

BEFORE THE HONORABLE NATIONAL GREEN TRIBUNAL  
EASTERN ZONE

KOLKATA BENCH

ORIGINAL APPLICATION NO. 76 OF 2025/EZ

Under Sections 14, 15, 18 & 20 of the National Green Tribunal Act, 2010

In the matter of:  
Rahul kumar

...Applicant

-Versus-

The District Magistrate, Banka & Ors.  
...Respondents

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Date: 15.04.2025

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#### SYNOPSIS

The present application challenges the inaction of the authorities in floating a tender for de-siltation/dredging for Chandan Reservoir near Laxmipur Village, Banka District by the Respondent No. 2 permitting commercial exploitation of dredged sand without complying with mandatory environmental safeguards. The Tender violates the Sustainable Sand Mining Management Guidelines, EIA Notification 2006 and this Tribunal's judgment in OA No. 99/2022/EZ, which specifically held that commercial dredging requires Environmental Clearance, Replenishment Study and proper DSR. Despite the commercial nature evident from revenue-sharing clauses, no statutory clearances have been obtained. The existing DSR (23.05.2022) doesn't cover Chandan Reservoir. Immediate intervention is sought to stay the tender and prevent irreversible environmental damage from unlawful mining activities.



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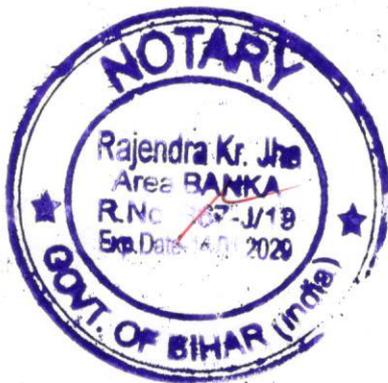
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...Respondents

List of Dates:

Sr. No.	Date	Event Description
1	23.05.2022	District Survey Report (DSR) for Banka District prepared-
2	27.02.2025	Impugned E- tender issued for de-siltation/dredging of Chandan Reservoir
3	08.04.2025	Corrigendum to E-Tender issued
4	April, 2025	Filing date of present Original Application



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Under Sections 14, 15, 18 & 20 of the National Green Tribunal Act, 2010



In the matter of:  
Rahul Kumar

...Applicant

-Versus-

The District Magistrate, Banka & Ors.  
...Respondents

MEMO OF PARTIES

Rahul Kumar, son of Vishwanath Das, having its address at Village - Manjira, PO - Manjira Thana, Banka, Bihar - 813 102;

..Applicant

1. The District Magistrate, Banka having its address at Banka Road, District-Banka, Bihar-813102 Email id: dm-banka.bih@nic.in

2. The Water Resource Department, Government of Bihar, served through its principal secretary having address at Sinchai Bhawan, Patna, Bihar – 800015, Email id: wrd-bih@nic.in

3. State Level Environmental Impact Assessment Authority (SEIAA), Bihar through, its member secretary having its address at 2nd Floor, Beltron Bhawan, Shastri Nagar, Patna-800023, Bihar seiaabihar@nic.in;seiaa.ms.br@gmail.com;

4 The Mines and Geology Department, Government of Bihar, served through its principal Secretary, having its address at Vikas Bhawan, Bailey Road, Patna – 800015, State of Bihar. Email: secymine-bih@nic.in

5. Ministry of Environment, Forest and Climate Change (MOEF&CC) served through its Secretary, having its address at Indira Paryavaran Bhavan, Jorbagh Road, New Delhi – 110003. Email id: secy-moef@nic.in

...Respondents

BEFORE THE HONORABLE NATIONAL GREEN TRIBUNAL,  
EASTERN ZONE,  
KOLKATA BENCH

ORIGINAL APPLICATION NO. \_\_\_\_\_ OF 2025/EZ

Under Sections 14, 15, 18 & 20 of the National Green Tribunal Act, 2010



Rahul Kumar, son of Vishwanath Das,  
having its address at Village - Manjira,  
PO - Manjira Thana, Banka, Bihar - 813  
102

...Applicant

VERSUS

1. The District Magistrate, Banka having its address at Banka Road, District-Banka, Bihar-813102 Email id: dm-banka.bih@nic.in
2. The Water Resource Department, Government of Bihar, served through its principal secretary having address at Sinchai Bhawan, Patna, Bihar – 800015, Email id: wrd-bih@nic.in
3. State Level Environmental Impact Assessment Authority (SEIAA), Bihar through, Its member secretary having its address at 2nd Floor, Beltron Bhawan, Shastri Nagar, Patna-800023,

Bihar

seiaabihar@nic.in;seiaa.ms.br@gmail.

com;

4. The Mines and Geology Department, Government of Bihar, served through its principal secretary, having its address at Vikas Bhawan, Bailey Road, Patna – 800015, State of Bihar, Email: secymine-bih@nic.in

5. Ministry of Environment, Forest and Climate Change (MOEF&CC) served through its Secretary, having its address at Indira Paryavaran Bhavan, Jorbagh Road, New Delhi – 110003. Email id: secy-moef@nic.in



...Respondents

The humble petition is on behalf of the

Applicant above named most respectfully

SHEWETH:

1. The addresses of the Applicantis stated herein above for serving notice of this Original Application.
2. The applicant most respectfully submits this application under Sections 14, 15, 18 & 20 of the National Green Tribunal Act, 2010 intervention against the illegal sand mining to be carried out under the guise of de-siltation/dredging operations in Chandan Reservoir near Laxmipur Village, Banka District.
3. The applicant, being a resident of Bihar and the affected area is directly impacted by the environmental degradation caused by such unlawful

activities, has the necessary locus standi to maintain the present proceedings.

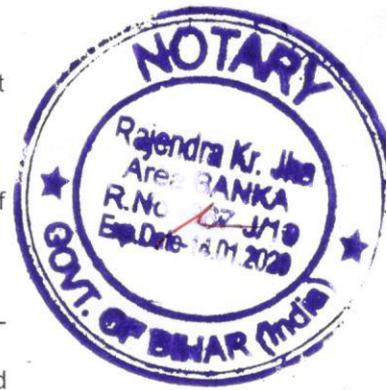
4. The addresses of the Respondents are given herein above for service of notices of this Original Application.

5. The respondent authorities being respondent no. 2 has issued an e-tender dated 27.02.2025, subsequently amended by corrigendum dated 08.04.2025, permitting large-scale commercial exploitation of dredged sand without complying with mandatory environmental safeguards under the Environment (Protection) Act, 1986 and the EIA Notification, 2006. A bare perusal of the tender document reveals its inherently commercial nature through explicit clauses allowing private contractors to sell the dredged material after paying royalty, with revenue-sharing arrangements benefiting the state exchequer. Copy of the E-Tender dated 27.02.2025 and corrigendum dated 8.4.2025 is annexed hereto and marked with Annexure A and B respectively.

6. The impugned action constitutes a blatant violation of the Sustainable Sand Mining Management Guidelines, 2016 which mandate prior Environmental Clearance, replenishment studies and proper District Survey Reports for any commercial dredging operations.

7. This Hon'ble Tribunal in OA No. 99/2022/EZ (Dipak Mahapatra vs. WBMDTCL) has already settled the legal position that sand mining cannot be permitted under the garb of de-siltation without complying with these statutory requirements. The judgment categorically held that such operations require proper scientific studies and clearances, none of which have been obtained in the present case.

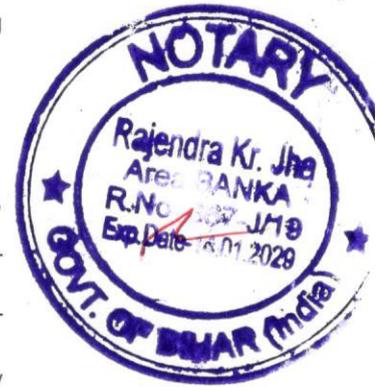
8. The existing District Survey Report dated 23.05.2022 prepared by the respondent authorities themselves makes no mention whatsoever of any sand deposits or silt accumulation in Chandan Reservoir. This glaring omission completely belies the respondents' subsequent claim in the impugned tender about "sediment accumulated since 1964" requiring



removal. Such material contradictions between official documents demonstrate a colourable exercise of power aimed at circumventing environmental regulations.

9. The tender suffers from multiple illegalities including the complete absence of a mandatory replenishment study to assess ecological impact, failure to demarcate mining zones through GIS mapping as required under the provisions of the 2020 Guidelines, and unauthorized permission for excavation up to 4 meters depth in violation of the prescribed 3-meter safety limit under the guidelines. These deficiencies render the entire tender process void ab initio for non-compliance with statutory safeguards.

10. The respondents' actions are further vitiated by their failure to have any Detailed Project Report (DPR) which is prepared for assessing the technical feasibility, environmental impact and financial viability of the proposed dredging operations. The complete lack of scientific basis for the project exposes it as a mere pretext for illegal sand mining.



#### I. FACTS :

1. The Respondent no. 2 herein has issued an e-tender on 27.2.2025 for de-siltation through dredging in Chandan Reservoir, District: Banka. The tender is for de-siltation/dredging of Chandan Reservoir to be awarded to private entities, permitting them to commercially exploit dredged sand without following the due process of law.
2. That pursuant to the Order dated 10<sup>th</sup> November, 2021 passed by the Hon'ble Supreme Court in CIVIL APPEAL NOS. 36613662 OF 2020 The State of Bihar & Ors. Vs Pawan Kumar & Ors., the state government of Bihar had made a District Survey Report (DSR) for the different districts of the State of Bihar. The order dated 10<sup>th</sup> November, 2021 extract is given herein below:

"We therefore find it appropriate to substitute the directions issued by the Tribunal vide judgment and order dated 14th October 2020, with the following directions:

(i) *The exercise of preparation of DSR for the purpose of mining in the State of Bihar in all the districts shall be undertaken afresh. The draft DSRs shall be prepared by the subdivisional committees consisting of the Sub-Divisional Magistrate, Officers from Irrigation Department, State Pollution Control Board or Committee, Forest Department, Geological or mining officer. The same shall be prepared by undertaking site visits and also by using modern technology. The said draft DSRs shall be prepared within a period of 6 weeks from the date of this order. After the draft DSRs are prepared, the District Magistrate of the concerned District shall forward the same for examination and evaluation by the SEAC. The same shall be examined by the SEAC within a period of 6 weeks and its report shall be forwarded to the SEIAA within the aforesaid period of 6 weeks from the receipt of it. The SEIAA will thereafter consider the grant of approval to such DSRs within a period of 6 weeks from the receipt thereon; .....*"



Copy of the DSR is annexed hereto and marked with Annexure C.

3. The Respondent No. 2 has issued an e-tender dated 27.02.2025 for desiltation through dredging in Chandan Reservoir, District Banka, which permits private entities to commercially exploit dredged sand without following due process of law. This tender is in blatant violation of the Hon'ble Supreme Court's order dated 10.11.2021, which mandated fresh preparation of District Survey Reports (DSR) for mining activities in Bihar through a rigorous process involving site visits and modern technology. The DSR 2022 for Banka District, prepared pursuant to this order, stated all details of all sands/silt and other source of minerals. However, there is no mention of any sediment accumulation in Chandan Reservoir in the DSR of 2022, directly contradicting the tender's claim of "60-year sand deposition" and exposing it as a post-facto fabrication to legitimize illegal mining.
4. **The tender suffers from legal infirmities as it lacks a Detailed Project Report (DPR) and fails to identify specific areas requiring desiltation or provide geo-coordinates for the proposed dredging work. Shockingly,**

Clause 2.30 of the tender leaves the demarcation of dredging areas to the contractor's discretion, in complete derogation of established environmental norms. Furthermore, Clause 2.45 illegally permits dredging during monsoon season, contrary to the blanket prohibition on mining activities during this period under existing regulations. These deficiencies demonstrate a reckless disregard for environmental due diligence and statutory compliance.

5. The impugned tender constitutes commercial mining disguised as maintenance dredging, violating the Sustainable Sand Mining Management **Guidelines (2016) and Enforcement & Monitoring Guidelines for Sand Mining (2020)**. It permits 4-meter-deep excavation despite the 3-meter safety limit prescribed in the provisions of the 2020 Guidelines, posing severe risks of riverbank collapse. The complete absence of a replenishment study and quantified sediment assessment renders the project arbitrary and illegal, as held by this Tribunal in OA No. 99/2022/EZ. The tender's revenue-sharing model, where the contractor can sell dredged material after paying royalties, confirms its commercial nature, bringing it squarely within the ambit of the EIA Notification, 2006 requiring prior Environmental Clearance.
6. The Respondent's actions amount to a colourable exercise of power. **While the District Survey Reports (DSR) 2022 meticulously catalogue all sand sources in Banka District, it contains no reference to Chandan Reservoir as a sand-bearing zone, completely undermining the Respondents' belated claim of 60-year sediment accumulation.**
7. Further, the law mandates that a Replenishment Study has to be done to assess environmental impact and as per the memorandum dated 12<sup>th</sup> July, 2023 issued by MOEF&CC, Environmental Clearance (EC) under the EIA Notification is mandated, if dredging is to be done for commercial purpose and from the scope of work as stated in the e-tender, its shall be evident that the dredging is being done for commercial purpose as the terms state therein that the "Chandan reservoir dredging project is structured on a

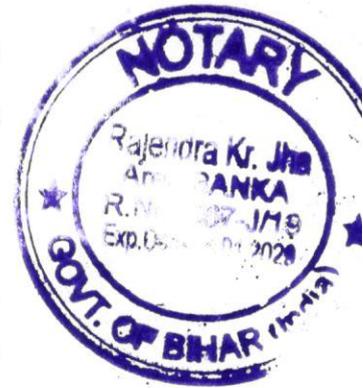


revenue-based model.." "...The Contractor shall have right to sell the dredged material after paying the requisite royalty charges to the Mining Department..." "...Additionally the Water Resource Department will receive a pre-determined share from the sale of processed dredged material..."

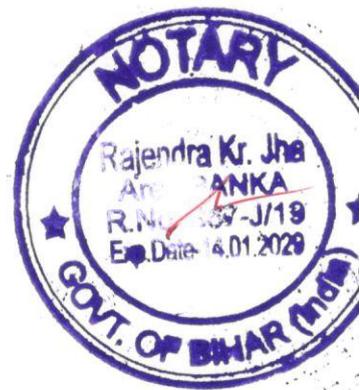
8. That the Applicant states that the facts of the present case, mirrors the facts in OA No. 99/2022/EZ, where the Tribunal held that commercial sand mining under the guise of dredging violates Sustainable Sand Mining Management Guidelines, 2016 and EIA Notification, 2006 and had categorically held that such action requires prior EC, DSR, and Replenishment Studies. In OA No. 99 of 2022/EZ, the Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti, had in its affidavit categorically stated in Paragraph-14 therein that : - "14. Central Water Commission (CWC) representative stated that the dredging done for maintenance purposes do not require Environmental Clearance. However, if the dredging is undertaken for a project for any commercial purposes, the following aspects are to be duly considered/addressed: - i. ii. iii. iv. Feasibility report of the project must be prepared and duly examined to assess the impact; Detailed Project Report (DPR) must be prepared by an expert agency; Dumped/dredged material must be utilized urgently; Flood Control Guidelines, already prepared, must be adhered to."
9. That the said OA No. 99 of 2022/EZ was disposed of vide the following directions inter alia as stated herein below:

"49. Considering Rule 9 sub-Rule (4) of the Notification dated 25.01.2022, it is clear that sand mining activities cannot be carried out for commercial purposes within the flowing river under the garb of dredging/de-silting.

50. On conspectus facts and law, we, therefore, dispose of this Original Application with a direction to the State Respondents that neither the Respondent No.1 nor Respondent No.10 shall be permitted to carry out



any further dredging/de-silting operation which permits commercial utilization of the dredged/de-silted materials by the successful bidder till a District Survey Report (DSR), Replenishment Study of the sand source in question is carried out and strict compliance of the Sustainable Sand Mining Management Guidelines, 2016 and the Enforcement & Monitoring Guidelines for Sand Mining, 2020, are observed and the successful bidder possesses the Environmental Clearance and all other statutory clearances for mining operations for commercial purposes. "



10. That MoEF&CC Notification S.O. 1244(E) dated 28.03.2020 exempts dredging only for maintenance, not commercial use.
11. That MOEF&CC vide the memorandum being no. F. No. 3-70/2020-IA.III [141127] dated 12<sup>th</sup> July, 2023 had stated that

"The Ministry, vide Notification S.O. 1224 (E) dated 28.03.2020, amended the appendix IX of EIA Notification to inter-alia provide exemption from Environmental Clearance (EC) for "Dredging and de-silting of dams, reservoirs, weirs, barrages, river and canals for the purpose of their maintenance, upkeep and disaster management.

Subsequently, the above mentioned Notification was challenged before the National Green Tribunal, Principal Bench in Original Application No. 190/2020 in the matter of Noble M. Paikada Vs. Union of India & Ors., wherein the Hon'ble Tribunal while disposing of the application vide order dated 28.10.2020, inter-alia held that ".....the exemption should strike balance and instead of being blanket exemption, it needs to be hedged by appropriate safeguards such as the process of excavation and quantum..." and directed to revisit the impugned notification dated 28.03.2020.

Subsequently, the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation in consultation

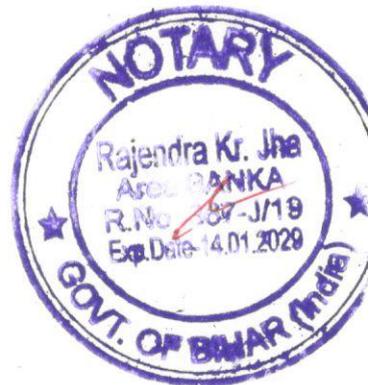
with the MoEF&CC issued the National Framework for Sediment Management. The document deals with the issue of environmental safeguards pertaining to desilting/ dredging of dams, reservoirs etc.”

Copy of the memorandum no. F. No. 3-70/2020-IA.III [141127] dated 12.7.2023 is annexed hereto and marked with Annexure D.

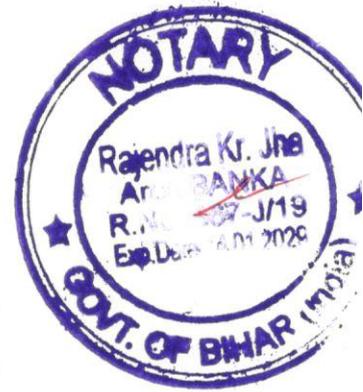
12. That the Honorable High Court of Uttarakhand at Nainital in Writ Petition (PIL) No.93 of 2015, Jai Prakash Badoni vs. Union of India & Ors. along with connected Writ Petition (PIL) No.95 of 2015, Shakti Sangh vs. State of Uttarakhand & Ors., passed on 24.06.2015. held in Paragraph-6 that “.. if dredging of rivers, canals, is done for the purposes of maintaining the canals, etc. would not appear to require Environmental Clearance. If, however, mining is done for the purpose of earning profit and is undertaken as a commercial venture as it involves dredging and de-silting then all the provisions of Environmental Impact Notification of 2006 and its subsequent amendments shall be applied to the said project. The same was reiterated in the judgment passed by the Hon'ble High Court in the matter of Writ Petition (PIL) No.93 of 2015 of Jai Prakash Badoni vs. Union of India & Ors. and another connected Writ Petition (PIL) No.95 of 2015, Shakti Sangh Priya vs. State of Uttarakhand & Ors.”

13. That in the present case, the tender has been issued/floated without any scientific study, DPR and replenishment study and in violation of other mandatory norms/guidelines. The tender has kept the terms vague with regard to the quantity to be removed or extracted nor does it deal with the disposal plan.

14. That the respondent no. 2 has floated the e-Tender as the desiltation is exempted as such using such pretext sand mining's activities shall be carried out in the river bed in the garb of de-siltation. However, in the present case, the exemption shall not be applicable for reasons as stated above.



15. That the tender is ex-facie in violation of the Sustainable Sand Mining Management Guidelines and the framework issued pursuant to the memorandum dated 12th July, 2023.
16. The MoEF&CC's memorandum dated 12.07.2023 and the Hon'ble Uttarakhand High Court's judgment in *Jai Prakash Badoni vs. Union of India* (W.P. (PIL) 93/2015) have clearly distinguished between maintenance dredging (which may be exempt) and commercial operations (which require full environmental compliance). The present tender, with its explicit commercial provisions, falls in the latter category but deliberately avoids mandatory clearances.
17. The purported de-siltation project is a textbook case of illegal sand mining camouflaged as public interest activity. The DSR 2022 – prepared by the respondent no. 2 under the District Magistrate's supervision – contains no reference to Chandan Reservoir as a sand source, demolishing Respondent No. 2's belated claim of 1964 sediment accumulation in the tender terms. The tender's 4-meter depth allowance directly contravenes the 3-meter safety limit prescribed to prevent ecological damage. The absence of a replenishment study violates this Tribunal's direction in OA No. 99/2022/EZ and MoEF&CC's mandate under the National Framework for Sediment Management 2023. By permitting unlimited extraction ("entire sediment since 1964") without baseline studies, the Respondents have engineered a sham process to circumvent environmental scrutiny, rendering the tender void ab initio.
18. The tender process, now at an advanced stage, poses an imminent threat of irreversible environmental damage and creation of third-party rights. In light of the identical facts in OA No. 99/2022/EZ, where this Tribunal prohibited commercial dredging without EC, DSR and replenishment studies, the present tender deserves to be stayed immediately. The complete absence of crucial safeguards - including GIS-based mining plans, 1:4000 scale maps, and proper disposal plans - renders the tender fundamentally illegal

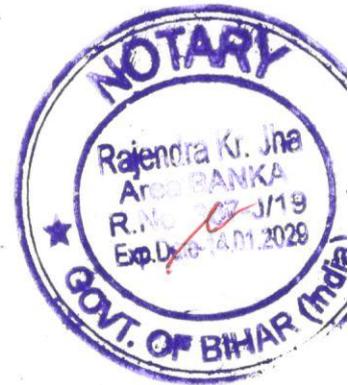


and void ab initio. The Respondents' attempt to bypass environmental scrutiny under the garb of maintenance dredging constitutes a flagrant violation of the precautionary principle and inter-generational equity, warranting urgent judicial intervention.

19. Hence this Hon'ble Tribunal may be pleased to stay the e-tender and issue such other directions as this Hon'ble Court may deem fit and proper.

**B. GROUNDS OF LAW:-**

- I. Because the impugned e-tender dated 27.02.2025 for desiltation of Chandan Reservoir permits commercial exploitation of dredged material as the tender explicitly provides for sale of dredged material and revenue sharing arrangements, which unmistakably establishes its commercial character as held by the Hon'ble Uttarakhand High Court in *Jai Prakash Badoni v. Union of India* (W.P. (PIL) No.93 of 2015);
- II. Because the tender has been issued without conducting a mandatory Replenishment Study to assess the ecological impact of the proposed dredging operations, in violation of the provisions of the Enforcement & Monitoring Guidelines for Sand Mining, 2020, and contrary to the directions issued by this Tribunal in OA No. 99/2022/EZ which specifically required such study before permitting any commercial dredging operations;
- III. Because the District Survey Report (DSR) 2022 for Banka District, prepared pursuant to the Hon'ble Supreme Court's order dated 10.11.2021, conspicuously omits any mention of Chandan Reservoir as a potential source of sand, thereby completely undermining the Respondents' belated claim of 60-year sediment accumulation in the reservoir and exposing the tender as an afterthought to legitimize illegal mining operations;
- IV. Because the tender permits dredging up to 4 meters depth in contravention of the provisions of the Enforcement & Monitoring Guidelines for Sand Mining, 2020, which prescribes a maximum 3-meter limit to prevent riverbed destabilization and ecological



damage, demonstrating the Respondents' reckless disregard for environmental safeguards and statutory compliance;

- V. Because the tender fails to identify the specific areas requiring desiltation or provide geo-coordinates for the proposed dredging work, instead leaving the demarcation of dredging areas entirely to the contractor's discretion under Clause 2.30, in complete derogation of the mandatory requirement for GIS-based mining plans under the provisions of the Enforcement & Monitoring Guidelines for Sand Mining, 2020;
- VI. Because the tender illegally permits dredging operations during monsoon season under Clause 2.45, contrary to the blanket prohibition on mining activities during this period under existing environmental regulations, further demonstrating the Respondents' disregard for ecological safeguards;
- VII. Because the Respondents have failed to prepare a Detailed Project Report (DPR) as required under the National Framework for Sediment Management, 2023, despite the Central Water Commission's clear stipulation in OA No. 99/2022/EZ that commercial dredging projects must be supported by a DPR prepared by an expert agency to assess environmental impacts;
- VIII. Because the entire tender process constitutes a colourable exercise of power, being designed to circumvent statutory environmental safeguards by disguising commercial mining operations as maintenance dredging, despite clear judicial precedents distinguishing between the two activities and prescribing separate regulatory regimes for each;
- IX. Because the Ministry of Environment, Forest and Climate Change (MoEF&CC) must clarify on affidavit whether additions or deletions can be made to the approved District Survey Report (DSR) within the stipulated five-year period under the Sustainable Sand Mining Management Guidelines (SSMMG), 2016 particularly when the existing DSR for Banka District (2022) makes no mention of Chandan Reservoir as a sand-bearing zone, yet the Respondents are

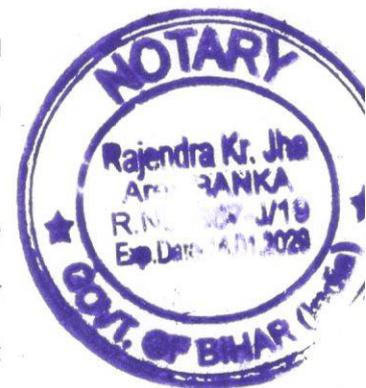


attempting to justify commercial dredging based on alleged 60-year sediment accumulation that finds no place in the official record;

- X. Because the MoEF&CC's sworn statement is necessary to determine whether the purported "desiltation" project qualifies as a permissible modification of the DSR or constitutes an illegal attempt to circumvent the statutory process for identification of sand mining sources, especially when the tender's commercial terms and lack of scientific studies demonstrate it to be a mining operation masquerading as maintenance work;
- XI. Because the MoEF&CC must specifically confirm whether its office memorandum dated 12.07.2023 regarding the National Framework for Sediment Management permits such post-facto additions to DSRs without fresh environmental appraisal.
- XII. Because the MoEF&CC's affidavit is essential to establish whether the Respondents' actions constitute a permissible exercise of administrative discretion or an impermissible subversion of the DSR process framed under the Environment (Protection) Act, 1986, especially when the tender's timing and terms suggest an orchestrated attempt to bypass environmental safeguards under the pretext of reservoir maintenance.
- XIII. Because the advanced stage of the tender process creates an imminent threat of irreversible environmental damage and crystallization of third-party rights, necessitating immediate judicial intervention to prevent ecological harm and uphold the rule of environmental law as mandated under Articles 21, 48A and 51A(g) of the Constitution of India.

#### C. LIMITATION

The instant application is being filed within the prescribed limitation period as the cause of action arose only on 27.2.2025 with the issuance of the e-tender and is continuing. Hence, the application is within the period of limitation.



**D. PRAYER**

It is most respectfully prayed that this Hon'ble Tribunal may be pleased to:

- I. Stay the e-tender dated **27.02.2025** being NIT No. 03/2024-25 being Annexure A hereto this petition and also the corrigendum dated 8.4.2025 being Annexure B hereto this Petition;
- II. Direct the Respondent no. 2 to submit a detailed report/affidavit bringing on record the DPR, replenishment study and other technical and scientific study undertaken by them prior to the issuance of the e-tender dated 27.2.2025;
- III. A Court monitored committee may be appointed to carry out inspection in the said Chandan Reservoir in the District - Banka and submit a factual status and an action taken report with recommendations before this Honorable Tribunal;
- IV. Direct the Respondents to conduct a Replenishment Study, prepare a DPR, and obtain EC before proceeding with any dredging/mining activity for the Chandan Reservoir in the District - Banka;
- V. Cost;
- VI. Pass such other directions or orders as this Honorable Tribunal may deem fit and proper;

**E. INTERIM RELIEF**

- a. Direction to stay the e-tender dated 27.02.2025 pending disposal of the present original application;
- b. Issue directions to the Ministry of Environment, Forest and Climate Change (MoEF&CC) to submit an affidavit specifically stating—
  - (a) Whether the existing District Survey Report (DSR) for Banka District can be amended or supplemented prior to the completion of its 5-year validity period;
  - (b) If such modifications are permitted, the legal basis under the Sustainable Sand Mining Management Guidelines, 2016 or other applicable

regulations that authorize such amendments; and

(c) Whether the purported '60-year sediment accumulation' claim in Chandan Reservoir, absent from the current DSR, can be introduced through such modifications without fresh scientific assessment for Chandan Reservoir in the District - Banka."

And for this act of kindness your applicant as in duty bound shall ever pray.



VERIFICATION

I, Rahul Kumar, son of Vishwanath Das, having its address at Village – Manjira, PO - Manjira Thana, Banka, Bihar - 813 102, the Applicant herein do hereby humbly verify that the statement made in paragraphs here in above are true to the best of my knowledge and belief to be based on records and the rest thereof are my humble submissions before this Honorable Tribunal.

Date: 15.04.25

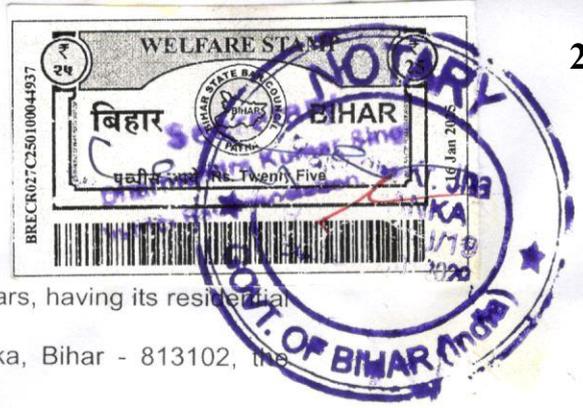
Deponent

राहुल कुमार



S.No. 586  
Date 15/4/25

AFFIDAVIT



I, Rahul Kumar, son of Vishwanath Das, aged about 36 years, having its residential address at Village - Manjira, PO - Manjira Thana, Banka, Bihar - 813102, the

Applicant do hereby solemnly affirm and state as follows:-

1. That I am the Applicant herein. I know and have made myself fully acquainted with the facts and circumstances of this case. I am competent to and do affirm this affidavit for and on behalf of myself.

2. The statements made in statement made in paragraph nos. 1 and 2, C and D are true to the best of my knowledge and the statement made in paragraphs no.

3 to 19 are information derived from record and I belief to be based on records and the rest thereof are my humble submissions before this Honorable Tribunal.



राहुल कुमार

Deponent

Identified by me

Subodh Kumar Mishra  
Advocate  
15/04/2025

Advocate

Enrollment no. 1954101

Before me

Shri/Smt. Rahul Kumar  
who is/are identified by  
Shri/Smt. Subodh Kumar Mishra  
Advocate Banka Solemnly  
affirmed declare before me

Notary Public

15/4/25  
Rajendra Kumar Jha  
Notary Public (Banka)  
Reg. No -367J/19

BIHAR COURT FEE

₹10

BRECR027C250400042266  
15 Apr 2025

BIHAR COURT FEE

₹10

BRECR027C250400042278  
15 Apr 2025

BIHAR COURT FEE

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BRECR027C250400042279  
15 Apr 2025

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BRECR027C250400042280  
15 Apr 2025

BIHAR COURT FEE

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BRECR027C250400042281  
15 Apr 2025

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BRECR027C250400042282  
15 Apr 2025

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15 Apr 2025

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15 Apr 2025

BIHAR COURT FEE

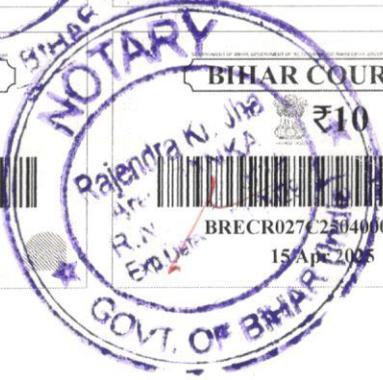
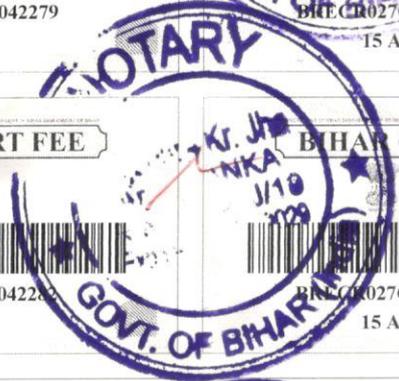
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15 Apr 2025

BIHAR COURT FEE

₹10

BRECR027C250400042286  
15 Apr 2025





Government of Bihar  
**WATER RESOURCES DEPARTMENT**

# **TENDER DOCUMENT**

**For**

**Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.**

**NIT NO. 03/2024-25**

**DOCUMENT FOR E-TENDERING ONLY**

(only on website: [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in).)

**OFFICE OF THE EXECUTIVE ENGINEER  
IRRIGATION DIVISION, BAUNSI**

**GOVERNMENT OF BIHAR  
WATER RESOURCES DEPARTMENT  
OFFICE OF EXECUTIVE ENGINEER  
IRRIGATION DIVISION, BAUNSI  
NATIONAL COMPETITIVE BIDDING  
(Through e-Tendering Procurement Only)**

1. NAME OF WORK : **Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.**
2. PERIOD OF CONSTRUCTION : 120 Months
3. DATE OF ISSUE OF NOTICE INVITING BID : 27.02.2025
4. PERIOD AND PLACE OF UPLOADING AND DOWNLOADING OF BID DOCUMENT : From 27.03.2025 to 08.04.2025, up to 03:00 PM Only on website ([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))
5. TIME, DATE AND PLACE OF PRE-BID MEETING : 01.04.2025 At 03:00 PM Conference Hall, Sinchai Bhawan, Patna
6. TIME AND DATE OF OPENING TECHNICAL BIDS : DATE: 09.04.2025 TIME 03:30 PM only on website: <https://eproc2.bihar.gov.in>
7. TIME AND DATE OF OPENING OF FINANCIAL BIDS : TO BE ANNOUNCED only on website: <https://eproc2.bihar.gov.in>
8. PLACE OF OPENING OF BIDS : THROUGH website: <https://eproc2.bihar.gov.in>
9. LAST DATE OF BID VALIDITY : 120 days from last date of bid submission.
10. OFFICER INVITING BID : Executive Engineer,  
Irrigation Division, Baunsi

**GOVERNMENT OF BIHAR  
WATER RESOURCES DEPARTMENT  
OFFICE OF THE EXECUTIVE ENGINEER  
IRRIGATION DIVISION, BOUNSI**

**NIT NO-03/ SBD/2024-25**

**EMAIL ID- [eeirrdivbausi@gmail.com](mailto:eeirrdivbausi@gmail.com)**

National Competitive Bidding Invitation

(Through E- Tender mode only – [www.eproc2bihar.gov.in](http://www.eproc2bihar.gov.in) )

Lt No. 241 / Bounsi

Date: - 27 / 02 / 2025

**1. Works Description: -**

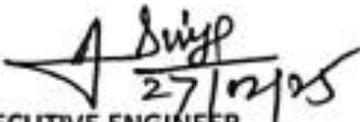
Sr no	Name of work	Estimated Revenue Amount to be Generated (in Lakh)	EMD (Payable in Online/ Physical/ Manual Mode) (In Rs. )	BOQ Cost (Non-refundable) Payable in Online Mode only) (In Rs.)	BID Processing Fee Payable to Beltron (Non-refundable) (Payable only in Online Mode).	Completion Period of Work.
01	Desiltation work of Chandan Reservoir through Dredging Process for 10 years.	7536.00	85,36,000.00	10,000.00	5900.00	10 years

2. Name of Officer Inviting Bid. :- EXECUTIVE ENGINEER  
IRRIGATION DIVISION, BOUNSI
3. Date of Issue of Notice Inviting Tender :- 27.02.2025
4. Period of Downloading and Uploading Tender Document: - From 17.03.2025 to 24.03.2025  
Only on website ([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))
5. Time, Date and Place of Pre- Bid Meeting :- 19.03.2025 At 2:30 PM  
Chief Engineer, Irrigation Creation  
Water Resources Department, Bhagalpur
6. Time and Date of Opening Technical Bid :- 26.03.2025 at 3.30 PM  
Only on website ([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))
7. Time and Date of Opening Financial Bid :- To be Announced later by  
competent Authority only on website-  
([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))
8. Place of Opening of Bid :- Only on Website-  
([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))
9. Bid Validity :- 120 Days
10. For detailed information visit :- Website : [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in)
11. Any Contractor registered with the Central Government/ Any State Government or any PSU or Agency of National repute may participate in the tender but registration with Water Resources Department, Govt, of Bihar will be essential after issue of Letter of Acceptance (LOA) for the work.
12. While participating in e-tendering process, the Contractor shall have to get themselves registered to get User ID, Password and digital Signature. This will enable them to access the website ([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in)) and download or participate in tendering process.

13. E-Tendering documents can be downloaded from and duly filled document can be uploaded only on website ([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))
14. (a) Under e-Tendering/ e-Procurement System, the Bid Processing Fee and the cost of the Tender Documents, which is non Refundable, Must be paid through Online Mode (e-payment Mode) i.e via Internet payment gateway (Credit/Debit card), Net Banking, NEFT/RTGS.  
(b) Under e-Tendering /e-Procurement System, the Earnest Money Deposited (EMD) can be submitted in either Online mode (e-Payment Mode) or Physical mode/Manual Payment System. In online Mode, The EMD can be Deposited through Internet Payment Gateway (Credit/Debit card), Net Banking and NEFT/RTGS. In case of Physical Mode/Manual Payment system, the EMD can only be Submitted in the form of Unconditional Bank Guarantee (As per the Format in SBD) which must be valid for 165 days (120+45 Days = 165 days) from the Bid Submission date. The Bank Guarantee must be issued by any Scheduled/ Nationalized Bank situated in Bihar State in favor of Executive Engineer Irrigation Division, Bounsi. (If a Bank Guarantee issued by a bank outside Bihar is submitted then it must be issued by a bank Situated in Bihar before the work agreement is done.)  
(c) "Bids along with necessary online payments must be submitted through e-procurement portal [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in) before the date and time specified in the NIT. The department doesn't take any responsibility for the delay/Non submission of Tender/Non-reconciliation of online Payment caused due to Non-availability of Internet Connection, Network Traffic/ Holidays or any other reason."  
(d) BSEDC Processing Fee and Tender Fee/ BOQ Fee has to be paid through e-Payment mode only. EMD may be paid either through online or offline Mode (Bank Guarantee).
15. Bidders/ Contractor can access tender Documents on the above-mentioned website, fill them and submit the completed tender documents as electronic tender on the website itself only. Contractor must attach Scanned copies of all paper i.e. Bank draft/Earnest money/All necessary certificates required in Eligibility criteria with electronic tender.
16. Corrigendum/ Addendum/ Corrections, if any will be published on the website only. The undersigned reserves the right to cancel / extend the BID without any prior information or assigning any reason.
17. The contractor should list up serial no. of scanned documents before uploading, so that the particular document may be located soon on the basis of Serial No / Page No. All documents must be uploaded in PDF, MS Office (Compatibility Mode) JPEG, ZIP format. Claims will not be entertained if uploaded documents were not able to download/ open the other format.
18. The contractors should fully satisfy themselves of Download ability /Visibility of scanned uploaded documents.
19. No claim shall be entertained on account of disruption of internet service being used by contractors. Contractors are advised to upload their bids well in advance to avoid last minute technical snag.
20. Regarding Royalty & Seigniorage fee, Mines and Geology department, Govt of Bihar's letter no. 4418 dated 19.10.2024 must be followed.
21. Conditional tender will not be considered valid.
22. Before uploading the bid, the tenderer/ contractor should must inspect the work site and familiarize themselves with the work. Any claim related to work after submission will not be considered valid.
23. In case of more than one successful tenderer quoting the same highest rate, the selection of successful contractor will be done through a lottery system as per the provision of the Bihar Public Works Code.
24. As per Dept. letter no. 01/PMC/Misc/879/2012 part-II-124 Dated 04.02.2021, It is mandatory to submit valid Character Certificate issued by District Superintendent of Police along with the tender.
25. For more information, contact can be made with the undersigned office during office hours. For details/clarifications regarding the e-tendering process, information can be obtained from e-tendering cell, computer cell, Sinchai Bhawan, Patna (0612-2235241) and toll-free no.- 18005726571 or via mail at [eproc2support@bihar.gov.in](mailto:eproc2support@bihar.gov.in) .
26. The Road Construction Department's letter number 3162 (S) Dated 09.05.2016 and Letter number 2863 (E) dated 07.06.2017 shall be applicable.

27. The Water Resources Department's letter number-536 Dated 13.06.2013, as per annexure-1, the prescribed eligibility must be fully met in the form of a Joint Venture.
28. The Road Construction Department, Govt of Bihar, Patna, through notification number – 7435 dated 14.08.2019, has completely reinstated Clause- 25 of SBD regarding "Settlement of Disputes and Arbitration". The Settlement of Disputes and Arbitration shall be done in accordance with the provisions made in the Bihar Public Works Contracts Disputes Arbitration Tribunal Act 2008, which will be considered Valid.
29. Within the submerged area of Chandan Reservoir, 216 Hectares of land owned by the Water Resources Department, Govt of Bihar, dredging will be carried out up to a depth of 4 meters for the removal of silt while paying the prescribed royalty for 10 years. This is a self-financing scheme, where the contractor will be permitted to extract the silt from Chandan Reservoir, separate the sand and silt, and use them for commercial purposes.
30. According to the procedure for determining tender price, the successful tenderer who offers the highest amount will be awarded the dredging work. The tenderer will be required to deposit the specified amount for each year in the treasury as an advance payment for the extracted sand from the reservoir as per predetermined rate in the tender.
31. The payment of royalty and other taxes shall be made by the contractor as per the regulations of the state government.
32. If there is a change in the schedule rate of sand, the Water Resources Department shall also revise the payment by the successful contractor to Water Resources Department. Additionally, the rate of royalty paid to the Department of Mines and Geology for the extracted sand will also be Changed accordingly.
33. Before starting Dredging work in Chandan reservoir, it is mandatory for the selected agency to obtain all necessary environmental and other specific clearance/approvals required for mining, transportation, storage and sale of sand. The responsibility for obtaining all the required approvals/NOCs for this project will rest with the contractor; the selected agency will also bear all the expenses required during obtaining different clearances/NOCs. Additionally, the contractor must comply with all the statutory regulations prescribed by the Mines and Geology Department and other relevant authorities.
34. The selected contractor must pay the prescribed amount annually based on the contractual documents for the minimum assured quantity to be extracted. This payment will be made in two equal half yearly installments before the commencement of the dredging period. The actual quantity extracted will be evaluated semi-annually. If the extracted quantity exceeds the minimum assured amount (semi-annual), the selected agency will pay the additional amount based on the prevailing sand rate.
35. While conducting dredging work in Chandan reservoir, the contractor must comply with the provisions mentioned in the "National Framework for Sediment Management, 2022" issued by the Ministry of Jal Shakti, Government of India, as well as other all relevant rules, directives, and regulations of the state and Central Government. The contractor must also follow the verdicts of the Hon'ble Courts and National Green Tribunal (NGT).
36. Before the transportation/sale of sand, it is mandatory for the selected agency to pay applicable royalty and other statutory fees to the Department of Mines and Geology.
37. Only those proposals will be accepted in which during dredging process there is no damage to the actual structure of the reservoir and is done by silt management in the view of increasing storage capacity of the reservoir.
38. Contractor should submit the Report on Environmental Impact due to running project. Assessment of impact will be done on yearly basis by an independent agency, and report shall be submitted to the Water Resource Department, Govt of Bihar.
39. Before carrying out of dredging work, it will be mandatory for the contractor to identify and demarcate the area owned by Water Resources Department, Govt of Bihar.

40. Before commencing dredging work in Chandan reservoir, a comprehensive survey of the reservoir will be conducted by the selected agency to estimate the actual silt load in accordance with the prescribed methods and procedures mentioned in the Standard Operating Procedure (SOP)/ guidelines and the scope of work defined in the tender. Additionally, the selected agency will prepare a detailed project report (DPR), which will include excavation, transportation, segregation, water treatment, disposal of extracted materials, social impact assessment, environmental impact assessment and environmental management plan.
41. It will be mandatory for the contractor to fulfill all the required technical qualifications mentioned in the tender documents.
42. During the execution of the dredging work, the Water Resources Department will periodically evaluate the contractor's work based on the technical aspects, standard parameters, criteria of work and, terms and conditions mentioned in the tender. If the work is found to be unsatisfactory during the interim evaluation, appropriate punitive action will be taken by the Water Resources Department against the contractor.

  
EXECUTIVE ENGINEER  
IRRIGATION DIVISION, BOUNSI (BANKA)  
17.02.25

**कार्यपालक अभियंता का कार्यालय**  
**सिंचाई प्रमंडल, बौंसी (बाँका)**  
**शुद्धि पत्र**

इस कार्यालय के पत्रांक- 241 दिनांक- 27.02.2025 द्वारा निर्गत निविदा आमंत्रण सूचना संख्या-03 एस० बी० डी०/2024-25 के तहत " चांदन जलाशय का ड्रेजिंग के माध्यम से 10 वर्षों तक डिडिलिटेसन कार्य " दैनिक समाचार पत्रों में दिनांक-02.03.2025 को निकाला गया था। जिसका PR. No.-020581 (WRD) 2024-25 है। उपरोक्त वर्णित निविदा आमंत्रण में निम्न प्रकार संसोधन किया जाता है:-

1. निविदा कागजात अपलोड एवं डाउनलोड करने की अवधि : दिनांक 21.03.2025 से दिनांक 01.04.2025 के 03:00 अपराह्न तक (केवल [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in) पर)।

Period of Downloading and Uploading Tender Document : -From 21.03.2025 to 01.04.2025 Only on website ([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))

2. प्री-बीड मितिग का समय, स्थान, एवं तिथि :- दिनांक 26.03.2025 को 03:00 बजे अपराह्न में सिंचाई भवन, सभागार, पटना।

Time, Date and Place of Pre- Bid Meeting :- 26.03.2025 At 3:00 PM  
Sabhagar, Sinchai Bhawan, Patna.

3. तकनीकी बीड खोलने की तिथि एवं समय :- दिनांक-03.04.2025 के अपराह्न 03:30 बजे (केवल वेबसाइट [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in) पर)।

Time and Date of Opening Technical Bid :- 03.04.2025 at 3.30 PM  
Only on website ([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))

4. बैंक गारंटी के रूप में अग्रधन की राशि निर्गत करने हेतु कार्यपालक अभियंता, सिंचाई प्रमंडल, बौंसी के स्टैट बैंक, बाँका के खाता की विवरणी निम्न प्रकार है:- Bank A/C (चालू खाता) No.-38974175085 एवं IFSC Code- SBIN0000243।

For the purpose of Issuance of EMD in the form of Bank Guarantee, the details of beneficiary Bank Account is as under- Executive Engineer, Irrigation Division, Bounsi Bank A/C (Current A/C)No.-38974175085 and IFSC Code- SBIN0000243.  
इसे इस हद तक संशोधित समझा जाय। शेष सभी शर्तें यथावत रहेंगी।

हस्ताक्षर

कार्यपालक अभियंता  
सिंचाई प्रमंडल, बौंसी

पत्रांक :-

/बौंसी,

दिनांक :-

प्रतिलिपि :-PRO जल संसाधन विभाग, पटना बिहार को सूचनार्थ एवं न्यूज पेपर में प्रकाशित करने हेतु समर्पित।

हस्ताक्षर

कार्यपालक अभियंता  
सिंचाई प्रमंडल, बौंसी

**Office of the Executive Engineer, Irrigation Division,  
Bounsi (Banka)  
Clarification Letter**

As per office memo no. – 241 dated – 27.02.2025, a short-term tender invitation notice no. – 03 SBD/2024-25 was issued for "Chandan Water Supply Scheme – 10 years distribution work through outsourcing" which was published in daily newspapers on date – 02.03.2025. Its PR. No.-020581 (WRD) 2024-25. The following amendments are made in the said short-term tender invitation:

1. Period of Downloading and Uploading Tender Document: From 21.03.2025 to 01.04.2025 till 03:00 PM (only on website [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in)).
2. Time, Date and Place of Pre-Bid Meeting:
  - Date: 26.03.2025 at 03:00 PM
  - Place: Sabhagar, Sinchai Bhawan, Samamar, Patna.
3. Time and Date of Opening Technical Bid:
  - Date: 03.04.2025 at 03:30 PM (only on website [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in)).
4. For the purpose of Issuance of EMD in the form of Bank Guarantee, the details of beneficiary Bank Account is as under:
  - Executive Engineer, Irrigation Division, Bounsi
  - Bank A/C (Current A/C) No.- 38974175085
  - IFSC Code – SBIN0000243

This shall be considered as the final amendment. All other terms and conditions shall remain unchanged.

Memo No: \_\_\_\_\_/Bounsi,

Date: \_\_\_\_\_

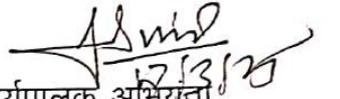
Copy to: PRO, Water Resources Department, Patna, Bihar, for information and publication in newspapers.

**Executive Engineer,  
Irrigation Division,  
Bounsi**

पत्रांक :- 328 / बौसी,

दिनांक :- 17/03/2025

प्रतिलिपि :- अधीक्षण अभियंता, सिंचाई अंचल, भागलपुर/मुख्य अभियंता, सिंचाई सृजन, जल संसाधन विभाग, भागलपुर/अधीक्षण अभियंता, योजना एवं मोनिटरिंग अंचल-3 सिंचाई सृजन, जल संसाधन विभाग, सिंचाई भवन, पटना को सूचनार्थ एवं आवश्यक कार्रवाई हेतु समर्पित।

  
कार्यपालक अभियंता  
सिंचाई प्रमंडल, बौसी  
17.03.25

Letter No.: 328 / Bounsi

Date: 17/03/2025

Copy To:

Superintending Engineer, Irrigation Circle, Bhagalpur / Chief Engineer, Irrigation Design, Water Resources Department, Bhagalpur / Superintending Engineer, Planning and Monitoring Circle-3, Irrigation Design, Water Resources Department, Irrigation Bhawan, Patna for information and necessary action.

Sd/-

Executive Engineer

Irrigation Division, Bounsi

Date: 17.03.2025

**कार्यपालक अभियंता का कार्यालय**  
**सिंचाई प्रमंडल, बाँसी (बाँका)**  
**शुद्धि पत्र**

इस कार्यालय के पत्रांक- 241 दिनांक- 27.02.2025 द्वारा निर्गत निविदा आमंत्रण सूचना संख्या-03SBD/2024-25 के तहत " चांदन जलाशय का ड्रेजिंग के माध्यम से 10 वर्षों तक डिसिल्टेशन कार्य " दैनिक समाचार पत्रों में दिनांक-02.03.2025 को निकाला गया था। जिसका PR. No.- 020581 (WRD) 2024-25 है। उपरोक्त वर्णित निविदा आमंत्रण सूचना में निविदा आमंत्रण सूचना संख्या -03SBD/2024-25 के स्थान पर निविदा आमंत्रण सूचना संख्या-03/2024-25 समझा जाय। इसे इस हद तक संशोधित समझा जाय। शेष सभी शर्तें यथावत रहेंगी।

हप/-  
कार्यपालक अभियंता  
सिंचाई प्रमंडल, बाँसी

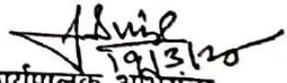
पत्रांक :- /बाँसी, दिनांक :-  
प्रतिलिपि :-PRO जल संसाधन विभाग, पटना बिहार को सूचनार्थ एवं न्यूज पेपर/विभागीय वेबसाइट पर प्रकाशित करने हेतु समर्पित।

हप/-  
कार्यपालक अभियंता  
सिंचाई प्रमंडल, बाँसी

पत्रांक :- 336 /बाँसी,

दिनांक :- 19/03/2025

प्रतिलिपि :- अधीक्षण अभियंता, सिंचाई अंचल, भागलपुर/मुख्य अभियंता, सिंचाई सृजन, जल संसाधन विभाग, भागलपुर/अधीक्षण अभियंता, योजना एवं मोनिटरिंग अंचल-3 सिंचाई सृजन, जल संसाधन विभाग, सिंचाई भवन, पटना को सूचनार्थ एवं आवश्यक कार्रवाई हेतु समर्पित।

  
 कार्यपालक अभियंता  
 सिंचाई प्रमंडल, बाँसी  
 19.03.25

**Office of the Executive Engineer,  
Irrigation Division, Bounsi (Banka)  
Clarification Letter**

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As per this office's letter no. – 241 dated 27.02.2025, short-term tender invitation notice no. – 03SBD/2024-25 was issued for “10 years of distribution work through outsourcing under Chandan Water Supply Scheme,” which was published in daily newspapers on date – 02.03.2025. Its PR No. – 020581 (WRD) 2024-25. The short-term tender invitation notice should now be read as Tender Invitation Notice No. – 03/2024-25 instead of 03SBD/2024-25. This should be considered as the final amendment. All other terms and conditions will remain unchanged.

**Sd/-  
Executive Engineer  
Irrigation Division,  
Bounsi  
Dated:**

Memo No: \_\_\_\_/Bounsi

Copy to: PRO, Water Resources Department, Patna, Bihar, for information and publication in newspapers / departmental website.

**Executive Engineer  
Irrigation Division, Bounsi  
Date: 19/03/2025**

Memo No: 336/Bounsi

Copy to: Chief Engineer, Irrigation Circle, Bhagalpur / Chief Engineer, Irrigation Planning, Water Resources Department, Bhagalpur / Chief Engineer, Monitoring & Planning Circle-3, Irrigation Planning, Water Resources Department, Sinchai Bhawan, Patna for necessary action and information.

**Executive Engineer  
Irrigation Division, Bounsi  
Date: 19/03/2025**

**कार्यपालक अभियंता का कार्यालय**  
**सिंचाई प्रमंडल, बाँसी (बाँका)**  
**शुद्धि पत्र**

इस कार्यालय के पत्रांक- 241 दिनांक- 27.02.2025 द्वारा निर्गत निविदा आमंत्रण सूचना संख्या-03/2024-25 के तहत " चांदन जलाशय का ड्रेजिंग के माध्यम से 10 वर्षों तक डिसिल्टेशन कार्य " दैनिक समाचार पत्रों में दिनांक-02.03.2025 को निकाला गया था। जिसका PR. No.-020581 (WRD) 2024-25 है। उपरोक्त वर्णित निविदा आमंत्रण में निम्न प्रकार पुनः संसोधन किया जाता है:-

1. निविदा कागजात अपलोड एवं डाउनलोड करने की अवधि : दिनांक 27.03.2025 से दिनांक 08.04.2025 के 03:00 अपराहन तक (केवल [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in) पर)।

Period of Downloading and Uploading Tender Document : -From 27.03.2025 to 08.04.2025 Only on website ([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))

2. प्री-बीड मितिग का समय, स्थान, एवं तिथि :- दिनांक 01.04.2025 को 03:00 बजे अपराहन में सिंचाई भवन, सभागार, पटना।

Time, Date and Place of Pre- Bid Meeting :- 01.04.2025 At 3:00 PM  
Sabhagar, Sinchai Bhawan, Patna.

3. तकनीकी बीड खोलने की तिथि एवं समय :- दिनांक-09.04.2025 के अपराहन 03:30 बजे (केवल वेबसाइट [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in) पर)।

Time and Date of Opening Technical Bid :- 09.04.2025 at 3.30 PM  
Only on website ([www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in))

इसे इस हद तक संशोधित समझा जाय। शेष सभी शर्तें पूर्ववत रहेंगी।

३०/-  
कार्यपालक अभियंता  
सिंचाई प्रमंडल, बाँसी

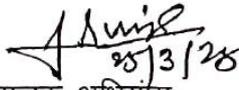
पत्रांक :- /बाँसी, दिनांक :-  
प्रतिलिपि :-PRO जल संसाधन विभाग, पटना बिहार को सूचनार्थ एवं न्यूज पेपर/विभागीय वेबसाइट पर प्रकाशित करने हेतु समर्पित।

३०/-  
कार्यपालक अभियंता  
सिंचाई प्रमंडल, बाँसी

पत्रांक :- 381 /बाँसी,

दिनांक :- 25/03/2025

प्रतिलिपि :- अधीक्षण अभियंता, सिंचाई अंचल, भागलपुर/मुख्य अभियंता, सिंचाई सृजन, जल संसाधन विभाग, भागलपुर/अधीक्षण अभियंता, योजना एवं मोनिटरिंग अंचल-3 सिंचाई सृजन, जल संसाधन विभाग,सिंचाई भवन, पटना को सूचनार्थ एवं आवश्यक कार्रवाई हेतु समर्पित।

  
कार्यपालक अभियंता  
सिंचाई प्रमंडल, बाँसी  
25.03.25

**Office of the Executive Engineer,  
Irrigation Division, Bounsi (Banka)  
Clarification Letter**

As per office letter no. 241 dated 27.02.2025, a tender invitation notice under Group–03/2024–25 for de-siltation work through Channel Jalashray Engineering for a period of 10 years was published in the daily newspaper on 02.03.2025. The PR No. is 020581 (WRD) 2024-25. The tender invitation has been revised as follows:

1. **Period of Downloading and Uploading Tender Document:**  
From 27.03.2025 to 08.04.2025 till 03:00 PM only on the website (www.eproc2.bihar.gov.in)
2. **Time, Date and Place of Pre-Bid Meeting:**  
Date: 01.04.2025 at 03:00 PM  
Venue: Sabhagar, Sinchai Bhawan, Patna
3. **Time and Date of Opening Technical Bid:**  
Date: 09.04.2025 at 03:30 PM  
Only on website (www.eproc2.bihar.gov.in)

This may be treated as an amendment to the earlier notice to this extent only. All other terms and conditions shall remain unchanged.

**Sd/-  
Executive Engineer  
Irrigation Division, Bounsi**

**Memo No.:** / Bounsi

**Date:**

**Copy to:**

PRO, Water Resources Department, Patna, Bihar for publishing in newspapers and uploading on the departmental website

**Sd/-  
Executive Engineer  
Irrigation Division, Bounsi**

**Memo No:** 381 / Bounsi

**Date:** 25/03/2025

**Copy to:**

Executive Engineer, Irrigation Circle, Bhagalpur

Chief Engineer, Irrigation Sujan, WRD, Bhagalpur

Executive Engineer, Planning and Monitoring Circle-3, Irrigation Sujan, WRD, Sinchai Bhawan, Patna

For necessary information and action.

**Sd/-  
Executive Engineer  
Irrigation Division, Bounsi  
25.03.2025**

# **INVITATION FOR BID (IFB)**

**SECTION- I**  
**INSTRUCTION TO BIDDERS**  
**(ITB)**

## Section – 1: Instructions to Bidders

### Table of Clauses

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	2. Source of Funds			20. Deadline for Submission of Bids	
	3. Eligible Bidders			21. Late Bids	
	4. Qualification of the Bidder		<b>E</b>	<b>Bid Opening and Evaluation</b>	
	5. One Bid per Bidder			22. Bid Opening	
	6. Cost of Bidding			23. Process to be Confidential	
	7. Site Visit			24. Clarification of Financial Bids	
<b>B</b>	<b>Bidding Documents</b>			25. Examination of Bids and Determination of Responsiveness	
	8. Content of Bidding Documents			26. Correction of Errors	
	9. Clarifications of Bidding Documents			27. Evaluation and Comparison of Financial Bids	
	10. Amendment of Bidding Documents		<b>F</b>	<b>Award of Contract</b>	
<b>C</b>	<b>Preparation of Bids</b>			28. Award Criteria	
	11. Language of Bid			29. Employer's Right to Accept any Bid and to Reject any or all Bids	
	12. Documents Comprising the Bid			30. Notification of Award and Signing of Agreement	
	13. Bid pries			31. Performance Security	
	14. Currencies of bid and Payment			32. Advance Payment and Security	
	15. Bid Validity			33. Corrupt or Fraudulent Practices	
	16. Bid Security		<b>G</b>	<b>Appendix to I TB</b>	
	17. Alternative Proposals by Bidders		<b>H</b>	<b>Annexure – I</b>	
	18. Format and Signing of Bid			<b>Annexure – II</b>	

## A. GENERAL

### 1. Scope of Bid

- 1.1 The Employer (named in Appendix to ITB) invites bids for the "**Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years**" (as defined in these documents and referred to as "**the works**") detailed in the table given in IFB.
- 1.2 The successful bidder will be expected to complete the works by the intended completion date specified in the Contract data.
- 1.3 This agreement will be a **TURNKEY PROJECT AGREEMENT based on revenue model**.
- 1.4 In the project, Contractors have to submit their **highest bid per cubic metre of saleable dredged material (sand)**.
- 1.5 Throughout these bidding documents, the terms "bid" and "tender" and their derivatives (bidder / tenderer, bid/tender, bidding/tendering, etc.) are synonymous.
- 1.6 This agreement will be a PERCENTAGE RATE AGREEMENT.
- 1.7 In the course of executing work in the designated dam / barrage, it shall be mandatory for the Contractor to adhere to the directions outlined in the 'National Framework for Sediment Management 2022' issued by the Govt of India, Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation.
- 1.8 The appointed agency shall abide by the BIHAR MINERALS (SUBSIDY, PREVENTION OF ILLEGAL MINING, TRANSPORTATION & STORAGE) (AMENDMENT) RULES, 2024 and shall register itself in online portal of Mines and Geology Department.

### 2. Source of Funds

- 2.1 Chandan reservoir dredging project is structured on a revenue-based model, where the successful bidder must deploy their own resources at their own risk and cost. The contractor shall have the right to sell the dredged material after paying the requisite royalty charges to the Mining Department.
- 2.2 Additionally, the Water Resources Department will receive a pre-determined share from the sale of processed dredged material, which must be deposited in advance every six months. At the end of each six months period:
  - a) If the actual dredged material exceeds the estimated quantity, the contractor shall pay the additional amount to the Water Resources Department.
  - b) If the actual dredged material is less than the estimated quantity, the contractor shall pay as per the minimum assured quantity which will be set as milestone (attached as another excel sheet herein), and the necessary payments will be made accordingly.

### **3 Eligible Bidders**

- 3.1 This Invitation for Bids is open to all bidders.
- 3.2 All bidders shall provide in Section 2, Forms of Bid and Qualification Information, a statement that the Bidder is neither associated, nor has been associated, directly or indirectly, with the Consultant; Engineer-in-Charge or any other entity that has prepared the design, specifications, and other documents for the Project or being proposed as Project Manager for the Contract or involved in supervision of the contract. A firm that has been engaged by the Employer to provide consulting services for the preparation or supervision of the works, and any of its affiliates shall not be eligible to bid.
- 3.3 Bidders shall not be under a declaration of ineligibility for delay, failure or corrupt and fraudulent practices by any of the State Govt. or Central Govt. or Public Undertaking or any Autonomous Body.
- 3.4 Any Contractor registered with the Central Government/ Any State Government or any PSU or Agency of National repute may participate in the tender but registration with Water Resources Department, Govt, of Bihar will be essential after issue of Letter of Acceptance (LOA) for the work.
- 3.5 The Contractor must be an enlisted Contractor in minimum A class or equivalent class with the State Govt. or Central Govt. or Public Undertaking or any Autonomous Body. He shall furnish necessary proof for the same.

### **4. Qualification of the Bidder**

- 4.1 All bidders shall provide in Section 2, Forms of Bid and Qualification Information, a preliminary description of the proposed work method and schedule, including drawings and charts indicating milestones to complete the project on time.
- 4.2 All bidders shall also furnish the following information in Section 2.
- (i) Evidence of access to or availability of credit facilities (minimum 35% of estimated cost) certified by the bankers.
  - (ii) Undertaking that bidder would be able to invest 100% of the contract value of work, during implementation of contract.
- 4.3 All bidders shall include the following information and documents with their bids in Section 2:
- (a) copies of original documents defining the constitution or legal status, place of registration and principal place of business; written power of attorney of the signatory of the Bid to commit the Bidder;
  - (b) total monetary value of dredging/desilting work performed for each of the last five years;
  - (c) experience in works of a similar nature and size for each of the last five years, and details of works underway or contractually committed; and clients who may be contacted for further information on those contracts;

- (d) major items of dredging/desilting equipment proposed to carry out the Contract or evidence of arrangement; of possessing them on long term hire or lease of 10 years / buying as defined therein;
- (e) qualifications and experience of key site management and technical personnel proposed for contract;
- (f) reports on the financial standing of the Bidder, such as profit and loss statements and auditor's reports for the past five years;
- (g) evidence of access to line(s) of credit and availability of other financial resources facilities (35% of contract value), certified by the Bankers.
- (h) undertaking that the bidder will be able to invest 100% of contract value of work, during implementation of work.
- (i) authority to seek references from the Bidder's bankers;
- (j) information regarding any litigation, current or during the last five years, in which the Bidder is involved, the parties concerned and dispute amount;
- (k) proposals for subcontracting components of the Works amounting to more than 10% of the Bid Price (for each, the qualifications and experience of the identified sub-contractor in the relevant field should be annexed);
- (l) the proposed methodology and programme of construction, backed with equipment planning and deployment, duly supported with broad calculations and quality control procedures proposed to be adopted, justifying their capability of execution and completion of the work as per technical specifications within the stipulated period of completion as per milestones.

