold in basements, and street flooding.⁴⁷

Effects of surface runoff

Erosion and deposition

Surface runoff can cause erosion of the Earth's surface; eroded material may be deposited a considerable distance away.

There are four main types of soil erosion by water:

- Splash erosion,
- Sheet erosion,
- Rill erosion,
- Gully erosion.

Splash erosion is the result of mechanical collision of raindrops with the soil surface: soil particles which are dislodged by the impact then move with the surface runoff.

Sheet erosion is the overland transport of sediment by runoff without a well-defined channel.

Soil surface roughness causes may cause runoff to become concentrated into narrower flow paths: as these incise, the small but well-defined channels which are formed are known as rills. These channels can be as small as one centimeter wide or as large as several meters.

If runoff continue to incise and enlarge rills, they may eventually grow to become **gullies**.

Gully erosion can transport large amounts of eroded material in a small time period.



Soil erosion by water on intensively-tilled farmland.

Reduced crop productivity usually results from erosion, and these effects are studied in the field of soil conservation. The soil particles carried in runoff vary in size from about .001 millimeter to 1.0 millimeter in diameter. Larger particles settle over short transport distances, whereas small particles can be carried over long distances suspended in the watercolumn.

There are many sediment transport equations which are suitable for use in the prediction of the replenishment rate of rivers/ watershed. Some of the Famous sediment transport equations are:

1. Dandy – Bolton Equation
2. Yang Equations
3. Engelund-HansenEquation
4. Modified Universal Soil Loss Equation(MUSLE)

M

REPLENISHMENT SCENARIO OF THE RIVER/STRETCHES :-

Replenishment study have been done by the team of experts in year 2018 & 2019 for sand ghats and stretcheson the basis of survey done with DGPS during periods (Pre-monsoon & Post Mansoon) of sediments transported by the river.Samereports are also submitted to the mining department.

DGPS survey have been done for both Pre & Post mansoon seasons which includes collection of samples for determination of specific gravity, preparation of plan and section at every 100m level

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determination of original ground level, reserve estimation based on data collection & quantification of sand transported during the monsoon season.

The Findings of replenishment study of different ghats /stretches of Banka district are as:-

NAME OF RIVER	ANNUAL PRODUCTION IN MT	REPLENISHED QUANTITY IN 2018 (IN MT)	REPLENISHED QUANTITY IN 2019 (IN MT)
CHANDAN	8065069	8465333	8887323
BADUA	527549	694822	1246693
SUKHANIYA	63239	81965	74733
CHEER	526895	620478	565781
ODHNI	70367	78504	74116
Total	9253119	9941102	10848646

Source:- Report of M/s Overseas Min-Tech Consultants, Jaipur

Conclusion

From the above replenishment study data, it has been observed that the replenished quantity of sand is found more than the actual production. In 2018 the replenished quantity is found Approx. 107% of the actual production and in 2019 it was found approx. 117%. Excavation plan have been prepared for above ghats sand based on this report only.

7. GENERAL PROFILE OF THE DISTRICT

River System

Banka is surrounded by three main rivers namely Chanan, Chir and Badua. Chanan river flows in the middle part while Chir flows in the East part and Badua flow in the West part of the district All the rivers are tributaries of river Ganga and are seasonal in nature.

Chanan/ Chandan River :

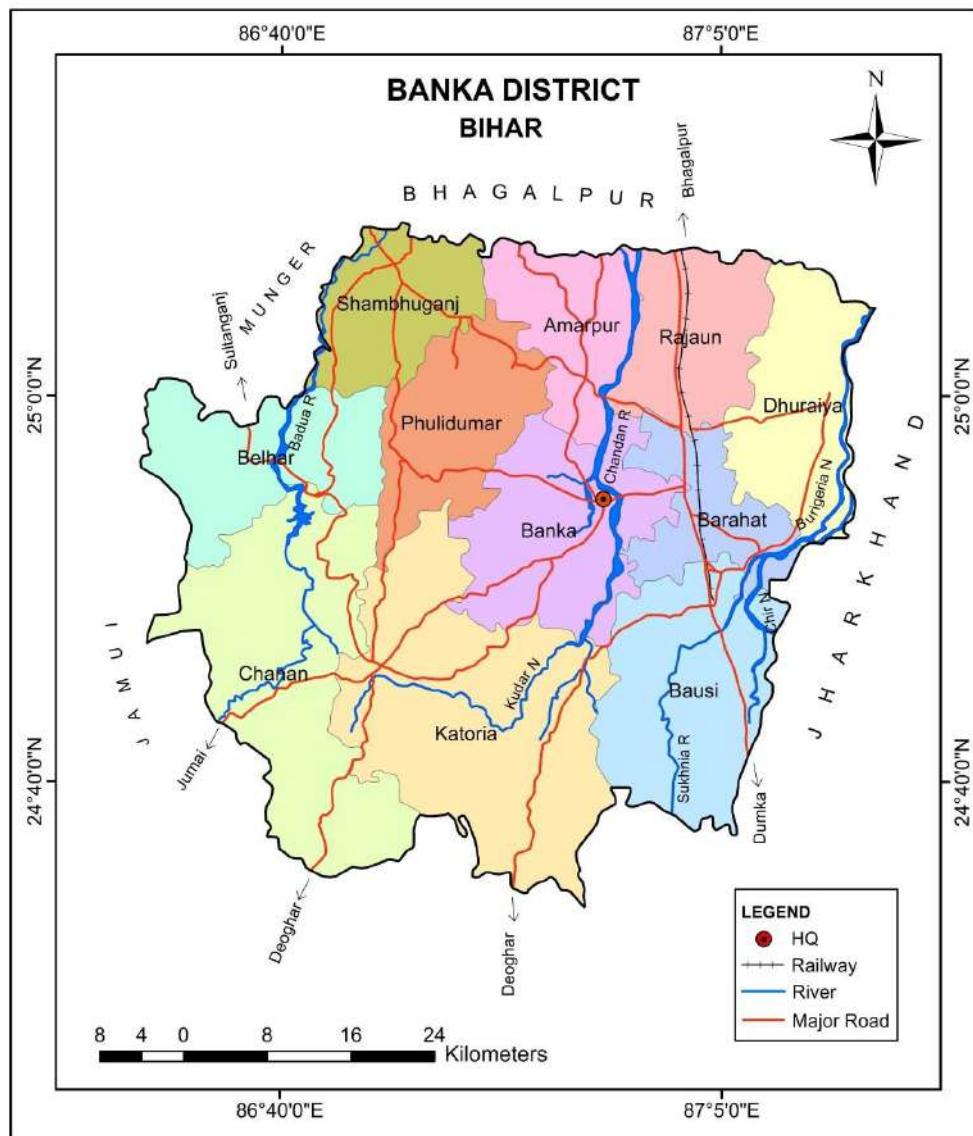
Chandan/Chanan(also known as Chanan) river originates from the northern part of Deoghar hills (Jharkhand) at an elevation of 274 metre and after traversing 110 km length bifurcates from South to North direction into number of small chanells with deltaic river characteristics before meeting the river Ganga through Yamuinia nala near Nathnagar, Bhagalpur. Before meeting with Ganga river, it passes through Banka and Bhagalpur District of Bihar. Chandan/Chanan river is seasonal river, but in monsoon season due to high flow of water it causes flood situations. Along with water flow, this carries huge amount of sand. Chanan river is non-perennial river. After monsoon season, river becomes dry for rest of the year.

Chir River :

Chir river originates from Dumka hilly area at an elevation of 165 m. Chir river flows in the Eastern part of the district. Its tributaries are Sukhania, Kajhia, Harna, Sundar and Gahra rivers. After monsoon season, river becomes dry for rest of the year. The river is non perennial river.

Badua River :

Badua originates from. It flow western part of districts. Badua river originates from chakai at an elevation of 265 m. The river is non Perennial River.



Climate

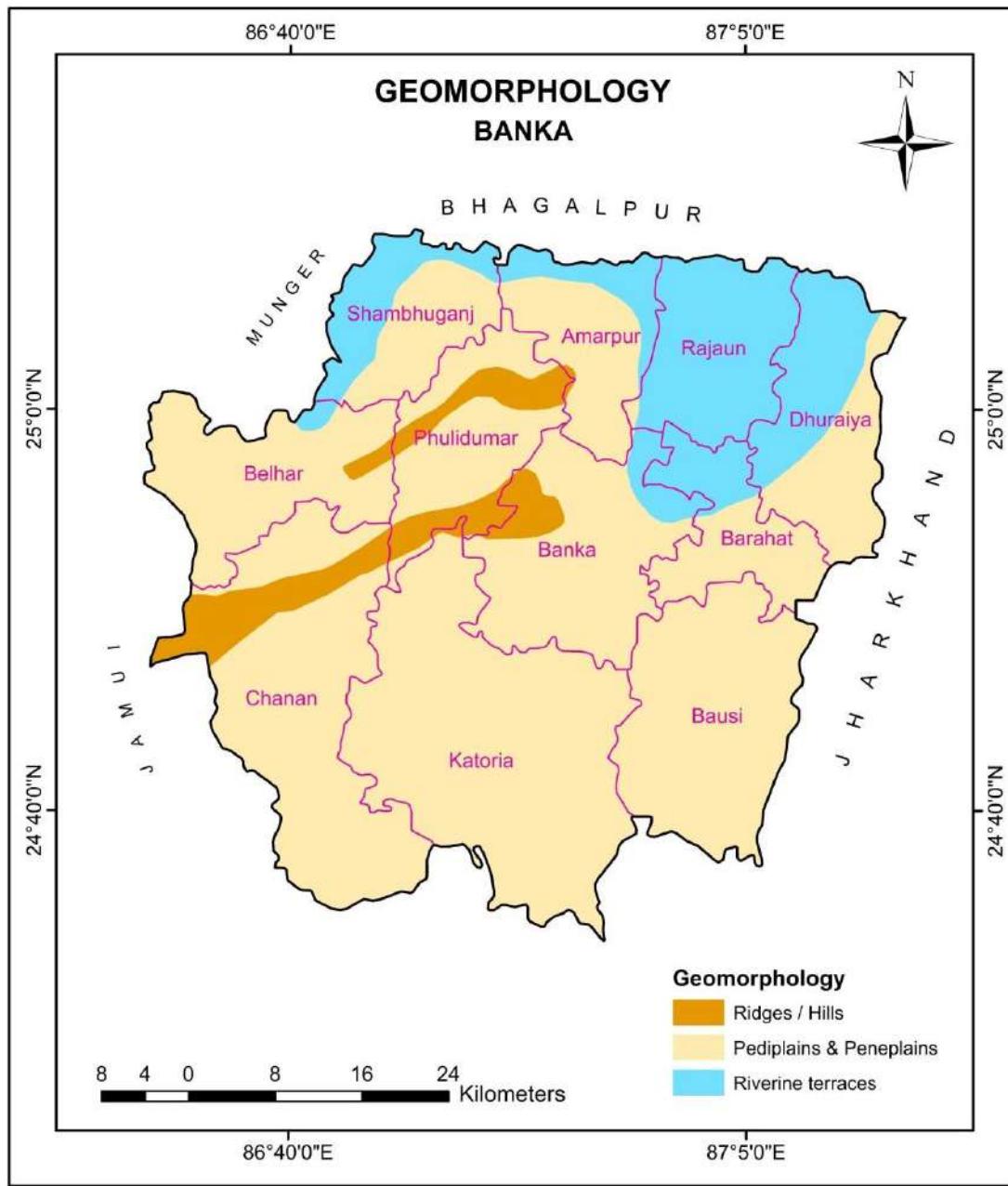
The climate of the district is characterized by hot summer and a pleasant winter. April to June comprises summer month while November to March makes cold season. The southwest monsoon breaks in the month of June and continues upto the end of September. The average annual rainfall in the district is 1168 mm. The district receives major amount (86%) of precipitation during the monsoon period.

