

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT
AND
ENVIRONMENTAL MANAGEMENT PLAN
OF
SAND MINING PROJECT ON CHANAN RIVER
BLOCK NO – 06 SAND GHAT, DISTRICT - BANKA**

SAND BLOCK	BLOCK 06
PROPOSAL NO	SIA/BR/MIN/414000/2023
TOR NO	SIA/1(a)/ 2315/2023
AREA	34.0 HA
PRODUCTION	612000 CUM/YEAR or 1083240 TPA
LOCATION	Mauja – Jitarpur, Anchal- Banka, District- Banka, (Bihar)

APPLICANT

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Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

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SL NO.	ANNEXURE
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ABBREVIATIONS

AAQ	Ambient Air Quality
bgl	Below Ground Level
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
CSR	Corporate Social Responsibility
dB	Decibel
DO	Dissolved Oxygen
EAC	Expert Appraisal Committee
EIA	Environmental Impact Assessment
EMC	Environmental Management Cell
EMP	Environment Management Plan
EPA	The Environment Protection Act
GLC	Ground Level Concentration
Ha	Hectare
Ham	Hectare Meter
HFL	High Flood Level
KLD	Kilo litre Per Day
Km	Kilo Meter
Leq	Equivalent Noise Level
LFL	Low Flood Level
LOS	Level of Service
MoEF	Ministry of Environment and Forest & Climate Change
NABET	National Accreditation Board for Education and Training
NGO	Non Governmental Organisation
NH	National Highway
NOC	No Objection Certificate
OSHA	Occupational Safety and Health Administration
PCU	Passenger Car Unit
PM	Particulate Matter
PUC	Pollution Under Control
QCI	Quality Council of India
R & R	Rehabilitation & Resettlement
RBM	River Bed Material
RL	Reduced Level
SEAC	State Expert Appraisal Committee
SH	State Highway
SPCB	State Pollution Control Board
T/cum	Tons Per Cubic Meter
TKN	Total Kjeldahl Nitrogen
TOR	Term of Reference
TPA	Tonnes Per Annum
UNFC	United Nations Framework Classification
VWG	Village Working Group

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1.0 PURPOSE OF THE REPORT

Environment Impact Assessment (EIA) is a process used to identify the environmental, social & economic impacts of a project prior to decision making. It aims to predict environmental impacts at an early stage of project planning & design, find ways & means to reduce adverse impacts. By using EIA, we can decide the suitable mitigation measures for implementation to maintain healthy working environment and contain pollution within permissible limits.

River plays an important role in the lives of the people. The river systems provide irrigation, potable water, transportation, electricity, and the livelihoods for a large number of people all over the country and to rural areas. Apart from this, river is also a good source of construction grade material as sand & gravel.

As transportation and construction infrastructure expanded since last few decades, the demand for construction grade sand also increased exponentially. The market demand of river sand is high throughout the nation. Sand is extracted directly from the river channel and it doesn't require processing other than size grading. But it is now well understood that continued and indiscriminate sand mining can cause serious environmental impacts, particularly if the river being mined is eroded.

Environmental Impact Assessment is one of the proven management tools for integrating environmental concerns in development process and for improved decision making as there is a need to harmonize the developmental activities with the environmental concerns into the larger interest of the society. The growing awareness, over the years, on environmental protection and sustainable development, has given further emphasis to the implementation of sound environmental management practices for mitigating adverse impacts from developmental activities. EIA study plays a vital role in sustainable development of a country. Recognizing its importance, the Ministry of Environment and Forest, Government of India had formulated policies and procedures governing the industrial and other developmental activities to prevent indiscriminate exploitation of natural resources and to promote integration of environmental concern in project development.

Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR)

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received from SEIAA, Bihar under EIA notification of the MoEF & CC dated 14th September, 2006 and its subsequent amendment there-off and also the EIA Guidance Manual for Mining of Minerals of MoEF & CC, Govt. of India, for seeking environmental clearance for mining of Sand in the applied mining lease area.

1.1 IDENTIFICATION OF PROJECT, PROJECT PROPONENT

The Proposed Sand Mining Project is located on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

The Proposed Production is 612000 Cum/Year or 1083240 Tonnes per annum and Area of the project site is 34.0 ha.

As per the Director of Geology, Bihar, the modification of mining plan has been approved .As per EIA notification 2016 and subsequent amendments, the project is coming under category ‘**B**’ (**B1**) and the lease area is more than 5.0 Ha, approved Mining Plan, Pre-feasibility Report and EMP are required for Environment Clearance in respect of the said quarry lease. Copy of letter is enclosed as **Annexure No. II.**

The proposed project is of River bed sand mining and falls under Category- “B1” as per EIA Notification 2006 and its subsequent amendments by Ministry of Environment Forests & Climate Change, GOI.

The details of the project are given below:

Name & Address of the Mine	Block 06	Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).
River	Chanan	
Mineral	Sand	
Area (ha)	Block 06	34.0 ha
Production	Block 06	612000 Cum/Year or 1083240 TPA

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Postal Address	Block 06	Shri Anil Singh M/s Maihar Developers Add. – Flat no. – 902A, Wasundhra Garden, Bariyatu, Moabadi, Dist. Ranchi Jharkhand - 834008
Status of Mine	Fresh application for Environmental Clearance.	
Project Cost	RS- 10,61,80,000/-	
CER Cost	CER cost will be 2% of the total project cost. This amount will be used for social welfare. CER COST is 10,61,80,000/-x 2% = Rs. 21,23,600/-	

1.2 BRIEF DESCRIPTION OF PROJECT

The proposed project is open cast semi-mechanized mining of sand with a proposed production of 1083240 TPA for applied lease. Detail has been given below:

The proposed project is over an area 34.0 ha. Details are summarized in Table no 1.1

As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as **Category ‘B-1’**. The estimated project cost for the proposed project is **given below:** (including auction cost)

Table: 1.1 Project cost & Production

Sand Ghat Block	Area (Ha.)	Khata No /Khasra No	Production	Auction Cost
Block 06	34.0	Khata No.- 231, Khasra No.- 548	1083240 TPA	10,09,80,000/-
Total			1083240 TPA	10,09,80,000/-

The proposed mining lease area falls in Survey of India Toposheet 72L/13 & 72P/01. The mine lease co-ordinates and connectivity details are listed below:

Table: 1.2 Mine lease Pillar Co-ordinates (Block 06)

Pillar	Geo Coordinate	
A	24°51'39.49"N	86°55'56.42"E

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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

10 KM BUFFER MAP OF THE STUDY AREA

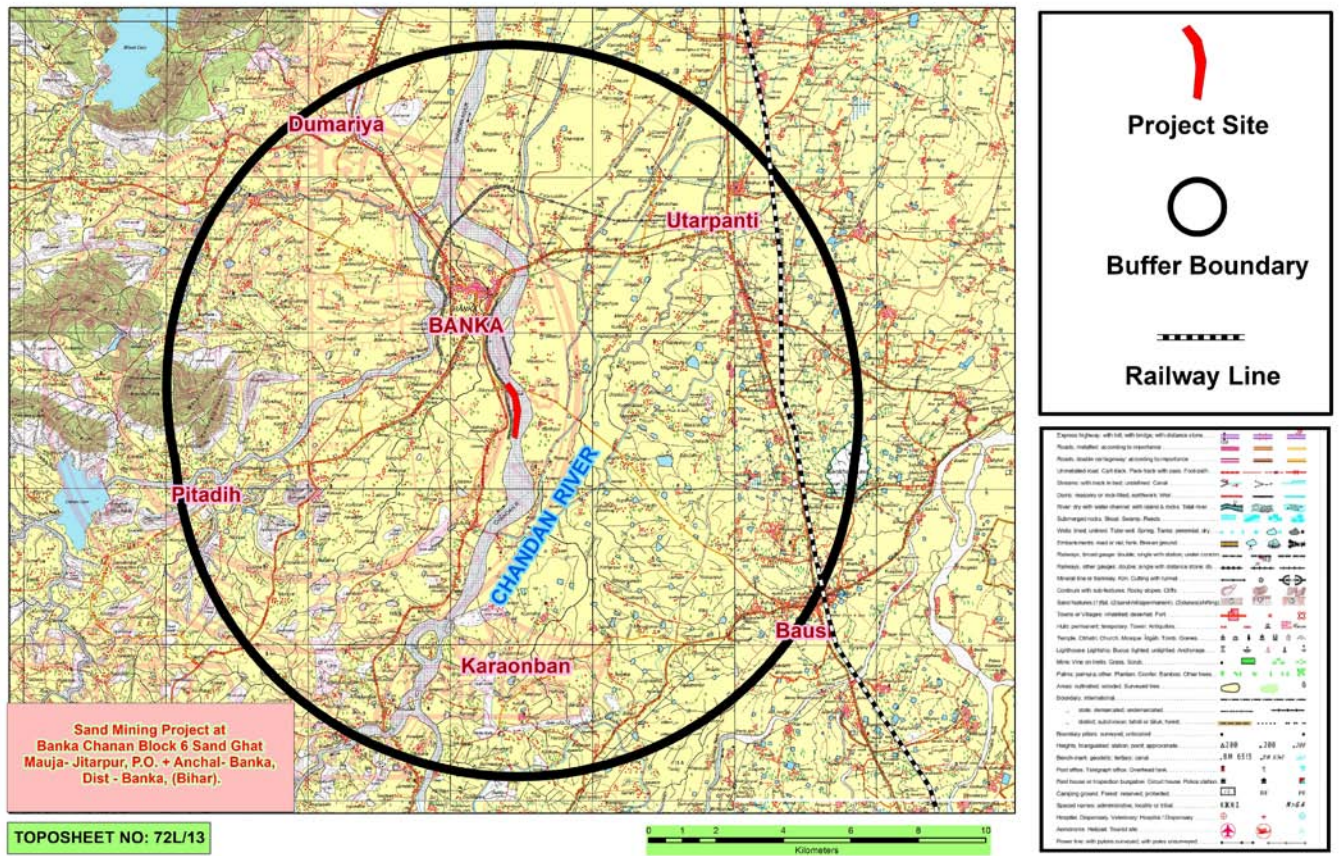


Figure 1.1, 10 km buffer map

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Table: 1.3, Connectivity Details given below

Nearest Habitation/ town	Blocks	Village	Distance (Km) Direction
	Block 06	Lakhaundi Maheshadih, Jitwarpur, Banka	approx.0.49 Km in E direction. approx.0.50 Km in W direction. approx.0.20 Km in W direction. approx.3.0 Km in NW direction.
Nearest Railway Station	Blocks	Railway Station	Distance (Km) Direction
	Block 06	Banka Railway Station	Banka Railway station, approx. 2.10 km towards NW direction.
Nearest Airport	Blocks	Airport	Distance (Km) Direction
	Block 06	Deoghar Airport	Deoghar Airport, approx. 51.0 km towards SW direction.
Nearest Highway	NH-333A, Approx. 1.8 Km towards NW direction. SH-25, Approx.3.0 Km in NW direction.		

1.3 Details of environmental settings

Sl. No.	Particulars	Details
1	Ecological Sensitive Areas (National Park, Wildlife Sanctuaries)	There is no any Ecological Sensitive Areas Like National Park, Wildlife Sanctuaries, etc are found within 10 km of the study area.
2	Nearest water body	The mine site lies on the dry bed of Chanan river.

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3	Seismic Zone	Zone- IV <i>Source</i> <i>BMTC</i> <i>2nd</i> <i>edition</i> https://www.bmtpc.org/disaster%20resistnace%20technolgies/ZONE%20I%20V.htm
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The EIA-EMP report is prepared as per the TOR granted under the EIA Notification. In order to assess the impact on environment due to proposed mine, it is necessary to ascertain present status of environment prevailing at the project site and identification and assessment of impacts on the environment of the proposed operation.

Project's importance to the country and the region

Sands are ubiquitous material; available everywhere and is being used from the time immemorial for wide applications in our daily life; infrastructures, building construction, highways, roads, townships, multiplexes, foundations of buildings and industrial units etc. and is an integral part of development. Life without sand is unthinkable. Over the millennia, the weathering effect, the flow of water at high velocities in rivers and the pressure of water from the high mountainous reservoirs converted and pushed the hard ground underneath into sands, etc. which travelled as sediments with the flow. This sand got deposited along the river course wherever conditions were favorable. In the deep past this settled sand was not extracted in a quantity in which it deposited; since due to less population the requirements was not enough. As a result of continuous deposit of sand , the rivers went on changing their course, widening by itself, eroding the fields and expanding, resulting in flooding, inundation and breaking their banks, causing devastation of property and loss of life. There has been a severe impact on every aspect of the environment. The rivers thus, needed channelization and therefore, extraction of these minor minerals through mining was expedient. The haphazard mining of sands being practiced now for long, through unregulated, uncontrolled and illegal way added almost an irreversible damage to the environment, which became a cause of serious concern to everyone. Though sands are very important mineral source for development, its mining through scientific methods has also become equally imperative.

It is for this purpose that 'mining plan' is being drawn so that all its aspects are taken care of justifiably, according to law, protecting the environment, removing all adverse impacts and creating a

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direct and indirect employment opportunities, improving socio-economic conditions of the local inhabitants and all-around status of life, achieving thereby a sustainable development.

Besides the above, the process of mining of minor minerals (Sand) is a constant source of revenue generation to the State Government through Royalty.

1.4 SCOPE OF THE STUDY

The project proposal was submitted to State Level Environment Impact Assessment Authority-Bihar for its appraisal. Based on which, presentation was held for Terms of Reference (TOR). Based on the data provided and presentation made, the SEIAA-Bihar has issued the Terms of Reference attached as **Annexure-1**.

Followings are the point wise compliance of the ToR provided by the SEIAA Bihar.

**Table: 1.5 Point wise compliance for TOR of Block -06
(ToR File No- SIA/1(a)/ 2315/2023)**

S. No	TOR	Compliance	Reference in the Report
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	This is fresh LOI, Mine is yet to be opened. It will open only after getting environmental clearance.	--
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	State Govt. has given consent for mining vide letter no. 2096/khanan dated. 02.12.2022	Annexure II, LOI

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<p>3</p>	<p>All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.</p>	<p>The documents including mine plan and EIA report submitted are compatible with one another w.r.t. to following information:</p> <p>Mining Lease Area- 34.0 Hectare</p> <p>Lessee: Shri Anil Singh, M/s Maihar Developers Add. – Flat no. – 902A, Wasundhra Garden, Bariyatu, Moabadi, Dist. Ranchi Jharkhand - 834008</p> <p>Waste generation-</p> <p>No waste will be generated.</p> <p>Mining Method-Opencast semi-mechanized method</p>	<p>Annexure- III</p> <p>Mine plan</p> <p>All details has been complied in chapter-2</p>
<p>4</p>	<p>All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery /toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).</p>	<p>All Corner Coordinates of mining lease area superimposed on Toposheet Map has been incorporated in EIA/EMP Report.</p>	<p>Refer Chapter 2</p> <p>Fig: 2.1, Corner Coordinates map</p>
<p>5</p>	<p>Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water</p>	<p>The land use map showing salient features of the area is given in the report.</p> <p>The geological map of the mine lease area is also given in the</p>	<p>Land-use of the study area Figure 3.1.</p>

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	bodies, streams and rivers and soil characteristics.	report showing geomorphology	
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The Lease area is dry part of River bed. This is a barren land. The mining process will be done by land use policy of the State & no land diversion has been proposed.	Chapter II & III
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating processes /procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions?. The hierarchical system or administrative order of the company to deal with the environmental issues and for insuring compliances with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA	Yes, the proponent Company has a well laid down Environment Policy. The hierarchical system or administrative order of the company has been given in the EIA report.	Chapter VIII Section 8.1 Corporate Environment Policy

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	Report.		
8	Issues relating to Mine safety ,including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	Issue related to mine safety has been given in of chapter 7.	
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine/lease period.	The 10 km zone from periphery of the lease has been considered as the study area. The Buffer map of the study area is attached with report. All the details in the EIA report are for the life of the mine period. The details of mining & production have been given in the report.	Chapter I Figure 1.1
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass	Land use pattern of 10 km from the periphery of the lease area has been prepared and incorporated with the report. The study area lies in Chanan River. There is no any Wild Life sanctuary & National Park,	Land-use of the study area Figure 3.1 , Table 3.1 10 km buffer map enclosed in Chapter I of EIA Report.

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	preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	protected forest within the study area.	
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use ,R&R Issues, if any, should be given.	There is no overburden outside the mine lease area.	
12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	There is no forest land within the lease area.	---

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13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and Compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	No forest land is involved in the lease area, therefore, deposition of net present value (NPV) and compensated Afforestation is not indicated.	
14	Implementation status of recognition of forest rights under the schedule tribes and other traditional forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated"	There is no forest land involved in the leased out area. Hence, this act is not applicable for this project.	
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given	There is no any Ecological Sensitive Areas Like National Park, Wildlife Sanctuaries, etc are found within 10 km of the study area. However, the vegetation details of the study area are incorporated with the report.	Chapter III Section 3.1.6 Biological Environment
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost	The details Impacts & there mitigation measures are given in chapter IV of EIA/EMP Report.	Chapter IV

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	implications and submitted.		
17	<p>Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger / Elephant Reserves / (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.</p>	<p>No National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger / Elephant Reserves / (existing as well as proposed) are found within 10 km of the study area.</p> <p>MAP showing eco sensitive zone is attached in Chapter III (Fig 3.4)</p>	<p>Chapter III</p> <p>Section 3.1.6</p> <p>Biological Environment</p>
18	<p>A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their</p>	<p>Detailed biological study of core zone and buffer zone within 10 km radius of the periphery of the mine lease has been carried out for the project. The same has been incorporated in the report</p>	<p>Chapter III</p> <p>Section 3.1.6</p> <p>Biological Environment</p>

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	conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.		
19	Proximity to Areas declared as ‘Critically Polluted’ or the Project areas attracting court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.	Proposed project does not come under critically polluted area.	
20	Similarly, for coastal projects ,A CRZ map duly authenticated by one of the authorized agencies demarcating LTL.HTL, CRZ area ,location of the mine lease w.r.t CRZ, Coastal features such as mangroves ,if any should be furnished.(Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)	There is no R & R involved in this project.	

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21	<p>R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.</p>	<p>There is no R & R involved in this project.</p>	
22	<p>One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna</p>	<p>Base line study was carried out for Pre Monsoon season March 2023 -May 2023 Details are provided in EIA/EMP Report. The locations of the monitoring stations were decided on the basis of prevailing meteorological conditions</p>	<p>Chapter III Section 3.1.2 Air Environment</p>

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	<p>shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report" Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the predominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.</p>	<p>(Wind direction & wind speed) of the study area.</p> <p>The wind rose has been given in chapter III of EIA/EMP Report. One location has been selected in downwind direction within 500 m from the lease boundary.</p> <p>The location of the monitoring sites has been shown in map.</p>	
<p>23</p>	<p>Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing</p>	<p>A detailed study on Air quality modeling will be incorporated at the time of FEIA.</p>	

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	pre-dominant wind direction may also be indicated on the map.		
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	The water requirement for Sand Block 06 is 4.0 KLD for drinking, dust suppression and green belt development. A detailed water balance is being provided in the report.	Chapter –II Section 2.7.4 Water Requirement
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water requirement will be fulfilled by private water tanker. So, no clearance is required.	Chapter II
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the project, if any required should be provided.	The project do not consume any process water except for drinking, dust suppression & plantation. Plantation is proposed, which will increase the water holding capacity & help in recharging of ground water. No artificial rainwater harvesting is proposed for the present project in lease area, however if any such project proposed by State Government PP will help out for the above.	
27	Impact of the Project on the water quality, both surface and groundwater,	Mining activity will be done on Dry Bed of River so there is no	Chapter II

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	should be assessed and necessary safeguard measures, if any required, should be provided".	impact on surface water. Mining will be up to 3 m below ground level or above the ground water table whichever comes first. This will not intersect the ground water table.	
28	Based on actual monitored data , it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter – alia,shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	The mining will be done only upto 3.0 m depth. The detailed impact and control measure w.r.t the quality of water in the surrounding area is discussed under Chapter 4.	
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	The project site lies on Chanan River. No diversion is proposed.	
30	Information on site elevation, working	The mining will be done as per	

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	the approved mining plan and 3 meter bgl whichever is comes first.	
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and Quantities coverage, plant species and time frame) and Submitted keeping in mind the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Plantation/afforestation will be done as per program i.e along the road sides and near civic amenities, as per mine plan. Post plantation, the area will be regularly monitored in every season for evaluation of success rate. List of Plant species selected for green belt is detailed in the EIA report. The plant species selected for green belt have a greater ecological value and are of good utility value to the local population. The plant species are selected by giving emphasis on local and native species and the species which are tolerant to pollution	Chapter VIII Section 8.2
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the	The projection has been done based on the mineral transportation. The details of traffic analysis	Chapter IV Section 4.6 Traffic Analysis Fig 4.2, Table

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	are discussed in the report.	4.3(i), 4.3(ii)
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report	A temporary rest shelter will be provided for the workers near to the site with provisions of water, first aid facility, protective equipments, etc. Details are given in the EIA/EMP Report.	Chapter II Section 2.12.2
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections)should be given in the EIA report.	Conceptual plans and Sections are given in Chapter 2.	
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should	Occupational health impact mainly is expected due air pollution due to fugitive dust emission because of movement of vehicles. However appropriate mitigation measures	Chapter VII Section 7.2 Chapter VIII

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	<p>be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.</p>	<p>for air pollution control have been given in the report, discussed in Chapter-4.</p> <p>Each labour will undergo pre-placement medical examination. Thereafter periodical health check up will be arranged as stated in the report.</p> <p>About 4.0 lakh for each lease for cluster situation has been earmarked for occupational health.</p>	<p>Section 8.3</p>
36	<p>Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.</p>	<p>The proposed project being a small scale semi-mechanized mining project, there will be hardly any process related health implication on the population of the nearby villages except fugitive dust emissions due to transportation. Budgetary allocation is given in Chapter-VIII.</p>	<p>Chapter VII</p> <p>Section 7.2</p> <p>Chapter VIII</p> <p>Section 8.3</p>
37	<p>Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given</p>	<p>Socio-economic significance provided to the local community i.e. to the nearby villagers is given in the EIA/EMP Report.</p>	<p>Chapter VI</p> <p>Section 6.4</p> <p>Chapter VII</p> <p>Section 7.2</p>

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	with time to time for implementation.								
38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project	The detailed environmental management plan to mitigate the environmental impacts has been mentioned in of the EIA/EMP Report.	Chapter VIII						
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	This is a draft EIA report. Public hearing is yet to be conducted.	--						
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending against the project.							
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The capital cost & recurring cost for has been earmarked for EMP. Chapter IX <table border="1" data-bbox="792 1566 1221 1703"> <thead> <tr> <th>Block</th> <th>Capital Cost</th> <th>Recurring Cost</th> </tr> </thead> <tbody> <tr> <td>Block 06</td> <td>4.15 Lakh</td> <td>5.5 lakh</td> </tr> </tbody> </table>	Block	Capital Cost	Recurring Cost	Block 06	4.15 Lakh	5.5 lakh	Chapter IX
Block	Capital Cost	Recurring Cost							
Block 06	4.15 Lakh	5.5 lakh							
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report".	A Disaster management Plan has been given in EIA report.	Chapter VI						

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	2% of the total cost of the project has been earmarked towards the Enterprise Social Commitment which will be used for the development of village.	
44	Besides the above, the below mentioned general points are also to be followed:-		
a	All documents to be properly referenced with index and continuous page numberings.	All the documents to be properly referenced with index and continuous page numbering.	
b	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	Compiled With EIA report.	
c	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.	Compiled With EIA report.	
d	Where the documents provided are in a language other than English, an English translation should be provided.	Compiled With EIA report.	

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

e	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Compiled With EIA report.	
f	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Compiled With EIA report.	
g	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	Agreed	

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

h	As per the circular no. J-11011/618/2010-IA. II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	This is new case for Mining. No certified compliance is required.	
i	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Compiled With EIA report.	

ADDITIONAL TERMS OF REFERENCE

1	Submit a report based on cumulative assessment of increase in air pollutants due to increase in traffic load in view of proposed mining activities on all the roads located within aerial distance of 10 km using suitable air model.	ISCST3 modelling will be submitted with Final EIA report.	
2	If the proposed mining lease is overlapping with the previously	No mining lease is overlapping with the previously allotted	

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	allotted mining lease or already working or worked out mining lease the same must be clearly shown on the map. The details about quantity of sand extracted from overlapped area should be furnished duly certified from the concerned District Mining Officer.	mining lease.	
3	The Satellite imageries (high resolution) of last three years in succession for summer, rainy and winter seasons of each proposed mining lease must be submitted.	Noted it will be submitted with Final EIA report. Traffic plan has been discussed in Chapter-4.	
4	A map on appropriate scale to show extraction paths to be used outside the mining lease boundary to approach major public roads (Rural/District road or State/National Highway). Alternatives route be explored if extraction path is passing through dense population/human settlements. Also, submit a cumulative traffic management plan for the cluster sand mining proposal.	Alternative route has been examined and has been discussed in chapter-4.	Figure 4.1 & Figure 4.2 of Chapter-4.
6	Submit a map of the area falling within a map of the area falling within 2.5 km radius from boundary of each mining lease showing all man-made public utility features such as bridge/public civil structures (including water intake	Noted it will be submitted with Final EIA report.	

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	points), culverts etc. and highways, and a table showing distance of the above mentioned man-made features from the mining lease boundary to facilitate decision making pertaining to relevant rules/Guidelines.		
6.	A report of the cumulative EIA/EMP study for the cluster sand mining blocks of the proposed mining site.	The proposed mining site does not fall in cluster situation.	

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

2.0 TYPE OF PROJECT

The project is proposed is for sand Ghat block no-06 for the excavation of sand from the bed of river Chanan. The proposed project is opencast semi-mechanized/OTFM mining project.

2.1 NEED FOR THE PROJECT

The project site lies on Chanan River. The river get recharged by the rain water and carries sediment consisting of sand etc during monsoon season, generally.

Sand is used widely in the construction industry. It is usually mixed with cement and other ingredients to create mortar for building. It is also used in agriculture, as sandy soils are ideal for crops such as watermelons, peaches and peanuts. Sand is also used in Aquaria as it makes a low cost aquarium base material. This project will also provide employment to local people helping them earn livelihood.

2.2 LOCATION DETAILS

The Proposed Sand Mining Project is located on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

The Proposed Production is 612000 Cum/Year or 1083240 TPA and Area of the project site is 34.0 ha.

As per the Director of Geology, Bihar, the modification of mining plan has been approved .As per EIA notification 2016 and subsequent amendments, the project is coming under category 'B' (B1) and the lease area is more than 5.0 Ha, approved Mining Plan, Pre-feasibility Report and EMP are required for Environment Clearance in respect of the said quarry lease. Copy of letter is enclosed as Annexure No. II.

The proposed project is of River bed sand mining and falls under Category- "B1" as per EIA Notification 2006 and its subsequent amendments by Ministry of Environment Forests & Climate Change, GOI.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Geo Coordinate of Lease Area:

Table 2.1, Mine lease Pillar Co-ordinates (Block 06)

Pillar	Geo Coordinate	
A	24°51'39.49"N	86°55'56.42"E
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

Chanan Block 06 Sand Ghat is well connected by NH 333A, Approx. 1.8 Km towards NW direction. SH 25 approx.3.0 Km in NW direction.

PILLAR CO-ORDINATES MAP OF THE STUDY AREA

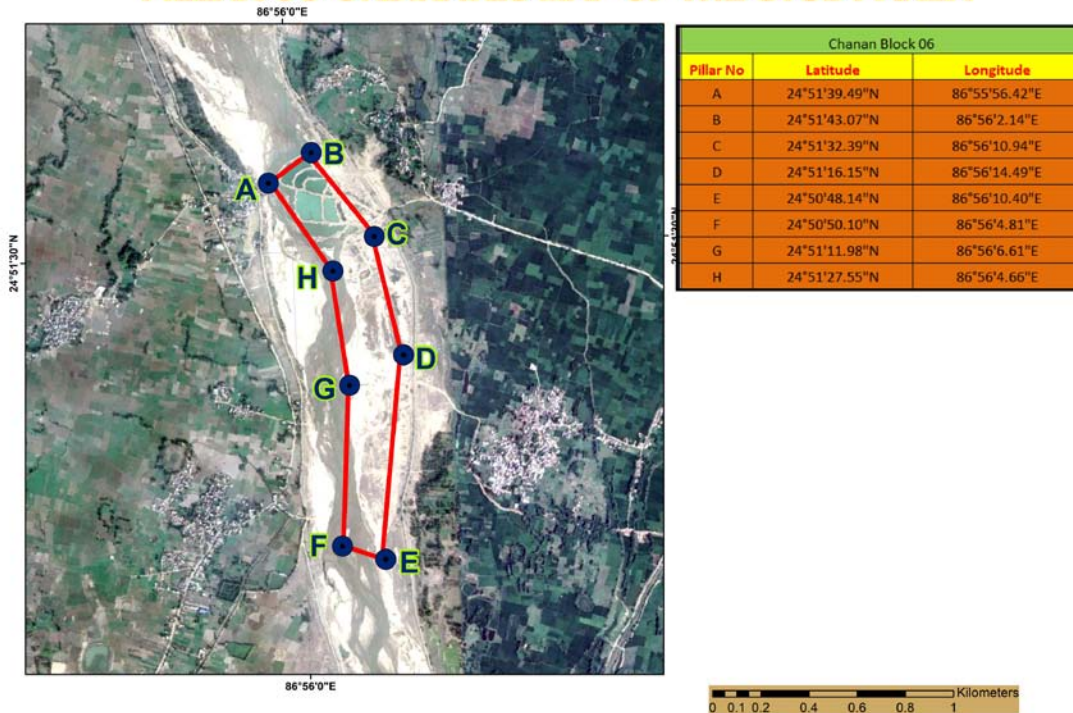


Figure 2.1:- Pillar Coordinate Map of Block 06

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

2.2.1 Lease / Block Area

The proposed project is Open Cast Semi-Mechanized Mining of Sand with a proposed production is given below in tabular form.