4.4 Bids from Joint ventures is allowed.

**4.5 A. To qualify for award of the contract, each bidder in its name should have in the last five years as referred to in Appendix:-**

- a) Achieved in any one year a minimum annual financial turnover (in dredging/desilting work only) of at least the amount equal to 50% (fifty percent) estimated cost of work for which bid has been invited. The turnover will be indexed at the rate of 8% for a year. (As indicated in appendix to ITB)
- b) Satisfactorily completed as a prime contractor (or as a nominated subcontractor, where the subcontract involved execution of all main items of work described in the bid document, provided further that all other qualification criteria are satisfied) at least one similar work not less than amount indicated in Appendix to ITB.
- c) executed in any one year, the minimum quantities of the following items of work as indicated in Appendix to ITB.

**B. Each bidder should further demonstrate:**

(a) availability (either owned or long term leased for 10 years) of the following key and critical equipment for this work:

Based on the studies, carried out by the Engineer the minimum suggested major equipment to attain the completion of works in accordance with the prescribed dredging schedule is shown in the Annexure-I.

Availability of the testing equipment required for establishing field laboratory to perform mandatory tests e.g., those stated in Appendix to ITB.

The bidders should, however, undertake their own studies and furnish with their bid, a detailed construction planning and methodology supported with layout and necessary drawings and calculations (detailed) as stated in clause 4.3(1) above to allow the employer to review their proposals. The numbers, types and capacities of each plant/equipment shall be shown in the proposals along with the cycle time for each operation for the given production capacity to match the requirements.

(b) availability for this work of personnel with adequate experience as required; as per Annexure-II.

(c) liquid assets and / or availability of credit facilities of no less than amount indicated in Appendix.

**C. To qualify for a package of contracts made up of this and other contracts for which bids are invited in the IFB, the bidder must demonstrate having experience and resources sufficient to meet the aggregate of the qualifying criteria for the individual contracts.**

4.6 Sub-contractor's experience and resources shall not be taken into account in determining the bidder's compliance with the qualifying criteria except to the extent stated in 4.5(A) above.

4.7 Bidders who meet the minimum qualification criteria will be qualified only if their available bid capacity is more than the total bid value. The available bid capacity will be calculated as under:

Assessed Available Bid capacity = (A x N x 3 - B)

Where,

A = Maximum value of dredging/desilting works executed in any one year during the last five years (updated to the price level of the year indicated in Appendix) taking into account the completed as well as works in progress.

N = Number of years prescribed for completion of the works for which bids are invited.

B = Value (updated to the price level of the year indicated in Appendix) of existing commitments and on-going works to be completed during the next 10 years. (Period of completion of the works for which bids are invited)

Note: The statements showing the value of existing commitments and on-going works as well as the stipulated period of completion remaining for each of the works listed should be countersigned by the Engineer-in-charge, not below the rank of an Executive Engineer or equivalent.

4.8 Even though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:

- made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or
- have record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc; and/or
- Participated in the previous bidding for the same work and had quoted unreasonably high bid prices and could not furnish rational justification to the employer.

## **5. One Bid per Bidder**

5.1 Each bidder shall submit only one bid for any work or one package or group. A bidder who submits or participates in more than one Bid (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the Bidder's participation to be disqualified.

## **6. Cost of Bidding**

6.1 The bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible and liable for those costs including commission on bank guarantee etc.

In case of cancellation of tender, cost of bidding document will be charged each times.

## **7. Site Visit**

7.1 The Bidder, at the Bidder's own responsibility and risk must visit and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for the execution of the Works. The costs of visiting the Site shall be at the Bidder's own expense.

7.2. Tender documents are not transferable.

## B. BIDDING DOCUMENTS

### 8. Content of Bidding Documents

8.1 The set of bidding documents comprises the documents listed below and addenda issued in accordance with Clause 10:

Section	Particulars	Volume No.
	<b>Invitation for Bids- IA</b>	
<b>1</b>	<b>Instructions to Bidders- IA</b>	
<b>2</b>	<b>Qualifications of Bidders - IA</b>	<b>I</b>
<b>3</b>	<b>General Conditions of Contracts</b>	
<b>3.1</b>	<b>NIT – IA</b>	
<b>3.2</b>	<b>PWD – 2 – IB</b>	
<b>3.3</b>	<b>General Rules &amp; Directions - IA</b>	
<b>3.4</b>	<b>Conditions of Contract- IA</b>	
<b>3.5</b>	<b>Clouse of Contract – IA</b>	
<b>4</b>	<b>Contract Data</b>	
<b>5</b>	<b>Special condition of Contract</b>	<b>II</b>
<b>6</b>	<b>Technical Specifications- IIIA</b>	
<b>7</b>	<b>Bill of Quantities- IIIB</b>	<b>III</b>
<b>8</b>	<b>Securities and other forms- IIIA</b>	
<b>9</b>	<b>Drawings</b>	<b>IV</b>
<b>10</b>	<b>Documents to be furnished by bidder</b>	<b>V</b>

8.2. One copy of each of the volumes I, II, III and IV will be issued to the bidder Documents to be furnished by the bidder in compliance to section 2 will be prepared by him and furnished as Volume-V in two parts (refer clause 12).

8.3 The bidder is expected to examine carefully all instructions, conditions of contract, contract data, forms, terms, technical specifications, bill of quantities, forms, Annexes and drawings in the Bid Document. Failure to comply with the requirements of Bid Documents shall be at the bidder's own risk. Pursuant to clause 25 hereof, bids which are not substantially responsive to the requirements of the Bid Documents shall be rejected.

### 9. Clarification of Bidding Documents.

#### 9.1 Pre-bid meeting

9.1.1 The bidder or his official representative is invited to attend a pre-bid meeting which will take place at the address, venue, time and date as indicated in appendix.

9.1.2 The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

9.1.3 The bidder is requested to submit any questions in writing or by fax to reach the Employer not later than one week before the meeting or through Video Conferencing as per NIT/ Amendment.

9.1.4 Minutes of the meeting, including the text of the questions raised (without identifying the source of enquiry) and the responses given will be transmitted without delay to all purchasers of the bidding documents. Any modification of the bidding documents listed in Sub-Clause 8.1

which may become necessary as a result of the pre-bid meeting shall be made the Employer exclusively through the issue of an Addendum pursuant to Clause 10 and not through the minutes of the pre-bid meeting. All bidders have to collect any addendum on next working day of pre-bid meeting. The bidder shall receive the minutes of the meeting on the next working day of the pre-bid meeting.

9.1.5 Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.

## **10. Amendment of Bidding Documents**

10.1 Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing addendum.

10.2 Any addendum thus issued shall be part of the bidding documents and shall be collected by all the purchasers of the bidding documents. Prospective bidders shall acknowledge receipt of each addendum in writing or by cable to the Employer. The Employer will assume no responsibility for postal delays.

10.3 To give prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at his discretion, extend as necessary the deadline for submission of in accordance with Sub-Clause 20.2 below.

## **C. PREPARATION OF BIDS**

### **11. Language of the Bid**

11.1 All documents relating to the bid shall be in English / Hindi.

### **12. Documents Comprising the Bid**

12.1 The bid to be submitted by the bidder as Volume V of the bid document (refer Clause 8.1) shall be in two separate parts;

Part I shall be named "Technical Bid" and shall comprise

- (i) Earnest money in the form specified in Section 8
- (ii) Qualification Information and supporting documents as specified in Section- 2
- (iii) Certificates, undertakings, affidavits as specified in Section 2
- (iv) Any other information pursuant to Clause 4.2 of these instructions
- (v) Undertaking that the bid shall remain valid for the period specified in Clause 15.1
- (vi) An affidavit affirming the information has been furnished in the bidding document is correct to the best of his knowledge and belief.

Part II shall be named "Financial Bid" and shall comprise

- (i) Form of Bid as specified in section 6
- (ii) Priced Bill of Quantities for items specified in Section 7

12.2 Each part will be separately sealed and marked in accordance with the Sealing and Marketing Instructions in Clause 19.

12.3 Following documents, which are not submitted with the bid, will be deemed to be part of the bid.

Section	Particulars	Volume No.
1	Invitation for Bids (IFB)	Volume 1
2	Instruction to Bidders	
3	General Conditions of Contract	Volume – 1
3.1	NIT – IA	
3.3	General Rules & directions - IA	
3.4	Conditions of Contract – IA	
3.5	Clause of Contract – IA	
4.	Contract Data	
5.	Special Condition of Contract	Volume – II
6	Specifications	Volume III
9	Drawings	Volume IV

### 13. Bid Prices

13.1 The contractor shall bid for the whole work as described in Sub-Clause 1.1 based on the priced Bill of Quantities submitted by the Bidder.

13.1.1 The bidder shall adopt the percentage rate method as specified in the appendix to ITB; only the same option is allowed to all the bidders. Percentage rate method requires the bidder to quote a percentage above / at par of the rates specified in the appendix to ITB.

Corrections, if any needed, shall be made by crossing out, initialing, dating and rewriting.

13.1.2. All duties, taxes and other levies payable by the contractor under the contract as for any other cause shall be excluded in the rates, prices and total bid price submitted by the bidder.

13.2 The rates and the prices quoted by the bidder are subject to adjustment during the performance of the contract in accordance with the provisions clause 10CC Condition of Contract (if applicable).

13.3 The rate should include the cost of all seen and unseen expenditure, No Claim, whatsoever will be entertained due to non-inclusion of any such event necessary for the completion of the item of work.

### 14. Currencies of Bid and Payment

14.1 The units, rates and the price shall be quoted by the bidder entirely in Indian Rupees. All payments shall be made in Rupees.

### 15. Bid Validity

15.1 Bids shall remain valid for a period not less than 120 days after the deadline date for bid submission specification Clause 20. A bid valid for a shorter period shall be rejected by the Employer as non-responsive. In case of discrepancy in bid validity period between that given in the undertaking pursuant to Clause 12.1(v) and the Form of Bid submitted by the bidder, the latter shall be deemed to stand corrected in accordance with the former and the bidder has to provide for any additional security that is required.

15.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request that the bidders may extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing or by cable. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid.

## 16. Earnest Money

16.1 The Bidder shall furnish, as part of his Bid, a Bid security in the amount as shown in column 4 of the table of IFB for this particular work. This bid security shall be in favour of Employer, and shall be in any of the following forms: -

- a. Under Online mode EMD may be made through Internet payment gateway (Credit/ Debit card) Net Banking, NEFT/ RTGS.
- b. Under Physical mode/ Manual payment system, Earnest Money duly pledged/ endorsed to the **Executive Engineer, Irrigation Division, Baunsi** should be unconditional bank guarantee from any scheduled Indian bank issued within the state in the format given in Vol. III (If issued from any bank outside state will be Converted to any bank within the state before executing the agreement.)

16.2 Unconditional bank guarantees issued as surety for the bid shall be valid for 45 days beyond the validity of the bid.

16.3 Any bid not accompanied by an acceptable Bid Security and not secured as indicated in Sub-Clauses 16.1 and 16.2 above shall be rejected by the Employer as non-responsive.

16.4 The Earnest money of unsuccessful bidders will be returned within 28 days of the end of the bid validity period specified in Sub-Clause 15.1.

16.5 The Earnest money of the successful bidder will be discharged when the bidder has signed the Agreement and furnished the required Performance Security.

16.6 The Earnest money may be forfeited

- (a) if the Bidder withdraws the Bid after Bid opening during the period of Bid validity; -
- (b) if the Bidder does not accept the correction of the Bid Price, pursuant to Clause 26; or
- (c) in the case of a successful Bidder, if the Bidder fails within the specified time limit to

- (i) sign the Agreement; or
- (ii) furnish the required Performance Security.

**17. Alternative Proposals by Bidder**

**17.1** Bidders shall submit offers that fully comply with the requirements of the bidding documents, including the conditions of contract (including time for completion), basic technical design as indicated in the drawing and specifications. Conditional offer or alternative offers will not be considered further in the process of tender evaluation.

17.2 Conditional tender will be rejected forthwith.

**18. Format and Signing of Bid**

**18.1** Deleted.

**18.2** The Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder, pursuant to Sub-Clause 4.3. All pages of the bid where entries or amendments have been made shall be initialed by the person or persons signing the bid and a certificate of corrections must be given by the employer.

18.3 The Bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the bidder, in which case such corrections shall be initialed by the person or persons signing the bid.

**D. SUBMISSION OF BIDS (Only on website: [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in).)****19. Deleted**

**19.1** The technical bid and Financial bid will have to be uploaded on [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in)

- Technical Bid: To be opened on dated: 09.04.2025.  
(Only on website: [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in).)
- Financial Bid: Not to be opened except with the approval of Departmental Tender Committee on website: [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in).

19.2 Deleted.

19.3 Deleted.

19.4 Deleted

**20. Deadline for Submission of the Bids - dated: 08.04.2025 till 03:00 pm  
(Only on website: [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in).)**

- 20.1 Complete Bids (including Technical and Financial) must be received by the Employer at the address specified above not later than the date indicated in appendix. In the event of the specified date for the submission of bids have declared a holiday for the Employer, the Bids will be received up to the appointed time on the next working day.
- 20.2 The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 10, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

**21. Late Bids**

- 21.1 Any Bid received by the Employer after the deadline prescribed in Clause 20 will be returned unopened to the bidder.

	<b>E.</b>	<b>BID</b>	<b>OPENING</b>	<b>AND</b>
	<b>EVALUATION</b>			
<b>22.</b>	<b>Bid</b>	<b>Opening</b>	<b>(only</b>	<b>on</b>
			<b>website:</b>	<b>www.eproc2.bihar.gov.in.)</b>
22.1	Deleted.			
22.2	Deleted			
22.3	The Technical Bid shall be opened. The amount, form and validity of the Earnest money furnished with each bid will be announced. If the bid security furnished does not conform to the amount and validity period as specified in the Invitation for Bid (ref. Column 4 and paragraph 3), and has not been furnished in the form specified in Clause 16, the remaining technical bid and the financial bid will be returned to the bidder.			
22.4	(i) Subject to confirmation of the bid security by the issuing Bank, the bids accompanied with valid security will be taken up for evaluation with respect to the Qualification Information and other information furnished in Part I of the bid pursuant to Clause 12.1. (ii) After receipt of confirmation of the bid security, the bidder will be asked in writing (usually within 10 days of opening of the Technical Bid) to clarify or modify his technical bid, if necessary, with respect to any rectifiable defects. (iii) The bidders will respond in not more than 7 days of issue of the clarification letter, (iv) Immediately (usually within 3 to 4 days), on receipt of these clarifications the Evaluation Committee will finalize the list of responsive bidders whose financial bids are eligible for consideration.			
22.5	At the time of opening of "Financial Bid", the names of the bidders found responsive in accordance with Clause 22.4(iv) will be announced. The bids of only these bidders will be opened. The remaining bids will be returned to the bidders unopened. The responsive Bidder's names, the Bid prices, the total amount of each bid, any discounts, Bid Modifications and withdrawals, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening. Any Bid price or discount, which is not read out and recorded will not be taken into account in Bid Evaluation.			
22.6	In case bids are invited in more than one package, the order for opening of the "Financial Bid" shall be that in which they appear in the "Invitation For Bid".			
22.7	The employer shall prepare minutes of the Bid opening, including the information disclosed to those present in accordance with Sub-Clause 22.5.			
<b>23.</b>	<b>Process to be Confidential</b>			

23.1 Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced. Any effort by a Bidder to influence the Employer's processing of Bids or award decisions may result in the rejection of his Bid.

#### **24. Clarification of Financial Bids**

24.1 To assist in the examination, evaluation and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, including breakdowns of unit rates. The request for clarification and the response shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids in accordance with Clause 26.

24.2 Subject to sub-clause 24.1, no Bidder shall contact the Employer on any matter relating to his bid from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Employer, it should do so in writing.

24.3 Any effort by the Bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decisions may result in the rejection of the Bidder's bid.

#### **25. Examination of Bids and Determination of Responsiveness**

25.1 During detailed evaluation of "Technical Bids", the Employer will determine whether each Bid (a) meets the eligibility criteria defined in Clause 3 and 4; (b) has been properly signed; (c) is accompanied by the required securities and; (d) is substantially responsive to the requirements of the Bidding documents. During the detailed evaluation of the "Financial Bid", the responsiveness of the bids will be further determined with respect to the remaining bid conditions, i.e., priced bill of quantities, technical specifications, and drawings.

25.2 A substantially responsive "Financial Bid" is one which conforms to all the terms, conditions, and specifications of the Bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality or performance of the Works; (b) which limits in any substantial way, inconsistent with the Bidding documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids.

25.3 If a "Financial Bid" is not substantially responsive, it will be rejected by the Employer, and may not subsequent be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

#### **26. Correction of Errors**

- 26.1 "Financial Bids" determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:
- (a) where there is a discrepancy between the rates in figures and in words, the rate in words will govern; and
  - (b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.
- 26.2 The amount stated in the "Financial Bid" will be corrected by the Employer in accordance with the above procedure and the bid amount adjusted with the concurrence of the Bidder in the following manner:
- (a) If the Bid price increases as a result of these corrections, the amount as stated in the bid will be the "bid price" and the increase will be treated as rebate;
  - (b) If the bid price decreases as a result of the corrections, the decreased amount will be treated as the bid price. Such adjusted bid price shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount the Bid will be rejected, and the Earnest money may be forfeited in accordance with Sub-Clause 16.6(b).

## **27. Evaluation and Comparison of Financial Bids**

- 27.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Sub-Clause 25.2.
- 27.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:
- (a) making any correction for errors pursuant to Clause 26; or
  - (b) making an appropriate adjustment for any other acceptable variations, deviations.
- 27.3 The Employer reserves the right to accept or reject any variation or deviation. Variations and deviations and other factors, which are in excess of the requirements of the Bidding documents or otherwise result in unsolicited benefits for the Employer shall not be taken into account in Bid evaluation.
- 27.4 If the Bid of the successful Bidder is seriously unbalanced in relation to the Engineer's estimate of the cost of work to be performed under the contract, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require that the amount of the performance security set forth in Clause 31 be increased at the expense of the successful Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.
- 27.5 A bid in the opinion of employee which contains several items in the Bill of Quantities which are unrealistically priced high and which cannot be substantiated satisfactorily by the bidder,

may be rejected as non-responsive.

## F. AWARD OF CONTRACT

### 28. Award Criteria

28.1 Subject to Clause 29, the Employer will award the Contract to the Bidder whose Bid has been determined

- (i) to be substantially responsive to the Bidding documents and who has offered the highest evaluated Bid Price; and
- (ii) to be within the available bid capacity adjusted to account for his bid price which is evaluated the highest in any of the packages opened earlier than the one under consideration.

In no case, the contract shall be awarded to any bidder whose available bid capacity is less than the evaluated bid price, even if the said bid is the highest evaluated bid.

The contract will in such cases be awarded to the next highest bidder at his evaluated bid price.

**29. Employer's Right to Accept any Bid and to Reject any or all Bids** Notwithstanding Clause 28, the Employer reserves the right to accept or reject any Bid, and to cancel the Bidding process and reject all Bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the ground for the Employer's action.

### 30. Notification of Award and Signing of Agreement

30.1 The Bidder whose Bid has been accepted will be notified of the award by the Employer prior to expiration of the Bid validity period by cable, telex or facsimile confirmed by registered letter. This letter (hereinafter and in the General Conditions of Contract called the "Letter of Acceptance") will state the sum that the Employer will pay the Contractor in consideration of the execution, completion and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

30.2 The notification of award will constitute the formation of the Contract, subject only to the furnishing of the performance security in accordance with the provisions of Clause 31 and furnishing all documents mentioned in clause 12.3 after signing each and every pages accordingly.

30.3 The Agreement will incorporate all agreements between the Employer and the successful Bidder. It will be signed by the Employer and the successful Bidder, after the performance security is furnished.

### 31. Performance Security

31.1 Within 7 days of receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Employer a Performance Security in any of the forms given below for an amount equivalent 3% of the Contract price including earnest money plus additional security for unbalanced Bids in accordance with the Clause 27.4 of ITB and the provisions of Bihar Financial Rules.

This will be refundable as indicated below

- (i) After completion of 2.5 successful years - 20 % PG shall be refunded
- (ii) After completion of 5 successful years - 40 % cumulative PG shall be refunded
- (iii) After completion of 7.5 successful years - 60 % cumulative PG shall be refunded
- (iv) After completion of 10 successful years - 80 % cumulative PG shall be refunded
- (v) Rest 20% will be refunded after getting all clearances, no dues and contractor has removed /dispose off silt safely without affecting environment & ecology of surrounding

Additional Performance Security for unbalanced bids i.e. rate quoted below schedule rate will be as follows:-

- a) For quoted rate below estimated rate - Non Responsive Bid
  - i. For quoted rate 0 to 5% above
    - 0.25% extra for each one percent above
  - ii. For quoted rate 5% to 15% above
    - 0.50% extra for each one percent above
  - iii. For quoted rate 15% to 20% above
    - 1% extra for each one percent above
  - iv For quoted rate 20% above
    - 2% extra for each one percent above

For example :

- a. For quoted rate 3% above estimated rate  

$$\text{Additional performance security} = 3 \times 0.25 = 0.75\%$$
- b. For quoted rate 17% above estimated rate  

$$\text{Additional performance security} = 5 \times 0.25 + 10 \times 0.50 + 2 \times 1.0 = 8.25\%$$
- c. For quoted rate 25% above estimated rate  

$$\text{Additional performance security} = 5 \times 0.25 + 10 \times 0.50 + 5 \times 1.0 + 5 \times 2.0 = 21.25\%$$

31.2 If the performance security is provided by the successful Bidder in the form of a Bank Guarantee in the name of employer (as per Clause 2 (xii) of Schedule "F"), it shall be issued either (a) at the Bidder's option, by a Nationalized/ Scheduled Indian bank within state or (b)

acceptable to the Employer.

31.3 Failure of the successful Bidder to comply with the requirements of Sub-Clause 31.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security.

**32.0 Advance Payment and Security**

32.1 The Employer will provide an Advance Payment on the Contract Price as stipulated in the General Conditions of Contract, subject to maximum amount, as stated in the Contract Data.

**33.0 Corrupt or Fraudulent Practices**

33.1 The Employer will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question and will declare the firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract with WRD, GoB and any other agencies, if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for the contractor, or in execution.

33.2 Furthermore, Bidders shall be aware of the provision stated in Sub-Clause and Sub-Clause 14 of the General Conditions of Contract.

1. Name of the Employer : Executive Engineer,  
Irrigation Division, Baunsi
2. The last five years means for this tender
 

2023	-	2024
2022	-	2023
2021	-	2022
2020	-	2021
2019	-	2020
3. The required annual financial turnover amount in Dredging/ Desiltation works is Rs. 3768.00 Lakhs {Cl. 4.5A(a)}
4. Value of similar work {Cl. 4.5A(b)}

Bidder should have satisfactorily completed atleast one similar work (Desiltation work through dredging in Dam /Reservoir / Barrages / lakes) of value not less than 10% of estimated value of contract (Rs. in Lakhs)	753.60
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5. Minimum Quantities of work are : {Cl. 4.5A(c)}

Items	Unit	Quantity
(a) Dredge material quantity (sand, silt, etc.)	MCM	1.283
(b) Experience of selling dredged material (sand, silt, etc.)	Rs. (in Lakhs)	753.60

6. Liquid assets and/or availability of credit facilities : 1884.00 Lakh {Cl. 4.5B(c)}
7. Price level of the financial year : 2024-25. (Cl. 4.7)
8. The pre-bid meeting will take place at 01.04.2025 At 03:00 PM Conference Hall, Sinchai Bhawan, Patna. (Cl. 9.1.2)
9. The technical bid will be opened on 09.04.2025 at 03:30 PM Only on website (www.eproc2.bihar.gov.in)
10. Address of the Employer :  
Executive Engineer, Irrigation Division, Baunsi (Cl.4.5A)
11. Identification : (Cl. 19.2b)

**Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.**

12. Bids may be submitted only in percentage rate method and will be awarded to the highest bidder.
14. The bid should be submitted latest by 08.04.2025 at 15:00 hours.  
(only on website: <https://eproc2.bihar.gov.in>) (Cl. 20.1)
15. The bid will be opened at : 03:30 PM on 09.04.2025  
(only on website: <https://eproc2.bihar.gov.in>)
16. The Earnest Money in favour of :  
Executive Engineer, Irrigation Division, Baunsi (Cl. 31.1)
17. Escalation factors (for the cost of works executed and financial figure to a common base value for works completed)
- | Year before | Multiply factor |
|-------------|-----------------|
| One         | 1.08            |
| Two         | 1.17            |
| Three       | 1.26            |
| Four        | 1.36            |
| Five        | 1.47            |
18. Bid will be submitted in percentage rate.

## Annexure-I

**LIST OF KEY PLANT & EQUIPMENT TO BE DEPLOYED ON SITE**

(Reference Cl. 4.5 (B) (a))

Type of Equipment Required	Quantity	Max. Age (in years)
Cutter Suction Dredger CSD of minimum Cutter Power 250KW	2 No.	15
Tug boat of minimum engine capacity - 250 HP	2 No.	15
HDPE Pipeline of minimum diameter 500 mm	2 km	10
Survey Vessel equipped with Multi-beam echosounder, Altimeter for facilitating the measurement of depth & width of the channel.	2 No.	5
Accommodation Boats (to accommodate operational staff)	2 No.	10
Tractor/Tipper/Dumper	10 No.	6
Silt Curtain	2 No.	10

## Annexure – II

**List of Key Personnel to be deployed on Contract Work  
[Reference Cl. 4.5 (B) (b)]**

Personnel/Qualification	Requirement (Nos.)
Project Manager - BE Civil + 10 years experience in dredging project (07 years as manager). The age of the personnel as on the date of bid submission shall not be more than 50 years.	1
Surveyor – Diploma and or SR I/II/III in hydrographic survey.	2
Crew – Must have inland vessel certification.	8
Dredger Master - Valid license / certificate from IWT / relevant marine institution and with 5 yrs of dredging experience	2
Environment Expert - Graduate in Environmental Engineering / Environmental Sciences with 5 years of relevant experience.	1
Health & Safety Expert - Graduate in Engineering/ Sciences and must have Diploma / Certification in Health and Safety with 03 years of relevant experience.	1
Social Expert - Graduate or equivalent in Social Sciences with 03 years of relevant experience.	1

**Quality Requirements**

1.	Valid Quality Management Certificate ISO 9001-2008/2015 issued by the International Organization for Standardization
2.	Valid Occupational Health and Safety Assessment Series (OHSAS) 18001 / 45001 issued by the International Organization for Standardization and experience in occupational health and safety management
3.	Valid Environmental management certificate ISO 14001: 2004/2015 issued by the International Organization for Standardization and experience with environmental management systems

**SECTION 2**  
**QUALIFICATION INFORMATION**  
(to be filled in by Bidder)

## QUALIFICATION INFORMATION

The information to be filled in by the Bidder in the following pages will be used for purposes of post qualification as provided for in Clause 4 of the Instructions to Bidders. This information will not be incorporated in the Contract.

1. For individual Bidders

1.1 Constitution or legal status of Bidder  
(Attach copy)

Place of registration :

Principal place of business :

Power of attorney of signatory of Bid (Attach)

1.2 Total value of **dredging / desilting work** performed in the last five years (in Rs. Lakh):

2019	2020 <sup>***</sup>
2020	2021
2021	2022
2022	2023
2023	2024

1.3.1 Work performed as prime contractor, work performed in the past as a nominated sub-contractor will also be considered provided the sub-contract involved execution of all main items of work described in the bid document, provided further that all other qualification criteria are satisfied (in the same name) on works of a similar nature over the last five years<sup>\*\*</sup> and upto last day of preceding month of last date of tender receipt (in light of ENC cum additional commissioner cum special Secretary, R.C.D. Bihar Patna's letter No. 2863(E) dated 07.06.2017)

Project Name	Name of the Employer	Description of work	Contract No.	Value of Contract (Rs. In Crores)	Date of issue of work order	Stipulated period of completion	Actual date of completion*	Remarks explaining reasons for delay & work completed)

\* Attach certificate(s) from the Engineer(s)-in-Charge

\*\* Immediately preceding the financial year in which bids are received.

\*\*\* Attach certificate from Chartered Accountant.

#1.3.2 Quantities of work executed as prime contractor, work performed in the past as a nominated sub-contractor will also be considered provided the sub-contract involved execution of all main items of work described in the bid document, provided further that all other qualification criteria are satisfied (in the same name and style) in the last five years: \*\*

Year	Name of the work	Name of the Employer*		
			Dredge material quantity (sand, silt, etc.)	Experience of selling dredged material (sand, silt, etc.)
2019-20				
2020-21				
2021-22				
2022-23				
2023-24				

1.4 Information on Bid Capacity (works for which bids have been submitted and works which are yet to be completed) as on the date of this bid.

(A) Existing commitments and on-going works

Description of works	Place & State	Contract No.	Name & Address of Employer	Value of Contract (rs. Cr.)	Stipulated Period of Completion	Value of works* of remaining to be completed (Rs. Cr)	Anticipated date of completion
1	2	3	4	5	6	7	8

\* Attach certificate(s) from the Engineer(s)-in-Charge

@ The item of work for which data is requested should tally with that specified in ITB clause 4.5A (C)

\*\* Immediately preceding the financial year in which bids are received.

# Delete, if pre qualification has been carried out.

## (B) Works for which bids already submitted:

Description of works	Place & State	Name & Address of Employer	Estimated value of works (Rs. In Cr)	Stipulated period of completion	Date when decision is expected	Remarks, if any



1.6 Qualifications and experience of key personnel required for administration and execution of the Contract (Ref. Clause 4.5 (B) (b)). Attach biographical data. Refer also to Sub Clause 4.3 (e) of instructions to Bidders and concerned Clause of the Conditions of Contract.

Position	Name	Qualification	Year of Experience (General)	Years of experience in the proposed position
Project Manager				
Etc.				

1.7 Proposed sub-contracts and firms involved. (Refer ITB Clause 4.3(k))

Sanction of the works	Value of Sub- contract	Sub-contractor (Name & Address)	Experience in similar work
1	2	3	4

Attach copies of certificates on possession of valid license for executing water supply/ sanitary work/ building electrification works (reference Clause 4.5(d) & Clause 4.5(e)).

\*1.8 Financial reports for the last five years: balance sheets, profit and loss statements, auditor’s reports (in case of companies/ corporation), etc. List them below and attach copies.

\* Delete, if pre qualification has been carried out.

1.9 Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List them below and attach copies of support documents.

1.10 Name, address and telephone, telex and fax numbers of the Bidder’s bankers who may provide references if contacted by the Employer.

1.11 Information on litigation history in which the Bidder is involved.

Other Party(ies)	Employer	Cause of Dispute	Amount involved	Remarks who wing present status

1.12 Statement of compliance under the requirements of Sub Clause 3.2 of the instructions to Bidders. (Name of Consultant engaged for project preparation is \*\* .....

1.13 Proposed work method and schedule. The Bidder should attach descriptions, drawings and charts as necessary to comply with the requirements of the Bidding documents. (Refer ITB Clause 4.1 & 4.3(1)).

1.14 Programme

- 1.15 Quality Assurance Programme
- 2. Additional Requirements
- 2.1 Bidders should provide any additional information required to fulfill the requirements of clause 4 of the Instructions to the Bidders, if applicable.
  - i. Affidavit
  - ii. Undertaking
  - \*\*\* iii. Update of original prequalification application
  - \*\*\* iv. Copy of original prequalification application
  - \*\*\* v. Copy of pre-qualification letter.
  - \*\* Fill the name of consultant
  - \*\*\* Delete, if prequalification has not been carried out.

**SAMPLE FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT FACILITIES**

(CLAUSE 4.2(I) OF ITB)

**BANK CERTIFICATE**

This is to certify that M/s \_\_\_\_\_  
is a reputed company with a good financial standing.

If the contract for the work, namely \_\_\_\_\_  
Is awarded to the above firm, we shall be able to provide overdraft/ credit facilities to the extent of Rs.  
\_\_\_\_\_ to meet their working capital requirements for executing to the above  
contract during the contract period.

Signature  
Name of Bank  
Senior Bank Manager  
Address of the Bank.

## AFFIDAVIT

1. I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct and correct and if found fake/forged, the undersigned will be liable for infliction upon the FIR and lawful punishment as well as black listing.
2. The undersigned also hereby certifies that neither our firm M/s \_\_\_\_\_  
\_\_\_\_\_ has been blacklisted nor has abandoned any work in any government department, India nor any contract awarded to us for such works have been rescinded, during last five years prior to the date of this bid.
3. The undersigned hereby authorizes and request(s) any bank, person, firm or corporation to furnish pertinent information deemed necessary and requested by the Department to verify this statement or regarding my (our) competence and general reputation.
4. The undersigned understand and agrees that further qualifying information may be required, and agrees to furnish any such information at the request of the Department project implementing agency.
5. The undersigned also hereby certifies that our firm M/s..... is not able to disqualify under the provisions made in Clause 3.3 & 4.8 of ITB under Section (1) of SBD.
6. I, the undersigned do hereby undertake that our firm M/s ..... would invest 100% of the value of the work during implementation of the contract.

(Signed by an Authorized Officer of the Firm)

Title of Officer

Name of Firm

Date :

## UNDERTAKING

I, the undersigned do hereby undertake that our firm M/s \_\_\_\_\_  
\_\_\_\_\_ would invest a minimum cash of  
100% of the value of the working during implementation of the Contract.

(Signed by an Authorized Officer of the Firm)

Title of Officer

Name of Firm

Date:

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**SECTION 3**  
**GENERAL CONDITIONS OF CONTRACT**

## GENERAL GUIDELINES

1. The book of General Conditions of Contract is applicable to both types of tenders i.e., “Percentage rate tenders” and “Item rate tenders”. Accordingly, alternative provisions for conditions No. 4. The appropriate alternatives will be applicable in specific cases depending on whether this is used for percentage rate tender (P.W.D.-2) or item rate tender (P.W.D.-3).
2. P.W.D.-1, schedules A to F, special conditions/ specifications and drawing only will be issued to be drawn and signed by both parties after acceptance of tender.
3. All banks are confined to Notice Inviting Tender (P.W.D.-1) and schedules A to F.
4. Authority approving the Notice Inviting Tender (NIT) shall fill up all the banks in P.W.D.-6 and in Schedules B to F before issue of Tender Papers.
5. The intending bidders will quote their rates in Schedule A.
6. The Performa for registers and Schedules A to F are only for information and guidance. These are not to be filled in the Standard Form. The Schedules with all blanks, duly filled shall be separately issued to all intending tenderers.

**GOVERNMENT OF BIHAR**  
**Irrigation Division, Baunsi**  
**WATER RESOURCES DEPARTMENT**  
**NOTICE INVITING TENDER NO. 03/ 2024-25**

1. **The Executive Engineer, Irrigation Division, Baunsi** on behalf of Governor of Bihar invites percentage rate bids from the eligible and approved contractor registered with any State Government or Central Govt. or any PSU or an Agency of National repute for the following

Group No	Name of work	Estimated Revenue Amount (in Lakh)	EMD (Payable in Online/ Physical/ Manual Mode) (In Rs.)	Time allowed for completion	Last date and time for receipt of bid	Time and date of opening of tender (Technical bid)	Place of sale and submission of tender
1	3	4	5	6	7	8	9
1.	<b>Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.</b>	<b>7536.00</b>	<b>85,36,000.00</b>	<b>120 Months</b>	<b>Dated 08.04.2025 up to 03:00 PM</b>	<b>Dated 09.04.2025 at 03:30 PM</b>	Through website <a href="http://www.eproc2.bihar.gov.in">www.eproc2.bihar.gov.in</a>

**Criteria of eligibility for issue of tender document**

- Issue of Tender to any Contractor registered with Central Government/ any State Government or any PSU or an agency of national repute may be permitted without the registration. However, registration with the concerned works department will be essential after issue of L.O.A. (Letter of Acceptance)  
 Following documents duly attested by gazetted officer and photocopies are required at the time of submission of bid (In case of other State PWD/CPWD/ any PSU eligible contractors or Agencies of National repute following documents (from a to c) have to be submitted after letter of acceptance).  
 (a) Registration paper (renewed) of appropriate class and deptt.  
 (b) Power of attorney/ partnership deed/ MoU of private limited company.  
 (c) Tools & plants ownership / long term lease certificate for 10 years required in aforesaid work duly verified from Divisional Engineer/other State Govt. Deptt. as PWD/CPWD Contractor will provide definite proof from appropriate authority for tools & Plant and Undertaking to install it on works site after getting letter of acceptance.
- Agreement shall be drawn with the successful tenderer on prescribed SBD PWD Form-2/3 which is available as Govt. of Bihar Publication, Tenderer shall quote his rates as overall percentage above/at par with the rate of B.O.Q. and conditions of the said form which will form part of the agreement.
- The amount of Estimated Cost or B.O.Q. amount of the work may vary.
- The Earnest money will be applicable on sanctioned cost of B.O.Q.
- The Time allowed for carrying out the work within 120 months in accordance with the phasing if

any indicated in the tender documents.

6. The site for the work is available as per approved schedule by the Department.
7. The receipt of applications for issue of forms only on website: [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in).  
Tender documents consisting of plans, specifications, the schedule of quantities of the various classes of work to be done and the set of terms & conditions of contract to be complied with by the contractor whose tender may be accepted and other necessary documents can be seen on website: [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in). and will be issued only on website: [www.eproc2.bihar.gov.in](http://www.eproc2.bihar.gov.in).:  
(I) Bid processing fee and cost of B.O.Q. (Non refundable) is mandatory to be paid through online mode (e-payment mode) i.e. payment Gateway (Credit/Debit card), Net Banking, NEFT/RTGS in E-Tendering/E-Procurement system.  
EMD will be acceptable either online mode (e-payment mode) or Physical mode/manual payment system under e-tendering/e-procurement system. Under online mode EMD may be made through Internet payment Gateway (Credit/Debit card), Net Banking, NEFT/RTGS. Under Physical mode/Manual payment system, Earnest money duly pledged / endorsed to **Executive engineer, Irrigation Division, Baunsi.**
8. The contractor shall be required to deposit requisite amounts as performance guarantee including earnest money in the form of Bank guarantee.
9. The description of the work is as follows:- **Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.**
  - Copies of other drawings and documents pertaining to the works will be open for inspection by the tenderers at the office of the above mentioned officer.
  - Tenderer are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the ground and sub soil (so far as is practicable), the form and nature of the site, the means of access to the site the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender.
  - A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed.
  - The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Govt. and local conditions and other factors having a bearing on the execution of the work.
10. Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.
11. The competent authority on behalf of Governor of Bihar reserves to himself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.

12. The contractor shall not be permitted to tender for works in the Irrigation Division, Baunsi (responsible for award and execution of contracts) in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Assistant Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the WRD. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
13. No Engineer of Gazetted rank or other Gazetted officer employed in Engineering or administrative duties in an Engineering Department of the Government of Bihar is allowed to work as a contractor for a period of two years after his retirement from Government service, without the previous permission of the Government of Bihar in writing. The contract is liable to be cancelled if either the contractor or any of his employee is found any time to be such a person who had not obtained the permission of the Government of Bihar as aforesaid before submission of the tender or engagement in the contractor's service.
14. The tender for the works shall remain open for acceptance for a period of 120 days from the date of opening of tenders. If any tenderer withdraws his tender before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 100% of the said earnest money as aforesaid.
15. The Department has right to cancel or postponed any work without giving any notice or clarification.
16. The Department may add or delete any of the condition required for execution of any work.
17. This Notice Inviting tender shall form a part of the contract document. The successful tenderer/contractor, the competent Authority, shall issue the letter of acceptance and will sign the contract within 15 days after submitting the performance guarantee:
  - a. The notice inviting tender, all the documents including additional conditions specifications and drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
  - b. Standard SBD Form-2.
18. The bidder/Tenderer shall be bearing all cost associated with preparation and submission of his bid, and the employer will in no case be responsible and liable for those cost including commission on bank guarantee etc. In case of cancellation of tender cost of bidding document will be charged each time.
19. Any condition or directions imposed by WRD. Govt. of Bihar will be treated as automatically transferred to the agency/contractor.
21. Contractor will have to submit affidavit as annexed in SECTION-2 sample format.

**Executive Engineer,  
Irrigation Division, Baunsi**

**GOVERNMENT OF BIHAR  
WATER RESOURCES DEPARTMENT**

STATE - BIHAR, CIRCLE – IRRIGATION CIRCLE, BHAGALPUR  
DEPARTMENT – WATER RESOURCES DEPARTMENT  
DIVISION – Irrigation Division, Baunsi

**WING SUB-DIVISION**

**Percentage Rate Tender & Contract for Works**

Tender for the work of :- **Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.**

- (i) To be submitted by 15:00 hours on 08.04.2025 only on website:www.eproc2.bihar.gov.in
- (ii) To be opened in presence of tenders who may be present at 15:30 hours on 09.04.2025 only on website: www.eproc2.bihar.gov.in.

Issued to : .....

**TENDER**

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F. Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the Governor of Bihar within the time specified in Schedule “F”, viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule- 1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provide for, by, and in respect in accordance with, such conditions so far as applicable.

We agree to keep the tender open for one hundred twenty (120) days from the due date of submission thereof and not to make any modifications in its terms and conditions.

A sum of Rs ..... lakhs have been deposited as Bank guarantee of a scheduled bank as earnest money. If I/we, fail to furnish the prescribed performance guarantee within prescribed period, I/we agree that the said Governor of Bihar or is successors in office shall without prejudice to any other right of remedy, be at liberty to forfeit the said earnest money absolutely. Further, if/we fail to commence work as specified, I/we agree that Governor of Bihar or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, up to maximum of the percentage mentioned in Schedule “F” and those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

I/we hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there

from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated .....

Signature of Contractor  
Postal Address

Witness:

Address:

Occupation:

## ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the Governor of Bihar for a sum of Rs..... (Rupees.....)

The letters referred to below shall form part of this contract Agreement: -

- a)
- b)
- c)

For & on behalf of the Governor of Bihar,

Signature.....

Dated .....

**GOVERNMENT OF BIHAR  
ALL WORKS DEPARTMENT**

**GENERAL RULES & DIRECTIONS**

1. All work proposed for execution by contract will be notified in a form of invitation to tender pasted in public places and signed by the officer inviting tender or by publication in News papers and the internet as the case may be.

This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender, and the amount of the security deposit to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the officer inviting tender shall also be open for inspection by the contractor at the office or officer inviting tender during office hours.

2. In the event of the tender being submitted by a firm, it must be signed separately either by one or all the partners of person duly authorized by the partners, it must be signed on behalf of the firm by a person holding the requisite authorizations, such authorizations to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952.
3. Receipts for payment on account of work done, when executed by a firm, must also be signed by one or all the partners or a duly authorized signatory of the firm.

**APPLICABLE FOR PERCENTAGE RATE TENDER ONLY (PWD-2)**

- 4A. In case of Percentage Rate Tenders, tenderer shall fill up the usual printed form, stating at what percentage above / at par (in figures as well as in words) the total estimated revenue given in Schedule of Quantities at Schedule-A, he will be willing to execute the work Tenders, which propose any alteration in the work specified in the said form of invitation tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, will be liable to rejection. No single tender shall include more than one work but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelope.
5. The officer inviting tender or his duly authorized assistant, will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amount of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money forwarded therewith shall thereupon be given to the contractor who shall thereupon for the purpose of identification sign copies of the specifications and other documents mentioned in Rule-I. In the event of a tender being rejected, the earnest money forwarded with such unaccepted tender shall thereupon be returned to contractor remitting the same, without any interest.
6. The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the highest or any other tender.

7. The receipt of an accountant or clerk for any money paid by the contractor will not be considered as an acknowledgement or payment to the officer inviting tender and the contractors shall be responsible for seeing that he procures a receipt signed by the office inviting tender or a duly authorized person.
8. The memorandum of work tendered for and the schedule of materials to be supplied by the department and their issue-rates, shall be filled and completed in the office of the officer inviting tender before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and incomplete, he shall request the officer to have this done before he completes and delivers his tender.  
For works of sensitive nature the tenderers shall sign a declaration under the Official Secrets Act 1923, for maintaining secrecy of the tender documents drawing or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawing given to them.

#### **APPLICABLE FOR PERCENTAGE RATE TENDER ONLY (PWD-2)**

9. In case of Percentage Rate Tenders only percentage quoted shall be considered. Any tender containing item rates is liable to be rejected. Percentage quoted by the contractor in percentage rate tender shall be accurately filled in figures and words, so that there is no discrepancy. However, if the contractor has worked out the amount of the tender and if any discrepancy is found in the percentage quoted in words and figures, the percentage which corresponds with the amount worked out by the contractor shall, unless otherwise proved, be taken as correct. If the amount of the tender is not worked out by the contractor or it does not correspond with the percentage written either in figures or in words, then the percentage quoted by the contractor in words shall be taken as correct. Where the percentage quoted by the contractor in figures and in words tally but the amount is not worked out correctly, the percentage quoted by the contractor will, unless otherwise proved, be taken as correct and not the amount.
10. In the case of any tender where unit rates of any item/items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation such a tender is liable to be disqualified and rejected.

#### **APPLICABLE FOR PERCENTAGE RATE TENDER ONLY (PWD-2)**

11. In percentage Rate Tender, the tenderer shall quote percentage above / at par (in figures as well as in words) at which he will be willing to execute the work. He shall also work out the total amount of his offer and the same should be written in figures as well as in words in such a way that no interpolation is possible. In case of figures, the word "Rs." should be written before the figure of rupees and word P after the decimal figures, e.g., "Rs 2.15 P and in case of words, the word "Rupees" should precede and the word "paise" should be written at the end.
12. (i) The contractor whose tender is accepted, will be required to furnish performance guarantee of 2 (two percent) including earnest money of the tendered amount within specified period. This guarantee shall be in the form of Govt. Securities or fixed deposit receipt of any scheduled bank, guarantee bonds of any scheduled bank or State Bank of India or Bank guarantee from any schedule bank in the State for works of more than one crore.  
(ii) The contractor whose tender is accepted, will also be required to furnish by way of Security

Deposit for the fulfillment of his contract, an amount equal to 8% of the tendered value of the work. The security deposit will be collected from the running revenue receipts of the contractor at the rates mentioned above.

13. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instruction from the Engineer-in-Charge shall be communicated in writing to the Engineer-in-Charge.
14. GST, purchase tax, turnover tax, service tax, entry tax, royalty or any other tax on material in respect of this contract shall be payable by the Contractor and Government will not entertain any claim whatsoever in respect of the same.
15. The contractor shall give a list of both gazetted and non-gazetted P.W.D. employees related to him posted in the division, if any.
16. The tender for the work shall not be witnessed by a contractor or contractors who himself/themselves has/have tendered or who may and has/have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tenders, liable to summary rejection.
17. The contractor shall submit list of works which are in hand (progress) in the following form: -

Name of work	Name and Particular of Div. Where work is being executed	Value of work	Position of work in Progress	Remarks
1	2	3	4	5

18. The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the Superintending Engineer/Executive Engineer may in his discretion without prejudice to any other right or remedy available in law cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

## CONDITIONS OF CONTRACT

### Definitions:

1. The contract means the document forming the tender and acceptances thereof and the formal agreement executed between the competent authority on behalf of the Governor of Bihar and the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time-to-time form one contract and shall be complementary to one another.
2. In the contract, the following expressions shall, unless the context otherwise requires have the meanings, hereby respectively assigned to them
  - (i) The expression works or work shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.
  - (ii) The site shall mean the land/or other places on. into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
  - (iii) The Contractor shall mean the individual, firm or company, whether incorporate or not, undertaking the works and shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.
  - (iv) The Engineer-in-Charge means the Engineer officer who shall supervise and be in-charge of the work and who shall sign the contract on behalf of the Governor of Bihar as mentioned in Schedule "F" hereunder.
  - (v) Government or Government of Bihar shall mean the Governor of Bihar.
  - (vi) Excepted Risks are risks due to riots (other than those on account of contractor employees), war (whether declared or not), invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, any act of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority Provided that the contractor is also to show that he has taken all due precautions to avoid / minimize any adverse after / damage from the above or causes solely due to use or occupation by Government of the part of the works in respect of which a certificate of completion has been issued or a caused solely due to Government's

faulty design of works.

- (vii) Bill of quantity means the price and completed Bill of Quantities forming part of the Bid.
- (viii) The intended completion date is the time intended to complete the work by the contractor.
- (ix) The start date is given in the contract data. It is the date when the contractor shall commence execution of the works. It does not necessarily coincide with any of the site possession date.
- (x) A sub contractor is a person or corporate body who has a contract with the contractor to carry out a part of the construction work in the contract, which includes work on the site.
- (xi) Temporary works are works designed, constructed, installed and removed by the contractor that are needed for construction or installation of the works.
- (xii) Market Rate shall be the rate as decided by the competent authority on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule "F" to cover, all overheads and profits.
- (xiii) Schedule(s) referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Government mentioned in Schedule "F" hereunder, with the amendments thereto issued up to date of receipt of the tender.
- (xiv) Department means any department of Government of Bihar, which invite tenders on behalf of Governor of Bihar as specified in schedule "F".
- (xv) Specifications means the specifications followed by relevant department of the Government of India / State Government.
- (xvi) Tender value means the value of the entire work as stipulated in the letter award.
- (xvii) Approved means approval in writing by competent authority of the Deptt. W.R.D.
- (xviii) Engineer-in-Chief means Engineer-in-Chief, Irrigation Creation. W.R.D, Sinchai Bhawan, Patna or another Engineer-in-Chief duly notified in future by WRD, GoB.
- (xix) Chief Engineer means concerned Chief Engineer, Irrigation Creation W.R.D. Bhagalpur or any other Chief Engineer duly notified in future by the Department Chief Engineer shall be Technical or Administrative head of the project.
- (xx) Drawing means the drawings referred to in the specifications, any modification of such drawings approved in writing by the superintending Engineer and such other drawings as may from time to time be furnished

or approved in writing by the concerned superintending Engineer.

- (xxi) Superintending Engineer means the Superintending Engineer, Irrigation Circle, Bhagalpur who is the technical and Administrative head of the circle in which this work on part of work lies and in future any other to be duly notified by W.R.D.
- (xxii) Executive Engineer means the Executive Engineer, **Irrigation Division, Baunsi** who is the technical and administrative head of the division in which the work lies and in future any other Executive Engineer to be duly notified by the department.

### **Scope and Performance**

3. Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
4. Heading and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
5. The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications, Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.

### **Works to be carried out :**

6. The work to be carried out under the Contract shall, except as otherwise provided these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of Quantities (Schedule - A) shall unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.

### **Sufficiency of Tender**

7. The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of Quantities,

which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.

### **Discrepancies and Adjustment of Errors**

8. The several documents forming the contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General Conditions.
- 8.1 In the case of discrepancy between the schedule of Quantities, the Specifications and/or the Drawings, the following order of preference shall be observed :-
  - i) Description of Schedule of Quantities.
  - ii) Particular Specification and Special Condition, if any
  - iii) Drawings.
  - iv) MORT&H specification.
  - v) Indian Standard Specifications of B.I.S.
- 8.2 If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.
- 8.3 Any error in description, quantity or rate in Schedule of Quantities or any omission there from shall not vitiate the Contract or release the Contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.

### **Signing of Contract**

9. The successful tenderer/contractor, after submitting the performance guarantee i.e. within 7 days of receipt of letter of acceptance shall attend the office of the Engineer-in-Charge for authentication signing and completion of the contractor document and execute the agreement consisting of :-
  - i) the notice inviting tender, all the documents including drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
  - ii) Standard P.W.D. Form as mentioned in Schedule 'F' consisting of: Various standard clauses with corrections up to the date stipulated in Schedule "F" along with annexure thereto.

## **CLAUSE OF CONTRACT**

### **CLAUSE 1      Performance Guarantee**

- (i) The contractor shall submit an irrevocable PERFORMANCE GUARANTEE of 3% (Three percent) of the tendered amount including earnest money in the shape as mentioned in the Bihar Financial Rules or Bank Guarantee (for work costing more than one crore) or any other deposits mentioned for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in scheduled 'F' from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in-Charge up to a maximum period as specified in schedule 'F' on written request of the contractor stating the reason for delays in procuring the Bank Guarantee, to the satisfaction of the Engineer-in-Charge. This guarantee shall be in the form of N.S.C. of Post Office/ Pledged in favour of EXECUTIVE ENGINEER, Irrigation Division, Baunsi; D.D. of any Scheduled Bank or State Bank of India or Bank Guarantee (for work costing more than Rupees one Crore).
- (ii) **The performance Guarantee shall be initially valid upto 60 days beyond the duration of work.**
- (iii) The Engineer-in-Charge shall not make a claim under Performance guarantee except for amounts to which the Governor of Bihar is entitled under the contract (notwithstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:
- (a) Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance guarantee
- (b) Failure by the contractor to pay Governor of Bihar any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions of the agreement, within 30 days of the service of notice to this effect by Engineer-in Charge.
- (iv) In the event of the contract being determined or rescinded under provisions of any of the clause/condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Governor of Bihar.

**CLAUSE 3                      When Contract can be determined/ Rescinded**

Subject to the other provisions contained in this clause the Engineer-In-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

- i) If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un workman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter.
- ii) if the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wind up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.
- iii) if the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date of completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.
- iv) If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge.
- v) if the contractor persistently neglects to carry out his obligations under the contract and/or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.

- vi) If the contractor commits any acts mentioned in Clause 21 hereof:
- vii) If the work is not started by the contractor within 1/8<sup>th</sup> of the stipulated time subject to the maximum of 15 days.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the Governor of Bihar shall have powers:

- a) To determine or rescind the contract as aforesaid (of which termination or rescission notice in writing to the contractor under the hand of Engineer-in-Charge shall be conclusive evidence). Upon such determination or rescission, the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the Government.
- b) After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof as shall be un-executed out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined or rescinded as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above course(s) being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

### **CLAUSE 3A**

In case, the work cannot be started due to reasons not within the control

of the contractor as decided by Chief Engineer within 1/4th of the stipulated time for completion of work, either party may close the contract. In such eventuality, the Earnest Money deposit and the Performance Guarantee of the contractor shall be refunded, but no payment on account of interest, loss of profit or damages etc. shall be payable at all. The reasons shall be examined by the Superintending Engineer and his decision shall be final and binding.

**CLAUSE 4      Contractor Liable to pay compensation even if action not taken under Clause-3**

In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause- thereof, shall have become exercisable and the same are not exercised the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work, or any part thereof, paying or allowing for the same in account at the contract rates or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses

of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.

## **CLAUSES 5      Time and Extension for Delay**

The time allowed for execution of the Works as specified in the Schedule 'F' or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in letter of acceptance or from the date of handing over of the site whichever is later. If the Contractor commits default in commencing the execution of the work as aforesaid, Government shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the performance guarantee absolutely.

- 5.1 As soon as possible after the contract is concluded the Contractor shall submit a Time & Progress Chart for each milestone and get it approved by the Department. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the work. It shall indicate the forecast of the dates of commencement and completion of various trades or sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and Contractor within the limitations of time imposed in the contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs for which a separate Programme has been agreed upon) complete the work as per milestone given in schedule 'F'.
- 5.2 If the work(s) be delayed
- by.
- i) force majeure, or
  - ii) Serious loss or damage by fire, or
  - iii) Civil commotion, local.
  - iv) delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the Contract, or
  - v) non-availability of stores, which are the responsibility of

Government to supply or

- vi) non-availability or break down of tools and Plant to be supplied or supplied by Government or
- vii) any other cause which, in the absolute discretion of the authority mentioned in Schedule 'F' is beyond the Contractor's control.

then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.

- 5.3 The basic centerlines, reference points and benchmarks will be fixed by the department. The contractor shall be established at his own cost at suitable points, additional reference lines and bench marks as may be necessary and instructed by the engineer-in-charge. The contractor shall remain responsible for the sufficiency and accuracy of all the bench marks and reference lines.

#### **CLAUSE 5A Minutes of Meeting**

The Engineer may require the contractor to attend a progress review meeting during execution of work.

The Engineer shall record the minutes of the meeting and provide a copy to the Contractor for compliance. These minutes will be a part of evidence in case of any request for extension of time or impunities action against the contractor.

#### **CLAUSE 6 Measurement of work done**

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine quantity and the value in accordance with the contract of work done. All measurement of all items having financial value shall be entered in Measurement Book and/or level field book so that a complete record is obtained of all works perform under the contract.

All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the contractor or his authorized representative at least once in a month during the progress of the work and such measurements shall be signed and dated by the Engineer-in-Charge and the contractor or their representatives in token their acceptance. If the contractor objects to any of the measurements

recorded, a note shall be made to that effect with reason and signed by both the parties for any reason the contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the Department shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor.

The contractor shall, without extra Charge, provide all assistance with every appliance labour and other things necessary for measurements and recording levels.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of India Standards and if for any item no such standard is available then a mutually agreed method as approved by the department. shall be followed.

The contractor shall give not less than seven days notice to the Engineer-in-Charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimension thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach

of measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing the same shall be uncovered at the contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the department to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement defects noticed till completion of the defects liability period.

#### **CLAUSE 8                    Completion Certificate and Completion Plan**

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within fifteen days of the receipt of such notice the Engineer-in-Charge shall inspect the work and if there is no defect in the work shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of execution thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the

requirements of this clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding surplus materials and rubbish etc. and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

**CLAUSE 8A                    Contractor to keep site clean**

When the annual repairs and maintenance of works are carried out, the splashes and droppings from white washing, color washing, painting etc. on walls, floor, windows etc. shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. where the work is done without waiting for the actual completion of all the other items of work in the contract. In case the contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor either departmentally or through any other agency. Before taking such action, the Engineer-in-Charge shall give ten days notice in writing to the contractor.

**CLAUSE 8 B                    Completion Plan to be submitted by the contractor**

The contractor shall submit completion plan as required vide General Specifications for Electrical works (Part-I internal) 1972 and (Part-II External) 1974 as applicable within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent to 2.5% of the value of the work subject to a ceiling of Rs. 15,000 (Rs. Fifteen thousand only) as may be fixed by the Superintending Engineer concerned and in this respect the decision of the Superintending Engineer shall be final and binding on the contractor.

**CLAUSE 10                      Materials supplied by Government**

Materials which Government will supply in rare case are shown in schedule 'B' which also stipulates quantum, place of issue and rate(s) to be charged in respect thereof. The contractor shall be bound to procure them from the Engineer-in-Charge. As soon as the work is awarded, the contractor shall finalize the programme for the completion of work as per clause 5 of this contract and shall give his estimates of materials required on the basis of drawings/or schedule of quantities of the work. The Contractor shall give in writing his requirement to the Engineer-in-Charge which shall be issued to him keeping in view the progress of work as assessed by the Engineer-in-Charge, in accordance with the agreed phased programme of work indicating monthly requirements of various materials. The contractor shall place his indent in writing for issue of such materials at least 7 days in advance of his requirement. Such materials shall be supplied for the purpose of the contract only and the value of the materials so supplied at the rates specified in the aforesaid schedule shall be set off or deducted, as and when materials are consumed in items of work (including normal wastage) for which payment is being made to the contractor, from any sum then due or which may therefore become due to the contractor under the contract or otherwise or from the security deposit. At the time of submission of bills the contractor shall certify that balance of materials supplied is available at site in original good condition.

The contractor shall submit along with every running bill (on account or interim bill) material wise reconciliation statements supported by complete calculations reconciling total issue, total consumption and certified balance (diameter/section-wise in the case of steel) and resulting variations and reasons therefore. Engineer-in-Charge shall (whose decision shall be final and binding on the contractor) be within his rights to follow the procedure of recovery in clause 42 at any stage of the work if reconciliation is not found to be satisfactory.

The contractor shall bear the cost of getting the material issued, loading, transporting to site, unloading, storing under cover as required, cutting assembling and joining the several parts together as directed by the engineer-in-charge. Notwithstanding anything to the contrary contained in any other clause of the contract and (or the PWD Code) all stores/ materials so supplied to the contractor or procured with the assistance of the Government shall remain the absolute property of Government and the contractor shall be the trustee of

the stores/materials, and the said stores/materials shall not be removed/disposed off from the site of the work on any account and shall be at all times open to inspection by the Engineer-in-Charge or his authorized agent. Any such stores/materials remaining unused shall be returned to the Engineer-in-Charge in as good a condition in which they were originally supplied at a require, but in case it is decided not to take back the stores/ materials the contractor shall have no claim for compensation on any account of such stores/materials so supplied to him as aforesaid and not used by him or for any wastage in or damage to in such stores/materials.

On being required to return the stores/materials, the contractor shall hand over the stores/ materials on being paid or credited such price as the Engineer-in-Charge shall determine, having due regard to the condition of the stores/materials. The price allowed for credit to the contractor, however, shall be at the prevailing market rate not exceeding the amount charged to him, excluding the storage charge, if any. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to the throwing himself open to account for contravention of the terms of the licenses or permit and/or for criminal breach of trust, be liable to Government for all advantages or profits resulting or which in the usual course would have resulted to him by reason or such breach. Provided that the contractor shall in no case be entitled to any compensation or damages on account of any delay in supply or non-supply thereof all or any such materials and stores provided further that the contractor shall be bound to execute the entire work if the materials are supplied by the Government within the original scheduled time for completion of the work plus 50% thereof or schedule time plus 6 months whichever is more if the time of completion of work exceeds 12 months but if a part of the materials only has been supplied within the aforesaid period then the contractor shall be bound to do so much of the work as may be possible with the materials and stores supplied in the aforesaid period. For the completion of the rest of the work, the contractor shall be entitled to such extension of time as may be determined by the Engineer-in-Charge whose decision in this regard shall be final and binding on the contractor.

The contractor shall see that only the required quantities of materials are got issued. Any such material remaining unused and in perfectly good/original

condition at the time of completion or determination of the contract shall be returned to the Engineer-in-Charge at the stores from which it was issued or at a place directed by him by a notice in writing. The contractor shall not be entitled for loading, transporting, unloading and stacking of such unused material except for the extra lead, if any involved, beyond the original place of issue. Quantities issued in excess of requirement with respect to work done and not returned back to the department, recovery will be made of double of issue rate.

**CLAUSE 10 A            Materials to be provided by the Contractor**

The contractor shall, at his own expense, provide all materials, required for the works other than those, which are stipulated, to be supplied by the Government.

The contractor shall, at his own expense and without delay, supply to the Engineer-in-Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract. The contractor shall, if requested by the Engineer-in-Charge furnish proof, to the satisfaction of the Engineer-in-Charge that the materials so comply. The Engineer-in-Charge shall within fifteen days of supply of samples or within such further period as he may require intimate to the Contractor in writing whether sample are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with specifications, approval of the Engineer-in-Charge shall be issued after the test results are received.

The Contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.

The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to

such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The Engineer-in-Charge or his authorized representative shall at all time have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access.

The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default the Engineer-in-Charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss for damage that may happen or arise to such materials. The Engineer-in-Charge shall also have full powers to require other proper materials to be substituted thereof and in case of default the Engineer-in-Charge may cause the same to be supplied and all costs which may attend such removal and substitution shall borne by the Contractor.

**CLAUSE 10 D Dismantled Material Govt. Property**

The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc. as Government's property and such materials shall be disposed off to the best advantage of Government according to the PWD code provision.

**CLAUSE 11 Work to be executed in accordance with specifications, drawing, orders etc.**

The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specification, designs, drawings and instruction as are not included in the standard specifications of Public Works Department specified in Schedule 'F' or in any Bureau of Indian Standard or any other, published standard or code or, Schedule

of Rates or any other printed publication referred to elsewhere in the contract.

The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

- 12.6 Any operation incidental to or necessary has to be in contemplation of tenderer while filing tender, or necessary for proper execution of the item included in the Schedule of quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said schedule of rates, as the case may be. Nothing extra shall be admissible for such operations.

**CLAUSE 13            Foreclosure of contract due to abandonment of reduction in Scope of work**

If at any time after acceptance of the tender Government shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-Charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

The contractor shall be paid at contract rates for works executed at site only.