Geomorphology

The district can be broadly divided into two broad physiographic division viz. alluvial plain in the north and the hilly tract in the south. The regional slope from south to north is prominent. The west of the alluvial plain of the river Ganga is bordered by the Munger- Kharagpur hills. The hills 52 of the district are generally moderate in height, denuded and irregularly scattered.

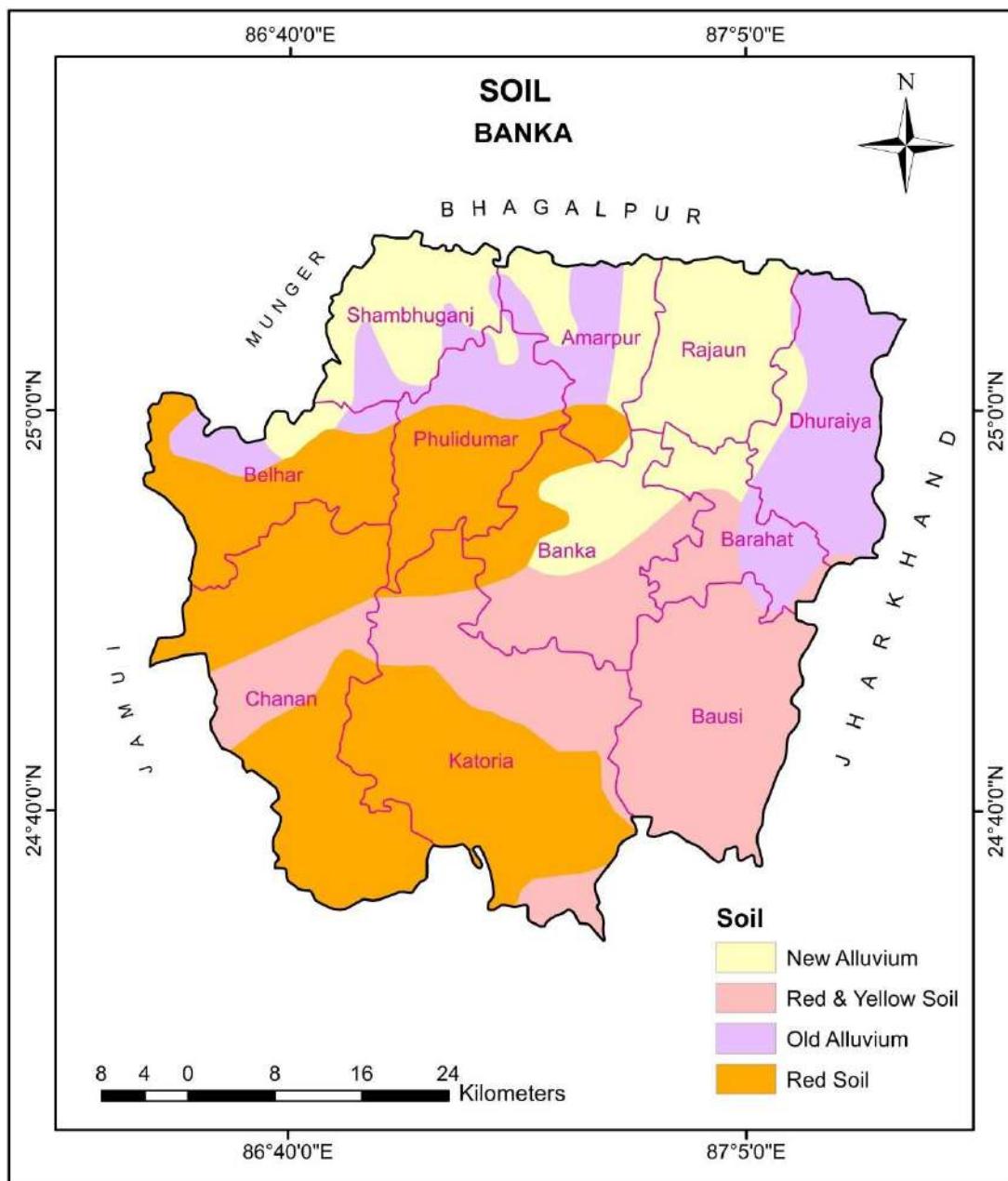
Geomorphologically the area is being divided into five distinct units. These units given below are in chronological order from youngest to oldest.

- 1) Diara Surface: It is the youngest morpho-unit of the area comprising of yellow-brown to brownish-grey compact clay. It is the recent flood plain of the major rivers passing through the district.
- 2) Belhar Surface: It is a flat alluvial low land usually free from regular annual flooding but is prone to water logging in the patches. The surface overlies the recent flood plain surface. The soil is buff to brown colour and rich in silt, sand or silty clay.
- 3) Sautadih Surface: The surface belongs to the older alluvial upland bordering the pediplains and the hilly area. The soil profile is well developed and characterised by deeply oxidised yellow to brownish red clay with ferruginous concretions.
- 4) Pediplain Surface: The surface borders the northern margin of the district. These rocky units are essentially produced by the erosional process. The surface has developed primarily on the granite gneisses and is characterized by lack of good soil profile and colluvial deposits of weathered material.
- 5) Hilly /Rocky upland: This includes the hilly area of the Chotanagpur plateau, consisting of granite gneiss, quartzites, phyllites and micaschist.



Soil

Banka district is characterized by a wide variety of soils, which can be broadly grouped into two categories, the alluvial soil and hilly soil. The alluvial soil derived partly from the older alluvium deposit and partly from the newer flood plain deposit is characterized by light grey to dark grey colour and fine texture. The hilly soil derived from the weathered product of rocks is coarse grained, ferruginous, low in nitrogen, medium to high potash and acidic in nature.



Irrigation

The various major surface water irrigation schemes present in the district are as follows:

1. Chandan Reservoir Irrigation Scheme
2. Kajia Danr Irrigation Scheme
3. Badua Reservoir Project-shambhuganj and Belhar blocks
4. Chandan, Bilasi Irrigation Scheme -Banka
5. Orhni Reservoir Irrigation Project – Banka, Pullidumer
6. Laxmipur Reservoir Irrigation Project-Bounsi Block

The Chandan reservoir is major irrigation project in the Banka district. Its command area falls in the Banka, Barahat, Rajaun and Dhuraiya block of Banka district. The gross command area is 1.40 m ha. and the surface water irrigation facility is available only to 0.64 m ha in kharif and 7690 ha during rabi (this is inclusive of water directed from small structures like ahar etc.

As per the available statistics of 1994-1995, area irrigated by different sources e.g canals,tubewells,dugwells,other sources etc. constitute 66% of the total cultivated area in the district.canal is the most important source of irrigation in the district. The area irrigated by ground water constitutes 9.44 %(private shallow tubewells 7.9%, other wells 1.5%) of the gross irrigated.

Demography

According to the Population Census in the year 2011, Banka District had population of 2,029,339 of which male and female were 1,064,307 and 965,032 respectively. The population of the Banka District constituted 1.95 percent of total population of Bihar. The average literacy rate of Banka District in 2011 was 60.12 percent compared to 42.73 percent of 2001. If things are looked out at gender wise, male and female literacy were 69.76 and 49.40 respectively. The total literates in Banka District were 1,002,069 of which male and female were 612,053 and 390,016 respectively. In 2001, Banka District had 547,326 in its district.

The main occupation of the people of Banka District is agriculture. Paddy is the most important food crop in the district while sugarcane is the most important non-food crop of the district. The farmers of Amarpur, Rajoun, Dhoraiya, circle grows sugarcane in abundance. Pisciculture also has grown as an important occupation of people of Banka District. As far as industrialisation of the district is concerned it can be said that the district Banka is totally backward in industrialization. One or two industries which are present in the district of Banka are stone crusher industry based at Bonsai and the Shivshankar Chemicals works at the Rajouncircle.

Banka District of Bihar though not much developed economically but the communication system of the district is developed to a large extent. It has several state highways and railways to a considerable extent. The various blocks of Banka district are connected by rail routes. And presently more land is being given by the District for further expansion of the rail network.

Rural/ Urban Household Ratio of Banka: Banka District has total household 381,601 from which 96% is in rural area and 4% is urban area.

Male/Female Literacy Ratio of Banka: Banka District has total 965,321 Literacy out of which 61% are male and 39% are female.

Sex Ratio – Banka District: The Sex Ratio of Banka district is 907. Thus for every 1000 men there were 907 females in Banka district. Also as per Census 2011, the child sex ratio was 943 which is greater than Average Sex Ratio 907 of Banka district.

Population Density – Banka district: The total area of Banka district is 3020 Km².

Thus the density of Banka district is 674 people per square kilometre. As per the initial provisional data of Census 2011. Around 30 sq. Km area is under urban region while 2,990 sq. Km is under rural region.

8. LAND UTILIZATION PATTERN IN THE DISTRICT

Forest

The district of Banka is situated in far south - east of the State Bihar. The eastern and southern border of the district coincides with district Godda of the state - Jharkhand. In west and north east it touches Jamui and Munger district respectively. The old district Bhagalpur is situated in the north side of Banka.