Sand Ghat Block	Area	Khata No /Khasra No	Production	Auction Cost
Block 06	34.0	Khata No.- 231, Khasra No.- 548	1083240 TPA	10,09,80,000/-
Total			1083240 TPA	10,09,80,000/-

As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as Category ‘B-1’. The estimated project cost for the proposed project is given in above table.

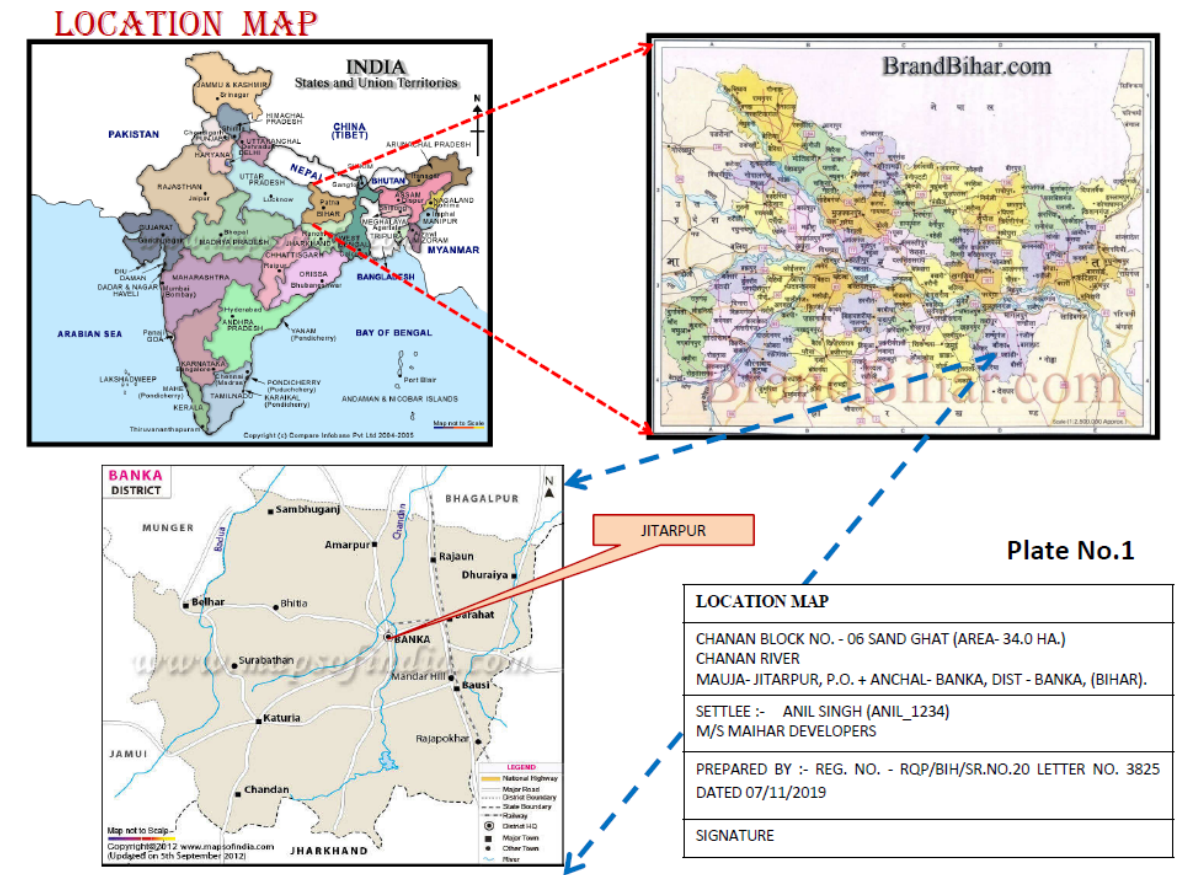


Figure 2.2:- Location map of the project site Block 06

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

2.3 TOPOGRAPHY & GEOLOGY

2.3.1 Topography

Banka district was a sub-division of erstwhile Bhagalpur district and was upgraded into a full fledged district on 21st February, 1991. The district lies between north latitude 24°30'0" to 25°07'0" and east longitude 86°30'00" to 87°12'00". It covers a parts the degree sheet number 72K, 72O, 72L and 72P of Survey of India. The geographical area of the district is 3019.5 km². It's district Headquarter is in Banka town. The district is bounded in the north by Bhagalpur, in the south by Deoghar, in the east by Godda, in the west by Jamui, in the NW by Munger and in the southeast by Dumka districts. The district is having population density 533 person/km² and the decadal growth rate of the last decade (1991-2001) is 24.47%. The population of schedule tribes and schedule caste are 4.7% and 12.43% of the total population respectively. There are two statutory towns namely Banka and Amarapur. The most populous block is Dhuraiya and the least populous is Phulidumar.

The Banka district lies in south of the river Ganga and constitutes a part of the Ganga River Basin. It falls under Badua –Chandan sub-basin. It has three watershed, namely Badua Nala, Chandan river watershed and the left bank watershed of Burigeria Nala & on the eastern side Odhni & Sukhniya drainages. The major part of the district falls under Chandan river watershed.

The area constitute almost alluvial plain without any conspicuous topographical features & forms a part of the vast Indo-Gangetic Plain. the elevation of the area above mean sea level ranges from 66 ASML on the north to 110 ASML in the south with an average elevation of 88 ASML. The general slope of the area is towards north ward.

Five major rivers/nalas, namely Badua N. (forming the north western boundary), Chandan R. which flows through the central part of the district and the Odhni & Sukhniya (forming the eastern boundary of the district) drains the area. All the five rivers/nalas originate from the hilly tracks present in the south of the district and flows from south to north direction. The streams namely Kudar, Orni, Panchkatia & Cheer are the main tributaries of Chandan, while Lohargara, Karunior, Belharna are the main tributaries of Badua. All the rivers are ephemeral in nature.

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

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

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

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

Source: Mining plan

2.3.2 GEOMORPHOLOGY

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. 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 characterized by deeply oxidized yellow to brownish red clay with ferruginous concretions.
- 4) Pedi plain Surface: The surface borders the northern margin of the district. These rocky units are essentially produced by the erosional process. The surface has developed

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

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: Mining plan

2.3.3 REGIONAL GEOLOGY

Regional Geology

Geologically, it represents nearly two third of Bihar is under cover of Ganga basin composed of alluvium and masks the nature of basement rocks.

Table 2.2. Showing the Geological Succession and their geographic distribution

Age	Geology	Occurrences
Quaternary	Alluvial Deposits (Sand, Clay, Silt, Fragments)	North Bihar Plain & Central Bihar Plain
Tertiary	Sand Stones & Clay Stones	North Champaran Hills
Gondwana	Coal Measures, Forming a series of Small outlier basins	Banka District
Vindhyan	Sandstones, Shales, Limestones, etc.	Parts of Bahbhua and Rohtas dist
Satpura	Schist, Phyllite, Quartzite	Part of Aurangabad, Gaya, Nawada, Nalanda, Sheikhpura and Munger District
Proterozoic	Mica Schist, amphibolites, quartzite, granite, dolerite and pegmatite	Nawada, Jamui and Banka
Archaean	Gneisses, Granites, Schists, Phyllites, quartzite, amphibolites & intrusive all metamorphosed sedimentary and igneous rocks	Part of Aurangabad, Gaya, Nawada, Jamui, Banka and Bhagalpur

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

2.3.4 LOCAL GEOLOGY OF THE AREA

The sand exposed in the River bed of Chandan, Badua, Odhni, Sukhniya & Cheer and surrounding areas is the product of the deposition of the sediments brought and deposited in the flood plains of River Ganga. These sediments are of recent geological formation. The litho-units exposed within the river and surrounding areas have formed as water borne sediments brought by flood water during rainy season every year and deposited in riverbed.

The litho units encountered in the riverbed and surrounding areas belongs to the Shivalik super groups. The size of the sediments towards the source i.e. host rock is coarse and at the tale end of the river the grain size is reduced to smaller sizes resulted in the formation of clay beds.

Sand and silt are deposited in the middle of the river whereas fine sand and soil are deposited at the fringe of the riverbanks.

Soil/ alluvium varying in thickness from 0.20m to 0.60m m constitute the top horizons in the area suitable for agriculture. River Ganga meanders through the area exposing the alluvium and soil at the banks. Sand is found in the river bed upto a depth of more than 3.0 m. The major part of bed remains dry as water flows in a single stream during the non-monsoon seasons. Only during rainy seasons the entire flood plain has water, when there will be no mining done.

Source: Mining Plan

2.3.5 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.

Source http://cgwb.gov.in/district_profile/Bihar/banka.pdf

2.4 GEOLOGICAL RESERVE

The geological reserves have been each stretches & for individual blocks. Geological reserves have been completed through cross sectional area method. The area of each section line is multiplied by strike influence to get the volume.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Proved Mineral Reserves (111): All quantities of sand occurring up to depth of 3m from surface has been considered as proved reserves.

Table-2.3:- Proved Mineral Reserves Block 06

Classification	Code	Quantity of Sand
A)Mineral Reserves		Cum
1)Proved Mineral Reserve	111	1020000
Total		1020000

Replenished quantity of sand = 1020000 cum. or 1805400 tonnes.

Source Mining Plan

2.4.1 Mineable Reserves:

Mineable reserves have been computed up to 3m depth from surface. Benches having height 1.5m & width 6.0m drawn from the ultimate pit limit. Area of each benches have been calculated multiplied by strike influence to get the volume. The volume multiplied by bulk density (1.77 g/cm³) to get the tonnage.

The minerals excavated from the river bed will be replenished gradually during the monsoon season every year. And the area pertaining to paleo channels of the river will be leveled & restored back.

Table-2.4:- Summary of minable reserves of Chanan 06 Sand Ghat as below (the bulk density multiply by 1.77)

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
88-86.5	1656	188	1.5	466992	826576
86.5-85	1646	178	1.5	439482	777884
Total				906474	1604459

Total Mineable Reserve = 906474 CUM or 1604459 Tonnes

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Table-2.5:- Classification Mineral Reserves

Sand Ghat	Area (Hect)	Geological Reserves (m3)	Mineable Reserves (m3)	Annual Permitted Reserve As per LoI (m3)
Chanan Block No. - 06	34.0	1020000	906474	612000

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

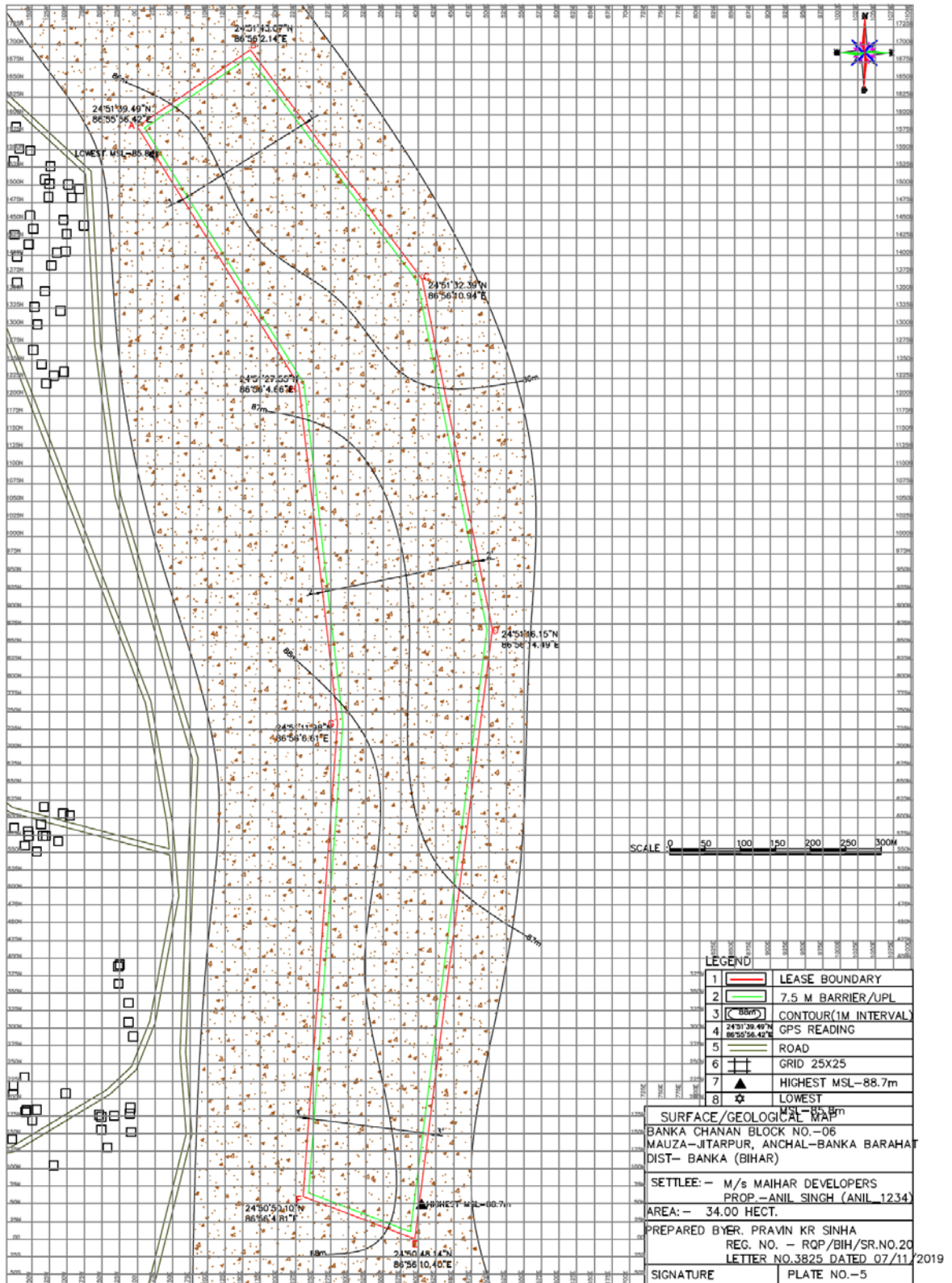


Figure 2.3:- Surface cum Geological Section of Block 06

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

2.4.2 Type Of Mining

- Mining will be done as per the guidelines of Bihar Mineral (Concession Prevention of illegal Mining Transportation & Storage) Rules, 2019.
- This is an open-cast mining project. The operation will be semi-mechanized/OTFM with use of excavators/JCBs truck /tractors combination or Manually etc. The sand will be collected in its existing form.
- Sand Mining will be carried out only upto a depth of 3 m bgl or above ground water level (whichever is less), for river bed block.
- No drilling /blasting are required as the material is loose in nature.
- Proper benching of 1.5 m height and 6m width will be maintained for mining blocks as per guideline M.M.R-2019, under rule 115(1).
- Mining will be done only during the day time and completely stopped during the monsoon season.

2.4.3 Year Wise Production Schedule:

The bench wise annual exploitation of sand from Chanan Block 06 Sand Ghat are given below :-

Table 2.6: Year wise Production Details of Chanan Block 06

YEAR	ROM sand (cum)
1 st Year	612000
2 nd Year	612000
3 rd Year	612000
4 th Year	612000
5 th Year	612000
Total	30,60,000

The annual extractable RBM comes to **612000 CUM or 1083240 Tonnes**. It will be replenished after rainy season every year.

Source: Mining Plan

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

2.5 Conceptual Mining Plan

Mine Applied Area will be worked for Chanan block No. – 06 Sand Ghat. However, as the digging depth will be restricted to 3.0 m only. This will be further replenished during rainy season. Sand Ghat will be worked systematically as the width is limited while length is much more. As the lease period is only 5 (Five) years, some of the area will be left un-worked at the end of lease period.

(i) Final Slope Angle to Be Adopted: Height of the bench is limited to 1.5 m while width of individual bench shall be kept 6.0m. River bank side will be protected by working in dry part of the river and by leaving safety distance of the width of the river of 5 meter. Bank side natural slope will not be disturbed. This will prevent collapse of bank and erosion. However, the height of the bank with respect to river bed is varying from 3-4 meters.

(ii) During plan period workings will be carried out in the Sand Ghat at a time of the Applied Area simultaneously. Scattered workings will ensure safety, remove congestion of vehicles and will have better control and management.

(iii) Ultimate Capacity of Dumps: There will be no OB removal / during the plan period. Therefore no proposal has been envisaged for its separate dumping. No outside material will be filled up in the extracted zone.

The conceptual plan & section of each mining plots are attached with mine plan.

2.6 Anticipated life of mine

There is as such no specific life of the mine as the area under reference is inactive part of river bed of the river and its pale channels and whatever quantity of minor minerals are extracted from the Applied Area during five year; almost equal to extracted quantity of the same are replenished every year and the river bed area will be leveled & restored back.. However, as lease has been granted for 5 years, mining will be done for the allotted time.

2.6.1 Waste –disposal arrangement

No waste as such will be generated at the site as all materials are saleable. If, at all silt clay will be generated along with the minerals will be used to dispose off in the low lying areas as spread, where plantation will be done after spreading top soil on it.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

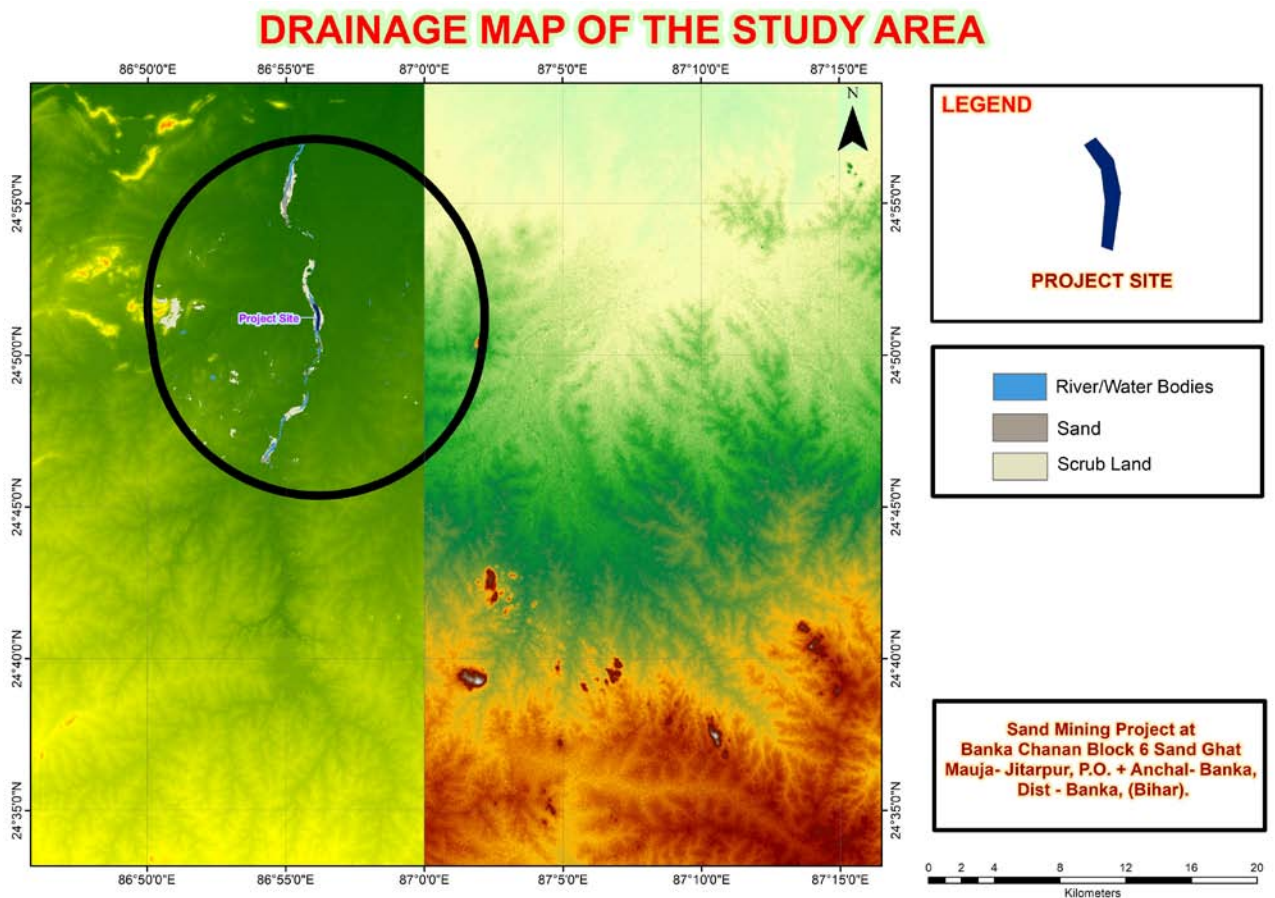
2.7 GENERAL FEATURES

2.7.1 Land-use pattern

The mine lease area is flat river bed and river banks. There is no forest land or agriculture land in the mine lease area. The entire mining lease lies within River.

2.7.2 Surface drainage pattern

The mine site lie on the dry bed of Chanan River so there will be no impact on surface water.



2.7.3 Man power requirement

The manpower requirement for the proposed project will be around 49 who will be utilized for excavation & loading of minerals into trucks or tractor-trolleys. Break-up of Man-power requirement is given in below **Table 2.7**.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Table 2.7 Manpower Requirement in Block 06

S. No.	Category	Numbers
1.	Administration	1
2.	Supervisor	2
3.	Skilled	11
4.	Un-skilled	35
TOTAL		49

2.7.4 Water supply

Water requirement for the proposed project will be provided for the workers for drinking & domestic purpose. Water will also be provided for dust suppression. Fresh water will be only used for drinking purpose. The break up for water requirement is given below:

Table 2.8 - Water requirement

Activity	Calculation	Round off Figure in KLD
Drinking	@ 10 lpcd per labor $10 \times 49 / 1000 = 0.49$ KLD	0.49
Dust Suppression	Total approach road to be water sprinkled = 300 m for block 06 $300 \text{ m} \times 6 \text{ m} \times 0.5 \times 2 \text{ times} \times 1800 / 1000 = 17.4$ KLD	1.8
Plantation	340 plant (during plan period) @ 5 L/per plant = $340 \times 5 \text{ lts} = 1700 / 1000 = 1.7$ KLD	1.7
Total		3.99 or 4.0 KLD

The water will be supplied from available sources from nearby village.

2.7.5 Site services

The following facilities/amenities will be extended by the mine management under site services:

- A temporary rest shelter will be provided for the workers near to the site for rest.
- Provisions will also be made for following in the rest shelter:
- ❖ First aid box will be made available at the site. In emergency worker.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- ❖ Sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.
- ❖ Mask and gloves distribution to the workers.

2.7.6 Extent of mechanization

The operation will be open cast semi- mechanized/OTFM with use of excavators/JCBs truck /tractors combination or Manually etc. The sand will be collected in its existing form.

2.7.7 Statutory requirements

It is accepted that effective resource management cannot be done in isolation. The proponent therefore vigorously pursues approaches towards coordination and integration where possible, so as to lead to coordinated regulatory systems.

Various acts dealing with matters relating to the conservation and protection of the environment and which a holder of a mining authorization must also take cognizance of include inter alia, the following:

- Bihar Minor Mineral Concession Rule, 2014 amended till date.
- The Mines Act, 1952.
- The Mines and Mineral (Development and Regulation) Act, 1957.
- Mines Rules, 1955.
- Mineral Concession Rules, 1960.
- Mineral Conservation and Development Rules, 1988.
- The Water (Prevention and Control of Pollution) Act, 1974.
- The Air (Prevention and Control of Pollution) Act, 1981.
- The Environment (Protection) Act, 1986.
- The Forest (Conservation) Act, 1980.
- The Wildlife (Protection) Act, 1972.

3.0 General

The main objective of describing the environment which may be potentially affected, are i) to assess present environmental quality and the environmental impacts and ii) to identify environmentally significant factors that could preclude mine development. Mining activities affect the existing status of environment at site. In order to maintain the existing environmental status at mining site it is essential study existing environmental status and assess the impact of upcoming project on various environmental components. This chapter gives idea of description of environment status of the study area and this will be helpful for assessment of impact on the environment due to proposed mining activities. Baseline environmental status in and around proposed mining lease area describe the existing conditions of air, noise, water, soil, biological and socio-economic environment. The proposed project as a center, a radial distance of 10 km is considered as study area for baseline data collection and environmental monitoring. The data was collected for various environmental attributes so as to compute the impacts that are likely to arise due to proposed development activity.

3.0.1 Study area & study period

The proposed project as a center, a radial distance of 10 km is considered as study area for baseline data collection and environmental monitoring. The baseline environment quality was carried out over a radial distance of 10 km around the mining lease area during the months of March 2023 to May 2023.

3.0.2 Methodology

Base line attributes like ambient air, water, meteorology, noise, Soil, Ecology and Biodiversity & Socio Economy condition were collected as per approved term of reference. Secondary data was also collected from various government department as well as local people. Methodology adopted in this study is as follows.

- ✓ By setting up meteorological station near project site
- ✓ Collection of site specific meteorological data at the mine site.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- ✓ Installation of respiratory dust samplers (for PM₁₀, PM_{2.5}) at different location in the study area for the collection of primary air pollutant and analyze the existing air conditions.
- ✓ Carrying out a detailed biological study for the Core and Buffer Zone
- ✓ Soil sample were collected from various location in the study area to analyze physical and chemical characteristics for assessment of impact on soil.
- ✓ Surface and Ground water samples were also collected from the various locations in the study area for analysing the existing water quality in the study area.
- ✓ Noise measurement has been done in core zone as well as buffer zone to analyze the existing situation in the study area.
- ✓ Literature review that includes identification of relevant data and articles from various publications, various government agencies and other sources for socio-economy, demography has been done with primary data collection in 10 km of the study area.
- ✓ Existing pollution load has been also identified in the buffer zone due to similar activities.
- ✓ Accordingly, field studies were carried out during the study period (March 2023 to May 2023) to establish the existing baseline conditions.

3.1 Land Environment of the Study area

Land use

Land use involves the management and modification of natural environment or wilderness in to built environment such as settlements and semi-natural habitats such as arable fields, pastures, and managed woods. It also has been defined as "the total of arrangements, activities and inputs that people undertake in a certain land cover type.

Land cover

Land cover is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground, water, etc. Earth cover is the expression used by ecologist Frederick Edward Clements that has its closest modern equivalent being vegetation. The expression continues to be used by the Bureau of Land Management.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

To assess the land use pattern surrounding the 10 km radius of the site, a detailed study was carried out. The land use pattern study reveals that the 10 km environs is predominantly agricultural land. The land use details are given in **Table- 3.1** and shown in **Figure-3.1**.

Table 3.1: Land Use Cover of the Project Study Area

Landuse Type	Area (Ha)
Scrub Land	512.66
Forest	581.06
River/Water Bodies	192.13
Settlement	3709.59
Vegetation	130.10
Agriculture	30000.38
AREA	35125.92

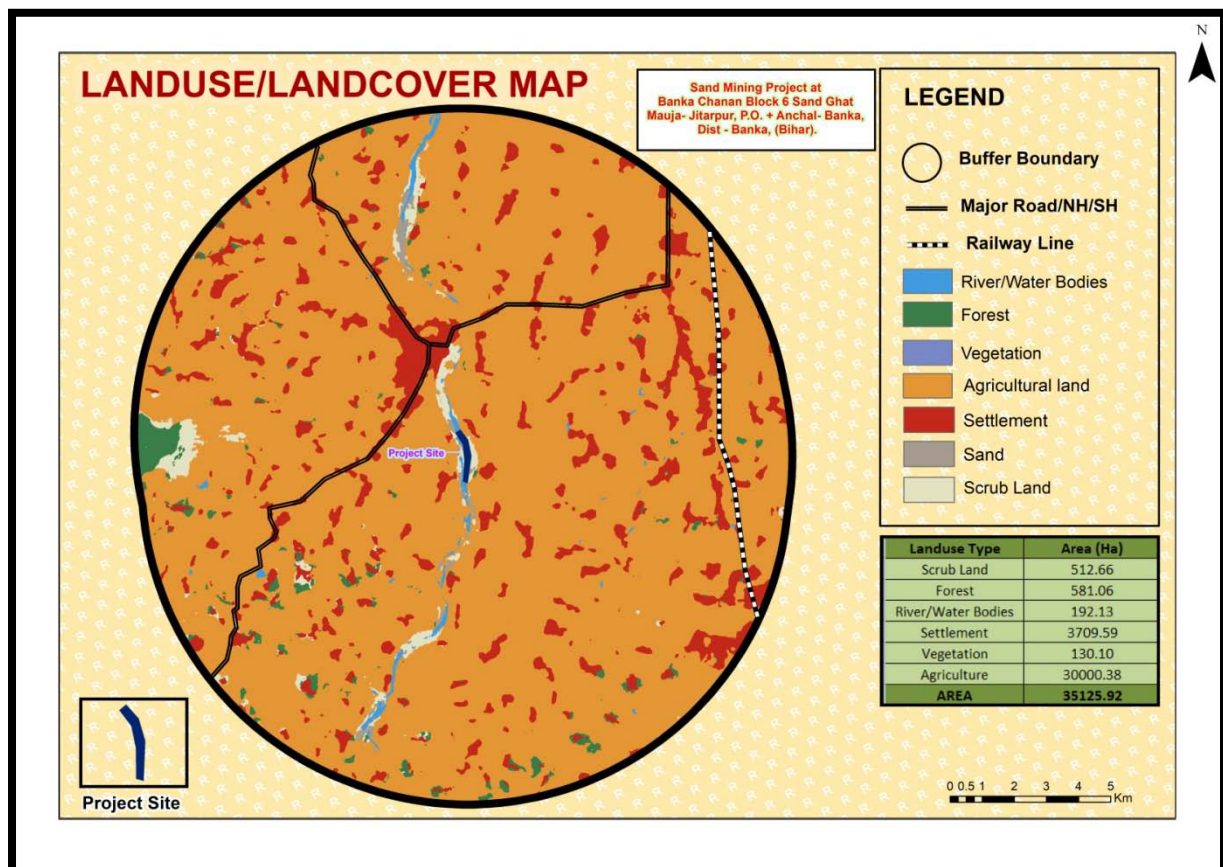


FIGURE 3.1: LAND USE COVER OF THE PROJECT STUDY AREA

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

3.2 Water Environment

Water quality assessment is one of the essential components of EIA study. Such assessment helps in evaluating the existing health of water body and suggesting appropriate mitigation measures to minimize the potential impact from development projects. Water quality of ground water has been studied in order to assess proposed water-uses in construction, drinking, cooling and horticulture purpose.