**CLAUSE 14            Cancellation of contract in full or part**

If the contractor:

- i) at any time makes default in proceeding with the works or any part

- of the work with due diligence and continues to do so after a notice in writing of 7 days from the Engineer-in-Charge; or
- ii) Commits default to comply with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge; or
  - iii) Fails to complete the works or items of work with individual dates of completion, on or before the date(s) of completion, and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge; or
  - iv) Shall offer or give or agree to give to any person in Government service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for Government; or
- v) Shall enter into a contract with Government in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Accepting Authority/Engineer-in-Charge; or
- vi) Shall obtain a contract with Government as a result of wrong tendering or other non-bonafide methods of competitive tendering; or
- vii) Being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors; or
- viii) Being a company, shall pass a resolution or the Court shall make an order for the winding up of the company, or a receiver or manager on

behalf of the debenture holders or otherwise shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or manager; or

- ix) Shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days; or
- x) Assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Competent Authority;

The Competent Authority may, without prejudice to any other right or remedy which shall have accrued or shall accrue hereafter to Government, by a notice in writing to cancel the contract as a whole or only such items of work in default from the Contract.

The Engineer-in-Charge shall on such cancellation by the Competent Authority have powers to:

- (a) Take possession of the site and any materials, constructional plant, implements stores, etc., thereon; and/or
- (b) Carry out the incomplete work by any means at the risk and cost of the contractor.

On cancellation of the contract in full or in part, the Engineer-in-Charge shall determine what amount, if any, is recoverable from the contractor for completion of the works or part of the works or in case the works or part of the works is not to be completed, the loss of Damage suffered by Government. In determining the amount, credit shall be given to the contractor for the value of the work executed by him up to the time of cancellation, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor.

Any excess expenditure incurred or to be incurred by Government in completing the works or part of the works or the excess loss or damages suffered or which may be suffered by Government as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to Government in law be recovered from any moneys due to the

contractor on any account, and if such moneys are not sufficient the contractor shall be called upon in writing and shall be liable to pay the same within 31 days.

If the contractor fails to pay the required sum within the aforesaid period of 30 days the Engineer-in-Charge shall have the right to sell any or all of the contractors unused materials, constructional plant, implements, temporary buildings, etc. and apply the proceeds of sale thereof towards the satisfaction of any sums due from the contractor under the contract and if thereafter there be any balance is outstanding from the contractor, it shall be recovered in accordance with the provisions of the contract.

Any sums in excess of the amounts due to Government and unsold materials, constructional plant, etc., shall be returned to the contractor, provided always that if cost or anticipated cost of completion by Government of the works or part of the works is less than the amount which the contractor would have been paid had he completed the works or part of the works, such benefit shall not accrue to the contractor.

#### **CLAUSE 15      Suspension of work**

i) The contractor shall, on receipt of the order in writing of the Engineer-in-Charge (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-Charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof, for any of the following reasons:

- a) on account of any default on the part of the contractor or;
- b). for proper execution of the works or part thereof for reasons other than the default of the contractor; or
- c) for safety of the works or part thereof.

The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.

ii) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above, the contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25%, for completion of the item or group of items of work for which a separate period of

completion is specified in the contract and of which the suspended work forms a part, and;

**CLAUSE 16 Action in case, work not done as per specifications**

All works under or in course of execution or executed in pursuance of the contract shall at all times be open and accessible to the inspection and supervision of the Engineer-in- Charge, his authorized subordinates in charge of the work and all the superior officers, officer of the Quality Control Organization of the Department and of the Cabinet (Technical) Vigilance, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-Charge or his higher authority or his authorized subordinates in charge of the work or to the Cabinet (Technical) Vigilance or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or article provides by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract the contractor shall, on demand in writing which shall be made within the period specified in schedule - F of contract data from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the contractor failing do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.

In such case the Engineer-in-Charge may not accept the item of work at the

rates applicable under the contract but may accept such items at reduced rates as the competent authority may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure and incidental items rectified, or removed and re-executed at the risk and cost of contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

**CLAUSE 17**      **Contractor liable for Damages defects during Maintenance period**

If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road curb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wired, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within defect liability period after a certificate final or otherwise of its completion shall have been given by the Engineer-in-Charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-Charge cause the same to be made good by other workmen and deduct the expense from any sums that may be due or at any time thereafter may become due to the contractor, or from his security deposit except for the portion pertaining to asphalted work which is governed by sub-para (iii) of clause 35 or the proceeds of sale thereof or of a sufficient option thereof. The security deposit of the contractor shall not be refunded before the expiry of defect liability period after the issue of the certificate final or otherwise, of completion of work, or till the final bill has been prepared and passed whichever is later.

**CLAUSE 18**      **Contractor to supply Tools & Plants etc.**

The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), plant, tools, appliances,

implements, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specification or other document forming part of the contract or referred to in these conditions or not. or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his so doing the same may be provided by the Engineer-in-Charge at case to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portion thereof.

**CLAUSE 18 A     Recovery of Compensation paid to workman**

In every case in which by virtue of the provisions sub-section (1) of Section 12, of the Workmen's Compensations Act, 1923, Government is obliged to pay compensation to a workman employed by the contractor, in execution of the works, Government will recover from the contractor the amount of the compensation so paid; and without prejudice to the right of the Government under sub-section (2) of section 12, of the said Act, Government shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by Government to the contractor whether under this contract or otherwise. Government shall not be bound to contest any claim made against it under sub-section (1) Section 12, of the said Act, except on the written request of the contractor and upon his giving to Government full security for all costs for which Government might become liable in consequence of contesting such claim.

**CLUASE 18 B     Ensuring Payment and Amenities to works if contract fails**

: In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and of the Contract Labour

(Regulation and Abolition) Central Rules, 1971, Government is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules under Clause 19H or under the P.W.D. Contractor's Labour Regulations, or under the Rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by P.W.D. Contractors, Government will recover from the contractor the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of the Government under sub-section (2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, Government shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by Government to the contractor whether under this contract or otherwise Government shall not be bound to contest any claim made against it under sub-section (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the Government full security for all costs for which Government might become liable in contesting such claim.

**CLAUSE 19    Labour Laws to be complied by the contractor**

The contractor shall obtain a valid license under the State Labour Act, and the Contract Labour (Regulation and Abolition) Central rules 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.

The contractor shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.

Any failure to fulfill these requirements shall attract the penal provisions of the contract arising out of the resultant non-execution of the work.

**CLAUSE 19 A**

No labour below the prescribed age shall be employed on the work.

**CLAUSE 19B**                      **Payment of wages**

Payment of wages:

- i) The contractor shall pay to labour employed by him either directly or through subcontractors, wages not less than fair wages as defined in P.W.D. Contractor's Labour Regulations or as per the provisions of the Contract Labour (Regulation and Abolition) Act 1970 and the contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.
- ii) The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.
- iii) In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the Public Works Department contractor's Labour Regulations made by Government from time to time in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions unauthorized by made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and the Contract Labour (Regulation And Abolition) Central Rules, 1971, wherever applicable.
- iv) a) The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non fulfilment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations.  
b) Under the provision of Minimum Wages (Central) Rules 1950, the contractor is bound to allow to the labours directly or

indirectly employed in the works one day rest for 6 days continuous work and pay wages at same rate as for duty. In the event of default the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-Charge concerned.

- v) The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Act, 1970, other modifications thereof or any other laws relating thereto and the rules made there under from time to time.
- vi) The contractor shall indemnify and keep indemnified Government against payments to be made under and for the observance of the laws aforesaid and the P.W.D. Contractor's Labour Regulations without prejudice to his right to claim indemnity from his sub-contractors.
- vii) The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.
- viii) Whatever is the minimum wage for the time being, or if the wage payable higher than such wage, such wage shall be paid by the contractor to the workmen directly without the intervention of Jamadar and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commission or otherwise.
- ix) The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

## **CLAUSE 19C**

In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall at his own expense arrange for the safety provisions as per P.W.D. Safety Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In case the contractor fails to make

arrangement and provide necessary facilities as aforesaid he shall be liable to pay a penalty of Rs. 200/- for each default and in addition the Engineer-in-Charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the costs incurred in that behalf from the contractor.

**CLAUSE 20**            **Minimum wages Act to be complied with**

The contractor shall at least pay and comply with all the provisions of the Minimum wages Acts and rules framed there under other labour laws related to contract labour.

**CLAUSE 21**            **Work not to be sublet. Action in case of insolvency**

The contract shall not be assigned or sublet without the written approval of the Engineer-in-Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the Governor of Bihar shall have power to adopt the courses specified in Clause 3 hereof in the interest of Government and in the event of such course being adopted the consequences specified in the said Clause 3 shall ensue.

**CLAUSE 22**            **Compensation**

All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of Government without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.

**CLAUSE 23**            **Changes in firm's institution to be intimated**

Where the contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu undivided family business concern such approval as aforesaid shall

likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 21 thereof and the same action may be taken, and the same consequences shall ensue as provided in the said Clause 21.

**CLAUSE 24            Approval of Engineer Incharge**

All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

**CLAUSE 25            Settlement of Dispute & Arbitration**

The Settlement of disputes and arbitration shall be done in accordance with the provisions made in Bihar Public Works Contracts Disputes Arbitrations Tribunal Act, 2008.

**CLAUSE 26            Contractor to indemnify Govt. against patent right**

The contractor shall fully indemnify and deep indemnified the Governor of Bihar against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under the action brought against Government in respect of any such matter as aforesaid the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the Governor of Bihar if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

**CLAUSE 28            Action where no specifications are specified**

In the case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications, Indian Road Congress for

road works and Indian Building Congress for building works or any central government agency. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturers specifications. If not available then as per Department Specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

**CLAUSE 29**      **With-holding and lien in respect of sums dues from Contractor**

- i) Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Engineer-in-Charge or the Government shall be entitled to with hold and also have a lien to retain such sum or sums in whole or in part from the security, if any deposited by the contractor and for the purpose aforesaid, the Engineer-in-Charge or the Government shall be entitled to withhold the security deposit, if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the Engineer-in-Charge or the Government shall be entitled to withhold and have a lien to retain to the event of payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract with the Engineer-in-Charge of the Government or any contracting person through the Engineer-in-Charge of the Government or any contraction person through the Engineer-in-Charge pending finalization of adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or Government will be kept withheld or retained as such by the Engineer-in-Charge or Government till the claim arising out of or under the contract is determined by the arbitrator (if the contract is governed by the arbitration clause) or by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such

withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Engineer-in-Charge or the Government shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company as the case may be, whether in his individual capacity or otherwise.

- ii) Government shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract etc., to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over-payment and it shall be lawful for Government to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by Government to the contractor, without any interest thereon whatsoever.

**CLAUSE 29 A    Lien in respect of claims in other contracts**

Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Engineer-in-Charge or the Government or any other contracting person or persons through Engineer-in-Charge against any claim of the Engineer-in-Charge or Government or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Engineer-in-Charge or the Government or with such other person or persons.

It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Engineer-in-Charge or the Government will be kept withheld or retained as such by the Engineer-in-Charge or the

Government till his claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause or by the competent court, as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

**CLAUSE 30     Unfiltered Water Supply**

The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

- i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.
- ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in-Charge, unsatisfactory.

**CLAUSE 32     Hire of Plant & Machinery**

- i) The contractor shall arrange at his own expense all tools, plant machinery and equipment (hereinafter referred to as T & P) required for execution of the work except for the Plant & Machinery listed in Schedule 'C and stipulated for issue to the contractor. If the contractor requires any item of T & P on hire from the T & P available will, if such item is available, hire it to the contractor at rates to be agreed upon between him and the Engineer-in-Charge. In such a case all the conditions hereunder for issue of T & P shall also be applicable to such T & P as is agreed to be issued.
- ii) Plant and Machinery when supplied on hire charges shown in Schedule 'C shall be made over and taken back at the departmental equipment yard/shed shown in Schedule 'C and the contractor shall bear the cost of carriage from the place of issue to the site of work and back. The contractor shall be responsible to return the plant and machinery in the condition in which it was handed over to him, and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation and otherwise during transit including damage to or loss of plant and for all losses due

to his failure to return the same soon after the completion of the work for which it was issued. The Divisional Engineer shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.

- iii) The plant and machinery as stipulated above will be issued as and when available and if required by the contractor. The contractor shall arrange his programme of work according to the availability of the plant and machinery and no claim, whatsoever, will be entertained from him for any delay in supply by the Department.
- iv) The hire charges shall be recovered at the prescribed rates from and inclusive of the date the plant and machinery made over up to and inclusive of the date of the return in good order even though the same may not have been working for any cause except major breakdown due to no fault of the contractor or faulty use requiring more than three working days continuously (excluding intervening holidays and Sundays) for bringing the plant in order. The contractor shall immediately intimate in writing to the Engineer in Charge when any plant or machinery gets out of order requiring major repairs as aforesaid. The Engineer in Charge shall record the date and time of receipt of such intimation in the log sheet of the plant or machinery. Based on this if the breakdown occurs before lunch period or major breakdown will be computed considering half a day's breakdown on the day of complaint. If the breakdown occurs in the post lunch period of major breakdown will be computed starting from the next working day. In case of any dispute under this clause the decision of the Superintending Engineer shall be final and binding on the contractor.
- v) The hire charges shown above are for each day of 8 hours (inclusive of the one-hour lunch break) or part thereof.
- vi) Hire charges will include service of operating staff as required and also supply of lubricating oil and stores for cleaning purposes. Power fuel of approved type, firewood, kerosene oil etc. for running the plant and machinery and also the full time chowkidar for guarding the plant and machinery against any loss or damage shall be arranged by the contractor who shall be fully responsible for the safeguard and security of plant and machinery. The contractor shall on or before the supply of plant and machinery sign an agreement indemnifying the Department against any

- loss or damage caused to the plant and machinery either during transit or at site of work.
- vii) Ordinarily, no plant and machinery shall work for more than 8 hours a day inclusive of one hour lunch break. In case of an urgent work however, the Engineer in Charge may, at his discretion, allow the plant and machinery to be worked for more than normal period or 8 hours a day. In that case the hourly hire charges for overtime to charge (1/8)th of the daily charges) subject to a minimum of half day's normal charges on any particular day. For working out hire charges for over time a period of half an hour and above will be charged as one hour and a period of less than an hour will be ignored.
  - viii) The contractor shall release the plant and machinery every seventh day for periodical servicing and/or wash out which may take about three to four hours or more. Hire charges for full day shall be recovered from the contractor for the day of servicing/ Wash out irrespective of the period employed in servicing.
  - ix) The plant and machinery once issued to the contractor shall not be returned by him on account of lack of arrangements of labour and materials, etc. on his part, the same will be returned only when they are required for major repairs or when in the opinion of the Engineer in Charge the work or a portion of work for which the same was issued is completed.
  - x) Log Book for recording the hours of daily work for each of the plant and machinery supplied to the contractor will be maintained by the Department and will be countersigned by the contractor or his authorized agent daily. In case the contractor contests the correctness of the entries and/or fails to sign the Log Book the decision of the Engineer in Charge shall be final and binding on him. Hire charges will be calculated according to the entries in the Log Book and will be binding on the contractor. Recovery on account of hire charges for road rollers shall be made for the minimum number of days worked out on the assumption that a roller can consolidate per day and maximum quantity of materials or area surfacing as noted against each in the annexed statement (see attached annexure).
  - xi) In the case of concrete mixers, the contractors shall arrange to get the hopper cleaned and the drum washed at the close of the work each

day or each occasion.

- a) In case rollers for consolidation are employed by the contractor himself, log book for such rollers shall be maintained in the same manner as is done in case of departmental rollers, maximum quantity of any item to be consolidated for each roller day shall also be same as in Annexure to Clause 34(x). For less use of rollers recovery for the less roller days shall be made at the stipulated issue rate.
- xii) The contractor shall be responsible to return the plant and machinery in the condition in which it was handed over to him and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation or otherwise or during transit including damage to or loss of parts, and for all losses due to him failure to return the same soon after the completion of the work for which it was issued. The Divisional Engineer shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.
- xiii) The contractor will be exempted for levy of any hire charges for the number of days he is called upon in writing by the Engineer in Charge to suspend execution of the work provided Government plant and machinery in question have, in fact remained idle with the contractor because of the suspension.
- xiv) In the event of the contractor not requiring any item of plant and machinery issued by Government though not stipulated for issue in Schedule 'C any time after taking delivery at the place of issue, he may return it after two days written notice or at any time without notice if he agrees to pay hire charges for two additional days without in any way affecting the right of the Engineer in-Charge to use the said plant and machinery during the said period of two days as he likes including hiring out to a third party.

### **CLAUSE 33     Employment of Technical Staff and employees**

Contractors Superintendence, Supervision, Technical Staff & Employees

- i) The contractor shall provide all necessary superintendence during execution of the work and as along thereafter as may be necessary for proper fulfilling of the ' obligations under the contract.

The contractor along with bidding of the tender, intimate in writing to the Engineer-in-Charge the name, qualifications, experience, age, address and other particulars along with certificates, of the technical representative to be in charge of the work. If there is any change then the new incumbent's qualifications and experience shall not be lower than specified in Schedule in I.T.B. (Annexure - 2). The Engineer-in-Charge shall within 15 days of issue of letter of acceptance intimate in writing his approval or otherwise it is deemed to be approved. Any such approval may at any time be withdrawn and in case of such withdrawal the contractor shall appoint another such representative according to the provisions of this clause. Decision of the tender accepting authority / Superintending Engineer shall be final and binding on the contractor in this respect. Technical staff shall be available at site within fifteen days of start of work.

If the contractor (or any partner in case of firm/company) himself has such qualifications, it will not be necessary for the said contractor to appoint such a principal technical representative but the contractor shall designate and appoint a responsible agent to represent him and to be present at the work whenever the contractor is not in a position to be so present. All the provisions applicable to the principal technical representative under the Clause will also be applicable in such a case to contractor or his responsible agent. The principal technical representative and/or the contractor or his responsible authorized agent shall be actually available at site at least two working days every week, these days shall be determined in advance and also during recording of measurement of works and whenever so required by the Engineer-in-Charge by a notice as aforesaid and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative in the site order book and in token of acceptance of measurements. There shall be no objection if the representative/agent looks after more than one work and not more than three works in the same station provided these details are disclosed to the Engineer-in-Charge and he shall be satisfied that the provisions and the purpose of the clause are fulfilled satisfactorily.

If the Engineer-in-Charge, whose decision in this respect is final and binding on

the contractor, is convinced that no such technical representative or agent is effectively appointed or is effectively attending or fulfilling the provision of this clause, a recovery shall be effected from the contractor as specified in Schedule 'F' and the decision of the Engineer-in-Charge as recorded in the site order book and measurement recorded in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint a suitable technical representative or responsible agent and if such appointed persons are not effectively present or do not discharge their responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as a suitable agent is appointed and the contractor shall submit a certificate of employment of the technical representative/responsible agent along with every on account bill/fixed bill and shall produce evidence if at any time so required by the Engineer-in-Charge.

The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work.

The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work.

The Engineer in Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer in Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer in Charge and the persons so removed shall be replaced as soon as possible by competent substitutes.

**CLAUSE 34      Levy/taxes payable by Contractor**

- i. GST or any other tax on materials in respect of this contract shall be payable by the contractor according to law in effect.
- ii. The contractor shall deposit royalty and obtain necessary permit for supply of the red earth, morum, sand chips bajri, stone, kankar, etc. from local authorities.
- iii. If pursuant to or under any law, notification or order any royalty, cess or the hike becomes payable to the Government of India and does not at any time become payable by the contractor to the State Government/

Local authorities in respect of any material used by the contractor in the works then in such a case, it shall be lawful to the Government of India and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from the dues of the contractor.

**CLAUSE 36      Termination of contract incase of imprisonment of contractor**

If the contractor is imprisoned, becomes insolvent compound with his creditors, has receiving order made against him or carries on business under a receiver for the benefit of the creditors or any of them, or being a partnership firm becomes dissolved, or being a company or corporations goes into liquidation or commences to be wound up not being a voluntary winding up for the purpose only of amalgamation or reconstitution the department shall be at liberty.

- (a) To give such liquidator, receiver, or other person in whom the contract may become vested, the option of carrying out the contract or a portion there of to be determined by the department, subject to his providing an appropriate guarantee for the performance of such contract or.
- (b) To terminate the contract, forthwith by notice in writing to the contractor, the liquidator, the receiver or person in whom the contract may become vested and take further action as provided in the relevant clauses of the contract.

**CLAUSE 37      Termination of contract on death of contractor**

Without prejudice to any of the rights or remedies under this contract if the contractor dies, the Divisional Officer on behalf of the Governor of Bihar shall have the option of terminating the contract without compensation to the contractor after the affidavit of his/ their legal heir/heirs that they are not going to be in this profession in future.

**CLAUSE 38      If relation working in Department then the contractor not allowed to tender**

The contractor shall not be permitted to tender for works in the

Concerned Division(responsible for award and execution of contracts) in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of the Superintending Engineer and Assistant Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Gazetted Officer in the Any Work & Deptt. or in the concerned department. Any breach of this condition by the contractors of this Department shall lead to blacklisting. If the contractor is registered in any other department, he shall be debarred from tendering in P.W.D. for any breach of this condition.

NOTE: By the term "near relatives" is meant wife, husband, parents and grand parents, children and grand children, brothers and sisters, uncles, aunts and cousins and their corresponding in law.

**CLAUSE 39    No-Gazetted Engineer to work as contractor within two years of retirement**

No engineer of gazetted rank or other gazetted officer employed in engineering or administrative duties in an engineering department of the Government of Bihar shall work as a contractor or employee of a contractor for a period of two years after his retirement from government service without the previous permission of State Government in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained said permission prior to engagement in the contractor's service, as the case may be.

**CLAUSE 41    Release of Performance Guarantee**

This will be refundable as indicated below

- (i) After completion of 2.5 successful years - 20 % PG shall be refunded
- (ii) After completion of 5 successful years - 40 % cumulative PG shall be refunded
- (iii) After completion of 7.5 successful years - 60 % cumulative PG shall be refunded
- (iv) After completion of 10 successful years - 80 % cumulative PG shall be refunded

- (v) Rest 20% will be refunded after getting all clearances, no dues and contractor has removed /dispose off silt safely without affecting environment & ecology of surrounding

**CLUASE 42      Responsibility of Technical Staff and employees**

Technical officers / staff deployed by the Contractor at any dredging site will also be responsible for inferior quality / poor performance of any work and his name will be circulated to all works division of the P.W.D. to debar from any other site, if his name is being proposed by other contractor.

**CLAUSE 43      Contractor's Risks**

All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the excepted risks are the responsibility of the Contractor.

**CLAUSE 44      Insurance**

The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the work, in the amounts and deductibles stated in the Contract Data for the following events which are due to the Contractor's risks:

- (a) loss of or damage to the Works, Plant and Materials;
- (b) loss of or damage to Equipment;
- (c) loss of or damage of property (except the Works, Plant, Materials and Equipment)  
in connection with the Contract; and
- (d) personal injury or death.

Policies and certificates for insurance shall be delivered by the Contractor to the Engineer for the Engineer's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

If the Contractor does not provide any of the policies and certificates required, the Employer may affect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of

the premiums shall be a debt due.

Alteration to the terms of an insurance shall not be made without the approval of the Engineer. Both parties shall comply with any conditions of the insurance policies.

**CLAUSE 45 Cash flow estimate to be submitted**

The Contractor shall, within the time stated in special Conditions of contract after the date of the Letter of Acceptance, provide to the Engineer for his information a detailed cash flow estimate, in quarterly periods, of all payments to which the Contractor will be entitled under the Contract and the Contractor shall subsequently supply revised cash flow estimates at quarterly intervals, if required to do so by the Engineer, in charge.

**CLAUSE 46 Safety, security and protection of the Environment**

The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein:

- (a) have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so far as the same is under his control) and the Works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons,
- (b) Provide and maintain at his own cost all lights, guards, fencing, warning signs and watchmen and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others, and
- (c) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

**CLAUSE 47 Cost of samples**

All samples shall be supplied by the Contractor at his own cost if the supply thereof is clearly intended by or provided for in the Contract.

**CLAUSE 48     Cost of tests**

The cost of making any test shall be borne by the Contractor if such test is :

- (a) clearly intended by or provided for in the Contract, or
- (b) particularized in the Contract (in case only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purposes which it was intended to fulfill) in sufficient detail to enable the Contractor to price or allow for the same in his Tender.

**CLAUSE 50     Commencement of works**

The contractor shall commence the Works as soon as is reasonably possible after the receipt by him of a notice to this effect from the Engineer, which notice shall be issued within the time stated in the Appendix to Tender after the date of the Letter of Acceptance. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

**CLAUSE 52****Force Majeure**

Neither party shall be liable to the other for any loss or damage occasioned by or arising out of acts of GOD such as Unprecedented flood, Volcanic eruption, Earthquake or other convulsion of nature and other acts such as general/ partial strikes by a section of government employees/ invasion, the act of foreign countries/ hostilities or war like operations before or after declaration of war, rebellion/ military or usurped power which prevent performance of the contract and which could not have been foreseen or avoided by a prudent person.

**CLAUSE 53****Recovery**

Any amount found recoverable from the contractor shall be recovered as public demand under the Bihar Public Demand Act. without prejudice to any other mode of recovery.

NOTE : In case of difference or ambiguity in Hindi and English version, the English version will prevail.

**SECTION – 4**  
**CONTRACT DATA**  
**(Proforma of schedules)**

**SCHEDULE "F"**  
**Reference to General Condition of Contract.**

Name of work: Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.

Estimated revenue: Rs. **75,36,00,000.00**

- i) Earnest money: Rs. **85,36,000.00**
- ii) Performance Guarantee: 3% of tender value (including earnest money)
- iii) Duration of work : 120 Months

**GENERAL RULES AND DIRECTION:**

Officer inviting tender : Executive Engineer,  
Irrigation Division, Baunsi

Definitions:

2(i) Engineer-in-Charge : Executive Engineer,  
Irrigation Division, Baunsi

2(ii) Department & Employer : Executive Engineer,  
Irrigation Division, Baunsi

Note:- Earnest Money and performance guarantee will be pledged in favour of Executive Engineer, Irrigation Division, Baunsi.

Clause 1

- i) Time allowed for submission of performance Guarantee from the date of issue of letter Acceptance, in days 7 days
- ii) Maximum allowable extension beyond the period provided in i) above in days 15 days

Clause 5

Number of days from the date of issue of notice to start. 07 days

Milestone(s) as per table give below:

### Table of Milestones

Volume of sludge based on actual estimation after award of work = V

Cumulative Timeline (in months)	Dredging Target	Cumulative Dredging Target	Remarks
6	0%		Moratorium period for obtaining NOC/permission from concerned departments. No payment to WRD is required during this period.
12	8% of V	8% of V	Advance bi-annual payment to WRD.
18	8% of V	16% of V	
24	8% of V	24% of V	
30	4.75% of V	28.75% of V	
36	4.75% of V	33.50% of V	
42	4.75% of V	38.25% of V	
48	4.75% of V	43% of V	
54	4.75% of V	47.75% of V	
60	4.75% of V	52.50% of V	
66	4.75% of V	57.25% of V	
72	4.75% of V	62% of V	
78	4.75% of V	66.75% of V	
84	4.75% of V	71.50% of V	
90	4.75% of V	76.25% of V	
96	4.75% of V	81% of V	
102	4.75% of V	85.75% of V	
108	4.75% of V	90.50% of V	
114	4.75% of V	95.25% of V	
120	4.75% of V	100% of V	

Time allowed for execution of work: 120 Months

Authority to give fair and reasonable extension of time for completion of work: Departmental Tender Committee

Clause 11

Specification to be followed for execution of as per Schedule of work: Specification attached WRD Bihar, RCD Bihar, BCD Bihar & BIS Code.

Clause 16

Competent Authority for Deciding reduced rate: Superintending Engineer

The following document also forms part of the contract.

- i. Letter of acceptance
- ii. Notice to proceed with the works
- iii. Contractor's Bid
- iv. Condition of Contract: General and special
- v. Contract Data
- vi. Additional condition
- vii. Drawings
- viii. Bill of Quantities and
- ix. Any other documents listed in the Contract data as forming part of the contract.

The law, which applies to the contract : The Law of Union of India

The court of jurisdiction : Patna High Court

The Language of contract document : English

The currency of the contract is : Indian Rupees

The Limit of Sub-Contracting : NA

**SECTION – 5**  
**SPECIAL CONDITION OF CONTRACT**

**SECTION –5**  
**SPECIAL CONDITIONS OF CONTRACT**

**1. MEASUREMENTS, PAYMENTS & SECURITIES etc.**

Executive Engineer will do supervision, take measurements, receive Payments, maintain accounts and will be in-charge of the works.

(I) Earnest money & Performance security will be pledged in the name of Executive Engineer, **Irrigation Division, Baunsi.**

The decision of the Superintending Engineer on any disputes in measurement or interpretation shall be final and binding on the contractor in respect of all measurements of contract items, substituted items, extra items, deviation etc.

**2. PAYMENT OF ROYALTIES & SEIGNIORAGE FEE etc**

Rules of mining department and WRD, Govt. of Bihar will be applicable.

2-1 ty lalk/ku foHkkx] iVuk ds i=kad 01/PMC/vivid/161/2023-205 dtd. 20.03.2023 ds funs'kkuqlkj ftUgsa dk;Z vkoafVr gksxk] mUgsa CBuD App (Call Before U dig App) ds ek;/e ls dk;Z lacaf/kr lwpuk nsuk gksxkA

**3. EVENTS OF ITEM OF WORK**

The tender specification has been drawn to facilitate the tenderers to quote firm rate for full completion of the work and that the rates quoted must contain the costs of all the events (or all related parts of that item) in each item of work direct as well as indirect including all incidental events not shown or specified but reasonably implied or necessary for the completion of the item of work. It is understood that if the tenderer has any doubt, he shall get it clarified before submitting his tender. Therefore, there should be no scope for any doubt or ambiguity regarding non-inclusion of any event in the items of work in the rate quoted by the contractor. No claim, whatsoever, will be entertained due to non-inclusion of any such event necessary for the completion of the items of work.

**4. EXTENTION OF PERFORMANCE SECURITY:**

The performance security (the Bank Guarantee) shall be initially valid upto 60 days beyond the duration of work. If the completion date gets extended the validity period of these including Bank guarantee will also have to be extended for further period accordingly.

**5. CAMP SITE AND REGULATIONS**

The type of constructions and the plans and specifications for the building to be erected in the contractor's camp nearby the worksite shall be subjected to the approval of the Engineer-in-charge.

The contractor shall provide, maintain and operate under competent direction, such camps and facilities convenient to the work as necessary

for the housing, feeding and accommodation of their employees at his own cost. The location, construction and maintenance of such camps shall be subject to the approval and guidance by the Engineer-in-charge but the department shall not bear any cost whatsoever under any circumstances.

Proper and adequate sanitation, electricity, security and water supply arrangement shall have to be made by the contractor himself at his own cost. It will also be the responsibility of the contractor to maintain properly the drainage in their camp in order to prevent unhygienic condition.

The contractors shall be responsible for maintaining good order in their camps and at worksites and for these purposes he shall employ such officers, watchmen, or other persons as may be required. All regulations shall be subject to the approval of the Engineer-in-charge.

Contractor will have to make his own arrangement for land for labour sheds, stack yards, store, godowns etc. near work site at his own cost.

## **6. LAW GOVERNING CONTRACT AND JURISDICTION OF COURTS**

This contract shall be governed by the Indian Laws for the time being enforce and shall be subject to the Court at PATNA having competent authority and jurisdiction.

## **8. DISCREPANCIES AND ADJUSTMENT OF ERRORS**

8.1 The contract drawings read together with the contract specifications are intended to show and explain the manner of executing the work and to indicate the type and class of materials to be used.

8.2 The contractor shall execute the whole and every part of the work in accordance with the drawings and specifications which form part of the contract and in accordance with such further drawings, details and instructions as may, from time to time, be given by the Engineer-in-charge.

8.3 It shall be the responsibility of the contractor to promptly bring to the notice of the Engineer-in-charge any error or discrepancy in the drawings, specifications, and contract documents and obtain his written order thereon. In case of any discrepancy between the description of items in the schedule of quantities and the specifications, the latter shall prevail. In case any feature of the work is not fully described and set forth in the drawings and specification the contractor shall forthwith apply to the Engineer-in-charge for further instructions, drawings or specifications. The decision of the Engineer-in-charge regarding the true intent and meaning of the drawings and specifications shall be final and binding.

8.4 Detailed drawing shall be followed and figured dimension should be followed in preference to scaled dimension. However, if any dimension indicated on a drawing differ from that obtained by scaling the drawings, the contractor shall bring the discrepancy to the notice of the Engineer-in-charge, whose decision in the matter shall be final and binding.

- 8.5 An error in description, quantity or price in schedule of quantities and price or any omission, therefore shall not vitiate the contract to relieve the contractor from the execution of the whole or any part of the works comprised therein according to drawing and specifications or from any of his obligations under the contract.

#### 10 INSTRUCTIONS & NOTICES

- 10.1 All Instructions, notices and communications shall be deemed to have been duly received by the contractor if delivered to the contractor or his authorized agent or left at, or posted at the address given by the contractor or his authorized agent, and they shall be deemed to have been served, in the case of service by post, on the date when the same should have reached such address in ordinary course of transmission by post and in other cases, on the day on which the same were so delivered or left.
- 10.2 The contractor shall, when he is not personally present at the site of the work, invariably place and keep at site a qualified agent duly authorized to act on his behalf and to receive on his behalf all orders and instructions from the Engineer-in-charge in relation to such work, including all orders by the Chief Engineer, Superintending Engineer, Executive Engineer or any other authorized officer in writing during the inspection of work. All such orders and instructions given to, and all acts done by such agents or the contractor shall be binding on the contractor, as if such orders and instructions were given to him or such acts had been done by him and him alone.

#### 11. LAY OUT

- 11.1 The Contractor shall be responsible for fixing Sign – Boards in good conditions at suitable prominent places of his work site showing Name of work, Name of Contractor, quantity of work, amount of work etc as per direction of Engineer in charge for which no extra payment will be done. These should be maintained in good condition till completion of the work at contractor's cost.
- 11.2 The contractor shall be responsible for the correct layout of all works at his own cost. The contractor shall execute the work true to alignments, grades, levels as shown in the drawings and as directed by the Engineer-in-charge and shall check these alignments, grades, and levels at frequent intervals. The contractor shall provide free of cost all facilities, like labours, and instruments and shall always co-operate with the departmental authorities to check all alignments, grades, levels and dimensions. Such checking shall not absolve the contractor of his own responsibility of maintaining the accuracy of the work under the contract.

#### 13 REFERENCE LINES AND BENCH MARKS

The department will fix the basic centre lines, reference points and benchmarks. The contractor shall establish at his own cost at suitable

points, additional reference lines and benchmarks as may be necessary. The contractor shall remain responsible for the sufficiency and accuracy of all the benchmarks and reference line. He shall take precautions to see that the lines, points and benchmarks fixed by the department are not disturbed by his works and he shall make good all such damages.

## **15 SITE ORDER BOOK**

- 15.1 Site order book with machine numbered pages bearing the certificates of the Executive Engineer for containing so many pages shall be maintained by the contractor at the work site and it will have to be produced before the Engineer-in-charge or other inspecting officers if they so desire, for noting down any observation/instruction concerning the work. This shall be the property of the department and the contractor shall deposit the same with the Engineer-in-charge after completion of the work before the final measurement.
- 15.2 The Engineer-in-charge or the representative authorized by him shall communicate or confirm his instructions to the contractor in respect of the execution of the work in the site order book and the contractor or his authorized representative shall confirm receipt of such instructions by the relevant entries in this book. If required by the contractor he shall be furnished with a certified true copy of such instruction. All instructions or order entered in the site order book shall require the approval of the Superintending order books shall be maintained on the site and shall never be removed from Engineer.
- 15.3 Site there under any circumstances. Only the certified copies under the signature of the Engineer-in-charge shall be sent to the Superintending Engineer for his approval.
- 15.4 The contractor or their authorized agents shall have no right to write anything in the site order book.
- 15.5 The site order books shall be maintained in the following form:

### **FORM OF SITE ORDER BOOK**

**Name of work -**

**Date or period of completion –**

S.No.	Date	Order or orders of the inspecting officers, Engineer-in-charge to the contractor (with	Action taken over the order or orders and by whom taken (With dated signature)	Acknowledgement of Contractor	Remarks

		dated signature			
01	02	03	04	05	06

15.6 The order or instruction noted in the site order book shall be taken into consideration at the time of final measurement and making final payments to the contractor.

## 16 PROGRESS REPORTS

The contractor shall furnish six prints of photographs at his own cost in respect to progress of the work done to the Engineer-in-charge on the 5th day of every month. The photographs shall be approximately 20cm x 20 cm size including a margin of 5 cm for binding and shall indicate various stages of construction date, the name of the contractor and the caption of the views taken.

The contractor shall also furnish monthly progress reports detailing the status, procurement of raw materials and the progress made in the construction work as per contract agreement and the strength of the organization employed on the job to the Engineer-in-charge on 5th day of every month.

## 17 PAYMENT PROCEDURE

- a. The work will be awarded to the Contractor quoting the highest rate payable to WRD, Bihar.
- b. The highest Contractor shall deposit the amount worked out as per his quoted rate, to the department. No payment shall be made by the Department for the said work.
- c. The applicable royalty and all other taxes will be borne by the contractor at their own cost. This rate can be revised as per the latest applicable rates by the concerned department.
- d. The minimum percentage rate that must be quoted is 3.74% of Rs. 434.64 per cubic meter (excluding royalty) of sand obtained from dredging operations. This schedule rate of sand, i.e. Rs. 434.64 (excluding royalty) can be revised as per the latest applicable rates by the State Govt. Accordingly, the net payable premium amount per cubic metre of dredged sand payable to WRD, Bihar by the Contractor will be revised.
- e. The minimum rate that must be quoted is Rs. 16.26 per cubic meter of saleable dredged material. This rate is 3.74% of Rs. 434.64 per cubic meter (excluding royalty) for sand at source, based on SOR 2022 rates.
- f. Any bid below 3.74% of Rs. 434.64 per cubic meter (excluding royalty) will be considered non-responsive.

- g. The contractor shall submit monthly report of quantity dredged wherein they will provide their dispatch data from previous month to the Executive Engineer.
- h. The Water Resources Department will receive a pre-determined share from the sale of processed dredged material, which must be deposited in advance every six months.
- i. At the end of each six months period:
  - If the actual dredged material exceeds the estimated quantity, the contractor shall pay the additional amount to the Water Resources Department.
  - If the actual dredged material is less than the estimated quantity, the contractor shall pay as per the minimum assured quantity which will be set as milestone (attached herein), and the necessary payments will be made accordingly.
- j. The contractor has to produce the receipts of royalty charges, at the end of every month in lieu of the selling of dredged materials extracted from reservoir/barrage under the agreement.
- k. The payment shall be accepted in the following instruments.
  - a. Demand Draft.
  - b. Cheque.
  - c. Transferred through Net banking/NEFT/RTGS/Debit card/Credit card or any other mode of online transfer in the Specified Account.
  - d. Any other mode as decided by Procuring Entity.

## 19 **SITE CLEARANCE**

The work shall not be deemed to be completed unless the contractor at his own cost has removed from the site of work and the premises of his work yard and the Government land allotted, if any, to the contractor for accommodations of his staff and employees, all the scaffolding surplus materials, tools and plants, rubbish, working platforms, soak pit and other structure which may have been erected by him for execution of the work and has done leveling and dressing of the areas so as to give as neat and clean look to the satisfaction of the Engineer-in-charge. If the contractor fails to comply with any of the requirements of this clause, the Engineer-in-charge shall at the expenses of the contractor take action to fulfil such requirement and may dispose of the scaffolding, the surplus materials, the tools and plants left over by the contractor and the contractor shall have no claim whatsoever in respect of any such materials except for any sum actually realized by the sale thereof. If the expenses of fulfilling such requirement is more than the amount on the disposal aforesaid the excess amount shall be recoverable from the security deposit or other sums payable to the contractor.

**20 MATERIALS**

- 20.1 Any materials brought to site shall not be removed from work site without the written permission of the Engineer-in-charge.
- 20.2 It shall be clearly understood that the rates quoted by the tenderer shall include all losses, wastages and wash away of materials, equipment tools, and plants etc. either due to rains or storms or floods or earthquakes in the normal course of works or other causes whatsoever.
- 20.3 For timely supply of materials required for the work, the contractor shall have to carry materials even by road or other means of transport and no claim whatsoever shall be entertained by the department on this account.
- 20.6 Dredged Materials shall be stored by the contractor only at places approved by the Engineer-in-charge. The storage and safe custody of the materials for the work and dredged material shall be the responsibility of the contractor and the Department shall entertain no claim or compensation.

**22 MATTERS RELATED TO CONTRACT TO BE TREATED AS CONFIDENTIAL.**

The contractor shall consider all documents, correspondences, decisions and orders concerning the contract as confidential and/or restricted in nature and he shall not divulge or allow access to them by any unauthorized person. Any violation of the security of these confidential and restricted documents will attract penal and legal actions against the contractor in accordance with the existing law(s).

**23 MEDICAL CARE**

Providing medical care to all the employees, authorities and workmen is the sole responsibility of the contractor himself. The department shall not provide any medical facility for the treatment of the contractors or their employees. In nearby hospitals, medical facilities are available. The contractor shall therefore make arrangement for First-Aid at site of work as well as for the emergency medical treatment in any approved permanent hospital for his personnel, authority and worker injured during the execution of the work entirely at his own cost. All cases of accident, injury etc. to the contractor's personnel shall be immediately brought to the notice of the concerned authorities by submitting the full report of the cause of accident, the nature of injury and the name of injured person. The Department shall not be responsible for any medical care.

**24 MEDICAL SUPERVISION**

The contractor shall employ only such person known to be free from contagious diseases. Any employee having such disease shall be removed as and when detected. The contractor shall remove such employee to approved medical hospital or permanently from the site of work or construction camps and colonies, whenever in the opinion of the Engineer-in-charge it is necessary for the protection of the public health or health of

such employee.

It shall be the sole responsibility of the contractor to arrange for medical care and supervision of his workmen and staff at his own cost.

## **25 OBSERVANCE OF LAWS, LOCAL REGULATIONS AND ATTACHMENTS**

The Contractor shall conform to all laws of the land and the regulations and bye-laws of any local authority and power, water or lighting authorities related with the canal system or structure. He shall before making any variations from the drawings or specifications that may be necessitated for so conforming, give written notice to Engineer-in-charge for instruction thereon.

The Contractor shall give all notice required by the said Acts. Regulation or bye-laws and pay all fees in connection therewith. He shall also ensure that no attachment are made against materials or works related to the contract. The contractor shall protect and indemnify Government against all claims or liabilities arising for or based on the violation of such laws, ordinance, regulations, bye-laws, decree or attachments by him or by his employees.

9

## **26 OTHER CONTRACTORS**

It may be required that several contractors under different contracts work at the same site simultaneously. When two or more contractors are engaged on work in the same vicinity each shall extend all possible and reasonable facilities to other in a spirit of active co-operation and mutual accommodation. The contractor shall not take or cause to be taken any step or action that may cause disruptions, discontentment or disturbances to the works, labour and arrangement of other contractors in the vicinity and in the project localities.

In case of any difficulty amongst the contractors the Engineer-in-charge shall direct manner in which each contractor shall conduct his work so far as it affects the other and his decision shall be binding upon all the contractors involved.

## **27 OTHER WORKMEN**

The Engineer-in-charge shall have full authority to depute workmen on the work site to execute other work not included in this contract. The contractor shall afford every reasonable facility during working hours, to enable such workmen to carry out the other works provided that such works shall be carried out in such manner as not to impede the progress of the work included in the contract.

## **28 POWER-SUPPLY**

The Department does not take any responsibility at all in the arrangement

to be made for the supply of power by the Bihar State Electricity Board. Contractor at his own cost shall make the arrangement for supply of power.

**29 PREVENTION OF ACCIDENTS**

The Contractor shall at all times exercise reasonable and proper precautions for the safety of the people employed on the work and shall comply with the provisions of the current safety laws on buildings and construction codes of the State Govt. as may be applicable to him. He shall also provide all necessary fencings and lights as required to protect cattle, livestock and the public from accident. All machinery or equipment and other sources of physical hazards shall be guarded in accordance with the regulations or laws of the State Govt. or the Govt. of India. The contractor shall be responsible for all risks to the lives and properties of the people from whatsoever cause, arising in connection with the execution of the works and during their progress although all reasonable and proper precautions may have been taken by the contractor. In case of Government (either alone or jointly with contractor) shall be called upon by the court of law to make good any such loss or losses or damages or to pay compensation including that payable under the provisions of the workmen's Compensation Act, Industrial Dispute Act etc., to any person or persons sustaining damage as aforesaid by reason of any act of negligence or omission on the part of the contractor the amount which the Govt. may be required to pay in respect thereof and the amount of any costs and charges (including legal costs and charges in connection with the legal proceedings) which Government may have to incur in these respects all these shall be recoverable from the contractor. Immediate reports of all accidents shall be submitted by the contractor to competent authorities according to statutory requirements giving such details as may be prescribed for that purpose.

The contractor shall at his own expense arrange for the safety operation as required including the provision in the safety manual published by the Central Water Commission, New Delhi (latest edition).

**30 PROTECTION OF ADJOINING PREMISES**

The contractor shall protect adjoining structural and decorative items, if any, from damages that could be caused by the execution of these works and make good at his own cost, if any, such damage occurs.

**31 REMOVAL OF CONTRACTOR'S MEN**

The contractor shall on the written direction of the Engineer-in-charge immediately remove from the work site, camps and colonies, any person employed thereon who may in the opinion of the Engineer-in-charge be incompetent or has misconduct himself. Such person shall not be employed again on the work without the written permission of the Engineer-in-charge.

**32 SECURITY MEASURES**

32.1 In view of the strategic importance of the project and installations of security restrictions may be imposed by the Engineer-in-charge as per directions of the Security Authorities and the contractor shall abide by all such restrictions and instructions.

32.2 In case, a system of identity card is introduced, the contractor shall at his own cost provide for his personnel, all such identity card with photos, if necessary duly signed by the Engineer-in-charge or his duly authorized representatives. The contractor shall keep the Engineer-in-charge informed regarding all visitors and obtain proper permits for their visit to the work. No unauthorized visitors shall be allowed at the work site.

### **33 SIGNED DRAWINGS - NO AUTHORITY TO THE CONTRACTOR**

Signed drawing alone shall not be deemed to be an order for work unless it is entered in the agreement or the schedule of drawings under proper attestation of the contractor and the Superintending Engineer or unless it has been sent to the contractor by the Superintending Engineer with a covering letter confirming that the drawing is an authority for working the contract.

### **34 SPECIFICATIONS**

In case of any class of work for which there is no specification available, such work shall be carried out in all respect in accordance with the standards and requirements as prescribed by the Superintending Engineer.

### **35 TAXES, DUTIES, ROYALTIES, LEVIES, GST, CESS, AND SEIGNIORAGE etc.**

35.1 If there is any variations statutory or otherwise, in the above taxes (excluding income tax) duties, levies etc or fresh taxes, duties, levies etc are effected by the Central or State Government or Local Bodies; then the difference between those existing on the date of submission of the tender and actually paid by the contractor (based on the bill and payment vouchers to be produced to the Engineer-in-charge) shall be adjusted upwards or downwards for fresh levies, increase or decrease as the case may be.

### **35.2 INCOME TAX**

Income tax at the prevailing rate on the gross value of work done under this contract by the contractor shall be deducted at source as per statutory provision by the Engineer-in-charge from every bill of the contractor.

### **36 USE AND CARE OF WORK SITE**

36.1 The contractor will be permitted to use without charge the site and the lands belonging to the Department for execution of work such as workshop and stores and for the related activities at site. The contractor shall not commence any operation on such departmental land except with the prior approval of the Engineer-in-charge. If the lands available in the area are

not adequate the contractor may have to make his own arrangements for additional lands. The Department shall not take any responsibility for arranging land for the contractor.

The contractor shall not demolish, remove or alter the structures, trees or other facilities at the site without prior approval of Engineer-in-charge. The land required for contractor's camps and offices will have to be arranged by the contractor himself.

36.2 All rubbish etc. shall be burnt or removed from the site as they accumulate. All surfaces and soil drain shall be kept in clean, sound and in workman like conditions. All the areas of the contractor's operation shall be cleared before returning them to the Engineer-in-charge.

The contractor shall make good, all damages or alterations made in as properly or land handed over to him before these are returned back without prejudice to the application of provisions of clause 3.51

### **37 WORK UNDER THE CONTRACTOR'S CHARGE**

The works shall be under the contractor's charge from the date of commencement till 10 years after calculated from the date it is handed over to the Engineer-in-charge after completion and the contractor shall be fully responsible for maintenance, protections and making good all damages to the work occurring during course of operation of the contract or due to any reason whatsoever. Taking over the whole or part of the work by the Engineer-in-charge shall not waive or diminish the responsibility of the contractor to maintain, execute all repairs, amendments, reconstructions, rectifications, making good all the defects, imperfections, shrinkable or other faults entirely at the expenses of the contractor.

### **38 SITE FOR EXECUTION OF WORK :**

Site for execution of the work will be available as soon as the work is awarded. In case it is not possible for the department to make the entire site available on the award of the work by any unavoidable reason is under process for the part of the site of work the contractor will have to arrange his working Programme accordingly. No claim whatsoever for not giving the entire site on award of work and for giving the site gradually will be tenable. Failure or delay by the department to hand over the contractor possession of the entire site necessary for the execution of the work shall in no way affect or vitiate the contract or alter the character thereof or entitle the contractor to damage or compensation therefore provided that the department may extend the time for completion of work by such period as it may consider necessary and proper.

40 Non-commercial dredge material can be used in restoration of Bank/ construction/ repairing of access roads and other suitable places as mutually agreed by Engineer-in charge and contractor.

41. The bidder will have to enclose over all Implementation schedule with the

bid. The same will be detailed using CPM and PERT after the agreement by the contractor. The Contractor will have to submit fortnightly progress report (or as and when required) with respect to the O.I.S.

42. In case of any printing error in either in quantity or amount, the same will be corrected as per estimate.
43. The arrangement of power during the whole work shall be done by the agency at his/her own cost.

# **SECTION – 6**

## **Technical Specification**

**SECTION-6.1**  
**TECHNICAL SPECIFICATION OF WORK**

**I. DESCRIPTION OF THE CHANDAN RESERVOIR**

- a) Chandan Dam was constructed in the year 1968 across river Chandan River near village Laxmipur in the Baunsi block of Banka District of the state of Bihar. The reservoir had a gross capacity of 157.23 MCUM and a live storage capacity of 135.74 MCUM above DSL.
- b) As per the survey conducted by WAPCOS in May 2015, the gross storage capacity of the reservoir has come down from 157.23 MCM to 56.23 MCM due to the continuous deposition of sediments in the reservoir area over a period of 48 years. Thus, 101.00 MCM silt has got deposited in the reservoir area during this period of 48 years. Leaving the Dead Storage Capacity of 21.49 MCM aside, remaining 79.51 MCM storage capacity has been lost due to the deposition of silt. This loss in storage capacity has directly resulted in a loss in stored water, which in turn has very badly affected the irrigation facility being provided to the farmers. At present, the stored water is not sufficient even to fulfill the Kharif irrigation requirement of the farmers of the Banka and Bhagalpur district of Bihar. Also no water is normally available for Rabbi Irrigation.
- c) Salient features of the Dam

<b>Hydraulic Particulars of Chandan dam</b>		
1	Latitude at Dam	24° 40' 27" N
2	Longnitude at Dam	86° 55' 00" E
3	Type of Dam	Earthen Dam
4	Length of Dam	1554 m
5	Full Reservoir Level	EL 152.44 m
6	M.W.L	EL 157.01 m
7	Sill Level of Canal Outlet	EL 131.09 m
8	Top of Dam	EL 160.06 m
9	Top width of Dam	N.A.
10	Capacity	157.23 Mcum
11	Dead Storage	21.49 Mcum
12	Full Capacity	157.23 Mcum
13	Max. Height from Sill Level	N.A.
14	Deepest Bed Level of the River	EL 119.81 m
<b>Spillway</b>		
1	Type	Ungated
2	Length	169.2 m
3	Maximum Flood Discharge	3113 cumecs

4	Crest Level	152.44 m
<b>Canal Sluice</b>		
1	Sill	131.09 m
2	Vent	2 nos.
<b>Other Details</b>		
1	Catchment Area	549 Sq km
2	Water Spread Area	10.81 Sq. km.
3	Average Annual yield	292.3 Mcum
4	Average annual rainfall	1176.8 mm

### SILT LOAD ASSESSMENT OF CHANDAN RESRVOIR

As per the Study Conducted by WAPCOS for making assessment of silt deposited in the of Chandan reservoir, it has been estimated that **12.83 MCM** is likely to be deposited in the designated area of Chandan Reservoir.

S NO.	PARTICULARS		QUANTITY IN MCM
1	<b>Silt Assessment</b>		
	<b>As per study conducted in 2019 for silt load deposition in submerged area of WRD land (216 ha)</b>	A	8.64 MCM
	<b>Average Annual silt load rate</b>	B	0.419 MCM
	<b>Existing Silt load</b>	A	8.64 MCM
C	<b>Likely Silt deposition during dredging period of 10years @ B</b>	B X 10	4.19 MCM
D	<b>Total Likely Silt deposition up to the end of dredging period</b>	$D = A + C$	<b>12.83 MCM</b>

Note: Above quantity is purely tentative & is based upon sedimentation study conducted in 2019. Contractor is advised to visit the site and get acquainted with the actual site conditions.

**SECTION-6.1 & 6.2****SCOPE OF WORK**

- 1.0 Name of Work: Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.**
- 2.0 FOR CHANDAN RESERVOIR**
- 2.1** Desilting / Dredging of Chandan Reservoir involves designated area in the confluence of Chandan River and Reservoir to the required bed level (Maximum upto +4.0 m) and this includes dredging in the submergence part of the River, transporting and removal of excavated material with all lead & lift.
- 2.2** Desilting in Chandan River in the submerged area shall be done only upto the level of +4.0 m. Any excavation beyond the specified level will not be allowed. The agency will have to complete the desilting work in ten (10) years.
- 2.3** The contractor shall conduct a detailed pre-commencement survey at their own cost, clearly identifying the dredging area, haulage roads, dykes etc. This survey must be submitted for approval to the Engineer-in-Charge before the actual commencement of work at the site.
- 2.4** In addition, a detailed project report (DPR) will be prepared by the selected agency; within a maximum of 02 months after issuance of Lol in consultation with the Engineer-in-Charge, which will include the dredging area, the entire process of dredging such as extraction, transportation, separation, water treatment and disposal plan of excavated material, Social Impact Assessment (SIA), Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) etc. This DPR will be submitted to the department for necessary approval.
- 2.5** Based on the survey findings, the final estimation of dredged material quantity and the corresponding contract value shall be determined. The agreement between the contractor and the department shall be executed only after the final quantity assessment and approval by all concerned authorities.
- 2.6** Any deviation from the approved site plan without prior written consent may result in penalties or termination of the contract. The contractor must ensure that all infrastructure, including roads, storage areas, and sediment management dykes, is developed in compliance with national sediment management guidelines, environmental regulations, and the directives of all relevant departments.
- 2.7** Before starting dredging work in Chandan reservoir, the selected agency will be required to obtain environmental and other necessary statutory clearances for mining, storage and sale of sand.
- 2.8** As per office memorandum of Ministry of Environment, Forest and Climate Change, Government of India vide F. No. 3-70/2020-IA.III [141127] dated 21.08.2023, dredging/ desilting of dams, reservoirs, weirs, barrages, river and canals for the purpose of their maintenance, upkeep and disaster management

have been exempted from the requirement of obtaining environment clearance. However, before the selling of dredged material, the appointed agency shall obtain Environmental Clearance or any other statutory requirement in coordination with the Employer. The timeline required to obtain all clearances will be deemed and can be considered for extension of time, due to relevant activities. However, the mobilization & dredging activities will not be affected by the requirement of environment clearance.

- 2.9 Mobilization:** - The contractor shall mobilize the required machinery and equipment in good working condition to the site within 15 days of award of work, ensuring compliance with operational and safety standards. The agency shall obtain necessary permissions from local authorities for mobilization, in coordination with the Employer, but at its own cost.
- 2.10** During transportation, the agency must take utmost care to prevent any damage to private or public property, as well as existing roads identified by WRD for the disposal of desilted materials. The mobilization route and the final equipment positioning at or near the site shall strictly adhere to the provisions outlined in the final approved Detailed Project Report (DPR).
- 2.11** As per the approved DPR, the designated entry and loading point for the disposal of desilted materials via tippers shall be the designated stockyard / Dyke area. The Employer shall facilitate identification of the necessary land for accessible roads to ensure a smooth transportation process. The contractor shall abide by the approved route plan and construct roads ensuring that all mobilization activities are carried out in compliance with environmental and safety regulations.
- 2.12** Desilting/Dredging is **MUST** to be carried out by cutter suction dredgers (CSD) and allied equipment as mentioned in the tender document.
- 2.13** All the material excavated by agency shall be disposed by the agency at their own risk and cost.
- 2.14** **The measurement of desilting / dredging shall be in cubic metre.**
- 2.15** The actual quantity of dredged material shall be determined based on dispatch details and verified through royalty receipts.
- 2.16** The Contractor shall also install or tie- up with a nearby weighbridge operator of suitable capacity for checking the weight of the vehicles (loaded & empty).
- 2.17** The agency shall be responsible for making payments to the government at the contract rate based on the terms of the contract. The royalty payments must be submitted along with the necessary documentation to the relevant authorities as per statutory requirements. Failure to submit timely payments and royalty receipts may result in penalties or suspension of operations or in extreme cases even termination of contract.
- 2.18** All the approach/haul road required, to reach material source, work site, camp etc shall have to be constructed & maintained by the contractor, during the

entire contract period, at his own risk and cost, for which no extra payment shall be made to the contractor.

- 2.19** The employer doesn't guarantee the suitability or availability of any land required for the work or any access route or access road, and will not entertain claim for any such non-availability of land or access route.
- 2.20** The contractor shall comply all prevailing safety norms health and safety laws, environment laws, labour laws, fair wages law, and all other laws which are applicable for the execution of work.
- 2.21** The contractor shall not change the existing natural course of rivers/ streams/nallah falling into the river and reservoir. Neither the contractor shall disturb the existing civil structures on site without prior permission of Engineer-in-charge.
- 2.22** The selected agency shall be required to pay a premium amount based on the minimum assured quantity of mineral to be extracted annually, as specified in the tender document. This payment must be made in two equal six-monthly installments before the commencement of the respective dredging period. The actual quantity of mineral extracted will be assessed every six months, and if this quantity exceeds the minimum assured quantity for that period, the agency shall pay an additional premium based on the approved rate of sand for the surplus quantity.
- 2.23** A moratorium period shall be granted until all necessary No Objection Certificates (NOCs) and statutory clearances are obtained, subject to a maximum cap of 06 months from the date of the agreement. Once all NOCs are secured or the 06 months period lapses, whichever is earlier, the contractual milestone for premium payment obligations towards WRD will commence. After the moratorium period lapses, any shortfall in achieving the set milestone quantity shall require the agency to pay the premium for the minimum assured quantity, irrespective of the actual extraction volume.
- 2.24** During processing and separation of silt extracted from Chandan reservoir, the yield of sand and other components will be properly assessed by the stakeholder departments of the State concerned.
- 2.25** In addition, it will be the responsibility of the contractor to obtain all other relevant statutory mandatory clearances as prescribed by the Mines and Geology, Department, in compliance with all prescribed rules and formalities.
- 2.26** Before dispatch/sale of sand by the selected agency, it will be mandatory to pay advance royalty and other statutory charges as applicable under Mines & Geology Department, Bihar.
- 2.27** Under no circumstances will the selected agency transport sand without obtaining proof of royalty payment and a valid transportation challan.
- 2.28** To prevent illegal mining and transportation of sand, appropriate technology like RFID / GPS tracking of their vehicles, CCTV surveillance, central monitoring, cashless online sale etc. will be adopted by the selected agency.

- 2.29** While carrying out dredging work in Chandan Reservoir, the contractor shall be required to comply with the regulations mentioned in the "National Framework for Sediment Management, 2022" issued by Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India and all other applicable rules. Acts of State and Government of India and relevant orders of the Hon'ble Courts / National Green Tribunal.
- 2.30** The Dredging/ Desilting Contractor shall undertake Dredging/ Desilting operations only in the submerged part of the designated desilting area. The contractor shall first demarcate the proposed dredging area of WRD before the commencement of operations.
- 2.31** The Dredging/ Desilting Contractor shall deploy required machinery, vehicles, operating crew/ manpower for Dredging/Desilting of targeted quantity of aggregates preferably.
- 2.32** The Dredging/ Desilting Contractor shall identify the Dyke as designated by the WRD department and shall be accessible by motorable road. It is the responsibility of the contractor to obtain permission/ NOC of usable roads connecting the dredging area in coordination with WRD.
- 2.33** The Dredging / Desilting Contractor shall deploy suitable machinery to load to motorable vehicles at Dyke.
- 2.34** The Dredging/ Desilting Contractor shall operate multiple stockyard to increase the efficiency of the project.
- 2.35** The Dredging/ Desilting Contractor shall undertake maintenance of the identified stockyard, secure the perimeter of the stockyard for inward and outward movement of motorable vehicles.
- 2.36** The Dredging/ Desilting Contractor shall ensure that vehicles entering into the stockyard from the Dredging/Desilting site shall carry dredge materials in dry condition to the maximum extent possible.
- 2.37** The Dredging/ Desilting Contractor shall arrange proper lighting arrangement and security at stockyard.
- 2.38** To ensure compliance and safety, the contractor must promptly inform the Employer of any suspected or observed illegal mining activities at the designated dredging site. Additionally, Government authorities will enforce strict measures to restrict illegal mining in the areas surrounding the designated dredging site.
- 2.39** The Dredging/ Desilting Contractor shall undertake the Dredging/Desilting activities complying all relevant provisions of Acts/ Rules/ Notifications including guidelines of Water Resource department of Government of Bihar, issued from time to time, and shall arrange at its own cost to obtain any statutory clearances/ approvals in coordination with the Employer, to undertake the said scope of work.

- 2.40** The period of contract is for 10 (Ten) years (including Rainy Seasons) from the date of execution of the Dredging/ Desilting Agreement.
- 2.41** The tenure of the contract may be extended based on mutual consent of WRD, Bihar and the Contractor.
- 2.42** Joint Measurement to be done on the quantity sold. The dredged material can be sold by the contractor in open market.
- 2.43** The contractor shall comply all prevailing safety norms, health and safety laws, environment laws, labour laws, fair wages law, and all other laws which are applicable for the execution of work.
- 2.44** All necessary precaution shall be taken by the Contractor not to cause any type of harm to the Dam / all structures/ Project during entire operation of desiltation/dredging work.
- 2.45** Dredging & desilting activities shall be allowed during monsoon. However, the safety of men & machines lies with the Contractor.
- 2.46** An Environmental Impact Assessment shall be carried out each year from the commencement of work through some third party monitoring (from any of the IITs/NITs) to determine the siltation load so that there is no over-exploitation of the resources at any point of time and the overall impact on Environment due to desiltation can be avoided. This cost shall be borne by the contractor.

**SECTION 7**  
**BILL OF QUANTITY**

**(Attached)**

**VOLUME- IIIB**  
**SECTION – 7**  
**BILL OF QUANTITIES (SCHEDULE –A)**

**Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.**

**BILL OF QUANTITIES**

S. No.	Particulars of Work	Rate of per Cubic metre of dredged sand (excluding royalty) as per RCD SOR 2024	Unit	Remarks
1	<b>Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.</b>	Rs. 434.84*	<b>Rs. per cubic metre</b>	<p>The premium rate in percentage per cubic metre of dredged sand payable to WRD, Bihar is to be quoted by the Contractor</p> <p>In fig. (.....%)</p> <p>In words .....</p> <p>This quoted rate in percentage is the premium rate payable to WRD by the contractor per cubic metre of sand obtained from dredging operations.</p>

Note:-

1. The work will be awarded to the Contractor quoting the highest rate payable to WRD, Bihar.
2. The highest (H-1) Contractor shall deposit the amount worked out as per his quoted rate to the department. No payment shall be made by the Department for the said work.
3. The applicable royalty and all other taxes will be borne by the contractor at their own cost. This rate can be revised as per the latest applicable rates by the concerned department.
4. **The minimum percentage rate that must be quoted is 3.74% of Rs. 434.84 per cubic meter (excluding royalty) of sand obtained from dredging operations. This schedule rate of sand, i.e. Rs. 434.84 (excluding royalty) can be revised as per the latest applicable rates by the State Govt. Accordingly, the net payable**

premium amount per cubic metre of dredged sand payable to WRD, Bihar by the Contractor will be revised.