The geographical area of the district is 305621 hectare ie 3019.3465 Sq. km.

The district head quarter of Banka is situated in Banka town. The district has been established on 21st, February, 1991. Earlier it was a Sub-Division of the district Bhagalpur.

The district consists 11 blocks and two towns Banka and Amarpur.

Amarpur, Banka, Barahat, Belhar, Bounsi, Chandan, Dhoraiya, Fullidumar, Katoriya, Rajoun, Shambhuganj.

Flora and Fauna

The district has some forested area under Banka, Bounsi Katoriya forest ranges. The wood of Banka range lie on the Hill slopes, those in the other two ranges lie in undulating land. Among the prominent variety of trees in forested areas are the Sal which is usually found associated with Abuns, Asan, Kendu and Mahua. Tasar worms are reared on Asan trees. Some other trees are Bahera, Kadam, Amaltas. Among the specials of the Acacia are Babul, Sirish, and Sain Babul. Among the fruits trees those of Mango and Jack fruits are common. Plantains, Date plants, Plums, Jamun are some of the other important fruitstrees.

Monkeys are common in the district, particularly the Hanuman. So are Jackal, Dear, lion, Bear, Leopards, Elephants are sometimes met with. Among the latter are Barsingha and Sambhar. Wild geese, Duck, Leel, and Quail are some of the game birds inhabiting the district. Peacocks, Parrots, Hawks, and Doves are other birds found in Katoriya forest/ Chandan forest. Sparrows, Crows and Vultures are of course common.

Several kinds of fishes are found eg. Rohu, Katla, Boari, and Tengra. Bachwa, Jhinga and Pothi are other Varieties.

Table 5. District-wise Forest Cover Area in Bihar (Area in Km²)

2011 Assessment								
District	Geographical Area Km ²	Very Dense Forest	Moderate. Dense Forest	Open Forest	Total	Percent of GA	Change	Scrub
Araria	2,830	0	12	76	88	3.11	2	0
Aurangabad	3,305	0	54	97	151	4.57	0	13
Banka	3,022	0	111	110	221	7.31	0	12
Begusaral	1,918	0	20	23	43	2.24	0	0
Bhabhua	3,381	0	555	507	1,062	31.41	0	20
Bhagalpur	2,567	0	29	13	42	1.64	0	0
Bhojpur	2,390	0	16	3	19	0.79	0	0
Buxar	1,708	0	2	1	3	0.18	0	0
Darbhanga	2,279	0	41	144	185	8.12	0	0
Gaya	4,976	0	124	506	630	12.66	0	46
Gopalganj	2,033	0	2	2	4	0.20	0	0
Jamui	3,107	0	383	249	632	20.34	0	2
Jehanabad	1,569	0	2	1	3	0.19	0	5
Katihar	3,057	0	18	44	62	2.03	0	0
Khagaria	1,486	0	2	6	8	0.54	0	0
Kishanganj	1,884	0	26	49	75	3.98	0	0
Lakhisarai	1,356	0	180	14	194	14.31	0	2
Madhepura	1,788	0	6	20	26	1.45	0	0
Madhubani	3,501	0	18	118	136	3.88	0	0
Munger	1,347	0	251	14	265	19.67	0	7
Muzaffarpur	3,172	0	102	75	177	5.58	21	0
Nalanda	2,367	0	5	23	28	1.18	0	6
Nawada	2,494	0	187	323	510	20.45	0	10
Pashchimi Champaran	5,228	231	524	166	921	17.62	8	0

(Source: India state of forest report 2011-Bihar)

Agriculture:

Banka district is primarily an agricultural region where more than 80 percent population is rural. Agriculture forms the mainstay of the economy in the region. The proportion of agricultural land to the total land is very high except in Katoria and Chanan anchals where the land is hilly and have extensive forest zone. Rice, Wheat, maize, gram and Khesari are popularly grown here. River Chandan, Badua and Chir provide water for irrigation and other purposes. Barahat, Rajoun and Amarpur blocks are famous for cultivation of good quality of rice viz. Katarni, Malbhogh, Kesour and Sonam rice. More than 80 percent of the working force is engaged in agricultural sector.

Agriculture is predominant occupation in the region, but industrialisation and modernisation is the call of the day. Many agro and cottage industries have developed and are taking place. The whole area is on the path of transformation. Rurban centres are growing fast. Means of irrigation, pattern of agriculture, modes of transportation, and industrial development are developing at speedy rate. Due to fast development in every field of life, environment is also changing.

No.	Blocks	<i>Area under different Harvest</i>				
		Aghan/ <i>Kharif</i>	Bhadai	Rabi	Garma	Total
1	Banka	7652.6	589.33	2857.2	1819.46	12918.59
2	Ampur	7362.69	3650.8	8769.76	2347.66	22130.94
3	Barahat	2576.2	130.96	2690.19	805.06	6202.41
4	Baansi	6076.58	528.18	1753.2	409.36	8767.2
5	Rajoun	10818	211.48	6308.81	994.41	18332.71
6	Katoria	3787.88	1718.5	2843.13	1217.38	9566.91
7	chanan	8808.95	1157.7	729.95	1140.79	11837.42
8	Belhar	8298.14	--	3510.37	888.07	12696.58
9	Dhoraiya	14073	--	2219.12	1236.96	17529.03
10	Shambhuganj	7185.13	--	1646.26	642.22	9473.61
11	Phullidumar	15857.6	--	1653.96	396.89	17908.41
BANKA DISTRICT		92496.7	7987	34982	11898.3	147363

Source : Agricultural deptt., Banka District (2011 – 12).

Area under major field crops & horticulture

Major field crops cultivated	Area ('000 ha)
Paddy	99.42
Maize	12.59
Pigeonpea	5.13
Blackgram	1.86

Horticulture Crops -Fruits	Area ('000 ha)
Total	99.42

Horticulture Crops - Vegetables	Area ('000 ha)
Cauliflower	1103
Cabbage	990
Tomato	1334
Onion	725
Brinjal	448

Source : https://agricoop.nic.in/sites/default/files/BR11_Banka_28.12.203.pdf

Mining

Banka District does not have any major mineral sources like Iron, Aluminum, Coal, etc. but district has a rich source of minor mineral mainly river bed material, Stone mining and soil mining etc. This has increased the demand in construction industry and various facilities are developed. All developmental activities need different construction material of which sand is basic material used for development of roads, bridges, buildings etc. River bed sand quarries are the only source of supply of sand. The River sand quarries are located at approachable distance from where sand is transported with ease and at low costs.

Hydrogeology

The Banka district can be sub-divided broadly into two hydrogeological units:

- 1) **Alluvial Formation:** It occupies the northern part of the district. The Quaternary alluvial deposits consisting of sand, silt and clay forms a good repository of the ground water. The ground water occurs in the porous material under both unconfined and semi-confined to confined conditions depending on the disposition of aquifers.
- 2) **Fissured Formation:** The fissured formation constitutes the Chotanagpur Granite Gneissic Complex and meta-sedimentaries. Ground water occurs in these rocks under confined to semi-confined conditions. The secondary porosity e.g. fractures, joints and fault planes acts as aquifer and controls the storage and movement of groundwater.

Ground water in the alluvial tract of the district:

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The thickness of Quaternary Alluvial deposit generally ranges from 15m to 100m in the northern part

of the district. The maximum depth to bedrock is at Raipura which is 99m. The sandy layers in the alluvial terrain form the main repository of ground water in the northern part of the district. The thickness of alluvial deposit increases from south to north. Ground water usually occurs under both unconfined conditions in aquifer disposed at shallower depth and under semi-confined to confined condition at deeper depths. The thickness of granular zone ranges between 18-25 m at a depth ranging between 50 and 99 m below ground level. The yield ranges between $60\text{m}^3/\text{hr}$ to $124\text{ m}^3/\text{hr}$ for a drawdown of 21 m and 8.00 m respectively. The available data indicate that in Shambhuganj block there exist a number of granular zones in shallow and deeper levels. In this block there is a wide scope of ground water development through shallow tubewells upto 50m depth. The deep tube wells up to 100m depth may give a discharge of $75\text{-}100\text{ m}^3/\text{hr}$. The exploratory data indicate that there is a wide variation of the transmissivity value which varies from $63.7\text{m}^2/\text{day}$ at Khirri to $1265\text{ m}^2/\text{day}$ at Rudpai. The transmissivity is found to be increasing towards northwestern part of the district, where the thickness of the aquifer is also more. The storage co-efficient value as estimated has been 2.75×10^{-3} at Warshabad, which shows that aquifer are under semi-confined condition. Ground water in the hard rock formation As the southern part of the district is underlain by Precambrian formations, the movement, occurrence and distribution of the ground water is primarily controlled by nature and distribution of joints, fissures and other structural zones of weakness. At places the granites and meta-sediments are weathered and extensively jointed. Ground water occurs in this weathered formation in unconfined condition, whereas the deeper fracture within the hard rocks also form a very good repository of ground water.

Depth to Water Level

Depth to ground water level maps for pre-monsoon and postmonsoons 2011 have been prepared. A perusal of the depth to water level map of pre-monsoon period indicates that water level is shallowest (0-4m bgl) in the northwestern part of the district covering Shambhuganj, western parts of Amarpur and northern part of Belhar blocks, The depth to water level in the range of 4-5 m covers the rest of Amarpur block, southern part of the Belhar and Shambhuganj and northern part of Pullidumar blocks and the subsequent range of 5-7 m water level occupies the major part of the district covering Belhar, north Chandan, north Katoria almost entirely Banka, Rajaun ,Dhuraiya and northern part of Bausi blocks. The deepest water level range of 7-9m occupies the southern hard rock area of the district, covering rest of Chandan, Katoria and Bausi blocks. During the post-monsoon period the depth to ground water level in the north western and north eastern parts of the district rests in the range of 0-3m bgl, followed by 3-5m range of water level covering the central part of the district. The southern part of Chandan and western part of the Katoria blocks show the deepest water level of 5-7m.