The water quality at the site and other locations within the 10 km impact zone was monitored during March 2023 to May 2023. The water sampling locations marked within the study are presented in **Table 3.2** and **Figure 3.2** and the result of the monitoring and analysis are presented in the **Table 3.3** showing Water Quality Monitoring Locations marked within the Study Area.

Table 3.2: Water Sampling Locations

Water (Ground) Monitoring Locations		
GW 1	Project Site (Block 6 Near Lakhnauri village)	0.37 km East
GW 2	Project Site (Block 7 Near Amba Village)	0.56 km East
GW 3	Bhurna	3.17 km East
GW 4	Banka	2.79 Km NW
GW 5	Mathadih	0.79 Km West

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

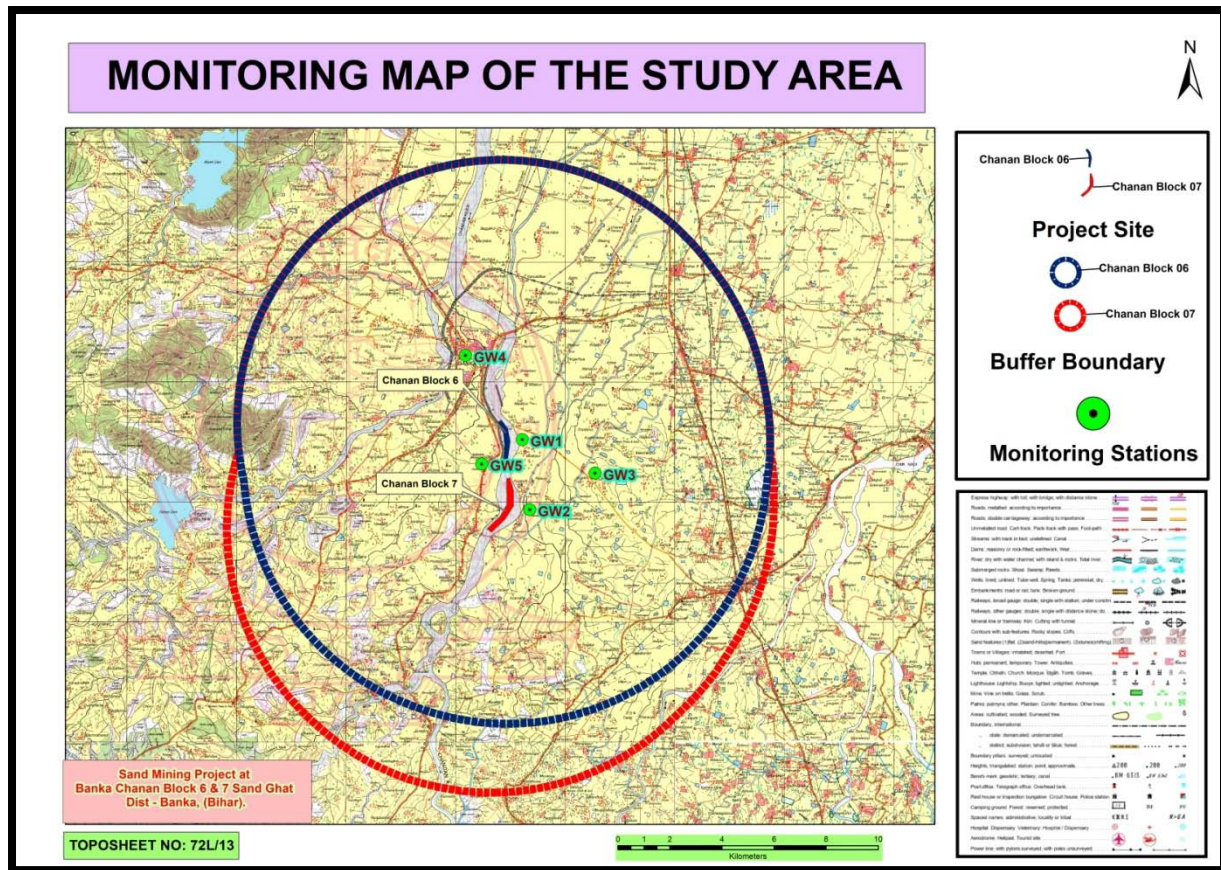


Figure 3.2 Water Sampling Location Map

Table 3.3 Ground Water Quality Monitoring Result

S. No.	Parameter	Unit	Limit (as per IS:10500)		GW1	GW2	GW3	GW4	GW5
			Desirable	Permissible					
1	Colour	Hazen	5	25	<2	<2	<2	<2	<2
2	Odour	-	Un	-	Un	Un	Un	Un	Un
3	Taste	-	Agreeable	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	5	10	<1	<1	<1	<1	<1
5	pH	-	6.5-8.5	No Relaxation	7.93	8.21	8.17	8.18	8.14
6	Total Hardness (as CaCO3)	mg/l	300	600	198	212	256	202	238
7	Iron (as Fe)	mg/l	0.3	1	0.15	0.13	0.11	0.1	0.09
8	Chlorides (as Cl)	mg/l	250	1000	48	52	60	47	56
9	Fluoride (as F)	mg/l	1	1.5	0.6	0.7	0.8	0.6	0.9
10	TDS	mg/l	500	2000	325	360	354	342	347
11	Calcium(as	mg/l	75	200	42	47	58	43	56

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

	Ca ²⁺)								
12	Magnesium (as Mg ²⁺)	mg/l	30	100	22	23	27	22	23
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
14	Manganese(as Mn)	mg/l	0.1	0.3	0.1	0.08	0.06	0.1	0.09
15	Sulphate (as SO ₄)	mg/l	200	400	35	28	30	32	39
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	3	4	3	4	5
17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
21	Arsenic (as As)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
23	Lead (as Pb)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
24	Zinc (as Zn)	mg/l	5	15	0.15	0.21	0.11	0.17	0.12
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	<0.01	<0.01	<0.01	<0.01
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
27	Mineral oil	mg/l	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
28	Alkalinity as CaCO ₃	mg/l	200	600	154	188	167	175	154
29	Aluminium (as Al)	mg/l	0.03	0.2	0.03	0.04	0.03	0.05	0.04
30	Boron (as B)	mg/l	1	5	0.2	0.3	0.3	0.2	0.3
Microbiological Parameter									
31	Total Coliform	MPN /100ml	10 , Max	-	<2	<2	<2	<2	<2
32	E.coli	E.coli /100ml	Absent	-	Absent	Absent	Absent	Absent	Absent

Observation:

Analysis of results of ground water reveals the following: -

- pH varies from 7.93 to 8.21
- Total hardness varies from 198 mg/l to 256 mg/l .



Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- Total dissolved solids vary from 325 mg/l to 360 mg/l.

The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by Indian Standards IS: 10500.

3.2 (b) SURFACE WATER

There is no surface water samples taken for the study area as the river is seasonal and not perennial so there is water in the river during the rainy season and in rest of the months it is dry channel.

3.2.1 Sampling frequency

Parameters for analysis of water quality were selected based on the utility of the particular source of water as per CPCB guidance. Surface water quality was monitored for parameters as per Methods of Monitoring & Analysis published by CPCB and it was rated according to the CPCB Water Quality Criteria against A, B, C, D & E class of water. Water samples were collected as Grab water sample from sampling location for complete physico-chemical and bacteriological tests respectively. The samples were analyzed as per standard procedure / method given in IS: 10500.

The surface water quality is compared with CPCB water quality criteria mentioned in Table :

Table 3.4, Water quality criteria as per Central Pollution Control Board

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less;

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

		pH between 6.5 and 8.5; Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less; pH between 6 to 9; Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l
	Below-E	Not Meeting A, B, C, D & E Criteria

As per the standard practice, one sample from each station was taken in January. Sampling was done by standard sampling technique as per the Standard Methods. Necessary precautions were taken for preservation of samples.

3.3 Air Environment

Meteorology is the key to understand the air quality. The essential relationship between meteorology and atmospheric dispersion involves the wind in the broadest sense. Wind fluctuations over a very wide range of time, accomplish dispersion and strongly influence other processes associated with them.

A meteorological station was set up at the proposed mine premises. Meteorological data was generated during the pre-monsoon season and shown in **Table-3.5**.

The following parameters were recorded at hourly intervals continuously during monitoring period, except rainfall which was recorded on daily basis.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- Wind speed
- Wind Direction
- Air Temperature

Table-3.5, Summarized project site meteorological data for Pre-Monsoon Season

Month	Temperature °C		Wind Speed (Km/Hr)	
	Min	Max	Average	Max
March 2023	21	38	10.4	21.0
April 2023	26	44	13.2	25.1
May 2023	28	43	14.7	27.8

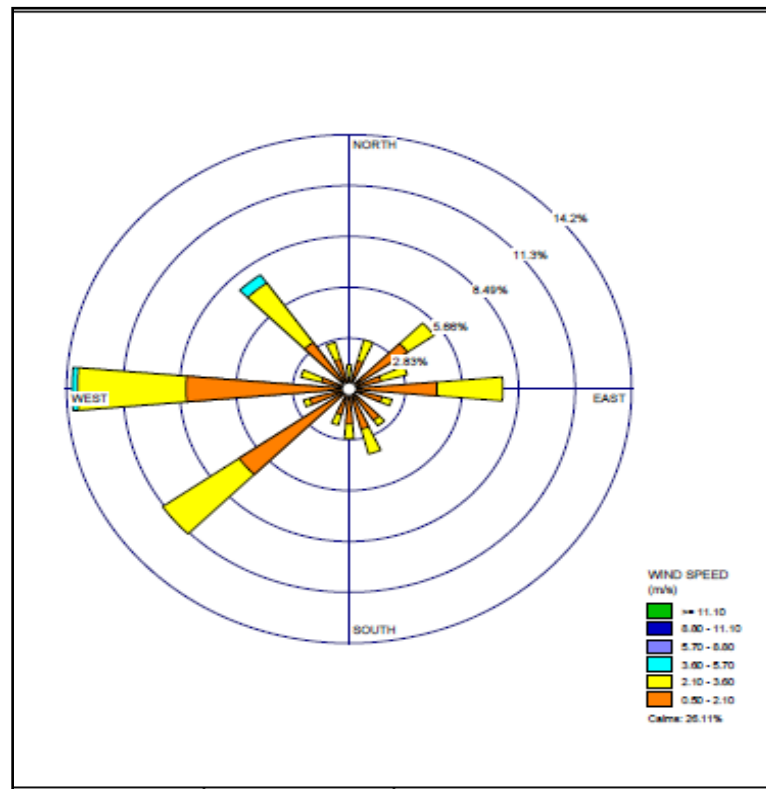


Figure 3.3: Wind Rose Diagram (at site)

3.3.1 Secondary Data Collected from IMD

Secondary data from IMD- Dumka been collected for temperature, relative humidity, rainfall, wind speed and direction. The data at IMD is usually measured twice a day viz., at 0830 and 1730 hr.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

The meteorological data is collected from the IMD- Dumka is about 82 km from project site, which is the nearest operating IMD station to the project site. The data collected from IMD includes wind speed, wind direction, temperature, relative humidity and rainfall for the year 1981-2010. The monthly maximum, minimum and average values are collected for all the parameters except wind speed and direction.

When the data generated at project site is compared with the data recorded at IMD, it is observed that the data generated at the site is broadly in comparison with regional meteorology, except for minor variations as described above.

3.3.2 Comparison of primary and secondary data

The India Meteorological Department (IMD) records the data twice a day viz. 0830 hr and 1730 hr while the site-specific data has been recorded at an hourly interval. On comparison of site specific data generated for study period vis-à-vis the IMD data, slight variations were observed. The following observations are brought out:

When the data generated at project site is compared with the data recorded at IMD, it is observed that the data generated at the site is broadly in comparison with regional meteorology, except for minor variations as described above such as predominant wind direction is NW at IMD while at project site predominant wind direction is West.

3.3.3 Ambient Air Quality

The ambient air quality was monitored in the impact area as per MoEF& CC guidelines. The study area represents entirely rural environment. The prime objective of the baseline air quality study was to assess the ambient air quality of the mining lease area.

3.3.4 Selection criteria for monitoring location

The baseline status of the ambient air quality has been assessed through a scientifically designed ambient air quality network. The design of monitoring network in the air quality surveillance programme has been based on the following consideration.

- Meteorological parameters including wind direction
- Topography of the study area

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- Representative of regional background air quality for obtaining baseline status
- Representative of likely impact areas.

Ambient Air Quality Monitoring (AAQM) stations were set up at 08 locations with due consideration to the above mentioned points. AAQM locations were selected in downwind, upwind as well as crosswind direction of the proposed mining lease area covering core and buffer zones. The details of the monitoring stations are given in **Figure 3.4** and shown in **Table-3.6**.

Ambient air quality monitoring was carried out twice a week with a frequency of 24 hours for three months during the study period. The common air pollutant namely Particulate Matter-10 (PM₁₀) & PM_{2.5}, Sulphur-dioxide (SO₂) and Oxides of Nitrogen (NO₂) has been measured through a planned field monitoring.

The baseline values of the air pollutants of concern are presented in Tables below statistical parameters like minimum, maximum, average and 98th percentiles have been computed from the observed field data for all sampling stations and are given **Table-3.7, Table-3.8, Table-3.9 & Table 3.10**. These are compared with the standards prescribed by Central Pollution Control Board (CPCB) for industrial, residential and rural zone.

Table 3.6: Ambient Air Quality Monitoring Stations

Air Monitoring Locations		
Location ID	Location name	Distance (Km) and Direction
AAQ 1	Project Site (Block 6 Near Lakhnauri village)	0.37 km East
AAQ 2	Project Site (Block 7 Near Amba Village)	0.56 km East
AAQ 3	Bhurna	3.17 km East
AAQ 4	Maharana	7.67 Km East
AAQ 5	Jabra	4.43 Km SE
AAQ 6	Mathadih	0.79 Km West
AAQ 7	Kaithpur	7.30 Km NE
AAQ 8	Banka	2.79 Km NW
AAQ 9	Pokhariya	4.14 Km SW

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

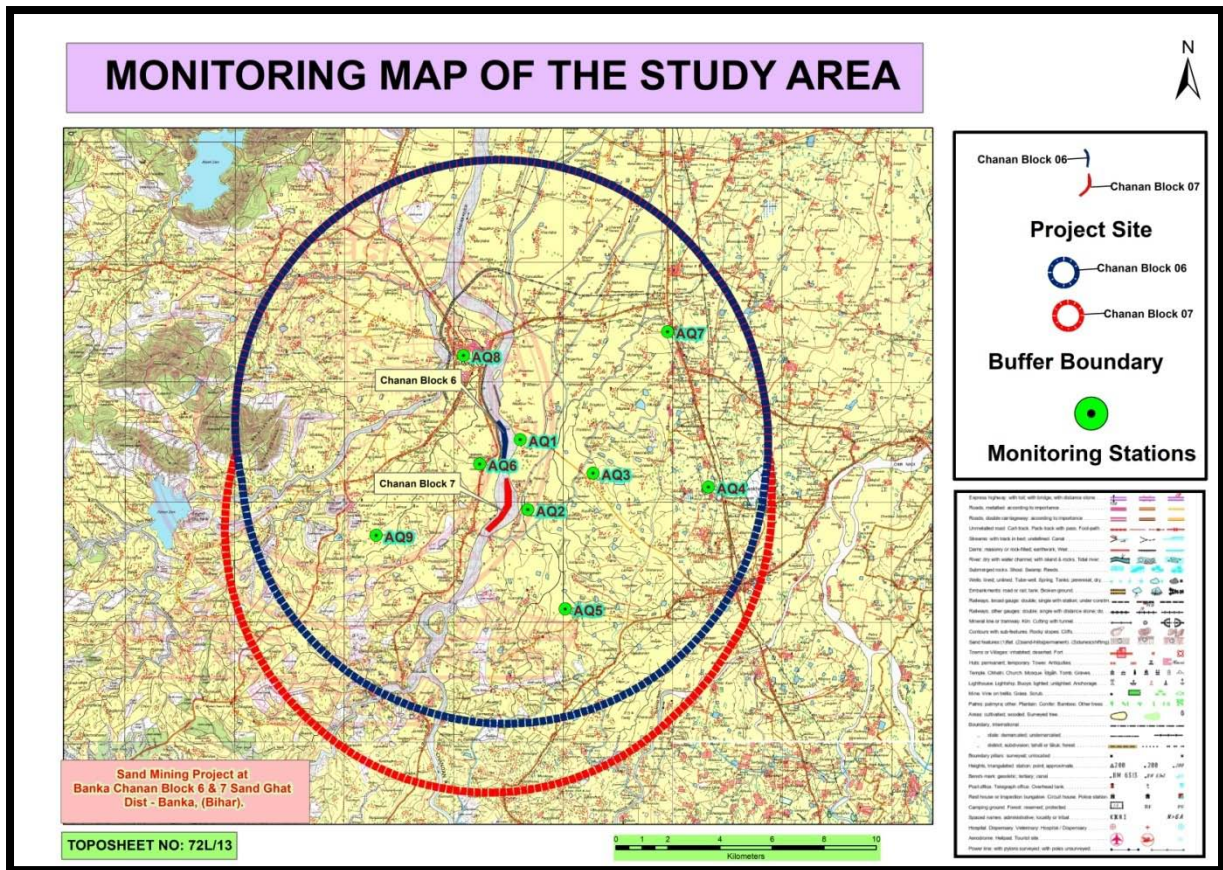


Figure 3.4 Ambient Air Quality Monitoring Stations

Table-3.7: Ambient Air Quality in the Study Area PM2.5

Location Code	Name of the station	PM2.5 (µg/m ³)			
		Min	Max	Average	98 th Percentile
AAQ1	Project Site (Block 6 Near Lakhnauri village)	27.80	38.50	31.80	38.10
AAQ2	Project Site (Block 7 Near Amba Village)	27.66	38.91	32.43	38.50
AAQ3	Bhurna	28.20	36.58	31.60	36.20
AAQ4	Maharana	29.50	37.56	33.10	37.10
AAQ5	Jabra	27.20	37.80	31.76	37.50
AAQ6	Mathadih	23.50	31.70	28.13	31.50
AAQ7	Kaithpur	31.20	40.10	35.92	39.80
AAQ8	Banka	37.30	49.80	44.10	49.00
AAQ9	Pokhariya	37.50	50.70	46.10	49.90

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Table-3.8: Ambient Air Quality in the Study Area PM10

Location Code	PM10 ($\mu\text{g}/\text{m}^3$)				
	Name of the station	Min	Max	Average	98 th Percentile
AAQ1	Project Site (Block 6 Near Lakhnauri village)	64.20	78.61	72.42	78.40
AAQ2	Project Site (Block 7 Near Amba Village)	70.12	86.51	76.61	86.10
AAQ3	Bhurna	69.23	79.32	74.79	79.10
AAQ4	Maharana	70.95	86.33	78.71	85.90
AAQ5	Jabra	59.60	78.30	69.24	77.90
AAQ6	Mathadih	61.40	76.80	67.70	76.50
AAQ7	Kaithpur	65.40	80.30	72.83	81.90
AAQ8	Banka	67.80	88.00	77.30	85.30
AAQ9	Pokhariya	68.60	88.50	79.40	87.90

Table-3.9: Ambient Air Quality in the Study Area SO2

Location Code	SO2 ($\mu\text{g}/\text{m}^3$)				
	Name of the station	Min	Max	Average	98 th Percentile
AAQ1	Project Site (Block 6 Near Lakhnauri village)	6.80	9.80	8.40	9.30
AAQ2	Project Site (Block 7 Near Amba Village)	6.40	9.40	7.40	8.90
AAQ3	Bhurna	5.30	7.70	6.28	7.20
AAQ4	Maharana	5.80	9.40	8.10	9.20
AAQ5	Jabra	5.90	7.10	6.57	6.80
AAQ6	Mathadih	5.60	7.30	6.60	6.90
AAQ7	Kaithpur	6.10	7.90	6.96	7.50
AAQ8	Banka	5.40	9.40	7.00	9.30
AAQ9	Pokhariya	5.60	9.20	7.30	9.10

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Table-3.10: Ambient Air Quality in the Study Area NO2

Location Code	NO2 ($\mu\text{g}/\text{m}^3$)				
	Name of the station	Min	Max	Average	98 th Percentile
AAQ1	Project Site (Block 6 Near Lakhnauri village)	17.20	19.90	18.57	19.50
AAQ2	Project Site (Block 7 Near Amba Village)	15.90	22.30	18.23	21.90
AAQ3	Bhurna	15.30	19.40	17.28	19.10
AAQ4	Maharana	16.20	19.70	17.58	19.40
AAQ5	Jabra	17.20	19.70	18.49	19.50
AAQ6	Mathadih	16.30	21.50	18.55	21.20
AAQ7	Kaithpur	17.30	23.60	20.03	23.20
AAQ8	Banka	10.40	18.60	14.60	18.30
AAQ9	Pokhariya	11.70	20.00	14.80	18.90

3.3.4.1 Baseline Scenario

Particulate Matter (PM2.5)

Fine particles include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. In general some of the important sources of particulate matter are mines. The following sources of particulate matter in the study area are identified:

- Emission due to vehicular movement
- Dust generation from ground or other mining operations

PM2.5 recorded within the study area was in the range of $23.50\mu\text{g}/\text{m}^3$ to $50.70\mu\text{g}/\text{m}^3$. Table 3.3 were compared with the National Ambient Air Quality Standards (NAAQS) and found that all sampling stations recorded in the study area are within the applicable limits i.e., $60\mu\text{g}/\text{m}^3$ for PM_{2.5} for industrial, residential, rural and other areas.

Suspended Particulate Matter (PM10)

Suspended particulate matter in general terms is the particulate matter in suspension in ambient air. It includes dust, smoke etc. In general some of the important sources of

suspended particulate matter are mines. The following sources of suspended particulate matter in the study area are identified:

- Emission due to vehicular movement
- Dust generation from ground or other mining operations

The minimum and maximum level of PM₁₀ recorded within the study area was in the range of 59.60 µg/m³ to 88.50 µg/m³. The 24 hourly average values of PM₁₀ were compared with the National Ambient Air Quality Standards (NAAQS) and found that all sampling stations recorded in the study area are within the applicable limits i.e., 100 µg/m³ for PM₁₀ in industrial, residential, rural and other areas.

Sulphur Dioxide (SO₂)

Sulphur dioxide gas is an inorganic gaseous pollutant. Sulphur dioxide emissions are expected to be emitted wherever combustion of any fuel containing Sulphur takes place. The Sulphur in the fuel will combine with oxygen to form Sulphur dioxide. The following sources of Sulphur dioxide in the study area are identified:

- Emissions from domestic/consumption of fuel (coal, diesel, etc)

Sulphur dioxide in atmosphere is significant because of its toxicity; Sulphur dioxide is capable of causing illness and lung injury. Further it can combine with water in the air to form toxic acid aerosols that can corrode metal surfaces, fabrics and the leaves of plants. Sulphur dioxide is an irritant to the eyes and respiratory system. Excessive exposure to Sulphur dioxide causes breathing related diseases as it affects the lungs.

The minimum and maximum concentration of SO₂ recorded within the study area was 5.30 µg/m³ to 9.80 µg/m³. The 24 hourly average values of SO₂ were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that all sampling stations recorded values are below the applicable limits 80 µg/m³ for Residential, Rural and other areas.

Oxides of Nitrogen (NO₂)

The important sources of oxides of Nitrogen are from utilities and auto exhaust due to vehicular movement in mine lease area. The following sources of oxides of nitrogen in the study area are identified.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- Emissions from vehicular movements in the study area.

Oxides of Nitrogen in the presence of sunlight will undergo reactions with a number of organic compounds to produce all the effects associated with photochemical smog. NO₂ has inherent ability to produce deleterious effects by themselves like toxicity. It causes asphyxiation when its concentration is great enough to reduce the normal oxygen supply from the air. The minimum and maximum level of NO₂ recorded within the study area was in the range of was 10.40 µg/m³ to 23.60 µg/m³.

The 24 hourly average values of NO₂ were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that all sampling stations recorded values are below the applicable limits 80 µg/m³ for Residential, Rural and other areas.

Ambient Air Quality in the Study Area, Free Silica

SiO ₂	AQ1	AQ2	AQ3	AQ4	AQ5	AQ6	AQ7	AQ8	AQ9
Minimum	1.46	1.52	1.48	1.55	1.47	1.61	1.58	1.65	1.57
Maximum	1.74	1.81	1.76	1.85	1.75	1.91	1.69	1.79	1.85

3.4 SOIL ENVIRONMENT

Soil may be defined as a thin layer of earth's crust, a medium for the growth of plants. The soil characteristics include both physical and chemical properties. The soil survey and soil sample were carried out / collected to assess the soil characteristics of the study area. Soil samples were collected from 06 locations and analyzed as per CPCB norms. The soil sampling locations are marked in **Figure 3.5** and shown in **Table 3.11**. The physico-chemical characteristic of these soil samples is given in **Table 3.12**.

Table 3.11: Description of soil sampling locations

Soil Monitoring Locations		
SQ 1	Project Site (Block 6 Near Lakhnauri village)	0.37 km East
SQ 2	Project Site (Block 7 Near Amba Village)	0.56 km East
SQ 3	Bhurna	3.17 km East
SQ 4	Banka	2.79 Km NW
SQ 5	Mathadih	0.79 Km West
SQ 6	Pokhariya	4.14 Km SW

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

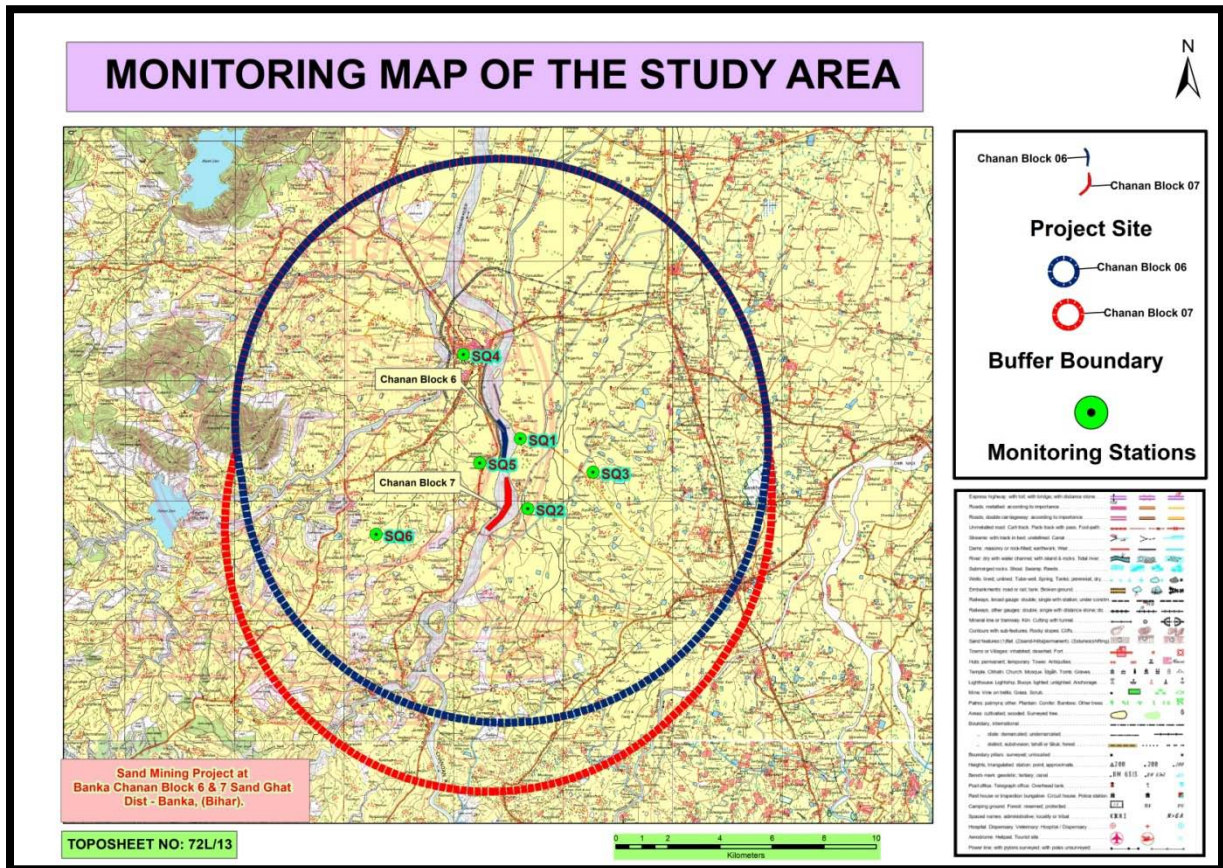


Figure 3.5, Soil Sampling Locations

Table 3.12: Physico-chemical properties of soil

S.No	Parameter	Unit	SQ-1	SQ-2	SQ-3	SQ-4	SQ-5
1	Texture	-	Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand
	Silt	%	1.95	7	10.08	15.04	16.03
	clay	%	7.87	8.74	9.53	11.51	12.53
	Sand	%	90.18	84.26	80.39	73.45	71.44
2	pH	-	8.06	7.74	8.13	8.12	8.16
3	Electrical Conductivity	µmhos/cm	1207	1321	1435	1440	1491
4	Cation exchange capacity	meq/100 gm	11.17	11.83	12.97	13.96	16.14
5	Potassium	mg/kg	63.14	70.38	79.31	80.33	95.32
6	Sodium	mg/kg	96.48	109.54	117.38	123.39	130.36
7	Calcium	mg/kg	1937.89	2038.71	2241.12	2325.12	2443.12
8	Magnesium	mg/kg	108.54	118.37	126.16	130.26	134.10

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9	Sodium Absorption Ratio	-	0.57	0.63	0.65	0.69	0.75
10	Water Holding Capacity	%	17.26	18.5	19.36	21.40	22.39
11	Porosity	%	46.01	45.34	44.75	45.80	49.79

Observations:

Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 7.74 to 8.16, which shows that the soil is alkaline in nature. Potassium is found to be from 63.14 meq/100 gm to 95.32 meq/100 gm.