5. Any bid **below 3.74% of Rs. 434.84 per cubic meter will be considered non-responsive.**
6. The contractor shall submit monthly report of quantity dredged wherein they will provide their dispatch data from previous month to the Executive Engineer.
7. The contractor has to produce the receipts of royalty charges, at the end of every month in lieu of the selling of dredged materials extracted from reservoir under the agreement.
8. The payment shall be accepted in the following instruments.
  - a) Demand Draft.
  - b) Cheque.
  - c) Transferred through Net banking/NEFT/RTGS/Debit card/Credit card or any other mode of online transfer in the Specified Account.
  - d) Any other mode as decided by Procuring Entity.

**SECTION 8**  
**SECURITIES AND OTHER FORMS**  
**(to be filled by Bidder/Employer)**

**BID SECURITY (BANK GUARANTEE UNCONDITIONAL)**

**WHEREAS** \_\_\_\_\_ [name of Bidder] (hereinafter called "the Bidder") has submitted his Bid dated \_\_\_\_\_ [date] for the construction of \_\_\_\_\_ [name of Contract hereinafter called "the Bid"].

**KNOW ALL PEOPLE** by these presents that We \_\_\_\_\_ [name of Bank] of \_\_\_\_\_ [name of country] having our registered office at \_\_\_\_\_ (hereinafter called "the Bank") are bound unto Executive Engineer, Irrigation Division, Baunsi in the sum of Rs. \_\_\_\_\_ for which payment will and truly to be made to the said Employer by the Bank itself, his successors and assigns by these presents.

**SEALED** with the Common Seal of the said Bank this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

**THE CONDITIONS** of this obligation are:

If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the form of Bid;

**OR**

If the Bidder having been notified to the acceptance of his bid by the Executive Engineer, Irrigation Division, Baunsi during the period of Bid validity;

fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or

fails or refuses to furnish the performance Security, in accordance with the Instruction to Bidders; or

does not accept the correction of the Bid Price pursuant to concerned clause.

We undertake to pay to the Executive Engineer, Irrigation Division, Baunsi up to the above amount upon receipt of his first written demand, without the Executive Engineer, Irrigation Division, Baunsi having to substantiate his demand, provided that in his demand the Executive Engineer, Irrigation Division, Baunsi will note that the amount claimed by him as due to him owing to the occurrence of one or any of the three conditions. (specifying the occurred condition or conditions.)

This Guarantee will remain in force up to and including the date ----- \_\_\_\_\_ "days after the deadline for submission of Bids as such deadline is started in the instructions to Bidders or as it may be extended by the Executive Engineer, Irrigation Division, Baunsi, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_

WITNESS \_\_\_\_\_

SEAL \_\_\_\_\_

[Signature, name and address]

The Bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees.

This figure should be the same as shown in Concerned Clause of the Instructions to Bidders.

45 days after the end of the validity period of the Bid. Date should be inserted by the Employer before the Bidding documents are issued.

**PERFORMANCE BANK GUARANTEE**

To \_\_\_\_\_ [name of employer (as per Clause 2 (xii) of Schedule "F")]

\_\_\_\_\_ [address of Employer]  
\_\_\_\_\_

WHEREAS \_\_\_\_\_ [name and address of Contractor] (hereafter called "the Contractor") has undertaken, in pursuance of Contract No. \_\_\_\_\_ dated \_\_\_\_\_ to execute \_\_\_\_\_ [name of Contract and brief description of Works] (hereinafter called "the Contract").

AND WHEREAS we have agreed to give the Contractor such a bank Guarantee :

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of ----- - ----- [amount of guarantee]\*in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of \_\_\_\_\_ [amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between your and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid upto 60 days beyond the duration of work.

Signature and Seal of the guarantor \_\_\_\_\_

Name of Bank \_\_\_\_\_

Address \_\_\_\_\_

Date \_\_\_\_\_

An amount shall be inserted by the Guarantor, representing the percentage the Contract price specified in the Contractor including additional security for unbalanced Bids, if any and denominated in Indian Rupees.

**LETTER OF ACCEPTANCE  
(Letterhead paper of the Employer)**

\_\_\_\_\_ (Date)

To

\_\_\_\_\_ (Name and address of the Contractor)

\_\_\_\_\_

\_\_\_\_\_

Dear Sirs,

This is to notify you that your Bid dated \_\_\_\_\_ for execution of the \_\_\_\_\_ (name of the contract and identification number, as given in the Instruction to Bidders) for the Contract Price of Rupees \_\_\_\_\_ (\_\_\_\_\_ ) (amount in words and figures), as corrected and modified in accordance with the Instructions to Bidders<sup>1</sup> is hereby accepted by our agency.

We accept / do not accept that \_\_\_\_\_ be appointed as the Adjudicator<sup>2</sup>. You are hereby requested to furnish performance Security, in the form detailed in Para 3.1 of ITB for an amount equivalent to Rs. \_\_\_\_\_ within 21 days of the receipt of this letter of acceptance valid up to 60 days from the date of scheduled completion of work i.e. up to \_\_\_\_\_ and sign the contract, failing which action as stated in Para 31.3 of ITB will be taken.

Yours faithfully,

Authorized Signature  
Name and title of Signatory  
Name of Agency

\_\_\_\_\_

<sup>1</sup> Delete "Corrected and" or "and modified" if only one of these actions applies. Delete as corrected and modified in accordance with the Instructions to Bidders, if corrections or modifications have not been affected.

**ISSUE OF NOTICE TO PROCEED WITH THE WORK  
(Letterhead of the Employer)**

\_\_\_\_\_ (Date)

To

\_\_\_\_\_ (Name and address of the Contractor)

\_\_\_\_\_

\_\_\_\_\_

Dear Sirs,

Pursuant to your furnishing the requisite security as stipulated in ITB Clause 31.1 and signing of the Contract for the Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years at a Bid Price of Rs. \_\_\_\_\_.

You are hereby instructed to proceed with the execution of the said works in accordance with contract documents.

Yours faithfully,

(Signature name and title of signatory authorized to sign on behalf of Employer)

## AGREEMENT FORM

### Agreement

This agreement, made the \_\_\_\_\_ day of \_\_\_\_\_ between \_\_\_\_\_ (name and address of Employer) [hereinafter called “the (name and address of contractor) hereinafter called “the Contractor” of the other part.]

Whereas the Employer is desirous that the Contractor execute

(name and identification number of Contract) (hereinafter called “the Works”) and the Employer has accepted the Bid by the Contractor for the execution and completion of such works and the remedying of any defects therein, at a cost of Rs. \_\_\_\_\_

**NOW THIS AGREEMENT WITNESSETH as follows:**

In this Agreement, words and expression shall have the same meanings as are respectively assigned to them in the conditions of contract hereinafter referred to and they shall be deemed to form and be read and construed as apart of this Agreement.

In consideration of the payments to be made by Contractor to the Employer as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all aspects with the provisions of the contract.

The Contractor hereby covenants to pay the Employer in consideration of the Execution and completion of the Works and remedying the defects wherein Contract price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

The following documents shall be deemed to form and be ready and construed as part of this Agreement viz.

- i. Letter of Acceptance
- ii. Notice to proceed with the works;
- iii. Contractor’s Bid
- iv. Condition of Contract: General and Special
- v. Contract Data
- vi. Additional condition
- vii. Drawings (To be supplied by Executive Engineer)
- viii. Bill of Quantities
- ix. Invitation for Bid (IFB)

- x. Notice inviting Tender (NIT)
- xi. Instruction to Bidders (ITB)
- xii. Technical specifications
- xiii. The letter exchanged between employer and the contractor after receipt of Tender but before award of the contract
- xiv. Any addenda or modification to above.
- xv. Any other documents listed in the Contract Data as forming part of the contract.

In witnessed whereof the parties there to have caused this Agreement to be executed the day and year first before written.

The Common Seal of \_\_\_\_\_ was hereunto affixed in the presence of:

Signed, Sealed and Delivered by the said \_\_\_\_\_ in \_\_\_\_\_ the presence of:

Binding Signature of Employer \_\_\_\_\_

Binding Signature of Contractor \_\_\_\_\_

**UNDERTAKING**

I, the undersigned do hereby undertake that our firm M/s \_\_\_\_\_  
\_\_\_\_\_ agree to abide by this bid for a period \_\_\_\_\_  
days for the date fixed for receiving the same and it shall be binding on us and  
may be accepted at any time before the expiration of that period.

\_\_\_\_\_  
(Signed by an Authorized Officer of the Firm

\_\_\_\_\_  
Title of Officer

\_\_\_\_\_  
Name of Firm

\_\_\_\_\_  
Date

**SECTION 9  
SITE MAPS**

**(Will be Supplied after Agreements)**

**SECTION 10**

ANY OTHER DOCUMENTS LISTED IN THE  
CONTRACT DATA AS FORMING PART OF THE  
CONTRACT (ATTACHED)

All letters with scanned copy

NEW GENERAL INFORMATION			
Template Group	RATE CONTRACT V.1.2	Bid Parts	2
Category	PERCENTAGE	Dealing Officer	Mr PRABHU SINGH (SUPERINTENDENT ENGINEER)
Organization Hierarchy	Government of Bihar --> Water Resources Department --> IRRIGATION CREATION, WRD, BHAGALPUR --> IRRIGATION CIRCLE, BHAGALPUR	System Tender No.	96053
Tender Reference No.*	03/2024-25/ID BOUNSI/WRD	Procurement Category *	CIVIL
Tender Currency	INR	Bidding Currency	INR
Tender Type*	Open Tender		
Minimum Number Of Bids*	2	Tender Call No. 1	1
Auction Enabled	No	Auction Type	
Initiate Auction After		Tender approving authority	PRABHU NARAYAN SINGH
From Indent	N	Indent No :	
Ranking Sequence	L1 Ranking	Offer Validity(In Days)	120
Detailed Description	Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years..	Tender issuing authority	ACHYUTANAND SINGH

OLD GENERAL INFORMATION			
Template Group	RATE CONTRACT V.1.2	Bid Parts	2
Category	PERCENTAGE	Dealing Officer	Mr PRABHU SINGH (SUPERINTENDENT ENGINEER)
Organization Hierarchy	Government of Bihar --> Water Resources Department --> IRRIGATION CREATION, WRD, BHAGALPUR --> IRRIGATION CIRCLE, BHAGALPUR	System Tender No.	96053
Tender Reference No.*	03/2024-25/ID BOUNSI/WRD	Procurement Category *	CIVIL
Tender Currency	INR	Bidding Currency	INR
Tender Type*	Open Tender		
Minimum Number Of Bids*	2	Tender Call No. 1	1
Auction Enabled	No	Auction Type	
Initiate Auction After		Tender approving authority	

From Indent	N	Indent No :	
Ranking Sequence	L1 Ranking	Offer Validity(In Days)	120
Detailed Description	Desiltation work through dredging of Chandan Reservoir near Laxmipur village in Banka district for 10 years.	Tender issuing authority	

**NEW DATE SCHEDULE**

<b>Bid Submission Start Date</b>	Mar 28, 2025
<b>Bid Submission Due Date</b>	Apr 25, 2025
<b>Bid Open Date</b>	Apr 26, 2025
<b>Physical doc Submission End Date as allowed in the tender document</b>	

**OLD DATE SCHEDULE**

<b>Bid Submission Start Date</b>	Mar 28, 2025
<b>Bid Submission Due Date</b>	Apr 8, 2025
<b>Bid Open Date</b>	Apr 9, 2025
<b>Physical doc Submission End Date as allowed in the tender document</b>	

बिहार राज्य पर्यावरण समाघात निर्धारण प्राधिकरण,  
द्वितीय तल, बेल्ट्रॉन भवन, शास्त्रीनगर, पटना-23

पत्रांक :- 251

पटना, दिनांक :- 23/05/2022

प्रेषक

सदस्य सचिव,  
SEIAA, Bihar

सेवा में,

जिलाधिकारी,  
बांका।

विषय :-

माननीय उच्चतम न्यायालय के सरकार द्वारा दायर सिविल अपील संख्या-3661-3662/2020 बिहार राज्य एवं अन्य बनाम पवन कुमार एवं अन्य मामले में दिनांक-10.11.2021 को पारित आदेश के त्वरित अनुपालन के आलोक में जिला सर्वेक्षण प्रतिवेदन के अनुमोदन के संबंध में।

महाशय,

निदेशानुसार उपर्युक्त विषयक के संबंध में सूचित करना है कि आपके द्वारा समर्पित बांका जिला के बालु खनिज हेतु जिला सर्वेक्षण प्रतिवेदन (DSR) को अनुमोदित कर इसकी एक प्रति संलग्न कर भेजी जा रही है।

अनु०:-यथोक्त।

विश्वासभाजन

6 23.5.2022

(सदस्य सचिव)  
SEIAA, Bihar

Bihar State Environmental Assessment Authority,  
2<sup>nd</sup> Floor, Beltron Bhawan, Shastrinagar, Patna-23

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Letter No. : 251

Patna, Date :-23/05/2022

**From:**

Member Secretary,  
SEIAA, Bihar

**To:**

The District Magistrate,  
Banka

**Subject:**

With reference to the approval of the District Survey Report, in view of the prompt compliance with the order dated 10.11.2021 passed by the Hon'ble Supreme Court in Civil Appeal Nos. 3661-3682 of 2020 (State of Bihar & Others vs. Pawan Kumar & Others), filed by the Government.

Sir,

In accordance with the instructions, this is to inform you that the District Survey Report (DSR) for the sand mineral of Banka district, as submitted by you, has been approved. A copy of the approved report is enclosed herewith for your reference.

Yours faithfully,

Sd/-  
Member Secretary  
SEIAA, Bihar

## जिला खनन कार्यालय, बाँका।

पत्रांक- 767/एम0, दिनांक- 04/05/2022

प्रेषक,

खनिज विकास पदाधिकारी,  
बाँका।

सेवा में,

सदस्य सचिव,  
State Environment Impact Assessment Authority,  
SEIAA, बिहार, पटना।

*[Handwritten Signature]*  
विषय -

SEIAA की बैठक दिनांक-03.05.2022 को (DSR) में संशोधन कर Final DSR जमा करने के संबंध में।

महाशय,

उपर्युक्त विषय के संबंध में कहना है कि दिनांक- 03.05.2022 को State Environment Impact Assessment Authority (SEIAA) की बैठक में जिला सर्वेक्षण प्रतिवेदन (DSR) में प्रस्तावित बालूघाटों में संशोधन कर एवं घाटों से संबंधित सभी दस्तावेज DSR में समायोजित कर Final DSR समर्पित करने लिए निदेशित किया गया था। तदालोक में बालूघाटों को संशोधित कर एवं सभी दस्तावेज DSR में सलग्न कर समर्पित किया जा रहा है।

अनुलग्नक :- यथोक्त।

विश्वासभाजन

*[Handwritten Signature]*  
04/05/2022  
खनिज विकास पदाधिकारी,  
बाँका



District Mining Office, Banka.  
Letter No.- 767/M, dated 04/05/2022

---

**From,**

Mineral Development Officer,  
Banka

**To,**

Member Secretary, State Environment Impact  
Assessment Authority, SEIAA, Bihar, Patna.

**Subject:**

Concerning the submission of the Final District Survey Report (DSR) after incorporating amendments, as discussed in the SEIAA meeting held on 03.05.2022.

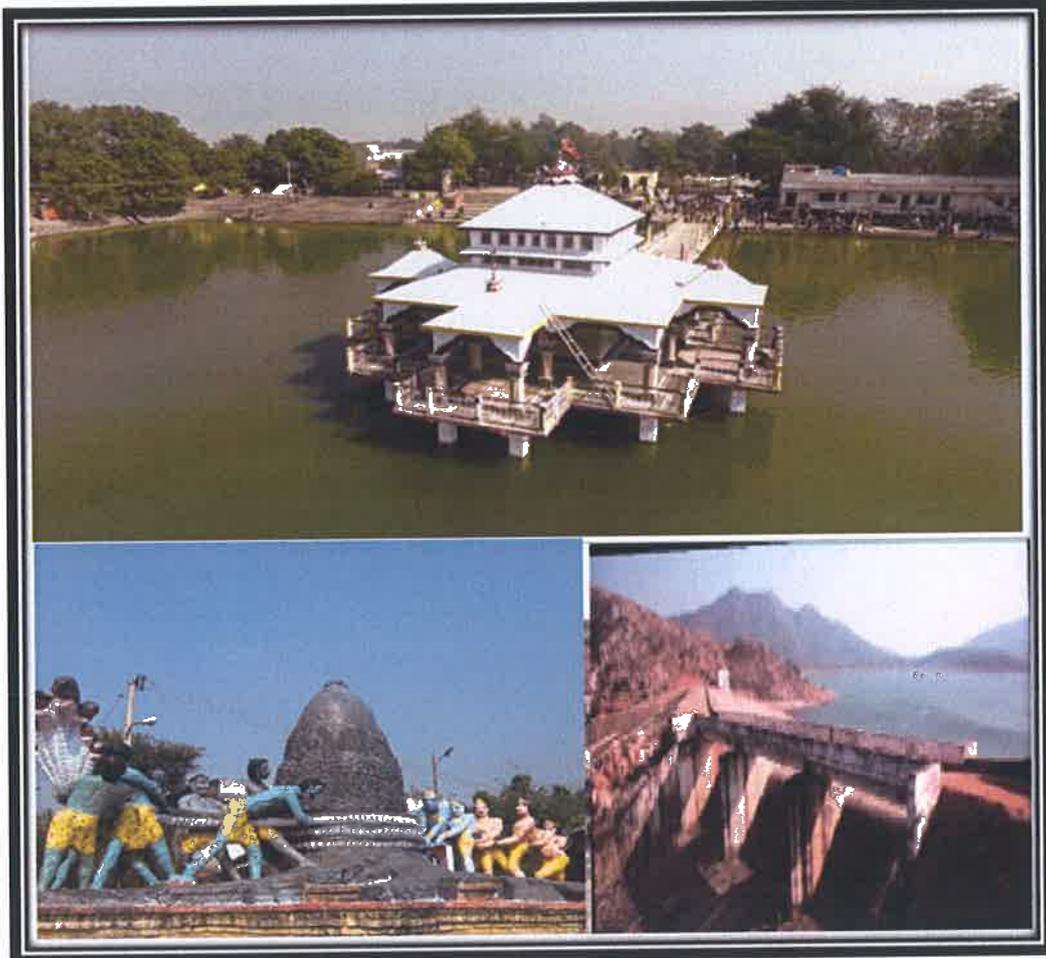
Sir,

With reference to the above-mentioned subject, it is stated that in the meeting of the State Environment Impact Assessment Authority (SEIAA) held on 03.05.2022, directions were issued to submit the Final District Survey Report (DSR) after amending the proposed sand ghats and incorporating all related documents into the DSR. Accordingly, the sand ghats are being revised, and all relevant documents are being integrated into the DSR for submission.

Yours faithfully,

Sd/-  
Minerals  
Development  
office, Banka

***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**



*Member Secretary  
 SEMAA, Bihar*

डॉ० पीति, भा0प्र0से0, अनुमण्डल पदाधिकारी, बाँका की अध्यक्षता में दिनांक- 25.04.2022 को सम्पन्न जिला सर्वेक्षण प्रतिवेदन (DSR) तैयार करने से संबंधित बैठक की कार्यवाही प्रतिवेदन

उपस्थिति पंजी के अनुसार -

कार्यवाही :- सर्वप्रथम अनुमण्डल पदाधिकारी, बाँका द्वारा समिति के सभी सदस्यों का स्वागत करते हुए बैठक की कार्यवाही प्रारम्भ की गई। सनिज विकास पदाधिकारी द्वारा अवगत कराया गया कि माननीय उच्चतम न्यायालय द्वारा सिविल अपील सं0- 3861-3662/2020 बिहार राज्य बनाम पवन कुमार एवं अन्य मामले में दिनांक- 10.11.2021 को पारित अन्तरिम आदेश के अनुपालन में खान एवं भूतत्व विभाग, बिहार पटना से प्राप्त निदेश के आलोक में बाँका जिलान्तर्गत गठित अनुमण्डल स्तरीय समिति द्वारा तैयार किये गये जिला सर्वेक्षण प्रतिवेदन (DSR) प्रारूप को सदस्य सचिव, बिहार राज्य आंकन समिति (SEAC, Bihar) के द्वारा दिनांक- 25.03.2022 के बैठक में दिये गये टिप्पणी/निदेश के आलोक में खान एवं भूतत्व विभाग, बिहार, पटना के आदेशानुसार SSMMG-2016 एवं (EMGSM-2020) के अनुसार संबंधित जिला सर्वेक्षण प्रतिवेदन (DSR) को सुधार कर सक्षम प्राधिकार को ससमय उपलब्ध कराते हुए उक्त (DSR) प्रारूप को आम लोगों का टिप्पणी (Comment) प्राप्त करने हेतु एक माह तक Public Domain में रखी गई। बाँका जिले संबंधित समर्पित किए गये जिला सर्वेक्षण प्रतिवेदन (DSR) प्रारूप पर बिहार राज्य स्तरीय आंकन समिति (SEAC, Bihar) द्वारा अपने पत्रांक- 132/पटना, दिनांक- 07.04.2022 से बैठक से संबंधित उपलब्ध कराए गए कार्यकृत के AGENDA ITEM No.-19 के अनुसार निम्नवत आपत्ति (Query) उठाई गई है :-

Sr. No.	Conditions	Compliance	Page No.
i.	Only two year data of Replenishment data has been provided i.e. year 2018 and 2019. No any factual data for Replenishment study has been submitted of concern district.	Factual data regarding replenishment study such as reduced level of pre & post mansoon season are given in tabular form. Refer page no... 33	33
ii.	The specific gravity of the material also needs to be ascertained by analyzing the sample from a NABL accredited lab.	Specific gravity of the sand material of rivers has been analyzed in NABL accredited laboratory. Analysis reports are attached as Enclosure - I	68
iii.	The permanent boundary pillars need to be erected after identification of an area of aggradations and deposition outside the bank of the river at a safe location for future surveying. The distance between boundary pillars on each side of the bank shall not be more than 100 meters.	Once the sand ghats have been finalized and the auction will be done, then this condition will be complied accordingly.	-
iv.	Demand and supply of the Riverbed Material through market survey needs to be carried out. In addition to this, future demand for the next 5 years also needs to be considered, to justify the number and area of the sand ghats.	As sand is used as raw material in construction of building and infrastructure projects, the demand of sands increasing day by day. In past, demand was not too much but now a days due to rapid industrialization and urbanization its demand increasing with pace of time. At present, demand of sand is more than the supply. Bihar has deposits of sand used for both construction and filling purposes	-



Minutes of the meeting regarding the preparation of the District Survey Report (DSR) held on 25.04.2022 under the chairmanship of Dr. Piti, IAS, Sub-Divisional Officer, Banka.

As per attendance register-

The proceedings commenced with the Sub-Divisional Officer, Banka, formally welcoming all committee members. The Mineral Development Officer then informed the house that, in compliance with the interim order dated 10.11.2021 passed by the Hon'ble Supreme Court in Civil Appeal Nos. 3661–3662/2020 (State of Bihar vs. Pawan Kumar & Others), and as per the directions received from the Department of Mines and Geology, Bihar, Patna, the District Survey Report (DSR) format was prepared by the Sub-Divisional Level Committee constituted in Banka district. The format was revised in light of the remarks and instructions received from the Member Secretary of the Bihar State Environmental Impact Assessment Committee (SEAC) during the meeting held on 25.03.2022. In accordance with the directives of the Mines and Geology Department, the DSR was updated as per the provisions of SSMMG-2016 and EMGSM-2020 and was submitted to the competent authority within the stipulated time. Furthermore, the draft DSR was placed in the public domain for one month to invite feedback from the general public. As per Agenda Item No. 19 of the proceedings shared by the Bihar SEAC via Letter No. 132/Patna dated 07.04.2022, the following objections/queries were raised regarding the DSR submitted for Banka district:

	<p>Mining area may be so selected as to cover the entire deposition area. Dividing a large area of deposition/aggradations into smaller mining leases should be avoided as it leads to loss of mineral and indirectly promotes illegal mining.</p>	<p>Condition has been complied, sand ghats proposed for mining is having high amount of sand deposits. Ghats have been made considering Bihar minor mineral concession rules amended till date and existing sand mining guidelines.</p>	-
vi.	<p>The DSRs should be placed in the public domain for at least one month from the date of publication of the advertisement for obtaining comments of the general public. The comments so received shall be placed before the concerned sub-divisional committee for active consideration. Only after such consultations, the DSR should be submitted before the SEAC. [As per procedures laid down in EMGSM - 2020 (Page No. 19 (P))]</p>	<p>The DSR has been placed in public domain on district website www.Banka.nic.in to receive comments from comments/suggestions. Regarding this an advertisement has been published in local news paper dated 22.03.2022. Till date comments have been received through E-mail. Reply of the same is attached as Sheet</p>	-
vii.	<p>The Committee observed that sand ghats have been proposed on the confluence/meanders/concavities/active Channels which require to be excluded from the DSR. No mining area should be proposed at any river bank concavities to avoid bank erosion and river stability.</p>	<p>All such Ghats have been removed from the DSR. List of proposed ghats are given in page no..21-27</p>	21-27
viii.	<p>The Committee was not shown any such map where 1/4th part of the area has been separated from central 3/4th part of the river as a minable and non-minable zone.</p>	<p>Condition has been complied. Refer Enclosure-.....V</p>	87
ix.	<p>In case sand ghat is located near by the Forest/ Wildlife Protected Area, (Bird Sanctuary / Wildlife Sanctuary / National Park / Tiger Reserve) a certificate regarding distance of such ghat from the boundary of Forest/ Protect Area as well as the notification status and extent of the Eco-Sensitive Zone issued by the Ministry of Environment, Forest and Climate Change, Govt. of India should be enclosed with the DSR.</p>	<p>Regarding this informations are given in tabular form. In this table, distance of each sand ghats from forest, eco sensitive are and boundary of WLS are provided. Refer Annexure - II</p>	57
x.	<p>If the proposed mining area has overlapping areas with previously allotted existing lease or already working or worked out mining lease then the same should be clearly depicted in the proposed mining area with different colour. Details about the quantity of Sand extracted from the overlapped area should be furnished duly certified from the concerned Department.</p>	<p>Details regarding this is provided in DSR. Refer Enclosure .....VI</p>	88



	Provide different colour map for proposed and existing sand mining area and also submit State, District Wildlife Sanctuary, Eco-Sensitive Zone boundary in different colour map and KML file to check the suitability of the mining site.	No any existing sand ghats are present in the district. Also no any Wildlife Sanctuary are present nearby the sand ghats. Map showing district boundary is attached as Enclosure- .....V Also KML of the same have been being submitted as soft copy.	87
xii.	Submit a map and KML, file regarding aquatic animal found in river.	Aquatic animal of least concern has been found in the river, therefore map & KML is not required.	-
xiii.	Calculate the Movable Mineral potential for each sand ghat in the prescribed format (SSMG 2016, as prescribed in page no. 25 and 26) for each river separately.	Condition has been complied. Movable mineral potential of each sand ghats have been calculated as per SSMG-2016. Refer Page no..21-27	21-27
xiv.	It should be for each mine area with respect to sand mining done [Ghats wise details of quantity of sand extracted and revenue generated (annually) for the past three years]. Only Sand mining revenue should be included in DSR not brick kiln/other minerals revenue.	Condition has been complied. Details of quantity extracted in last 3 years are given in page no--- 28  Revenue generated due to sand only in last 3 years are given in page no...28	28
xv.	All the Annexure as prescribed in the EMGSM, 2020 should be duly filled and complete.	All the annexures has been attached as per EMGSM 2020. Refer page no...55	55
xvi.	Old and new proposed Ghats must be mentioned in all the DSR. (List, Map & KML file).	Details of old and new ghat and their map are given in page no...18 to 25 Also KML of the same have been being submitted as soft copy.	15 to 27
xvii.	District Border line (Bold mark) should be mentioned in the maps/images/KML file in DSR.	Condition has been complied, Refer composite map showing district boundary. Refer Enclosure-...V	87
xviii.	All the primary and secondary data should be supported by proper references and documentary support along with the page number in the compliance report of revised DSR.	All the primary and secondary data has been taken from authentic references.	-
xix.	FMISC (Flood Management Improvement Support Center), a R&D unit under WRD (Water Resource Department) at Anishabad has resolution satellite maps of river systems of Bihar. District Authorities may contact the office of FMISC for procurement of geo-referenced map of the river to support the DSR.	As per the direction received from FMISC, a recent satellite image maps have been made. Maps are attached here as Enclosure-..... III	78

साथ ही जिला के NIC वेबसाईट पर जिला सर्वेक्षण प्रतिवेदन (DSR) प्रारूप को Upload करने के पश्चात विभिन्न व्यक्तियों द्वारा आपत्ति दर्ज करते हुए कार्यालय के मेल पर सूचित की गई, जिसका प्रत्युत्तर निम्नवत है :-



S.No	Issue raised	Person name	Reply
1	Some newly Proposed Sand Ghats geo-coordinates overlap with the 5 Years or till Expiry of Lease Period sand Ghats	1. <b>Suraj Bhushan Sharma</b> through E-Mail (suraj171189@gmail.com) 2. <b>Anil Kumar</b> through E-Mail (annuojha0001@gmail.com) 3. <b>Environment Status</b> through E-Mail (envmepl@gmail.com)	The details of proposed sand ghats, which are overlapping with existing ghats are given as Enclosure- VI. in DSR.
2	Newly Proposed Sand Ghats is a violation of MOEF&CC sustainable sand mining guidelines 2016 and some others.	1. <b>Suraj Bhushan Sharma</b> through E-Mail (suraj171189@gmail.com) 2. <b>Anil Kumar</b> through E-Mail (annuojha0001@gmail.com) 3. <b>Environment Status</b> through E-Mail (cnvmepl@gmail.com)	The proposed sand ghats have been made in DSR as per SSMG-2016 and ESGSM 2020, which are being scrutinized by SEIAA-Bihar under the light of honorable Supreme Court Order.
3	Some newly Proposed Sand Ghats geo-coordinates mentioned in DSR 2022 do not match the Proposed Sand Ghats area.	1. <b>Suraj Bhushan Sharma</b> through E-Mail (suraj171189@gmail.com) 2. <b>Anil Kumar</b> through E-Mail (annuojha0001@gmail.com) 3. <b>Environment Status</b> through E-Mail (envmepl@gmail.com)	Detailed survey has been done physically on the site regarding the area measurement. Geo-coordinated mentioned in DSR of all the sand ghats are according to the area proposed for mining.

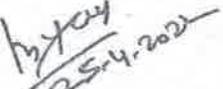
समिति द्वारा खनिज विकास पदाधिकारी को निदेशित किया गया कि उक्त अद्यतन जिला सर्वेक्षण प्रतिवेदन (DSR) को जिला पदाधिकारी महोदय को अवगत कराते हुए सदस्य सचिव SEIAA Bihar, पटना को संशोधित DSR को भेजा जाए।

अन्त में सधन्यवाद ज्ञापन के साथ बैठक की कार्यवाही समाप्त की गई।

  
25-04-2022  
खनिज विकास पदाधिकारी,  
बाँका।

  
25-04-22  
कार्यपालक अभियन्ता  
वन क्षेत्र पदाधिकारी, लघु सिंचाई विभाग, कार्य  
बाँका प्रमण्डल बाँका

  
25/04/2022  
कार्यपालक अभियन्ता  
बाढ़ नियंत्रण विभाग,  
कार्य प्रमण्डल बाँका काँगा (बाँका)

  
25-4-2022  
क्षेत्रीय पदाधिकारी,  
BSPCB, बाँका

भूमि सुधार उप समाहर्ता,  
बाँका



Following the upload of the District Survey Report (DSR) format on the district's NIC website, several individuals submitted objections via the official email. The responses to these objections are as follows:

The Committee instructed the Mineral Development Officer to forward the revised DSR to the Member Secretary, SEIAA Bihar, Patna, after duly informing the District Officer about the updated report.

The meeting concluded with a vote of thanks.

Sd/-  
Mineral Development  
officer, Banka

Sd/-  
Forest Range Officer,  
Banka

Sd/-  
Engineer Minor Irrigation  
Department, Work  
Division Banka

Sd/-  
Regional Officer, BSPCB,  
Banka

Sd/-  
Regional Officer, BSPCB,  
Banka

Sd/-  
Land Reforms Deputy  
Collector, Banka

Sd/-  
Executive Engineer Flood  
Control Department,  
Works Division Beacon  
(A)

Sd/-  
Circle Officer, Banka

**CONTENT**

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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 15<sup>th</sup> January 2016 and the amended notification S.O. 3611(E) dated 25<sup>th</sup> 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, Forests, 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.



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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/rivers/streams 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

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### GUIDELINES FOR MINING OF MINERALS

The erstwhile Ministry of Environmental and Forests (MOEF), The government of India, made Environmental Clearance (EC) mandatory through its Notification of 27<sup>th</sup> 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 14<sup>th</sup> 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 15<sup>th</sup> January 2016, vide S.O. 3611(E) dated 25<sup>th</sup> 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 27<sup>th</sup> 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 Harayana 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.

In 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 27<sup>th</sup> 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-11011/47/2011-IA.II (M) dated 18<sup>th</sup> 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 15<sup>th</sup> January, 2016 & 20<sup>th</sup> 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 14<sup>th</sup> 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 15<sup>th</sup> January, 2016 and its amendments dated 25<sup>th</sup> 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, Gol notification S.O 141 (E) dated 15.01.2016
- Sustainable Sand Mining Guidelines
- MoEF&CC, Gol notification S.O 3611 (E) dated 25.07.2018
- Enforcement and Monitoring Guidelines for Sand Mining 2020

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**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-II/OI/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.



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- ❖ 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).

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## 1. INTRODUCTION

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### **BANKA AT A GLANCE: -**

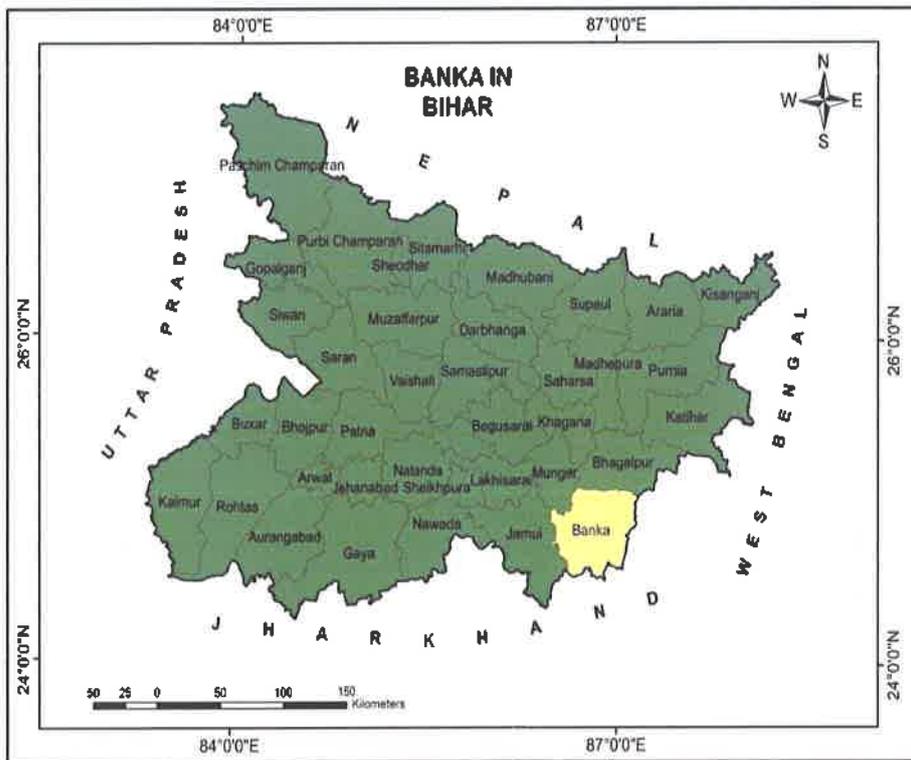
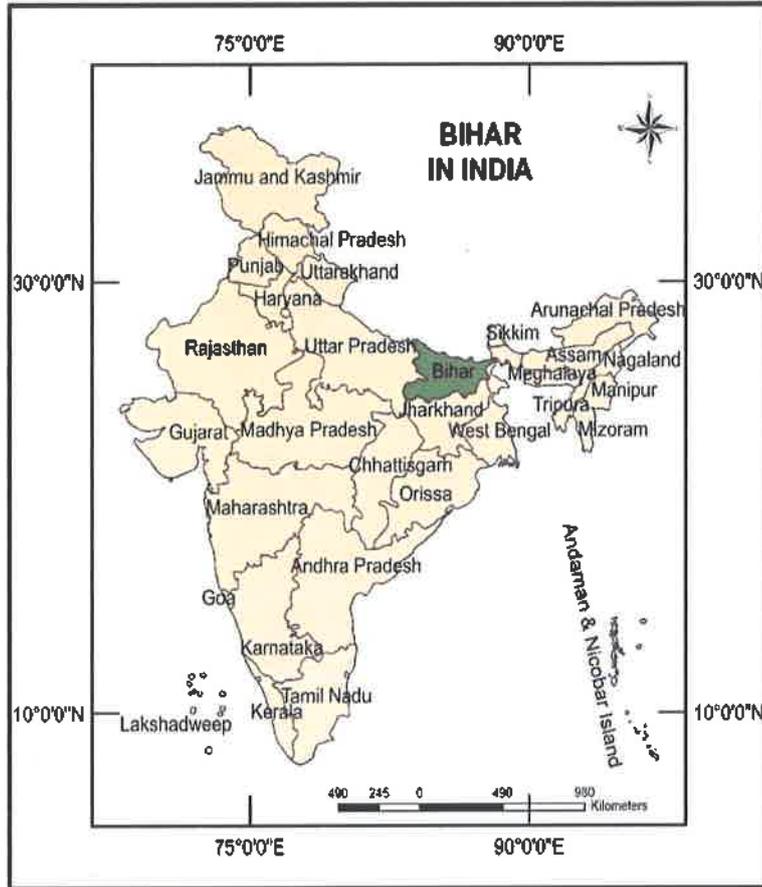
#### **1.1 Location and Geographical Area**

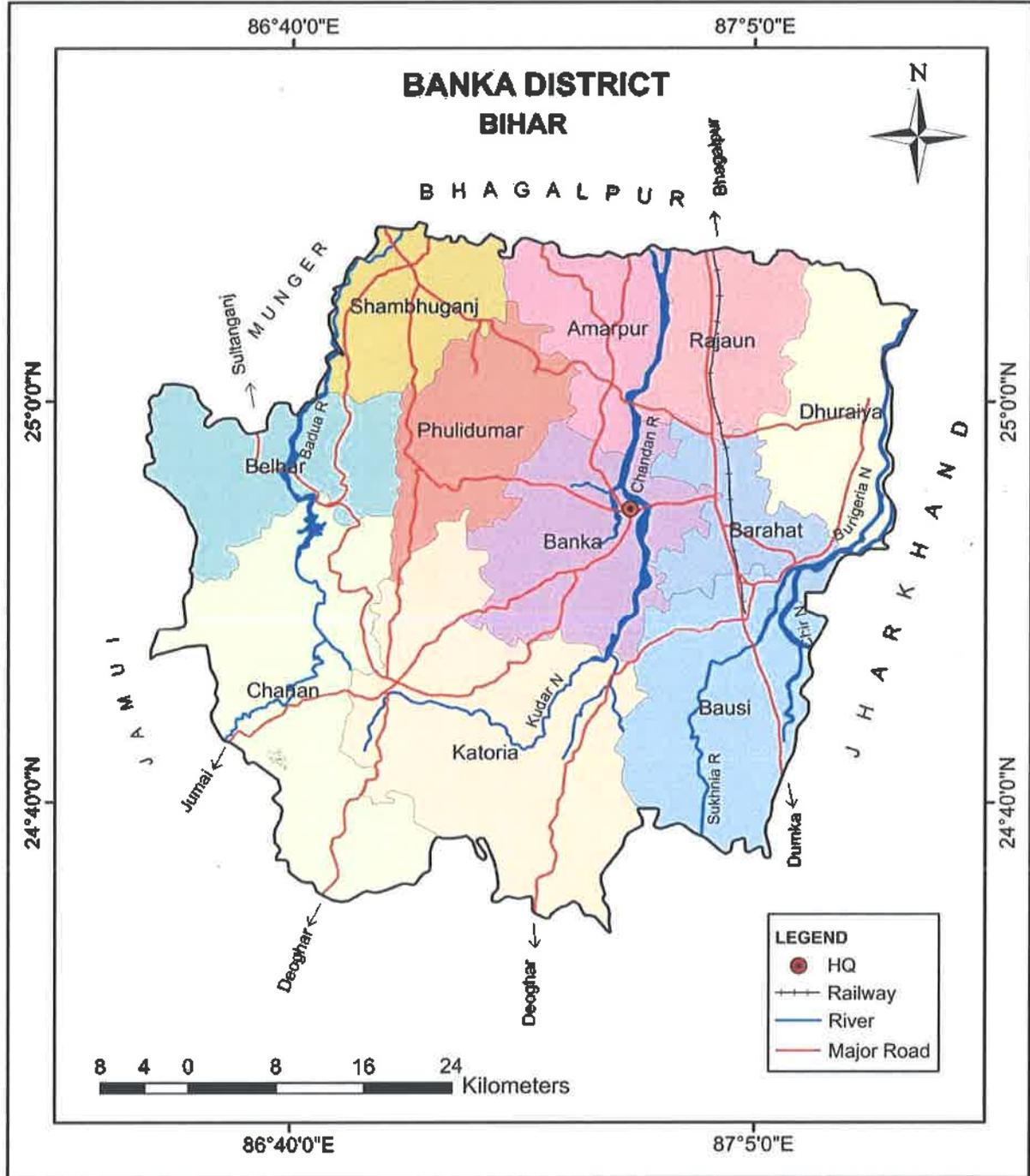
The district of Banka is situated in far south - east of the State Bihar. The eastern and southern border of the district coincide with district Godda of the state - Jharkhand. In west and north east it touches Jamui and Munger district respectively. The old district Bhagalpur is situated in the north side of Banka. The district is situated between 240 32' to 250 0' North and between 860 30' to 870 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 are available in the district. Other mineral sources are not available.

(Source :- District Portal, Banka)







**1.2 Administrative Units: -**

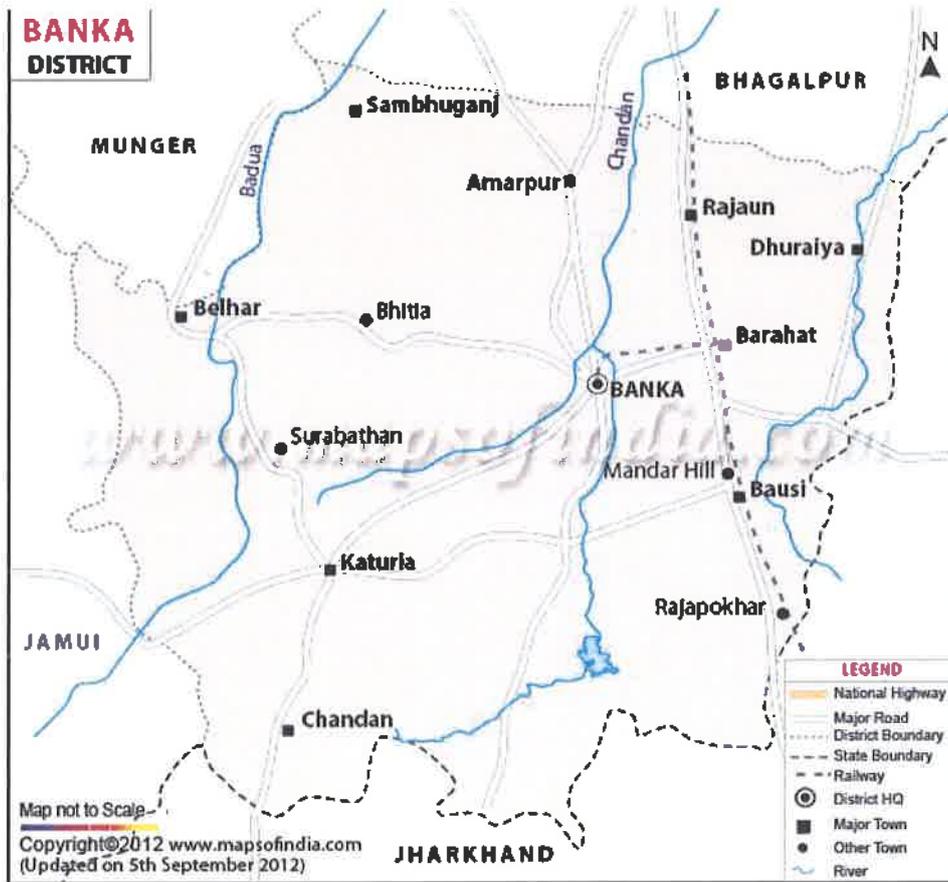
The district head quarter of Banka is situated in Banka town. The district has been established on 21st, February, 1991. Earlier it was a Sub-Division of the district Bhagalpur. The district consists 11 blocks and two towns Banka and Amarpur.

Amarpur, Banka, Barahat, Belhar, Bounsi, Chandan, Dhuraiya, 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 orth-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 <sup>0</sup> 58' 9.35" E 86 <sup>0</sup> 55' 25.42"	GHAT-MAJHONI VILL- MAJHONI POST- CHILKABAR ANCHAL-RAJON	CHANDAN	PLOT NO. 1	587/16.03.2017
		B	N 24 <sup>0</sup> 58' 12.13" E 86 <sup>0</sup> 55' 37.87"				
		C	N 24 <sup>0</sup> 57' 52.55" E 86 <sup>0</sup> 55' 44.77"				
		D	N 24 <sup>0</sup> 57' 52.46" E 86 <sup>0</sup> 55' 31.99"				
2	20	A	N 24 <sup>0</sup> 57' 50.63" E 86 <sup>0</sup> 55' 30.53"	GHAT-PATWE BHORWA VILL-PATWE BHORWA POST-JAITHOR JAMUA ANCHAL- AMARPUR	CHANDAN	326	587/16.03.2017
		B	N 24 <sup>0</sup> 57' 48.75" E 86 <sup>0</sup> 55' 44.03"				
		C	N 24 <sup>0</sup> 57' 31.29" E 86 <sup>0</sup> 55' 42.82"				
		D	N 24 <sup>0</sup> 57' 32.93" E 86 <sup>0</sup> 55' 29.44"				
3	2.50	A	N 24 <sup>0</sup> 57' 19.08" E 86 <sup>0</sup> 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
		B	N 24 <sup>0</sup> 57' 18.86" E 86 <sup>0</sup> 55' 30.47"				
		C	N 24 <sup>0</sup> 57' 06.10" E 86 <sup>0</sup> 55' 31.89"				
		D	N 24 <sup>0</sup> 57' 8.2" E 86 <sup>0</sup> 55' 29.15"				
4	4.0	A	N 24 <sup>0</sup> 56' 19.86" E 86 <sup>0</sup> 55' 14.10"	GHAT- MAJHAYARA ARAZI VILL-AJHAYARA POST-BANKA ANCHAL- BANKA	CHANDAN	21	324/04.03.2016
		B	N 24 <sup>0</sup> 56' 18.07" E 86 <sup>0</sup> 55' 21.39"				
		C	N 24 <sup>0</sup> 56' 12.78" E 86 <sup>0</sup> 55' 17.02"				
		D	N 24 <sup>0</sup> 56' 14.07" E 86 <sup>0</sup> 55' 10.79"				
5	29	A	N 24 <sup>0</sup> 56' 1.42" E 86 <sup>0</sup> 55' 2.50"	GHAT- RAJPUR/KAKNA VILL-KAKNA POST-RAJPUR ANCHAL- BANKA	CHANDAN	1439/521	SEIAA/1/(A)348/1 6 by Feb 2019
		B	N 24 <sup>0</sup> 56' 0.82" E 86 <sup>0</sup> 55' 14.92"				
		C	N 24 <sup>0</sup> 55' 33.90" E 86 <sup>0</sup> 55' 10.34"				
		D	N 24 <sup>0</sup> 55' 34.12" E 86 <sup>0</sup> 54' 58.16"				
6	24	A	N 24 <sup>0</sup> 55' 8.32" E 86 <sup>0</sup> 54' 57.94"	GHAT-BAISA VILL-BAISA POST-BANKA ANCHAL- BANKA	CHANDAN	01	588/16.03.2017
		B	N 24 <sup>0</sup> 55' 7.84" E 86 <sup>0</sup> 55' 18.29"				
		C	N 24 <sup>0</sup> 54' 43.47" E 86 <sup>0</sup> 54' 58.75"				



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7	1.4	D	N 24° 54' 42.03" E 86° 54' 48.35"	GHAT- MANJHIRA VILL-MANJHIRA POST-MANJHIRA ANCHAL- BANKA	CHANDAN	01	324/04.03.2016	5 Years or till Expiry of Lease Period
		A	N 24° 54' 39.50" E 86° 54' 52.29"					
		B	N 24° 54' 39.25" E 86° 54' 55.53"					
		C	N 24° 54' 34.19" E 86° 54' 57.29"					
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 VILL-	CHANDAN	01 & 1083 & 1086		5 Years or till Expiry of Lease Period
		B	N 24° 49' 8.16" E 86° 55' 46.10"					



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		C	N 24° 48' 48.76" E 86° 55' 48.44"	LAKHNOURI POST-BANKA			336/04.03.2016	
		D	N 24° 48' 49.42" E 86° 55' 37.79"	ANCHAL- BANKA				
15	20	A	N 24° 48' 21.09" E 86° 55' 34.79"	<b>GHAT- LAKHNOURI</b>				5 Years or till Expiry of Lease Period
		B	N 24° 48' 15.88" E 86° 55' 38.98"	VILL- LAKHNOURI	CHANDAN	1084& 1095& 1096	331/04.03.2016	
		C	N 24° 47' 58.99" E 86° 55' 8.42"	POST-BANKA				
		D	N 24° 48' 4.34" E 86° 55' 4.66"	ANCHAL- BANKA				
16	30	A	N 24° 47' 6.63" E 86° 54' 36.31"	<b>GHAT- KUNANI</b>				5 Years or till Expiry of Lease Period
		B	N 24° 47' 3.85" E 86° 54' 42.57"	VILL-KUNANI	CHANDAN	172/172/01		
		C	N 24° 46' 35.49" E 86° 54' 21.90"	POST- MANJHIRA				
		D	N 24° 46' 39.45" E 86° 54' 16.85"	ANCHAL- BANKA			SEIAA/1/(A)/347/ 16 by 22 Feb. 2019	
17	2.6	A	N 24° 46' 47.65" E 86° 54' 17.94"	<b>GHAT- JOGIPAHADI</b>				
		B	N 24° 46' 43.42" E 86° 54' 20.79"	VILL- JOGIPAHADI	CHANDAN	129		
		C	N 24° 46' 39.17" E 86° 54' 16.07"	POST-MANJHIRA				
		D	N 24° 46' 42.72" E 86° 54' 13.80"	ANCHAL- BANKA				
18	2.8	A	N 24° 46' 20.37" E 86° 54' 12.19"	<b>GHAT- DOMUHAN</b>				5 Years or till Expiry of Lease Period
		B	N 24° 46' 16.49" E 86° 54' 16.20"	VILL-KHUDBADI	CHANDAN	1185	337/04.03.2016	
		C	N 24° 46' 13.29" E 86° 54' 14.20"	POST-MANJHIRA				
		D	N 24° 46' 14.02" E 86° 54' 10.01"	ANCHAL- BANKA				
19	3.6	A	N 24° 46' 7.24" E 86° 53' 47.29"	<b>GHAT- DOMUHAN</b>				5 Years or till Expiry of Lease Period
		B	N 24° 46' 5.57" E 86° 53' 46.84"	VILL-DOMUHAN	CHANDAN	1185	326/04.03.2016	
		C	N 24° 46' 6.85" E 86° 53' 32.37"	POST-MANJHIRA				
		D	N 24° 46' 9.88" E 86° 53' 32.63"	ANCHAL- BANKA				
20	3.9	A	N 24° 45' 57.03" E 86° 53' 15.85"	<b>GHAT- DOMUHAN</b>				5 Years or till Expiry of Lease Period
		B	N 24° 45' 53.55" E 86° 53' 16.15"	VILL-DOMUHAN	CHANDAN	129 &1185	550/16.02.2017	
		C	N 24° 45' 50.68" E 86° 53' 2.56"	POST-MANJHIRA				
		D	N 24° 45' 52.27" E 86° 53' 2.33"	ANCHAL- BANKA				



**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 <sup>0</sup> 54'5.25" E 86 <sup>0</sup> 38'19.51"	<b>GHAT-MAJHLI DEOGARH ROAD.</b> VILL-MATIHANI POST-MAJHLI MATIHANI ANCHAL-BELHAR	BADUA	659	333/04.03.2016	5 Years or till Expiry of Lease Period
		B	N 24 <sup>0</sup> 54'00.31" E 86 <sup>0</sup> 38'24.41"					
		C	N 24 <sup>0</sup> 53'56.60" E 86 <sup>0</sup> 38'22.00"					
		D	N 24 <sup>0</sup> 54'1.25" E 86 <sup>0</sup> 38'14.96"					
2	3.5	A	N 24 <sup>0</sup> 57'59.02" E 86 <sup>0</sup> 37'24.10"	<b>GHAT-MAJHLI DEOGARH ROAD.</b> 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 <sup>0</sup> 57'5.12" E 86 <sup>0</sup> 37'31.04"					
		C	N 24 <sup>0</sup> 57'2.87" E 86 <sup>0</sup> 37'31.73"					
		D	N 24 <sup>0</sup> 56'57.00" E 86 <sup>0</sup> 37'31.73"					
3	3.1	A	N 24 <sup>0</sup> 57'54.69" E 86 <sup>0</sup> 37'37.56"	<b>GHAT-BAGHAUNIA VILL-BAGHAUNIA POST-BAGHAUNIA ANCHAL-BELHAR</b>	BADUA	609	223/10.05.2016	5 Years or till Expiry of Lease Period
		B	N 24 <sup>0</sup> 57'54.55" E 86 <sup>0</sup> 37'41.92"					
		C	N 24 <sup>0</sup> 57'46.86" E 86 <sup>0</sup> 37'42.28"					
		D	N 24 <sup>0</sup> 57'46.57" E 86 <sup>0</sup> 37'38.60"					
4	4.6	A	N 24 <sup>0</sup> 58'48.65" E 86 <sup>0</sup> 38'29.12"	<b>GHAT-KUMARSAR VILL-CHORA POST-SAHODA ANCHAL-BELHAR</b>	BADUA	818	222/10.05.2016	5 Years or till Expiry of Lease Period
		B	N 24 <sup>0</sup> 58'43.32" E 86 <sup>0</sup> 38'30.59"					
		C	N 24 <sup>0</sup> 58'40.36" E 86 <sup>0</sup> 38'21.15"					
		D	N 24 <sup>0</sup> 58'43.82" E 86 <sup>0</sup> 38'19.27"					
5	2.5	A	N 24 <sup>0</sup> 59'2.02" E 86 <sup>0</sup> 38'58.70"	<b>GHAT-SAHODA VILL-SAHODA POST-SAHODA ANCHAL-SAMBHU GANJ</b>	BADUA	301	221/10.05.2016	5 Years or till Expiry of Lease Period
		B	N 24 <sup>0</sup> 58'57.61" E 86 <sup>0</sup> 38'59.67"					
		C	N 24 <sup>0</sup> 58'54.62" E 86 <sup>0</sup> 38'53.72"					
		D	N 24 <sup>0</sup> 58'57.57" E 86 <sup>0</sup> 38'52.28"					
6	1.1	A	N 25 <sup>0</sup> 0'53.90" E 86 <sup>0</sup> 39'29.96"	<b>GHAT-RANADIH VILL-RANADIH POST-RANADIH ANCHAL-SAMBHU GANJ</b>	BADUA	66	Reject	5 Years or till Expiry of Lease Period
		B	N 25 <sup>0</sup> 00'52.67" E 86 <sup>0</sup> 39' 27.28"					
		C	N 25 <sup>0</sup> 0'49.14" E 86 <sup>0</sup> 39'22.37"					
		D	N 25 <sup>0</sup> 0'50.69" E 86 <sup>0</sup> 39'21.22"					



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**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 <sup>0</sup> 53' 49.42" E 86 <sup>0</sup> 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 <sup>0</sup> 53' 42.32" E 86 <sup>0</sup> 54' 26.88"					
		C	N 24 <sup>0</sup> 53' 41.74" E 86 <sup>0</sup> 54' 23.41"					
		D	N 24 <sup>0</sup> 53' 48.56" E 86 <sup>0</sup> 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 <sup>0</sup> 46' 41.59" E 87 <sup>0</sup> 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 <sup>0</sup> 46' 42.20" E 87 <sup>0</sup> 01' 19.47"					
		C	N 24 <sup>0</sup> 46' 36.64" E 87 <sup>0</sup> 01' 15.12"					
		D	N 24 <sup>0</sup> 46' 35.72" E 87 <sup>0</sup> 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 <sup>0</sup> 53' 42.33" E 87 <sup>0</sup> 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 <sup>0</sup> 53' 41.67" E 87 <sup>0</sup> 08' 46.42"					
		C	N 24 <sup>0</sup> 53' 32.95" E 87 <sup>0</sup> 08' 51.53"					
		D	N 24 <sup>0</sup> 53' 33.10" E 87 <sup>0</sup> 08' 47.50"					
2	3.9	A	N 24 <sup>0</sup> 52' 0.75" E 87 <sup>0</sup> 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 <sup>0</sup> 51' 57.05" E 87 <sup>0</sup> 07' 37.62"					
		C	N 24 <sup>0</sup> 51' 55.86" E 87 <sup>0</sup> 07' 27.06"					
		D	N 24 <sup>0</sup> 51' 59.03" E 87 <sup>0</sup> 07' 27.32"					
3	4.1	A	N 24 <sup>0</sup> 51' 3.35" E 87 <sup>0</sup> 5' 43.84"	GHAT- PANJWARA RD. NEAR KACHMACHIYA VILL-	CHEER	387		5 Years or till Expiry of Lease Period
		B	N 24 <sup>0</sup> 51' 00.88" E 87 <sup>0</sup> 5' 47.43"					
		C	N 24 <sup>0</sup> 50' 54.62"					



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		D	E 87 <sup>u</sup> 5' 39.85" N 24 <sup>o</sup> 50' 57.81" E 87 <sup>o</sup> 5' 37.06"	KACHMACHIYA POST-LAKHPURA ANCHAL- BARAHAT			334/04.03.2016	
4	4.89	A	N 24 <sup>o</sup> 50' 40.09" E 87 <sup>o</sup> 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 <sup>o</sup> 50' 42.08" E 87 <sup>o</sup> 4' 1.75"						
	C	N 24 <sup>o</sup> 50' 29.13" E 87 <sup>o</sup> 3' 47.98"						
	D	N 24 <sup>o</sup> 50' 30.95" E 87 <sup>o</sup> 3' 46.07"						

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**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 (CUM)	MINEABLE RESERVE (CUM)	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1.	BANKA CHANAN 01	35.0	1050000	840000	A	24°57'41.17"N 86°55'30.18"E	CHANDAN	1696	206
					B	24°57'40.64"N 86°55'35.67"E			
					C	24°57'21.55"N 86°55'39.29"E			
					D	24°56'45.43"N 86°55'30.79"E			
					E	24°56'46.08"N 86°55'26.79"E			
					F	24°56'51.74"N 86°55'28.69"E			
					G	24°57'7.23"N 86°55'29.50"E			
					H	24°57'21.49"N 86°55'27.78"E			
2.	BANKA CHANAN 02	30.0	900000	720000	A	24°56'25.21"N 86°55'21.13"E	CHANDAN	1101	272
					B	24°56'23.15"N 86°55'31.38"E			
					C	24°55'50.58"N 86°55'14.41"E			
					D	24°55'51.61"N 86°55'8.89"E			
					E	24°56'12.16"N 86°55'12.66"E			
3.	BANKA CHANAN 03	27.0	810000	648000	A	24°55'34.39"N 86°55'2.57"E	CHANDAN	1155	234
					B	24°55'34.69"N 86°55'9.54"E			
					C	24°55'20.56"N 86°55'10.42"E			
					D	24°55'6.78"N 86°55'3.49"E			
					E	24°54'57.76"N 86°55'1.04"E			
					F	24°54'58.06"N 86°54'54.33"E			



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4.	BANKA CHANAN 04	31.0	930000	744000	A	24°54'4.29"N 86°55'19.72"E	CHANDAN	1192	223
					B	24°54'9.79"N 86°55'23.28"E			
					C	24°54'4.52"N 86°55'37.56"E			
					D	24°53'58.10"N 86°55'48.90"E			
					E	24°53'44.32"N 86°56'4.46"E			
					F	24°53'39.14"N 86°56'0.81"E			
					G	24°53'57.27"N 86°55'35.43"E			
5.	BANKA CHANAN 05	50.0	1500000	120000	A	24°52'54.40"N 86°55'54.67"E	CHANDAN	1701	294
					B	24°52'51.37"N 86°56'0.10"E			
					C	24°52'39.42"N 86°55'53.77"E			
					D	24°52'25.67"N 86°55'52.27"E			
					E	24°51'59.75"N 86°55'55.56"E			
					F	24°51'59.52"N 86°55'43.87"E			
					G	24°52'20.56"N 86°55'40.13"E			
					H	24°52'41.12"N 86°55'44.53"E			
6.	BANKA CHANAN 06	34.0	1020000	816000	A	24°51'39.49"N 86°55'56.42"E	CHANDAN	1671	203
					B	24°51'43.07"N 86°56'2.14"E			
					C	24°51'32.39"N 86°56'10.94"E			
					D	24°51'16.15"N 86°56'14.49"E			
					E	24°50'48.14"N 86°56'10.40"E			
					F	24°50'50.10"N 86°56'4.81"E			
					G	24°51'11.98"N 86°56'6.61"E			
					H	24°51'27.55"N 86°56'4.66"E			



DSR BANKA

7.	BANKA CHANAN 07	55.9	1677000	1341600	A	24°50'29.49"N 86°56'9.01"E	CHANDAN	2299	243
					B	24°50'30.85"N 86°56'14.22"E			
					C	24°50'14.49"N 86°56'19.05"E			
					D	24°49'55.55"N 86°56'19.37"E			
					E	24°49'38.34"N 86°56'7.44"E			
					F	24°49'21.98"N 86°55'48.64"E			
					G	24°49'27.04"N 86°55'42.45"E			
					H	24°49'42.40"N 86°56'0.65"E			
					I	24°49'57.36"N 86°56'9.64"E			
					8.	BANKA CHANAN 08			
B	24°48'12.46"N 86°55'30.16"E								
C	24°48'7.97"N 86°55'12.28"E								
D	24°47'50.85"N 86°54'52.25"E								
E	24°47'53.49"N 86°54'49.64"E								
F	24°48'11.28"N 86°55'7.07"E								
G	24°48'16.40"N 86°55'15.84"E								
9.	BANKA CHANAN 09	33.0	990000	792000	A	24°47'10.04"N 86°54'27.74"E	CHANDAN	1510	218
					B	24°47'6.49"N 86°54'37.19"E			
					C	24°46'43.85"N 86°54'22.70"E			
					D	24°46'21.53"N 86°54'13.22"E			
					E	24°46'25.20"N 86°54'6.85"E			



DSR BANKA

**BADUA -01 (STRETCH - 2) ( UNIT 01 FROM 24°57'52.70"N 86°37'41.00"E TO  
24°58'28.55"N 86°38'5.81"E)**

SR. NO	BLOCKS	AREA IN HECT.	GEOLOGICAL RESERVE (CUM)	MINEABLE RESERVE (CUM)	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-02	42	840000	672000	A	25° 0'14.06"N 86°39'7.96"E	BADUA	3987	10
					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			

**BADUA -02 (STRETCH - 2) ( UNIT 02 FROM 24°57'50.86"N 86°37'38.32"E TO  
24°55'21.93"N 86°37'3.93"E)**

3	BLOCK-03	40	800000	640000	A	24°57'51.36"N 86°37'35.43"E	BADUA	2809	14
					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	40	800000	640000	A	24°56'23.52"N 86°37'15.10"E	BADUA	1968	203
					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			

**BADUA -03 (STRETCH - 2) ( UNIT 03 FROM 24°43'35.97"N 86°37'13.60"E TO  
24°43'12.98"N 86°35'30.52"E)**

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE	MINEABLE RESERVE	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	27	540000	432000	A	24°43'35.71"N 86°37'12.24"E	BADUA	3931	68
					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			



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**ODHNI RIVER (STRETCH - 3) ( FROM 24°54'17.28"N 86°54'22.71"E TO 24°49'53.62"N  
86°51'27.00"E**

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE (CUM)	MINEABLE RESERVE (CUM)	COORDINATES	RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER	
1	BLOCK-01	15	300000	240000	A	ODHNI	1042	143	
					B				24°54'16.61"N 86°54'21.27"E
					C				24°54'15.31"N 86°54'23.09"E
					D				24°53'42.93"N 86°54'27.04"E
2	BLOCK-02	25.5	510000	408000	A	ODHNI	2822	90	
					B				24°52'30.96"N 86°54'34.62"E
					C				24°52'31.58"N 86°54'37.67"E
					D				24°51'42.65"N 86°53'24.84"E
3	BLOCK-03	28.8	576000	460800	A	ODHNI	2240	128	
					B				24°51'31.72"N 86°52'49.67"E
					C				24°51'29.26"N 86°52'51.03"E
					D				24°50'34.34"N 86°52'2.31"E
4	BLOCK-04	7.1	142000	113600	A	ODHNI	1264	56	
					B				24°50'35.84"N 86°51'59.67"E
					C				24°50'14.70"N 86°52'2.08"E
					D				24°50'15.00"N 86°52'4.32"E

**KURAR RIVER (STRETCH -4) (FROM 24°46'8.17"N 86°53'44.71"E TO 24°44'31.47"N  
86°51'39.48"E )**

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE (CUM)	MINEABLE RESERVE (CUM)	COORDINATES	RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	13.7	274000	219200	A	KURAR	820	27 167



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					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	370000	296000	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	183200	146560	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 -5) (FROM 24°54'16.55"N 87° 8'42.24"E TO 24°47'14.99"N 87° 4'8.09"E )**

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE (CUM)	MINEABLE RESERVE (CUM)	COORDINATES	RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	18	360000	288000	A 24°54'15.29"N 87° 8'41.33"E	CHIR	2385	75
					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	8	160000	128000	A 24°52'48.09"N 87° 8'6.82"E	CHIR	1195	66
					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	24	480000	384000	A 24°50'31.29"N 87° 4'17.64"E			104 28

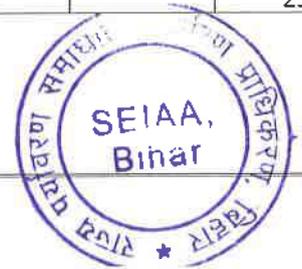


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					B	24°50'30.58"N 87° 4'23.12"E			
					C	24°49'18.63"N 87° 4'11.23"E			
					D	24°49'19.00"N 87° 4'8.33"E			
4	BLOCK-04	21	420000	336000	A	24°49'12.88"N 87° 3'49.69"E	CHIR	2165	96
					B	24°49'12.28"N 87° 3'52.72"E			
					C	24°48'26.74"N 87° 3'34.33"E			
					D	24°48'27.75"N 87° 3'28.27"E			
5	BLOCK-05	22	440000	352000	A	24°48'2.88"N 87° 3'26.23"E	CHIR	1657	132
					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 6) (FROM 24°49'29.39"N 87° 3'9.97"E TO 24°43'59.61"N 86°59'19.02"E )**

SR.NO.	BLOCKS	AREA IN HA.	GEOLOGICAL RESERVE (CUM)	MINEABLE RESERVE (CUM)	COORDINATES		RIVER	APPROX LENGTH IN METER	AVG. WIDTH IN METER
1	BLOCK-01	11.9	238000	190400	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	274000	219200	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	236000	188800	A	24°46'54.50"N 87° 1'51.61"E	SUKHANIYA	1748	67 29



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					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	278000	222400	A	24°46'0.21"N 87° 0'18.82"E	SUKHANIYA	1285	108
					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	400000	320000	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	317.9	19.26
BADUA	50000	155	775	149	19.22
ODHNI	30000	100	300	76.4	25.47
KURAR	24000	90	216	41.36	19.15
CHIR	30000	145	435	93	21.38
SUKHANIYA	18000	125	225	71.3	31.69



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

**Table 3**

<b>Year wise Total Revenue Collection (in Rupees Lakhs)</b>				
<b>S. No.</b>	<b>District</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>
<b>1</b>	<b>Banka</b>	<b>7515.83</b>	<b>7519.28</b>	<b>6849.30</b>

*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	2019-20	9253119	3723483.94	93087098.50
2	2020-21	9253119	1784979.66	44624491.50
3	2021-22	9253119	2463408	61585200

**Source :** Mines & Geology Department, Patna, GoB

**Demand and Supply :**

As sand is used as raw material in construction of building and infrastructure projects, the demand of sand is increasing day by day. In past, demand was not too much but now a days due to rapid industrialization and urbanization its demand increasing with pace of time. At present, demand of sand is more than the supply. Bihar has deposits of sand used for both construction and filling purposes. Districts falling south of the river Ganga have yellow sand used for construction whereas districts falling north of the river Ganga have only white sand which is primarily used for filling purposes. Settlement potential of yellow sand districts differs from those of white sand, as there is a huge demand for construction sand whereas sand used for filling purposes has limited potential.