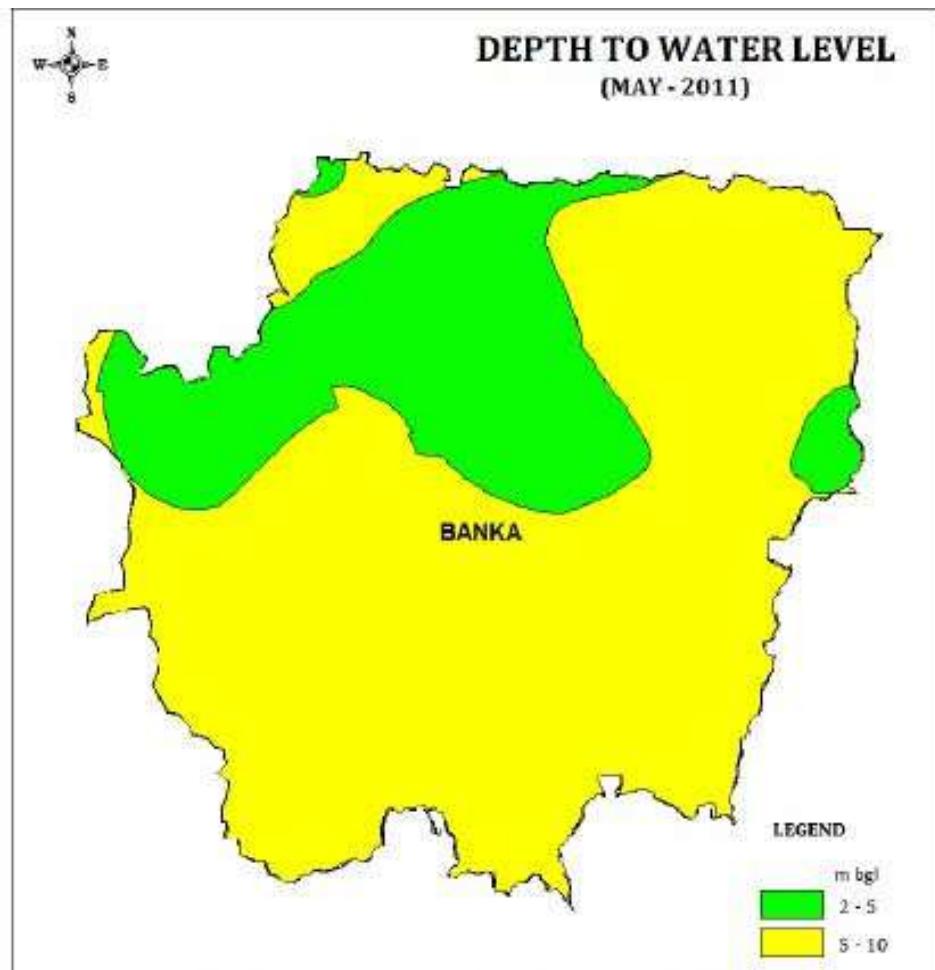


Fig. 3 Depth to water level map of pre-monsoon 2011.