3.5 NOISE ENVIRONMENT

The noise levels within the study area were recorded using Sound Level Meter and noise monitoring results were compared with the Ambient Noise Quality Standard notified under Environment Protection Act, 1986. The levels recorded are as stated in **Table 3.13**. The noise level monitoring locations are marked in **Figure 3.6** and shown in **Table 3.14**.

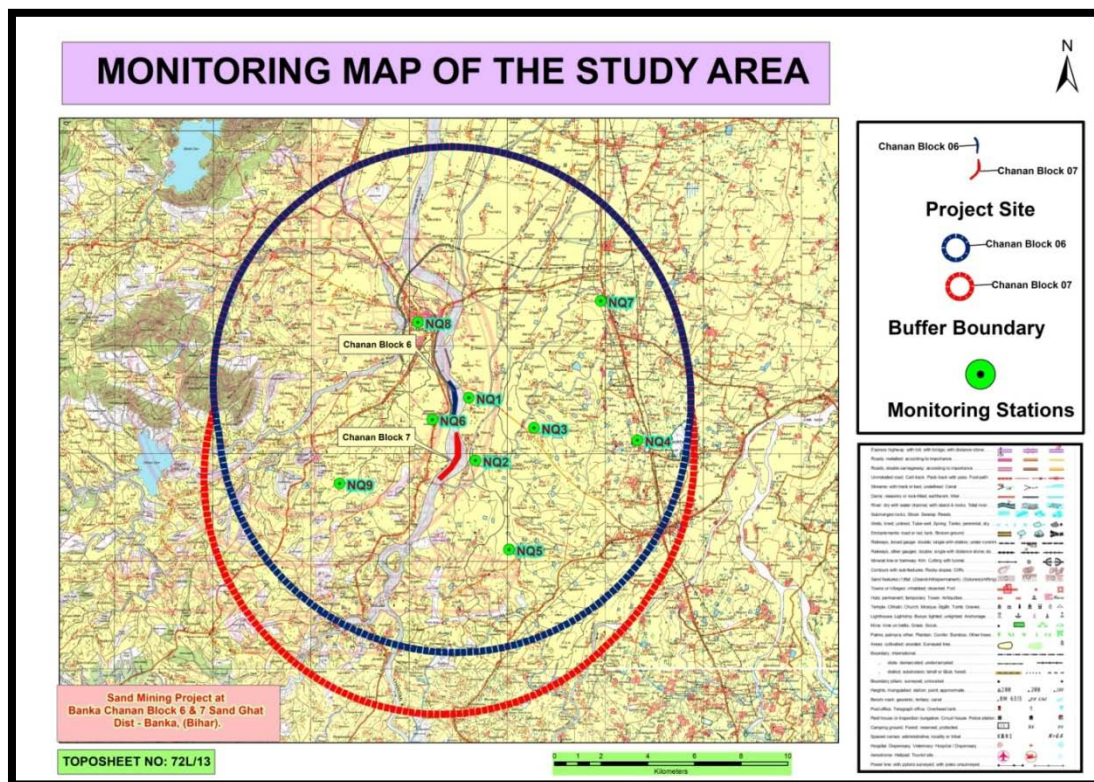


Figure 3.6 Noise Monitoring Stations

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Table 3.13: Noise Quality Monitoring Stations

Noise Monitoring Locations		
NQ 1	Project Site (Block 6 Near Lakhnauri village)	0.37 km East
NQ 2	Project Site (Block 7 Near Amba Village)	0.56 km East
NQ 3	Bhurna	3.17 km East
NQ 4	Maharana	7.67 Km East
NQ 5	Jabra	4.43 Km SE
NQ 6	Mathadih	0.79 Km West
NQ 7	Kaithpur	7.30 Km NE
NQ 8	Banka	2.79 Km NW
NQ 9	Pokhariya	4.14 Km SW

Table 3.14: Noise Monitoring Results

S. No.	Locations		Equivalent Noise Level, dB (A)			
			Limit (as per CPCB Guidelines), Leq, dB(A)		Observed value Leq, dB(A)	
			DAY*	NIGHT*	DAY*	NIGHT*
1	NQ1	Industrial Zone	75	70	48.36	43.22
2	NQ2	Residential Zone	55	45	41.52	37.57
3	NQ3	Residential Zone	55	45	42.97	38.64
4	NQ4	Residential Zone	55	45	43.45	39.57
5	NQ5	Residential Zone	55	45	40.43	36.52
6	NQ6	Residential Zone	55	45	43.59	39.57
7	NQ7	Residential Zone	55	45	49.91	41.65
8	NQ8	Residential Zone	55	45	46.52	41.55
9	NQ9	Residential Zone	55	45	42.51	40.51

Results

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as 40.43 dB(A) to 49.91 dB(A) respectively. The minimum & maximum noise levels at night time were found to be 36.52 dB (A) & 43.22 dB(A) respectively.

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There are several sources in the 10 km radius of study area, which contributes to the local noise level of the area. On the commencement of the project, the sound from traffic activities will add to the ambient noise level of the area. This will be kept under check by taking proper suggestive measures.

3.6 BIOLOGICAL ENVIRONMENT

3.6.1 Introduction

Biodiversity reflects the potential of a regional ecosystem and also biological communities influence and react sensitively to changes in the balance of environmental stresses.

Conservation of the biodiversity is essential for the sustainable development as it not only provides the food, fodder and medicine, but also contributes to improvement of essential environmental factors. Before starting any Environmental Impact Assessment study, it is necessary to identify the baseline of relevant environmental parameters which are likely to be affected as a result of the operation of the proposed project. A similar approach has been adopted for conducting the study on Biological Environment for this Project.

The study was conducted in the project area to assess all the details the biological environment especially flora and fauna for their diversity. The present study is highlighting the various issues pertaining to floristic diversity and the faunal wealth in the core area *i.e.* Banka sand mine block 5 and buffer zone *i.e.* area within 10 km radius.

3.6.2 Description of the Study Area

Banka block 5 sand mine is located on the dry river bed of Chandan River over an area of 29.0 ha in Banka district of Bihar. Banka district lies under the Seismic Zone-IV as per IS-1893 (part-1)-2002. Forest of Banka district comprises of tropical moist deciduous vegetation due to high temperature and humidity. Land development refers to the activities which increase the fertility of land leading to higher productivity. There is no any Eco-sensitive zone such as Wildlife Sanctuary and National Parks present in the buffer zone while one Jungle Jhari forest are present in western part approx. 7 km in the buffer zone.

The proposed project site lies in the Agro climatic zone of the middle gangetic plain region. It is a fertile alluvial plain drained by the Ganga and its tributaries. Rice, maize, millets in kharif, wheat, gram, barley, peas, mustard and potato in Rabi are important crops and the village people are mainly agrarian.

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Forests

The Forest cover in the state, based on interpretation of satellite data of Nov 2008 Jan 2009 is 6845 km² which is 7.27 % of the states geographical area. In terms of forest canopy density classes the state has 231 sq km very dense forest, 3,280 sq km moderately dense forest, 3,334 sq km open forest. In terms of forest canopy density classes, the Banka district under very dense forest area is nil, 111 sq km area under moderately dense forest and 110 sq km area under open forest. Therefore, approx. 7.31 % of the total geographical area of the district is under forest cover. (Source: *India State of Forest Report Bihar, 2011*; http://fsi.nic.in/cover_2011/bihar.pdf)

3.6.3 Methodology

The ecological survey has been conducted during winter season for the collection of primary data of flora and fauna, and other environmental observations from Core zone (at the project site) and Buffer zone (around 10 km radius of the project site).

A detailed survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visits and secondary data was collected from the Forest Department and published relevant literature. The mode of data and parameters considered during field investigations is given in Table below.

Table 3.15 Mode of data collection & parameters considered during the Survey

Aspect	Data	Mode of data collection	Parameters monitored
Terrestrial Ecology	Primary data collection	By field survey	Floral and Faunal diversity
	Secondary data collection	*Forests department of Bihar *Department of Forest and Environment Bihar *Published literatures	Floral and Faunal diversity and study of vegetation, forest type, importance etc.

Vegetation Study

Vegetation study was conducted in both buffer and core zones. The inventory of plants was prepared through the field visits, personal interviews and group discussion with local people. The species composition revealed that plants are deciduous in nature and in the shrub form.

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Any species which could not be identified in the field was brought back (flowers/leaves specimen) and cross-checked with the help of expert institutions/resource person.

a) Flora and Fauna of Core Zone

Flora

The core zone comprises flat sandy bed of Chandan River where mining operation is proposed. Most of the areas nearby the project site are waste land. No major trees were recorded from the core zone except some seasonal grasses. No ecologically sensitive plant species has been reported from this area. Some grass species were recorded from core zone such as Doob and Motha etc.

Fauna

Core zone of the proposed mine area is dry sand bed and devoid of any major plant species, So, mammals and avifauna were not observed during the study period. There is no any aquatic habitat in the core zone, so aquatic flora and fauna also does not exist.

b) Flora and Fauna of Buffer Zone

Flora

Terrestrial Flora

The buffer zone devoid of any forest except in the western part of 10 km buffer at approx. 7 km there is one Jungle jhari forest area. Common trees such as Mahua (*Madhuca indica*) Mango (*Mangifera Indica*), Arjun (*Terminalia arjuna*), Neem (*Azadirachta indica*), Peepal (*Ficus religiosa* (L.)), Palas (*Butea monosperma*) Tal (*Borassus flabellifer*), Babool (*Acacia nilotica*), Khejri (*Prosopis cineraria*) have been found on the edges of agricultural fields along pathways and along the river bank. Detail list of flora has been enumerated in the tables below.

Table 3.16 List of Trees in Study area

S. No.	Botanical Name	Common Name	Family
1.	<i>Mangifera indica</i>	Mango	Anacardiaceae

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S. No.	Botanical Name	Common Name	Family
2.	<i>Acacia nilotica</i>	Babool	Fabaceae
3.	<i>Bombax ceiba</i>	Semal	Malvaceae
4.	<i>Dalbergia sissoo</i>	Sisam	Fabaceae
5.	<i>Ficus benghalensis</i>	Bargad	Moraceae
6.	<i>Ficus religiosa</i>	Pipal	Moraceae
7.	<i>Azadirachta indica</i>	Neem	Meliaceae
8.	<i>Melia azedarach (L.)</i>	Bakain	Meliaceae
9.	<i>Syzigium cumini (L.) Skeels</i>	Jamun	Myrtaceae
10.	<i>Ziziphus mauritiana Lam.</i>	Ber	Rahmnaceae
11.	<i>Emblica officinalis Gaertn.</i>	Amla	Euphoriaceae
12.	<i>Tamarindus indica (L.)</i>	Emli	Caesalpiniaceae
13.	<i>Aegle marmelos Linn</i>	Bel	Rutaceae
14.	<i>Terminalia arjuna</i>	Arjun	Combretaceae
15.	<i>Madhuca indica</i>	Mahua	Sapotaceae
16.	<i>Neolamarckia cadamba</i>	Kadamb	Rubiaceae
17.	<i>Diospyros melanoxylon</i>	Kend	Ebenaceae
18.	<i>Terminalia elliptica</i>	Asan	Combretaceae
19.	<i>Artocarpus heterophyllus</i>	Katahal	Moraceae
20.	<i>Borassus flabellifer</i>	Tal	Arecaceae

Source: <http://forest.bih.nic.in/>

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Table 3.17 List of Shrubs and Herbs in Study area

S.No.	Botanical name	Local name	Family
1.	<i>Achyranthes aspera</i>	Apamarg/Chirchita	Amaranthaceae
2.	<i>Justicia Adhatoda</i>	Adusa	Acanthaceae
3.	<i>Anona squamosa</i>	Sitaphal	Anonaceae
4.	<i>Argemone mexicana</i>	Siarkanta	Papaveraceae
5.	<i>Calotropis gigantea</i>	Aak	Apocynaceae
6.	<i>Colebrookia oppositifolia, Smith.</i>	Kalabansa	Lamiaceae
7.	<i>Euphorbia nivulia</i>	-	Euphorbiaceae
8.	<i>Holarrhena pubescens</i>	-	Apocynaceae
9.	<i>Lantana camara</i>	Raimuniya	Verbenaceae
10.	<i>Thevetia peruviana</i>	Kaner	Apocynaceae
11.	<i>Bambusa gracilis</i>	Bamboo	Gramineae
12.	<i>Butea monosperma</i>	Palas	Fabaceae
13.	<i>Hibiscus rosasinensis</i>	China rose	Malvaceae
14.	<i>Jasminum sambac</i>	Jasmin	Apocynaceae

Fauna

Terrestrial Fauna

Table 3.18 Faunal Species observed in the Buffer Zone

S. No	English Name	Scientific Name	Schedule Status (WPA-1972)	IUCN Status

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

S. No	English Name	Scientific Name	Schedule Status (WPA-1972)	IUCN Status
Mammals				
1	Indian hare	<i>Lepus nigricollis</i>	IV	LC
2	Fulvous Fruit Bat	<i>Rousettus leschenaulti</i>	V	LC
3	Bandicoot Rat	<i>Bandicota indica</i>	V	LC
4	Indian Field Mouse	<i>Mus booduga</i>	V	LC
5	Indian Flying Fox Bat	<i>Pteropus giganteus</i>	V	LC
6	Indian Grey Mongoose	<i>Herpestes edwardsii</i>	IV	LC
7	Indian porcupine	<i>Hystrix indica</i>	IV	LC
8	Three-striped Palm Squirrel	<i>Funambulus palmarum</i>	II	LC
Avian Fauna				
1	Common Babbler	<i>Turdoides caudata</i>	IV	LC
2	Common Myna	<i>Acridotheres tristis</i>	IV	LC
3	Common Quail	<i>Coturnix coturnix</i>	IV	LC
4	House Sparrow	<i>Passer domesticus</i>	IV	LC
5	Jungle Babbler	<i>Turdoides striata</i>	IV	LC
6	Jungle Bush Quail	<i>Perdicula asiatica</i>	IV	LC
7	Jungle Crow	<i>Corvus macrorhynchos</i>	IV	LC
8	Jungle Myna	<i>Acridotheres fuscus</i>	IV	LC
9	Red Jungle fowl	<i>Gallus gallus</i>	IV	LC
10	Rock Pigeon	<i>Columba livia</i>	IV	LC
11	Scarlet Mini vet	<i>Pericrocotus flammeus</i>	IV	LC
Reptiles and Lizards				
1	Common Krait	<i>Bungarus caeruleus</i>	IV	NA
2	Rat Snake	<i>Ptyas mucosus</i>	II	NA
3	Rock Lizard	<i>Agama buberulatus</i>	-	DD
4	Chameleon	<i>Chamelion calcarata</i>	II	DD

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S. No	English Name	Scientific Name	Schedule Status (WPA-1972)	IUCN Status
5	Indian House Gecko	<i>Hemidactylus flaviviridus</i>	-	DD

Source: Present Survey Data and Data supported by Department of Forest, Bihar.

IUCN Red list: LC: Least Concern, VU: Vulnerable, NE: Not Evaluated, EN: Endangered, NT: Near Threatened.

Management Scheme/Plan (point wise) of flora and fauna of the buffer zone & core zone of the mine area.

Core zone: Lease area is located on the dry river bed of Chandan river and any animal species belongs to Schedule-I category as per Wildlife Protection Act (1972) are not observed.

Buffer zone: As per Wildlife Protection Act (1972), no Schedule-I species were observed from buffer zone. However, all care will be taken for protection of others flora & fauna also, if any in the lease hold area.

3.7 Socio-Economic Environment

Demography & Socio-Economic Features

Demography

Demography is one of the important indicators of environmental health of an area. It includes population, sex ratio, number of households, literacy, population density, etc. In order to assess the Demographic & Socio-economic features of the area, Census data 2011, for one major district named Banka of Bihar state was compiled and placed in the form of tabulation and graphical representation.

Demography of the Banka District

As per the census records 2011, Banka district has a population of 2034763 persons followed by 10,67,140 males and 9,67,623 females respectively. Out of the total population of the district, about 71313 persons (8.3%) population lived in urban areas while 1963450 persons

(91.7%) live in rural areas. The decadal Variation of the district has been seen at 26.5% during the decade 2001-11. The Rural area of the district has attained a higher decadal variation of 26.5 percent as compared to that of urban area at 26.4 percent. The district has a population density of 672 inhabitants per square kilometre (1,740/sq. mi)

As per 2011 census sex ratio of the district is 907 females per 1,000 males. The same for rural and urban areas of the district stands at 908 and 875 respectively. As per the census records 2011, the sex ratio of population in the age group 0-6, was recorded as 943 females per 1,000 males. While the sex ratio of (0-6) population in the rural areas of the district is 944, the sex ratio of (0-6) population for the urban areas is only 899 females per 1000 males.

As per the census records 2011, it is observed that the proportion of scheduled castes and scheduled tribe's population to the total population of the district is found to be only 12.2&4.4% respectively. For rural areas, the respective proportion of scheduled castes and scheduled tribes to the total population of the district comes out to be 12.2&4.6% respectively. Similarly, in urban areas, the percentage of scheduled castes and scheduled tribe's population to the total population of the district comes out to 10.7& 0.3% respectively.

It is also observed from the census records 2011, that the district has registered a literacy rate of 58.2%. As regards to rural and urban areas of the district the literacy rates have been registered 57.6&72.6% respectively. The gap in the male-female literacy rates has been 20.0% point as it is 67.0% male and 47.0% female respectively. For the district as a whole, the literacy rate of males is much higher than that of females.

Census data 2011 shows that the work participation rate (WPR) in the district is 18.4% for main workers and 19.5% for marginal workers. Proportion of non workers in the district is 62.1%.

Religions

As per the census Records 2011, the population of the Banka district during 2011 was 2,034,763 persons. Hindus constitute 87.12% (1,772,655 persons) of the population in the district followed by Muslims 12.33% (250,925 persons). All other four major religious communities have almost negligible percentages. The share of major religion in the population of the State and district is as follows;

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Caste-wise Population Distribution of Major Religions, 2011

S.No.	Religion	Population	Percentage	Population	Percentage
1.	Hindu	86078686	82.69	1772655	87.12
2.	Muslims	17557809	16.87	250925	12.33
3.	Chirstian	129247	0.12	6138	0.30
4.	Sikh	23779	0.02	139	0.01
5.	Buddhist	25453	0.02	113	0.01
6.	Jain	18914	0.02	94	0.004
7.	Other	13437	0.01	1035	0.05
8.	Not Stated	252127	0.24	3664	0.18

Note- *Other religions and persuasions (incl. Unclassified Sect.),

Source : Census of India 2011

Mother Tongue

The population of the Banka district during 2001 Census was 16,08,773. As per distribution of different mother tongues (languages mentioned under 8th Schedule of Constitution of India) as returned during the 2001 Census for Banka district, Hindi, the main mother tongue of the district was returned by 89 percent (14,31,863 persons) of the population. The corresponding percentage for the Urdu, the second most prominent language spoken in Banka district, was 6.4 percent (1,03,513 persons). Speakers of other Scheduled languages were very thin in number than the two described above.

Methodology

In order to assess the Demographic & Socio-economic features along with the 10km distance based on field surveys and public consultations undertaken during the baseline field study period and Census records 2011, for Banka district of Bihar state respectively was compiled and placed in the form of tabulation and graphical representation. Entire study area is observed predominantly rural and no town was found in the study area.

Purpose of the Study

Socio-economic study was conducted to establish the baseline demographic features and impacts due to this 'SandGhatProject', as operation phase of any project invariably leads to

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Socio-economic changes. The construction phase of any kind of project could lead to unplanned and haphazard development of slums of various size and description with little or rudimentary.

Description of Social Environment

As per the Census Records 2011, the study area has a total of 132 villages and one major Town named Banka (NP/22 Wards) lying under Banka District in Bihar state. Overall study area villages are falling mainly under Six (06) no of tehsils namely Dhuraiya(03 villages), Barahat (19 villages), Banka (76 villages) and Chanana (01 villages), Katoria (11 villages), Bausi (22 village) of Banka district in Bihar state.

There are about 15 villages found as uninhabited villages in the study area. There is one major town named Banka (NP/22 Wards) found in the 10km radial study zone.

Population Distribution (10 km)

As per the Census Records 2011, the total population of 10 km study zone was recorded as 32,35,15persons of 132villages and one major town named Banka (NP)of Bankadistrict inBihar state. Male-female wise total population was recorded as 1,69,520 males (52.4%) and 1,53,995(47.6%) females respectively.

Total number of ‘Households’ was observed as 61803in the 10 km radius study zone. Scheduled Caste (‘SC’) population was observed as 33735persons consisting of 17639males (52.3%) and 16096 females (47.7%) in the 10km study zone. Scheduled Tribes (‘ST’) population was also observed as 9316 persons (3.0%) consisting of 4736 males (50.8%) and 4580females (49.2%) in the 10 km study zone.The child population (0-6 Age) of the study area is recorded as 59398(18.4%) and comprising of 30646 (51.6%)males&28752 (48.4%) females respectively.

Rural and Urban population distribution is shown in **Table 3.19, Figure 3.7 & 3.8** given as follows;

Table 3.19: Rural & Urban Population Distribution (10 km)

Zone	No. of Households	Total Population			Scheduled Castes			Scheduled Tribes		
		Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
Rural	52992	277538	144929	132609	28278	14748	13530	9102	4628	4474

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%age	85.7%	85.8%	85.5%	86.0%	83.8%	83.6%	84.0%	97.7%	97.7%	97.7%
Urban	8811	45977	24591	21386	5457	2891	2566	214	108	106
%age	14.3%	14.2%	14.5%	14.0%	16.2%	16.4%	16.0%	2.3%	2.3	2.3
Total (10km)	61803	323515	169520	153995	33735	17639	16096	9316	4736	4580

Source-Census of India, 2011

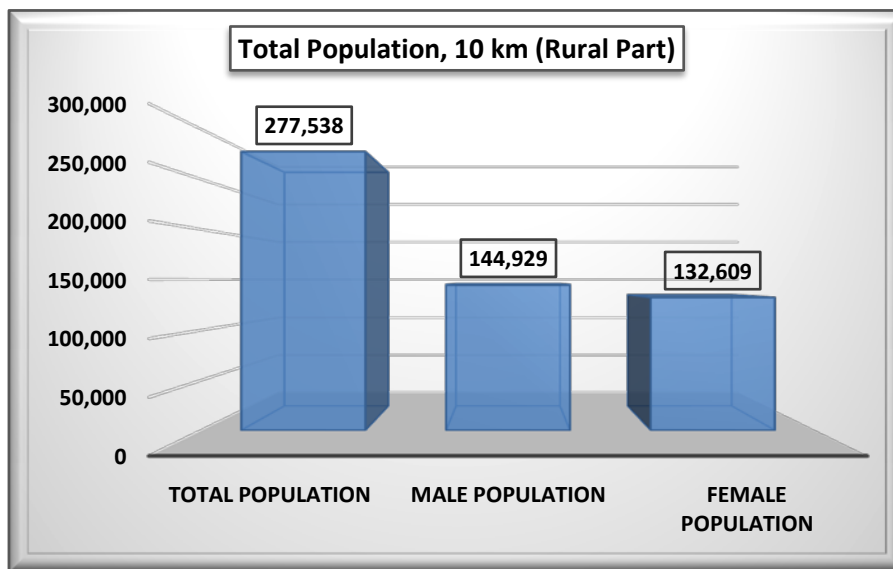


Figure 3.7: Male-Female Wise Rural Population Distribution

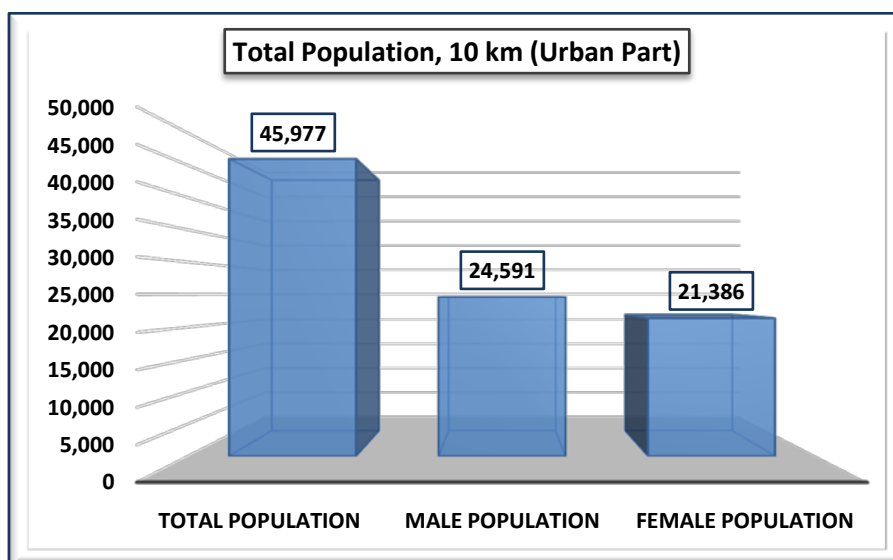


Figure 3.8: Male-Female Wise Urban Population Distribution

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Village wise details of population distribution are given as follows in **Table 3.20 & 3.21.**

Table 3.20: Village-wise Population Distribution (10km)

Name of Village/Town	No of Households	Total Population			Child Population (0-6 Years)		
		Persons	Male	Female	Persons	Male	Female
Parsa	167	933	503	430	151	71	80
Kushmaha	450	2264	1205	1059	471	249	222
Jagatpur	358	1741	922	819	289	137	152
Turdih	106	561	303	258	127	70	57
Turdih	105	467	240	227	85	51	34
Saharna	289	1489	787	702	241	133	108
Gordhoa	433	2340	1230	1110	519	282	237
Balarpur	56	304	162	142	63	33	30
Parsa	31	178	98	80	42	24	18
Chitarsari	Uninhabited Village						
Bhurna	1331	7429	3882	3547	1579	792	787
Tappadih	151	807	405	402	166	86	80
Naraenpur	1070	6044	3058	2986	1244	619	625
Guwarba	178	885	460	425	157	86	71
Hijrar	149	826	420	406	145	68	77
Barhaunia	151	768	392	376	160	66	94
Kharihara	918	4987	2619	2368	1051	561	490
Muluk	216	1154	616	538	181	84	97
Sondiha	3475	17864	9283	8581	3194	1625	1569
Dafarpur	398	2188	1141	1047	433	222	211
Pathra	2217	11717	6159	5558	2312	1201	1111
Auria	2474	12862	6710	6152	2678	1359	1319
Dudhari	2910	15395	7804	7591	3201	1656	1545
Kakwara	2210	11794	6171	5623	1980	1039	941
Kakwara Tola	173	785	397	388	141	67	74

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Harpur							
Kakwara Tola Asramha	405	2156	1139	1017	422	216	206
Kakwara Tola Bahera	844	4536	2345	2191	864	426	438
Kakwara Tola Ratautia	781	4460	2271	2189	933	456	477
Kakwara Tola Kataili	1444	7877	4164	3713	1425	763	662
Kakwara Tola Jhirwa	364	2015	1072	943	311	161	150
Kakwara Tola Chiutia	615	3375	1791	1584	703	363	340
Kakwara Tola Amarpur	557	3136	1646	1490	563	282	281
Domohan	520	3049	1582	1467	648	314	334
Jogipahari	33	165	80	85	29	11	18
Jalmarai	37	202	107	95	33	19	14
Deopur	336	1777	953	824	301	163	138
Gauripur	257	1454	762	692	250	116	134
Khudbari	Uninhabited Village						
Barmahua	106	517	273	244	108	51	57
Gowabakhar	111	588	320	268	79	44	35
Desaria	145	897	467	430	190	95	95
Majra	369	2228	1136	1092	403	204	199
Burhsaili	Uninhabited Village						
Khawaspur	192	1188	599	589	253	124	129
Korara	137	670	337	333	156	74	82
Madodiha	246	1306	697	609	183	80	103
Lakrikola	571	2729	1433	1296	488	241	247
Ikorla	194	844	462	382	142	84	58