\*\*\*\*\*



## 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.



## 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

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:

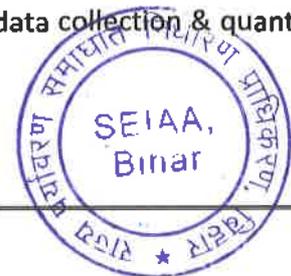
1. Dandy – Bolton Equation
2. Yang Equations
3. Engelund-HansenEquation
4. Modified Universal Soil Loss Equation(MUSLE)

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 stretches on the basis of survey done with DGPS during periods (Pre-monsoon & Post Monsoon) of sediments transported by the river. Same reports are also submitted to the mining department.

DGPS survey have been done for both Pre & Post monsoon seasons which includes collection of samples for determination of specific gravity, preparation of plan and section at every 100m level 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
<b>Total</b>	<b>9253119</b>	<b>9941102</b>	<b>10848646</b>

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

**Estimation of Sand Resources in Pre monsoon period & Post monsoon period in sand ghat of year 2019**

Sl. No.	Sand Ghat Name	River	Area in Sq. m.	Pre monsoon RL (m)	Post monsoon RL (m)	Diff. RL
1	MAJHONI GHAT	Chandan	230000	67.2599	70.0626	2.8027
2	MAJHAYARA ARAZI GHAT		40000	68.0267	70.2738	2.2471
3	RAJPUR/KAKNA GHAT		290000	68.8776	68.994	0.1164
4	BAISA GHAT		240000	67.7539	69.8189	2.065
5	MALDAUN GHAT		120000	78.7035	80.9736	2.2701
6	BISUNPUR GHAT		200000	74.4677	78.7148	2.2471
7	GOVINDPUR GHAT		160000	78.1083	80.8544	2.7461
8	JITARPUR GHAT		29000	83.7646	86.0395	2.2749
9	SARAN/GODIYA GHAT		28000	95.3748	97.5248	2.15
10	GODIYA GHAT		45000	96.4778	99.2485	2.7707
11	LAKHNOURI GHAT		180000	89.4584	91.5578	2.0994
12	LAKHNOURI GHAT		200000	94.8882	97.0881	2.1999
13	KUNANI & JOGIPAHADI GHAT		326000	93.6821	95.7964	2.1143
14	DOMUHAN GHAT		28000	96.2371	98.4729	2.2358
15	DOMUHAN GHAT		36000	97.1981	99.5978	2.3991
16	DOMUHAN GHAT		39000	97.6783	99.8254	2.1471
17	MAJHLI DEOGARH ROAD GHAT	Badua	41000	96.1297	98.4254	2.2957
18	MAJHLI DEOGARH ROAD GHAT		35000	73.5317	76.3056	2.7739
19	BAGHAUNIA GHAT		31000	74.8195	76.9666	2.1471
20	KUMARSAR GHAT		46000	67.4585	70.4921	3.0336
21	SAHODA GHAT		25000	67.9524	70.1995	2.2471
22	SAJUPUR ROAD NEAR OMAN COLLEGE GHAT	Odhni	25000	81.2961	83.4825	2.1864
23	SABALPUR GHAT	Sukhniya	23000	89.2723	91.475	2.2027
24	PAIR GHAT	Cheer	45000	63.1618	65.2684	2.1066



						<b>DSR BANKA</b>
25	SARBA GHAT	Cheer	39000	68.6832	70.9597	2.2765
26	PANJWARA RD. NEAR KACHMACHIYA GHAT	Cheer	41000	76.7079	74.4093	2.7014
27	SABALPUR GHAT	Cheer	48900	89.4342	91.3332	1.899

### **Conclusion**

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

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## **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 :**

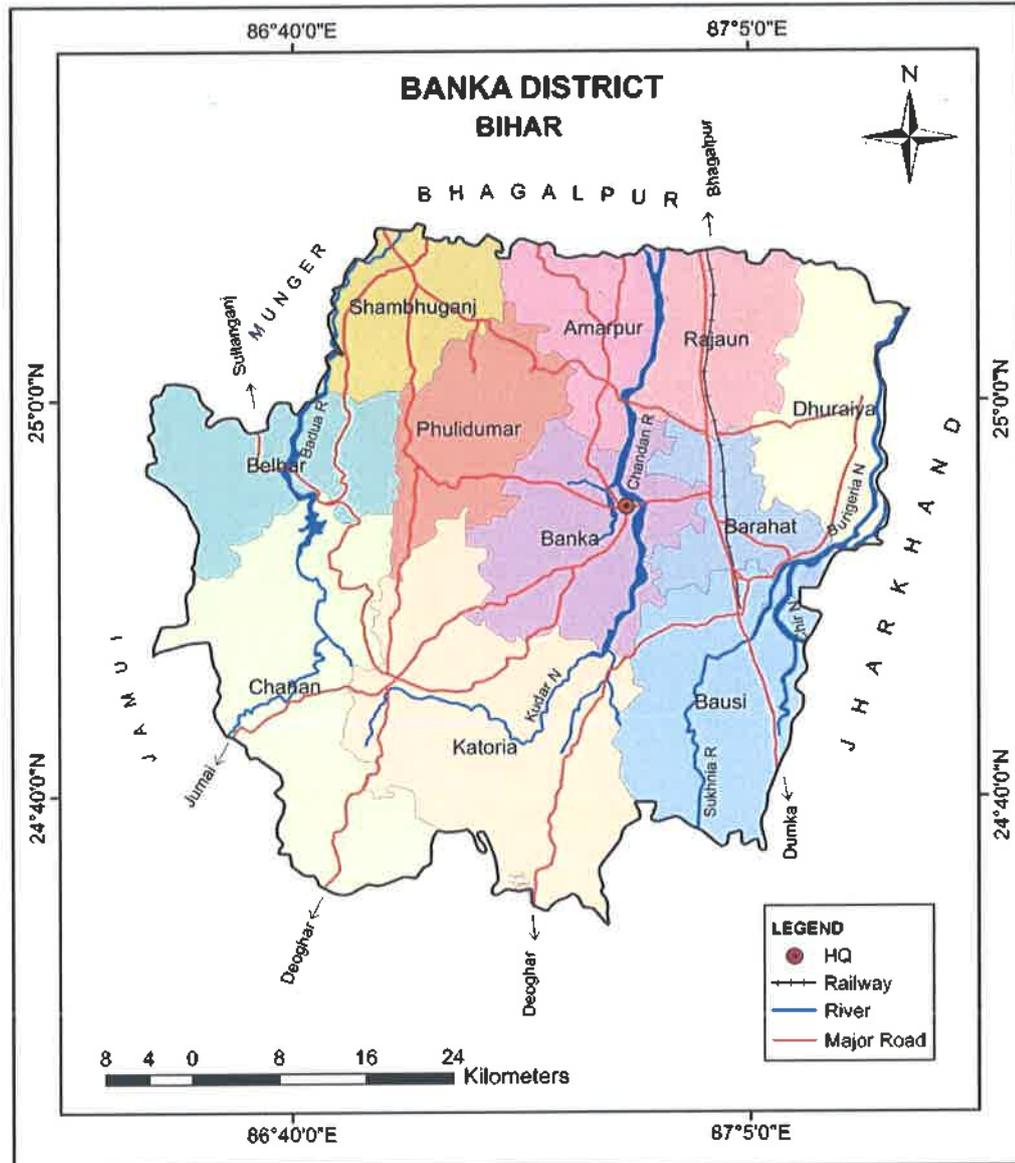
Chir river originates from Dumka hilly area at an elevation of 165 m. Chir river flows in the Eastern part of the district. Its tributaries are Sukhania, Kajhia, Harna, Sundar and Gahra rivers. After monsoon season, river becomes dry for rest of the year. The river is non perennial river.

#### **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.

Source :- Hydrological Inventory of South Bihar River Basins (Report by Instistute of Hydrology Jal vighyan Bhawan Roorki U.P)





Source : - NIC Bihar

### 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

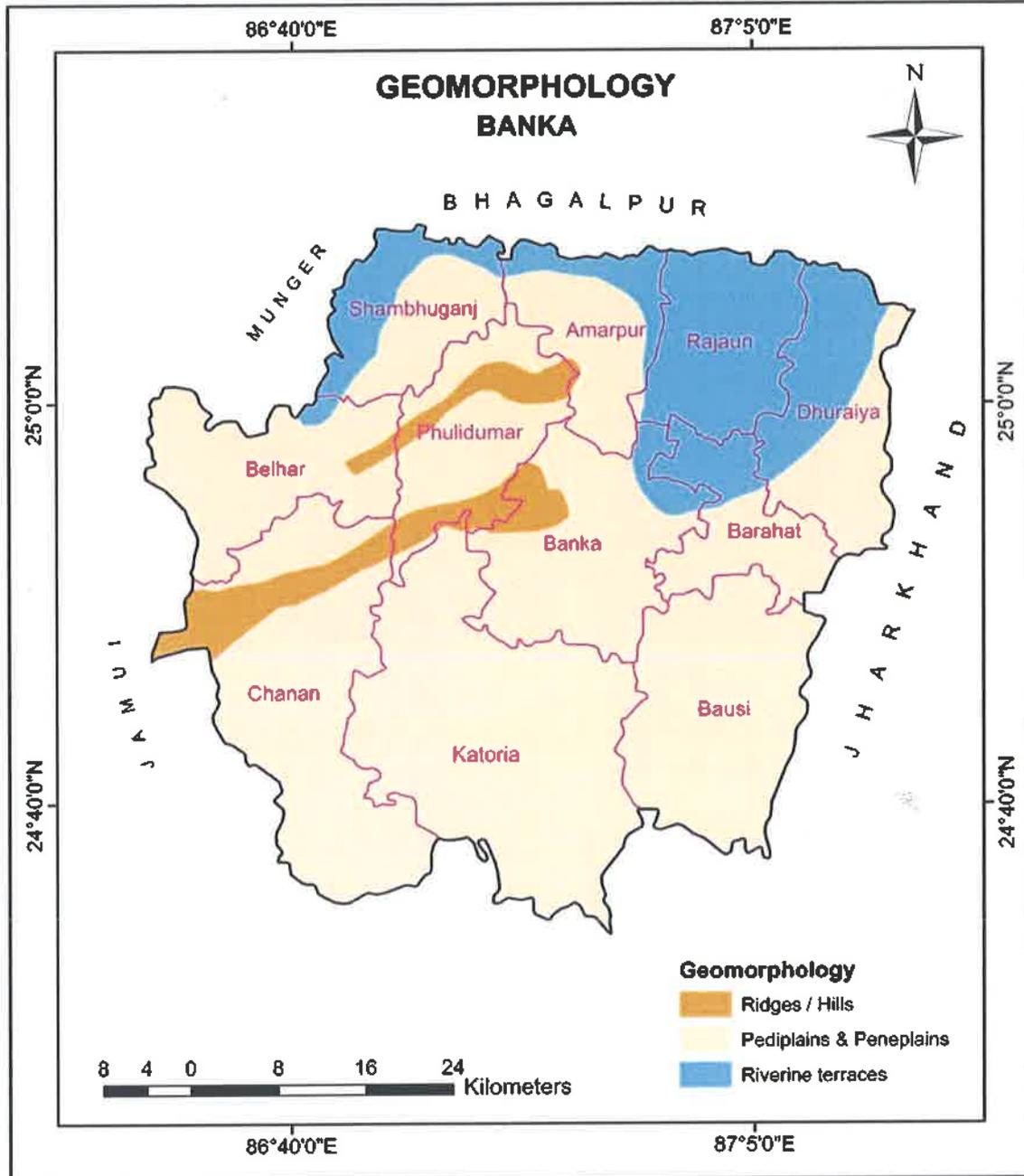
The district can be broadly divided into two broad physiographic division viz. alluvial plain in the north and the hilly tract in the south. The regional slope from south to north is prominent. The west of the alluvial plain of the river Ganga is bordered by the Munger- Kharagpur hills. The hills of 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 mica schist.



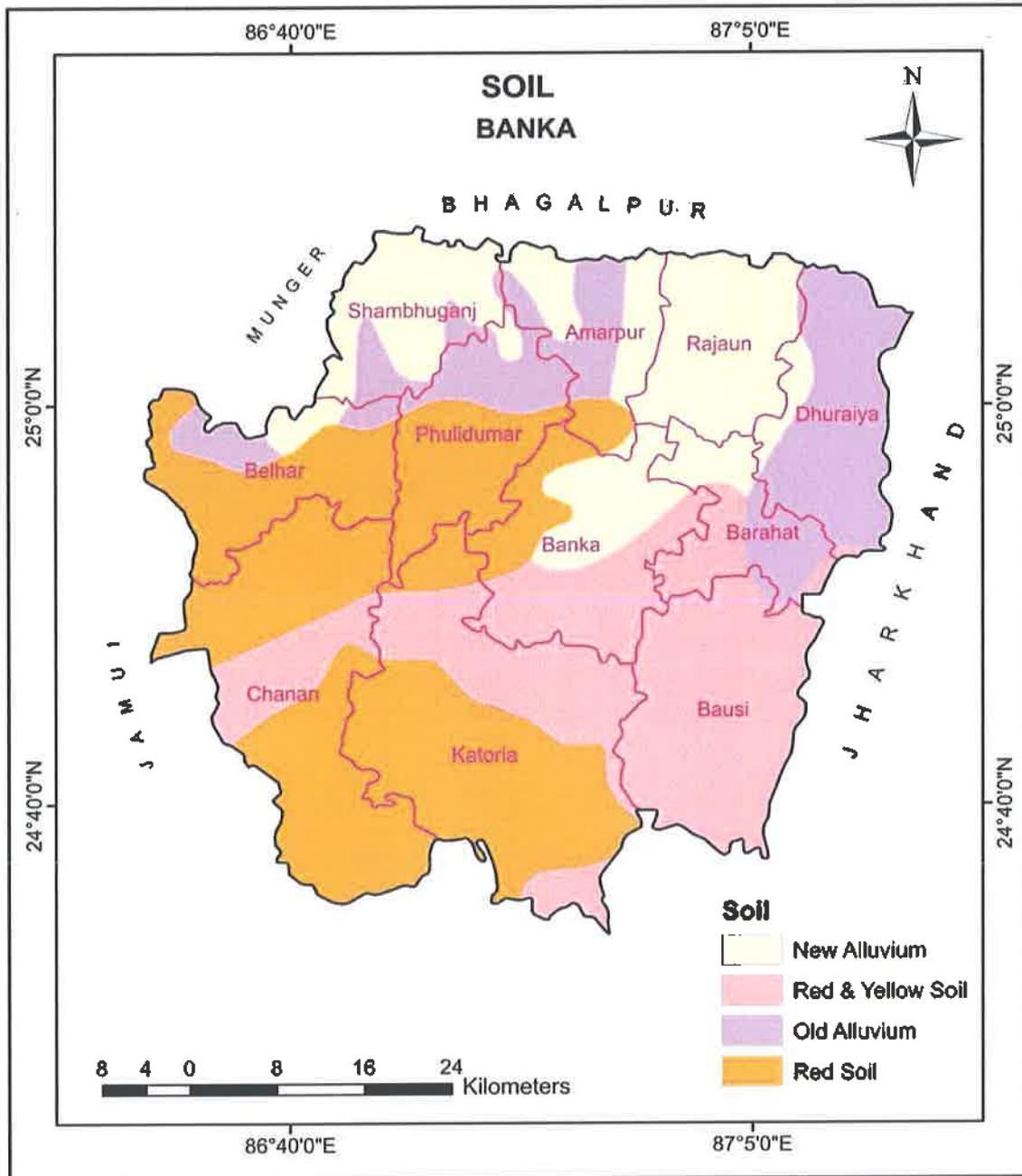


Source – NIC Bihars

**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.





Source : - Soil & Land Use survey of India

### 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-Bousni Block



The Chandan reservoir is major irrigation project in the Banka district. Its command area falls in the Banka, Barahat, Rajoun 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 Rajoun circle.

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 Km<sup>2</sup>.

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 i.e. 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 fruits trees.

Monkeys are common in the district, particularly the Hanuman. So are Jackal, Dear, lion, Bear, Leopards, Elephants are some times 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. Forest Cover Area in the District (Area in Km<sup>2</sup>)**

District	Geo-graphical Area	2021 Assessment				% of GA	Change wrt 2019 assessment	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Banka	3020	0.00	99.96	177.06	272.02	9.57	16.29	21.59

(Source: India state of forest report 2021-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	Area under different Harvest				
		Aghan/ Kharif	Bhadai	Rabi	Garma	Total
1	Banka	7652.6	589.33	2857.2	1819.46	12918.59
2	Amarpur	7362.69	3650.8	8769.76	2347.66	22130.94
3	Barahat	2576.2	130.96	2690.19	805.06	6202.41
4	Baunsi	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

<b>Horticulture Crops -Fruits</b>	Area ('000 ha)
Total	99.42

<b>Horticulture Crops - Vegetables</b>	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](https://agricoop.nic.in/sites/default/files/BR11_Banka_28.12.203.pdf)

### Mining

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 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.



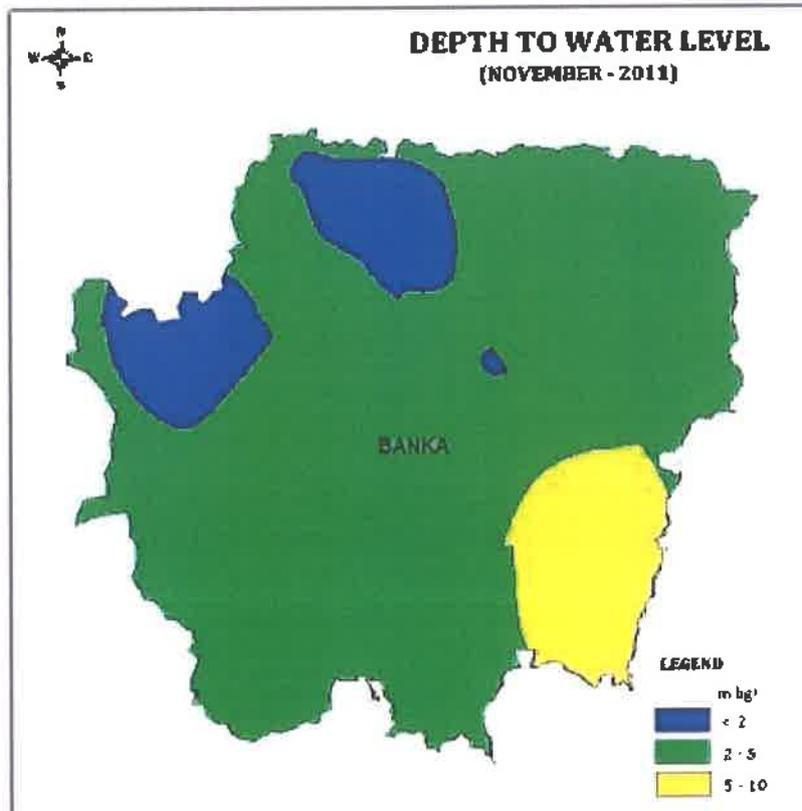
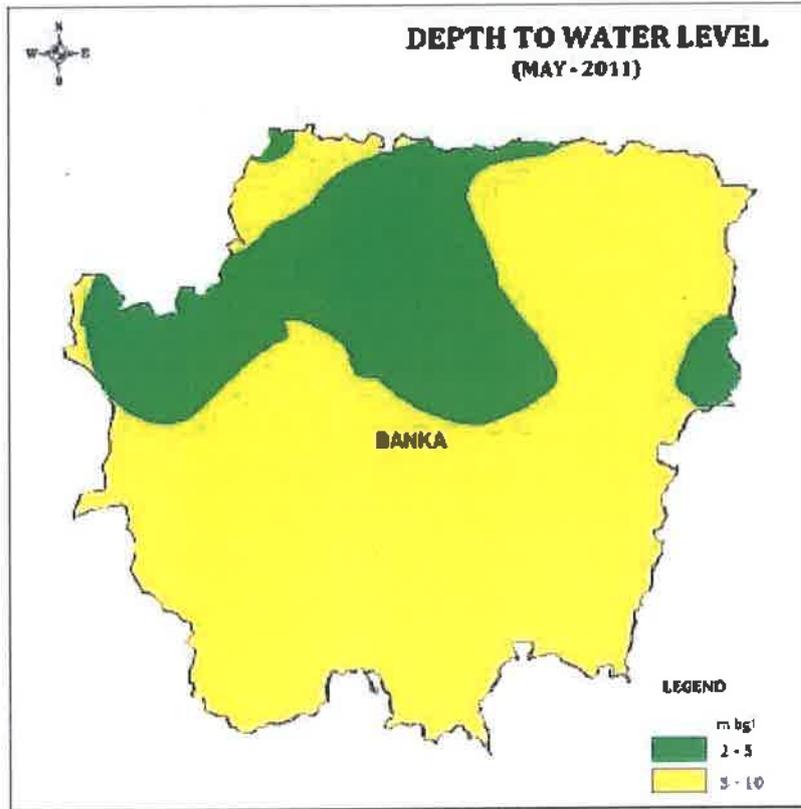
### Ground water in the alluvial track of the district:

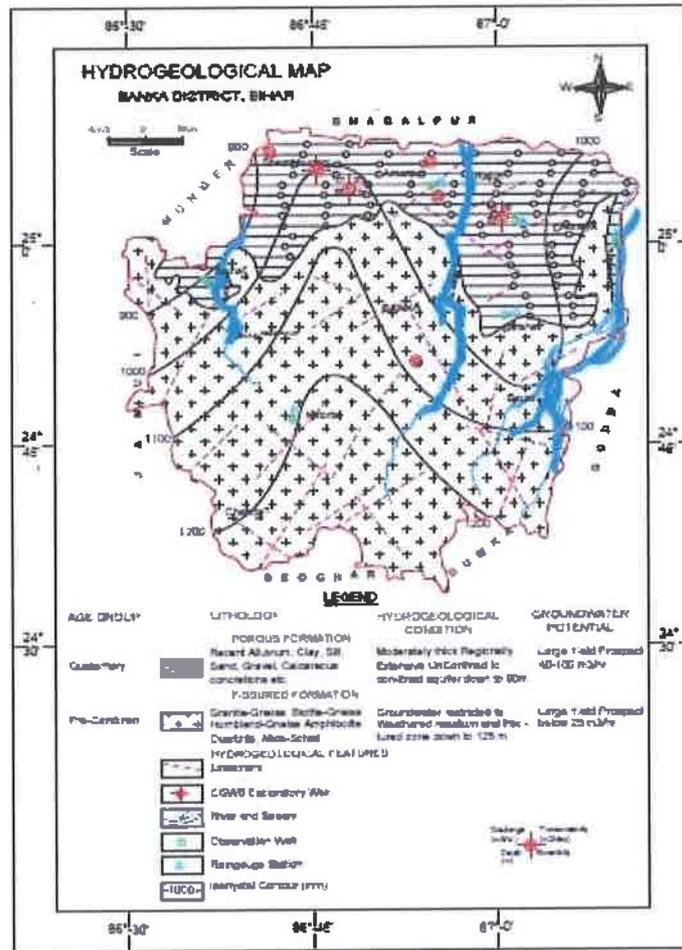
The thickness of Quaternary Alluvial deposit generally ranges from 15m to 100m in the northern part of the district. The maximum depth to bedrock is at Raipura which is 99m. The sandy layers in the alluvial terrain form the main repository of ground water in the northern part of the district. The thickness 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 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  $2.75 \times 10^{-3}$  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-sedimentaries 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.

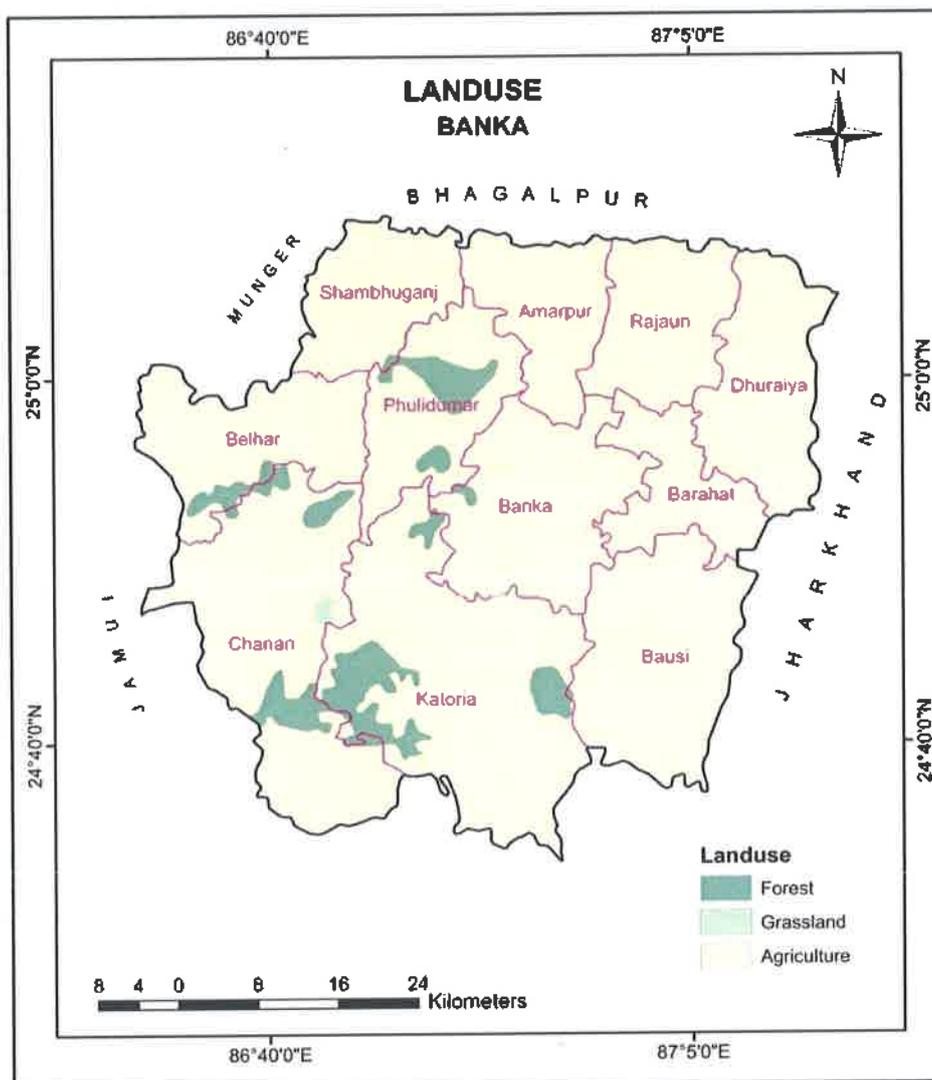






Map Source – Report of CGWB, Ministry of Water Resources (Govt. of India) Mid-Eastern Region Patna





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 track 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.



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### 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)

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## **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.**

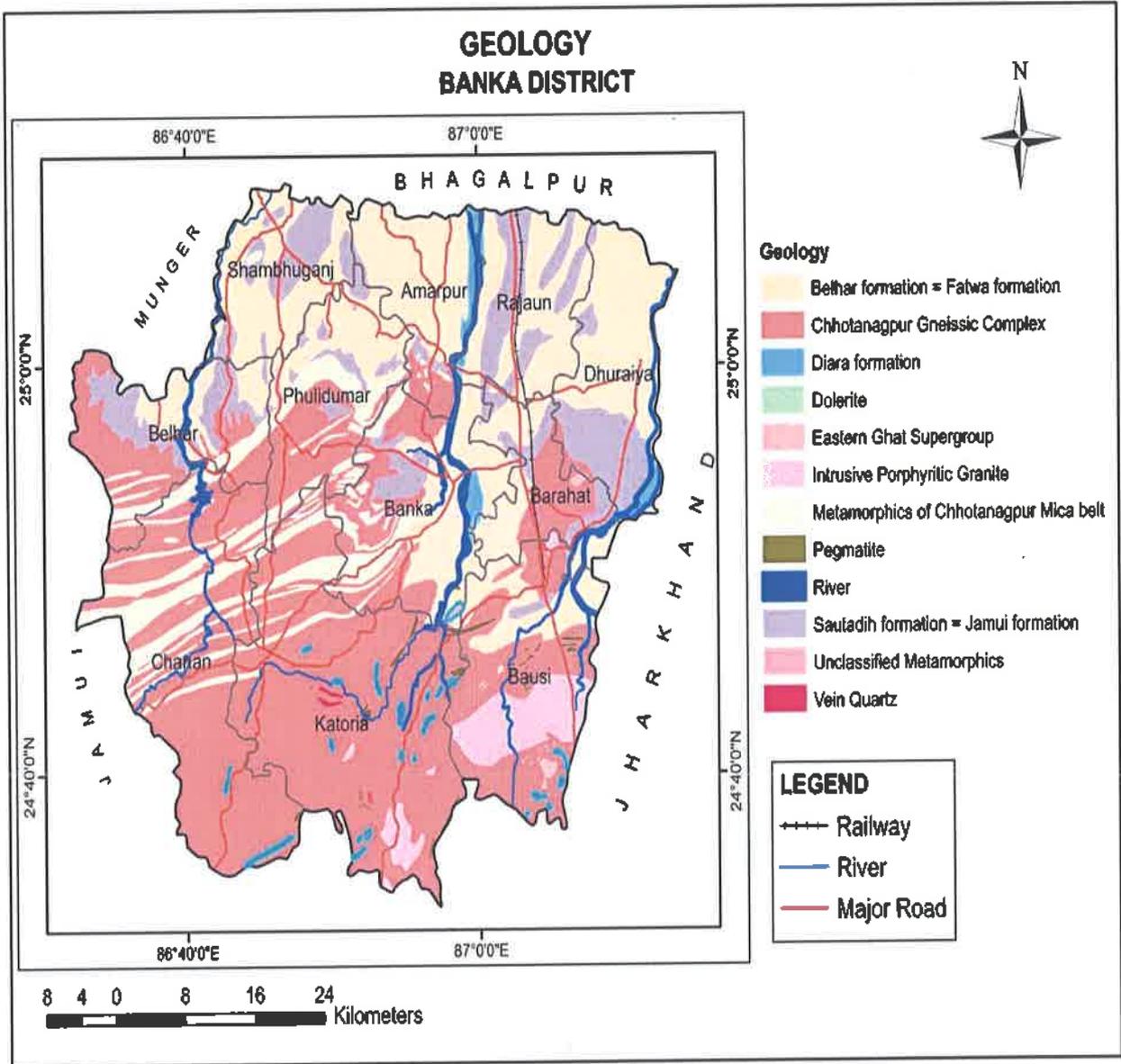
The rocky upland surface is represented by low flat topped mounds/hill ridges occupying a small portion of the area. It consists of resistant rock like quartzite and granite gneiss. The pediplain area occupies major area and is product of erosional processed of pediplaination. Alluvial surface occupies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

The drainage system of the area is mainly controlled by Chandan – Chatimi, Chhuri 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 pelitic 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 quartzveins**
- **Metabasics including Metadolerite**
- **Gneisses and associated Migmatite**
- **Feldspathic quartzite**

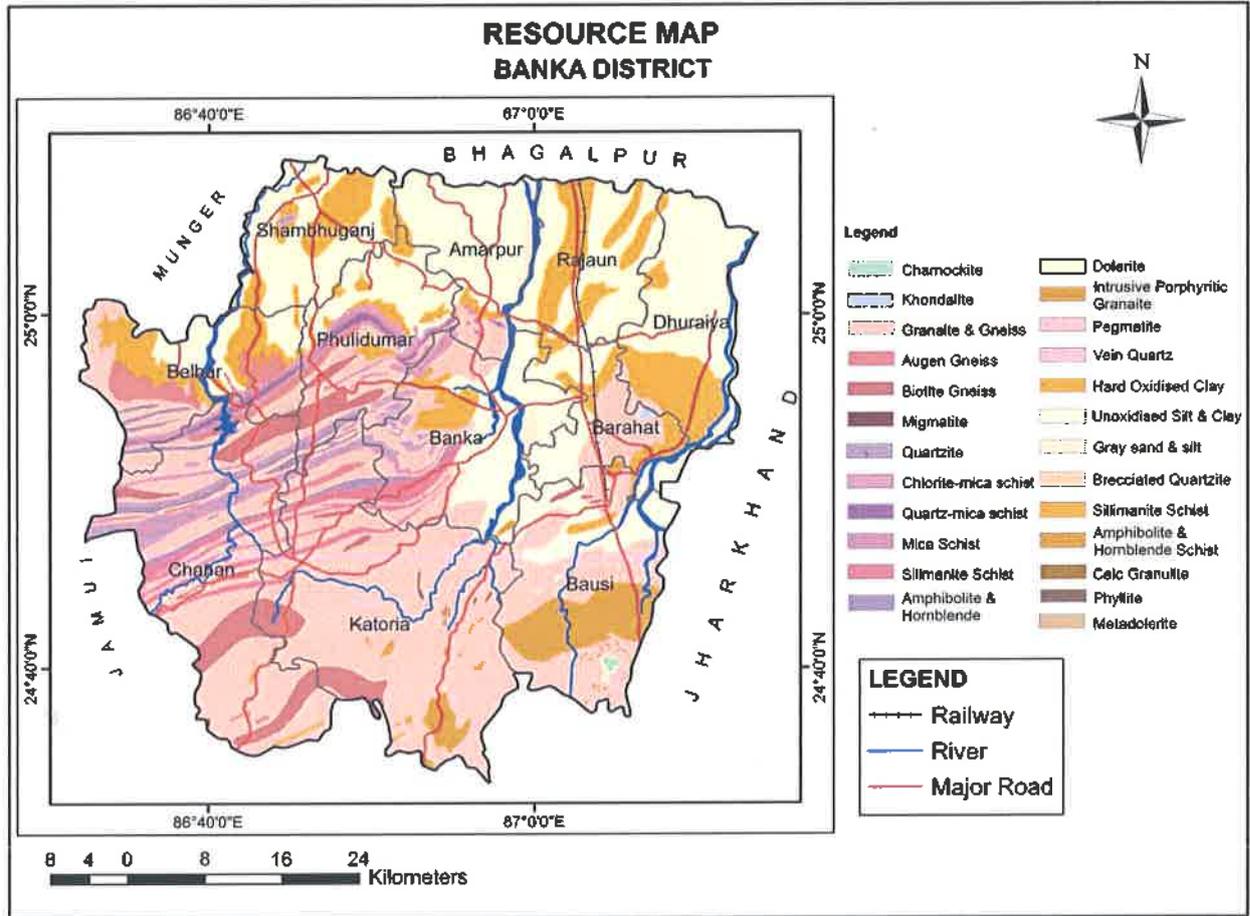




Source – NIC Bihar



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Source – NIC Bihar

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12.3 Mineral Potential and Annual DepositionTable 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	13.64	13649	233	3	3180217	9540651	10303903
Chir		9.70	9703	94.6	3	917903.8	2753711	2974008
Badua		15.25	15246	72.5	3	1105335	3316005	3581285
Odhni		7.37	7368	104	3	766272	2298816	2482721
Kurar		4.50	4499	107	3	481393	1444179	1559713
Sukhaniya		9.52	9522	77	3	733194	2199582	2375549

Note:- Specific gravity of sand = 1.80 ton/m<sup>3</sup> (Source : - Report, Noida Testing Laboratories)



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Cheer	Pair	4.5	NA	6.66	NA	-	Sand	Existing
Cheer	Sarba	3.9	NA	4.64	NA	-	Sand	Existing
Cheer	Panjwara Rd. Near Kachmachiya	4.1	NA	3.03	NA	-	Sand	Existing
Cheer	Sabalpur	4.89	NA	2.89	NA	-	Sand	Existing
Chanan	Banka Chanan 01	35	NA	0.9	NA	1512000	Sand	Proposed
Chanan	Banka Chanan 02	30	NA	1.2	NA	1296000	Sand	Proposed
Chanan	Banka Chanan 03	27	NA	1.15	NA	1166400	Sand	Proposed
Chanan	Banka Chanan 04	31	NA	2.12	NA	1339200	Sand	Proposed
Chanan	Banka Chanan 05	50	NA	4.35	NA	2160000	Sand	Proposed
Chanan	Banka Chanan 06	34	NA	7.92	NA	1468800	Sand	Proposed
Chanan	Banka Chanan 07	55.9	NA	8.72	NA	2414880	Sand	Proposed
Chanan	Banka Chanan 08	22	NA	6.5	NA	9504000	Sand	Proposed
Chanan	Banka Chanan 09	33	NA	4.35	NA	1425600	Sand	Proposed
Badua	Badua - 01	42	6.4	7.4	NA	1814400	Sand	Proposed
Badua	Badua - 02	80	6.5	4.7	NA	3456000	Sand	Proposed
Badua	Badua - 03	27	NA	1.6	NA	1166400	Sand	Proposed
Odhni	Odhni River (Block 1 to 4)	76.4	NA	4.5	NA	3300480	Sand	Proposed
Kurar	Kurar River (Block 1 to 03)	41.36	NA	3.5	NA	1786752	Sand	Proposed
Chir	Chir River (Block 1 to 5)	93	NA	4.2	NA	4017600	Sand	Proposed
Sukhania	Sukhania River Block 1 to 05	71.3	NA	5.5	NA	3080160	Sand	Proposed



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## Annexure-III

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

Lease No.	Transportation Route No.	Number of tippers /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	2.66	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	3.37	Black Topped	Unpaved	Lease Owner	
Banka Chanan 03	SH 25	304	2628	1.40	Black Topped	Unpaved	Lease Owner	
Banka Chanan 04	SH 25	150	2767	1.01	Black Topped	Unpaved	Lease Owner	
Banka Chanan 05	NH 333A	337	2767	0.83	Black Topped	Unpaved	Lease Owner	
Banka Chanan 06	NH 333A	352	3640	1.79	Black Topped	Unpaved	Lease Owner	
Banka Chanan 07	NH 333A	340	2628	3.41	Black Topped	Unpaved	Lease Owner	
Banka Chanan 08	SH 25	351	2628	5.10	Black Topped	Unpaved	Lease Owner	
Banka Chanan 09	SH 25	351	2628	4.83	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	
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	
SukhanianRiver Block 1 to 05	SH 19	642	3640	1.0	Black Topped	Unpaved	Lease Owner	



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## Annexure-IV

Table 13: Final List of Potential Mining Leases (existing &amp; 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	Majhoni	23	NA	0.14	YES	-	Sand	Existing
Chanan	Patawe Bhorwa	20	NA	0.63	YES	-	Sand	Existing
Chanan	Patawe Bhorwa & Majhyara Arazi	2.5	NA	1.48	YES	-	Sand	Existing
Chanan	Majhyara Arazi	4	NA	1.27	YES	-	Sand	Existing
Chanan	Rajpur Kakna	29	NA	0.94	YES	-	Sand	Existing
Chanan	Baisa	24	NA	0.85	YES	-	Sand	Existing
Chanan	Manjhira	1.4	NA	0.95	YES	-	Sand	Existing
Chanan	Maldaun	12	NA	1.61	NA	-	Sand	Existing
Chanan	Bishunpur	20	NA	3.81	NA	-	Sand	Existing
Chanan	Govindpur	16	NA	4.23	NA	-	Sand	Existing
Chanan	Jitarpur	2.9	NA	5.91	NA	-	Sand	Existing
Chanan	Saran Godiya	2.8	NA	7.63	NA	-	Sand	Existing
Chanan	Godiya	4.5	NA	8.72	NA	-	Sand	Existing
Chanan	Lakhnauri	18	NA	8.23	NA	-	Sand	Existing
Chanan	Lakhnauri- 02	20	NA	6.63	NA	-	Sand	Existing
Chanan	Kunani	30	NA	4.48	YES	-	Sand	Existing
Chanan	Jogipahari	2.6	NA	4.71	YES	-	Sand	Existing
Chanan	Domuhan- 01	2.8	NA	3.93	NA	-	Sand	Existing
Chanan	Domuhan- 02	3.6	NA	4.18	NA	-	Sand	Existing
Chanan	Domuhan- 03	3.9	NA	4.46	NA	-	Sand	Existing
Badua	Majhli Deogarh Road	4.1	NA	1.26	NA	-	Sand	Existing
Badua	Majhli Deogarh Road	3.5	5.91	5.69	YES	-	Sand	Existing
Badua	Baghaunia	3.1	5.93	6.58	YES	-	Sand	Existing
Badua	Kumarsar	4.6	6.88	7.15	NA	-	Sand	Existing
Badua	Sahoda	2.5	7.79	7.47	NA	-	Sand	Existing
Badua	Randih	1.1	9.09	10.62	NA	-	Sand	Existing
Odhni	Saijpur Road	2.5	NA	1.43	NA	-	Sand	Existing
Sukhniya / Cheer	Sabalpur	2.3	NA	6.11	NA	-	Sand	Existing



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Cheer	Pair	4.5	NA	6.66	NA	-	Sand	Existing
Cheer	Sarba	3.9	NA	4.64	NA	-	Sand	Existing
Cheer	Panjwara Rd. Near Kachmachiya	4.1	NA	3.03	NA	-	Sand	Existing
Cheer	Sabalpur	4.89	NA	2.89	NA		Sand	Existing
Chanan	Banka Chanan 01	35	NA	0.9	NA	1512000	Sand	Proposed
Chanan	Banka Chanan 02	30	NA	1.2	NA	1296000	Sand	Proposed
Chanan	Banka Chanan 03	27	NA	1.15	NA	1166400	Sand	Proposed
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Chanan	Banka Chanan 06	34	NA	7.92	NA	1468800	Sand	Proposed
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Odhni	Odhni River (Block 1 to 4)	76.4	NA	4.5	NA	3300480	Sand	Proposed
Kurar	Kurar River (Block 1 to 03)	41.36	NA	3.5	NA	1786752	Sand	Proposed
Chir	Chir River (Block 1 to 5)	93	NA	4.2	NA	4017600	Sand	Proposed
Sukhania	Sukhania River Block 1 to 05	71.3	NA	5.5	NA	3080160	Sand	Proposed

**Note : Distance measured from forest/WC/ESZ as per the shape file/kml received by Aranya Bhawan (Letter is attached in Annexure)**



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## Annexure-V

Table 15 Final Transportation Routes for individual leases and leases in Cluster

Lease No.	Transportation Route No.	Number of tippers /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	2.66	Black Topped	Unpaved	Lease Owner	Location with GPS coordinate is mentioned in potential sand ghat list And route map is attached in the annexure
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Banka Chanan 05	NH 333A	337	2767	0.83	Black Topped	Unpaved	Lease Owner	
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Chir River (Block 1 to 7)	SH 19	2317	3640	1.0	Black Topped	Unpaved	Lease Owner	
SukhanianRiver Block 1 to 05	SH 19	642	3640	1.0	Black Topped	Unpaved	Lease Owner	

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### **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  $1.8 \text{ ton/m}^3$ . 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.

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## **14. DISASTER RISK MANAGEMENT**

### **Bihar Hazard Profile**

The multi-disaster prone state of Bihar requires a multi-disciplinary approach to deal with these disasters requiring participation of various stakeholders. It requires a continuous and integrated process of planning, organising, coordinating and implementing measures that are necessary for risk prevention, mitigation of risk impacts, preparing to face the disaster event, response, rehabilitation and reconstruction. Some of the prominent disasters and their impacts are –

### **Flood:-**

Bihar's topography is marked by a number of perennial and non-perennial rivers of which, those originating from Nepal are known to carry high sediment loads that are then deposited on the plains of Bihar. A majority of the rainfall in this region is concentrated in the 3 months of monsoon during which the flow of rivers increases up to 50 times causing floods in Bihar. 68800 sq km out of a total area of 94160 sq km, an estimated 73% per cent of the total land area in Bihar is vulnerable to flood . Annual flooding in Bihar accounts for about 30-40% of the flood damages in India; 22.1% of the total flood affected population in India is reported to be located within the state of Bihar. 28 districts of Bihar fall under most flood prone and flood prone districts.

### **Earthquake :-**

Bihar is located in the high seismic zone that falls on the boundary of the tectonic plate joining the Himalayan tectonic plate near the Bihar-Nepal Border and has six sub-surface fault lines moving towards the Gangetic planes in four directions. Major parts of the state are classified under in seismic zone IV and V by the Vulnerability Atlas of India, i.e. as having high earthquake vulnerability with the potential to cause very high degree of devastation. In all, 15.2% of the total area of Bihar is classified under Zone V and 63.7% of the total area of Bihar falls in Zone IV. Of the 38 districts, 8 districts fall in seismic zone V while 24 districts fall in seismic zone IV and 6 districts in seismic zone III with most districts falling under multiple seismic zones (i.e. either seismic zone V & IV or seismic zone IV & III). The state has in the past experienced major earthquakes; the worst was the 1934 earthquake in which more than 10,000 people lost their lives,



followed by 1988 earthquake.

#### **Drought :-**

Though the climate of Bihar is favourable for production of various crops, the agriculture of the state is dependent on behaviour of monsoon and distribution of rainfall. Although the average rainfall in the state is 1120 mm, considerable variations occur between the different parts of the State. Large part of the state is now increasingly vulnerable to drought due to climate change. In the absence of adequate rainfall, most part of Bihar including North Bihar which is prone to floods faces drought situations. South and South West Bihar are more vulnerable and often experiences severe drought situations.

#### **Other Hazards :-**

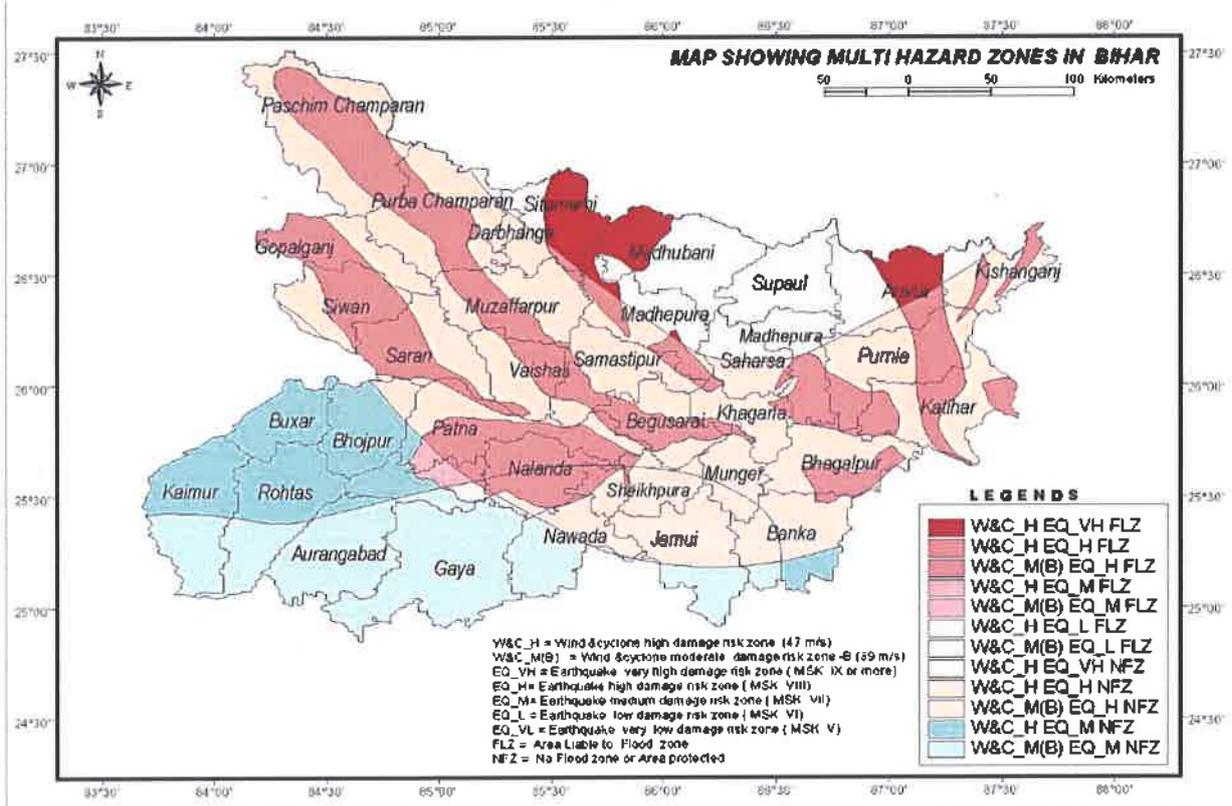
Apart from the above hazards, the state is also prone to cold and heat waves, Cyclonic storms (high speed winds) and other human-induced hazards like fire, epidemics, road / boat accidents, stampedes etc. Incidences of fire are mainly local in nature but have a severe impact on villages. Since a majority of Kucha houses have thatch roofs and wooden structures, in the summer months when winds are high, fires from the traditional stoves spread to damage entire villages.

#### **Initiatives of BSDMA towards making disaster resilient Bihar :-**

Though the state is a multi-hazard prone state, it has also been moving towards greater disaster resilience. Bihar State Disaster Management Authority (BSDMA), together with Disaster Management Department of Government of Bihar, has been taking various initiatives towards awareness generation and capacity building of various stakeholders and also the affected population. Emphasis of BSDMA has been towards structural and non-structural strengthening of the system to reduce disaster risks and mitigate their impacts. Safety Weeks (Road Safety, Earthquake Safety, Fire Safety & Flood Safety), training of stakeholders, safe school programmes, safe construction guidelines, Free Earthquake Safety Clinic & Centre, wide circulation of IEC materials etc. are some of the important initiatives of the Authority.



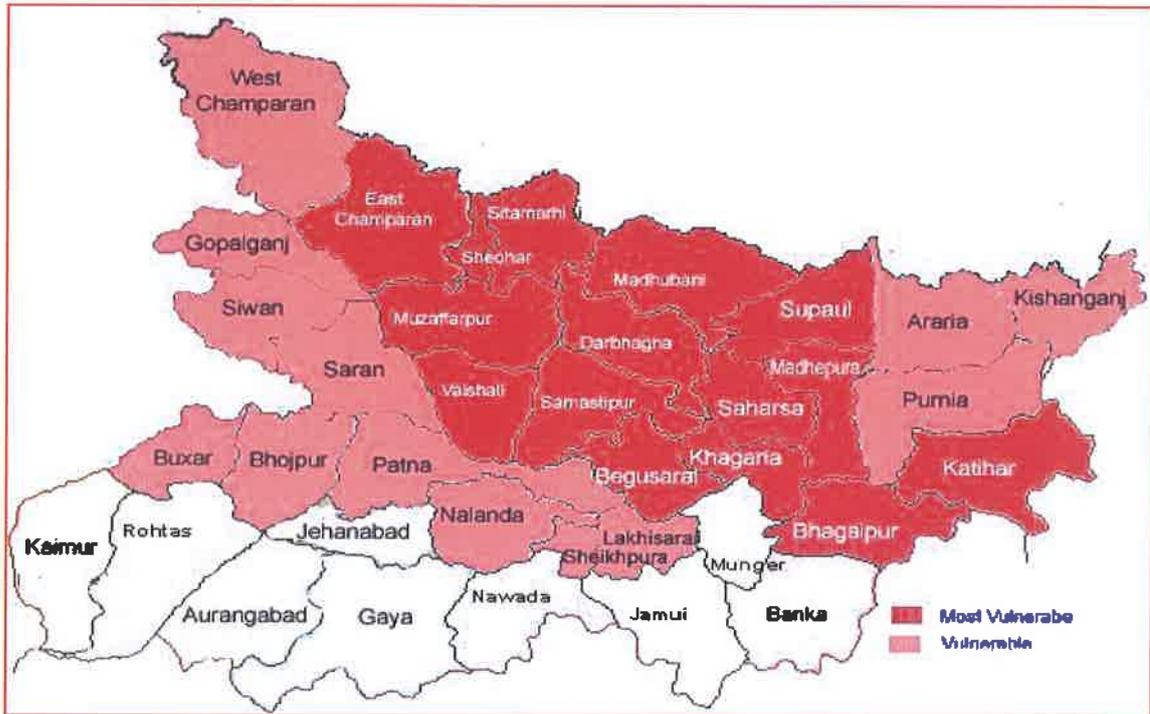
**DSR BANKA**



Disclaimer: This map was compiled based on the data/information compiled by the Ministry of Urban Development and Poverty Alleviation, UNDP. It has not verified the accuracy of information of the Map. Source: B&H/TPC, India

Source : - Bihar State Disaster Management Authority



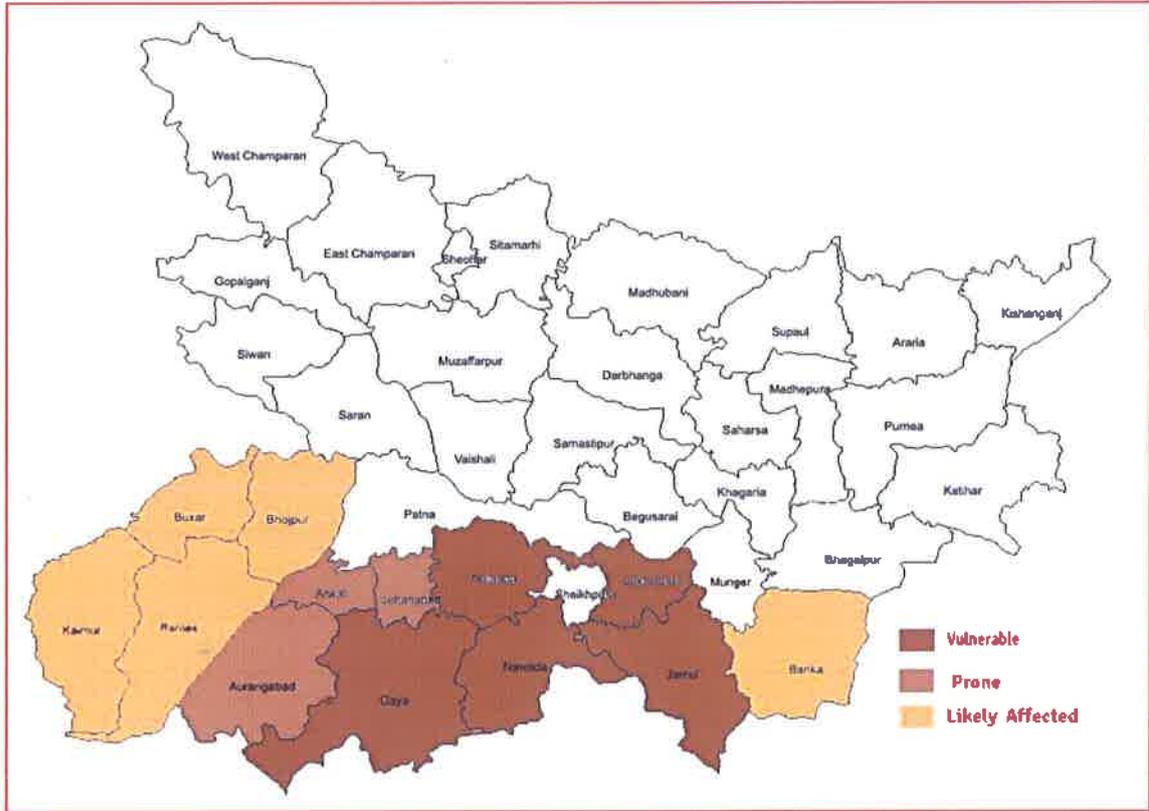


Source: Developed on Inputs from DMD, GoB

- 2. Flood— Most Vulnerable :** East Champaran, Sheohar, Sitamarhi, Katihar, Madhubani, Vaishali, Muzaffarpur, Darbhanga, Samastipur, Madhepra, 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**



***References***

- District Mining Office –Banka
- Mines & Geology Department, Patna, GoB
- Geology of Bihar and Jharkhand by T. M.Mahadevan
- National Institute of Disaster Management Report
- Report of Central Ground Water Board, Ministry of Water Resources- State Unit Office, Patna, September 2013
- <http://mines.bih.nic.in/>
- <http://banka.bih.nic.in/>
- Geology & Mineral Resources of The States Of India – Geological Survey Of India, Part V – Bihar And Jharkhand
- Maps from Geological Survey of India
- [https://agricoop.nic.in/sites/default/files/BR11\\_Banka\\_28.12.203.pdf](https://agricoop.nic.in/sites/default/files/BR11_Banka_28.12.203.pdf)



DSR BANKA

**Enclouser I**  
**(Undertaking Regarding Aquatic Animals Found in River)**

**UNDERTAKING**

I, KUMAR RANJAN representative of sub-divisional committee formed to prepare District Survey Report for River bed material of Banka district, hereby undertake that:

- A. The aquatic animal found in Chanan, Badua, Odhni, Kurar, Chir & Sukhaniya rivers are of least concern and abundantly found all over the river area such as common species of Fishes & amphibians.
- B. No any Rare, Endangered and endemic species are found within the study area of Chanan, Badua, Odhni, Kurar, Chir & Sukhaniya river.
- C. If any REEF species will be found in the river, precautionary measures will be taken care accordingly.

Place: BANKA, BIHAR

Date: 16/04/2022

*Kumar Ranjan*  
16/04/2022  
Deponent

I hereby again solemnly affirm that my above statement is true correct to my knowledge and belief. Nothing material has been concealed therein.

Deponent : KUMAR RANJAN.