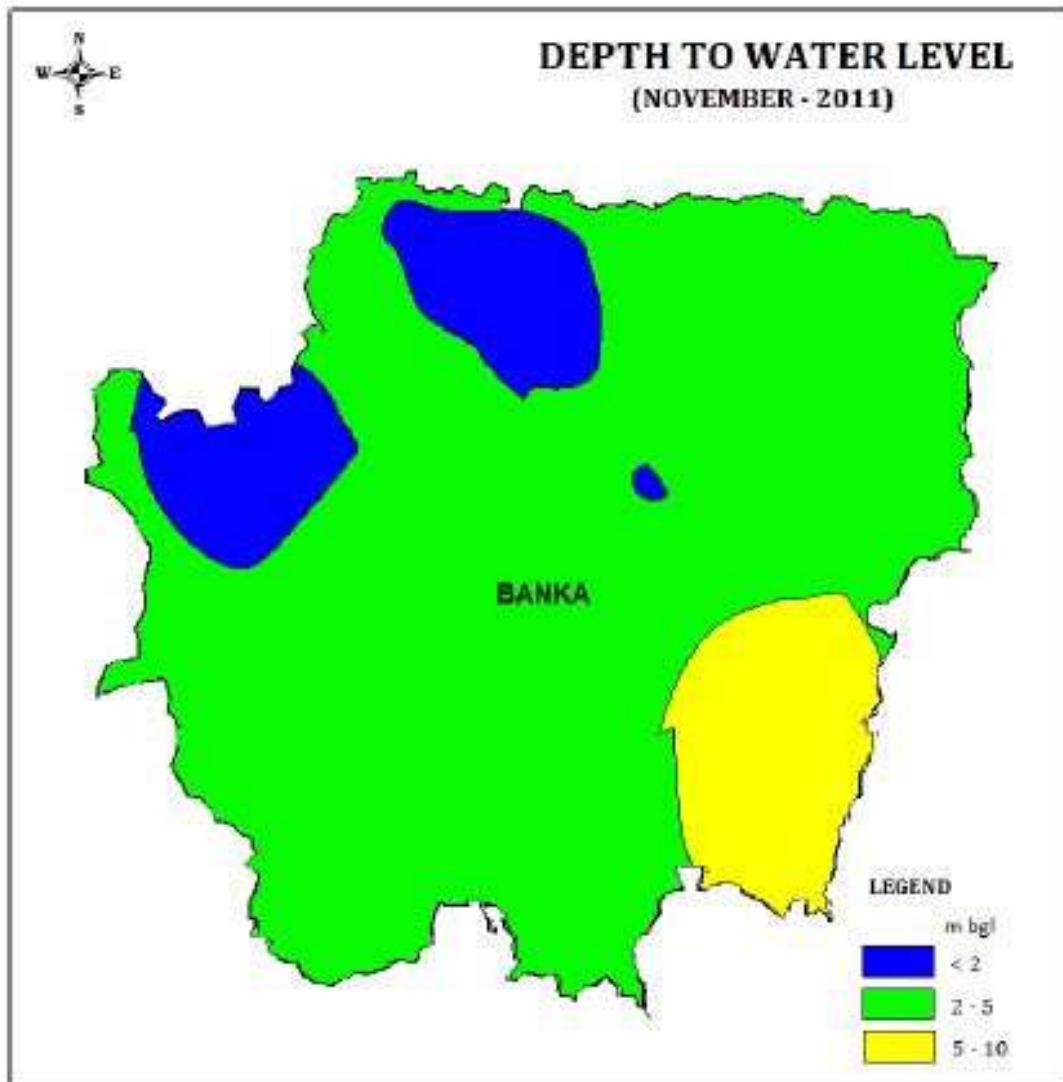


Fig. 4 Depth to water level map of post-monsoon 2011

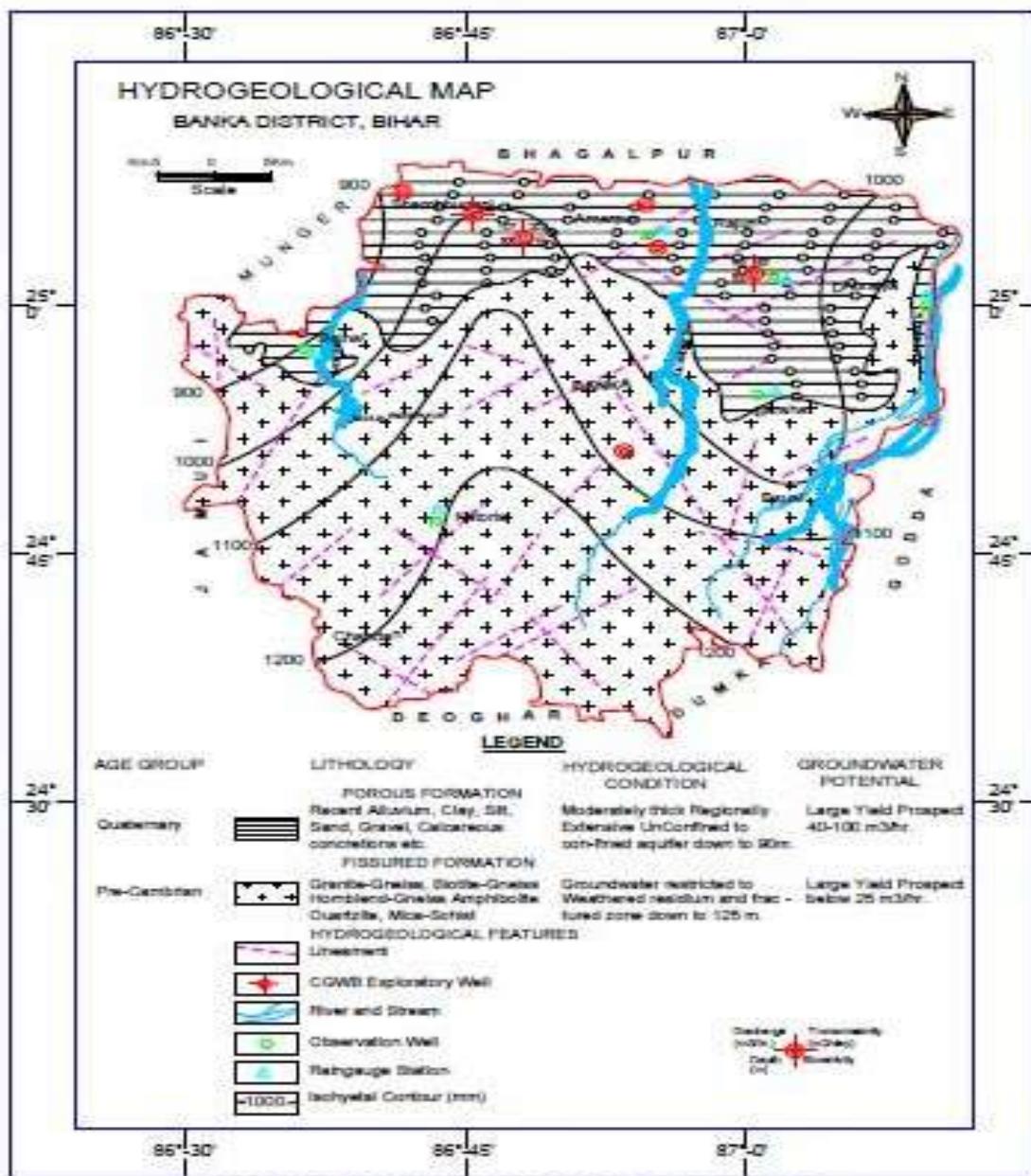
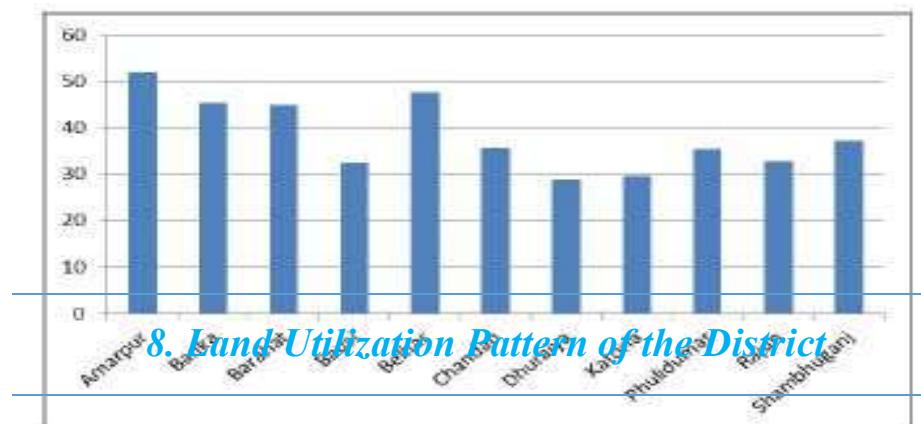
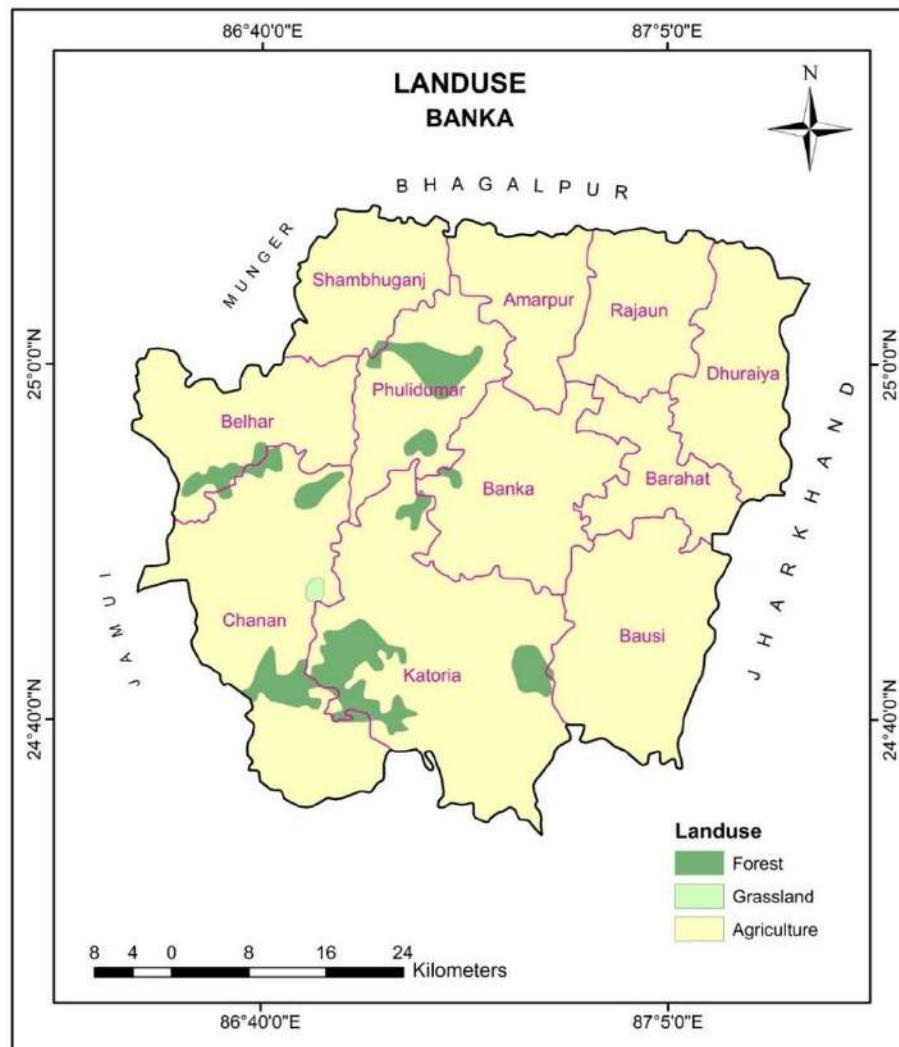


FIGURE 2. HYDROGEOLOGICAL MAP OF BANKA DISTRICT, BIHAR





Landuse	Area (in hectare)
Forest	46000
Barren and uncultivable land	43000
Land under non-agricultural uses	42000
Permanent pasture and grazing land	2000
Cultivable waste other than fallow	8000

Source: 1999, Directorate of Statistics and evaluation, Bihar, Patna

9. Physiography of the District

The Bihar state can be broadly subdivided into three major units i.e main physical subdivisions are the Northern Mountains, the Gangetic Plains and the Central Highlands.

Northern Mountains comprises the Himalayan ranges including their foot hills. The Gangetic Plains, situated between the Himalayas and the Deccan plateau, constitute the most fertile Plains of the sub-basin ideally suited for intensive cultivation. The Central highlands lying to the south of the Great plains consists of mountains, hills and plateaus intersected by valleys and river plains. They are largely covered by forests. Aravali uplands, Bundelkhand upland, Malwa plateau, Vindhyan ranges and Narmada valley lie in this region. Predominant soil types found in the sub-basin are sandy, loamy, clay and their combinations such as sandy loam, loam, silty clay loam and loamy sand soils.

The district can be broadly divided into two broad physiographic division viz. alluvial plain in the north and the hilly tract in the south. The regional slope from south to north is prominent. The west of the alluvial plain of the river Ganga is bordered by the Munger- Kharagpur hills. The hills of the district are generally moderate in height, denuded and irregularly scattered.

10. Rainfall: Month wise

The area receives rainfall by South-West monsoon. Rainy season sets in the middle of June and lasts till September. The District Rainfall in millimetres shown below are the arithmetic averages of Rainfall of stations under the district. The annual average rainfall is 1181.46 mm.

Table 6: - 5 Years Rainfall data of Banka district

Year		2016	2017	2018	2019	2020	5 Years Avg. (in mm)
S. No	Month	Avg. (in mm)					
1	January	18.3	0	0	0	6.2	4.9
2	February	0	0	0	43	56.8	19.96
3	March	0	7.8	2.7	0.6	55.9	13.4
4	April	0	24.7	8	12.3	36.2	16.24
5	May	66	80.2	52.9	101.5	93.2	78.76
6	June	267.2	89.7	165.2	56.7	241.8	164.12
7	July	281	398.5	406.2	272.8	278.1	327.32
8	August	190.8	235.2	309.7	117.5	164.2	203.48
9	September	377.3	238.8	71.5	376.3	295.5	271.88
10	October	77.3	130.5	30.5	118.9	40.7	79.58
11	November	0	0	0	0	0	0
12	December	0	0	6.6	2.5	0	1.82

Source:-India Meteorological Department, Ministry of Earth Sciences, Delhi
[https://hydro.imd.gov.in/hydrometweb/\(S\(up04vf55o2ci04rn1oeemwfl\)\)/DistrictRaifall.aspx](https://hydro.imd.gov.in/hydrometweb/(S(up04vf55o2ci04rn1oeemwfl))/DistrictRaifall.aspx)

11. GEOLOGY AND THE MINERAL WEALTH OF THE AREA

The area forms eastern part of the Chhotanagpur plateau. Which happens to be eastern coastal block of Indian peninsular shield. The area shows in general a mature peneplain topography with a few undulating mounds/ hills here and there. The general slope is from south to north.

The area can be classified into three distinct geomorphic surfaces viz-

- i) **Rocky upland surface**
- ii) **Pediplain surface and**
- iii) **Alluvial surface.**

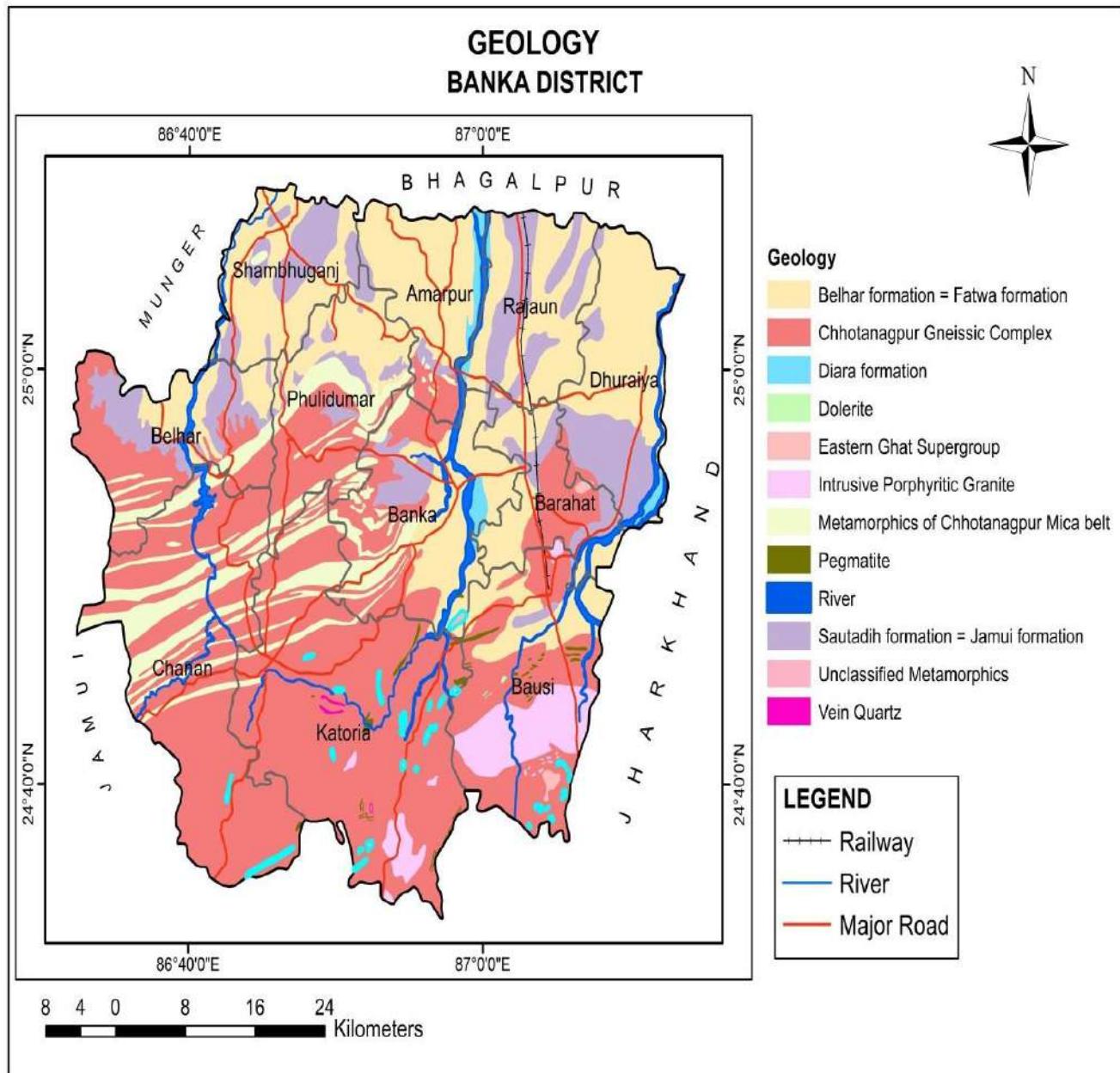
The rocky upland surface is represented by low flat topped mounds/hill ridges occupying a small portion of the area. It consists of resistant rock like quartzite and granite gneiss. The pediplain area occupies major area and is product of erosional process of pediplaination. Alluvial surface occupies linear track along the river, nadi and nala in the area.