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Baghajain	Uninhabited Village						
Karar	148	727	388	339	140	68	72
Chapri	60	275	142	133	58	34	24
Amba	195	991	523	468	231	129	102
Kunauni	133	640	346	294	101	54	47
Gorhia	5	18	10	8	0	0	0
Shadpur	115	589	314	275	71	38	33
Maheshadih	364	1930	1016	914	372	180	192
Jitwarpur Arazi	Uninhabited Village						
Saram	56	269	131	138	53	21	32
Lakhnauri	780	3938	2049	1889	725	383	342
Maniaun	433	2276	1162	1114	417	211	206
Dhaka	749	3676	1917	1759	657	355	302
Telia	849	4239	2154	2085	840	426	414
Bardiha	Uninhabited Village						
Kajhia	477	2544	1319	1225	455	235	220
Singarpur	286	1710	876	834	289	151	138
Majdiha	Uninhabited Village						
Desra	509	2749	1477	1272	541	278	263
Dalawar	Uninhabited Village						
Laskari	339	1710	884	826	288	144	144
Chamraili	376	1960	1022	938	385	172	213
Majlispur	91	598	311	287	141	70	71
BaidaChak	85	527	293	234	107	63	44
Bhagwanpur	250	1469	777	692	313	177	136
Jitwarpur	429	2270	1229	1041	395	207	188
Gobindpur	Uninhabited Village						
Baisa Rampur	192	1012	528	484	212	111	101
Meharpur	277	1454	784	670	262	140	122
Danra	825	3883	2044	1839	685	364	321
Jamhra	178	831	460	371	145	81	64

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Kalyanpur	259	1362	709	653	288	148	140
Karikado	133	695	370	325	133	65	68
Pararia	397	1911	924	987	374	172	202
Kakna	445	2207	1183	1024	392	210	182
Majhiara	323	1614	864	750	321	162	159
Baisa	271	1473	783	690	275	134	141
Maldaun	Uninhabited Village						
Bishunpur	319	1607	856	751	228	126	102
Asni	74	343	196	147	38	26	12
Riga	257	1243	648	595	262	148	114
Jogdiha	315	1643	840	803	310	147	163
Raunia	748	3897	2086	1811	693	354	339
Bhithi	161	952	503	449	155	84	71
Murhara	100	480	241	239	99	57	42
Bindi	305	1576	813	763	253	125	128
Banki	9	41	19	22	5	1	4
Balarpur	Uninhabited Village						
Banka (NP)/22 Wards	8811	45977	24591	21386	7355	3836	3519
Jamua	166	845	453	392	168	98	70
Tola Kaithatkar	95	483	249	234	84	38	46
Baghmari	87	471	242	229	96	48	48
Tola Dhobni	92	501	268	233	104	60	44
Tola Basatpur	Uninhabited Village						
Tola Garbaran	49	238	120	118	62	31	31
Tola Tilwari	82	357	170	187	76	32	44
Tola Medha	200	999	551	448	138	81	57
Tola Kadragora	91	402	200	202	75	32	43
Tola Tilaundha	75	364	209	155	60	41	19
Tola Biradih	13	78	45	33	3	2	1
Tola	544	2891	1512	1379	475	250	225

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Jamdahakhas							
Tola							
TekuadihNandirai	12	74	40	34	19	11	8
Tola Pokharia	45	220	120	100	31	16	15
Pilua	498	2870	1496	1374	432	223	209
Angaro Jabra	1250	5731	2989	2742	1005	541	464
Kusamaha	722	3612	1893	1719	608	336	272
Babhangawan	704	3853	2046	1807	744	396	348
Porai	516	2422	1301	1121	533	300	233
Jogdiha	Uninhabited Village						
Nath Than	9	16	10	6	0	0	0
KasbaMandar	1489	7568	3957	3611	1288	659	629
Bagduma	1708	8901	4629	4272	1852	942	910
Digri Pahari	21	134	70	64	25	14	11
Bishun Pur	57	298	157	141	52	26	26
Barham Pur	229	1267	663	604	166	83	83
Rani	135	693	348	345	120	65	55
Sirai	742	4001	2097	1904	709	382	327
Gorhia	169	739	378	361	125	58	67
Simra	108	570	281	289	93	53	40
Gorgawan Arazi	Uninhabited Village						
Gorgawan Arazi	Uninhabited Village						
Madho Pur	553	2606	1346	1260	470	245	225
Sasan	85	406	220	186	69	31	38
Asanha	601	3146	1658	1488	593	311	282
Phaga	1248	6502	3417	3085	965	486	479
TOTAL (10km)	61803	323515	16952 0	15399 5	59398	30646	28752
<i>Source-Census of India, 2011</i>							

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Table 3.21: Village-wise SC & ST Population Distribution (10km)

Name of Village/Town	Total Population	Scheduled Castes			Scheduled Tribes		
		Persons	Males	Females	Persons	Males	Females
Parsa	933	262	146	116	0	0	0
Kushmaha	2264	512	261	251	0	0	0
Jagatpur	1741	193	107	86	0	0	0
Turdih	561	258	136	122	0	0	0
Turdih	467	72	37	35	0	0	0
Saharna	1489	0	0	0	0	0	0
Gordhoa	2340	15	6	9	9	6	3
Balarpur	304	43	25	18	0	0	0
Parsa	178	101	58	43	0	0	0
Chitarsari	Uninhabited Village						
Bhurna	7429	604	317	287	0	0	0
Tappadih	807	0	0	0	0	0	0
Naraenpur	6044	217	113	104	0	0	0
Guwarba	885	0	0	0	0	0	0
Hijrar	826	189	92	97	0	0	0
Barhaunia	768	0	0	0	0	0	0
Kharihara	4987	278	149	129	0	0	0
Muluk	1154	526	271	255	0	0	0
Sondiha	17864	1338	688	650	70	35	35
Dafarpur	2188	124	65	59	4	2	2
Pathra	11717	648	338	310	0	0	0
Auria	12862	542	266	276	15	8	7
Dudhari	15395	1368	676	692	914	476	438
Kakwara	11794	2176	1172	1004	49	24	25
Kakwara Tola Harpur	785	622	317	305	0	0	0
Kakwara Tola	2156	67	42	25	619	334	285

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Asramha							
Kakwara Tola							
Bahera	4536	399	196	203	337	165	172
Kakwara Tola							
Ratautia	4460	24	13	11	774	383	391
Kakwara Tola							
Kataili	7877	1343	713	630	929	481	448
Kakwara Tola							
Jhirwa	2015	0	0	0	0	0	0
Kakwara Tola							
Chiutia	3375	478	256	222	0	0	0
Kakwara Tola							
Amarpur	3136	589	316	273	0	0	0
Domohan	3049	197	102	95	0	0	0
Jogipahari	165	0	0	0	0	0	0
Jalmarai	202	0	0	0	0	0	0
Deopur	1777	366	191	175	213	116	97
Gauripur	1454	0	0	0	0	0	0
Khudbari	Uninhabited Village						
Barmahua	517	298	154	144	0	0	0
Gowabakhar	588	0	0	0	0	0	0
Desaria	897	8	4	4	0	0	0
Majra	2228	443	230	213	0	0	0
Burhsaili	Uninhabited Village						
Khawaspur	1188	196	104	92	415	201	214
Korara	670	0	0	0	0	0	0
Madodiha	1306	0	0	0	0	0	0
Lakrikola	2729	253	139	114	0	0	0
Ikorla	844	0	0	0	0	0	0
Baghajain	Uninhabited Village						
Karar	727	0	0	0	0	0	0

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Chapri	275	0	0	0	0	0	0
Amba	991	452	249	203	0	0	0
Kunauni	640	1	1	0	0	0	0
Gorhia	18	0	0	0	0	0	0
Shadpur	589	0	0	0	0	0	0
Maheshadih	1930	161	76	85	0	0	0
Jitwarpur Arazi	Uninhabited Village						
Saram	269	25	11	14	0	0	0
Lakhnauri	3938	584	300	284	1	1	0
Maniaun	2276	0	0	0	0	0	0
Dhaka	3676	287	149	138	2	1	1
Telia	4239	953	486	467	0	0	0
Bardiha	Uninhabited Village						
Kajhia	2544	400	211	189	0	0	0
Singarpur	1710	0	0	0	0	0	0
Majdiha	Uninhabited Village						
Desra	2749	15	6	9	0	0	0
Dalawar	Uninhabited Village						
Laskari	1710	0	0	0	0	0	0
Chamraili	1960	93	54	39	0	0	0
Majlispur	598	0	0	0	0	0	0
BaidaChak	527	0	0	0	0	0	0
Bhagwanpur	1469	41	21	20	0	0	0
Jitwarpur	2270	134	72	62	0	0	0
Gobindpur	Uninhabited Village						
Baisa Rampur	1012	43	21	22	0	0	0
Meharpur	1454	90	48	42	7	1	6
Danra	3883	386	200	186	0	0	0
Jamhra	831	0	0	0	0	0	0
Kalyanpur	1362	254	123	131	0	0	0
Karikado	695	5	4	1	0	0	0

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Pararia	1911	141	69	72	0	0	0
Kakna	2207	335	179	156	14	9	5
Majhiara	1614	330	166	164	0	0	0
Baisa	1473	0	0	0	0	0	0
Maldaun	Uninhabited Village						
Bishunpur	1607	422	225	197	0	0	0
Asni	343	0	0	0	0	0	0
Riga	1243	590	304	286	2	1	1
Jogdiha	1643	239	120	119	0	0	0
Raunia	3897	949	500	449	0	0	0
Bhithi	952	197	101	96	0	0	0
Murhara	480	251	128	123	0	0	0
Bindi	1576	182	94	88	0	0	0
Banki	41	21	9	12	0	0	0
Balarpur	Uninhabited Village						
Banka (NP)/22 Wards	45977	5457	2891	2566	214	108	106
Jamua	845	121	59	62	0	0	0
Tola Kaithatkar	483	0	0	0	417	210	207
Baghmari	471	0	0	0	0	0	0
Tola Dhobni	501	0	0	0	0	0	0
Tola Basatpur	Uninhabited Village						
Tola Garbaran	238	0	0	0	0	0	0
Tola Tilwari	357	0	0	0	0	0	0
Tola Medha	999	1	0	1	1	1	0
Tola Kadragora	402	0	0	0	0	0	0
Tola Tilaundha	364	0	0	0	0	0	0
Tola Biradih	78	0	0	0	0	0	0
Tola Jamdahakhas	2891	493	258	235	0	0	0
Tola TekuadihNandirai	74	0	0	0	0	0	0

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Tola Pokharia	220	0	0	0	0	0	0
Pilua	2870	21	11	10	55	30	25
Angaro Jabra	5731	771	399	372	391	208	183
Kusamaha	3612	606	327	279	0	0	0
Babhangawan	3853	29	15	14	395	196	199
Porai	2422	306	161	145	91	44	47
Jogdiha	Uninhabited Village						
Nath Than	16	0	0	0	0	0	0
KasbaMandar	7568	532	274	258	332	159	173
Bagduma	8901	938	498	440	1	1	0
Digri Pahari	134	0	0	0	117	61	56
Bishun Pur	298	0	0	0	0	0	0
Barham Pur	1267	138	74	64	1	0	1
Rani	693	0	0	0	37	18	19
Sirai	4001	158	83	75	721	346	375
Gorhia	739	0	0	0	0	0	0
Simra	570	0	0	0	355	169	186
Gorgawan Arazi	Uninhabited Village						
Gorgawan Arazi	Uninhabited Village						
Madho Pur	2606	341	173	168	331	162	169
Sasan	406	160	85	75	0	0	0
Asanha	3146	578	298	280	159	75	84
Phaga	6502	755	406	349	1324	704	620
TOTAL (10km)	323515	33735	1763 9	16096	9316	4736	4580

Source-Census of India, 2011

Sex Ratio

The 'Sex Ratio' of the study area is a numeric relationship between females and males of an area and bears paramount importance in the present day scenario where the un-ethnic pre-determination of sex and killing of female foetus during pregnancy is practiced by

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unscrupulous medical practitioners against the rule of the law of the country. It is evident that by contrast the practice of female foeticide is not prevalent in the study area.

The 'Sex Ratio' was observed as 907 females per 1000 males in the District followed by 908 and 875 for the rural and urban part of the district. The same was recorded as 908 females for every 1000 males in the study area. The child (0-6 yr age) sex ratio of the stud area was observed as 938 female children per 1000 male children.

The village wise male-female population distribution for the study area is depicted and shown by graphical representation in **Figure 3.9**.

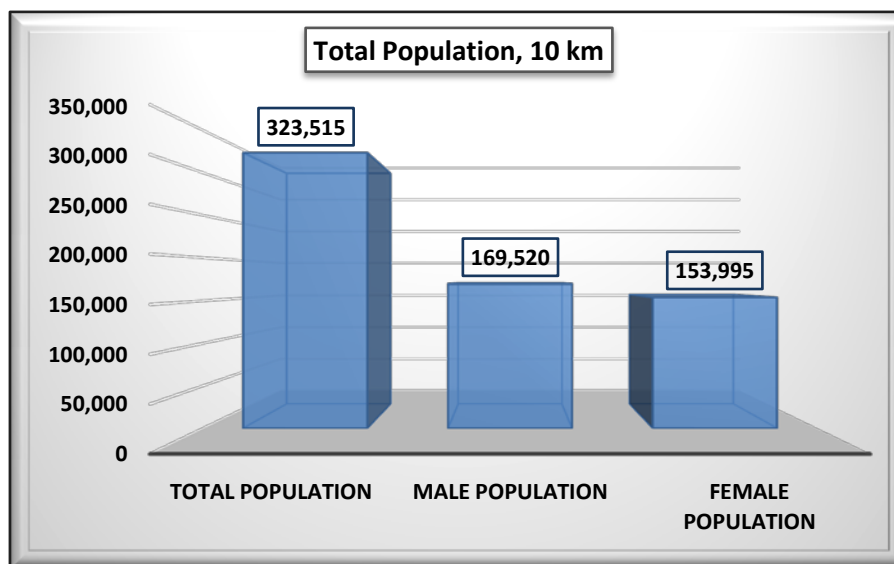


Figure 3.9: Male-Female Wise Population Distribution

Scheduled Caste & Scheduled Tribe Population

On the basis of the village wise SC & ST population distribution of the study area during 2011, the 'Scheduled Castes' population was observed as 33735 persons consisting of 17639 males and 16096 females respectively in the study area which accounts as 10.4% to the total population (323515 persons) of the study area. Scheduled Tribes ('ST') population was observed as 9316 persons, accounts as 3.0% to the total population of the study zone consisting of 4736 males and 4580 females in the 10km radius study zone. It implies that the rest 86.6% of the total population belongs to the general category.

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Male-female wise distribution of ‘SC’ & ‘ST’ population in the study area is graphically shown in **Figure 3.10 & 3.11** as follows.

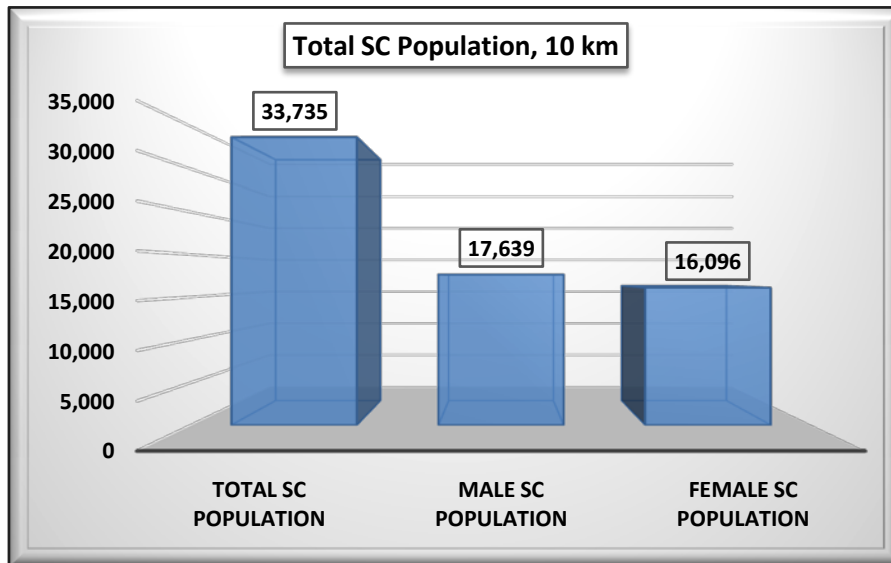


Figure 3.10: Scheduled Caste Population in the Study Area

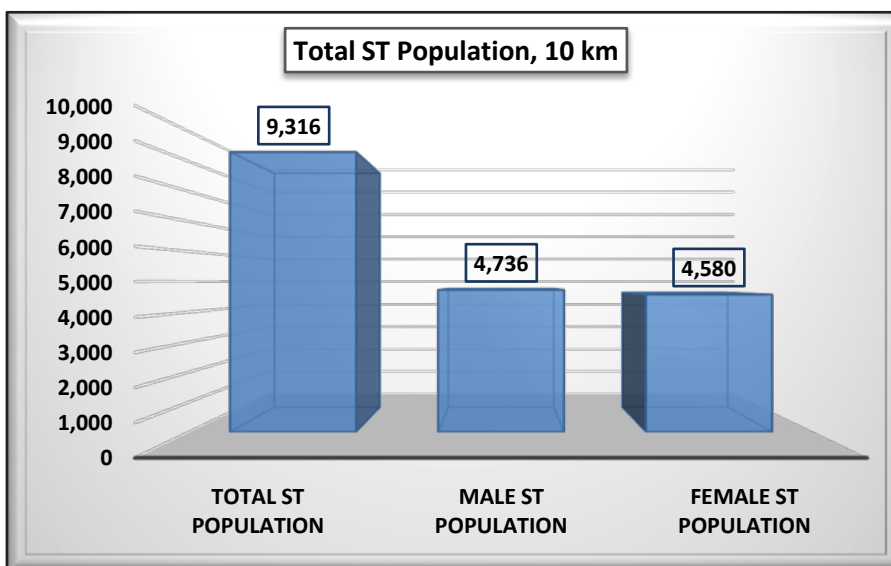


Figure 3.11: Scheduled Tribes Population in the Study Area

Literacy Rate

Literacy level is quantifiable indicator to assess the development status of an area or region. Male-Female wise literates and illiterate’s population is represented in **Table 3.22**. Total literate’s population was recorded as 159239 persons (49.2%) in the study area. Table 3.22

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reveals that Male-Female wise literates are observed as 96789&62450 persons respectively, implies that the ‘Literacy Rate’ is recorded as 49.2% with male-female wise percentages being 29.9% &19.3% respectively.

The Male-Female wise graphical representation of literates & illiterate’s population in study area villages/town is shown in **Figure 3.12**.

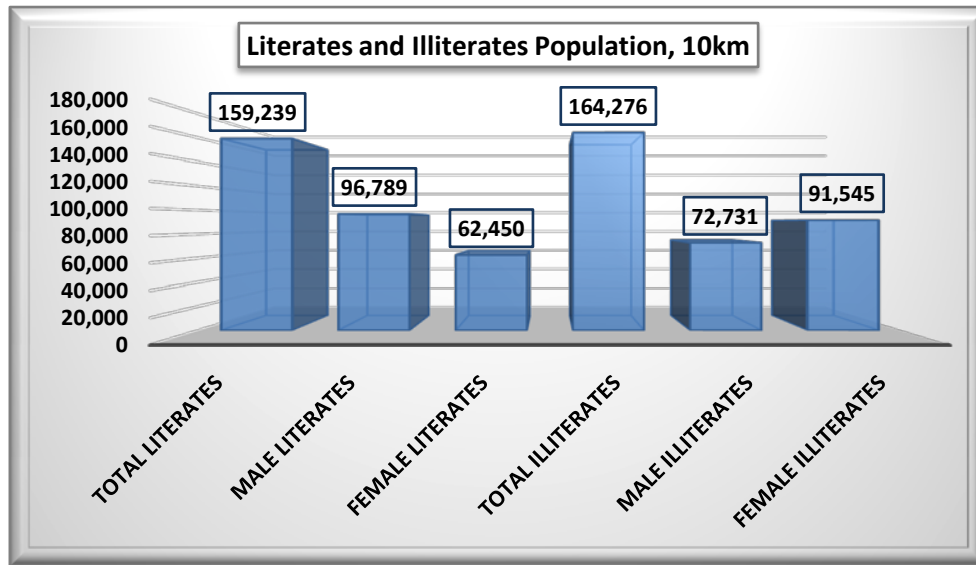


Figure 3.12: Male-Female Wise Distribution of Literates & Illiterates

Table 3.22: Male-Female Wise Literates and Illiterates(10km)

Name of Village/Town	Total Population	Literates			Illiterates		
		Persons	Males	Females	Persons	Males	Females
Parsa	933	547	326	221	386	177	209
Kushmaha	2264	940	579	361	1324	626	698
Jagatpur	1741	1013	617	396	728	305	423
Turdih	561	226	141	85	335	162	173
Turdih	467	280	156	124	187	84	103
Saharna	1489	1065	587	478	424	200	224
Gordhoa	2340	625	395	230	1715	835	880
Balarpur	304	70	51	19	234	111	123
Parsa	178	35	22	13	143	76	67

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Chitarsari	Uninhabited Village						
Bhurna	7429	2881	1808	1073	4548	2074	2474
Tappadih	807	317	203	114	490	202	288
Naraenpur	6044	2247	1370	877	3797	1688	2109
Guwarba	885	437	245	192	448	215	233
Hijrar	826	460	267	193	366	153	213
Barhaunia	768	331	187	144	437	205	232
Kharihara	4987	1941	1220	721	3046	1399	1647
Muluk	1154	508	311	197	646	305	341
Sondiha	17864	9289	5572	3717	8575	3711	4864
Dafarpur	2188	1042	641	401	1146	500	646
Pathra	11717	5293	3375	1918	6424	2784	3640
Auria	12862	5271	3261	2010	7591	3449	4142
Dudhari	15395	6068	3753	2315	9327	4051	5276
Kakwara	11794	5789	3551	2238	6005	2620	3385
Kakwara Tola Harpur	785	291	189	102	494	208	286
Kakwara Tola Asramha	2156	959	596	363	1197	543	654
Kakwara Tola Bahera	4536	2102	1348	754	2434	997	1437
Kakwara Tola Ratautia	4460	1614	1094	520	2846	1177	1669
Kakwara Tola Kataili	7877	3155	2032	1123	4722	2132	2590
Kakwara Tola Jhirwa	2015	1197	734	463	818	338	480
Kakwara Tola Chiutia	3375	1658	1024	634	1717	767	950
Kakwara Tola Amarpur	3136	1428	891	537	1708	755	953

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Domohan	3049	1538	943	595	1511	639	872
Jogipahari	165	100	56	44	65	24	41
Jalmarai	202	134	74	60	68	33	35
Deopur	1777	814	496	318	963	457	506
Gauripur	1454	731	485	246	723	277	446
Khudbari	Uninhabited Village						
Barmahua	517	214	157	57	303	116	187
Gowabakhar	588	360	231	129	228	89	139
Desaria	897	370	249	121	527	218	309
Majra	2228	1114	702	412	1114	434	680
Burhsaili	Uninhabited Village						
Khawaspur	1188	442	279	163	746	320	426
Korara	670	226	139	87	444	198	246
Madodiha	1306	735	461	274	571	236	335
Lakrikola	2729	1293	805	488	1436	628	808
Ikorla	844	404	262	142	440	200	240
Baghajain	Uninhabited Village						
Karar	727	356	245	111	371	143	228
Chapri	275	72	49	23	203	93	110
Amba	991	283	188	95	708	335	373
Kunauni	640	381	223	158	259	123	136
Gorhia	18	17	10	7	1	0	1
Shadpur	589	466	255	211	123	59	64
Maheshadih	1930	995	605	390	935	411	524
Jitwarpur Arazi	Uninhabited Village						
Saram	269	75	47	28	194	84	110
Lakhnauri	3938	1543	932	611	2395	1117	1278
Maniaun	2276	1172	700	472	1104	462	642
Dhaka	3676	1819	1118	701	1857	799	1058
Telia	4239	2054	1194	860	2185	960	1225
Bardiha	Uninhabited Village						

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Kajhia	2544	987	601	386	1557	718	839
Singarpur	1710	727	439	288	983	437	546
Majdiha	Uninhabited Village						
Desra	2749	1196	734	462	1553	743	810
Dalawar	Uninhabited Village						
Laskari	1710	850	510	340	860	374	486
Chamraili	1960	919	590	329	1041	432	609
Majlispur	598	296	186	110	302	125	177
BaidaChak	527	323	198	125	204	95	109
Bhagwanpur	1469	602	362	240	867	415	452
Jitwarpur	2270	1258	782	476	1012	447	565
Gobindpur	Uninhabited Village						
Baisa Rampur	1012	465	273	192	547	255	292
Meharpur	1454	698	439	259	756	345	411
Danra	3883	1776	1075	701	2107	969	1138
Jamhra	831	508	317	191	323	143	180
Kalyanpur	1362	602	373	229	760	336	424
Karikado	695	352	215	137	343	155	188
Pararia	1911	950	551	399	961	373	588
Kakna	2207	993	586	407	1214	597	617
Majhiara	1614	925	582	343	689	282	407
Baisa	1473	751	472	279	722	311	411
Maldaun	Uninhabited Village						
Bishunpur	1607	1017	569	448	590	287	303
Asni	343	299	169	130	44	27	17
Riga	1243	678	402	276	565	246	319
Jogdiha	1643	957	589	368	686	251	435
Raunia	3897	2005	1260	745	1892	826	1066
Bhithi	952	504	314	190	448	189	259
Murhara	480	194	112	82	286	129	157
Bindi	1576	1032	575	457	544	238	306

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Banki	41	23	13	10	18	6	12
Balarpur	Uninhabited Village						
Banka (NP)/22			1689				
Wards	45977	29281	8	12383	16696	7693	9003
Jamua	845	464	279	185	381	174	207
Tola Kaithatkar	483	254	169	85	229	80	149
Baghmari	471	254	154	100	217	88	129
Tola Dhobni	501	227	160	67	274	108	166
Tola Basatpur	Uninhabited Village						
Tola Garbaran	238	105	54	51	133	66	67
Tola Tilwari	357	139	88	51	218	82	136
Tola Medha	999	715	424	291	284	127	157
Tola Kadragora	402	232	134	98	170	66	104
Tola Tilaundha	364	154	114	40	210	95	115
Tola Biradih	78	53	36	17	25	9	16
Tola Jamdahakhas	2891	1770	1063	707	1121	449	672
Tola							
TekuadihNandirai	74	2	2	0	72	38	34
Tola Pokharia	220	53	35	18	167	85	82
Pilua	2870	1738	1030	708	1132	466	666
Angaro Jabra	5731	2777	1702	1075	2954	1287	1667
Kusamaha	3612	1809	1071	738	1803	822	981
Babhangawan	3853	1651	1043	608	2202	1003	1199
Porai	2422	842	539	303	1580	762	818
Jogdiha	Uninhabited Village						
Nath Than	16	16	10	6	0	0	0
KasbaMandar	7568	4125	2465	1660	3443	1492	1951
Bagduma	8901	3810	2333	1477	5091	2296	2795
Digri Pahari	134	23	17	6	111	53	58
Bishun Pur	298	140	91	49	158	66	92
Barham Pur	1267	825	467	358	442	196	246

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Rani	693	379	228	151	314	120	194
Sirai	4001	2120	1272	848	1881	825	1056
Gorhia	739	358	192	166	381	186	195
Simra	570	281	174	107	289	107	182
Gorgawan Arazi	Uninhabited Village						
Gorgawan Arazi	Uninhabited Village						
Madho Pur	2606	996	658	338	1610	688	922
Sasan	406	174	116	58	232	104	128
Asanha	3146	1471	941	530	1675	717	958
Phaga	6502	3327	2091	1236	3175	1326	1849
TOTAL (10km)	323515	159239	9678 9	62450	164276	7273 1	91545
<i>Source-Census of India, 2011</i>							

Economic Profile of Banka District:

Banka is a district among 38 districts of Bihar state, India. The district was formed on 21 February 1991, when it was separated from Munger district.

The economy of the district is mainly based on agriculture. Almost all people of the district is engaged in agriculture since it has no big industries and factories. Every year a huge chunk of revenue comes from the agricultural products grown in the district. Some of its chief agricultural products are paddy, wheat, lentils etc. The district is not very developed educationally due to lack of educational institutions in the district compels its students to go to other places in order to take education.

In 2006 the Ministry of Panchayati Raj named Banka one of the country's 250 most backward districts (out of a total of 640). It is one of the 36 districts in Bihar currently receiving funds from the Backward Regions Grant Fund Programme (BRGF).

Workers Scenario:

Occupational studied to assess the skills of people in the study area. Occupational pattern helps in identifying major economic activities of the area. In the study area the Main and Marginal Workers population was observed as 64930 (20.0%) and 50,953(16.0%) to the total

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

population (323515), while the remaining 207632(64.0%) persons were recorded as non-workers. Thus it implies that the semi-skilled and non-skilled work-force required in study area for the project is available in aplenty.