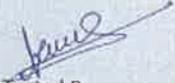


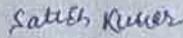
DSR BANKA

**Enclouser II****(Specific gravity & Bulk density of sand from NABL lab)**

S. No.		TEST PARAMETERS	TEST METHOD	RESULTS	REQUIREMENTS
1		Specific gravity	IS 2386 (P-3):1963	2.10	-
2		Bulk Density (oven dry Compacted), kg/l	IS 2386 (P-3):1963	1.77	-

**\*END OF REPORT\***

Tested By 

  
 Authorized Signatory  
 Rappid Test Lab Pvt. Ltd.  
 Block-A, Raut City Commercial  
 Complex, Garikhana Khagaul  
 Patna-801105(Bihar)

Block-A, Raut City, Commercial Complex, Garikhana, Khagaul, Patna-801105 (Bihar). Near Radiant International School  
 Ph No.: 91-8802366634, Website: [www.rappidtestlabs.com](http://www.rappidtestlabs.com), Email: [rappidtestlab@gmail.com](mailto:rappidtestlab@gmail.com), [manojbteee040@yahoo.com](mailto:manojbteee040@yahoo.com)

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# RAPPID TEST LAB PRIVATE LIMITED

OUR DREAM IS QUALITY ONLY



Issue to Mineral Development officer Banka		ULR No.: TC102142200000050F		
		Date of Receipt: 13.04.2022		
		Date of Testing: 13.04.2022-14.04.2022		
Description of Sample: BADUA SAND		Date of Report: 14.04.2022		
Name of River: BADUA		Name of Village: SANHOLI		
Ref No: Nil				
S. No.	TEST PARAMETERS	TEST METHOD	RESULTS	REQUIREMENTS
1	Specific gravity	IS 2386 (P-3):1963	2.08	-
2	Bulk Density (oven dry Compacted), kg/l	IS 2386 (P-3):1963	1.78	-

\*END OF REPORT\*

*[Signature]*  
Tested By

*[Signature]*  
Authorized Signatory

Rappid Test Lab Pvt.Ltd.  
Block-A,Raut City Commercial  
Complex,Gankhana Khagaul  
Patna-801105(Bihar)

Block-A, Raut City, Commercial Complex, Gankhana, Khagaul, Patna-801105 (Bihar). Near Radiant International School  
Ph No.: 91-8802366634, Website: [www.rappidtestlabs.com](http://www.rappidtestlabs.com), Email: [rappidtestlab@gmail.com](mailto:rappidtestlab@gmail.com), [manojbtee040@yahoo.com](mailto:manojbtee040@yahoo.com)

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# RAPPID TEST LAB PRIVATE LIMITED

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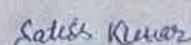


TC-10214

Issue to Mineral Development officer Banka		ULR No.: TC1021422000000051F		
		Date of Receipt: 13.04.2022		
Description of Sample: Darbhashan Sand		Date of Testing: 13.04.2022-14.04.2022		
Name of River: DARBHASHAN		Date of Report: 14.04.2022		
Ref No: Nil		Name of Village: TOLA AAGACHI		
S. No.	TEST PARAMETERS	TEST METHOD	RESULTS	REQUIREMENTS
1	Specific gravity	IS 2386 (P-3):1963	2.08	-
2	Bulk Density (oven dry Compacted), kg/l	IS 2386 (P-3):1963	1.77	-

\*END OF REPORT\*

  
Tested By

  
Authorized Signatory  
Rappid Test Lab Pvt.Ltd.  
Block-A,Raut City Commercial  
Complex,Gankhana Khagaul  
Patna-801105(Bihar)

Block-A, Raut City, Commercial Complex, Gankhana, Khagaul, Patna-801105 (Bihar), Near Radiant International School  
Ph No.: 91-8802366634, Website: [www.rappidtestlabs.com](http://www.rappidtestlabs.com), Email: [rappidtestlab@gmail.com](mailto:rappidtestlab@gmail.com), [nanojbtece040@yahoo.com](mailto:nanojbtece040@yahoo.com)

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# RAPID TEST LAB PRIVATE LIMITED

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TC-10214

Issue to Mineral Development officer Banka		ULR No.: TC102142200000052F		
		Date of Receipt: 13.04.2022		
		Date of Testing: 13.04.2022-14.04.2022		
Description of Sample: Odhni Sand		Date of Report: 14.04.2022		
Name of River: ODHNI		Name of Village: Dara		
Ref No: Nil				
S. No.	TEST PARAMETERS	TEST METHOD	RESULTS	REQUIREMENTS
1	Specific gravity	IS 2386 (P-3):1963	2.03	-
2	Bulk Density (oven dry Compacted), kg/l	IS 2386 (P-3):1963	1.80	-

**\*END OF REPORT\***

*[Signature]*  
Tested By

*[Signature]*  
Authorized Signatory

Rapid Test Lab Pvt.Ltd.  
Block-A,Raut City Commercial  
Complex,Garikhana Khagaul  
Patna-801105(Bihar)

Block-A, Raut City, Commercial Complex, Garikhana, Khagaul, Patna-801105 (Bihar). Near Radiant International School  
Ph No.: 91-8802366634, Website: [www.rapidtestlabs.com](http://www.rapidtestlabs.com), Email: [rapidtestlab@gmail.com](mailto:rapidtestlab@gmail.com), [manojbreee040@yahoo.com](mailto:manojbreee040@yahoo.com)

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DSR BANKA



# RAPPID TEST LAB PRIVATE LIMITED

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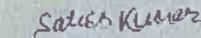


TC-10214

Issue to Mineral Development officer Banka		ULR No.: TC1021422000000053F		
		Date of Receipt: 13.04.2022		
		Date of Testing: 13.04.2022-14.04.2022		
Description of Sample: KURAR SAND		Date of Report: 14.04.2022		
Name of River: KURAR		Name of Village: TOLA KADRAGORA		
Ref No: Nil				
S. No.	TEST PARAMETERS	TEST METHOD	RESULTS	REQUIREMENTS
1	Specific gravity	IS 2386 (P-3):1963	2.12	-
2	Bulk Density (oven dry Compacted), kg/l	IS 2386 (P-3):1963	1.79	-

\*END OF REPORT\*

  
Tested By

  
Authorized Signatory

Rappid Test Lab Pvt.Ltd.  
Block-A,Raut City Commercial  
Complex,Garikhana Khagaul  
Patna-801105(Bihar)

Block-A, Raut City, Commercial Complex, Garikhana, Khagaul, Patna-801105 (Bihar). Near Radiant International School  
Ph No.: 91-8802366634, Website: [www.rappidtestlabs.com](http://www.rappidtestlabs.com), E.mail: [rappidtestlab@gmail.com](mailto:rappidtestlab@gmail.com), [nuwojteece040@yahoo.com](mailto:nuwojteece040@yahoo.com)

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# RAPPID TEST LAB PRIVATE LIMITED

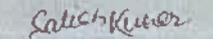
OUR DREAM IS QUALITY ONLY



Issue to <b>Mineral Development officer Banka</b>		ULR No.: TC1021422000000055F		
		Date of Receipt: 13.04.2022		
Description of Sample: SUKHANIYA SAND		Date of Testing: 13.04.2022-14.04.2022		
Name of River: SUKHANIYA		Date of Report: 14.04.2022		
Ref No: Nil		Name of Village: NIMA		
S. No.	TEST PARAMETERS	TEST METHOD	RESULTS	REQUIREMENTS
1	Specific gravity	IS 2386 (P-3):1963	2.11	-
2	Bulk Density (oven dry Compacted), kg/l	IS 2386 (P-3):1963	1.76	-

\*END OF REPORT\*

  
Tested By

  
Authorized Signatory

Rappid Test Lab Pvt.Ltd.  
Block-A,Raut City Commercial  
Complex,Garikhana Khagaul  
Patna-801105(Bihar)

Block-A, Raut City, Commercial Complex, Garikhana, Khagaul, Patna-801105 (Bihar), Near Radiant International School  
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# RAPPID TEST LAB PRIVATE LIMITED

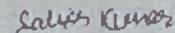
OUR DREAM IS QUALITY ONLY



Issue to <b>Mineral Development officer Banka</b>		ULR No.: <b>TC102142200000054F</b>		
		Date of Receipt: <b>13.04.2022</b>		
		Date of Testing: <b>13.04.2022-14.04.2022</b>		
Description of Sample: <b>CHIR Sand</b>		Date of Report: <b>14.04.2022</b>		
Name of River: <b>CHIR</b>		Name of Village: <b>Pair Village</b>		
Ref No: Nil				
S. No.	TEST PARAMETERS	TEST METHOD	RESULTS	REQUIREMENTS
1	Specific gravity	IS 2386 (P-3):1963	2.09	-
2	Bulk Density (oven dry Compacted), kg/l	IS 2386 (P-3):1963	1.81	-

\*END OF REPORT\*

  
Tested By

  
Authorized Signatory

Rappid Test Lab Pvt.Ltd  
Block-A,Raut City Commer  
Complex,Garikhana Khaga  
Patna-801105(Bihar)

Block-A, Raut City, Commercial Complex, Garikhana, Khagaul, Patna-801105 (Bihar). Near Radiant International School  
Ph No.: 91-8802366634, Website: [www.rappidtestlabs.com](http://www.rappidtestlabs.com), Email: [rappidtestlab@gmail.com](mailto:rappidtestlab@gmail.com), [manojbtccc040@yahoo.com](mailto:manojbtccc040@yahoo.com)

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80



**Enclosure III**  
**(Geo tagged Photographs)**



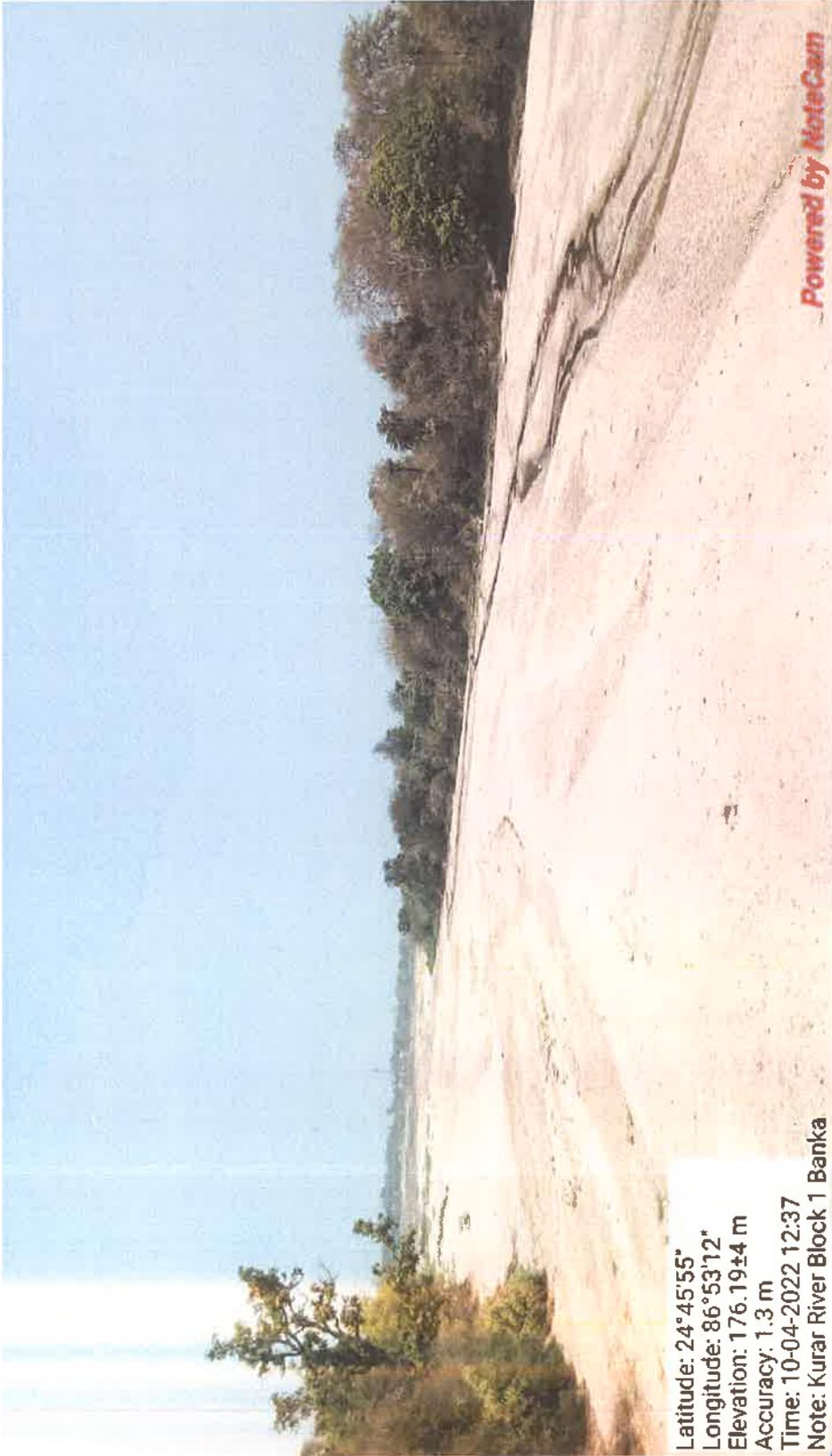
Latitude: 24°57'42"  
Longitude: 86°55'28"  
Elevation: 115.28±4 m  
Accuracy: 1.3 m  
Time: 02-26-2022 13:02  
Note: Chanan Block 1 WB Banka





Latitude: 24°53'47"  
 Longitude: 86°54'26"  
 Elevation: 116.6±4 m  
 Accuracy: 3.0 m  
 Time: 06-04-2022 18:02  
 Note: Odhni River Block 1 Banka





Latitude: 24°45'55"  
Longitude: 86°53'12"  
Elevation: 176.19±4 m  
Accuracy: 1.3 m  
Time: 10-04-2022 12:37  
Note: Kurar River Block 1 Banka

Powered by NoteCam





Latitude: 24°45'55"  
 Longitude: 86°53'12"  
 Elevation: 176.49±5 m  
 Accuracy: 2.1 m  
 Time: 10-04-2022 12:35  
 Note: Kurar Block 2 Banka



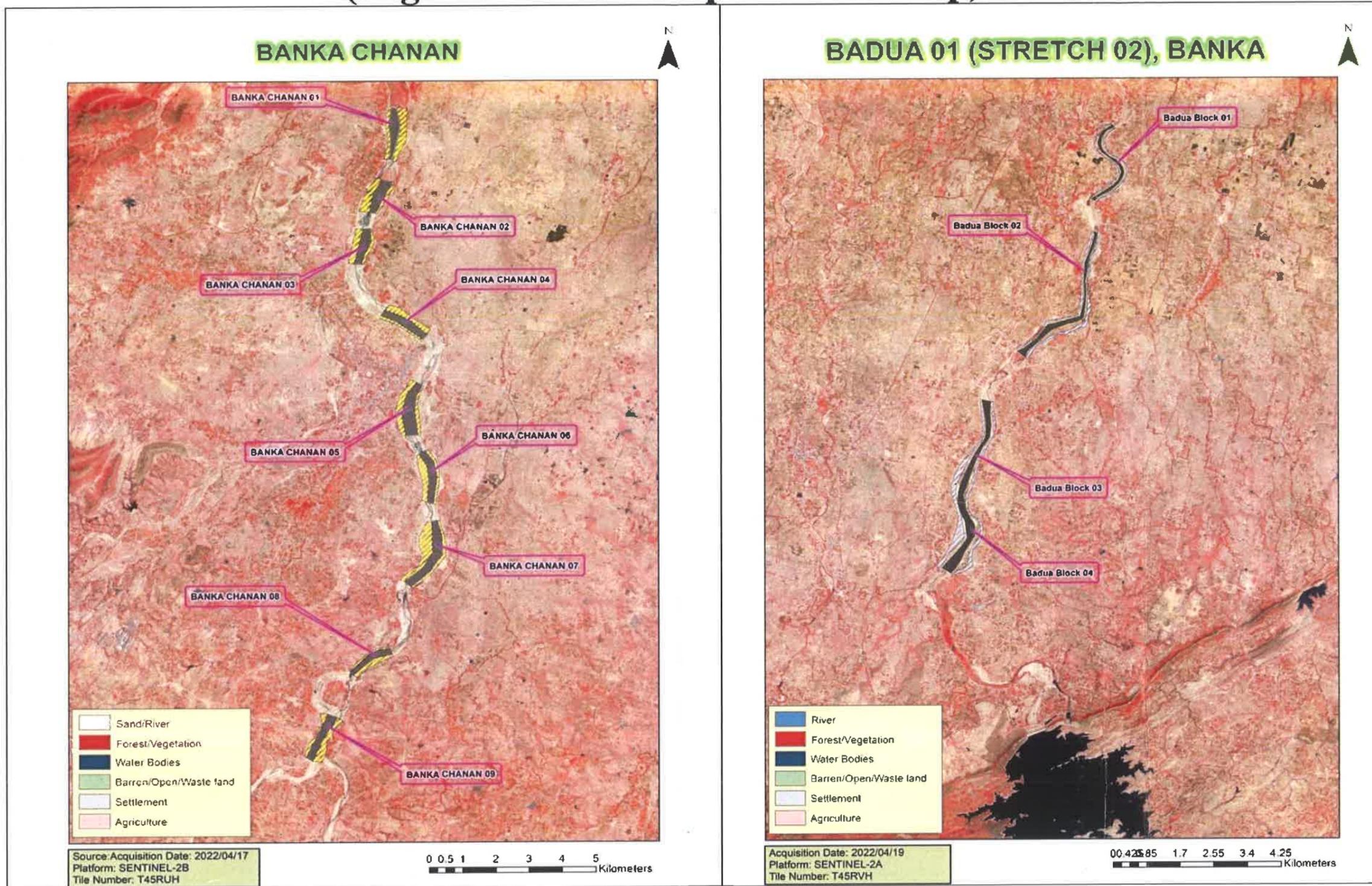


Latitude: 24°46'7"  
 Longitude: 86°53'32"  
 Elevation: 149.1±4 m  
 Accuracy: 3.0 m  
 Time: 06-03-2022 16:19  
 Note: Domuhan 3.6 Ha Ghat Banka

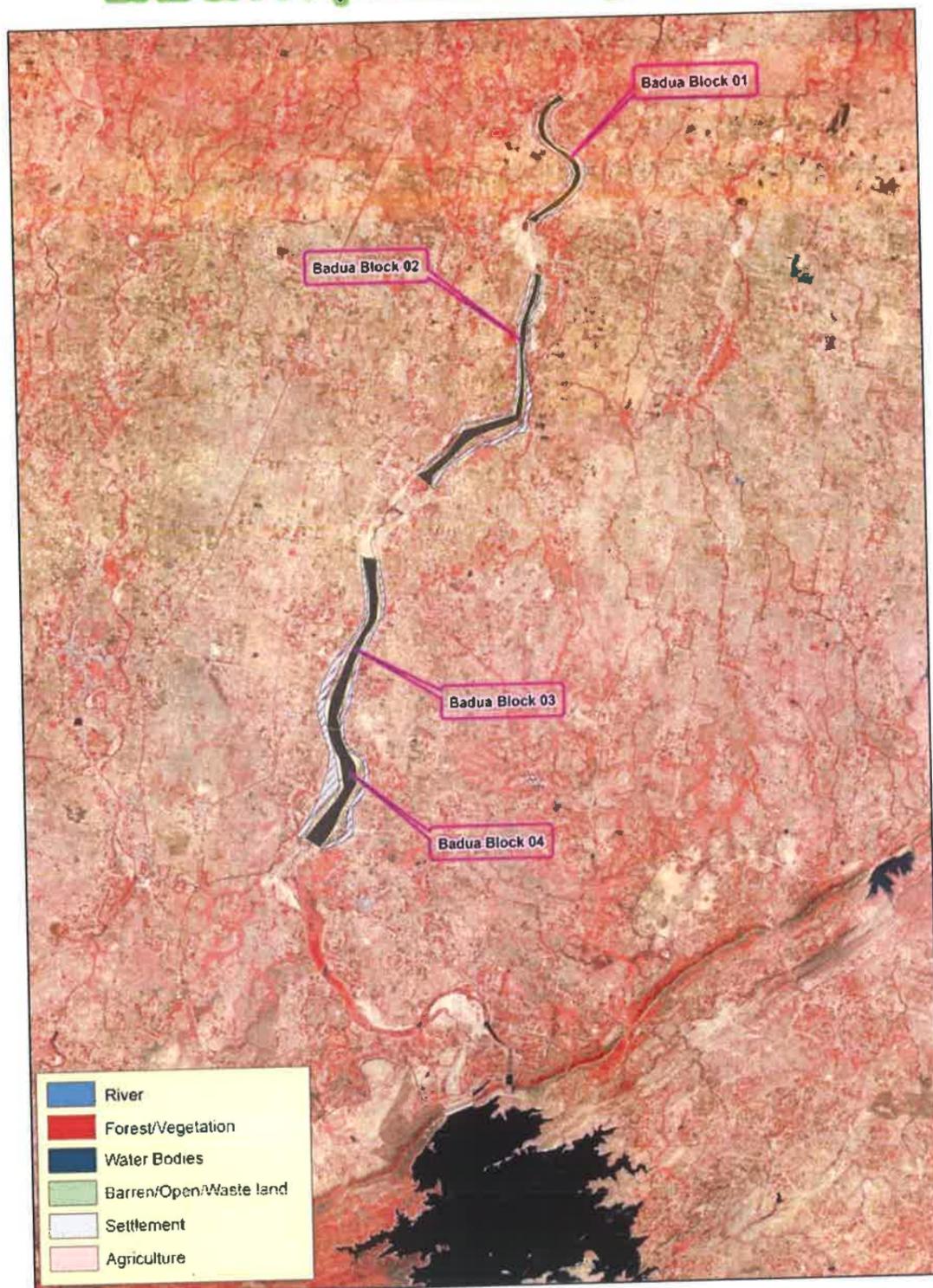


# Enclosure IV

## (High Resolution Map/Sentinel Map)



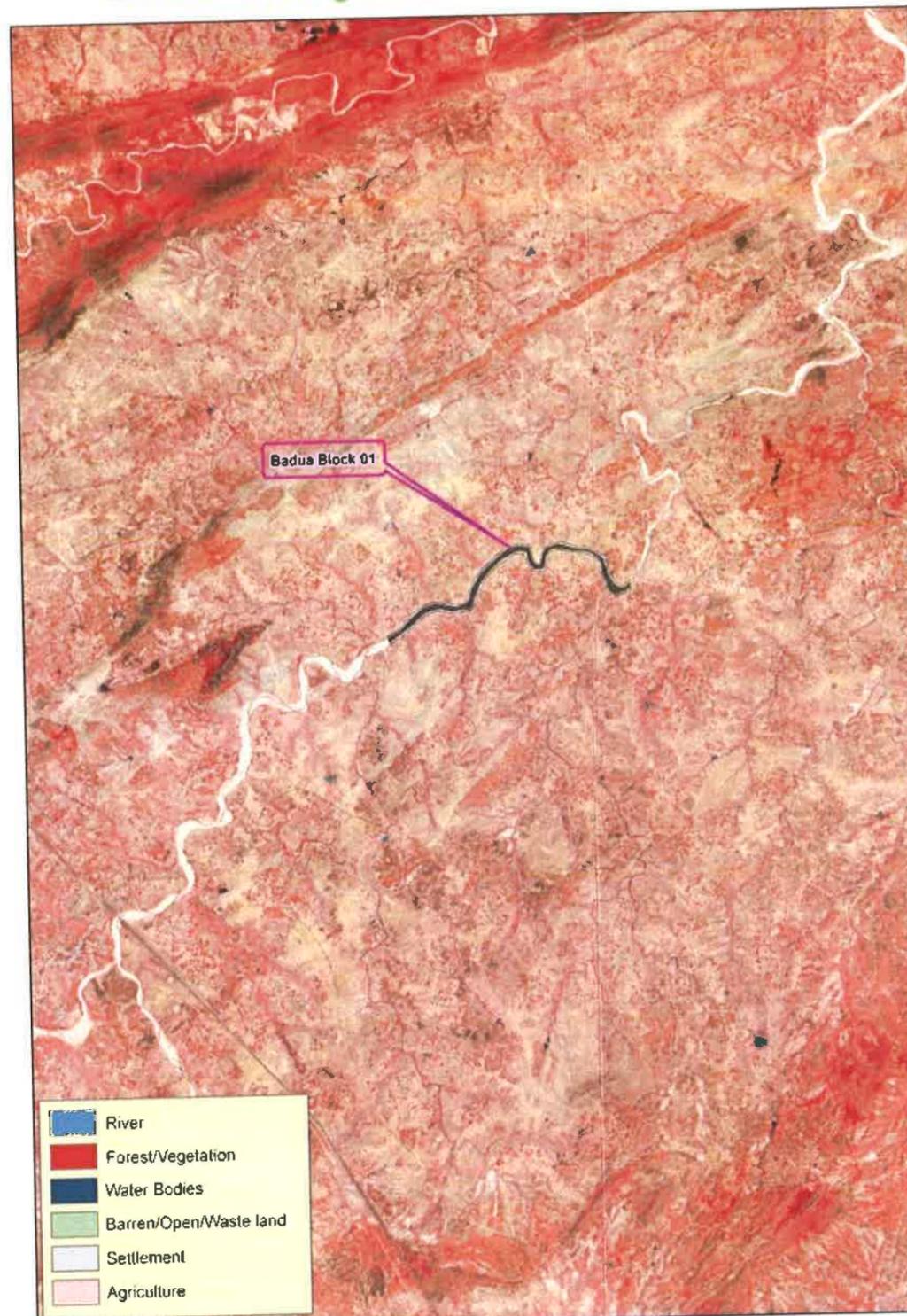
### BADUA 01 (STRETCH 02), BANKA



Acquisition Date: 2022/04/19  
Platform: SENTINEL-2A  
Tile Number: T45RVH

00.425 1.7 2.55 3.4 4.25 Kilometers

### BADUA 03 (STRETCH 02), BANKA

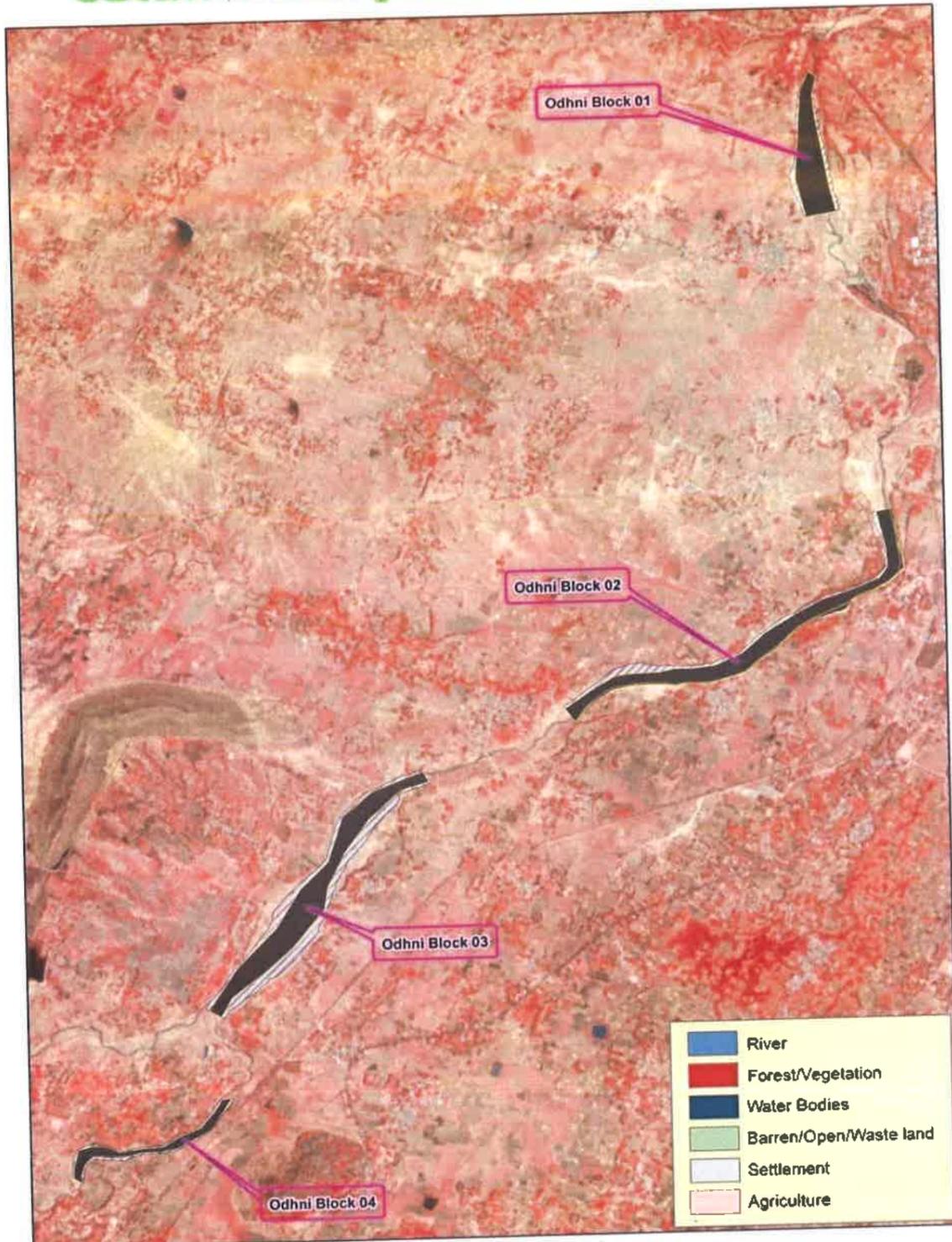


Acquisition Date: 2022/04/19  
Platform: SENTINEL-2A  
Tile Number: T45RVH

0 0.5 1 2 3 4 5 Kilometers



### ODHNI RIVER (STRETCH 03), BANKA



Acquisition Date: 2022/04/19  
Platform: SENTINEL-2A  
Tile Number: T45RVH

0 0.2 0.4 0.8 1.2 1.6 2 Kilometers

### KURAR RIVER (STRETCH 04), BANKA

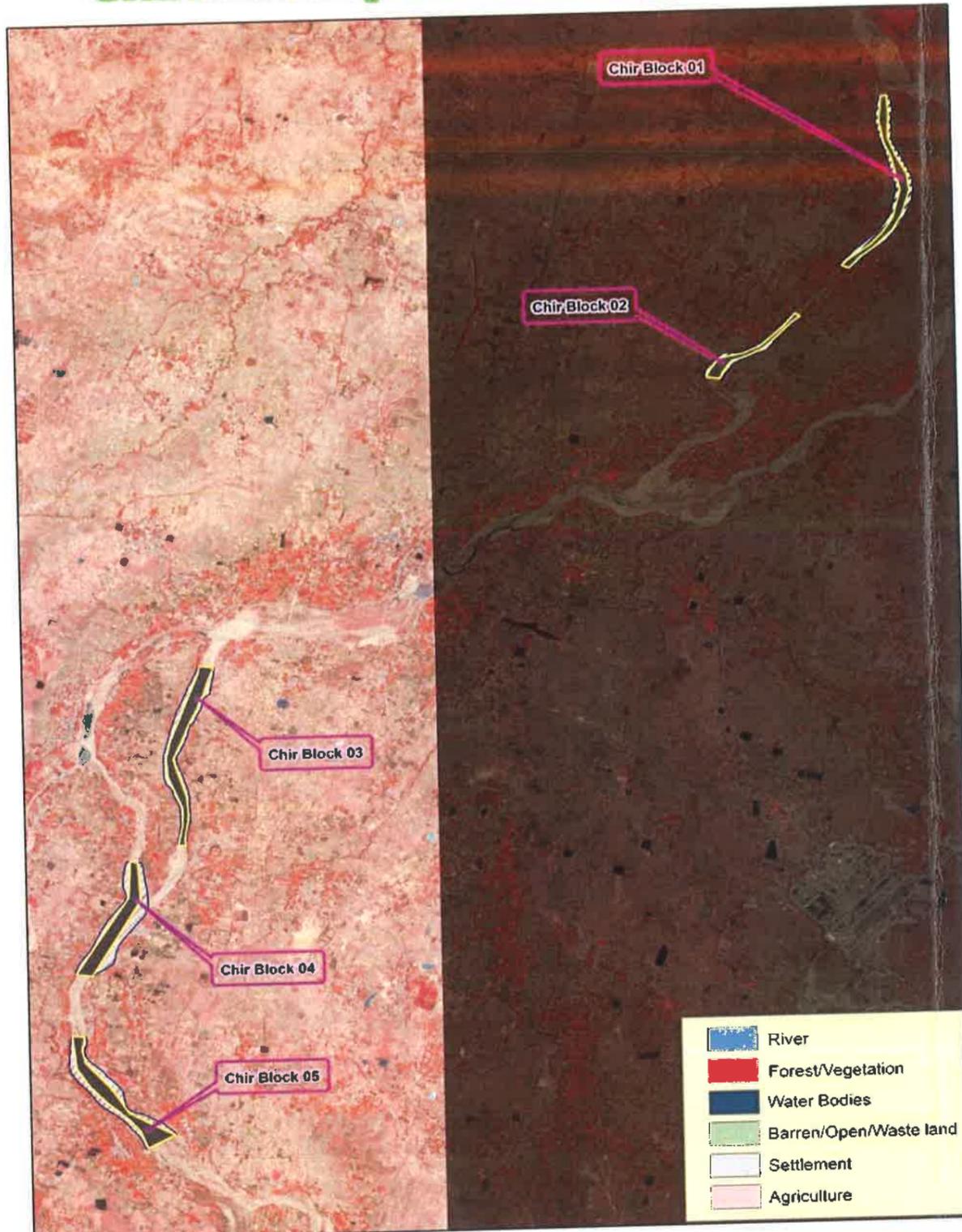


Acquisition Date: 2022/04/19  
Platform: SENTINEL-2A  
Tile Number: T45RVH

0 0.2 0.4 0.8 1.2 1.6 2 Kilometers



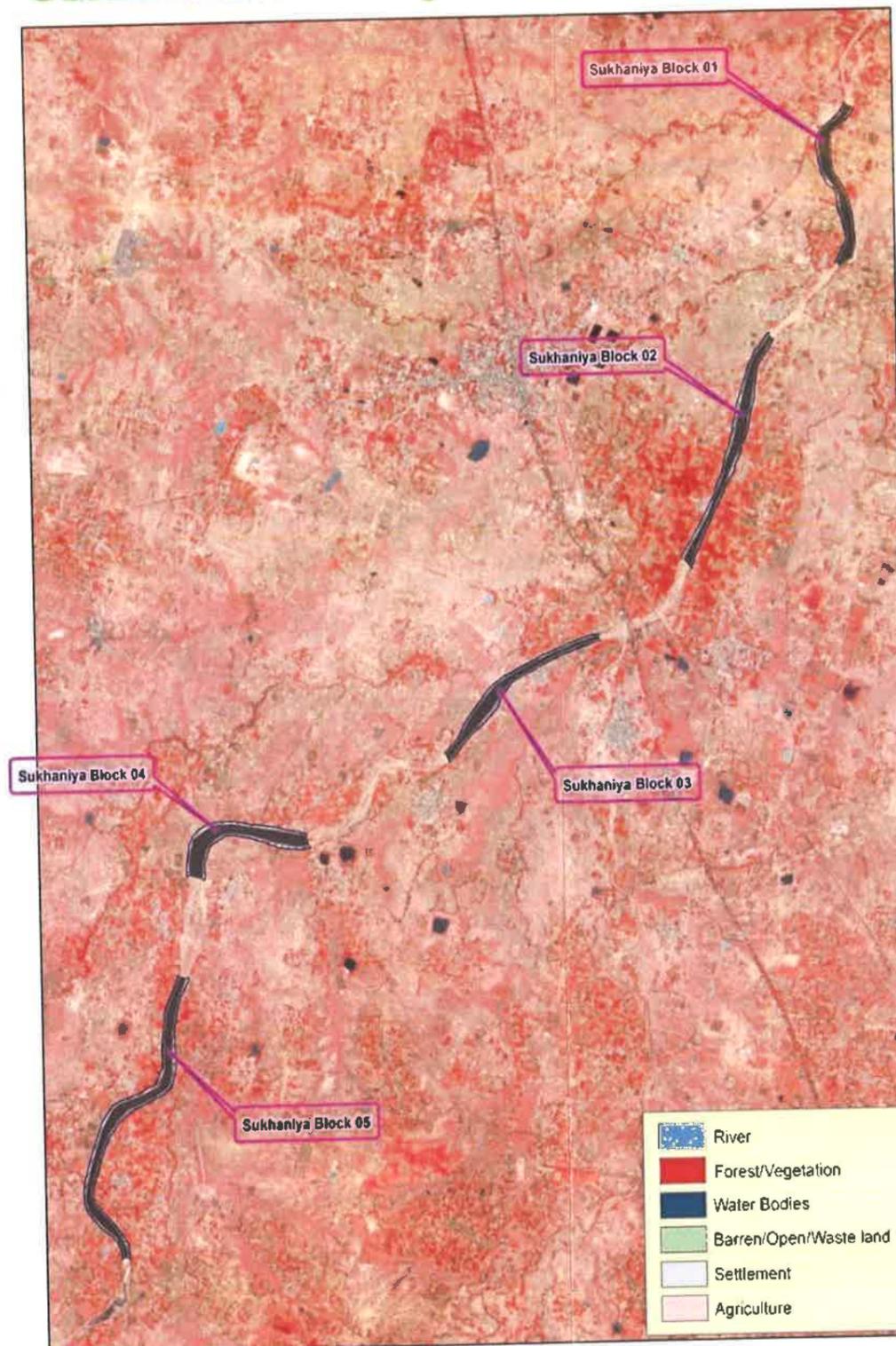
# CHIR RIVER (STRETCH 05), BANKA



Acquisition Date: 2022/04/19  
Platform: SENTINEL-2A  
Tile Number: T45RVH

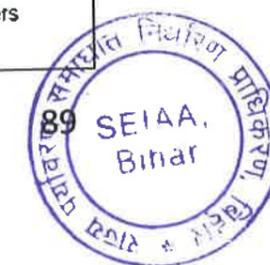
0 0.45 0.9 1.8 2.7 3.6 4.5 Kilometers

# SUKHANIYA RIVER (STRETCH 06), BANKA



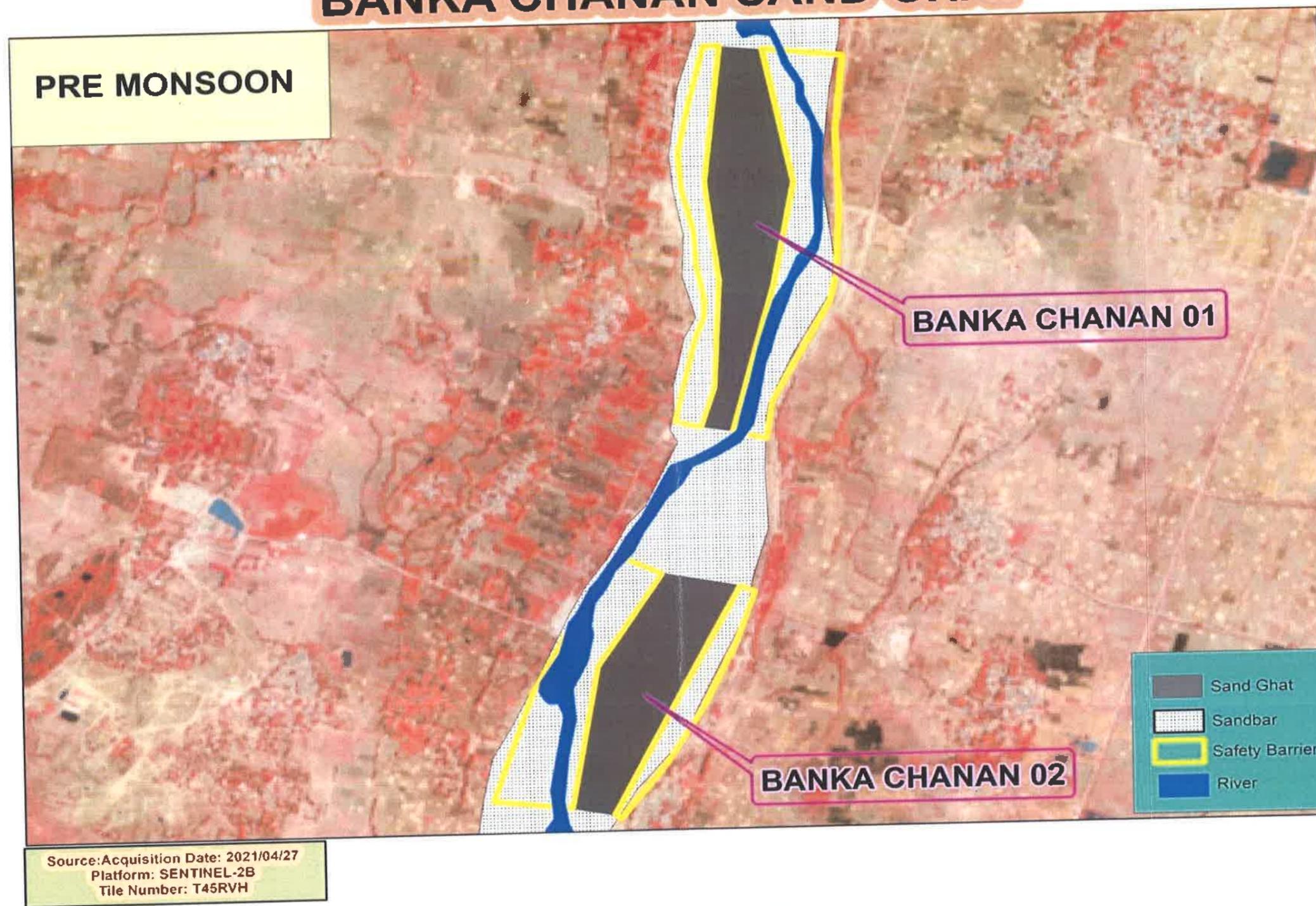
Acquisition Date: 2022/04/19  
Platform: SENTINEL-2A  
Tile Number: T45RVH

0 0.25 0.5 1 1.5 2 2.5 Kilometers

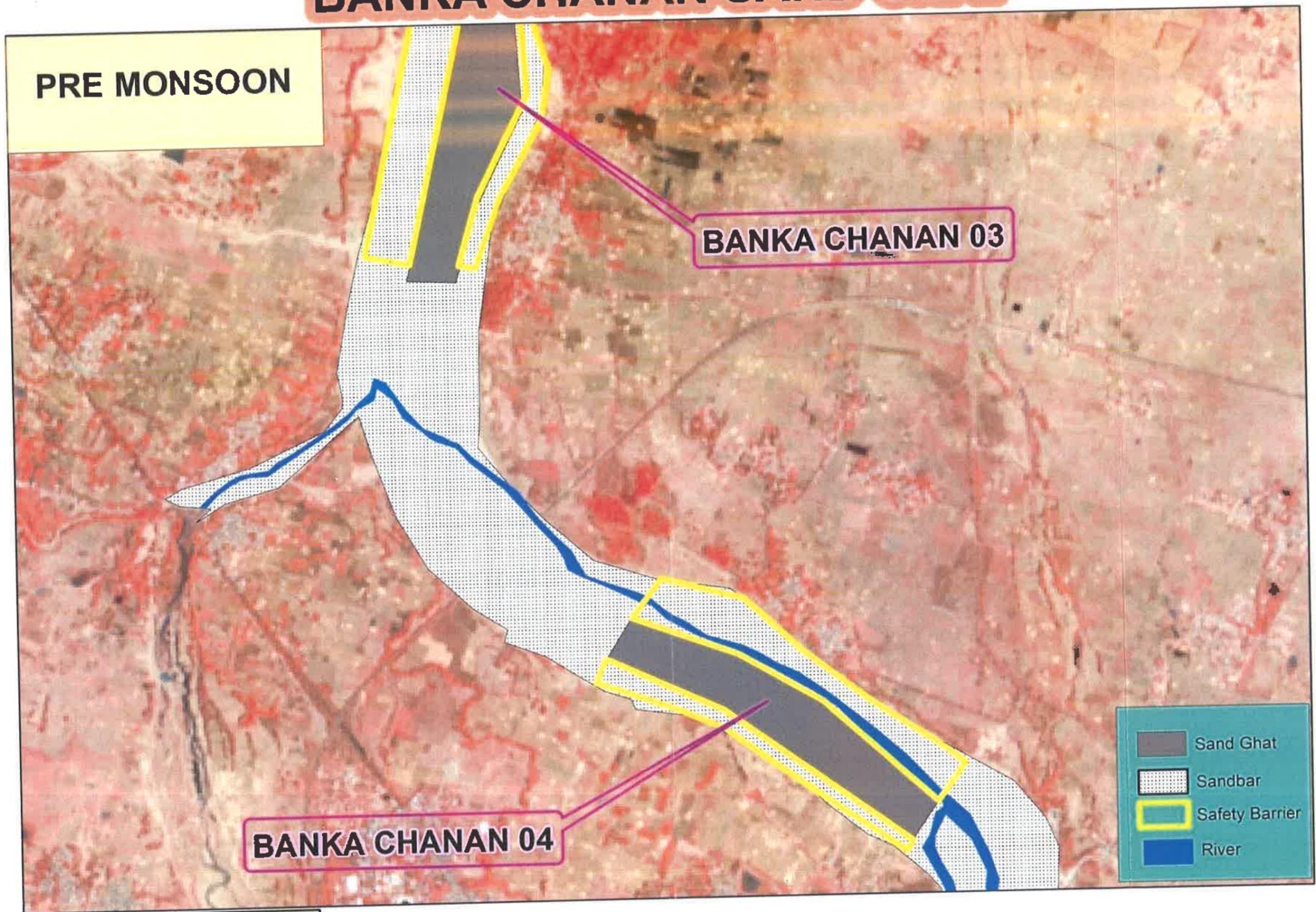


**Enclosure V**  
**(Plate Showing Sand Bars in Pre-monsoon and Post - Monsoon)**

**BANKA CHANAN SAND GHAT**



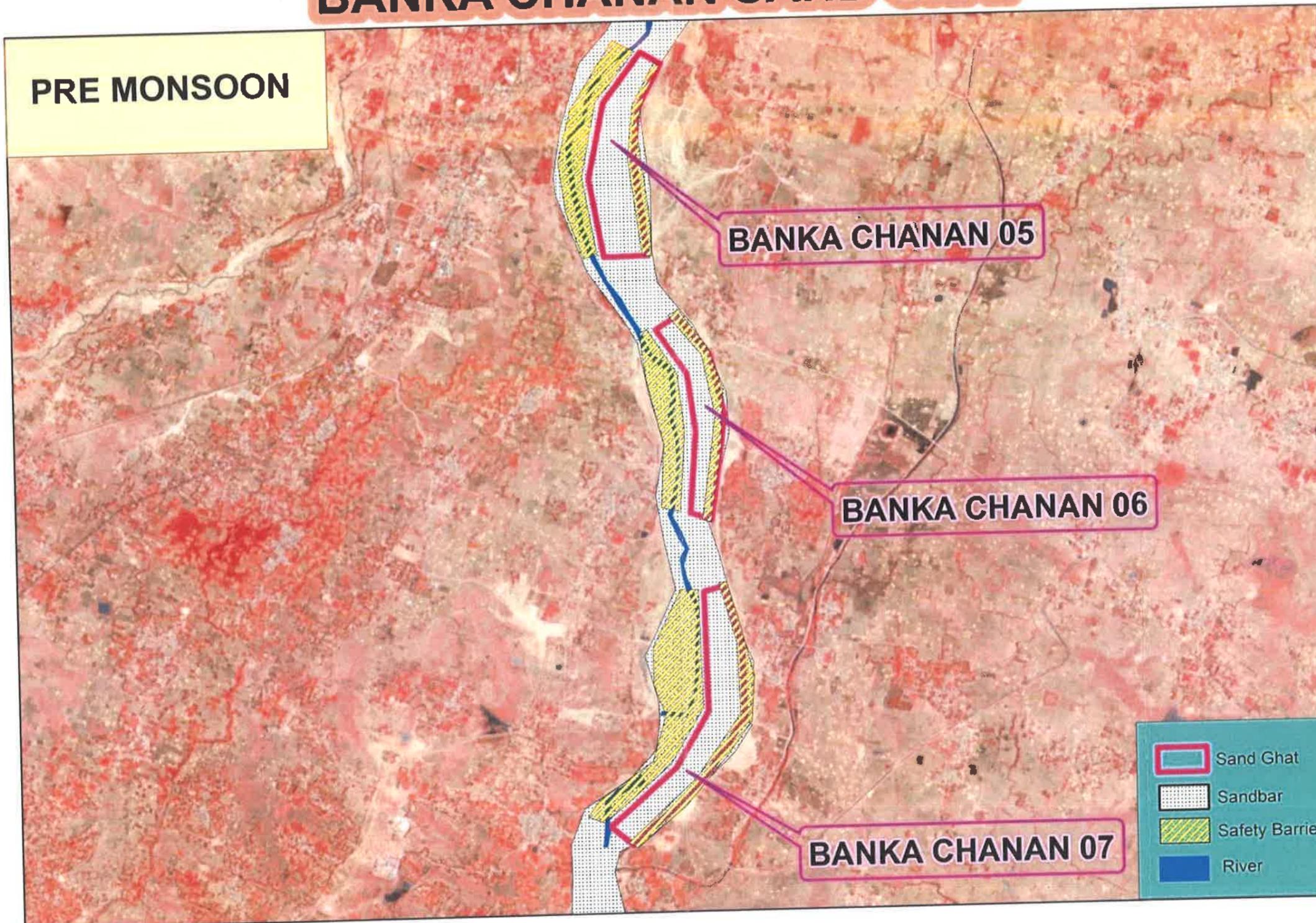
# BANKA CHANAN SAND GHAT



Source: Acquisition Date: 2021/04/27  
Platform: SENTINEL-2B  
Tile Number: T45RVH



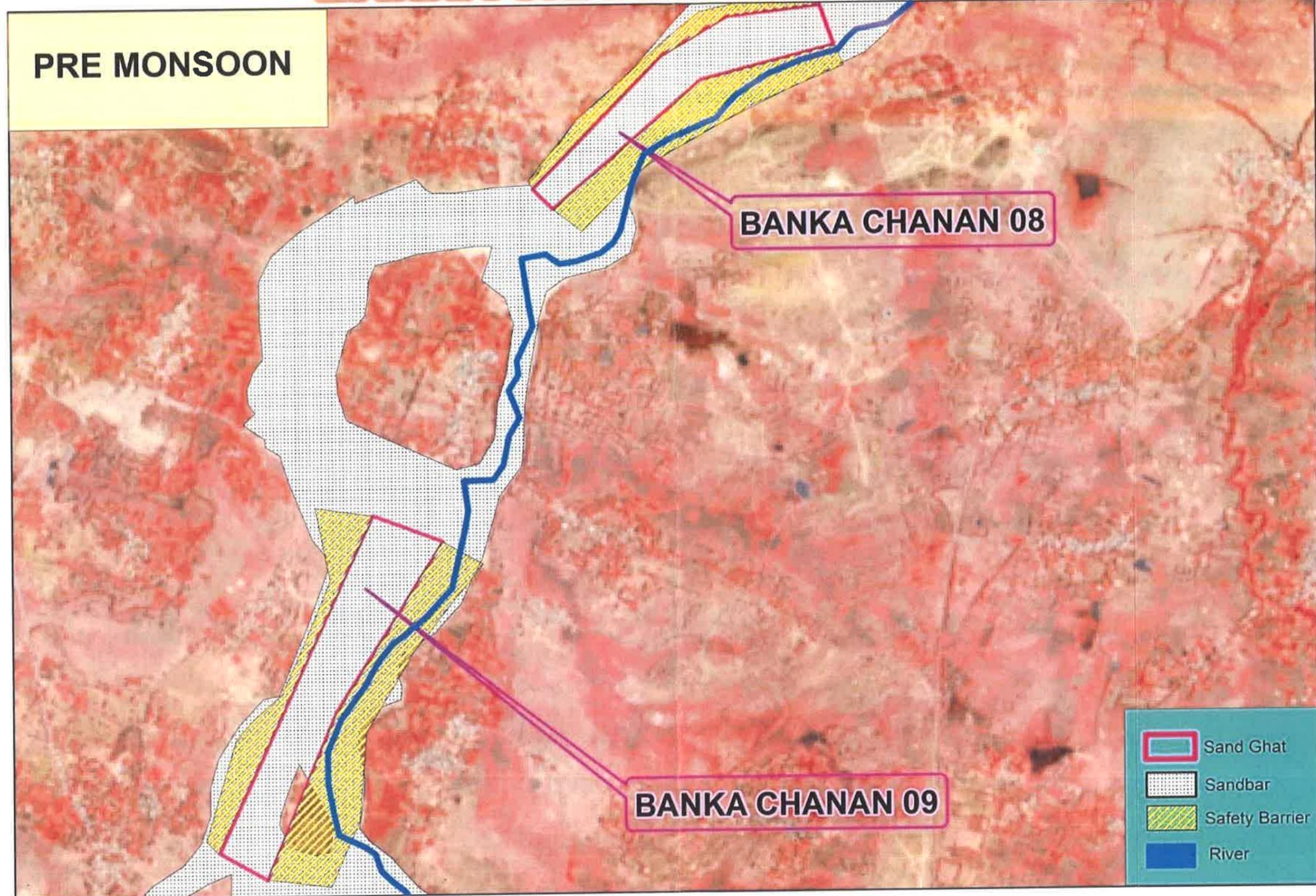
# BANKA CHANAN SAND GHAT



Source: Acquisition Date: 2021/04/27  
Platform: SENTINEL-2B  
Tile Number: T45RVH



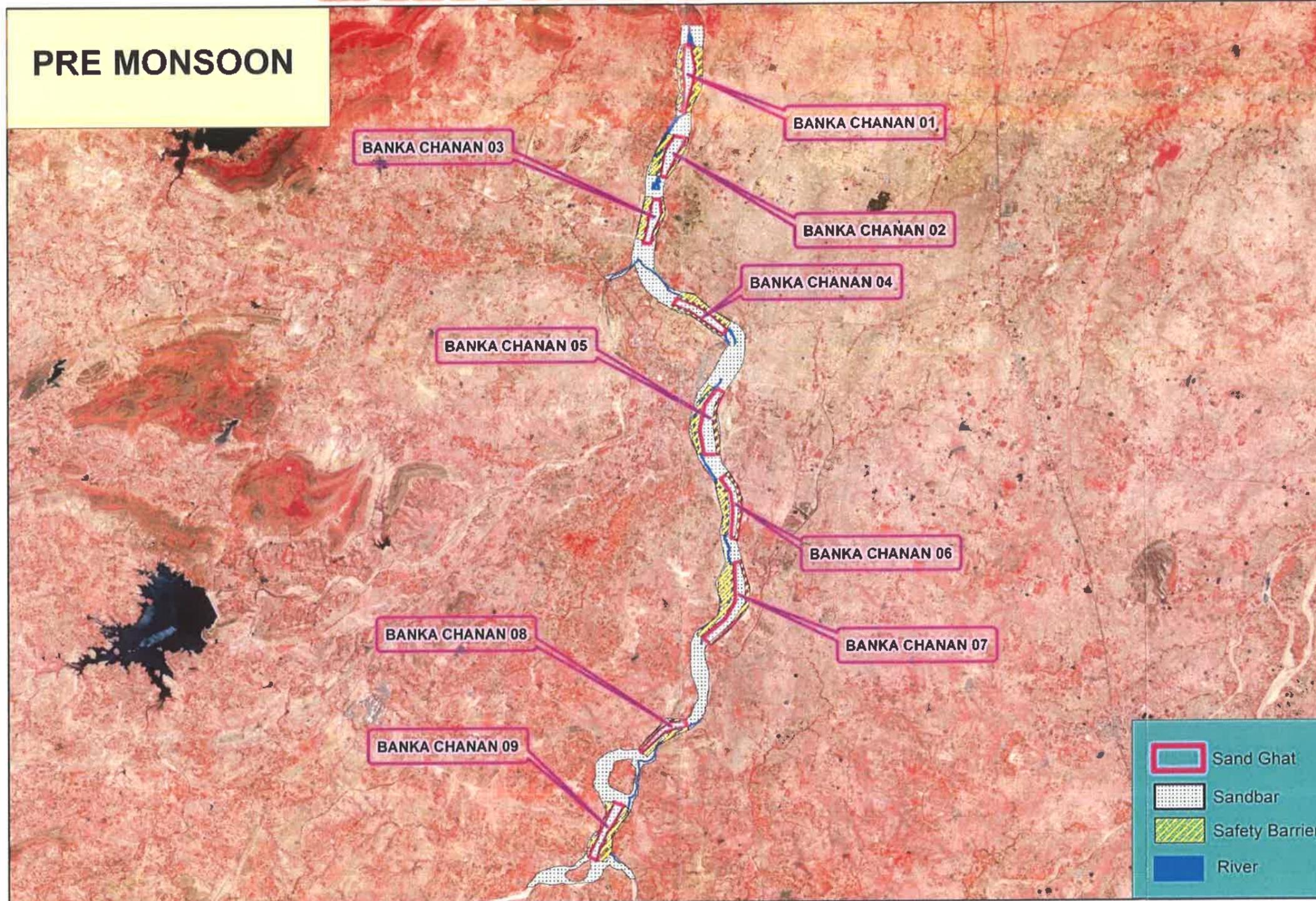
# BANKA CHANAN SAND GHAT



Source: Acquisition Date: 2021/04/27  
Platform: SENTINEL-2B  
Tile Number: T45RVH



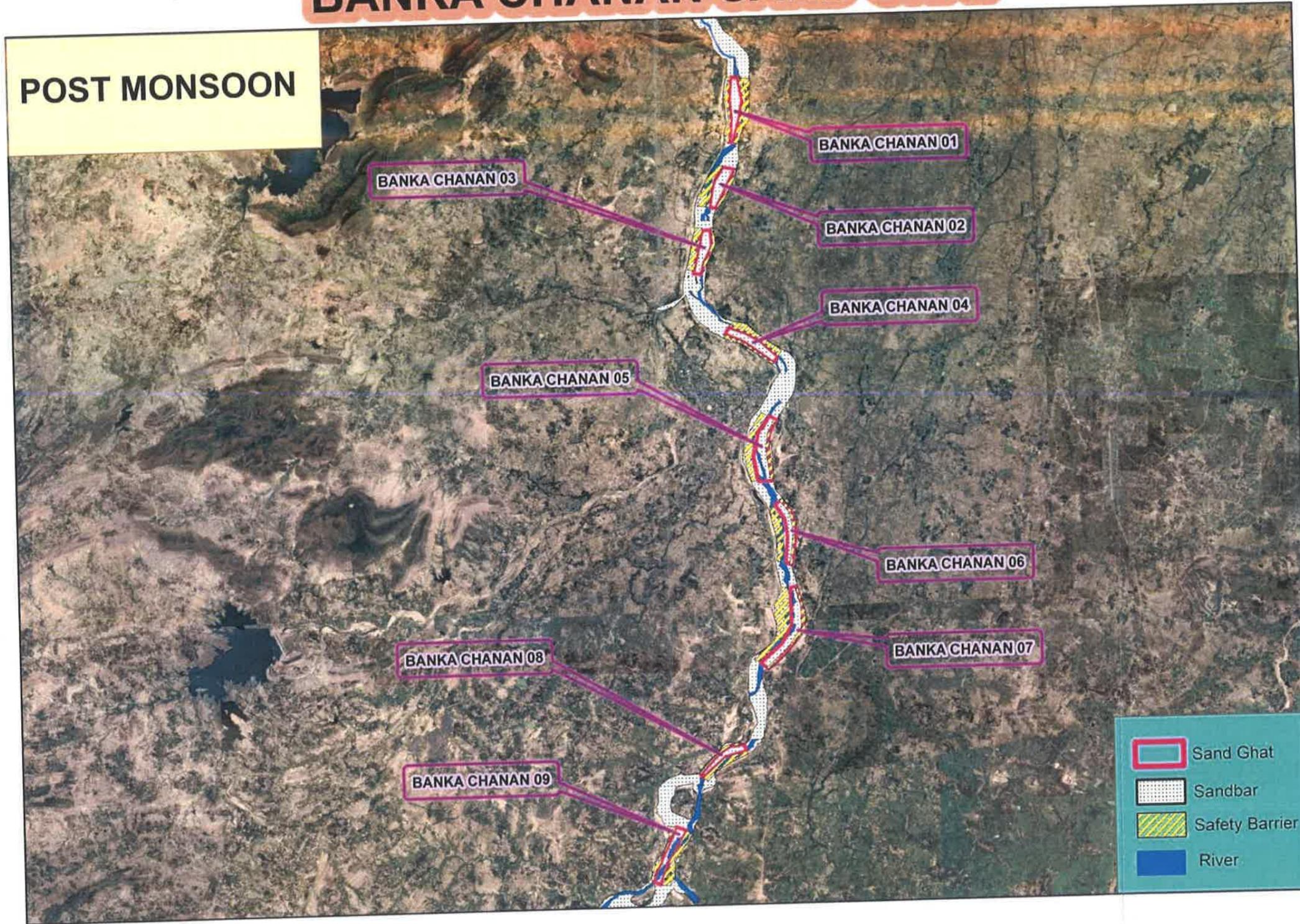
# BANKA CHANAN SAND GHAT



Source: Acquisition Date: 2021/04/27  
Platform: SENTINEL-2B  
Tile Number: T45RVH



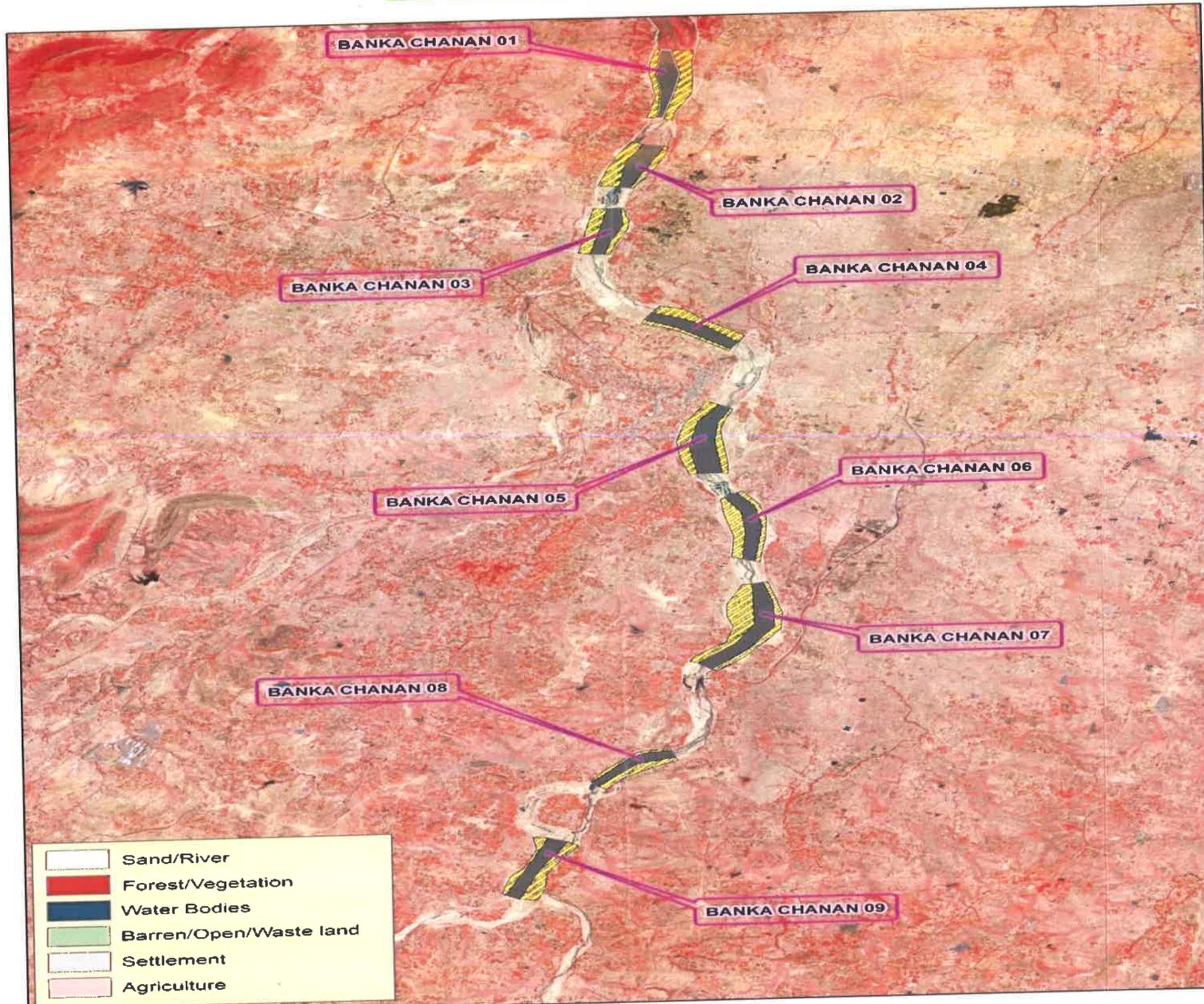
# BANKA CHANAN SAND GHAT



Source:Satellite Imagery  
Acquisition Date:December 2021



# BANKA CHANAN



Source: Acquisition Date: 2022/04/17  
Platform: SENTINEL-2B  
Tile Number: T45RUH

0 0.5 1 2 3 4 5 Kilometers



# BADUA 01 & 02 (STRETCH 02), BANKA

PRE MONSOON



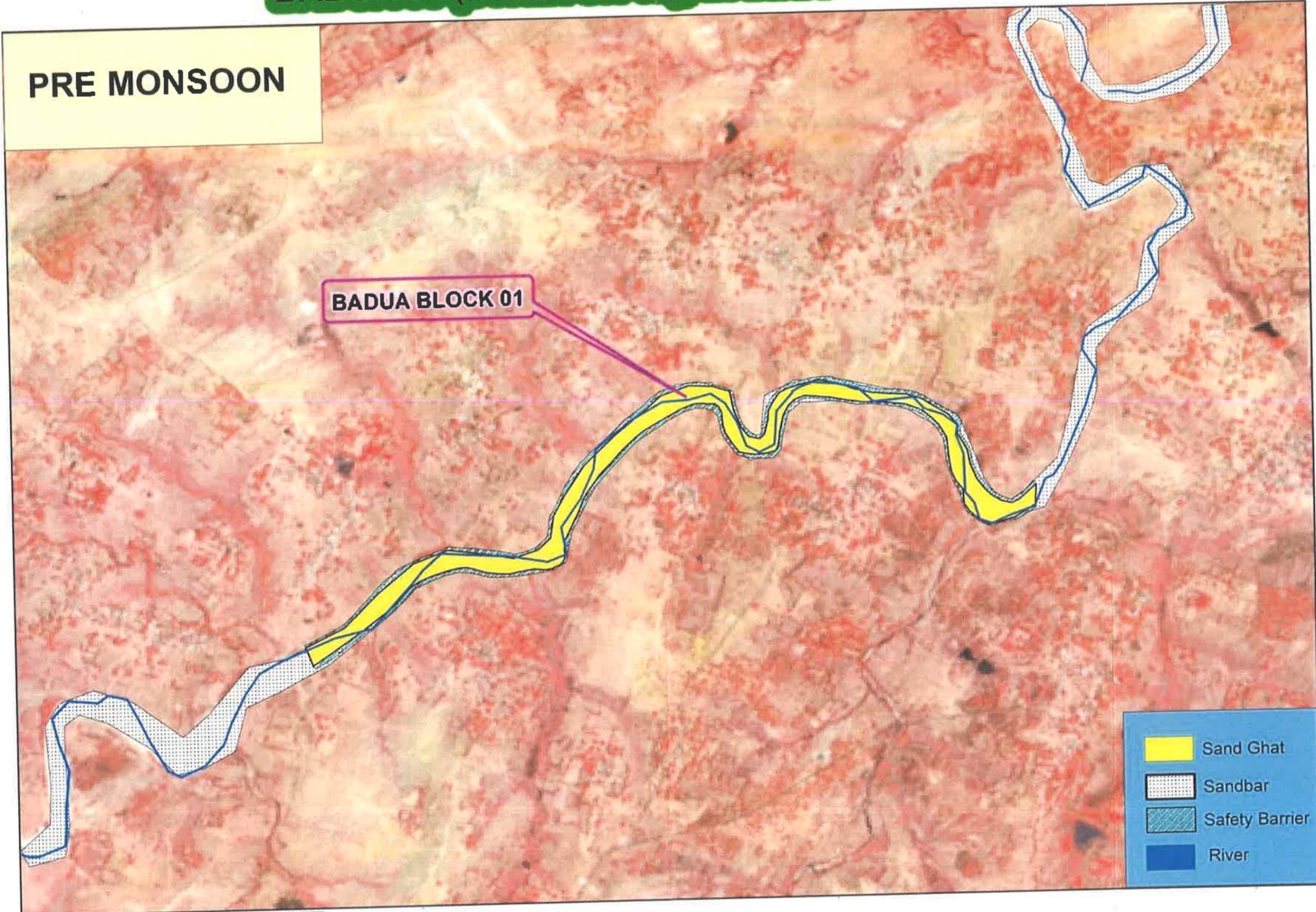
	Sand Ghat
	Sandbar
	Safety Barrier
	River