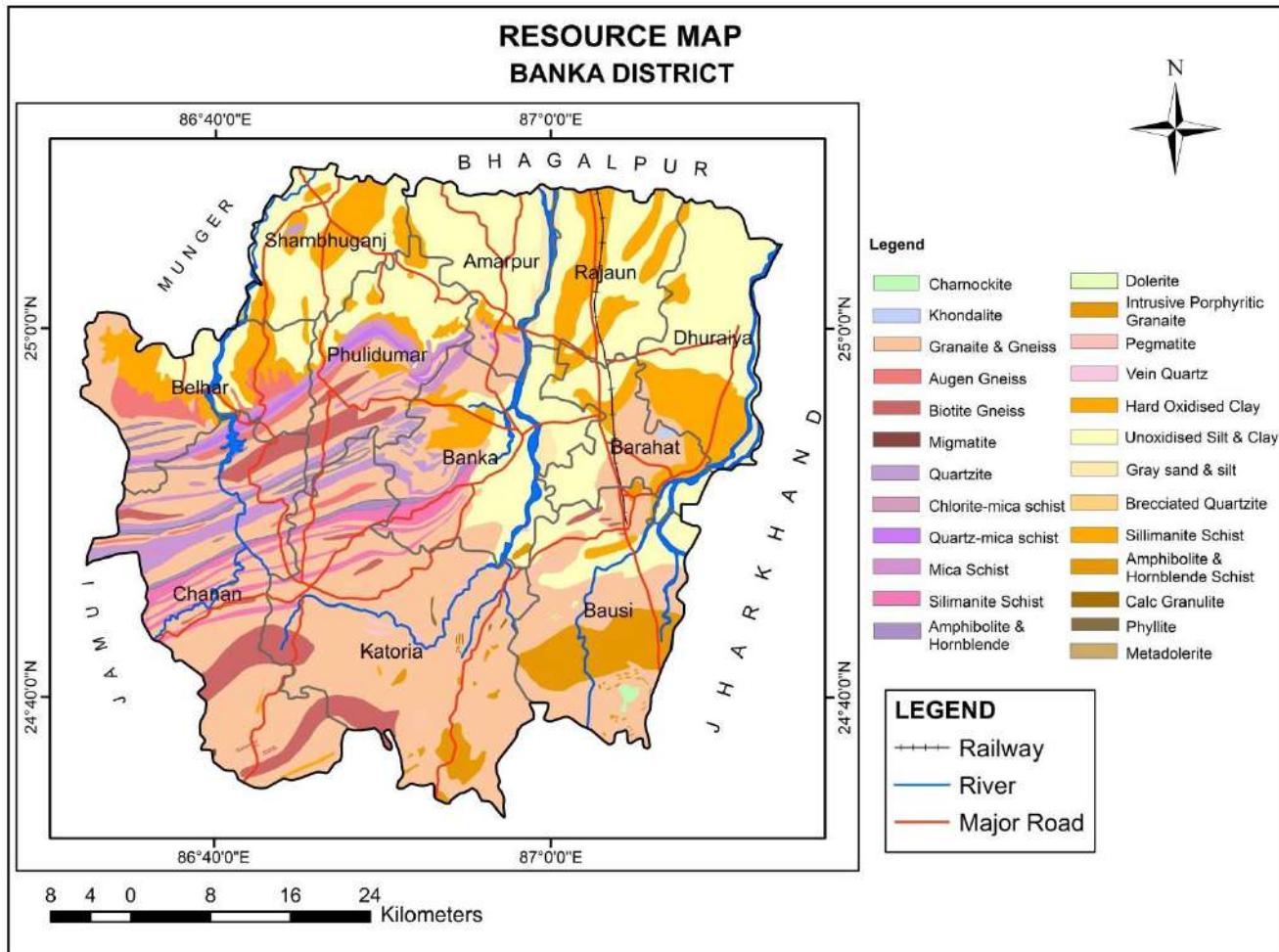
The drainage system of the area is mainly controlled by Chandan – Chatimi, Chhauri Nihan, Dharun, Jhilua and Dharbhasan rivers.

The area is occupied by the rocks of the Chhotanagpur granite gneiss consisting of meta-sedimentary group of rocks comprising palitic schist, quartzite, associated with granite gneiss and granitoids. Later igneous intrusions of acidic to basic composition invaded the Meta sediments and gneisses. Geological succession of the area may be described as follows:

- **Pegmatite and quartz veins**
- **Metabasics including Metadolerite**
- **Gneisses and associated Migmatite**
- **Feldspathic quartzite**

There are numerous base metal (Lead-Zinc) occurrences of varying sizes, reported from among them are Charkipahari-Tulsitan and Bindasa.





12. ADDITIONAL INFORMATION

12.1 Drainage system with description of main rivers

Table 7

Drainage system with description of main river			
Sl.no	Name of the River	Area drained(sq. km)	% Area Drained in the District
1	Chandan/Chanan	640	3.28
2	Badua	296	2.19

Source : https://insa.nic.in/writereaddata/UpLoadedFiles/PINSA/Vol49B_1983_6_Art06.pdf

12.2 Salient features of Important Rivers and Streams

Table 8

Salient Features of Important River and Streams				
Sr. no	Name of the River Stream	Total Length in the District (in km)	Place of Origin	Altitude at Origin
1	*Chandan	60	Northern part of Deoghar Hills	275
2	Chir	30	Hills of Dumka	165
3	Badua	50	Chakai	265
4	Odhni	30	Katoria	190
5	Kurar	24	Bhorabadar	163
6	Darbashan	19	Salaiya	217
7	Sukhaniya	18	Pareya	162

Source - * Report of the 2nd Bihar Irrigation Commission, 1994 (Volume-V)

12.3 Mineral Potential and Annual Deposition**Table 9**

Name of the River	Portion of the River Stream Recommended for Mineral Concession	Length of area recommended for mineral concession (in km)	Length of area recommended for mineral concession (in meter)	Average width of area recommended for mineral concession (in meters)	Depth in meter (as per statute)	Area recommended for mineral concession (in square meters)	Volume recommended for mineral concession (in cum)	Mineable Mineral Potential (in metric tonne) 60% of total mineral potential
Chandan	Only commercial viable zones are recommended for mineral concession to get economic feasibility	35.79	35790	316	3	11309640	33928920	36643233
Chir		14.74	14742	178	3	2624076	7872228	8502006
Badua		36.53	36530	157	3	5735210	17205630	18582080
Odhni		7.37	7368	104	3	766272	2298816	2482721
Kurar		4.50	4499	107	3	481393	1444179	1559713
Darbashan		10.40	10396	40	3	415840	1247520	1347322
Sukhaniya		9.52	9522	77	3	733194	2199582	2375549

Note:- Specific gravity of sand = 1.80 ton/m³(Source : - Report, Noida Testing Laboratories)

Annexure - II**Table 10. List of Potential Mining Leases (existing & proposed)**

River Details	Lease Details	Area (in Ha)	Distance (in KM) from PA/BR/WC	Distance from Forest Area (in KM)	Mining leases within 500 meters (if yes cluster area)	Total excavation in Tonnes /Annum considering digging depth max as 3 meters	Mineral to be mined (Sand/ Bajri/ RBM etc.)	Existing / Proposed
CHANAN	Banka Chanan 01	75.5			NA	3669300	Sand	Proposed
CHANAN	Banka Chanan 02	83			NA	403380	Sand	Proposed
CHANAN	Banka Chanan 03	82.2			NA	3994920	Sand	Proposed
CHANAN	Banka Chanan 04	40.7			NA	1978020	Sand	Proposed
CHANAN	Banka Chanan 05	89			NA	4325400	Sand	Proposed
CHANAN	Banka Chanan 06	91			NA	4422600	Sand	Proposed
CHANAN	Banka Chanan 07	95.10			NA	4621860	Sand	Proposed
CHANAN	Banka Chanan 08	92			NA	4471200	Sand	Proposed
CHANAN	Banka Chanan 09	95			NA	4617000	Sand	Proposed
CHANAN	Banka Chanan 10	97			NA	4714200	Sand	Proposed
BADUA	Badua - 01	282.1			NA	13710060	Sand	Proposed
BADUA	Badua - 02	176.86			NA	8595396	Sand	Proposed

DARBASHAN	Darbashan River (Block 1 to 5)	42.17			NA	2049462	Sand	Proposed
ODHNI	Odhni River (Block 1 to 4)	76.40			NA	3713040	Sand	Proposed
KURAR	Kurar River (Block 1 to 03)	41.36			NA	2010096	Sand	Proposed
CHIR	Chir River (Block 1 to 7)	257.40			NA	12509640	Sand	Proposed
SUKHANIA	Sukhania River Block 1 to 05	71.30			NA	3465180	Sand	Proposed

Annexure-III

Table 11 Cluster & Contiguous Cluster details

River Name	Cluster No.	Lease No	Location (Riverbed / Patta Land)	Village	Area (in Ha)	Total Excavation (Ton)	Total Mineral Excavation (Ton)
NA	NA	NA	NA	NA	NA	NA	NA