The village-wise main and marginal worker's population with further classification as casual, agricultural, households and other workers is shown as follows in **Table 3.23**.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Table 3.23: Village-wise Occupational Pattern (10km)

Name of the Village/Town	MAIN WORK_P	MAIN_C L_P	MAIN_A L_P	MAIN_H H_P	MAIN_O T_P	MARG WORK_P	MARG_C L_P	MARG_A L_P	MARG_H H_P	MARG_OT _P
Parsa	60	30	7	5	18	323	7	279	17	20
Kushmaha	402	57	322	3	20	751	105	584	4	58
Jagatpur	445	191	127	14	113	297	88	145	19	45
Turdih	120	9	109	0	2	78	0	78	0	0
Turdih	90	52	11	0	27	41	0	40	0	1
Saharna	348	265	54	0	29	5	2	2	0	1
Gordhoa	347	163	170	0	14	424	23	321	19	61
Balarpur	64	2	53	0	9	49	25	19	1	4
Parsa	42	8	24	0	10	36	10	21	0	5
Chitarsari	Uninhabited Village									
Bhurna	890	479	76	3	332	1195	104	1050	2	39
Tappadih	172	73	16	1	82	88	1	85	0	2
Naraenpur	1320	401	392	25	502	947	27	802	31	87
Guwarba	257	139	102	0	16	100	15	79	1	5
Hijrar	85	63	2	0	20	250	14	219	0	17
Barhaunia	3	0	0	0	3	392	2	389	0	1

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Kharihara	928	438	371	0	119	259	19	228	0	12
Muluk	179	56	110	0	13	117	4	112	1	0
Sondiha	3762	729	1177	107	1749	1463	164	1020	25	254
Dafarpur	395	190	104	5	96	156	20	76	2	58
Pathra	2129	564	987	65	513	1616	259	896	19	442
Auria	1751	680	712	54	305	2573	490	1923	71	89
Dudhari	1892	791	753	32	316	4525	1245	2925	136	219
Kakwara	2709	1092	1295	18	304	1835	156	1598	18	63
Kakwara Tola Harpur	416	406	6	0	4	18	18	0	0	0
Kakwara Tola Asramha	291	10	240	25	16	649	102	457	77	13
Kakwara Tola Bahera	1106	607	376	3	120	1157	372	651	102	32
Kakwara Tola Ratautia	781	387	339	3	52	750	202	527	1	20
Kakwara Tola Kataili	1682	1178	430	15	59	1833	272	1493	31	37
Kakwara Tola	384	57	258	3	66	344	68	262	0	14

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Jhirwa										
Kakwara Tola	931	324	333	55	219	185	57	105	2	21
Chiutia										
Kakwara Tola	700	344	214	41	101	290	11	242	33	4
Amarpur										
Domohan	733	218	476	3	36	449	263	125	29	32
Jogipahari	41	0	40	0	1	52	3	38	6	5
Jalmarai	102	79	6	13	4	2	0	0	1	1
Deopur	806	480	316	1	9	24	12	9	1	2
Gauripur	282	54	197	12	19	268	8	256	0	4
Khudbari	Uninhabited Village									
Barmahua	140	112	23	0	5	97	33	60	1	3
Gowabakhar	176	158	16	0	2	1	1	0	0	0
Desaria	153	126	23	0	4	74	26	47	0	1
Majra	737	523	202	1	11	253	239	13	0	1
Burhsaili	Uninhabited Village									
Khawaspur	498	214	277	0	7	0	0	0	0	0
Korara	36	14	0	0	22	250	144	48	1	57
Madodiha	634	442	189	0	3	29	22	7	0	0

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Lakrikola	871	306	529	2	34	370	73	291	1	5
Ikorla	118	110	1	0	7	289	83	202	1	3
Baghajain	Uninhabited Village									
Karar	189	109	77	0	3	0	0	0	0	0
Chapri	59	0	59	0	0	75	0	75	0	0
Amba	184	58	125	1	0	277	6	271	0	0
Kunauni	85	14	43	3	25	189	6	173	5	5
Gorhia	4	0	4	0	0	3	0	3	0	0
Shadpur	143	105	21	1	16	25	21	4	0	0
Maheshadih	495	122	213	47	113	105	26	78	0	1
Jitwarpur Arazi	Uninhabited Village									
Saram	71	3	55	4	9	61	2	58	0	1
Lakhnauri	1118	393	672	2	51	671	132	304	5	230
Maniaun	412	122	234	1	55	617	15	586	9	7
Dhaka	677	137	388	10	142	344	50	282	2	10
Telia	1013	253	524	14	222	429	32	377	2	18
Bardiha	Uninhabited Village									
Kajhia	550	361	160	0	29	732	48	680	0	4
Singarpur	563	195	349	8	11	170	17	151	1	1

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Majdiha	Uninhabited Village									
Desra	434	61	307	55	11	865	141	645	72	7
Dalawar	Uninhabited Village									
Laskari	414	99	297	0	18	163	65	94	0	4
Chamraili	250	20	121	8	101	572	282	280	2	8
Majlispur	139	85	42	0	12	126	30	92	0	4
BaidaChak	58	45	7	0	6	46	14	19	0	13
Bhagwanpur	358	103	224	14	17	145	18	114	10	3
Jitwarpur	635	237	347	3	48	420	39	368	1	12
Gobindpur	Uninhabited Village									
Baisa Rampur	203	62	108	3	30	381	58	318	2	3
Meharpur	265	90	100	0	75	258	35	200	2	21
Danra	929	399	246	27	257	699	203	249	83	164
Jamhra	113	46	57	0	10	187	91	94	0	2
Kalyanpur	335	137	193	0	5	302	79	223	0	0
Karikado	178	86	90	0	2	63	0	62	0	1
Pararia	454	116	222	10	106	74	0	68	5	1
Kakna	251	75	129	12	35	464	22	396	10	36
Majhiara	366	27	320	11	8	433	39	384	6	4

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Baisa	349	76	88	17	168	160	18	127	1	14
Maldaun	Uninhabited Village									
Bishunpur	231	177	18	0	36	304	30	274	0	0
Asni	62	49	0	7	6	8	1	3	0	4
Riga	212	62	100	2	48	118	1	117	0	0
Jogdiha	327	105	67	3	152	103	1	94	1	7
Raunia	812	227	450	8	127	667	34	357	2	274
Bhithi	261	34	154	1	72	104	19	70	6	9
Murhara	36	30	0	0	6	175	0	175	0	0
Bindi	300	90	137	38	35	204	6	179	3	16
Banki	6	4	0	0	2	6	5	0	0	1
Balarpur	Uninhabited Village									
Banka (NP)/22 Wards	9804	894	2153	449	6308	2588	209	1294	206	879
Jamua	224	5	188	7	24	15	1	5	3	6
Tola Kaithatkar	5	0	2	0	3	113	0	79	0	34
Baghmari	122	59	10	0	53	72	64	2	0	6
Tola Dhobni	133	88	25	1	19	3	0	2	0	1
Tola Basatpur	Uninhabited Village									

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Tola Garbaran	54	0	54	0	0	50	0	50	0	0
Tola Tilwari	100	73	27	0	0	6	0	6	0	0
Tola Medha	208	110	35	6	57	341	170	62	7	102
Tola Kadragora	102	1	101	0	0	94	0	94	0	0
Tola Tilaundha	68	1	55	8	4	46	13	4	11	18
Tola Biradih	15	0	0	4	11	26	0	26	0	0
Tola Jamdahakhas	316	60	188	15	53	915	26	757	49	83
Tola TekuadihNandirai	3	0	1	0	2	32	0	23	1	8
Tola Pokharia	99	95	1	1	2	0	0	0	0	0
Pilua	319	172	26	5	116	471	44	362	6	59
Angaro Jabra	563	251	190	46	76	1689	124	1524	19	22
Kusamaha	815	316	308	6	185	282	8	244	7	23
Babhangawan	791	429	292	1	69	965	386	571	2	6
Porai	552	120	380	5	47	247	6	229	5	7
Jogdiha	Uninhabited Village									
Nath Than	4	1	0	3	0	3	0	3	0	0
KasbaMandar	1396	232	524	57	583	1230	84	894	34	218
Bagduma	1171	294	520	5	352	1418	78	1234	5	101

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Digri Pahari	39	1	36	2	0	7	3	3	1	0
Bishun Pur	69	4	55	9	1	17	3	4	5	5
Barham Pur	172	16	61	23	72	241	24	140	22	55
Rani	50	2	18	11	19	431	7	409	10	5
Sirai	341	118	59	11	153	1377	125	1159	7	86
Gorhia	145	2	135	0	8	285	17	263	1	4
Simra	94	86	0	0	8	113	1	112	0	0
Gorgawan Arazi	Uninhabited Village									
Gorgawan Arazi	Uninhabited Village									
Madho Pur	945	258	610	9	68	99	53	35	0	11
Sasan	219	0	218	0	1	5	0	4	0	1
Asanha	498	300	156	11	31	986	25	930	16	15
Phaga	1945	221	1600	7	117	1137	173	940	7	17
TOTAL (10km)	64930	21244	26241	1521	15924	50953	8019	37232	1307	4395

Source-Census of India, 2011

ABBREVIATIONS:

MAIN WORKERS POPULATION: **MAIN_WORK_P:** Main worker's total population, **MAIN_CL_P:** Main cultivated labour population, **MAIN_AL_P:** Main agricultural labour population, **MAIN_HH_P:** Main worker's population involved in household industries, **MAIN_OT_P:** Main other worker's population

MARGINAL WORKERS POPULATION:

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

MARG_WORK_P: Marginal worker's total population, **MARG_CL_P:** Marginal cultivated labors total population, **MARG_AL_P:** Marginal agricultural labors population, **MARG_HH_P:** Marginal workers involved inhousehold industries, **MARG_OT_P :** Marginal other workers Population

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Distribution of work participation rate of the study area population is shown in **Table 3.24** as follows;

Table 3.24: Distribution of Work Participation Rate (10km)

Occupation Class	Year, 2011
Main Workers	64930 (20.0%)
Male	53617(82.6%)
Female	11313(17.4%)
Marginal Workers	50953(16.0%)
Male	27301(53.6%)
Female	23652(46.4%)
Non-Workers	207632(64.0%)
Male	88602 (42.7%)
Female	119030(57.3%)
Total Population (10km)	323515
<i>Source: Census of India Records, 2011</i>	

Graphical representation of Workers Scenario is given below as **Figure 3.13**.

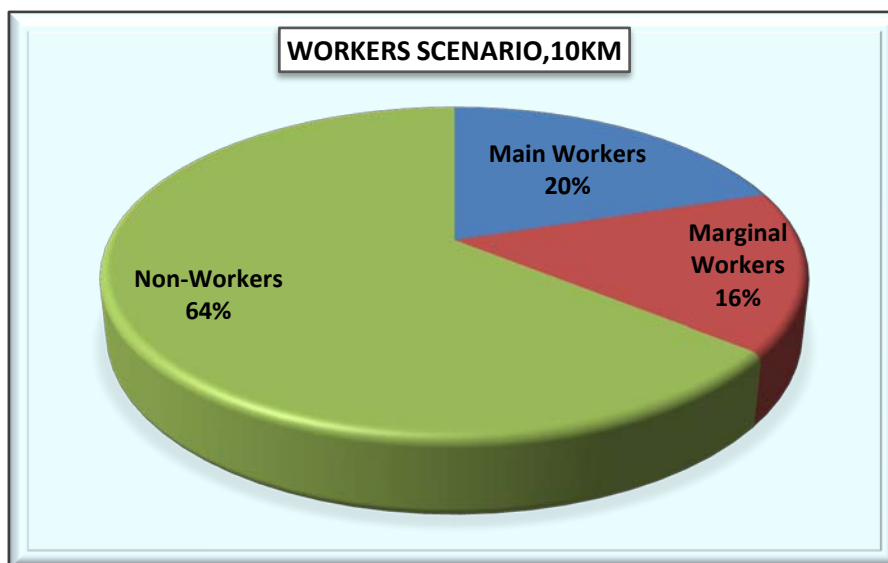


Figure 3.13: Workers Scenario of Study Area

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Composition of Main Workers:

The 'Main Workers' were observed as 64930 persons (20.0%) to the total population (323515) of the study area and its composition is made-up of Casual laborers as 21244 (33.0%), Agricultural laborers as 26241 (40.0%), Household workers 1521 (2.0%) and other workers as 15924 (25.0%) respectively.

Composition of Main workers is shown below as **Figure 3.14**.

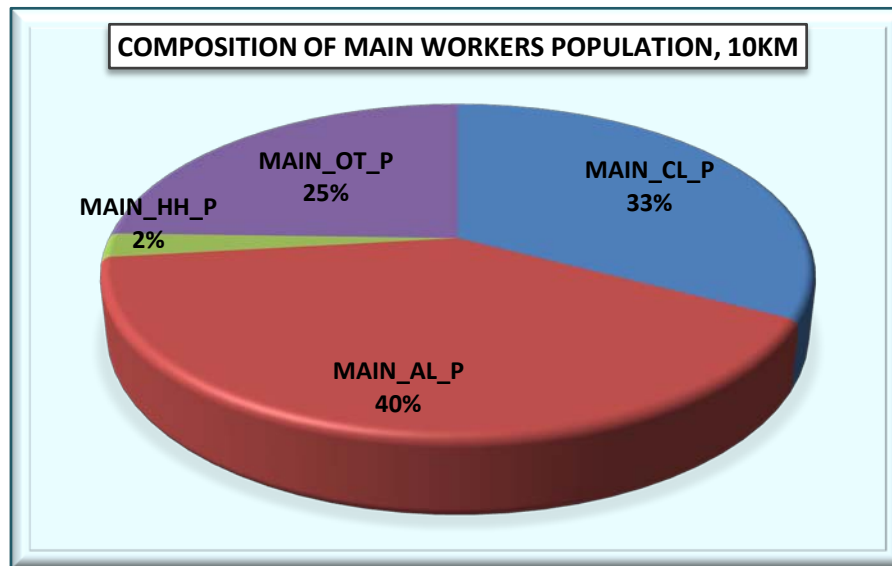


Figure 3.14: Composition of Main Workers Population

Composition of Marginal Workers:

The total marginal workers are observed as 50953 which constitute 16.0% to the total population (323515) comprising of Marginal Casual Laborers as 8019 (16.0%), Marginal Agricultural Laborers as 37232 (73.0%), Marginal Household laborers as 1307 (2.0%) and marginal other workers were also observed as 4395 (9.0%) of the total marginal workers respectively.

Details about marginal workers in the study area are tabulated in **Table 3.24**. Composition of Marginal workers is shown in **Figure 3.15** as follows.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

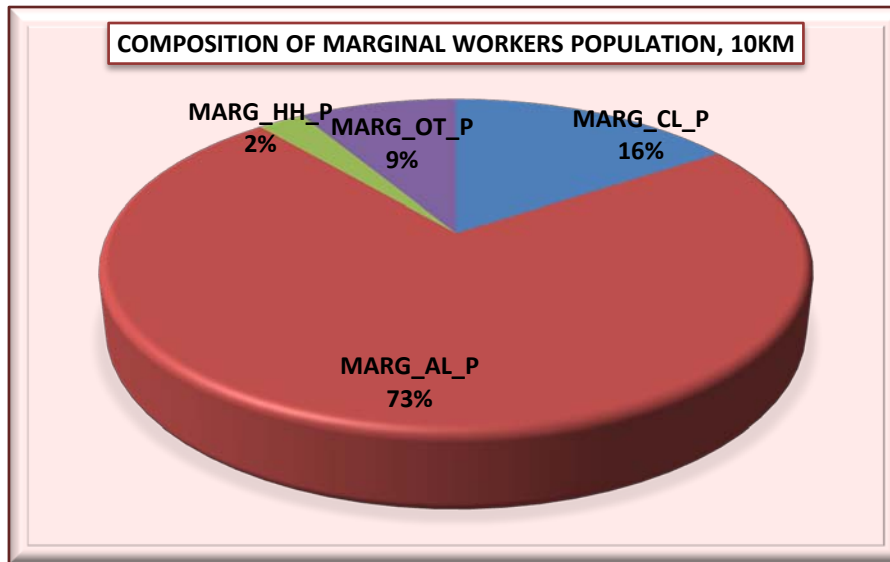


Figure 3.15: Composition of Marginal Workers

Composition of Non-Workers:

The total Non-worker's population was observed as 207632 which accounts 64.0% to the total population (323515) of the study area. Male-female wise Non-worker's population was recorded as 88602 Males (42.7%) and 119030 Females (57.3%) respectively.

Details about Total Non-workers in the study area are compiled in **Table 3.25**. Graphical representation of Non-worker's population is shown as follows in **Figure 3.16**.

Table 3.25: Composition of Non-Workers

Non-Workers Population		
Persons	Males	Females
207632	88602 (42.7%)	119030(57.3%)

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

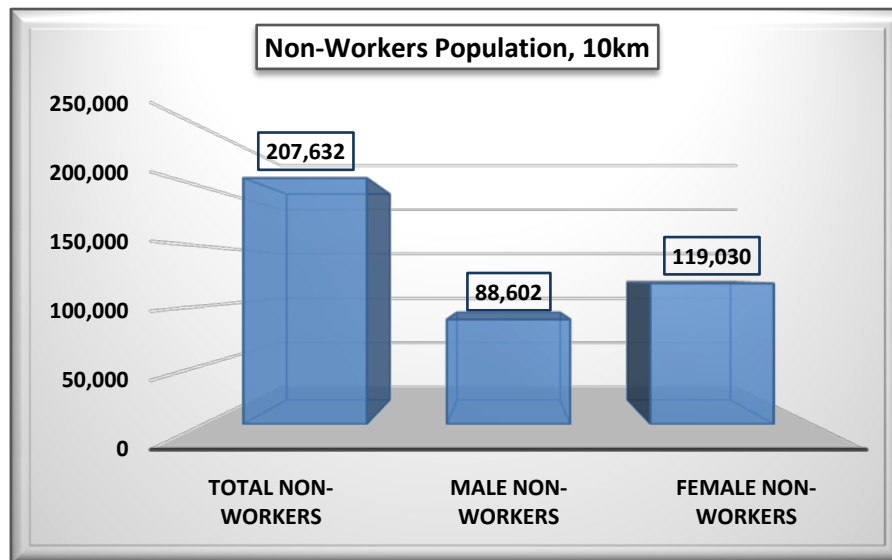


Figure 3.16: Composition of Non-Workers

Basic Infrastructure Facilities Availability(as per the census records of 2011)

A review of basic infrastructure facilities (Amenities) available in the study area has been done on the basis of the field survey and Census records, 2011 for the study area inhabited villages of Banka District in Bihar state. The study area has average level of basic infrastructure facilities like educational, medical, potable water and power supply and transport & communication network.

As per the Census Records 2011, the study area has a total of 132 villages and one major Town named Banka (NP/22 Wards) lying under Banka District in Bihar state. Overall study area villages are falling mainly under Six (06) no of tehsils namely Dhuraiya (03 villages), Barahat (19 villages), Banka (76 villages) and Chanana (01 villages), Katoria (11 villages), Bausi (22 village) of Banka district in Bihar state.

There are about 15 villages found as uninhabited villages in the study area. There is one major town named Banka (NP/22 Wards) found in the 10km radial study zone.

Educational Facilities

There is a total no. of 66 Primary schools existing in the 10km radius study area. About 47 no of Middle schools are found in the study area. About 8 no of Higher Secondary School (SS) and only one Senior Secondary School (SSS) facility is available in the study area. The

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

educational facilities have been further strengthening now and a number of private public schools and colleges are also functioning in the surroundings of the study area. Besides, there are Engineering and Medical colleges available in Towns and District headquarters only. Higher education facilities are available in Towns of the district. There is a considerable improvement in educational facility. The villages of the study area have no such facilities can reach within 5to 10km range.

Availability of University Education in Banka District

There are several affiliated and constituted colleges of the TilkaManjhi University, Bhagalpur which imparts under graduate and post graduate education in the district. IGNOU (Indira Gandhi National Open University) has opened study center K.K.M College in Banka where one can study many distance courses of under graduate, post graduate and vocational etc.

Medical Facilities

The medical facilities are provided by different agencies like Govt. & Private individuals and voluntary organizations in the study area. As per the census 2011, only 14no of primary health centersexistin the study area; most of the study area villages depend upon the towns & district HQ of the study area having such facility. No community health centre exists in the study area except one primary health centre found in Tola Jamdahakhas village of Katoria tehsil in Banka district.Only 10no of Primary Health Sub-Centers exists in the villages of the study area. Only 6no of Mother & Child Welfare Centersarefound in the study area. Noallopathic hospitalexists in the study area. Only 2medical dispansariesand 6 Family Welfare Centerswerefound in the study area. Overall study area villages are served by moderate level of medical facilities. Specialized medical facilities are available only in towns and District Headquarter (HQ) only.

Potable Water Facilities

Potable water facility is available in most of the villages of the study area. The entire study area has average level of potable water facilities. Hand Pump(HP) water facility is commonly observed in the study area as potable water facility. Out of the total 133 villages/towns,only40 villages (30.0%)are served with River/Canal water in the study area. As per the census records 2011, only 4 villages were foundbeing served with Tank/Pond/Lake as potable water facility in the study area.

Communication, Road & Transport Facilities

Apart from Post & Telegraph Office (PTO) services, transport is the main communication linkage in the study area. Compiled census 2011, data shows that the study area has good postal facilities in the 10km radius zone. Only 19 villages(14.4%) were found serving with Post Office facilities in the study area, remaining villages are depending upon towns of the study area. The study area has average rail and road network, passes from the area.

Nearest railway station is Banka Junction, towards NW direction. About 10 villages were found with railway station facility in the study area. Site is well connected by National Highway & State Highway road also passing in the area. Nearest railway station is Banka Railway Station in Northwest direction. Nearest town is Banka (NP) located in NW direction. Nearest airport is Jai Prakash Narayan International Airport Patna located in NW.

Communications (Banka District)

Roads - The district of Banka is well served by a network of roads. Road communication is the main mode of transportation in this district. The roads are classified as the National Highways, State Highways, Major district roads and other district roads. They are maintained by the Public Works Department, the Rural Engineering Organisation, the Zila Parishad, Municipalities. It is also connected with the interior of the district by metalled road. Three State Highway (SH) Cross the district. SH-19, 22 and 25 pass through the district. Following are the other black-topped roads maintained by the P.W.D. These are all State Highways.

Rural area of the district is also connected with other district roads from District H.Q and Block H.Q.

The important roads in the area north of the Ganges are Bihpur-Ghaghrihat road (9.5 km), Naugachhia-Gopalpur-Colgong road (21.0 km), the road from Gosaingaon to the junction of Bihpur-Birpur Road (21.0 km) and Kotoria-Tuitanga road (11.0 km). The District Board also maintains considerable length of pucca roads. Besides, there are a good number of other district roads in the district.

Railways - The district of Banka has a railway communication system. It is served by Eastern Railway Zone. Railways have provided 44 Km from Bhagalpur to Mandar Hill. It connects Rajoun, Barahat, and Bounsi Blocks with Bhagalpur. The Broadgauge is serving since British Period. Railway has sanctioned the following Projects;

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

1. *Mandar Hill* - Rampur Hat

2. *Sultanganj* - Deoghar Via Banka

Besides these a Rail Bus service has been provided by Railways to reach the passengers from Banka to Jasidih. Jasidih is connected with Road and Railway communication where main line trains are available.

Airway - Banka is not served by any regular air service.

Boats– The district is not served by boat service.

Banking Facility

The study area has almost all the schedule commercial banks with ATM facility at urban areas and the district HQ.

Trade and Commerce

The development of the means of communication has had a great impact on the trade and commerce of the district. The district may now be said to be fairly well- connected by Road and Rail.

The district has less number of wholesale traders. Retail traders are available in the following places where public (civilians) get the essential commodities. Retail Trading goes in the following markets, e.g., Banka, Amarpur, Bousi, Barahat, Sahebganj, Belhar and Katoria. The Trader of this district has to depend on whole sale trade of Bhagalpur at present, which is about 50 kms away from this place.

Mines and Minerals

(1) *China Clay*: Sufficient quantity of China clay is found in Samukhiya of Banka Block and Satletwa of Kotoria Block. Consequently, Government has established Ceramic state near Banka at Samukhia More.

(2) *Mica*: Mica is found in Fulhara under Katoria Block. Some year ago this used to be excavate here.

(3) *Granite*: Sufficient quantity of granite is found in Bhelwa and Kolharia of Bausi and Katoria C.D. Blocks of this district.

Power Supply

It is revealed from the compiled information on amenities availability as per the census record of 2011; most of the villages and towns are electrified for Domestic, Agriculture, and Commercial & for all purposes. About 96 villages (72.7%) of the study area are electrified for domestic purpose, 96 villages (72.7%) for agricultural purpose, and for commercial & for all purposes in the study area. Out of 133 villages/towns in the study area, 36 villages (27.3%) including 15 uninhabited villages (11.4%) are not electrified for any purpose in the study area.

The district receives its entire power supply from Bihar State Electricity Board. All the towns of Banka district have electricity. In the rural areas, the Government is trying to extend electric line to the maximum number of villages by implementing various schemes for rural electrification. There is a Sub Power Grid at Banka Town.

Village/town wise Basic Infrastructure and Amenities availabilities data for the entire study area is compiled and presented in **Table 3.26** as follows;

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Table 3.26: Village wise Basic Amenities Availability (10km)

Name of the Village/Town	Education				Medical				Drinking Water				C T	Communication & Transport				Approach to the Village				Power Supply				Nearest Town Distance, km			
	P	M	S	S	C	P	P	M	H	D	F	T		W	H	T	R	P	P	B	R	P	K	N	F		E	E	E
			S	S	C	H	H	C			W			P	W	k	O	T	S	S	R	R	W	P	D	Ag	C	A	
Parsa	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	1	2	1	1	1	1	1	Banka,35km
Kushmaha	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	1	1	2	2	2	1	2	1	1	1	1	1	Banka,35km
Jagatpur	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	1	1	1	1	1	1	1	Banka,25km
Turdih	1	0	0	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Banka,8km
Turdih	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	1	2	1	1	1	1	1	Banka,8km
Saharna	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	1	2	1	1	1	1	1	Banka,5km
Gordhoa	2	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	1	2	1	1	1	1	1	Banka,6km
Balarpur	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	1	2	1	1	1	1	1	Banka,4km
Parsa	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	1	2	1	1	1	1	1	Banka,4km
Chitarsari	Uninhabited Village																								Banka,4km				

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BASELINE ENVIRONMENTAL STATUS

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Bhurna	2	3	0	0	0	0	1	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	Banka,8km	
Tappadih	2	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Banka,15km
Naraenpur	1	2	1	1	0	1	1	1	0	0	1	2	1	1	2	1	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	Banka,13km
Guwarba	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Banka,8km
Hijrar	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Banka,6km
Barhaunia	2	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	Banka,4km
Kharihara	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Banka,4km
Muluk	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	Banka,8km
Sondiha	1	1	1	0	0	0	0	0	0	0	0	2	1	1	2	1	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	Banka,10km
Dafarpur	2	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	1	2	1	1	2	1	2	2	2	2	2	2	Banka,12km
Pathra	2	4	1	0	0	0	0	0	0	0	0	2	1	1	2	1	2	2	1	2	2	2	2	2	1	1	1	2	2	2	2	Banka,16km
Auria	1	1	0	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	1	2	1	1	2	1	2	2	2	2	2	2	Banka,12km
Dudhari	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	1	2	1	2	1	1	1	1	1	1	Banka,10km
Kakwara	0	0	2	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	2	2	2	2	2	1	2	1	1	1	1	1	Banka,8km
Kakwara Tola Harpur	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	1	2	1	2	1	1	1	1	1	1	Banka,9km
Kakwara Tola Asramha	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Banka,9km



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Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Kakwara Tola Bahera	0	0	0	0	0	0	1	1	0	1	1	2	2	1	2	2	2	1	2	2	2	2	2	1	2	1	1	1	1	1	1	Banka,5km
Kakwara Tola Ratautia	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	Banka,9km
Kakwara Tola Kataili	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	Banka,8km
Kakwara Tola Jhirwa	2	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	Banka,5km
Kakwara Tola Chiutia	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	1	2	1	2	2	2	2	1	2	1	2	2	2	2	2	Banka,7km
Kakwara Tola Amarpur	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	1	2	2	2	2	1	1	1	2	2	2	2	2	Banka,10km
Domohan	1	1	0	0	0	1	1	1	0	0	1	2	2	1	2	2	2	2	1	2	2	2	2	1	2	1	1	1	1	1	1	Banka,15km
Jogipahari	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	Banka,15km
Jalmarai	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	Banka,16km
Deopur	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	Banka,17km
Gauripur	2	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	Banka,12km
Khudbari	Uninhabited Village																										Banka,12km					



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Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Barmahua	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	Banka,16km	
Gowabakhar	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2	2	1	1	1	1	1	1	Banka,13km
Desaria	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	Banka,13km	
Majra	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	1	2	2	2	2	1	1	2	1	1	1	1	1	1	Banka,12km	
Burhsaili	Uninhabited Village																											Banka,12km						
Khawaspur	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	1	2	2	2	2	1	1	2	1	1	1	1	1	1	Banka,14km	
Korara	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	Banka,16km	
Madodiha	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	Banka,11km	
Lakrikola	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	Banka,10km
Ikorla	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	Banka,16km
Baghajain	Uninhabited Village																											Banka,16km						
Karar	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	Banka,17km
Chapri	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	Banka,17km
Amba	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Banka,15km
Kunauni	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	Banka,13km
Gorhia	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	Banka,9km
Shadpur	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	Banka,10km
Maheshadih	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	1	2	2	2	2	1	1	2	1	1	1	1	1	1	1	Banka,6km



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BASELINE ENVIRONMENTAL STATUS

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Gobindpur	Uninhabited Village																										Banka,5km													
Baisa Rampur	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	Banka,7km			
Meharpur	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	Banka,2km		
Danra	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	Banka,8km		
Jamhra	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	Banka,7km		
Kalyanpur	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	Banka,6km		
Karikado	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	Banka,6km	
Pararia	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	Banka,6km	
Kakna	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	Banka,7km	
Majhiara	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	Banka,3km	
Baisa	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	Banka,2km	
Maldaun	Uninhabited Village																										Banka,2km													
Bishunpur	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	1	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1	Banka,2km		
Asni	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	Banka,2km	
Riga	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	Banka,4km	
Jogdiha	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	1	2	2	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	Banka,6km	
Raunia	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Banka,6km
Bhithi	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Banka,6km



CHAPTER-3

BASELINE ENVIRONMENTAL STATUS

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Murhara	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	Banka,3km
Bindi	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	Banka,4km
Banki	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	Banka,5km
Balarpur	Uninhabited Village																											Banka,5km							
Banka (NP)/22 Wards	Urban Part																											Banka (NP),0km							
Jamua	1	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	1	Sultanganj,36km	
Tola Kaithatkar	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	Banka,35km	
Baghmari	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	1	1	1	1	2	1	2	2	2	2	2	2	Deoghar, JH,10km	
Tola Dhobni	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	1	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	Banka,39km	
Tola Basatpur	Uninhabited Village																											Banka,24km							
Tola Garbaran	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	Banka,13km	
Tola Tilwari	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	1	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	Banka,16km	
Tola Medha	1	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	1	1	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	Banka,20km	
Tola Kadragora	1	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Banka,26km	
Tola Tilaundha	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	Banka,27km	
Tola Biradih	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	Banka,12km	
Tola Jamdahakhas	1	1	0	0	0	1	1	1	0	0	1	2	2	1	2	1	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	Banka,18km



CHAPTER-3

BASELINE ENVIRONMENTAL STATUS

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Simra	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	Banka,19km
Gorgawan Arazi	Uninhabited Village																											Banka,19km						
Gorgawan Arazi	Uninhabited Village																											Banka,19km						
Madho Pur	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	Banka,26km
Sasan	1	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	Banka,27km
Asanha	0	0	0	0	0	1	1	1	0	0	1	2	2	1	1	1	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	Banka,26km
Phaga	1	1	0	0	0	0	1	0	0	0	0	2	2	1	1	1	2	2	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	Banka,28km
TOTAL (10km)	6	4	8	1	0	4	1	6	0	2	6	<i>Status for Availability and Non-Availability is shown as A (1) & NA (2) respectively</i>																						

Source-<http://www.censusindia.gov.in/2011census/dchb/DCHB.html>

Abbreviations:

Educational Facilities: P-Primary School, M-Middle School, SS-Higher Secondary Schools, SSS-Senior Secondary School

Medical Facilities: CHC-Community Health Centre, PHC-Primary Health Centre, PHSC-Primary Health Sub-Centre, MCWC-Maternity and Child Welfare Centre, H-Hospital, D-Dispensary, FWC-Family Welfare Centre

Drinking Water Facilities: T-Tap Water, W-Well Water, HP-Hand Pump, TW-Tube Well Water, R-River Water, Tk-Tank Water, O-Other Drinking Water Facility, CT-Community Toilet

Communication & Transport Facilities: PO-Post Office, SPO-Sub-Post Office, PTO-Post & Telegraph Office, Tel. -Telephone Connection, Mob. -



Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Mobile Phone Coverage, BS-Bus Services, RS-Railways Services

Approach to Village: PR-Paved Roads, KR-Kuchha Road, FP-Foot Path

Power Supply: ED-Power Supply for Domestic use, E Ag. -Power Supply for Agricultural use, EC- Power supply for Commercial use, EA-Electricity for All Purposes

Nearest Town & Distance, km : a for < 5 Km, b for 5-10 Km and c for 10+ km of nearest place where facility is available is given.