Source: Acquisition Date: 2021/04/27  
Platform: SENTINEL-2B  
Tile Number: T45RVH



# BADUA 03 (STRETCH 02), BANKA

PRE MONSOON



BADUA BLOCK 01

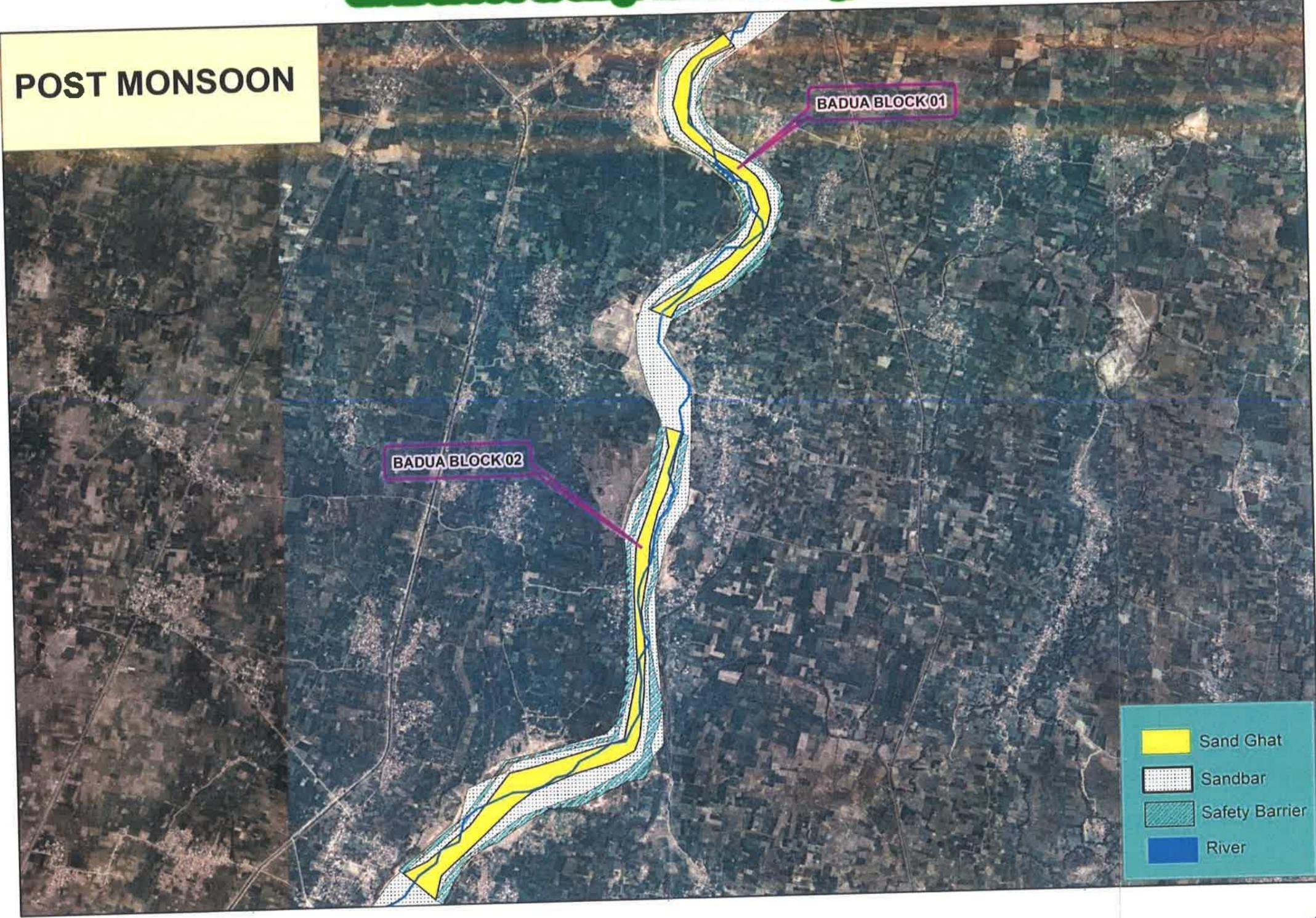
- Sand Ghat
- Sandbar
- Safety Barrier
- River

Source: Acquisition Date: 2021/04/27  
Platform: SENTINEL-2B  
Tile Number: T45RVH



# BADUA 01 & 02 (STRETCH 02), BANKA

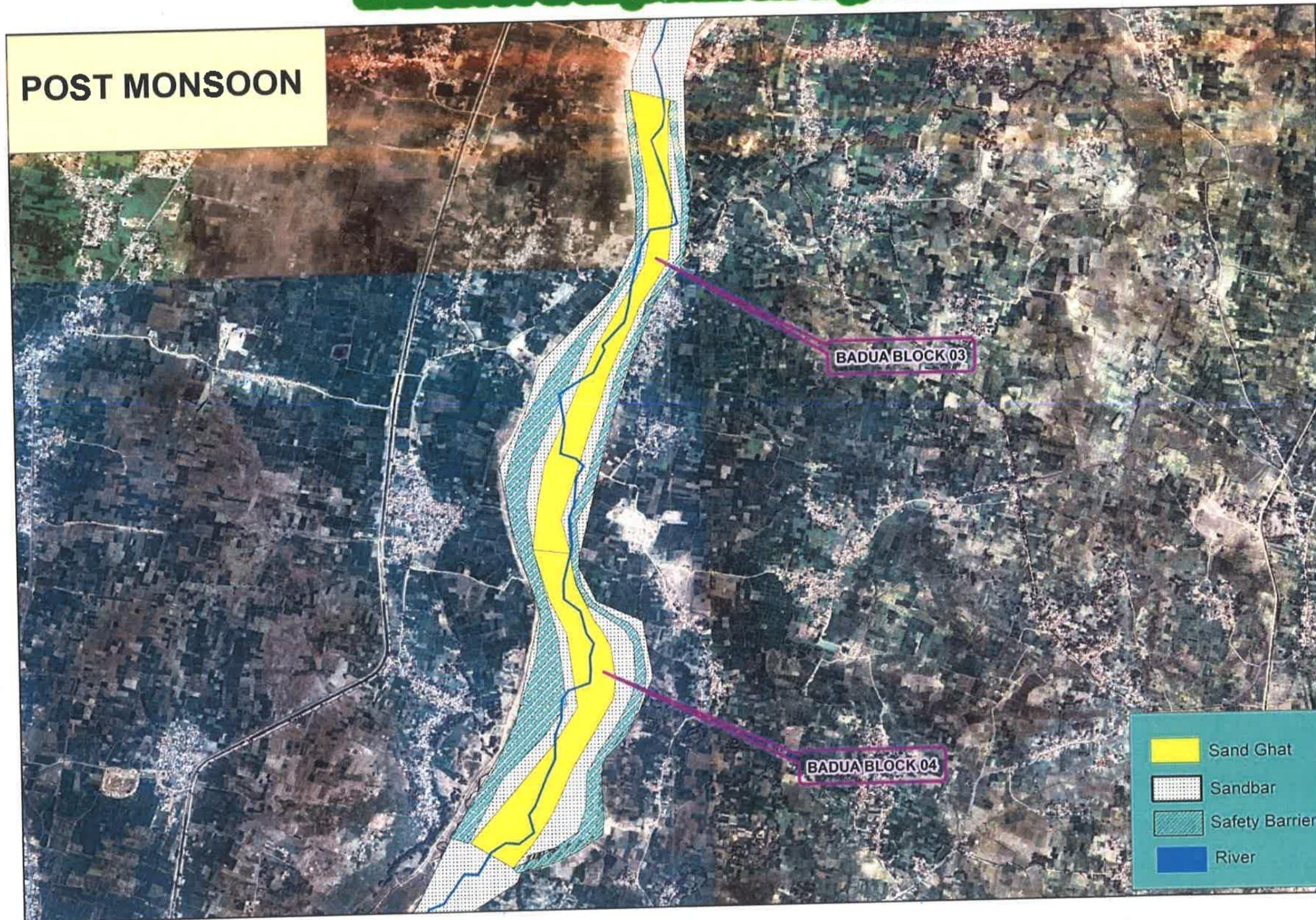
POST MONSOON



Source:Satellite Imagery  
Acquisition Date:December 2021



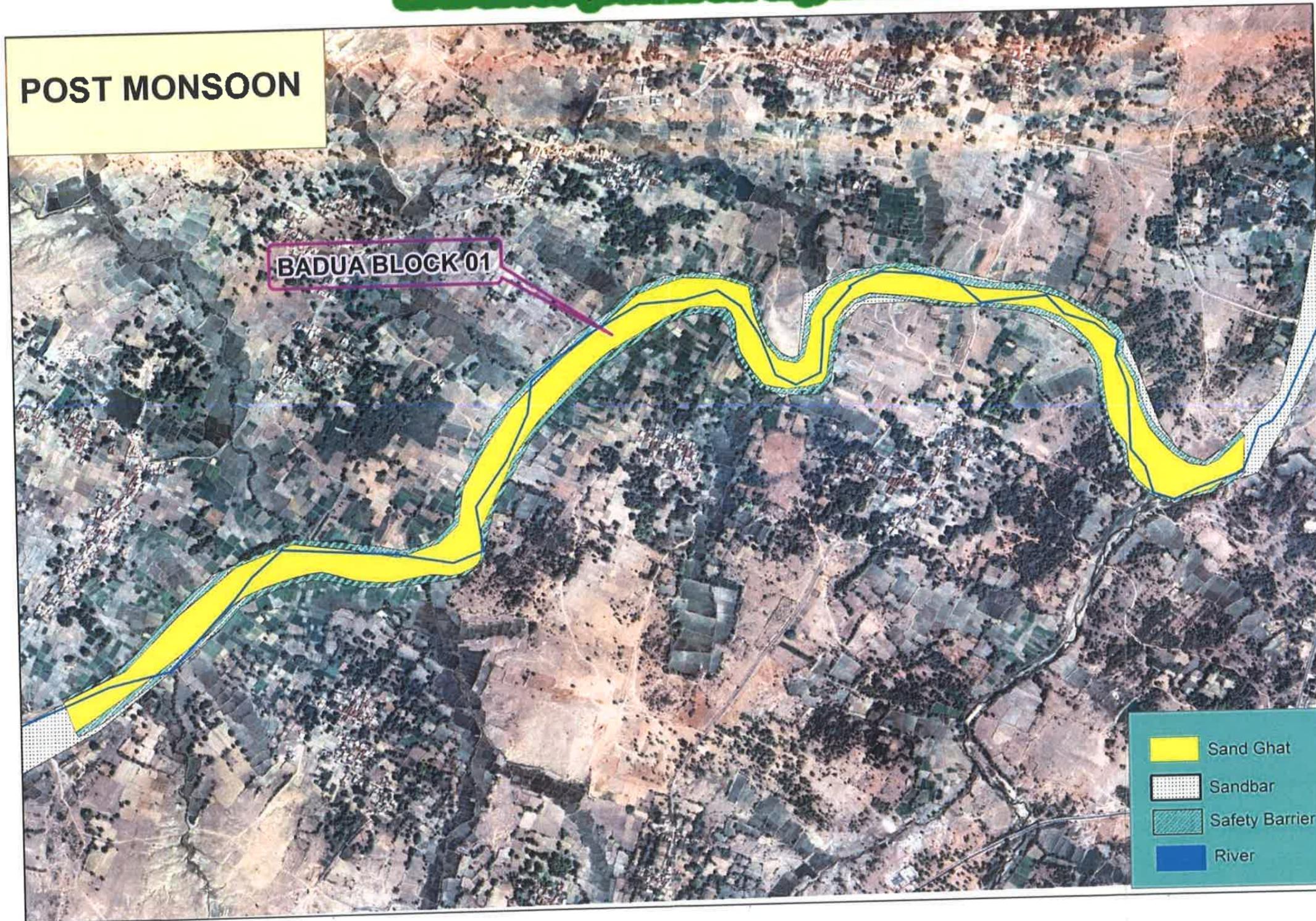
# BADUA 01 & 02 (STRETCH 02), BANKA



Source:Satellite Imagery  
Acquisition Date:December 2021



# BADUA 03 (STRETCH 02), BANKA



Source:Satellite Imagery  
Acquisition Date:December 2021



F. No. 3-70/2020-IA.III [141127]  
Government of India  
Ministry of Environment, Forest and Climate Change  
(IA Division)

Indira Paryavaran Bhawan  
Jor Bagh Road, Aliganj,  
New Delhi - 110003

Dated: 12<sup>th</sup> July, 2023

**OFFICE MEMORANDUM**

**Subject:** Clarification on the exemption from EC provided vide Notification S.O. 1224 (E) dated 28.03.2020 for dredging and de-silting of dams, reservoirs, weirs, barrages, river and canals for the purpose of their maintenance, upkeep and disaster management - reg.

The Ministry, vide Notification S.O. 1224 (E) dated 28.03.2020, amended the appendix IX of EIA Notification to inter-alia provide exemption from Environmental Clearance (EC) for "*Dredging and de-silting of dams, reservoirs, weirs, barrages, river and canals for the purpose of their maintenance, upkeep and disaster management.*"

2. Subsequently, the above mentioned Notification was challenged before the National Green Tribunal, Principal Bench in Original Application No. 190/2020 in the matter of Noble M. Paikada Vs. Union of India & Ors., wherein the Hon'ble Tribunal while disposing of the application vide order dated 28.10.2020, *inter-alia* held that "*.....the exemption should strike balance and instead of being blanket exemption, it needs to be hedged by appropriate safeguards such as the process of excavation and quantum...*" and directed to revisit the impugned notification dated 28.03.2020.

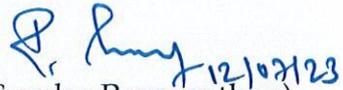
3. Subsequently, the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation in consultation with the MoEF&CC issued the National Framework for Sediment Management. The document deals with the issue of environmental safeguards pertaining to desilting/ dredging of dams, reservoirs etc.

4. The above mentioned framework was referred to the concerned Expert Appraisal Committee (EAC) for deliberation. After due deliberation, the EAC opined that the framework addresses the environmental concerns associated with the sediment management practices in dam/reservoirs/barrages in a comprehensive and holistic manner.

5. Based on the recommendations of the EAC and keeping in view the direction of Hon'ble NGT, the matter has been examined by the Ministry in detail and it is hereby directed that the exemption from EC provided vide S.O. 1224 (E) dated 28.03.2020 for dredging and desilting of dams, reservoirs, weirs, barrages, river and canals shall be subject to Environmental Safeguards as proposed in the National Framework for Sediment Management (*copy enclosed*) issued by the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation as enclosed to this Office Memorandum.

6. This is issued with the approval of the Competent Authority.

Encl: as above.

  
(Sundar Ramanathan)  
Scientist 'E'

To

1. Chairman, Central Pollution Control Board (CPCB)
2. Chairman and Member Secretaries of SEIAA/ SEACs
3. Chairpersons/Member Secretaries of all SPCBs/UTPCCs
4. All the Officers of I.A. Division

Copy for information to:

1. PS to Hon'ble Minister for Environment, Forest and Climate Change
2. PS to Hon'ble MoS (EF&CC)
3. PPS to Secretary (EF&CC)
4. PPS to DGF&SS (EF&CC)
5. PPS to AS(TK)/PPS to JS (SKB)
6. Website, MoEF&CC/Guard file



**Government of India  
Ministry of Jal Shakti  
Department of Water Resources,  
River Development  
and Ganga Rejuvenation**



# **National Framework for Sediment Management**





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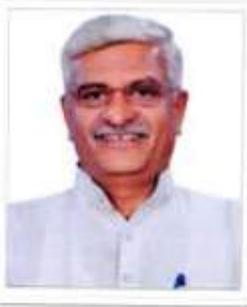
# NATIONAL FRAMEWORK FOR SEDIMENT MANAGEMENT

MINISTRY OF JAL SHAKTI  
DEPARTMENT OF WATER RESOURCES,  
RIVER DEVELOPMENT & GANGA REJUVENATION

NEW DELHI  
October, 2022

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भारत 2023

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Minister for Jal Shakti  
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## FOREWORD

Rivers are extremely valuable natural resource and important part of human life. They are a major source of fresh water; a source of sustenance and featuring strongly in our cultures and religious practices. Rivers also act as agents of rich deposits of sediment which forms the flood plains and valleys. Often dams are constructed on rivers to store water and manage it for human use.

In present times, due to rapid urbanization and development, many new issues are coming up, leading to change in the river dynamics. Reservoirs are also losing their storage capacity because of sedimentation. Hence, comprehensive sediment management has now become the need of the hour for the sustainable development of the water resources of the country.

Ministry of Jal Shakti (MoJS) is actively involved in overall planning, policy formulation, coordination and management of the water resources of the country. MoJS has taken several policy initiatives and enacted legislations for managing the rivers from time to time. In yet another milestone, MoJS has come up with the Framework for Sediment Management, for managing the sediments in a holistic manner. This framework lays emphasis on sediment management through integrated river basin management plan. It provides reference of all existing guidelines/policies dealing with the various aspects of the sediment management.

The Framework will facilitate the concerned stakeholders such as the State Governments, other Ministries, departments etc. in planning strategies and implementation of projects giving due consideration to environment and ecology.

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## PREFACE

Rivers are our lifelines. They are enablers of human development. Rivers serve as an important source of drinking water, provide pathways for navigation as well as sediments to the floodplains. These sediments enrich the soil with nutrients. Deltas and river banks, where much sediment is deposited, are often the most fertile agricultural areas in a region. Areas rich in sediments are often rich in biodiversity. Sediments carried by the rivers include good quality sand which is extensively used in the construction industry.

However, rapid urbanization and development, impact natural processes of the river. Dams and barrages constructed across the river for various uses alter the flow dynamics and sediment distribution pattern. The impact of climate change on river flows presents another challenge. Sediment transport being a complex phenomenon, integrated sediment management in a river basin should be the way forward for sustainable management of sediment.

Ministry of Jal Shakti has prepared a "National Framework for Sediment Management". The formulation of the National Framework on Sediment Management is the result of the efforts put in by various officers of Department of Water Resources, River Development & Ganga Rejuvenation (DoWR, RD&GR) and Central Water Commission (CWC). The document has been prepared after extensive discussion and consultation with the State Governments/Union Territories and stakeholding Ministries/Departments.

The National Framework document will serve as a guidance document for management of sediment across the river basin. It is hoped that the National Framework will be made use of by stakeholders in line with other existing guidelines/policies for efficient and sustainable sediment management in the country.

(Pankaj Kumar)



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## Abbreviations

BC Ratio	:	Benefit Cost Ratio
BIS	:	Bureau of Indian Standards
CWC	:	Central Water Commission
DoWR, RD & GR	:	Department of Water Resources, River Development and Ganga Rejuvenation
DPR	:	Detailed Project Report
DRIP	:	Dam Rehabilitation and Improvement Project
EPC	:	Engineering, Procurement and Construction
GIS	:	Geographic Information System
GoI	:	Government of India
GSI	:	Geological Survey of India
HKKP	:	Har Khet Ko Pani
IWAI	:	Inland Waterways Authority of India
MCM	:	Million Cubic Meter
MoEF&CC	:	Ministry of Environment, Forest and Climate Change
MoPSW	:	Ministry of Ports, Shipping and Waterways
MoRTH	:	Ministry of Road Transport and Highways
NHAI	:	National Highways Authority of India
NHIDCL	:	National Highways & Infrastructure Development Corporation Limited
NOC	:	No Objection Certificate
O&M	:	Operation and Maintenance
PMKSY	:	Pradhan Mantri Krishi Sinchayee Yojana
PSU	:	Public Sector Undertaking
RRR	:	Repair, Renovation and Restoration
SLUSI	:	Soil & Land Use Survey of India
SPCB	:	State Pollution Control Board
TAC	:	Technical Advisory Committee
ToR	:	Terms of Reference
UTPCC	:	Union Territory Pollution Control Committee

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## Glossary of Terms

<b>Aggradation</b>	:	to raise the level of (a river valley, a stream bed, etc.) by depositing sediment, or the like.
<b>Appurtenant structure</b>	:	consists of spillways, low level outlet structure and water conduits, hydro-mechanical equipment, energy dissipation and river training structure and other associated structures acting integrally with the dam.
<b>Bathymetry</b>	:	a type of hydrographic survey that allow us to measure the depth of a water body as well as map the underwater features.
<b>Bed Load</b>	:	the sediment which is in almost continuous contact with the bed, carried forward by rolling, sliding or hopping.
<b>Channel</b>	:	a feature that conveys surface water and is open to the air.
<b>Channelization</b>	:	the straightening and deepening of a stream channel to permit the water to move faster or to drain a wet area for farming.
<b>Contour Bunding and Trenching</b>	:	the hill side is split up into small compartments on which the rain is retained and surface run-off is modified with prevention of soil erosion.
<b>Degradation</b>	:	process of lowering of channel bed due to the erosion of sediment
<b>Density Current</b>	:	as clear water of reservoir comes in contact with muddy inflow, due to the difference in densities a "stratified flow" condition occurs and the underflow is called as "density current".
<b>Dredging</b>	:	process that removes deposited sediment from the bottom of rivers/reservoirs using different techniques.
<b>Estuary</b>	:	an area where a freshwater river or stream meets the ocean.
<b>Lateral connectivity</b>	:	connectivity between channel-riparian and floodplain
<b>Longitudinal connectivity</b>	:	upstream and downstream connectivity
<b>NOC</b>	:	No Objection Certificate.
<b>Riparian</b>	:	pertaining to the banks of streams, wetlands, lakes or tidewater.
<b>Sediment Budgeting</b>	:	an accounting of the inflow, outflow, and storage changes of sediment in a river/reservoir system.

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- Suspended Load** : part of the total sediment transport which is maintained in suspension by turbulence in the flowing water for considerable periods of time without contact with the stream bed.
- Trap efficiency** : the ratio of total deposited sediment to the total sediment inflow.
- Wash Load** : consists of fine particles, which do not exist on the bed of the reach under consideration, which remain in suspension throughout the reach.
- Watershed** : an area of land that contains a common set of streams and rivers that all drain into a single larger body of water, such as a larger river, a lake or an ocean.

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# NATIONAL FRAMEWORK FOR SEDIMENT MANAGEMENT

## PREAMBLE

Sediment transport, bank erosion and associated channel mobility represent key physical processes of rivers; their understanding is of crucial importance for defining river restoration and management strategies. Most alluvial rivers have experienced increased sedimentation or bed load deficit, both due to natural processes and series of human interventions in the river catchment along the river bank or on river itself and in the riparian zone. Rapid urbanization and industrialization in flood plains, encroachment of river beds, changes due to various human activities and deforestation in catchment area of rivers etc are the main causes of increased sedimentation in rivers. Problem of sedimentation in rivers is somewhat moderated by trapping sediment in reservoirs. However, it results in loss of reservoir storage thereby reducing its benefits and serviceable life.

Sediment management in reservoirs and dams is becoming crucial to water resources development and management. Reservoirs have been used worldwide to provide reliable water supply for irrigation, domestic, industrial, hydro power generation, and flood management etc. Dams have contributed significantly towards economic development, food production security, resilience building against natural disaster (droughts and floods) and mitigation of ill effects of climate changes. Old dams have traditionally been designed with a certain “design life”, typically 50 or 100 years, which were determined by sedimentation rate, trap efficiency, provision of sediment storage pool volume (dead storage). Most reservoirs are therefore gradually being filled up. The annual reservoir storage loss globally due to sedimentation is around 0.5 to 1 % in average but varies easily between 0 and 5% depending on the location. Half of the dams in India are more than 25 years old. As the ageing dams approach the end of their original design lives and depletion of their storage capacity due to sedimentation, water scarcity will be more widespread. Thus, there is an urgent need to update policies and guidelines for exploring all options for alleviating the impact of reservoir sedimentation.

Common practices carried out by river management agencies demonstrate that sediment management has rarely been based upon best practices developed on scientific knowledge. For these reasons, a different approach to sediment management is desirable, incorporating: (i) knowledge and management of sediments at the basin scale; (ii) a wider application of available scientific knowledge.

While keeping rivers in pristine condition is the ultimate goal, development of civilization has always been on the banks of the rivers, to utilise blessings of the rivers and their water. Dams and barrages have to be constructed across the river to utilise the water resources for overall development of the country and the society. Therefore, sediment issues in dams, barrages and rivers cannot be dealt separately. For a sensible sustainable sediment management in rivers and reservoirs, it is necessary to adopt a scientific framework for sediment management at national level. This national framework document highlights the key issues related to sediment management and recommendations for policy-makers and stakeholders. The document is prepared to take appropriate actions and measures by the concerned Departments and other stakeholders.

## 1.0 COMPOSITION OF SEDIMENT AND TRANSPORT:

Sediment transport is the movement of organic (humus, decomposing material such as algae, leaves etc.) and inorganic particles by water. This is related with the total energy available with water, composition of the river bank material/catchment soil composition & topography along with other factors like seismic/tectonic activity and anthropogenic factors. In other words, greater the quantity of flow and velocity, the more sediment will be conveyed. Water flow can be strong enough to suspend particles in the water column as they move downstream, or simply push them along the bottom of a waterway. The intermediate type of movement where particles move downstream in a series of bounces or jumps, sometimes touching the bed and sometimes carried along in suspension until they fall back to the bed is called saltation. Transported sediment may include mineral matter, chemicals, pollutants and organic material. The total transported sediment load includes all particles moving as bed load, suspended load and wash load (very fine particles). As per BIS Code IS: 6339 (as been revised in 2013), the classification of coarse, medium and fine sediment is as under:

Sediment type	Particle size
Coarse sediment	$D > 0.25$ mm
Medium sediment	$D = 0.062$ mm to $0.25$ mm
Fine sediment	$D < 0.062$ mm

### 1.1 Sedimentation in Rivers and Reservoirs

Deposition and erosion of sediment along the length of river is a natural phenomenon. However, sediment deposition at any place in river depends on many factors such as the stages of rivers, catchment/ watershed/ drainage characteristics, its size, geological disposition along the course of the river and human interventions, whereas erosion of soil in the catchment of a river is greatly governed by rainfall & its intensity, slope, soil characteristics, forestation etc. of the catchment area.

Siltation is a natural process through which river tries to reach to a stable regime condition.

Similarly, sedimentation in reservoirs is also a natural process. The detailed process of siltation/sedimentation in rivers and reservoirs is given at **Annexure-I**. Policy intervention requires due attention in the reaches where human settlement and economic activities are extended. Sediment is a socio-economic, environmental and geo-morphological resource, as well as a tool of nature. However, changes in sediment quantity and quality can have a significant impact both in rivers and reservoirs and prove to be resource as well as menace in its own manner.

#### 1.1.1 Rivers:

Sediment in rivers mainly contains boulders, cobbles, pebbles, sand, silt and clay. Sand has high economic value and is a valuable material largely used in construction works. Due to huge demand of sand, MoEF&CC, Govt. of India has come up with "Sustainable Sand Mining Management Guidelines – 2016 and supplemental document "Enforcement and monitoring guidelines for sand mining-2020". Boulders, cobbles and pebbles are also very important for construction industry.

However, when sediment in rivers is deposited at undesirable place, it turns into a menace. It may cause aggradation and degradation. Further, it also causes meandering, braiding and widening of rivers, which in turn causes erosion of river banks and endangers the embankments and settlements on the banks of rivers. Sedimentation in rivers also causes reduction of navigable depth and rising of river beds causing drainage congestion. In such cases, it becomes necessary to remove the sediment by suitable means at selected places.

### 1.1.2 Reservoirs:

Due to reduction of velocity of water in reservoirs, part of incoming sediment gets trapped. Sedimentation in reservoir results in loss of capacity, impacts dam safety, risk to downstream habitation etc. as sedimentation in reservoirs is generally accumulative. By removal of sediment, the capacity and life of a reservoir can be extended, planned operational benefits can be ensured, and minimise the risk to downstream stakeholders.

## 2.0 BASIC PRINCIPLES OF SEDIMENT MANAGEMENT

### 2.1 Sediment Management in Watershed

It is imperative to minimise the sediment intake to a minimum level for a dam or reservoir for its optimal functionality and longevity. This involves a two-pronged approach: catchment area treatment and appropriate land use planning to address unsustainable land use to reduce soil erosion & sediment production. Catchment area interventions need to be given priority as it arrests silt within the boundary of a watershed which will help in minimizing siltation in river bed & reservoirs. Details on catchment area treatment/intervention are given in **Annexure II**. The steps to reduce sediment inflow must include determination of inflow of silt into the river/reservoir. Sediment inflow assessment may be based on soil erosion modelling and silt monitoring along with assessment of agronomic practices and other land-based activities, point & non-point source of pollutions, agriculture run-off in the catchment, which is essential to determine quantity and quality of sediment and the reservoir's rate of sedimentation.

To reduce sediment production in the watershed sustainably, the following actions should be taken:

- (i) study watershed characteristics
- (ii) current status of watershed management activities
- (iii) assess the vulnerability of watershed in terms of soil erosion by using available observed sediment data at various streams G&D sites, water reservoirs (if hydrographic survey data available), soil loss modelling, to identify and prioritise the degraded micro-watershed for treatment with biological and engineering measures for erosion control,
- (iv) stream bank erosion control using various river training works
- (v) trapping sediment upstream in river before entering into reservoir and
- (vi) planting trees to provide vegetation cover and retention to the soil for preventing erosion.

To start with, the Digital Micro Watershed Atlas of India- 2019 of Soil and Land Use Survey of India (SLUSI), Ministry of Agriculture can be followed for delineation & management planning. The “Common Guidelines for Watershed Development Projects”, Department of Land Resources, 2008, Ministry of Rural Development, Govt. of India may be referred for development of watershed

projects. For implementation of the watershed programme, a synergy is required to ensure the convergence of various programs implemented by the various central ministries and State Governments.

## 2.2 Sediment Management in Rivers

The following basic principles should be followed for sediment management of Indian rivers:-

1. Sediment management should become a part of integrated river basin management plan. Regular sediment budgeting for all basins should be done especially which are affected by heavy siltation problem.
2. Removal of sediments from river bed may help in channelization of river flow during the lean season and improve the navigability, but will not have any considerable effect on flood levels.
3. There is natural deposition of sediments upstream of any barrage, but this attains equilibrium after few years. Desiltation in upstream of a barrage may be taken for channelization of stream flow. However proper operation of Gates should be ensured for reducing sediment deposition in the upstream of the Barrages/Wier.
4. Urbanization and infrastructure development works like buildings, roads, embankments etc. require large amount of sediment. The quantity of sediment removed in such cases from the river shall be limited to the extent to which it does not harm the ecology of river or gainfully utilized in developmental works, whichever amount is less. Exploitable quantity should be determined "a-priori" and the reach should be monitored for excessive exploitative practices.
5. There is a need to pursue the de-siltation/dredging schemes with utmost care backed by scientific study, including simulations through mathematical and/or physical model study at appropriate scales and employing consistent formulations applicable to the given site. Mathematical and/or physical model study is exempted for dredging/de-siltation carried out for navigation purpose by Inland Waterways Authority of India.
6. If necessary, permanent observation stations may be opened for collecting data such as cross-section, hydrological observation etc. This should be coupled with periodic monitoring of various morphological changes with space technology such as formation of shoals, meandering tendency of the river, effect of construction of hydraulic structures, damages to the bank, effect of afforestation/ deforestation and tectonic occurrences. Data sharing mechanism is to be established in case of an inter-state river.
7. Different approaches of sediment management may be resorted to in rivers depending upon the stages of the river. The details of the same, along with some other management strategies are given in **Annexure-II**.
8. Sediment management action must follow best practices to minimize damage to the environment and river morphology. Restriction details for de-siltation/dredging are placed at **Annexure-III**.

9. In case, if it is not possible to utilise sediment removed by dredging/ de-silting of rivers; a proper utilisation/disposal plan needs to be prepared, with the consideration that it does not create any environmental, ecological and social issues.

### 2.2.1 Effect of De-siltation in Reducing Floods

In general, de-silting of rivers does significantly affect flood levels. In this regard, it is mentioned that the Mittal Committee was constituted by the erstwhile Ministry of Water Resources in the year 2001, under the Chairmanship of Dr. B.K. Mittal, Former Chairman, Central Water Commission. The main objectives of the Committee were to identify the cause and extent of siltation in rivers, to suggest measures to minimize siltation, to examine as to whether de-silting is a technically feasible means to minimize magnitude of floods in rivers, to suggest appropriate technology/ methods of de-silting of rivers, to propose a realistic operational programme in a time-bound manner and other related aspects. The findings/recommendations of the Committee were as follows:

- (i) De-silting of rivers for flood control is not an economically viable solution;
- (ii) Dredging in general has been found to be inadequate and should not be resorted to, particularly in major rivers;
- (iii) There are, of course, some locations such as tidal rivers, confluence points with narrow constrictions and the like which can be tackled by de-silting after thorough examination and techno-economic justification;
- (iv) Selective dredging is suggested depending upon local conditions; and
- (v) De-silting of rivers can marginally minimize the magnitude of floods and be effective only for a short period.

However, selective need-based dredging of certain reaches of rivers coupled with structural and non-structural measures may be considered in order to protect habitation, agriculture land, airports, industrial and institutional installations etc.

### 2.2.2 Extraction for Navigational Purpose

Inland Waterways Authority of India (IWAI) is required to carry out dredging to clear shoals/shallow patches on fairways in National Waterways as a mandatory functional requirement in terms of provisions of Section 14 (Chapter IV) of IWAI Act, 2016 (82 of 85).

The above dredging shall be necessitated to be carried out at frequent intervals as and when shoals are surfaced and identified based on continuous fortnightly/monthly bathymetric surveys being carried out by IWAI. This maintenance dredging is also required to be taken up at short notice and complete the dredging in a time bound manner to facilitate navigation. The above maintenance activities of dredging including its disposal are also exempted from obtaining clearance from MoEF&CC.

### 2.2.3 Extraction for Economic Uses

Sediment deposit in both rivers and reservoirs at some places contains considerable quantity of sand. In places where sediment deposits are having good sand content (of the order of 30% - 40%), it is possible to extract sand from sediment to meet the ever-increasing demand of sand. Sediment component such as silt and clay bears comparatively lesser economic value but still can be used in many works such as for brick making, as filling material, construction of embankments, roads,

constructing raised platforms for flood proofing etc. Its different uses are given at **Annexure-IV**. There is possibility of revenue generation in such cases.

#### **2.2.4 Indispensable Removal**

Many a time, excess deposition of sediment at undesirable places causes bank erosion, shifting of river course and navigational issues. Sediment deposition on the mouth of a river may cause large scale flooding due to drainage congestion. At many places, sediment needs to be removed from a river to channelize it to bring it to its original course especially during pre-monsoon and post monsoon. In such cases, it is imperative to remove the sediment by practically suitable means. Similarly, in some old reservoirs, especially those which are supplying drinking water, sediment removal becomes necessary to regain their capacity. In hydro-power projects, excess deposition of sediment just below the intake level of turbines hamper their operation and has to be removed with suitable means.

### **2.3 Sediment Management in Reservoirs**

The importance of reservoir sedimentation management is evident when one considers that the cost of replacing storage lost annually due to sediment deposition throughout the world is significant. If sedimentation can be managed successfully, the loss in reservoir storage space due to this phenomenon can be lowered and life of reservoir can be prolonged significantly. The benefit of effective reservoir sedimentation management is enormous.

It is possible to successfully manage reservoir sedimentation by using comprehensive sediment management strategy coupled with measures to reduce sediment yield from watershed, route sediments around or through storage, and recover the lost capacity of reservoir through de-silting. Integrated management of reservoir sedimentation is easy to manage for new reservoirs which can be integrated at planning stage itself. In the existing reservoirs, one or combination of more than one technique can be explored in a holistic way. None of single technique/measure can be 100% effective for long term sustainability of sediment management in reservoirs. Due consideration shall be given to address environmental and social safeguards during the planning stage. In addition to this, robust institutional and sound financing mechanism forms the integral part of comprehensive planning and implementation strategy for sediment management.

The brief detail of framework for addressing sediment problems in reservoirs are given in the following paras.

#### **2.3.1 Measures to Minimise Sediment Deposition in Reservoirs**

The main source of incoming sediment to any reservoir is catchment erosion. Therefore, the first step to address the root cause of incoming sediment is watershed management through various engineering and bio-engineering techniques to arrest sediment erosion effectively. The next step is to manage the sediment deposited in the river by routing the sediment around or through the storage by various kinds of sediment by-pass and sediment pass-through interventions. There are structural and non-structural techniques for sediment routing. Sediment Bypass, include Flood Bypass Channel or Tunnel and off-stream reservoirs for bypassing sediment inflows away from reservoirs. Sediment pass-through strategies including draw-down flushing (complete and partial), pressure flushing, sluicing and venting turbid density currents are non-structural interventions comprising operational techniques for evacuating sediment from the reservoirs.

There are several techniques for sediment routing that take advantage of temporal variation in sediment discharge, managing flows during periods of highest sediment yield to minimize sediment trapping in the reservoir. The basic strategy is to impound the clear water and release the sediment-laden flood flows. Sediment routing techniques require a part of the river inflow and storage volume for transporting sediment around or through the reservoir. Consequently, this may not be feasible in reservoirs, where all the inflow is being captured and stored. However, as reservoir capacity is diminished by sedimentation, sediment routing may become more feasible.

The sediment not arrested through the above referred two stages, partially gets deposited in the reservoir and part of it is discharged downstream of the reservoir (suspended and colloidal). The deposited sediment in the reservoir is to be dredged to restore the lost capacity to the possible extent keeping in view techno-economic and environmental feasibility.

### **2.3.2 De-silting of Reservoirs**

Sediment deposit in reservoirs may have adverse impact on storage, as well as safety of dams. The safety of reservoirs is directly having huge consequences to the downstream habitations as well as other vital installations along with the planned benefits. Dam safety requirement shall be complied with, when it comes to enforcing constructive or operational sediment management measures; at no time should such measures lead to an unacceptable state of dam safety.

Sediment management measures to reclaim live storage, to improve operations or for environmental reasons shall be in compliance with applicable environmental requirement, unless they are necessary to preserve immediate dam safety, and prevent an uncontrolled release of reservoir water that could lead to even larger environmental damages or cause loss of life, injuries or large damages to properties in the downstream area.

At the same time, for existing reservoirs; in case of high sediment inflow, long term integrated watershed management shall be explored effectively. In some of existing large reservoir(s), watershed management has resulted substantial reduction in erosion in turn reduced the sediment inflow viz. in Maithon Reservoir, initial average annual loss of capacity of 7.38 MCM reduced currently to 1.37 MCM over a period of time.

Annual loss of overall storage of Panchet Reservoir was reduced from 14.98 MCM/year (years 1959-66) to 4.06 MCM/year (years 1996- 2019) considering the maximum flood management pool of 132.62m (435 ft.) mainly on the ground of construction of Tenughat Dam upstream of Panchet Dam.”

## MAITHON DAM WATERSHED MANAGEMENT

- Maithon dam (Damodar Valley Corporation - DVC) is a 56.08 m high composite dam constructed across river Barakar, Dhanbad District (Jharkhand). **The initial gross storage capacity of Maithon dam is 1196 MCM with live storage of 607 MCM considering the Maximum flood management pool of 150.91 m (495 ft.) and minimum drawdown level of 132.62 m (435 ft.)**
- It is a multipurpose dam with main function of flood control, supplying water for irrigation, Municipal & Industrial use, hydro power generation, and tourism. The construction commenced in December' 1951 and completed in September' 1957.
- Damodar Valley Corporation is working since 1949-50 to tackle the soil erosional problems in upper Damodar-Barakar catchment area through **soil and water conservation/integrated watershed management programs** with multidisciplinary approach by its Soil Conservation Department located at Hazaribagh.



Drainage line treatment



Rainwater harvesting structures



**Key Soil Conservation Measures**

- ✓ Afforestation, Pastoral Development, Contour Trenching
- ✓ Field hedge, pasture and horticultural development, drainage line treatments, silt detention dams, ponds' renovation, reclamation of land, demonstrations on moisture conservation
- ✓ Construction of water harvesting structures

- Measures have played a significant role in arresting sediment deposition by more than 60% which has resulted, among other benefits, in **reducing loss rates in storage capacity from 7.38 MCM/year (years 1955-65) to 1.37 MCM/Year (years 2002-19)**.

The structural invention(s) which includes renovation of low-level permanent river outlet with appropriate replacement provision for original valve with a new gate to allow sluicing during high flow event, renovation of power plant penstocks by replacing few penstock with a sluicing pipe and modifying the other penstock for electricity generation, retrofitting of dams by providing de-silting tunnel(s), silt-bypass weir/tunnel(s)/ tank/ chamber(s), de-silting etc. can be explored on case to case basis keeping in view engineering and techno-economic and environmental feasibility in providing such modifications. Such typical strategies have been experimented in Shihmen reservoir, Taiwan.

## SHIHMEN DAM (TAIWAN) SEDIMENT MANAGEMENT

- The reservoir management in Taiwan faces lots of challenge. The main source of rainfall is the northeast monsoon. Mean annual precipitation is about 2500 mm/year. On an average 3 to 4 typhoon strike the country every year. **Soil erosion is very high, almost having a rate of 3 to 6 mm/year.** Shihmen dam is located very near to Taoyuan city of Taiwan. It was commissioned in year 1964
- The gross storage capacity is 309 MCM. **This dam is a classic example of post construction retrofitting for integrated sediment management.** The journey of sediment management started by construction of 121 check dams which majority of these got filled by year 2007. **It is estimated that annual inflow of sediment in reservoir is 3.42 MCM.**

SUSTAINABLE SEDIMENT MANAGEMENT STRATEGIES AT SHIHMEN DAM



Sediment yield reduction (Check Dams)



Mechanical & Hydraulic Dredging



Sluicing



Routing-venting turbidity currents



Simultaneous operation of spillway and penstock sluice venting turbid density current

- Then structural inventions included modification of permanent river outlet gates (4%) by replacing the original Howell-Bunger valve with a jet flow gate to allow sluicing during high flow events, renovated the power plant penstocks, replacing one penstock with a sluicing pipe and modifying the other penstock for electricity generation (55%), introduction of two nos of sediment-bye pass tunnels i.e. Dawanping (21%, under construction) and amuping (19%, commissioned) silt sluice tunnels. Also, some part is managed by dredging near dam(15%) and dredging upstream of dam(12%). **This arrangement is almost balancing the inflow sediment with outgoing sediment volume**

A majority of Indian reservoirs have been built through conventional design life approach rather than life cycle management approach. The latter approach considers storage as renewable as compared to exhaustible by first one. Furthermore, abandoning dam sites may not be affordable in any respect, as available sites for new reservoirs are very limited. Hence, there exist ample scope and cost-effectiveness in prolonging their lifetime.

De-silting plan for a given reservoir should be comprehensive. It shall be prepared based on latest bathymetry survey inputs along with representative sub profiling data of a given reservoir. The basic information shall include various methods of dredging along with their utilities and performances in accordance with different specific site conditions, proposed method with justification, estimated cost and proposed dredging volume, revenue and non-revenue models, cost benefit analysis vis-a-vis restored capacity, disposal plan of dredged material with detail of sediment stacking and processing yard, method of contract which include EPC/turnkey or work contract method with fixed time schedule, environment and social safeguards and monitoring mechanism etc. The de-silting of Manglam Dam in Kerala is a classic example of revenue model under implementation.

### MANGALAM DAM'S REVENUE MODEL FOR DE-SILTATION

- ❑ Mangalam dam, was commissioned in 1957. The original gross storage and live storage are 25.49 MCM and 25.34 MCM respectively. Reservoir offers water for Irrigation, and drinking water to the people of Palakkad district, Kerala.
- ❑ As per hydrographic survey of 2015 including sub-bottom profiling sampling (grid size 50mx50m) the revised capacity of Mangalam reservoir is 19.9 MCM.
- ❑ Kerala Water Resources Department published a **Standard Operating Procedure for de-silting of reservoirs** in year 2017. Mangalam dam was the first de-silting project taken up.
- ❑ Since deposited sediment was found to be comprised about 60% of silt and clay; and 35% sand, State government adopted a revenue-based model, with turnkey method of contracting, for using sediment as a resource (e.g., agricultural, construction, and pottery activities)



*Wet Dredging at Mangalam Dam*

**SUSTAINABLE SEDIMENT  
MANAGEMENT STRATEGIES  
AT MANGALAM DAM**



*Mechanical (dry) and  
Hydraulic (wet)  
dredging*



*Revenue-based Model  
for Sediment  
Management*

- ❑ The revenue model resulted in earning of Rs 17 Cr, completely subsuming the cost of de-silting of Rs. 107 Cr. Although, de-silting amount is not very large, but this revenue-based model is very encouraging for dam owners by restoring lost capacity of about 3.0 MCM which is equivalent to creation of additional water storage in true sense.



*Revenue Model using  
sediment as resource*

The following basic principles should be followed in De-silting of reservoirs:

- i. Regular monitoring of sediment deposition in reservoir should be carried out. Integrated Bathymetry survey with sub-profiling sampling needs to be done to determine the actual quantity of sedimentation in reservoirs and estimation of the rate of sedimentation.
- ii. For reservoirs selected for potential intervention, it is necessary to perform a diagnosis of the sedimentation problem, formulate and select the most viable management alternative, prior to implementing the selected measures.
- iii. In case, if it is not possible to utilise sediment removed by dredging/de-silting / flushing from reservoirs; a proper utilisation/disposal plan needs to be prepared, with the consideration that it does not create any environmental, ecological and social issues.

- iv. De-siltation for restoring the lost capacity of the reservoirs may be carried out by comparative analysis of revenue and non-revenue models. For reservoirs, which are constructed for providing drinking water supply as well as other strategic services, de-silting may be done on need basis including non-revenue model. Also for safety of dam, it requires the de-silting; this may be preceded to other concern keeping in view associated disaster consequences.
- v. De-siltation/Dredging/Flushing in the cascade of reservoirs depends on the natural sediment load and may be shared between reservoirs. Appropriate monitoring mechanism along with institutional strengthening provision shall be inbuilt items in any programme of sedimentation management of reservoirs especially once the reservoir located in a lower riparian State is affected, when carried out in the reservoir, due care should be taken so that it does not affect downstream reservoirs. Proper consultation, with the reservoir authorities of downstream projects should be done. In case of hydro-power plants, each project or cascade projects should have coordinated Standard Operating Procedure (SOP), so that to the extent possible, sediment concentration may follow normal river regime during flushing.
- vi. De-siltation/dredging work shall not affect any existing structures/ facilities. De-siltation, especially in reservoirs shall be done in such a manner that it does not induce any landslides and slip circle failure in case of quick drawdown conditions. Restriction details for de-siltation/dredging are placed at **Annexure-III**.
- vii. In financing for new facilities, sediment management measures are considered to be an integral part of the facility cost. A life-cycle management approach shall always be recommended. For de-silting existing reservoirs, recurrent measures are financed through O&M budget. Reclamation of live storage is to be considered as like creating a new facility. Also, de-silting for reinstating safe operation is financed like other rehabilitation works (e.g. DRIP).
- viii. Financing de-silting in cascades of reservoirs depends on the natural sediment load and may be shared between the reservoirs. Appropriate monitoring mechanism along with institutional strengthening provision shall be inbuilt items in any program of sedimentation management. Also, in case de-silted material is discharged or dumped in the downstream of dam, impacting immediate downstream reservoir located in lower riparian State, proposed Plan may also be shared with lower riparian State. In case of a reservoir having interstate implications, the downstream states should have a member in the State/Central TAC.
- ix. The dredged material is a resource and the beneficial reuse in convergence with various concern organisation/agencies will not only bring direct economic values, but also social and environmental merits. Hence its end use should be part of comprehensive action plan. The possible major use of dredged material includes land reclamation, improvement & filling, construction & protection materials (for highways, railways, flood protection embankment etc.), top soil enhancement and agricultural use, habitat creation and restoration, beach nourishment and shore protection, river management (e.g. sand plug for channel closure) etc.
- x. A Feasibility Report should be prepared considering various techniques of removal of sediment. The economic analysis of long term benefits owing to consideration of removed sediment as a resource should be an important part of the feasibility report. Restored capacity of reservoir should be considered equivalent to creation of new live storage and apart from the intended benefits in terms of various uses of reservoir water

(irrigation, drinking water, industrial water, hydro power, fisheries, tourism etc.), the benefits from selling of sand for construction purpose, silt and clay for pottery and tiling industries in the open market by the contractor should also be considered for cost-benefit analysis. The use of revenue model shall be invariably explored. However, in case of strategic restoration of lost capacity (like drinking water, trans-boundary rivers etc.), even the non-revenue model may be considered. In order to ensure credible and bankable competitive bidding, the bid document shall be supported in terms of proposed volume and composition of dredged sediment through a latest close interval sub-bed profiling data of reservoir.

The details about the measures that can be adopted for sediment management of reservoir are listed in **Annexure-V**.

### 2.3.3 Data Base & Survey:

- i. Dam owners / Project Authority must carry out integrated bathymetry survey with sub-profiling sediment sampling of all large reservoirs of the country, keeping in view proper intervention for reclaiming of storage to improve water security. The survey is to be carried out at prescribed as per Compendium on sedimentation of reservoirs in India (2020).
- ii. For preparation of strategic action plan for handling the challenge of reservoir sedimentation in future, integrated Bathymetry Survey and Sub-bottom Profiling should be conducted compulsorily. The sub bottom profiling would give the thickness of underwater sediment, its composition (type), density etc.
- iii. Remote sensing Technique can be used for regular sediment assessment.
- iv. GIS-based model for predicting sediment quantity and quality based on basin characteristics and river flow can be developed.
- v. Video documentation of entire exercise of de-siltation, dredging, and other interventions executed for sediment management can be made so that cross learning can be promoted.

### 2.3.4 Retrofitting of Existing Dams

Retrofitting of existing dams: keeping in view availability of very limited sites for construction of new storage reservoir(s) along with various other challenges including R&R and environment impacts, dam owner(s)/Project Authority/(ies) may explore for retrofitting of few dams at a marginal cost. This retrofitting can be in many forms i.e. increasing the height of dam to the safe extent possible to create additional storage to meet extra demand, harnessing the available much easy hydroelectric potential at appropriate location(s), pumped storage option(s) etc. to make these reservoirs part of climate resilient strategies.

### 2.3.5 Institutions and Financing:

Certain guiding principles determine the arrangement of institutional setup and financing: Firstly, sediment management measures must never compromise dam safety and result in unacceptable state of dam safety. Secondly, sediment management measures must comply with prevailing environmental requirements, unless dam safety requires otherwise. Thirdly, reservoir sediment management is to be considered as an integral part of planning, design and operation of any new facility. Finally, sediment

management decisions follow similar considerations, needs, rules, processes as those for other environmental projects.

For de-silting of existing reservoirs, recurrent measures are financed through O&M budget. In order to handle the challenge of reservoir sedimentation on long term basis, all owners of reservoirs shall initiate policy interventions for earmarking certain percentage of dam revenues for carrying out de-siltation activities for sustainable dam operation and maintenance. Reclamation of live storage is to be considered akin to creating a new facility.

Financing de-silting in cascades of reservoirs depends on the natural sediment load and may be shared between reservoirs. Appropriate monitoring mechanism along with institutional strengthening provision shall be inbuilt items in any programme of sedimentation management.

## 2.4 Sediment Management for Lakes/Water Bodies

Lakes and water bodies constitute important habitats and food resources for a diverse array of fish, aquatic life, and wildlife. These are of great importance to mankind. They regulate the flow of river. During the rainy season, they prevent flooding and they help to maintain the flow of water during the dry season. Therefore, sediment management for Lakes and Water bodies are equally important for their sustenance. The scheme, namely, “Repair, Renovation & Restoration (RRR) of Water Bodies” is under implementation by Ministry of Jal Shakti, GoI with the objective of comprehensive improvement and restoration of water bodies in the country presently covered under the “Guidelines for the scheme on Repair, Renovation and Restoration (RRR) of Water Bodies under PMKSY (HKKP) – 2022”.

## 3.0 CLIMATE CHANGE PERSPECTIVE

Climate change is now an unequivocally accepted phenomenon, which in turn will result in increased hydrologic variability. This is an emerging challenge for development and sustainability of water resources management. The water storage infrastructure more generally, are appropriate focal points for both sustainable development and climate resilience. In turn, sediment management is a necessary element of sustainable and climate-resilient plan that includes reservoir storage and hydro-power generation.

Climate change, such as more frequent and intense rain events, can increase erosion and result in greater amounts of sediment washing from watershed, reaching into rivers and reservoirs. To mitigate adverse impact of climate change in reliability of water supply, construct reservoir storage spaces as large as possible. In reservoir sediment management context, developing and retaining enough reservoir storage space to satisfy water supply needs over the very long term requires inclusion of reservoir sediment management facilities in dam and reservoir designs right from the start, at project conception. It requires abandoning the conventional design life approach to dam design and adopting a life-cycle management approach.

In run-of-river projects, sediment management aims to improve operational efficiency. If sediment is not removed from run-of-river facilities before it enters the canal heads/the turbines, it may cause heavy siltation in canals and clogging of the cooling water intakes of the electro-mechanical equipment and also abrasion of the blades of the turbine, which decrease the efficiency as well as increase operation and maintenance costs and diminish the amount of power that can be generated. The objective of sediment management in storage

projects is to ensure project longevity for storing large amounts of water for planned benefits and use during droughts. Such storage also provides the opportunity to attenuate floods up to some extent.

The life cycle of dams and reservoirs consists of operation and maintenance, continued and regular implementation of reservoir sediment management approaches, and regular refurbishment of the dam and its appurtenant structures. Reservoir sediment management and refurbishment of the dam and its appurtenant structures allow for continued use of the dam and its reservoir, ideally in perpetuity. In principle, the approach does not include the element of disposal. A major difference between the life-cycle management approach and the design life approach is the focus on preventing storage loss caused by reservoir sedimentation. It eliminates the threat of losing the reservoir's ability to store water over the very long term and promotes continued use of the dam and reservoir, providing utility to both current and future generations.

#### **4.0 ENVIRONMENT AND SOCIAL SAFEGUARDS**

Dredging and de-silting of dams, reservoirs, weirs, barrages, rivers and canals for purpose of their maintenance, upkeep and disaster management is exempted from environment clearance as per S.O.141(E) of MoEF&CC dated 15th January, 2016. However, reservoir sediment management methods such as by-passing, flushing or de-silting of existing reservoirs are associated with environment & social risks and impacts, which are to be identified based on interventions proposed and locational sensitivity, if any, such as dam/reservoir located in protected area, reservoirs notified as wetlands/bird sanctuaries, etc. and some of the above interventions would involve creation of new infrastructures. In such cases all statutory clearances will be required. Wild life clearance would be applicable if reservoir is in a notified protected area. For structural intervention for sediment by-passing in existing dams or any other activity, if the land required is forest land, diversion of forest land would attract forest clearance process as per Forest Conservation Act, 1980.

For the de-siltation activity, a proper Feasibility Report along with Environment Management Plan to dispose the silt is required to be prepared as per the guidelines provided in the "Handbook for Assessing and Managing Reservoir Sedimentation", CWC,2019. "Operational Procedures for Assessing and Managing Environmental Impacts in Existing Dam Projects", Central Water Commission, November 2020 with competent level approval of MoEF&CC, can be referred for the environmental and social safeguard issues related to de-silting in the existing dams in context of various statutory and regulatory norms.

#### **5.0 DISPOSAL OF DREDGED / DESILTED MATERIALS**

- a) The proposal for de-siltation/ dredging activities shall be prepared as per applicable guidelines and prior approval may be taken from concerned agencies to ensure hassle free implementation. River gravels/sands/silts are valuable resource and could be used gainfully in construction works, including housing, roads, embankment and land reclamation activities.
- b) Appropriate sediment disposal plan shall be a part of Feasibility Report along with applicable Environment and Social safeguards. Dredged material shall be disposed as per the approved Environmental Management Plan. It should not contaminate any water body, adverse impact to the flora and fauna existing adjacent to the disposal site(s) etc.
- c) Desilted material should not be used for filling up of wetlands and water bodies including oxbow lakes, as these are important for recharging ground water and providing base flow in rivers during lean season.

- d) In the case of de-silting of reservoirs, regarding applicability and procedures for Environment Clearance, Forest Clearance and Wildlife Clearance, activity listed at Sl. No.18, Table 2.2, can be referred in the “Operational Procedures for Assessing and Managing Environmental Impacts in Existing Dam Projects” CWC, November, 2020. This referred guideline has the competent level approval of MoEF&CC.
- e) NOC from State Pollution Control Board (SPCB)/Union Territory Pollution Control Committee (UTPCC) as well as concerned local authorities is required in advance for disposal site for disposal of dredged materials. Requirement of NOC from State/Union Territory Pollution Control Board and from local authorities for disposal of dredged material is exempted for dredging carried out for navigation purpose by Inland Waterways Authority of India.

## 6.0 EVALUATION OF SEDIMENT MANAGEMENT PROJECTS

Dredging/de-silting projects including all components and their techno-economic performances need to be evaluated. An ongoing monitoring program is essential for optimizing sediment management. Short and long-term monitoring plans should be developed as an integral aspect of the Sustainable Management Plan.

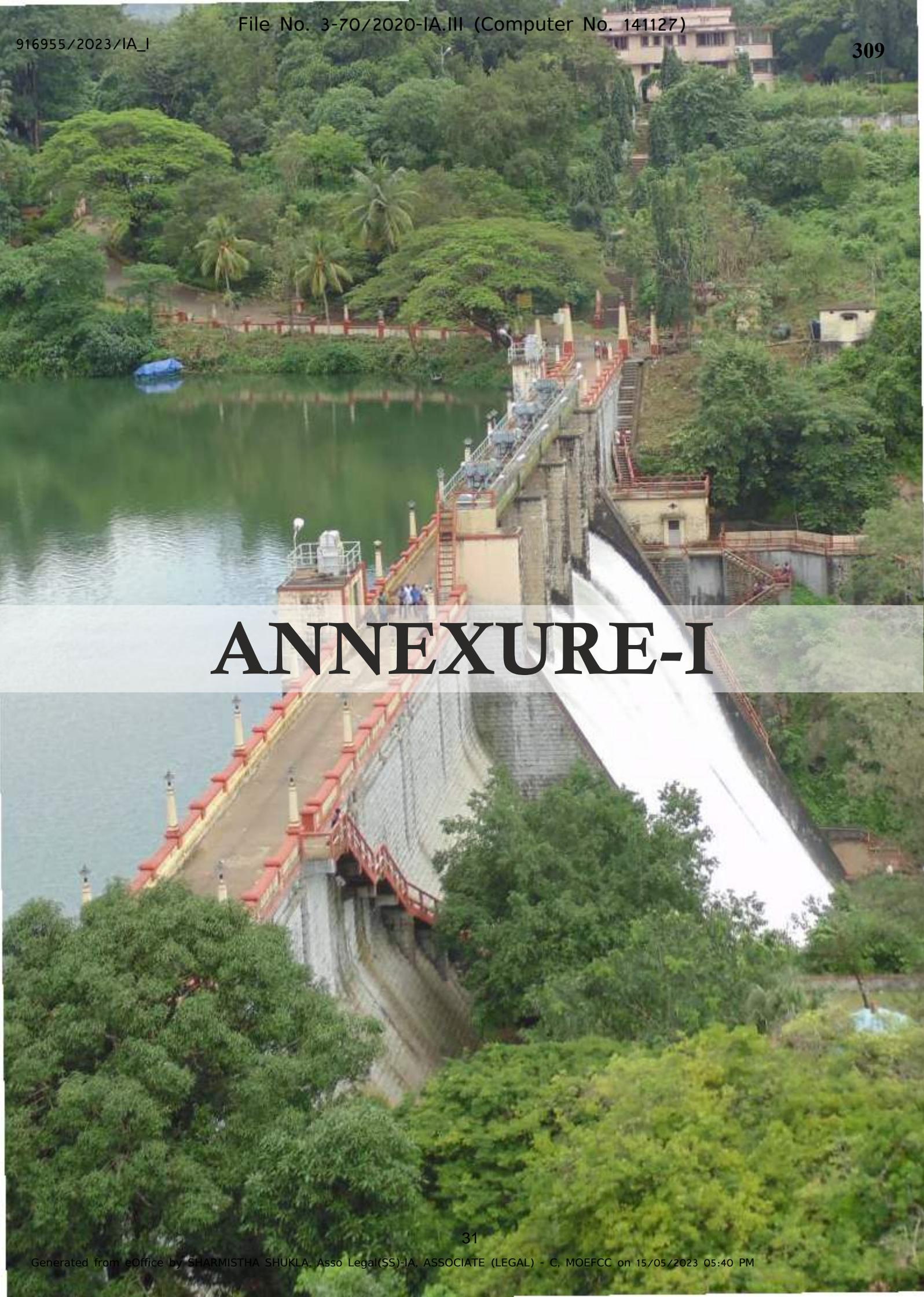
## 7.0 APPRAISAL OF THE PROPOSAL

- 7.1 Regarding Environmental Clearance of project other than de-silting of reservoirs, “Procedure for Environmental Clearance for Mining of Minor Mineral including Cluster”, as enumerated in appendix XI of MOEF&CC Gazette notification no. S.O. 141 (E) dated 15.01.2016 (as amended from time to time) may be followed; including the exemptions. The exemption given in Appendix XI of MOEF&CC Gazette notification regarding dredging and de-silting of dams, reservoirs, weirs, barrages, river and canals will be applicable for purpose of annual/routine maintenance/upkeep and disaster management only.
- 7.2 There are instances of sediment removal from dams/rivers for different purposes and activities like for commercial purposes, restoration of storage capacity of reservoirs, channelization of rivers, etc. Such activities generally do not fall under regular maintenance/upkeep or disaster management and will be governed by this national framework for sediment management.
- 7.3 The detailed procedure for appraisal, environmental & other clearances and monitoring of the proposals of sand and gravel mining has been described in the “Sustainable Sand Mining Management Guidelines, 2016” of MoEF&CC”.

Further, the detailed Guidelines for de-silting of reservoirs, its applicability and procedures for Environment Clearance, Forest Clearance, and Wildlife Clearance, activity listed at Sl. No.18, Table 2.2, in the “Operational Procedures for Assessing and Managing Environmental Impacts in Existing Dam Projects” CWC, November, 2020 may also be referred.

- 7.4 For de-silting/ dredging of sediment from rivers/ reservoirs; comprehensive DPR may be prepared by the State Authority/ Project authority/ PSU/private company etc. A Technical Advisory Committee (TAC) may be constituted by concerned State for appraisal and

approval of the DPR for the techno-economic viability. Concerned regional Chief Engineer of CWC or his representative should be included as one of members of the State TAC. Suggested composition of State TAC is enclosed at **Annexure-VI**.



# ANNEXURE-I

## SEDIMENTATION PROCESS IN RIVERS AND RESERVOIRS

All rivers and streams flowing in alluvial plains tend towards a stable flow condition maintaining a balance between the silt load carried, silt load deposited, and the resulting volume and velocities achieved. This is generally called a stable sediment regime for the river. When underlying parameters of volume and velocities are disturbed, either due to lower gradient (entering into plain reaches) or encroachment in flood plain, widening of the channel (braiding of river streams), suspended silt particles in the river water settle down, this is called siltation. This phenomenon is normally called sedimentation when it occurs in a reservoir.