Contiguous Clusters:

River Name	Contiguous Cluster No.	Cluster No	Number of leases in the cluster	Location (Riverbed / Patta Land)	Distance between clusters	Village	Area of Cluster (Ha)	Total Mineral Excavation (Ton)
NA	NA	NA	NA	NA	NA	NA	NA	NA

Annexure-IV

Table 12 : Transportation Routes for individual leases and leases in Cluster

Lease No.	Transportation Route No.	Number of tipper s /day of lease	Number of tippers /day of all the lease on route	Length of Route in KM	Type of Road (Black Topped/unpaved)	Recommendation for road (Black Topped/unpaved)	The road will be Constructed by Govt/ Lease Owner	Route Map & Location
Banka Chanan 01	SH 25	296	2628	3.75	Black Topped	Unpaved	Lease Owner	Location with GPS coordinate is mentioned in potential sand ghat list And route map is attached in the annexure
Banka Chanan 02	SH 25	307	2628	1.0	Black Topped	Unpaved	Lease Owner	
Banka Chanan 03	SH 25	304	2628	2.50	Black Topped	Unpaved	Lease Owner	
Banka Chanan 04	NH 333A	150	2767	1.25	Black Topped	Unpaved	Lease Owner	
Banka Chanan 05	SH 19	329	3640	12.0	Black Topped	Unpaved	Lease Owner	
Banka Chanan 06	NH 333A	337	2767	6.0	Black Topped	Unpaved	Lease Owner	
Banka Chanan 07	SH 19	352	3640	7.0	Black Topped	Unpaved	Lease Owner	
Banka Chanan 08	SH 25	340	2628	5.0	Black Topped	Unpaved	Lease Owner	
Banka Chanan 09	SH 25	351	2628	6	Black Topped	Unpaved	Lease Owner	
Banka Chanan 10	SH 22	359	2898	2.0	Black Topped	Unpaved	Lease Owner	
Badua - 01	SH 22	2539	2898	2.50	Black Topped	Unpaved	Lease Owner	
Badua - 02	NH 333A	1592	2767	1.50	Black Topped	Unpaved	Lease Owner	
Darbasan River (Block 1 to 5)	SH 25	380	2628	1.0	Black Topped	Unpaved	Lease Owner	

Odhni River (Block 1 to 4)	NH 333A	688	2767	1.0	Black Topped	Unpaved	Lease Owner	
Kurar River (Block 1 to 03)	SH 25	373	2628	6.0	Black Topped	Unpaved	Lease Owner	
Chir River (Block 1 to 7)	SH 19	2317	3640	1.0	Black Topped	Unpaved	Lease Owner	
Sukhania River Block 1 to 05	SH 19	642	3640	1.0	Black Topped	Unpaved	Lease Owner	

Cluster No	Transportation Route No	Number of tipper s/day of cluster	Number of tippers /day of all the clusters on route	Length of Route in KM	Type of Road (Black Topped/ unpaved)	Recommendation for road(Black Topped/ unpaved)	The road will be Constructed by Govt/Lease Owner	Route Map & Location
NA	NA	NA	NA	NA	NA	NA	NA	NA

Annexure-V

Table 13: Final List of Potential Mining Leases (existing & proposed)

River Details	Lease Details	Area (in Ha)	Distance (in KM) from PA/BR/WC	Distance from Forest Area (in KM)	Mining leases within 500 meters (if yes cluster area)	Total excavation in (MT/Yr) (Mine depth max as 3 m)	Mineral to be mined (Sand/Bajri/RBM etc.)	Existing /Proposed
NA	NA	NA	NA	NA	NA	NA	NA	NA

Annexure-VI**Table 14 Final List of Cluster & Contiguous Cluster****Clusters :-**

River Name	Cluster No.	Lease No	Location (Riverbed / Patta Land)	Village	Area (in Ha)	Total Excavation (Ton)	Total Mineral Excavation (Ton)
NA	NA	NA	NA	NA	NA	NA	NA

River Name	Contiguous Cluster No	Cluster No	Number of leases in the cluster	Location (Riverbed /Patta Land)	Distance between clusters	Village	Area of Cluster (in Ha)	Total Mineral Excavation (Ton)
NA	NA	NA	NA	NA	NA	NA	NA	NA

Annexure-VII**Table 15 Final Transportation Routes for individual leases and leases in Cluster**

Lease No.	Transportation Route No.	Number of tipper s/day of lease	Number of tippers /day of all the lease on route	Length of Route in KM	Type of Road (Black Topped/ unpaved)	Recommend ation for road (Black Topped/ unpaved)	The road will be Construc ted by Govt/ Lease Owner	Route Map & Locati on
Banka Chanan 01	SH 25	296	2628	3.75	Black Topped	Unpaved	Lease Owner	Location with GPS coordinate is mentioned in potential sand ghat list And route map is attached in the annexure
Banka Chanan 02	SH 25	307	2628	1.0	Black Topped	Unpaved	Lease Owner	
Banka Chanan 03	SH 25	304	2628	2.50	Black Topped	Unpaved	Lease Owner	
Banka Chanan 04	NH 333A	150	2767	1.25	Black Topped	Unpaved	Lease Owner	
Banka Chanan 05	SH 19	329	3640	12.0	Black Topped	Unpaved	Lease Owner	
Banka Chanan 06	NH 333A	337	2767	6.0	Black Topped	Unpaved	Lease Owner	
Banka Chanan 07	SH 19	352	3640	7.0	Black Topped	Unpaved	Lease Owner	
Banka Chanan 08	SH 25	340	2628	5.0	Black Topped	Unpaved	Lease Owner	
Banka	SH 25	351	2628	6	Black	Unpaved	Lease	

DSR BANKA

Chanan 09					Topped		Owner	
Banka Chanan 10	SH 22	359	2898	2.0	Black Topped	Unpaved	Lease Owner	
Badua - 01	SH 22	2539	2898	2.50	Black Topped	Unpaved	Lease Owner	
Badua - 02	NH 333A	1592	2767	1.50	Black Topped	Unpaved	Lease Owner	
Darbaskan River (Block 1 to 5)	SH 25	380	2628	1.0	Black Topped	Unpaved	Lease Owner	
Odhni River (Block 1 to 4)	NH 333A	688	2767	1.0	Black Topped	Unpaved	Lease Owner	
Kurar River (Block 1 to 03)	SH 25	373	2628	6.0	Black Topped	Unpaved	Lease Owner	
Chir River (Block 1 to 7)	SH 19	2317	3640	1.0	Black Topped	Unpaved	Lease Owner	
Sukhania River Block 1 to 05	SH 19	642	3640	1.0	Black Topped	Unpaved	Lease Owner	

Cluster No	Transpor tatio n Route No	Number of tipper s /day of cluster	Number of tipper s /day of all the clusters on route	Length of Route in KM	Type of Road (Black Topped/ unpaved)	Recomm endation for road (Bla ck Topped/ unpaved)	The road will be Construc ted by Govt/Le ase Owner	Route Map & Locati on
NA	NA	NA	NA	NA	NA	NA	NA	NA

13. METHODOLOGY ADOPTED FOR CALCULATION OF MINERAL POTENTIAL :

The mineral potential is calculated based on field investigation and geology of the catchment area of the river or streams. As per the site conditions and location, depth of minable mineral is defined. The area for removal of the mineral in river or stream can be decided depending on geo-morphology and other factors, it can be 50% to 60% of the area of a particular river or stream.

The specific gravity of sand is 1.8 ton/m³. The quantum of deposition varies from stream to stream depending upon factors like catchment lithology, discharge, river profile and geomorphology of the river course. There are certain geomorphological features developed in the river beds such as channel bar, point bar etc. where annual deposition is about three meters.

14. DISASTER RISK MANAGEMENT

The Basis :

The fundamentals of existence lie in the struggle one has fought, the instruments one has used and the lessons one has learnt to survive. In this respect, Bihar's struggle for existence is far more grim than most of the states. It has undergone mitosis for as many as four times and has suffered through disasters of the worst kind many a time.

The Vision :

Right from the days following the battle of Buxar in 1764 after which Bihar was passed on to East India Company as a part of the Bengal Presidency, to 1912 when Bihar and Orissa were separated as one State, to 1936 when both Bihar and Orissa were made independent States, to 1956 when some key areas of Bihar was included in West Bengal, to 2000 when Bihar was divided to form the state of Jharkhand, the State has went on losing its natural resource base and got pushed to confine within an area prone to all sort of hazard: earthquake, flood, cyclonic storm/Gale /Hail Storm, drought, fire, extreme cold and heat waves etc.

For such a state of hazards which Bihar is, the VISION of Disaster Management is :

"To attain a position where people are ready to help themselves, local bodies to extend mutual help, the administration to organize public help and the government to facilitate the helping of helpers."