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Brief Description of Places of Religious, Historical or Archaeological Importance and Tourist interest in Villages and Towns of the District: *(District level information only)*

Brief description of place of religious, historical or archaeological and tourist interest are as follows;

Block Amarpur - The village Amarpur is the headquarters of the development block bearing the same name and is situated about 19 km away from Banka on Banka-Shambhuganj Road. Amarpur is at a distance of 26 km from Bhagalpur on Bhagalpur- Kajraili Road. According to local tradition, the village was formed by Shah Umar Vajir of Shah Suja, the Governor of Bihar. He rehabilitated the persons who left village Patwai when it was eroded by the river Chanan.

Village Asauta - The village is said to have been established by Maharani Chandarjoti after she left Kharagpur. The Maharani built a Garh (fort) and a tank at Asauta. She also built a mosque for her son. The ruins of the Garh and mosque still exist.

Village Banhara - The village is situated just west of Amarpur. According to local tradition, Shah Suja, who was the governor of Bengal and Bihar during the period of the Mughal Emperor Shah Jehan, had his headquarters in the village.

Village Dumrama - The village is located at a distance of 3 km from the block HQ's at Amarpur, on the road to Bhagalpur. Remains of Stupas are believed to indicate the existence of Buddhist Monasteries here in the remote past, according to the local tradition, the village was the seat of Khaetauri chiefs, the last of whom was king Debai who had built fort in the villages surrounded by moats.

Jesth Gour Math - The place is situated on the left bank of the river Chandan; 2 km east of Amarpur-Banka Road it is considered to be a place of great religious importance for the Hindus. The Jesth Gour Sthan is a Shiva temple at the foot of a hillock on the western bank of river Chandan. On the top of the hillock which is known as Jesth Gour Pahar, there is a temple of Kali and also an ancient well. A large fair is held around the temple on the occasion of Shivratri.

Bausi - It is about 5 km north of Bausi. The hill is about 700 Ft high. This hill is extremely sacred in the Hindu Mythology. The Skand Puran records the history of the famous

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AmritManthan (the churning of the ocean). Due to this mythical association, the hill has assumed considerable religious significance and had been a place of pilgrimage up till now.

Papharni - At the foot of the hill there is a tank called Papharni. From the vicinity of the tank three routes lead to the top of the hill. At the foot of the hill there are also a number of dilapidated temples. In the middle of Papharni Tank, Mahavishnu, Mahalaxmi marvelous temple has been built. Several ruins of temples are present here. On the summit of the hill, two Jain Temples are situated. Large number of Jain Pilgrims come here to worship Lord Basupujya. It is believed that this place is Nirvan Bhumi of Basupujya. On the hill there are many kunds (Small Tank). The depth of the kund Akash Ganga and Sankh Kund is fine. Sita Kund among these is famous. Sita Kund has been named after goddess Sita as she is believed to have taken bath here.

Lakshdeeps Temple - The ruins of the temple are even present in the foot of the hill. In the past 1 lakh deep (Candle) was used to light here. One candle (Deep) was brought from every house. The area was well known as Balisha at that time. According to Balisha Purans this was "Sidh Peeth of Lord Shiva". On the top of the hill is a large temple. In this temple Lord Ram had himself established Lord Madhusudan. The present large temple was constructed during Jahangir Period. A temple called Nath Temple is in the foot which guides to understand Nath Community. There is also a Vidyapeeth where people from distant places come to study. A large fair is held on 14th January every year for 10 days at Bausi on the eve of Makar Sankranti.

Sambhugunj - Village Chutiya: The village is about 8 Kms away from the headquarters at Sambhuganj. There is a hill in the village containing a temple of Chuteshwar Nath. There is a large cave in the hill. Traces of marks left by chariot wheels of stones are said to indicate that a big battle was fought here in the remote past.

Village Gouripur - This is another village about 3 kms away from village Asauta in Sambhuganj Block. A Shiv temple constructed by Maharani Chandarjoti of Kharagpur lies in this village.

Dhuraiya - The village is located at a distance of about 10 kms from Tekari Railway Station in Dhuraiya Block. It is noted for its Shiv Temple. A large fair is held on the occasion of Shivratri.

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Village Indrabaran - The village is situated at distance of Block headquarters at Katoriya on Katoriya- Deoghar Road. It has rest houses (Dharmshalas) for pilgrims who travel on foot in large number from Sultanganj to Deoghar.

Village Lachhmipur - The village is situated about 29 kms South-East of Block headquarters at Katoria on the river Chandan. It is noted as the erstwhile seat of the Rajas Lachhmipur, ruins of whose forts still exist.

Village Rupsa - It is an ancient village in Rajoun block, situated about 6 kms west of Bhagalpur – Dumka Road on the eastern bank of the river Chandan. The village has ancient temples of goddesses Kali and Durga, where large fairs are held on the occasion of Kali Puja and Durga Puja.

Shravani Mela in the month of Shravan (July – Aug) Pilgrims (Kamaria) travel from Sultanganj to Deoghar on foot carrying Ganga Jal (water from the Ganga river) to offer on Lord Shiva. The Distance is 105 Kms of which 64 Kms lie under Banka District of three Blocks, Belhar, Katoria and Chandan. The Scene on the road is like a fair for one month. The whole administration becomes busy for the welfare of Kamaria's safety, Medical aid Traffic Police, water supply, sanitary and electricity etc. Government has provided Dharmshalas (Rest Houses) for Kamarias at different places during the whole Shravan month. Lakhs of pilgrims (Kamarias) go on foot by this way. Several non government help groups become active in the shravani mela to help the devotees.

Social and Cultural Events

No major social and cultural events have taken place in the district during the decade. However, the district has been famous for fairs and melas held at different places throughout the year. There is a brief lull during the two months of rainy season.

Rehabilitation & Resettlement (R & R)

Policy to be adopted (Central/State) in respect of the project affected persons including home or land oustees and landless labour. Hence, any planning with respect to Rehabilitation & Resettlement is not applicable.

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4.0 GENERAL

Identification of all potential environmental impacts due to project is an essential step of Environmental Impact Assessment. In case of mining projects, impacts on biodiversity, air pollution, water pollution, waste management and social issues are significant. Both direct and indirect environmental impacts will be created on various environmental attributes due to proposed mining activity in the surrounding environment, during the operational phase.

The occurrence of sand (minor mineral) deposits, being site specific, their exploitation often does not allow for any choice except adoption of eco-friendly operation. Positive impacts on socio-economic environment are expected due to creation of employment opportunities. Mining activities are normally carried out over a long period which also encourages development in the area such as roads, schools, hospitals etc.

Keeping in mind, the environmental baseline scenario as detailed in Chapter III and the proposed mining activity described in Chapter II, it is attempted to assess the likely impact and its extent on various environmental parameters and likely mitigation measures to be adopted.

The following parameters are of significance in the Environmental Impact Assessment and are being discussed in detail:

1. Land Environment
2. Water Environment
3. Air Environment
4. Noise Environment
5. Biological Environment
6. Socio-Economic Environment
7. Solid Waste
8. Traffic Environment

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4.1 LAND ENVIRONMENT

The proposed extraction of stream bed materials, mining below the existing streambed, and alteration of channel-bed form and shape may lead to several impacts such as erosion of channel bed and banks, increase in channel slope, and change in channel morphology if, the operations are not carried out scientific & systematically.

The mining and allied activities involved due to mining result in creation of temporary haul roads and formation of mined pits, etc. affecting the land use pattern. In this project, silt and clay are also produced as a constituent along with minerals, which are considered to be waste.

Anticipated Impacts:

- Mining activity will impact river bed topography by formation of excavation voids.
- River bed mining may bring in some change in topography at the nearby area of the mine lease.
- Stacks of solid waste generated from mining activity may hinder the flow of water in monsoon season.

Mitigation measures:

Adopting suitable, site-specific mitigation measures can reduce the degree of impact of mining on land. Some of the land-related mitigation measures are as follows:

- Excavated pits will get replenished annually in monsoon itself & will be restored to original.
- The mine working will remain confined to allotted river bed only, so it will not disturb any surface area outside the mine lease area which may affect topography or drainage.
- Solid waste will not be stacked on the bank side as it will hinder the flow of water in monsoon season.

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4.2 WATER ENVIRONMENT

Anticipated Impacts:

Mining of sand from within or near *river* has an indirect impact on the physico-chemical habitat characteristics during monsoon season. These characteristics include in stream roughness elements, depth, velocity, turbidity, sediment transport and stream discharge.

The detrimental effects, if any, to biota resulting from bed material mining are caused by following:

- Alteration of flow patterns resulting from modification of the *river*
- An excess of suspended sediment during monsoon season.

Mitigation measures

Project activity will be carried out only in the dry part of the Chanan River. Hence, none of the project activities affect the water environment directly. In the project, it is not proposed to divert or truncate any stream in monsoon season only. No proposal is envisaged for pumping of water either from the *River* (in monsoon) or tapping the ground water.

In the lean months, the proposed mining will not expose the base flow of the *River* and hence, there will not be any adverse impact on surface hydrology.

The deposit will be worked from the top surface up to a maximum depth of 3m below ground level or above the ground water table whichever comes first. Hence mining will not affect the ground water regime as well.

Further mining will be completely stopped during the monsoon seasons to allow the excavated area to regain its natural profile.

4.3 AIR ENVIRONMENT

Impact On Air Quality

The proposed project includes various activities like development of benches, approach roads, haul roads, excavation and transportation of mineral and waste materials. These operations generally result in generation of dust and thereby pose health hazards. However, it is proposed that adequate control measures will be provided at every stage of operation such as, water sprinkling at loading, unloading points and on haul roads before transportation to reduce the fugitive dust emissions.

The mining is proposed to be carried out by opencast manual method. The air borne particulate matter (PM10) generated by ore and waste handling operations, transportation and screening of ore is the main respirable air pollutant. The emissions of Sulphur dioxide (SO₂), Nitrogen Oxides (NO₂) contributed by vehicles plying on haul roads will be marginal. Prediction of impacts on air environment has been carried out taking into consideration proposed production and net increase in emissions.

4.3.1 Emissions Details

Loading - unloading and transportation of sand material, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the proposed mining activities releasing Particulate Matter (PM10) affecting Ambient Air of the area. Emission during, Loading and unloading was calculated by the area sources. Details of emission during loading/unloading and transportation on the haul road, wind erosion of the exposed area and road maintenance were discussed and combined impact was predicted in the worst case scenario under worst meteorological condition given as follows:

Loading and Unloading - US EPA, 2008, revision of emission factor for AP-42 was used to calculate emission of particulate matter released into the atmosphere during loading and unloading separately. Emission during loading was found more than during unloading. Emission of PM10 during loading was calculated and found to be $1.92 \times 10^{-3} \text{ g/s/m}^2$ based on moisture

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content 10-20% mine. It is assumed that moisture content was 10% and further moisture content will be increased to 10-20% to reduce emission of PM₁₀ during unloading and average wind speed was 0.92 m/s as observed with site data as shown in wind rose and discussion of local meteorology of the area.

Haul Road - US EPA, 2006, revision of emission factor for AP-42 was used to calculate emission of particulate matter released into the atmosphere during transportation of ore and overburden by trucks operated per hour on haul road. Emission of PM₁₀ due to transportation of sand on haul road was 1.65×10^{-4} g/s/m² based on assumption that silt content spread on road surface was 5%, and efficiency of PM₁₀ emission control 90%. Truck will be fully covered with tarpaulin material and emission of PM₁₀ during on the haul road will be insignificant.

Based on the above consideration that there was low emission of PM₁₀ during transportation of ore and overburden, however during loading & unloading, transportation of ore over the haul road, emission of PM₁₀ of the exposed area due to wind erosion and movement of light vehicles on the road were not considered and combined with mining activities. US EPA based Dispersion ISCST-3 model was used for prediction of impact with 24-h meteorological data of the study period for the assessment of GLC.

4.3.2 Meteorological Data

The meteorological data recorded at hourly interval during the month of March 2023 to May 2023 on wind speed 0.92 m/s, wind direction, dry & wet bulb temperature, humidity, cloud cover and rainfall was processed to extract hourly mean meteorological data as per the guidelines of CPCB/MoEF for prediction of impacts from the area source. Stability was computed by Turner's method and mixing height was obtained from publication of IMD "Atlas of Hourly Mixing Height in India, 2008.

Data recorded from authorized source/Govt. agency were used as meteorological input for Dispersion Model which was stored in the computer for further analysis and interpretation to study the local meteorology of the study area. It was observed that westerly & north westerly was pre-dominant wind during summer as shown in wind rose (Figure 4.1) with low wind speed

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and 13.6 % calm condition was observed during study period at the site which was very much close and cumbersome with long term meteorological data of IMD. Average wind speed was 0.92m/s. Impact of the pollutants was anticipated in southeast sector under influence of north easterly & westerly winds. Ambient air quality locations were selected based on the long term wind rose pattern of the area. Air quality sampling locations were finalized to study the baseline status around the proposed site and to study impact at various locations. 24-h maximum impact of PM10 was envisaged in southeast sector at very short distance from the site due to moderate to low wind speed.

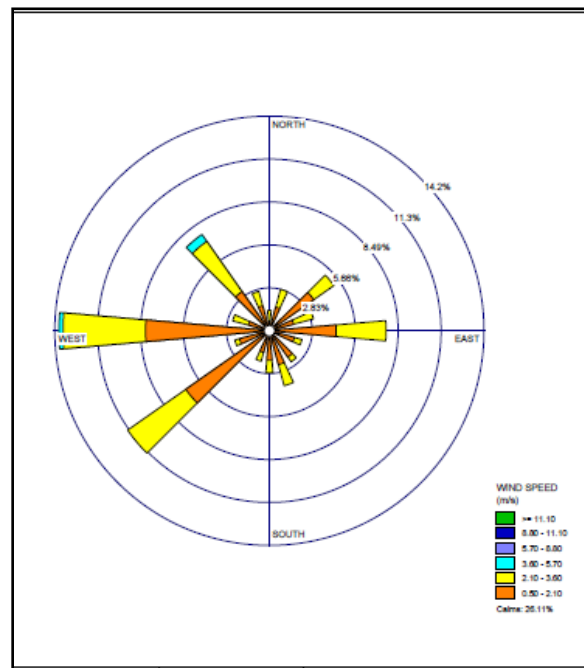


Figure 4.1: Wind Rose Diagram

Stable atmospheric condition E & F dominates in early morning and night hours and B, C & D in day hours were observed. Pollutants were dispersed from the proposed source under influence of local meteorology and dispersed on the ground in downwind direction close (~100 m) to the source under influence of moderate to low wind speed. High temperature and low humidity were observed at site with high temperature in day hours and low during night. There was no significant rain fall received and sky was clear of clouds in most of the days.

4.3.3 Frame work of Computation & Model details

By using the above-mentioned inputs, ground level concentrations due to the mining activities have been estimated to know the incremental rise in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere. Air quality modeling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards and to apply mitigation measures to reduce impact caused by mining activities.

PM10 was the major pollutant occurred during mining activities. Impact of area source emission was considered and prediction of impact was made on various monitoring locations in the study area due to i) loading and unloading and iii) transportation of vehicles on the haul road in the mining area. Impact was predicted in the worst case scenario due to combined impact of loading and unloading and emission due to transportation of vehicles on mine on haul road of mining area and other mining activities will occur simultaneously.

Impact was predicted over the distance of 10,000 m and 2,000 m around the source in grids of 200m & 20 m respectively in Cartesian coordinates(X,Y) to assess the impact at each receptor separately at the various locations and maximum incremental GLC value at the project site. Maximum impact of PM10 was observed close to the source due to low to moderate wind speeds. Incremental value of PM10 was superimposed on the base line data monitored at the proposed site to predict total GLC of PM10 due to combined impacts.

Mitigation measures

The collection and lifting of minerals will be done by loaders. Therefore, the dust generated is likely to be insignificant as there will be no drilling & blasting. The only air pollution sources are the road transport network of the trucks. The mitigation measures like the following will be resorted:

- ✓ Water sprinkling will be done on the haul roads twice in a day.

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- ✓ Deploying PUC certified vehicles to reduce their emissions
- ✓ Proper tuning of vehicles to keep the gas emissions under check
- ✓ Monitoring to ensure compliance with emission limits would be carried out during operation
- ✓ There is no major source of emissions except emission from combustion of fuels from the Transportation Vehicles and Material Handling.
- ✓ Besides this, to control the emissions further regular preventive maintenance of Equipment / Transportation Vehicles will be carried out on contractual basis.
- ✓ It will be ensured that all transportation vehicles carry a valid PUC certificate.
- ✓ Plantation will be carried out along the approach road, river banks & at all strategic places in the vicinity area.
- ✓ Periodic air quality monitoring will be done to assess the quality and for timely corrective actions.
- ✓ Water sprinkling will be done on the haul roads twice in a day. This will reduce dust emission further.
- ✓ Speed limits will be enforced to reduce airborne fugitive dust from vehicular traffic.
- ✓ Spillage from the trucks will be prevented by covering tarpaulin over the trucks.

4.4 NOISE ENVIRONMENT

The proposed mining activity is semi-mechanized in nature. No drilling & blasting is envisaged for the mining activity. Hence, the only impact is anticipated is due to movement of vehicles deployed for transportation of minerals.

Anticipated Impacts:

- Mental disturbance, stress& impaired hearing.
- Decrease in speech reception& communication.
- Distraction and diminished concentration affecting job performance efficiency.

The noise level in the working environment are compared with the standards prescribed by Occupational Safety and Health Administration (OSHA-USA) which has been adopted and

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enforced by the Govt. of India through model rules framed under Factories Act, 1980 and CPCB 2000 norms. The summary of the permissible exposures in cases of continuous noise as per above rules is given below:

Table 4.1, Damage risk criteria for hearing loss OSHA regulations

Maximum allowable duration per day in hour	Sound pressure dB(A)	Remarks
(1)	(2)	(3)
8.0	90	1. For any period of exposure falling in between any figure and lower figure as indicated in column (1), the permissible sound is to be determined by extrapolation or proportionate scale.
6.0	92	
4.0	95	
3.0	97	
2.0	100	
1 ½	102	
1	105	
¾	107	
½	110	
¼	115	

Noise at lower levels (sound pressure) is quite acceptable and does not have any bad effect on human beings, but when it is abnormally high- it incurs some maleficent effects.

a. Mitigation measures

The following measures have been envisaged to reduce the impact from the transportation of minerals:

- The vehicles will be maintained in good running condition so that noise will be reduced to minimum possible level.
- In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones.
- No such machinery is used for mining which will create noise to have ill effects.
- Awareness will be imparted to the workers about the permissible noise levels & maximum exposure to those levels.

4.5 BIOLOGICAL ENVIRONMENT

Mining which leads to the removal of channel substrate, re-suspension of streambed sediment and stockpiling on the streambed, will have ecological impacts. These impacts may have an effect on the direct loss of stream reserve habitat, disturbances of species attached to streambed deposits, reduced light penetration, reduced primary production, and reduced feeding opportunities. Sand mining generates additional traffic, which negatively impairs the environment.

Anticipated Impacts:

Flora

The proposed project of river bed sand mining shall be carried out on the riverbed of Chanan River. There are no trees in the project area. The project shall also not lead to any change in land use and will be replenished every year after successive rains. The proposed mining activity, which although is an economically gainful activity, also constitutes river training work. It allows for necessary dredging activity which may otherwise lead to flooding of the valley.

There shall be negligible air emissions or effluents from the project site during loading of the truck. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.

Fauna

Animals are sensitive to noise and avoid human territory. The project stretch of the river is not an identified drinking water point for the animals. However, any animal desirous of accessing the river can continue to do so upstream or downstream of the stretch during the mining activities, as there will not be any damming or diverting of water. Hence, no significant impact is anticipated from the proposed project.

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Mitigation measures

As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated, however, the following mitigation measures will be taken to further minimize it:

Flora

Although, the project will not lead to any tree cutting, plantation activities shall be undertaken to improve the vegetation cover of the area. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.

Fauna

The workers shall be directed to not venture out of the leased area for collecting fuel wood, or hunting. They shall also be trained not to harm any wildlife. No work shall be carried out after sunset.

4.6 TRAFFIC ANALYSIS

Transportation Route:

The sand extracted will store the nearby storage point. From there sand will be transported to the market. Sand will be stored in to storage point and from there it will be transported in the night time when traffic load is low on nearest SH or NH.

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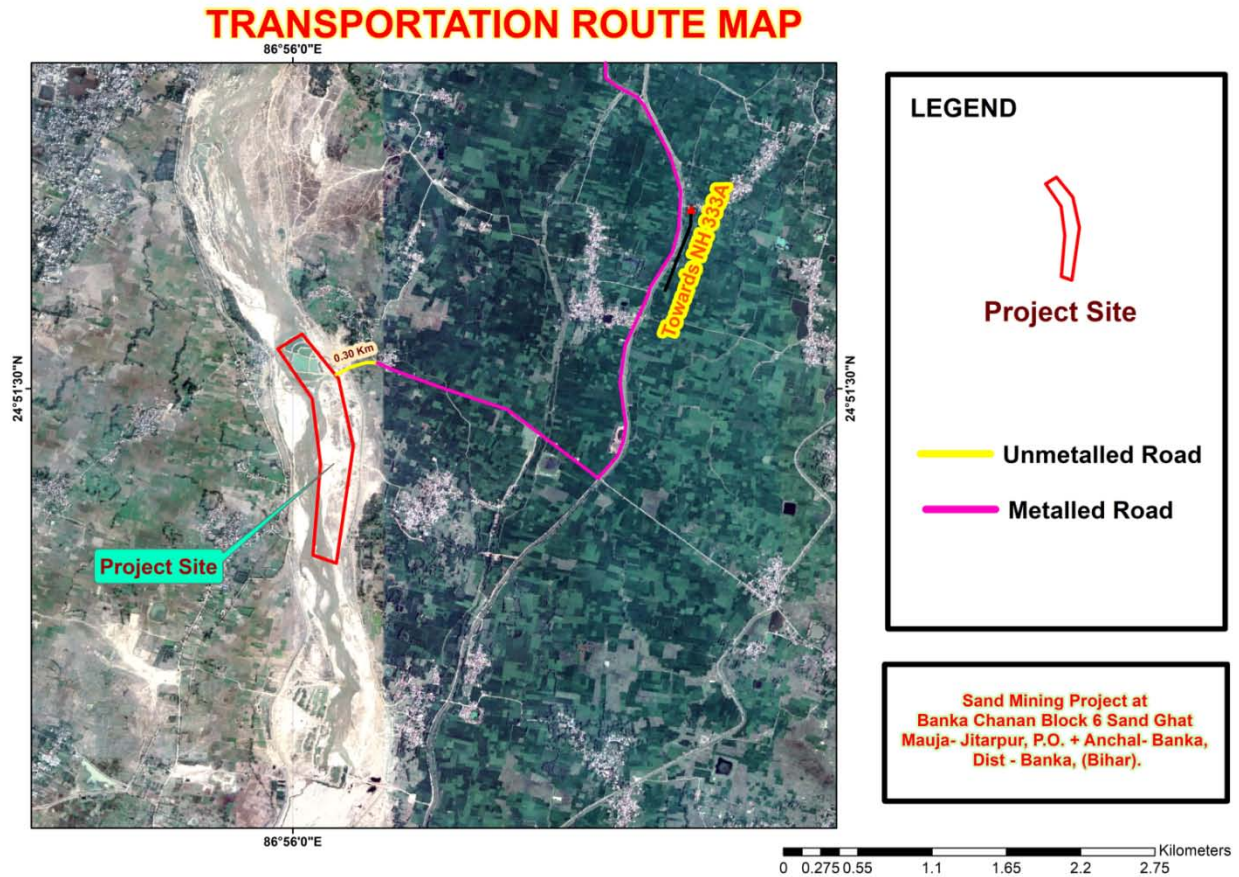


FIGURE 4.1 MAP SHOWING EVACUATION ROUTE

Traffic analysis is carried out by understanding the existing carrying capacity of the roads near to the project site and the connecting main roads in the area. Then depending on the capacity of the mine, the number of trucks that will be added to the present scenario will be compared to the carrying capacity.

Table 4.2 (i): Existing Traffic Scenario & LOS

Road	V	C	Existing V/C Ratio	LOS
National Highway (NH-333A)	2500	15,000	0.16	A

Source: Capacity as per IRC: 64-1990

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V= Volume of Vehicles in PCU's/day & C= Capacity of Road in PCU's/day

The existing Level of Service (LOS) is "A" & "B" i.e. excellent & very good.

V/C	LOS	Performance
0.0 - 0.2	A	Excellent
0.2 - 0.4	B	Very Good
0.4 - 0.6	C	Good / Average / Fair
0.6 - 0.8	D	Poor
0.8 - 1.0	E	Very Poor

Reference: ENVIS Technical Report, IISc, Bangalore.

During Mine operation for Sand **Block 06**

Proposed Capacity of Mine/annum : 1083240 TPA

No. of working days : 250 days

Proposed Capacity of mine/day : 4333

Truck Capacity : 16 tonnes

No. of trucks deployed/day : 271

Increase in PCU/day (271*3) : 813

Table 4.2 (ii): Modified Traffic Scenario & LOS

Road	V	C	Modified V/C Ratio	LOS
National Highway (NH-333A)	2500+813=3313	15000	0.22	B

Results

From the above analysis it can be seen that the LOS has changed from 0.16 to 0.22 at Highway intersection that is remain 'B' i.e 'Very Good '. Hence, there will not so much adverse affect on the proposed evacuation roads due to additional traffic. Traffic management has been proposed as given in below

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Traffic Management:

1. Roads will be repaired regularly and maintained in good conditions.
2. Haul roads will be sprinkled with water to keep the dust suppressed.
3. A supervisor will be appointed to regulate the traffic movement near the site.
4. Speed breakers will be constructed near accident prone areas to calm the traffic and its speed.

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5.0 ANALYSIS OF ALTERNATIVE TECHNOLOGY AND SITE

5.1 Site Alternatives under Consideration

Presence of sand for commercial exploitation has been identified based on the result of geological investigations and exploration. The mining projects are site specific as such alternate sites were not considered.

5.2 Analysis of Alternative Technology

5.2.1 Choice of Method of Mining

Factors in the choice of an actual mining method for a given deposit are deposit characteristics, requirement of health and safety and environmental concerns, production, scheduling scope of mechanization, workforce requirements wage rates, replenishment, operating and capital cost estimates. The selection of the mining method (development and extraction) is a key decision to be made in the opening up of a mine.

Surface or open cast mining is used for large, near-surface mineral deposits. Mineral is exploited, loaded into trucks, and hauled to a market.

The opencast mining method will be adopted because of the following reasons:

- The opencast mining operations ensure higher mineral conservation.
- Replenishment

The method used for mining is efficient for sand mining, so no alternative mining method is proposed.

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6.0 INTRODUCTION

Regular monitoring of the various environmental parameters is necessary to evaluate the effectiveness of the management programme so that the necessary corrective measures can be taken in case there are some drawbacks in the proposed programme. Since environmental quality parameters at work zone and surrounding areas are important for maintaining sound operating practices of the project in conformity with environmental regulations, the post project monitoring work forms part of Environmental Monitoring Program.