Main factors responsible for the siltation / sedimentation are:

- (i) Physical and hydrological characters of the catchment, such as slope, geology and structures, land use, land cover, urbanisation, agricultural practices, deforestation and forest degradation etc.,
- (ii) Intensity of erosion in the catchment (sheet, rill, gully and stream channel erosion) including over-exploitation of minerals,
- (iii) Occurrence of landslides/landslips especially in hilly areas with heavy rainfall
- (iv) Construction of Roads, Houses etc. in the flood plain.
- (v) Quality, quantity and concentration of the sediment brought down by the river,
- (vi) Size, shape and length of the reservoir and operation strategies impacting trap efficiency of the reservoir,
- (vii) Some additional sources of silt generation are as follows:
  - a) In rural areas, the erosion source is typically soil degradation due to intensive or inadequate agricultural practice thereby resulting in an increased amount of silt and clay in the water bodies that drain the area.
  - b) In urban areas, the additional siltation sources are construction activities and seepage & sewage sludge discharged from household/business establishments with no septic tanks/wastewater treatment facilities.
  - c) In water, the main pollution source is sediment from dredging, and the deposited dredged material near water shore.

The detailed phenomena of sedimentation in rivers and reservoirs are explained as under:-

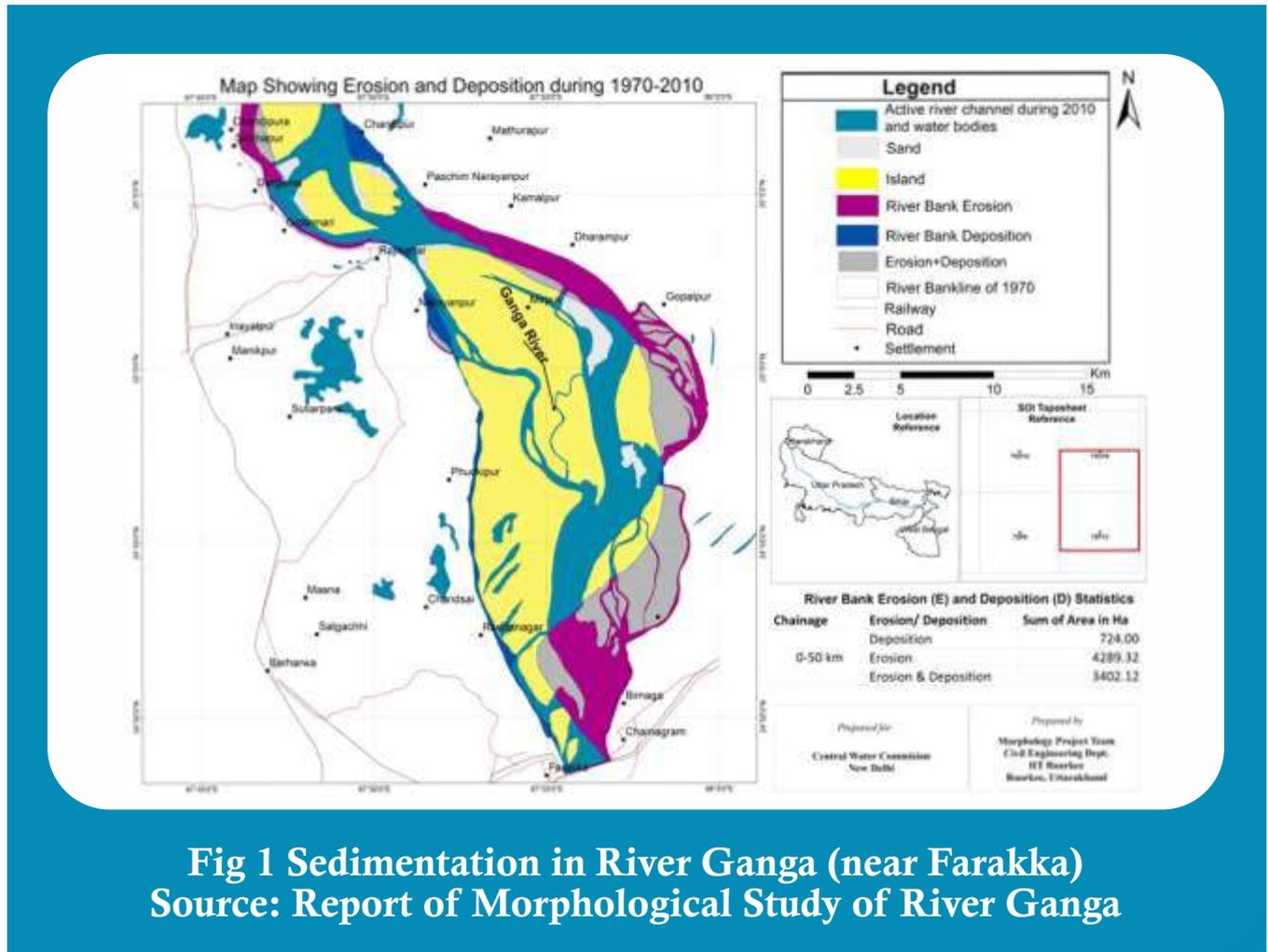
### SEDIMENTATION IN RIVERS

Rivers are natural channels to drain water from highlands to lowlands/seas. Erosion and aggradations are the most important geological processes which have brought down large amounts of sediments from the higher elevations to the plains and have formed large fertile plains, which were adopted by the hominoid races for their development and sustenance. Big towns were located on the banks of rivers to

meet needs of water and navigation. These sediments are responsible for formation of delta of a river and providing sand to sea beaches. Further, flora and fauna (e.g. Mangrove forest) depend on water and sediment supply from rivers. Fishes and other aquatic organisms choose specific sediment types of river environments for feeding, breeding and spawning. Over time, the high lands of an area get worn down. The material thus eroded is utilized further downstream to build banks and flood plains.

Sediment carrying capacity of a river is directly proportional to the kinetic energy of water. With more kinetic energy water is capable of carrying larger amount of sediment and of bigger size. However, due to human interventions on rivers (e.g. Dams, bund, barrages etc.) natural regime of river is disturbed. Traditional flood plains remain no longer available for offloading the excess sediments and river is forced to deposit sediment in its channel or nearby. Further, as the river flows from high gradient to low gradient, momentum of the flow is reduced progressively by consumption of the kinetic energy in overcoming the flow resistance and consequently reducing its capacity to carry the sediments by tractive forces along the bed and suspension of coarser particles through turbulence, inducing thereby silt deposition en route. In the Indian context, which is essentially having monsoon type climate, there is huge variation of flows in different seasons.

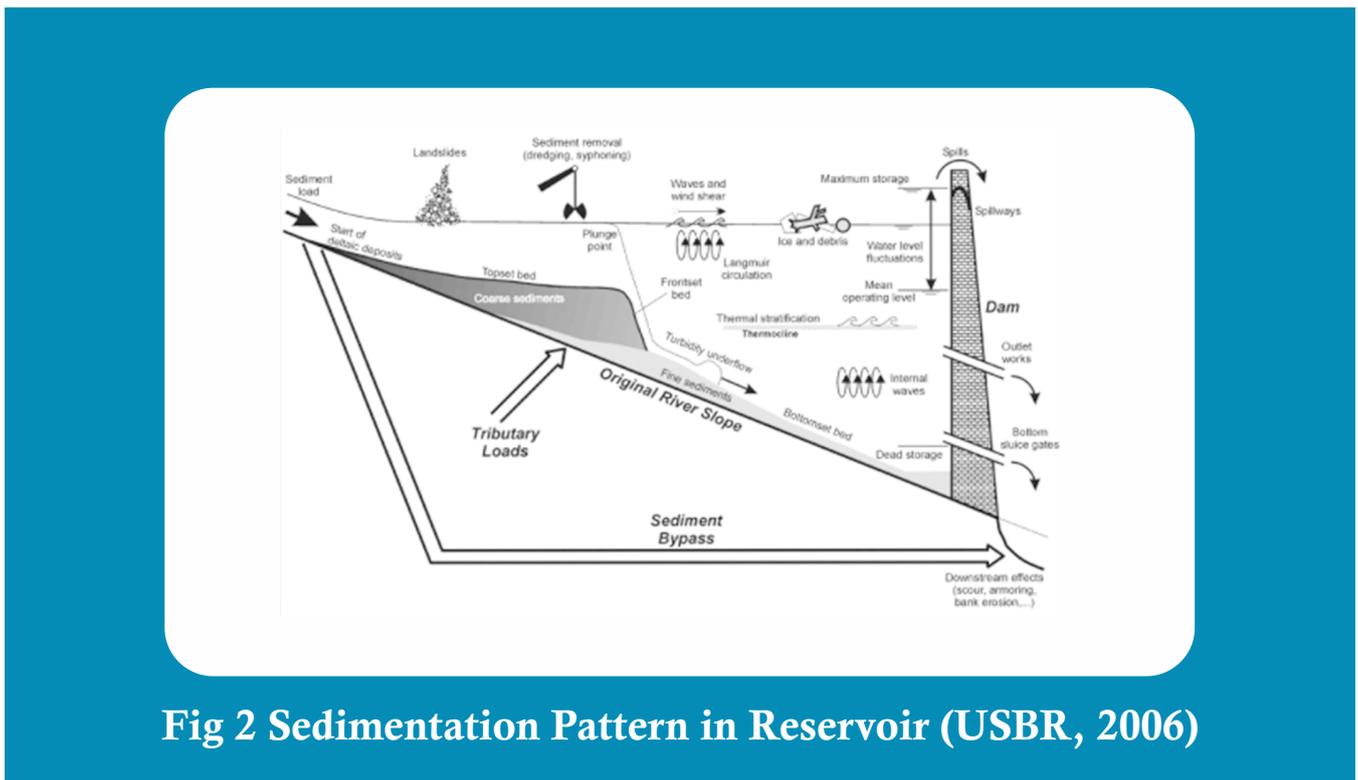
Further, during floods also the rate of increase and decrease of flow is very high. As sediment carrying capacity of river is directly proportional to the quantity and velocity of water, during high flows considerable sediment is carried in the river which is deposited as the flow reduces. This rapid change of flows causes erosion and deposition at different places. This is also the main cause of change of cross-sections in alluvial rivers.



**Fig 1 Sedimentation in River Ganga (near Farakka)**  
**Source: Report of Morphological Study of River Ganga**

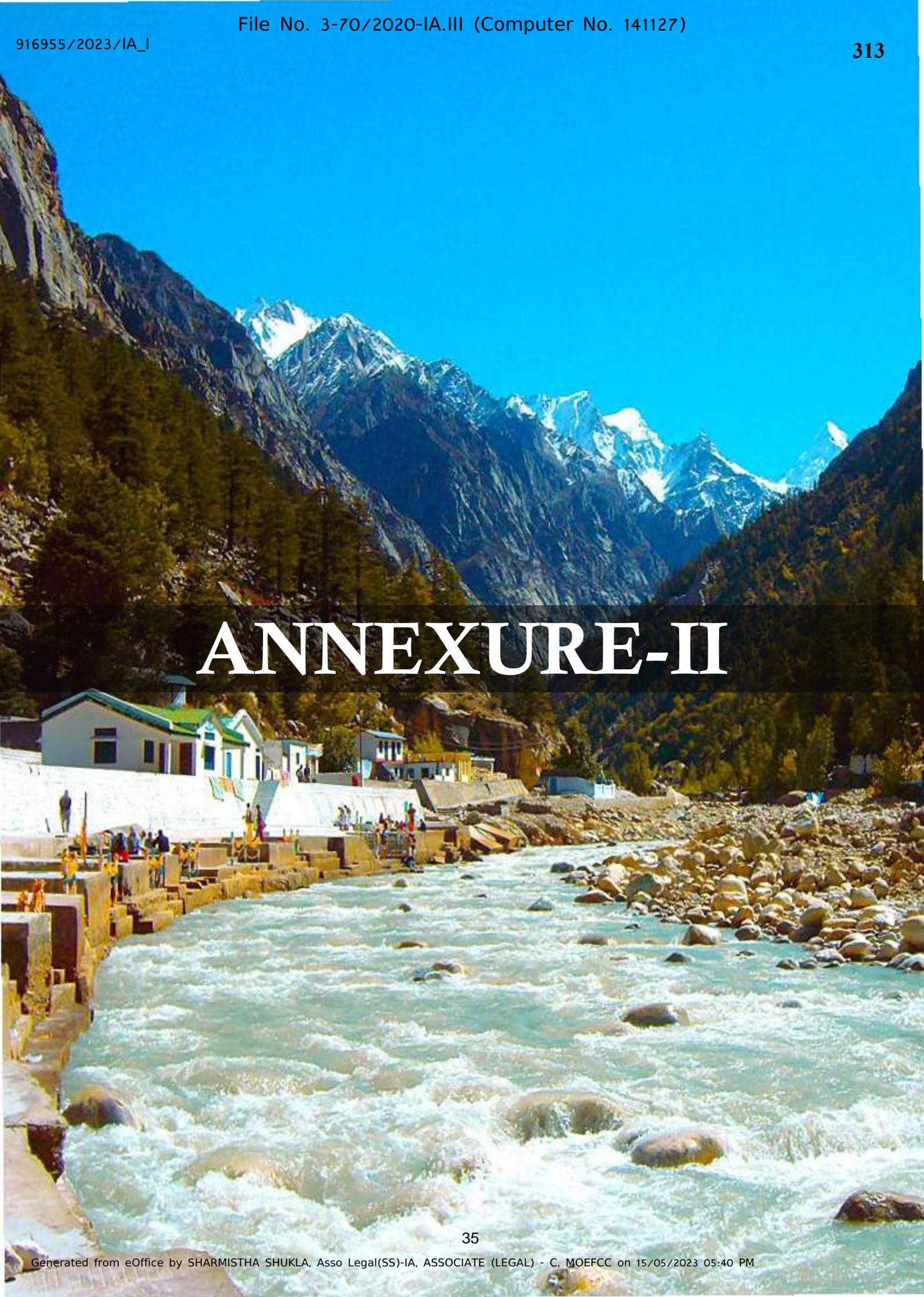
## SEDIMENTATION IN RESERVOIRS

Reservoirs are generally a part of the river system and quantity of sediment entering in the reservoir is dependent on the catchment area, type of soil, vegetation cover and gradient of river upstream of the reservoir. The river water entering the reservoir carries sediments which settle at various reaches in the reservoir. River systems erode material from the ground they flow over; these sediments are then transported downstream. When a river is dammed, the velocity of the water is slowed down and thus its ability to transport these sediments is reduced. When the velocity is too low the sediments in the river water will begin to settle down. The largest particle will settle first, near the upstream end of the reservoir, and often cause what is known as backwater delta. The finer suspended colloidal material (silts and clays) will settle down close to the dam where velocities are even lower. Some of the finer particles will remain in suspension and will flow through/over the outlet structures. The backwater delta will move forward towards the dam wall as time progresses. Depending on the shape, density, viscosity, size of the particle and flow, sediment settles in a reservoir in different patterns. The layer of water containing fine particles travel further down towards the dam as density current and may deposit there or near the rim of the reservoir. A major secondary effect is the downstream degradation of the river channel caused by the releases of clearer water. Siltation in rivers may or may not be accumulative; whereas sedimentation in reservoirs is generally accumulative.



**Fig 2 Sedimentation Pattern in Reservoir (USBR, 2006)**

Sedimentation processes in a reservoir are quite complex because of the wide variation of the many influencing factors, the most important being, (1) hydrological fluctuations in water and sediment inflow, (2) sediment particle size variation, (3) reservoir operation fluctuations, and (4) physical controls or size and shape of the reservoir. Other factors that for some reservoirs may be quite important are: vegetative growth in upper reaches, turbulence and/or density currents, erosion of deposited sediments and/or shoreline deposits, and operation for sluicing of sediment through the dam.



# ANNEXURE-II

## APPROACH FOR SEDIMENT MANAGEMENT OF RIVERS

To reduce sediment production in the watershed sustainably, the main actions include (i) study watershed characteristics, (ii) assess the vulnerability of watershed in terms of soil erosion & sediment production using modelling and to identify & prioritise the degraded micro-watershed for treatment, (iii) treatment of the prioritised micro watersheds with biological and engineering erosion control measures, (iv) stream bank erosion control using river training works like spurs etc., and (v) trapping sediment upstream of reservoir (in river) .

Identification of hotspots may be carried out for prioritizing the action plans for Sediment Management thereby helping in targeted, cost-effective interventions. It is recommended to quantify the sediment load in order to identify effectiveness and type of interventions required.

**A. Upper course-** In this stage, the rivers have steep slopes and high sediment transport capacity. The following sediments management practices may be adopted-

- a. Catchment Area Treatment-** Catchment Area Treatment and Watershed Development works along with good agricultural practices and river bank protection/anti-erosion works are necessary to reduce silt inflow into the river system and must be undertaken in a comprehensive way. Catchment area treatment on watershed approach plays an important role in minimizing sedimentation. Watershed management programme needs to be integrated with river basin management programme appropriately. An effective and permanent method of sediment control is soil conservation in the catchment.

The method to be adopted in catchment may include-

- i. Afforestation and forest management
- ii. Regrading and grassland management
- iii. Cultivation practices, such as crop rotation, increasing organic matter, mulching, seasonal cover crops, contour cultivation, strip cropping and terracing.
- iv. Gully control and check dams- contour bunding and trenching.
- v. Appropriate land use controls for protecting areas of importance.
- vi. The various on-farm practices to control the soil detachment to reduce silt load may include the following practices:
  - To maintain grass cover on soil
  - To control sediment generation through film trap
- vii. Adoption of practice of bio-filter strips, field borders, sediment retention terraces and ponds

- b. **Regrading & Check dams-** Regrading of river bed slope and construction of check dams may be suitably adopted for management of degradation of river beds as per techno-economic feasibility.
- c. Controlled construction activities of roads and houses also reduce the silt intake in hilly areas.
- d. Occurrence of landslides / landslips especially in hilly areas with heavy rainfall need to be controlled by proper slope stability measures.
- e. **Storage Reservoirs-** The reservoirs are built to store water. Incidentally, these act as settling tanks for sediment and trap the sediment carried by the river. Therefore, the sediment concentration of the water released from the reservoir gets effectively reduced depending upon the size of the reservoir.
- f. River training works such as bank protection, spurs etc. should also be made for the vulnerable reaches to check the river bank erosion.
- g. **Boulder/Gravel/ Sand Mining-** In the upper course, boulder, gravels and sand (course & fine) are deposited in the river. If these are mined at this stage and used for construction purpose, then Boulder/ Gravel/sand mining can be done strictly as per following guidelines-

- I. “Sustainable Sand Mining Management Guidelines – 2016” of MoEF&CC
- ii. “Sand Mining Framework” released by Ministry of Mines in March, 2018
- iii. GSI Guidelines for riverbed gravel/ sand mining.

**B. Middle course-** In this stage, the river exits the hills, enters the plains, gets meandered mostly on bed of fine sand, has a wide river bed and flood plain. Most importantly, the river gets modified through human interventions in terms of huge quantities of water diversion/abstraction and subjected to high degree of pollutant loads from domestic, industrial and agricultural activities. In this stage, following sediments management practices may be adopted:-

- a. **River training works such as bank protection, spurs etc –** River training works are used to control the erosion of river banks. Erosion control of riverbank reduces the sediments intake in river
- b. **Submerged Vanes & Bandalling-** These methods may be adopted for management of localized aggradations within the river course as per techno-economic feasibility.
- c. **Sand Mining -** In this stage, sand is deposited in the river. If these are mined at this stage and used for construction or other purposes, then a major portion of sediment can be reduced. Sand mining can be done as per the guidelines mentioned above.
- d. **De-siltation/Dredging-** De-silting using sluicing and flushing near water resources infrastructure is very effective in increasing their serviceability. However, there exist some

locations such as congestion at the mouth of tidal rivers, confluence points and the likes which can be tackled by de-silting after thorough examination. For navigation purpose the river reaches in the waterway path can be dredged, to have minimum required draft for plying vessels. De-silting improves the hydraulic efficiency if done near outlets and intakes.

When the meander loop extends substantially in the lateral direction, the friction loss over the meander length generates a head loss thereby resulting in a rise in the flood levels. Over the course of time, when the water path around a meander lengthens, arising to a critical level, a natural cut-off takes place. Construction of artificial cut-offs (cunnette) can be utilized as a method for flood control.

It is necessary to appreciate that de-silting does not always lead to reduction of flood levels as the levels in the river are essentially controlled by the hydraulic conditions persisting at the cross sections forming upstream and downstream boundaries of the reach. The lowering of the bed level within the reach may not have influence on them consequently leading back to drainage problems within the season or within a few years. On the other hand, unsystematic dredging may have the effect on bank destabilisation.

- C. Lower course-** In this stage, the river experiences considerable changes in the sediment transport and deposition, causes wide spread flooding, undergoes frequent changes in the channel path/ delta formation.

The following sediments management practices may be adopted:-

- (a) **Desiltation/ Dredging-** In this stage, generally delta formation occurs due to heavy siltation, which leads to drainage congestion and the mouth of river gets choked. In these areas, dredging/ de-silting works may be undertaken to maintain flow continuity and ensure sediments transportation to sea.
- (b) **River training works wherever possible may be taken up for sediment management.**

### **General Guidelines for carrying out de-siltation/ dredging work**

- (i) A study of the river reach may be selected for de-siltation/ dredging by appropriate mathematical and/ or physical model studies by employing consistent practices. Based on the outcome, the DPR may be prepared.
- (ii) Dredging for de-silting of Indian rivers may be adopted only in exceptional circumstances or when no other sustainable alternative is available. However, dredging for maintaining the necessary draft for maintaining the navigation may be done as and where required. However, it shall be ensured that such dredging does not cause any considerable pollution to river water and not harm flora and fauna.
- (iii) The de-silting of any river reach needs to be justified bringing out clearly the flooding caused due to siltation along with technical comparisons of the alternative flood mitigation measures with “do nothing” or “proposed de-silting/ dredging” being other options. It should invariably be associated with sediment flux studies and morphological studies to confirm no significant adverse effect on downstream or upstream reach of the river including the safety and effectiveness of river crossings, water intakes, existing river

bank / flood protection measures, etc. Post dredging, sediment flux studies should also be carried out to quantify the amount of silt likely to be deposited in future i.e. Sediment modelling studies for the river may be done before taking up any such project.

- (iv) Negative impact on ecology and environment due to de-silting may also be studied along with other studies and should be invariably made a part of DPR.
- (v) The quantity of sediments needed to be removed from rivers is usually very high. Since it may not be easy to find lands for silt disposal, therefore it should be ensured that all silt removed from river should be utilized in some works in association with concerned state government.
- (vi) The proposal for de-siltation/ dredging work should also contain environmentally acceptable, practically possible silt disposal/ utilisation plan. River gravels/sands/silts are valuable resource and could be used gainfully in construction works, including housing, roads, embankment and reclamation works. Since it is very difficult to find lands for silt disposal therefore it should be ensured that all silt removed from river is utilized in some works in association with concerned state governments. However, in the critical cases where it becomes necessary to remove the silt for free flow of water or protection of any installation, action may be taken up with the prior approval of the committee.
- (vii) Under no circumstances, disposal should create any contamination of water bodies, harmful to the flora and fauna existing adjacent to the disposal sites or disposed material should come back into the river again.
- (viii) Desilted material should not be used for filling up of wetlands and water bodies including oxbow lakes, as these are important for recharging the ground water and providing base flow in rivers during lean season.
- (ix) The modus operandi for sediment disposal should be finalized before carrying out dredging. No project should be executed before formulating a suitable and sustainable action plan for sediment disposal and be preceded by EIA Study, as per MoEF& CC notification dated 15.01.2016 to avoid damage to ecology. The methodology to be adopted (say use of dredgers etc.) should be clearly laid down in the proposal so that its co-relation with the environmental hazards can be made.
- (x) Normally, funds required for dredging projects are enormous. Before embarking on a major de-silting operation in any of the rivers, the financial implications may be discussed in detail.
- (xi) The dredging/de-siltation/mining activities thereby disturbing the river regime may result into some adverse impacts, i.e., (a) River bed degradation; (b) Bank erosion; (c) Channel widening; (d) Lowering of water surface elevations in the river channel; (e) Lowering of water table elevations adjacent to the river; (f) Reduction in the structural integrity of bridges, pipelines, jetties, barrages, weirs, foundations supporting high tension lines, existing bank protection works and other man-made structures; and (g) Loss of environmental values resulting from (a) through (e). Restrictions as presented in **Annexure III** need to be enforced

before planning and executing any dredging/ de-silting / mining activities. These restrictions may be modified only after proper study and monitoring the effects of dredging / de-silting / mining.

## OTHER STRATEGIES

### 1. Silt management upstream of bridges, barrages & weirs

Shoal formation upstream of barrages/bridges in the pond area is a natural phenomenon. Reduced velocities of water in upstream of barrage leads to deposit of silt, but sometime after construction, this attains equilibrium and the incoming silt is washed away through the under sluices and during the flood season when all gates of the barrage are open.

- I. Upstream reaches of construction works, like barrages/bridges, etc., tend to get silted leading to wandering of river. As the waterway provided for design flood condition is much larger than actual waterway required in normal condition, there is a tendency for shoal formation upstream of barrages. Possibly, proper operation of gates verified on the basis of physical or mathematical modelling, river training, cut-off developments and provision of extra water way near the constrictions could be tried after proper assessment without impacting the morphology of river elsewhere. The area freed from the development in the form of oxbow lakes should be used for flood moderation rather than reclaiming it for other purposes.
- II. Sediment sluicing may be incorporated to maintain sediment continuity from upstream to downstream reaches after carrying out necessary studies.

**2. Lateral Connectivity for Sediment Management-** Construction of embankment has resulted in breaking the lateral connectivity of river with its flood plain. Therefore, the silt carried by the river is being deposited in river bed only leaving the flood plains devoid of sediments. This has resulted in rising of river bed and causing bank erosion at high flood levels. In order to provide lateral connectivity to the river with its flood plains, sluice gates may be provided at appropriate places in the embankment to allow controlled flooding in flood plains. This will allow silt carried by the river to be deposited in its flood plains in thin layers distributed over vast areas and will ultimately result in reduction of silt loads in rivers and will make the agriculture fields in flood plains fertile. This will benefit in multiple ways-

- (a) Reduced high flood levels in downstream.
- (b) Increased fertility of flood plains. Thus reducing the dependency of farmers on chemical fertilizers.
- (c) Recharge of ground water.
- (d) Rejuvenation of the water bodies etc.

Here, it may be mentioned that the sluice gates which allow incoming of flood waters in country side will be used for discharging extra water in river again when flood levels in rivers go down. Such sluice gates will also reduce drainage congestion on country side, if any.

### 3. Floodplain Management

River tends to achieve equilibrium on its own given the hydrology, sediment and natural bed and bank disposition. It is necessary to provide the river sufficient flood plain areas and lakes along the river to

moderate the flood level. Any encroachment of flood plain, reclamation of lakes or disconnection of lakes from river should be avoided. Rather, adjoining lakes/depressions may be de-silted to increase their storage capacities. The de-silting of lakes, etc., should be in such a manner that the sediment continuity is maintained and should not lead to head cut that creates safety issues for the river crossings, water intakes or river training works locally or upstream.

To maintain the hydrological and ecological balance, regulation of different activities in the river bed and different zones of flood plain is essential. The River Regulation Zoning for demarcating necessary zones should be implemented as early as possible. Central Water Commission in 1975 has already prepared a draft Flood Plain Zoning Bill in this regard.

#### **4. Solid Waste Management**

Solid waste from community including garbage, rubbish, agricultural waste, toxic Industrial discharge, construction debris, landfills in the catchment area etc. all contributes to pollution in rivers which damages highly sensitive and fragile river ecosystem. Such anthropogenic activities cause aggradations and morphological changes in the river. The disposal of solid waste needs to be controlled by the community, local municipal bodies and government bodies.

Special care should be taken for solid waste generated out of industrial processes. Many times, the same contains toxic materials and intermixing with other silt may render the same unusable for food chain use. Such waste should not be allowed to be dumped in the river.

#### **5. River rejuvenation / Environmental flow**

There is need to construct storages with sufficient flood cushion. The stored water needs to be released during the non-monsoon period in such a way that environmental flow and silt carrying capacity of river is by and large maintained. This will also improve the ecology of river. In this regard, DoWR, RD & GR, Ministry of Jal Shakti, GoI has issued guidelines on e-flow for river Ganga in 2018 vide notification dated 09.10.18

#### **6. Bed-load management**

Bed-load relocation (dredging) and artificial bed load supply, etc. Flood Control Programs-Detention basins (holding ponds), energy dissipaters in channels (culvert outlet controls, forced hydraulic jumps, drop structures, stilling wells, etc. Land use controls: these are used to reduce storm runoff), Embankments/dyke/levee construction, Periodic flushing of rivers, etc may be used to control the sediments.

#### **7. Land Management and Soil Conservation Techniques**

Check dams, settling basins, vegetation covers, agricultural practices, etc. may be adopted to control sedimentation.

#### **8. Artificial Nourishment (with sediments) in the River**

Due consideration has to be given for artificial nourishment (with sediment) in River stretches/ Reaches that contain inadequate quantity of bed sediments. This is very important to protect psammophilic/lithophilic organism that are inhibiting in river stretches devoid of adequate supply of sediments.

Further, artificial sediment nourishment is required, in certain cases, to contain the adversities of hungry water effect in river environment. This will also minimise the ill-effect on coastal and near shore environment as well.

#### **9. Application of Multi-Temporal High-resolution Satellite Imagery**

Multi-temporal high-resolution satellite imagery may be used for identification of hotspots (heavily sediment-laden stretches). However, there are some limitations for monitoring suspended sediment concentration using remote sensing such as availability of satellite data for the study period as sediment yield is time-dependent and simultaneous satellite imagery might not be available. Therefore, more research is necessary to harness the advancements in satellite remote sensing for studying the suspended sediment dynamics and sediment management in river stretches.

# ANNEXURE-III

## **DREDGING/DE-SILTING/ MINING RESTRICTIONS**

The dredging/ de-silting/ mining restrictions are intended to limit the adverse impacts associated with it. They are intended to limit those impacts to a level which will have limited and manageable minor effect on the morphology and ecology of the river. These are guiding principles and de-silting works should be done only and after detailed studies are undertaken. If the State Government/local bodies have any regulatory law in this regard, conservative restriction shall be followed. However, dredging by Government agencies like IWAI, PSUs etc. for maintaining the necessary draft for maintaining the navigation may be done as and where required.

### **1.0 Restriction on River Bed Degradation**

The magnitude of dredging-induced river bed degradation is a key factor influencing the degree of instability of the river channel. This may result in secondary impacts such as bank erosion, channel widening, lowering of water surface elevations adjacent to the river, alteration of aquatic and terrestrial habitat, and a reduction in the structural integrity of man-made structures. Since secondary impacts increase as riverbed degradation increases, the degree of dredging/ de-silting/ mining induced river channel instability can be limited by identifying and selecting appropriate reaches for suitably controlling the amount of dredging related degradation. The dredging /de-silting / mining of the river reach shall be altered or terminated if the average river bed degradation over a 10 km reach length is more than 1 meter. A reach of river which has been dredged / de-silted /mined out and closed for further dredging will not be reopened until sufficient materials have accumulated to support renewed dredging activities for a reasonable period of time.

### **2.0 Restrictions Concerning Man-made Structures**

#### **2.1 Barrage or weirs or jetties**

The barrages or weirs act as a river bed control structures across river and have huge influence on the river bed. If they fail, it could induce unintended severe riverbed degradation, bank erosion and channel widening due to design and other related issues. The unregulated dredging/ de-silting can result in Structural/functional failure of the structure in addition to the ill effects on river regime. To safeguard the structural integrity of the barrage or a weir, following restrictions shall apply:-

- a) Dredging/ de-silting/ mining activity upstream of structure will be allowed only beyond 200 m or  $L/5$  whichever is more (Where L is the length of barrage/weir).
- b) Dredging/de-silting/ mining activities downstream of the structures will be allowed only beyond a distance of 800 m or L whichever is less (Where L is the length of barrage/weir).
- c) The region of extraction shall be decided in upstream so as to have a positive effect on hydraulics of the pond and channel.
- d) Maximum volume of extraction on downstream shall be decided by proper monitoring so that it will not have any effect on the integrity of the structure.

## 2.2 Water Intake Structures

No dredging below the natural bed level will be allowed within 150 m distance from the intake structures for safeguarding structural integrity. However, dredging can be carried out, if the water flow to the intake structures has been obstructed by excessive sedimentation. The dredging activity shall be restricted so that the water level reduction will not lead to functional difficulties in diverting water in to the intakes.

## 2.3 Bridges

No dredging will be allowed below the level of top of raft/bottom of pier within 150 m of any bridge crossing to safeguard the structural integrity of the bridge. This shall not be applied where water way has been obstructed by excessive sediment deposit and is causing flooding of upstream reaches.

## 2.4 Pipelines

2.4.1 Pipelines buried in the riverbed have a high potential to be adversely impacted by dredging activities. If degradation of the riverbed exposes pipelines, damage could occur through sagging, buoyancy or displacement of the line downstream due to an accumulation of debris. The following restrictions will limit the potential for dredging/ de-silting/ mining induced localized degradation to expose buried pipelines:

- a) No dredging will be allowed within 60 m of any pipelines that is buried 3 m or below the river bed.
- b) No dredging will be allowed within 150 m from any pipeline that is buried less than 3 m below the river bed. Additional restrictions may be required for any pipeline located on or above the river bed. Such restrictions could be developed on a case by case basis.

2.4.2 Laying of pipelines/telecommunication lines/internet cables etc. below the bed of any river should be done only after the approval of the concerned competent authority.

## 2.5 Bank Stabilization Structures

No dredging will be allowed within 60 m of the most upstream and downstream point of the bank stabilization structure. Dredging/ de-silting/ mining restrictions as shown in Figure 1 & 2 and the limit given in Guidelines/Notification 2020 of MoEF&CC shall apply for the bank stabilization structures. The same restrictions shall apply to levees or embankments also.

## 2.6 Other structures

The support structure for high tension lines passing over the river shall also be treated as bridge piers and relevant restrictions as provided in clause.2.3 for bridges shall apply. Restrictions regarding other man-made structures not identified in this section may be determined on a case to case basis.

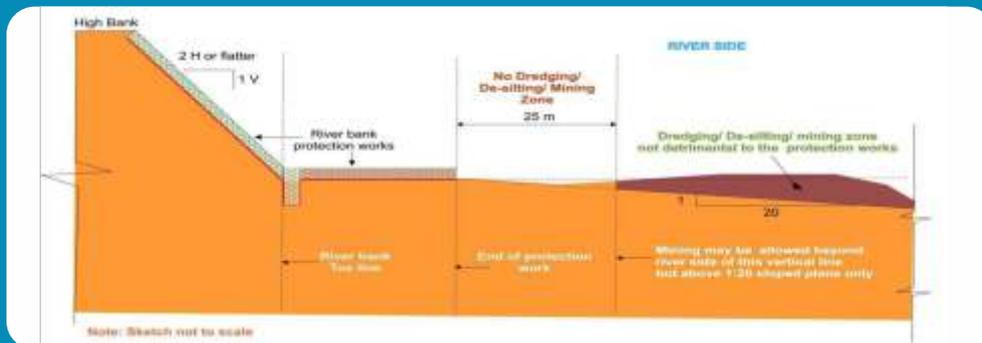
## 3.0 Restrictions Concerning Natural Formations

### 3.1 Natural Rock or Hard Deposits in River Channel

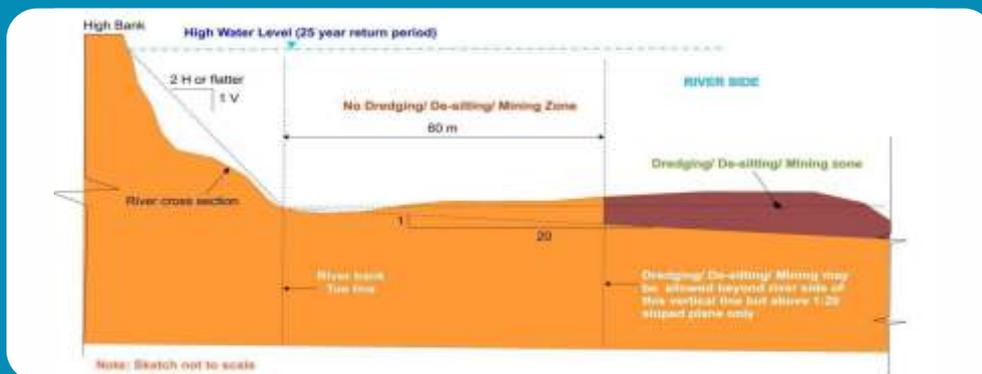
Natural rock or hard deposits located on or in the riverbed may act as riverbed controls and/or may increase aquatic habitat diversity. The importance of rock or hard deposit is dependent upon extent of its area, its thickness and other relevant factors. Based on these hard deposits, river is restrained to flow along a predefined alignment. Dredging/ de-silting/ mining shall not dislodge such hard deposits or dredging of collected silt upstream or downstream of such hard stratum shall not in turn displace it, whereby the river loses its control. Therefore, restrictions concerning natural rock deposits will have to be dealt case by case basis. River Ganga flows along important ghats of Varanasi and other such places, where people gather in large numbers. It is held to flow along these ghats due to peculiar alignment formed by rock or hard strata and silt deposits together. Hence, dredging / de-silting / mining shall be avoided at these places entirely along the width and at least 5 km upstream and downstream of such congregational areas. However, for navigational purpose, limited dredging will be allowed in such shallow reaches as recommended in DPR.

### 3.2 River Banks

Dredging/ de-silting/ mining close to riverbanks have a high potential to adversely impact the stability of those banks, especially when dredging/ de-silting/ mining occurs near the outside of sharp river bends. Bank erosion induced by such dredging can result in the loss of land, damages to man-made structures, and adverse impact to environmental resources. Therefore, to limit the potential bed/bank degradation, restrictions as per notifications and guidelines being notified under Environment (Protection) Act, 1986 (latest Guidelines/Notification 2020 of MoEF&CC) shall apply on Dredging/ de-silting/ mining. The restrictions as shown in Figures 1 and 2 may be used as a guide as documented for river Ganga in the report of the Committee constituted for preparation of guidelines for works on de-siltation from Bhimgauda (Uttarakhand) to Farakka (West Bengal) prepared in 2017. Such restrictions for other rivers need to be derived by studies.



**Figure 1: Typical Dredging / De-silting / Mining Restrictions for protecting river bank with bank protection works**



**Figure 2: Typical Dredging / De-silting / Mining Restrictions for protecting natural river banks**

# ANNEXURE-IV

## SEDIMENT-A RESOURCE

### NATURAL FUNCTIONS OF SEDIMENT

The presence of the sediment in rivers is very important and equally beneficial. It is important because it often enriches the soil with nutrients. This deposited sediment on the banks and flood plains of a river which is highly mineral-rich makes excellent and the most fertile farmlands. This even reduces the need of fertilisers and pesticides to be used for cropping.

Areas rich in sediments are often also rich in biodiversity. They also provide the spawning bed for fishes. Further, deltas are the wetlands that form as rivers empty their water and sediment into oceans/seas. These deltas are important wetland habitats. Plants such as lilies and hibiscus grow in deltas, as well as herbs such as wort, which are used in traditional medicines. Many animals (Hilsa fish, crustaceans such as oysters, etc) are indigenous to the shallow, shifting waters of a delta. River sediment is an important source of beach nourishment. Sediment starvation may result in receding riparian zones and wetland.

### BENEFICIAL USES OF SEDIMENT

Most dredged/removed/extracted material can be a valuable resource and should be considered for beneficial uses. Potential beneficial uses of dredged material should be thoroughly examined as part of pre-project planning studies. Preliminary surveys should be made during the reconnaissance phase of new studies and detailed aerial and ground surveillance should be conducted for feasibility studies. Modern tools such as remote sensing, visual data management systems and automatic data processing may be employed to help determine the most appropriate locations and best uses for dredged material.

Depending upon the geological formation a river passes through, the dredged material will vary in its composition. Therefore, the suitability of the dredged material has to be investigated/ assessed for its optimal application. Physical, engineering and chemical characteristics of dredged material proposed for beneficial use must be determined during the initial stages of planning. A number of standard soil properties are used to determine the physical and engineering characteristics of dredged material. Soil tests mainly would include grain-size analysis, Atterberg's Limits, bulk density, specific gravity and compaction characteristics. Engineering tests may mainly include shear strength, compressibility and permeability parameters. The chemical characteristics determination may include chemical constituents, cation exchange capacity, Nitrogen, Sulphur, Heavy metals, water quality considerations, concentration, organic content and contamination depending on the potential use.

The most common beneficial use of the dredged material is as a substrate for habitat development which refers to the establishment and management of relatively stable and biologically productive plant and animal habitats. This can range from wetland, upland, aquatic to island habitats. The river dredged material, if suitable can be used for construction, raising and strengthening of embankments, dykes, levees for bank protection works, raised platforms for flood proofing etc. This would serve the dual purpose of increasing the water flow area in the river as well as a resource material for use in river bank protection works.

Shore erosion is a major issue along the country's coastline and one of the most desirable, cost-effective shore protection alternatives is beach nourishment, which is usually accomplished by transporting sand/ sandy dredged material from inshore or offshore locations by truck, hopper dredge or hydraulic pipeline to an eroding beach.

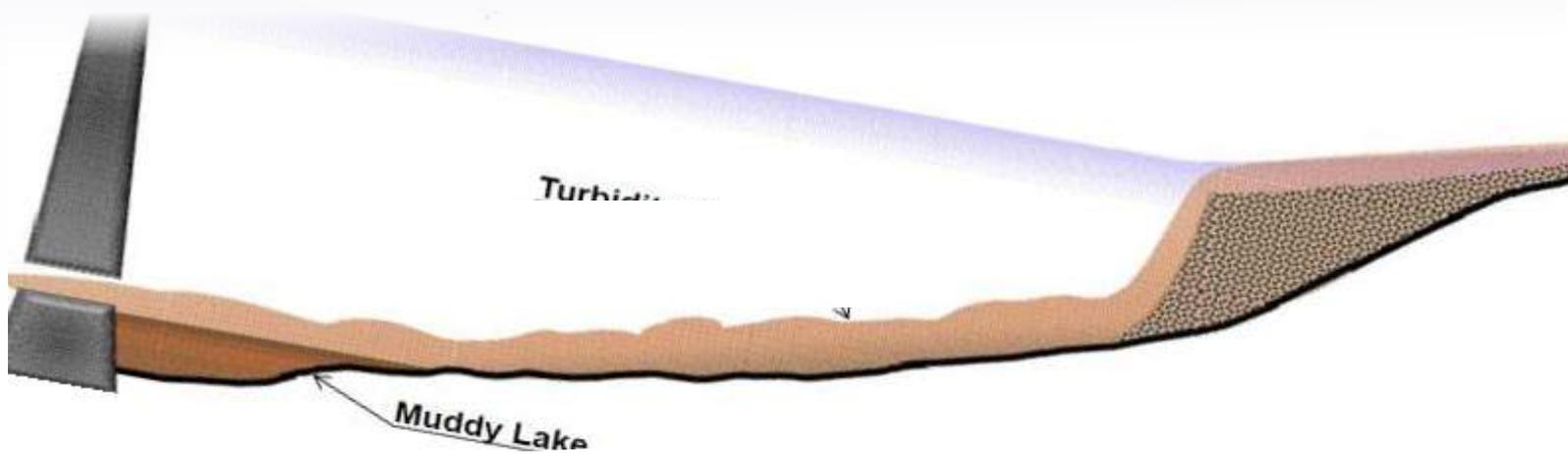
Other uses for dredged material include agriculture, forestry, horticulture, aquaculture industries, reclamation of abandoned strip mine sites, capping of solid waste landfills, protect landfills, manufacture bricks and hardened material that could be moderately contaminated and still be acceptable.

The dredged material is generally a good fill material for a variety of construction projects and serves as foundation material for road projects. Industrial/commercial development near waterways can be aided by the availability of hydraulic fill material from nearby dredging activities. The use of dredged material to expand or enhance river bank or port-related facilities has the potential benefits to the local economy.

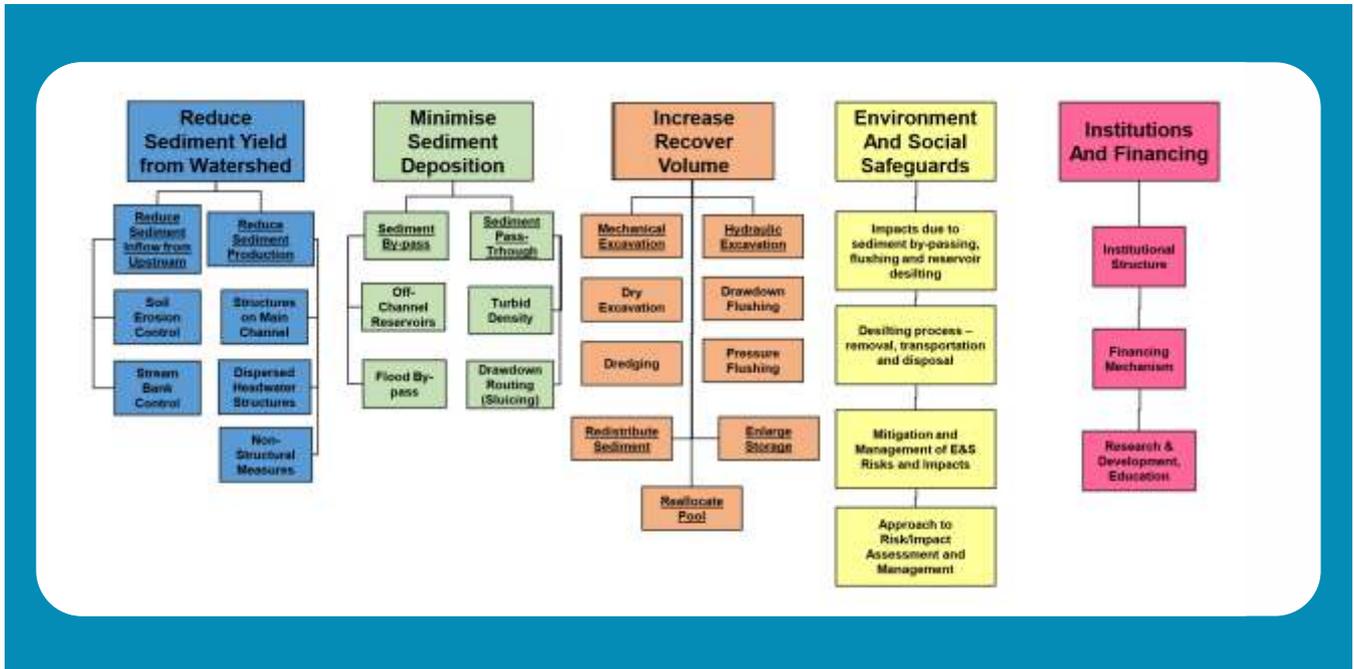
In spite of the sometimes poor foundation qualities, dredged material containment areas have become useful sites of high and low rise residential and business complexes. However, it is mandatory to ascertain the competency and suitability of the dredged material when it is proposed to be used in the foundation or as a construction material. Success has been attained where the properties of the dredged material have been properly accounted for in the residential design. A number of coastal areas have been built on dredged material foundations in areas where insufficient land was available for a commercial airport and use of dredged material was easily justified both economically and socially.

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# ANNEXURE-V



## MEASURES FOR SEDIMENT MANAGEMENT IN RESERVOIR



Measures to reduce sediment yield from watershed are common for rivers as well as reservoirs. The approach given under **Annexure-II** may be referred for further details.

The other strategies for sediment management in reservoirs are described hereunder:

### A. Minimize Sediment Deposition

#### 1.0 Sediment Bypass

It is a technique for reducing sediment inflow/deposition into reservoirs. This can be further sub divided into two categories:

##### 1.1 Flood Bypass Channel or Tunnel

The purpose of a bypass is to divert sediment laden flood flows around a reservoir to downstream of the dam. By-passing a reservoir by making use of conveyance structures (tunnel or channel) is often only feasible when favorable hydrological, topographical and morphological conditions exist. The ideal geometry for sediment bypass is one where the river makes a sharp turn between the point of sediment collection and the point of sediment reintroduction to minimize the length of the conveyance device and take advantage of the relatively steeper gradient for gravity flow. Where that ideal condition does not exist, the technique is most practical where the reservoir is relatively short, as there must be sufficient gradient to drive the transport of sediment through the diversion tunnel or diversion channel. This measure has considerable financial implication in construction of diversion infrastructures, hence may not be preferable options for many reservoirs.

## 1.2 Off-stream reservoir

Off-channel/Off-stream storage reservoirs are built adjacent to the main river channel (e.g., a small tributary or on the flood plain). Water from the main river is diverted into the reservoir during times of low sediment concentrations. It is an alternate approach to sediment bypass tunnel, such that the diversions from the weir are clear-water diversions, while sediment-laden water is left in the river to pass downstream. Similar to sediment bypass, there needs to be sufficient gradient to drive flow through diversion channels or tunnels to the off-channel storage feature. One advantage of this approach is that all bed load entering into reservoirs can be excluded.

## 2.0 Sediment Pass-through

It is the technique for evacuation of sediments from reservoir. There are various methods for pass-through described here under:

### 2.1 Reservoir drawdown/slucing

Sluicing is an operational technique by which a substantial portion of the incoming sediment load is passed through the reservoir and dam before the sediment particles can settle, thereby reducing the trap efficiency of the reservoir. This is accomplished in most cases by operating the reservoir at a lower level during the flood season in order to maintain sufficient sediment transport capacity (turbulent and colloidal) through the reservoir. Higher flow velocities and higher sediment transport capacities in the water flowing through the reservoir result from operating the reservoir at these lower levels. The increased sediment transport capacity of the water flowing through the reservoir reduces the volume of sediment that is deposited. After the flood season, the pool level in the reservoir is raised to store relatively clear water. Effectiveness of sluicing operations depends mainly on the availability of excess runoff, on the grain size of the sediments and on reservoir morphology. One advantage of this approach is that deposition in the reservoir is minimized and the sediment continues to be transported downstream during the flood season when sediment is naturally discharged by the river. Finer sediments are more effectively transported through the reservoir than coarse sediments. A drawdown and sluicing strategy may be employed at reservoirs of all sizes, but the duration of sluicing depends on the watershed size and the time scale of flood events.

### 2.2 Vent turbid density currents

In some instances sediments can flow into a reservoir as a density current. This phenomenon can occur when the sediment concentration in the inflow is much higher than the water in the impoundment and/or there is a significant temperature difference between the incoming flow and the impounded water. Under such circumstances the density current may flow under the impounded water in the reservoir toward the dam. If the density current is not allowed to flow through the dam by means of low-level gates, a technique known as density current venting, it will curl up at the dam and its return-flow will mix with the clearer water in the reservoir. The sediment thus mixed into the clearer water will deposit with time. Most dams have been designed with a dead storage capacity below which there are no outlets and therefore the water in this zone cannot be used. Many designers incorrectly assumed that sediments would naturally deposit in this dead storage.

## **B. Increase/Recover Volume**

### **1.0. Mechanical Excavation**

#### **1.1. Dry Excavation**

By dry excavation, sediment which is temporarily above water is removed from the reservoir bed. At the upper delta area of the reservoir with coarse sediment deposits from flood events, the reservoir bed can be dried out and excavated by lowering the reservoir level, for instance on a seasonal basis if water level variations over the seasons are predictable. Earth-moving equipment such as bulldozers, scrapers, excavators and trucks are used. Dry excavation in the delta may be done in combination with installing a sediment check dam at the upstream end of the reservoir and mechanically removing sediment captured in the check dam.

By completely emptying the reservoir of water, access is allowed to dry excavation of the finer sediment in the lower part of the reservoir. Dry excavation in this part will in general be more challenging due to the finer material which tends to have higher water content if unconsolidated, and considerable time may be required for the sediment to dewater and consolidate. Furthermore, the access road by truck along the reservoir bed to transport the excavated sediment away may be difficult to establish. Costs of emptying the reservoir should also consider the lost benefits of power production, flood control, water supply for irrigation etc.

Coarse sediment at the upper delta consisting of sand and gravel, usually represent a higher commercial value than fine silty or clayish material from the lower part of the estuary. Such added benefits of reusable sediment which could be transported directly to the buyer of such sediment, should be considered.

The feasibility of mechanical excavation as compared to alternatives also depends on the volume of material involved to be transported from the reservoir by truck and the difficulty of obtaining suitable sites for placement of the excavated material within an economic distance with least environmental and social impact.

As dry excavation with complete emptied reservoir is performed by shutting down the dam for one year or more, it will be a larger investment in terms of lost benefits, and the interval in between such operations should be a specified number of years to be determined by careful sedimentation analyses. In case of cascade of reservoirs, the lost benefits may be alleviated by de-silting reservoirs in rotation.

#### **1.2. Dredging**

By dredging, sediment is removed from the reservoir bed from beneath the water. Mechanical excavators mounted on barges represent one option whereas hydraulic dredging with use of slurry pipelines by which a mix of sediment and water is pumped onshore is another option. Mechanical excavators are most efficient with coarse and/or well consolidated sediment in shallow areas. While excavating and lifting sediment from the bottom to the water surface, spill may occur, and the softer/finer material, the more spill.

Hydraulic dredging is a common solution to sediment removal in the deeper part of the reservoir. Transport and disposal of sediment are key factors to consider. One option is to

discharge the dredged material downstream of the dam in a way, so that the downstream river has capacity for this extra sediment load. In such case, hydrosuction dredging or siphon dredging utilising the gravity of force can be considered to reduce pump energy requirements. Another option is to pump the slurry to nearby containment areas, from where the water can be drained, and the dredged material can settle and consolidate for either permanent disposal or transport by other means (trucks) to other disposal sites.

Important considerations for accessing the feasibility are the cost and efficiency of the dredging equipment itself, power supply, the dredging operation including synchronisation with the river flow, natural as well as released flow downstream, the transport and disposal of the slurry and/or excavated sediment, the sediment spilling including adverse effects this may have on the environmental conditions within the reservoir. Transport of heavy dredging equipment, spare parts, fuel etc. to and from the reservoir site is another consideration.

Pump energy, abrasion of equipment, and availability of nearby containment areas (including the river downstream) are main factors which determine the feasibility of dredging. Considering that sedimentation is of increasing concern in many countries, substantial product development goes on and many new technologies such as submersible dredge pumps emerge. Thus, awareness of the newest solutions within dredging is important to identify the best technical solutions.

Every dam site has its own constraints and opportunities when it comes to de-silting and solutions may be very different for e.g. small irrigation dams and for large hydro-power reservoirs

## **2.0. Hydraulic Excavation**

### **2.1. Draw-down Flushing**

Flushing is a technique whereby the flow velocities in a reservoir are increased to such an extent that deposited sediments are re-mobilized and transported through low-level outlets in the dam. For flushing to be successful, in general the ratio of reservoir storage to mean annual flow should not exceed 4%, because with larger storage the reservoir cannot be easily drawn down. Also flushing flows need to pass through the low-level outlet without appreciable backwater; it may not be feasible to use large floods which exceed low-level gate capacity as flushing event.

Two approaches to flushing exist: complete draw-down flushing and partial draw-down flushing. Complete draw-down flushing reservoir is emptied during the flood season), resulting in the creation of river-like flow conditions in the reservoir. Partial draw-down flushing occurs when the reservoir level is drawn down only partially. In this case the sediment transport capacity in the reservoir increases, but usually only enough to allow sediment within the reservoir to be re-located, i.e., sediment is moved from upstream locations in the reservoir basin to locations further downstream and closer to the dam.

### **2.2. Flushing Sediment for Dams in Series**

In flushing sediment through a series of dams, simultaneous flushing can be accomplished by releasing the flushing pulse first from the upstream reservoir. Just before that pulse reaches the next downstream reservoir, its lower level gates are also opened to pass the sediment. After finishing the

sediment flush, the reservoirs are refilled and clear water released from upper level gates to flush the downstream channel of deposited sediment. The basic sequence of operations is to draw down the reservoir water level, maintaining a free-flow state over several hours (the duration being determined by the amount of sediment to be flushed), and then allowing the reservoir water level to recover.

### 2.3. Pressure flushing

This technique is a variant of draw-down flushing, rather than drawing the reservoir down so that it is acting like a river in carrying its sediment load, pressure flushing works only to remove sediment directly upstream of the dam to keep intakes operational. The reservoir level is not lowered, but outlets are opened to remove sediments a short distance upstream of the outlet, creating a cone-shaped area of scour just upstream of the outlet, the scour hole being created in a fraction of the time it would take to refill. However, the scale of sediment removal by this technique is much smaller than with draw-down flushing. Rather, pressure flushing serves to reduce sediment concentrations to the intake and thereby reduce abrasion of hydraulic structures by sediment. To maintain or restore reservoir capacity, pressure flushing is not an effective technique.

## 3.0. Adaptive Strategies

As an alternative to actively handling sediment, the lifetime of reservoirs may be prolonged through other approaches. This must be considered in the feasibility studies of de-silting. A non-exhaustive list of options is described below.

### 3.1. Reconfigure Reservoir Layout

Other than from siltation over the last decades of an ageing reservoir, the hydrological design basis may have altered (e.g. different hydrograph inflow due to climate change, upstream watershed characteristics etc.), and the water resource demands downstream may also have changed considerably.

With new design criteria, consideration of new benefits and new costs (including environmental and social safeguarding costs), definition of minimum requirements, a redesign of the existing reservoir may therefore be considered. With relevant modifications, a conversion of the current layout of the reservoir into a different reservoir (although located at the same place) may be investigated.

Reconfiguration could be by dividing the existing pool into two or more interlinked pools, some possibly off-channel. Pools could serve different purposes (flood control, water supply for irrigation and other, hydro-power, fishery, tourism etc). Each pool will have better steering of sediment processes such as siltation of fine sediment in some pools and coarse sediment in other (upstream) pools. Efficient sediment handling strategies will be devised for each. The overall storage capacity will most likely be less (as existing siltation is still there), but the remaining capacity is better utilised.

A reconfiguration of the reservoir layout and utilisation will be an attempt to convert the design into a life cycle management mode instead of the original finite lifetime mode. Re-establishing a natural long-term balance of sediment considering the need for natural sediment transport processes in the downstream river should be part of this approach.

### 3.2. **Modify Reservoir Structures**

The lifetime of the reservoir may be extended by few passive modifications of the structures in the reservoir or addition of new structures.

Check dams upstream of the reservoir will arrest coarse sediment, which can subsequently be dry excavated. Other guiding structures could be built in parts of the reservoir (or sub-pools) to manipulate the flow pattern and thereby the sediment transport and siltation pattern. Submerged guiding walls could steer the near-bed sediment processes like fluid mud. The elevation of outlets could be increased. Sediment screens could protect inlets. Eddy formations in front of penstocks which cause high suspended sediment concentrations could be arrested by structural measures to reduce coarser abrasive sediment that reaches turbines. Protective coatings of gates, pipelines, and other equipment exposed to scour or abrasion by sediment.

The crest of the dam may be elevated to increase the storage volume, and the elevation of the spillway can be increased and thereby modifying the overall rules of reservoir operation. This will, however, not address the overall siltation issue, but simply extend the lifetime of the reservoir.

### 3.3. **Improve Operational Efficiency**

The efficiency of the storage capacity allocated for different purposes must be considered as an alternative to increase the storage volume. The feasibility of such solutions may be many times more beneficial but may involve participation of other stakeholders also. Examples are provided in the following.

Flood control is usually based on decades-old operating rules. With modern technology and use of low-cost internet-of-things sensor technologies, real-time hydrological data can be collected, processed and used as the backbone of dynamic rule-curves.

The same real-time data technology is applicable for hydro-power production, which may also take other parameters into account in a dynamic multi-criteria optimisation using real-time data of grid demands, electricity spot pricing forecasts, as well as conjunctive use of stored water for multiple purposes (power production during flood prone season, or crop-growth season etc.).

The loss of water in irrigation canal systems (transmission losses), as well as the field efficiency in the command area (equal distribution between fields, use of drip and sprinkler irrigation etc.), and the crop efficiency of water use (crop-per-drop) can in most cases be substantially improved. Examples of water loss of 50-80% are not uncommon in irrigation systems and should be considered as options alongside with desilting reservoirs. Other water-intensive activities drawing water from the reservoir may also be optimised.

### 4.0. **Mechanical Removal of Silt**

During low season (low flow conditions) when the reservoir is dry or marginally filled, silt may be removed from the live storage area and transported to a desired safe location. Though Environmental impact during dry excavation is generally not very high, as dry earth is being removed, it should not contribute to sediment runoff during subsequent rainy/flood conditions. This dumping place should be selected in such a way that neither it becomes a cause of sedimentation of the same reservoir from which the sediment is removed nor cause of deposition in subsequent reservoirs. Further, the temporary approach roads laid for truck movements for silt

removal shall be cleared off on completion of the work as it may affect the flow path of water into the reservoir later.

#### **5.0. Handling of Removed Sediment**

Disposal or use of sediment which is removed from the reservoir is a major consideration which must be investigated thoroughly as part of the feasibility analysis. The characteristics of the sediment: Quantity as well as Quality, must be clarified as part of the long-term sediment monitoring programme as well as additional sediment analysis in connection with de-silting projects. The quality of sediment is related to its physical properties (grain size, density, load-bearing capacity, cohesiveness etc.) as well as chemical and biological properties (toxicity, nutrient contents, metal contents, organic contents, sediment oxygen demand etc.) and determines its environmental impact and potential utilisation. Different options for handling the sediment must be considered for planning de-siltation actions. The available strategies are Disposal of Sediment below Dam, Transport and Disposal Off-channel, filling up old abandoned mineral mines to reduce land subsidence, Redistribute sediment within reservoir, utilisation as resource, etc.

# ANNEXURE-VI

**Suggestive composition of State Technical  
Advisory Committee (TAC) for Techno-economic  
Appraisal of Sediment Management Schemes**

S No	Committee Composition	
1	Principal Secretary(Irrigation/Flood Control/ water Resources)	Chairman
2	Representative of State Finance Department	Member
3	Chief Engineer of CWC of concerned basin	Member
4	Representative from State Environment & Forest Department	Member
5	Member (Technical). Inland Waterways Authority of India and Development Advisor (Ports) MoPSW.	Member
6	Representative from Dept of Mining	Member
7	Representative from District Administration of concerned area	Member
8	Engineer- in-Chief (Flood control/ Water Resources/ Navigation/ Irrigation)	Member
9	Representative from Ministry of Earth Sciences	Member
10	Representative from Building Construction Dept/ Road Construction Dept	Member
11	Regional Officer, MoRTH/NHAI/NHIDCL	Member
12	Member from Downstream State (in case of Inter State implication)	Member
13	Chief Engineer/General Manager (Dam Owner/ Project Authority)	Member Secretary

**Terms of Reference (ToR) of the Committee:**

1. The Committee shall examine the proposal in detail from Technical, Environmental and Financial and social aspects including BC ratio.
2. Committee shall examine details critically and ensure that the proposed works are not repetitive in nature.
3. Source of funding of scheme may be mentioned.
4. Committee shall check the DPR prepared as per guidelines and having all relevant information.
5. Committee may co-opt any member as Special Invitee.
6. Committee shall ensure that works are not broken in pieces to reduce the level of approval.

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सत्यमेव जयते

**Government of India  
Ministry of Jal Shakti  
Department of Water Resources,  
River Development  
and Ganga Rejuvenation**

# **National Framework for Sediment Management**



राहुल कुमार

## VAKALATNAMA

BEFORE THE HONORABLE NATIONAL GREEN TRIBUNAL  
EASTERN ZONE ; KOLKATA BENCH  
ORIGINAL APPLICATION NO. \_\_\_\_\_ OF 2025/EZ

In the Matter of :

Rahul Kumar

..Applicant

Vs

The District Magistrate, Banka & Ors.

..Respondents

KNOW ALL MEN by these presents that I, Rahul Kumar, son of Vishwanath Das, having its address at Village - Manjira, PO - Manjira Thana, Banka, Bihar - 813 102 the Applicant herein do hereby in my/our name to appoint Ms. Roma Singh, Advocate as my true and lawful Pleader/Advocate & Attorneys to appear and act for me/us in the matter noted above to file suit, written statement, conduct suit, appeal from original suit, order etc., And for that purpose to do all acts and things, whatsoever in that connection including compromise of the above matter depositing in or withdrawing money from, filing or taking out of appear, document and payment order from Court referring matters in dispute between the parties here to arbitration, withdrawing the above matters with liberty to file fresh suit, sending properties released from attachment, filing execution or miscellaneous cases and other petitions, bidding at execution sale, obtaining payment from us out of Court withdrawing custody and other fees and doing on my/our behalf other acts, in the above matter as are necessary and proper. I/We hereby agreeing to ratify and confirm all acts so done by the said advocate or attorneys as my/our own acts and as if done by me/us to all intents and purposes.

Dated the 15<sup>th</sup> day of April, 2025

Received and accepted by me

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