The Objectives:

In order to achieve the Mission, the objectives of the plan have been set as :

- i. Treating community as the primary stakeholder and first respondent in the Disaster Management Plan, focusing on disaster risk reduction, prevention, mitigation and preparednessmeasures.
- ii. Emphasizing preparedness at the community level and readiness at the local bodies level.
- iii. Facilitating therole play by the administration and government departments and otherstakeholdersthroughinstitutionalmechanism.
- iv. Creation of specialized institutions to makedisaster management aninclusive exerciseandtowedittodevelopmentinitiatives.
- v. To create a dependable early warning system towarn the people and activate otherstakeholders.
- vi. Ensuring quick response and providing relief with care and attention tothose belonging

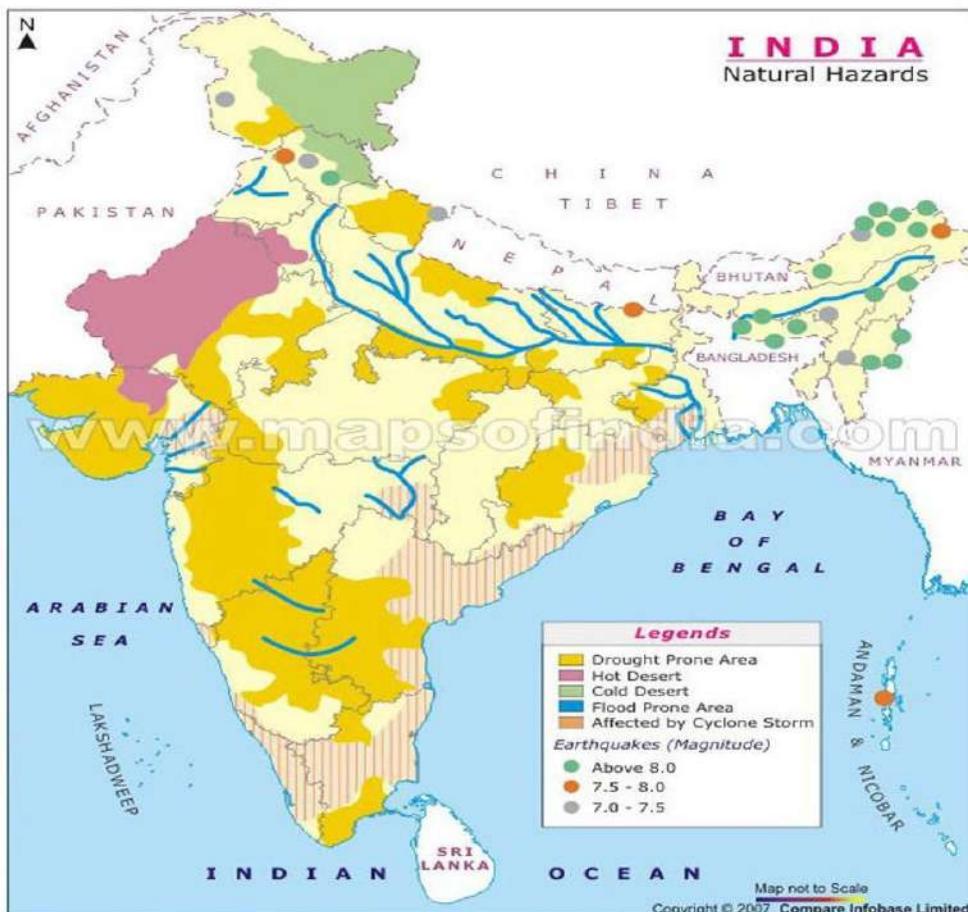
- to them marginalized section.
- vii. To undertake rehabilitation with "Build Back Better" motif.

The Approach :

The process adopted for the formulation of the Plan has been

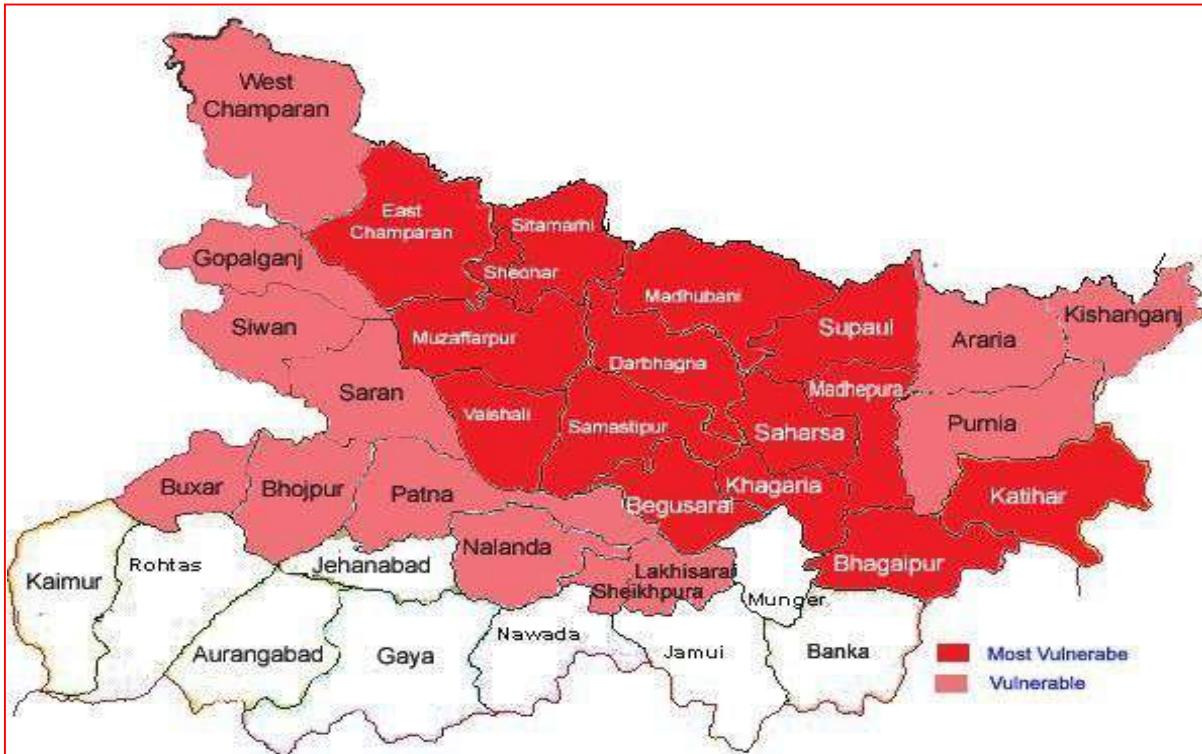
- i. **Holistic:** Covering all the hazards the state is vulnerable to.
- ii. **Integrative:** Covering prevention, mitigation, preparedness & response measures.
- iii. **Participative:** Including the affected people, the Panchayati Raj Institutions, the district administration, the government departments & expert institutions.
- iv. **Associative:** Creating space for the support and help from the corporate bodies, civil societies, NGOs, CBOs and other sand solicit their participation in disaster management.

Mitigation of air pollution through particulate matters transported by the wind as a result of excavations, stockpiles, waste dumps, haul roads, mobile sources (cars, trucks, heavy equipment) etc. Also, control over noise pollution and vibration caused by several equipments used in several phases of mining include loading and unloading of minerals to dumpers, chutes, power generation, and the sources.



EQ Zone V- 10.9%	Wind Velocity m/s 55 & 50 - 5%	Flood Prone Area in % - 7.9%
IV- 17.3%	47- 40.2%	
III- 30.4%	44&39- 48%	
II- 41.4%	33- 6.7%	

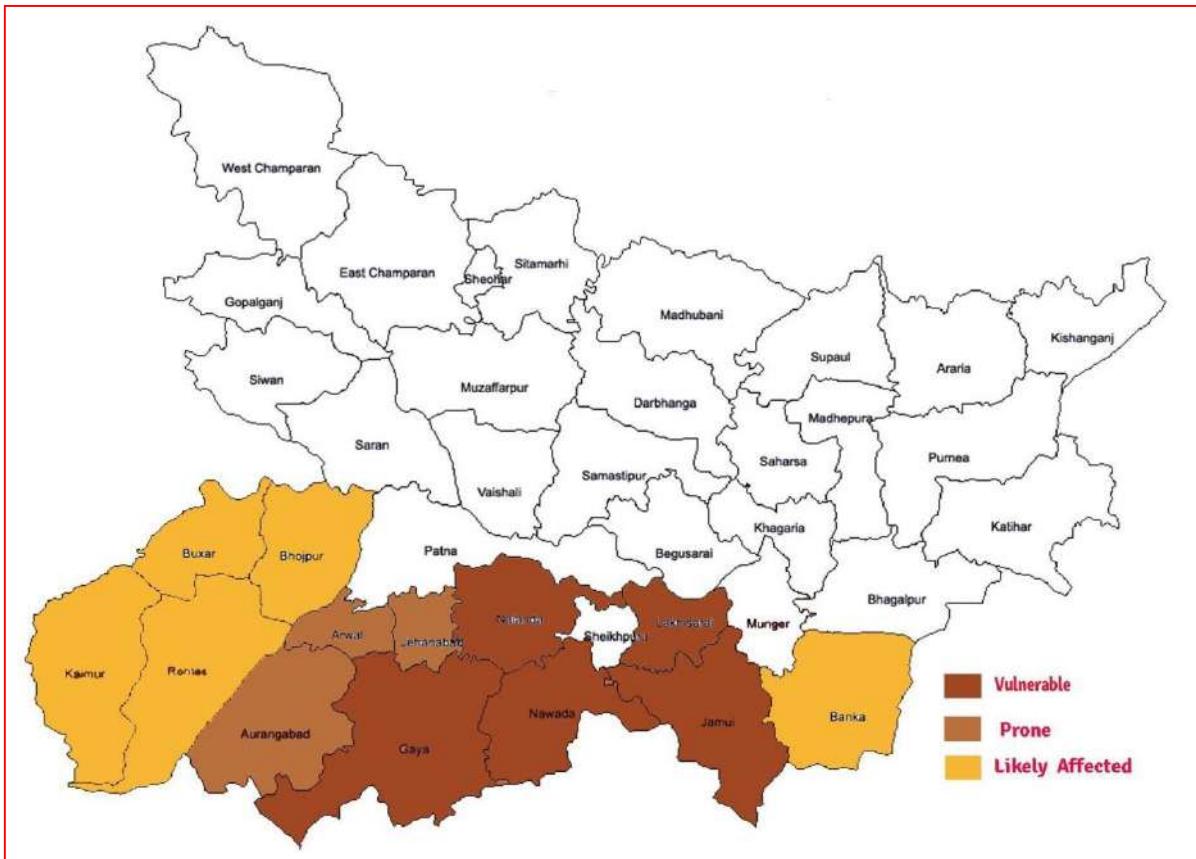
FLOOD PRONE AREA IN BIHAR:



Source: Developed on Inputs from DMD, GoB

2. Flood— Most Vulnerable : East Champaran, Sheohar, Sitamarhi, Katihar, Madhubani, Vaishali, Muzaffarpur, Darbhanga, Samastipur, Madhepura, Supaul, Saharsa, Khagaria, Begusarai, Bhagalpur.

Vulnerable : West Champaran, Gopalganj, Siwan, Saran, Buxar, Bhojpur, Patna, Nalanda, Lakhisarai, Sheikhpura, Purnia, Araria, Kishanganj.

DROUGHT PRONE AREAS

Source: Developed on Inputs from DMD, GoB

3. Drought — Vulnerable District : Gaya,Nawada,Jamui,Nalanda,Lakhisarai

Prone District : Jehanabad,Arwal,Aurangabad

Likely District : Kaimur,Bhojpur,Buxar,Rohtas,Banka

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PHOTOGRAPHS OF SITE VISIT AND PHYSICAL SURVEY OF OF POTENTIAL SAND GHAT BY UAV/DRONE TECHNOLOGY