Environmental Monitoring Program will be implemented once the project activity commences. Environmental monitoring program includes (i) Environmental surveillance, (ii) analysis & interpretation of data, (iii) Preparation of reports to support environmental management system and (iv) Organizational set up responsible for the implementation of the programme.

6.1 ENVIRONMENTAL MONITORING AND REPORTING PROCEDURE

Monitoring shall confirm that commitments are being met. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges and wastes, for measurement against corporate or statutory standards, consent limits or targets. It may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

The preventive approach to environment management may also require monitoring of process inputs, for example, type and method used, resource consumption, equipment and pollution control performance etc.

The key aims of environment monitoring are:

1. To ensure that results/ conditions are as forecast during the planning stage, and where they are not, to pinpoint the cause and implement action to remedy the situation.

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2. To verify the evaluations made during the planning process, in particular with risk and impact assessments and standard & target setting and to measure operational and process efficiency.
3. Monitoring will also be required to meet compliance with statutory and corporate requirements.
4. Finally, monitoring results provide the basis for auditing i.e. to identify unexpected changes.

6.2 MONITORING METHODOLOGIES AND PARAMETERS

Air quality monitoring

Air Quality monitoring is essential for evaluation of the effectiveness of abatement programmes and to develop appropriate control measures. Suspended Particulate Matter (SPM), Sulphur Dioxide (SO₂) and Nitrogen Dioxide (NO₂) will be monitored at the workplace i.e. core zone. The methodology proposed for is shown below:

Table 6.1, Monitoring methodologies and parameters

Parameters	Technique	Technical Protocol
PM ₁₀	Gravimetric method	IS 5182 (Part-XXIII)
Sulphur Dioxide	Improved West and Gaeke	IS-5182 (Part-II)
Nitrogen Dioxide	Modified Jacob & Hochheiser	IS-5182 (Part-VI)

Water quality monitoring

Water quality monitoring involves periodical assessment of quality of surface water and the ground water near the mining project.

- Surface water samples will be analyzed for all the parameters as per EPA, 1986
- Ground water samples will be analyzed for all the parameters as per IS-10500:2012.

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Soil quality monitoring

The soil quality monitoring is carried out to assess the soil characteristic. The soil quality will be analyzed as per CPCB norms.

Noise level monitoring

Noise level monitoring will be done for achieving the following objectives:

- a) To compare sound levels with the values specified in noise regulations
- b) To determine the need and extent of noise control of various noise generating sources

Noise level monitoring will be done at the work zone to assess the occupational noise exposure levels. Noise levels will also be monitored at the noise generating sources like mineral handling arrangements, vehicle movements and also at the nearest village for studying the impact due to higher noise levels for taking necessary control measures at the source.

Socio-economic Survey

Socio economic condition will be monitored to assess the demographic particulars of the area including the impacts on the social & economical condition on the residents nearby.

Plantation Monitoring Programme

Plantation monitoring will be done to ensure survival & growth rate of plantations.

6.3 MONITORING SCHEDULE

The schedule has been shown below for the parameters proposed for monitoring.

Table 6.2, Details of monitoring schedule

S.No.	Description of Parameters	Schedule of Monitoring
1	Air Quality	24 hourly samples twice/Thrice a week in each season except monsoon
2	Water Quality (Surface & Groundwater)	Once a season for 4 seasons in a year
3	Soil Quality	Once in a year in project area

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4	Noise Level	Twice a year for first two years & then once a year
5	Socio-economic Condition	Once in 3 years
6	Plantation Monitoring	Once in a season

6.4 MONITORING SCHEDULE - IMPLEMENTATION

An implementation programme has been prepared as it serves no purpose if it is not implemented in letter and spirit.

Implementation of proposed control measures and monitoring programme has an implication on mining site as well as on the surrounding area. Therefore, mine management should strengthen the existing control measures as elaborated earlier in this report and monitor the efficacy of the control measures implemented in the entire study area:

- a) Collection of air and water samples at strategic locations with frequency suggested and by analyzing thereof. If the parameters exceed the permissible tolerance limits, corrective regulation measure will be taken.
- b) Collection of soil samples at strategic locations once every two years and analysis thereof with regard to deleterious constituents, if any.
- c) Measurement of water level fluctuations in the nearby ponds dug wells and bore wells and to assess if mining has got any impact on it or not.
- d) Measurement of noise levels at mine site and adjacent villages will be done twice a year for first two years and thereafter once a year.
- e) Post plantation, the area will be regularly monitored in every season for evaluation of success rate. For selection of plant species local people should also be involved.

An Environmental Management Cell (EMC) is envisaged which will be responsible for monitoring EMP and its implementation. EMC members should meet periodically to assess the progress and analyze the data collected during the month.

6.5 BUDGET ALLOCATION FOR MONITORING

The EMC will be responsible to carry on the monitoring. Budget allotment has also been proposed for the same:

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Table 6.3, Budget for monitoring

S. No.	Description	Cost to be incurred (in lakhs/annum)
1	Water Quality (Surface & Groundwater)	1.0
2	Soil Quality	0.50
3	Air Quality	1.0
4	Noise Level	0.5
5	Plantation Monitoring	0.5
6	Socio-economic Condition	0.5
TOTAL		4.0

6.6 REPORTING SCHEDULES OF THE MONITORING DATA

It is proposed that voluntary reporting of environmental performance with reference to the EMP should be undertaken. The environmental monitoring cell shall co-ordinate all monitoring programmes at site to furnish the data to the State regulatory agencies regularly in respect of the stipulated prior environmental clearance terms and conditions. The proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and also the details of website where it is displayed.

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7.0 PUBLIC CONSULTATION

This is Draft EIA report public hearing is yet to be conducted.

7.1 HAZARD IDENTIFICATION AND RISK ASSESSMENT METHODOLOGY

Risk is to expose someone or something to danger, harm or loss. The different steps of risk assessment procedure are as given below:

Step I: Hazard Identification

The purpose of hazard identification is to identify and develop a list of hazards for each job in the organization that are reasonably likely to expose people to injury, illness or disease if not effectively controlled. Workers can then be informed of these hazards and controls put in place to protect workers prior to them being exposed to the actual hazard.

Step II: Risk Assessment

Risk assessment is the process used to determine the likelihood that people exposed to injury, illness or disease in the workplace arising from any situation identified during the hazard identification process prior to consideration or implementation of control measures.

Risk occurs when a person is exposed to a hazard. Risk is the likelihood that exposure to a hazard will lead to injury or health issues. It is a measure of probability and potential severity of harm or loss.

Step III: Risk Control

Risk control is the process used to identify, develop, implement and continually review all practicable measures for eliminating or reducing the likelihood of an injury, illness or diseases in the workplace.

Step IV: Implementation of risk controls

All hazards that have been assessed should be dealt in order of priority in one or more of the following hierarchy of controls

The most effective methods of control are:

- ✓ Elimination of hazards.

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- ✓ Substitute something safer.
- ✓ Use engineering/design controls.
- ✓ Use administrative controls such as safe work procedures.
- ✓ Protect the workers i.e. by ensuring competence through supervision and training, etc.

Each measure must have a designated person assigned for the implementation of controls.

This ensures that all required safety measures will be completed.

Step V: Monitor and Review

Hazard identification, risk assessment and control are an on-going process. Therefore regularly review the effectiveness of your hazard assessment and control measures. Make sure that you undertake a hazard and risk assessment when there is change to the workplace including when work systems, tools, machinery or equipment changes. Provide additional supervision when the new employees with reduced skill levels or knowledge are introduced to the workplace.

A) RISK ANALYSIS

The risk assessment portion of the process involves three levels of site evaluation:

- a) Initial Site Evaluation,
- b) Detailed Site Evaluation,
- c) Priority Site Investigations and Recommendations.

The risk assessment criteria used for all levels of site evaluation take into account two basic factors:

- The existing site conditions
- The level of the travelling public's exposure to those conditions.

The Initial Site Evaluation and Detailed Site Evaluation both apply weighted criteria to the existing information and information obtained from one site visit. The Initial Site Evaluation subdivides the initial inventory listing of sites into 5 risk assessment site groups. The Detailed Site Evaluation risk assessment is then performed on each of the three highest risk site groups in order of the group priority level of risk. The result of the Detailed Site Evaluation process is a prioritized listing of the sites within each of the three highest risk site groups.

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Risk analysis is done for:

- Forecasting any unwanted situation
- Estimating damage potential of such situation
- Decision making to control such situation
- Evaluating effectiveness of control measures

Table 7.1, Risk Likelihood Table for Guidance

Step 1: Assess the Likelihood				Step 2: Assess the Consequences		
L1	Happens every time we operate	Almost Certain	Common or repeating occurrence	C1	Fatality	Catastrophic
L2	Happens regularly (often)	Likely	Known to have occurred "has happened"	C2	Permanent disability	Major
L3	Has happened (occasionally)	Possible	Could occur or "heard of it happening"	C3	Medical/hospital or lost time	Moderate
L4	Happens irregularly (almost never)	Unlikely	Not likely to occur	C4	First aid or no lost time	Minor
L5	Improbable (never)	Rare	Practically impossible	C5	No injury	Insignificant

A logical systematic process is usually followed during a qualitative risk assessment to identify the key risk events and to assess the consequences of the events occurring and the likelihood of their occurrence Table 7.2

Table 7.2, Qualitative Risk Assessment

Risk Rank	L1	L2	L3	L4	L5
Likelihood Consequence	Almost certain	Likely	Possible	Unlikely	Rare
C1 Catastrophic	1	2	4	7	11

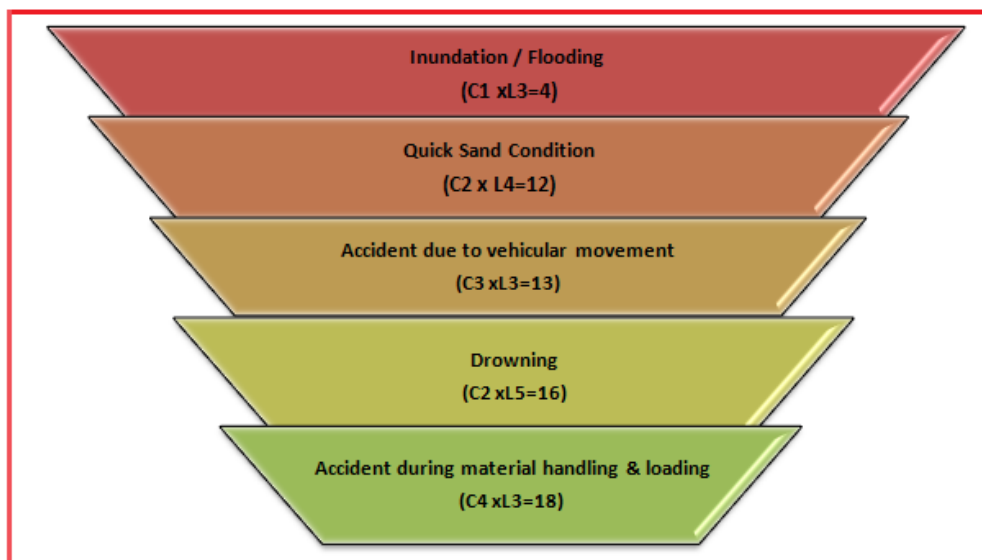
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C2 Major	3	5	8	12	16
C3 Moderate	6	9	13	17	20
C4 Minor	10	14	18	21	23
C5 Insignificant	15	19	22	24	25

RISK RATING:

HIGH RISK 1-6	MEDIUM RISK 7-15	LOW RISK 16-25
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7.2 RISK ASSESSMENT



There are various factors, which can create unsafe working conditions/hazards in mining of minor minerals from bed of river.

The key risk(hazard x probability) event rating associated with sand mining and to assess its consequences of such events occurring and the likelihood based on above Table 7.1 (ii) are as:-

The Risk rating of such hazards is as follows:

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7.2.1 INUNDATION/FLOODING

The risk rating assigned to this activity is assigned as '4' i.e., it is possible and will have catastrophic with major consequences, if work started without assessment of the *river* condition especially during monsoon season.

Inundation or flooding is expected and beneficial for these mines as during this time only the mineral reserve gets replenished.

Measures to prevent consequences of inundation/flooding

Inundation of flooding is expected and beneficial for these mines as during this time only the mineral reserve gets replenished.

1. During monsoon months and heavy rains the mining operations are ceased.
2. There should be mechanism/warning system of heavy rains and discharges from the upstream dams.

7.2.2 Quick Sand Condition

The risk rating assigned to this activity is assigned as '12' i.e., it is an unlikely event with major consequences as frequency of this risk is less likely to occur.

Two things may create the conditions to form quicksand. Underground water may seep-up and saturate the sand, thereby reducing the friction between the sand grains and giving the sand a liquid nature. Or, sand or another soil may be sifted by the force of an earthquake so that friction is lessened and the earth becomes unsteady.

This creates danger condition to the trucks plying near the *river* and banks for transportation of minerals.

Measures to Prevent Quick Sand Condition

1. The only way to avoid quick sand condition is by avoiding mineral lifting below water table.
2. Mining will be done in layers rather than going for maximum depth at one time.

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7.2.3 ACCIDENT DUE TO VEHICULAR MOVEMENT

The risk rating assigned to this activity is assigned as '13' i.e., it is possible event with moderate consequences as frequency of this operation is more but the predicted/assumed intensity is less like minor cuts, bodily injury. The possibilities of road accidents are due to reckless or untrained driver or overloading of trucks or in case pathway is not compacted suitably, etc.

Measures to Prevent Accidents during Transportation

1. All transportation within the main working should be carried out directly under the supervision and control of the management.
2. The Vehicles will be maintained/repared and checked thoroughly by the competent person.
3. A statutory provision of constant education, training etc. will go a long way in reducing the incidents of such accidents.
4. Overloading will not be permitted and will be covered with tarpaulin.
5. The maximum permissible speed limit will be ensured.
6. The truck drivers will have valid driving license.

7.2.4 DROWNING

The risk rating assigned to this activity is assigned as '16' i.e., it is a rare accident but will have major consequences, if occurred. This may occur due to flash floods etc due to which the workers at the site may get seriously injured or drowned.

Measure to Prevent Drowning

1. The mining will be done under strict supervision and only in the dry part of the *river*.
2. Mining will be completely stopped in monsoon season to avoid such accidents.
3. Deep water areas will be identified and 'No Go Zones' will be clearly marked and made aware to the mine workers.

7.2.5 ACCIDENT DURING MATERIAL HANDLING & LOADING

The risk rating assigned to this activity is assigned as '18' i.e. it is possible event with minor consequences", as frequency of this operation is more but the predicted/assumed intensity is less like minor cuts, abrasion, etc. may be due to bank of *river* collapse, over thrown boulders/pebbles, injuries due to carelessness use of hand tools, etc.

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Measures to Prevent Accidents during material handling & loading

1. The truck should be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.
2. The loading should be done from one side of the truck only to avoid over throw of materials.
3. The workers should be provided with gloves and safety shoes during loading.

All the activities will be done under strict supervision/control to avoid anticipated accidents so that the risk is reduced to a level considered **As Low As Reasonably Practicable (ALARP)** conditions which are adequately safe and healthy.

7.3 DISASTERS & ITS MANAGEMENT

7.3.1 Anticipated Disaster

- 1. Floods:** Most of the areas of this district are flood prone owing to the presence of seasonal rivers. Rivers and its tributaries cause heavy losses to the human lives, livestock, land and property mainly due to flash floods. Hence no mining has been proposed during monsoon and flood alerts will be given, if any.
- 2. Earth Quake:** Banka District like other areas of Bihar is moderately vulnerable to earthquake as it exists in Zone IV. However the vulnerability to damage near the site is quite low as there are no built in structures at the site.
- 3. Drought:** due to deficiency in rainfall prime reasons of recurring drought in Bihar is the nature of soil with low mineral and humus-contents besides extremely poor water holding capacity. Recurrent rainfall variability and sustained departure from the normal rainfall vis-a-vis low reliability, fluctuating both surface and underground water resources and extremely poor water holding capacity of the major soil group appear to have clubbed together to cause frequent droughts in Bihar. Besides, there is a positive relationship between reducing forest land and the increasing rainfall variability and the phenomenon is well manifested in Bihar scenario of recurrent droughts.

7.3.2 Disaster Management Plan & Strategy

The Disaster Management Plan has three components:

(A) Risk Analysis and Vulnerability Assessment:

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The Risk Analysis and Vulnerability Assessment depict the present picture for each disaster-exposure, loss of life, property damage, etc. It also shows geographic distribution of each hazard. The various monitoring facilities, regulatory regimes, countermeasures available for each disaster are identified and listed.

(B) Response Plan:

The response plan presents an organizational structure of the District to effectively handle the disaster in a coordinated and quickest possible manner to mitigate the impact of disaster. It identifies functional areas such as relief, restoration, communication, information, transport, emergency health services etc and proposes assignments to various departments; including identifying lead and supporting departments. The response plan also lays down preparedness checklists and standing operating procedure (SOP) guidelines.

(C) Mitigation Strategy:

The mitigation strategy and plan focus on the long-term planning for impact reduction. It deals with the issues of continued commitment to hazard identification and risk assessment, applied research and technology transfer, investment- incentives for mitigation, and leadership and co-ordination for mitigation.

The mine management will be in regular contact with the District administration to gather information on natural disasters and will pass on the message at the site to avoid any loss of health or wealth due to impending disasters.

Though the responsibility of disaster management is vested with the center and state Governments, it is extremely difficult for them to deal effectively all the aspects of disaster management according to the needs of the affected people.

Thus disaster management plan of the Banka District has been prepared through incorporation of the features of Community Based Disaster Management and involvement of local governments, Municipalities etc.

7.4 SOCIO-ECONOMIC IMPACT OF THE PROJECT & SAFETY MEASURES

INTRODUCTION

Socio-Economic Impact Assessment (SEIA) refers to systematic analysis of various social and economic characteristics of human being living in a given geographical area during a

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given period. The geographical area is often called Study Area or Impact Area. SEIA is carried out separately but concurrently with Environment Impact Assessment (EIA). The study area consists of core area where the project is located and a buffer area encircling the project area with a radius of 10 km from the periphery of the core area. For every new project or existing project under expansion or tied for modernization or change in product mix, Socio-economic Impact Assessment is mandatory. The Socio-economic impact assessment focuses the effect of the project on social and economic well-being of the community. The impact may be direct or indirect. Further, the impact may be positive or negative.

OBJECTIVES OF SEIA

The prime objective of the current study is to assess the impact of the proposed mining project on socio-economic characteristics of people living in the neighborhoods. Further, it is to be established whether the impending impact would be direct or indirect. Furthermore, it is to be examined whether the said impact would be positive or negative. Lastly, it is to be comprehended if the impact is positive how long it would sustain or if it is negative how soon the same could be eased.

SCOPE

The Scope of the study is as follows:

- a) To collect baseline data of the study area
- b) To comprehend socio-economic status of the people living in the study area.
- c) To assess probable impact of the project on social and economic aspects in the study area.
- d) To measure the impact of the project on Quality of life of the people living in the study area.
- e) To ensure sustainability of positive impact.
- f) To suggest mitigation measures and agency responsible for taking action in case of adverse impact.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

SOCIO-ECONOMIC IMPACT OF THE PROJECT

Impact on Demographic Composition

The proposed Project will hardly make any difference in the demographic composition of the study area as the additional employment it envisages to create will be met locally to the maximum extent. Hence, the chances of in-migration of people from outside the study area are remote. Accordingly, there will be no variation in the total population of the study area including that of sex ratio, when the mine starts operating.

Employment Opportunities

The proposed Project will provide employment to the local people. The number of workers to be deployed in the mining project will depend upon the quantity of minerals to be extracted from the mine by the lease holder. Both the miners and the unskilled workers will be recruited locally. It has estimated that around **49 people** will get employment in this mining project for a period of ten months in a year. It is a positive impact of the project since it is providing employment opportunities to the local people. The project will not affect the vulnerable groups of people.

Increased supply of sand in the market

The demand for minerals is ever increasing with the growth of the infrastructure development in our country. Both Government departments and private developers have taken up construction of roads, bridges and buildings in a big way. The requirement for the building materials is always high and there is already an acute shortage of sand in the market and the construction industry is the main sufferer. With the commencement of the proposed mining project the supply of minerals will increase and the gap between demand & supply will decrease to some extent, if not fully.

Impact on agriculture

It is non-forest land and the proposed activity is to take place in the bed of the Chanan River. There will be no negative impact on agriculture as no cultivation is taking place on the proposed mining area. Since, scientific mining will be adopted in the proposed mining project the area will be free from annual floods, which destroy standing crops and land &

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

property. This is a positive impact of the proposed mining project.

Impact on road development

Movement of trucks and other vehicles to and fro the mining site is expected to increase, when mining will start. The existing roads are connecting the quarry with the national highway connected by metalled followed by un-metalled roads. Hence, there is need for road maintenance and repairing regularly in the mining area. Further, there are risks of accidents during loading of extracted minerals into trucks and transportation to markets for sells. However, accidents can be avoided by taking due care and precautions.

Income to Government

The proposed mining activity will benefit the State in the form of royalty, dead rent, fees and earnings from taxes.

Impact on Law & Order

As most of the workers to be employed in the proposed mining project are local residents no law & order problem is envisaged. It is expected that the workers will attend to their duties from their residence and return to their homes after the day's work. There would have been law & order problem if the workers were migrants and lived in shanties closed to the mining area. However, to meet any untoward incident one police post may be set up closed to the mining site.

Impact on Health

There are no chances of occurring diseases, due to mining. The minerals excavated are non-toxic. To avoid respiratory problem from dust necessary protection should be taken.

Few safety measures are outlined below:

- a) **Safe Working Environment:** The project proponent shall ensure health and safety of all the employees at work. Efforts will be made to provide and maintain a safe work environment and ensure that the machinery and equipment in use is safe for employees. Further, it will be ensured that working arrangements are not hazardous to employees.
- b) **Provision of First Aid:** The first aid treatment reflects the hazards associated with the mining of minerals. The first-aiders will be well trained in handling patients working in the Project.

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- c) **Regular Health Examination:** For all mine workers regular health examination will be made compulsory. Treatment of serious back injury; existing asthma or respiratory diseases, existing skin diseases, lung function test (pre and post ventolin), Audiograms, Chest X- ray etc. will also be taken care of.
- d) **Health Education:** Adequate health education and information related to the job will be provided to the workers. Baseline health information will be recorded for future references.
- e) **Tie-up with the Nearest Hospital for Medical Assistance:** To meet the medical needs of the mine workers tie-up with nearest hospitals will be made. Efforts will be made to reserve few beds in the above hospitals for the workers of the mining project. This will ensure timely medical aid to the affected persons.
- f) **Supply of Mask and Gloves:** The workers in the Sand mining project are subject to respiratory diseases. For protection from dust it will be made compulsory for all workers to wear masks and gloves, while working in the mine.
- g) **Administration of Anti-venom Injections:** Provision of Anti-venom therapy will be made available for administration to the workers in case of snake, spider and insect bites, while working in the mine.
- h) **Special Telephone Number:** A special telephone number will be made available to the workers in case of emergency so that they can dial the same for–medical assistances. Further, efforts will be made to provide vehicles to the patients in short duration for shifting to a hospital.
- i) **Special Group Insurance Scheme:** All the mine workers will be covered under a Group Insurance Scheme of LIC or any other Insurance company.

CONCLUSION

The commissioning of the Sand Mining Project Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar) provides employment to local people who are in search of the same. The granting of environment clearance to make mining of sand legally valid and it will generate revenue for the state. It is expected that prospective entrepreneurs will venture to set up industrial units in the vicinity in the near future making the area a mixed society, dependent on industry, trade and business. With the implementation of the project the occupational

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pattern of the people in the area will change making more people engaged in mining, industrial and business activities rather in agriculture only. The study area is still lacking in health and educational facilities. It is expected that same will improve to a great extent with opening of the project and associated industrial & business activities.

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8.0 GENERAL

Various benefits are envisaged while planning for the mining of sand from Chanan River Bed. Sand is very important minor mineral and is the principal raw material for meeting the huge demand of construction material required in building construction and infrastructure works, road material for construction and maintenance of roads / highway; elastic ballast material for rail tracks in the State of Bihar & and nearby cities and towns of Bihar. The natural available materials in shoal deposits of Chanan River bed quarry site have been found suitable from techno-economic consideration.

8.1 PHYSICAL BENEFITS

The opening of the proposed project will enhance the following physical infrastructure facilities in the adjoining areas.

- a. **Road Transport:** There will be improved road communication due to the proposed project and maintenance will also be done time to time.
- b. **Market:** Generating useful economic resource for construction. Excavated minor mineral sand will provide a good market opportunity.
- c. **Enhancement of green cover:** As a part of reclamation plan, plantation will be carried along the river banks or along the road sides or near the civic amenities.
- a. **Creation of community assets** (infrastructure) like provision for drinking water, construction of school buildings, village roads/ linked roads, dispensary & health centre, community centre, market place etc, as a part of corporate social responsibility.

8.2 SOCIAL BENEFITS

- a) **Increase in Employment Potential due to the project activity:** Employment opportunities will increase both directly as well indirectly.
- b) **Contribution to the Exchequer** as the saleable minerals will be given royalty. Since the quarries will be leased out to successful allottees, mining operation in the state will get legalized and it will fetch income to the state exchequer.
- c) **Increased Health related activities:** Healthcare promotional activities will be undertaken. Pre-placement & and Periodic medical checkups will be done, which will

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lift the general health status of the residents of the area. Health camps, medical aids, family welfare programs, immunization camp, sports will be arranged.

Table-8.1, Budget for Public Health

S. No.	Activities recommended for communities level services	Tentative cost (Lakh Rs) For Each Mine
1	Awareness campaigns regarding health issues in the nearby villages.	1.0
2	Provide free health checkups & medicines to the nearby villagers of the project site.	1.0
3	Assistance to set up a temporary health center during the lease tenure.	0.5
	Total	2.5

- d) **Educational attainments:** Educational activities will be promoted by the lessee. Awareness program will be arranged covering basic issues related to primary level education, environment, health and hygiene etc.
- e) **Strengthening of existing community** facilities through the Community Development Programme.

Table 8.2, Budget for Occupational Health

Particulars	Recurring Cost per year (Rs.) For Each Mine
For routine checkup	1,00,000
Medical aid as per ESI Scheme	2,00,000
Training	1,00,000
Total	4,00,000

8.3 ENVIRONMENTAL BENEFITS

- Protection of banks
- Reducing submergence of adjoining agricultural lands due to flooding.
- Reducing aggradations of river level.
- Protection of crops being cultivated along the bank.

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- e. A check on illegal mining activity.

8.4 CORPORATE ENVIRONMENTAL RESPONSIBILITY

2% of capital cost of the project cost will be allotted for the Corporate Environmental Responsibility as per OM dated 1st May 2018. The following has been proposed considering the needs & demand of the people.

CER cost will be 2% of the total project cost. This amount will be used for social welfare.

CER COST is 10,61,80,000/-x 2% = Rs. 21,23,600/-

For each activity the funds to be earmarked by the proponent will be decided after discussion with the local authority/people and the beneficiaries during Public Hearing. It has been planned to undertake a concurrent evaluation of the activities to be taken up under the CER programme.

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9.0 INTRODUCTION

The environmental management must be integrated into the process of mine planning so that ecological balance of the area is maintained and adverse effects are minimized. The Environmental Management Plan (EMP) consists of a set of monitoring programme, mitigation measures, and management control strategies to minimize adverse environmental impacts.

The EMP has therefore been made considering implementation and monitoring of environmental protection measures during and after mining operations. Measures to be taken for each of the impact areas are detailed in the following paras:

9.1 ENVIRONMENTAL MANAGEMENT CELL (EMC)

It is imperative to establish an effective organization to implement, maintain, monitor and control the environmental management system. A separate Environmental Management Cell (EMC) will be formed to look after the environment related matter of the mine. The structure of EMC is as follows:

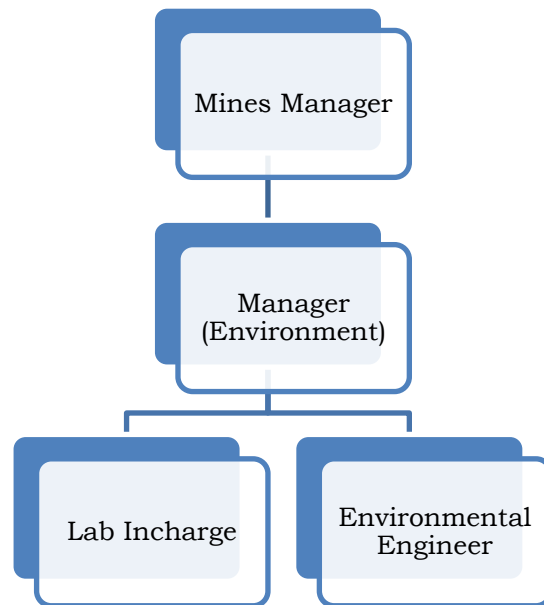


Figure 9.1 Environment Management Cell

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

The EMC will perform the following activities:

- EMC will oversee that environmental control measures are implemented as per the plan.
- EMC will ensure ambient Field monitoring like air monitoring, meteorological monitoring and noise monitoring in coordination with outside agencies.
- Coordinating the environment related activities within the organization as well as with outside agencies.
- Reporting the status report to the statutory authorities.
- Systematically document and record keeping w.r.t. environmental issues.
- Plantation and their maintenance
- Collection statistics of health of workers and population of surrounding villages.
- Environmental compliance to the regulatory authorities.
- Communication with the concerned department on the environmental issue.
- Monitoring the progress of implementation of environmental management programme.

9.2 AIR POLLUTION CONTROL MEASURES

During the course of sand mining, no toxic substances are released into the atmosphere, so there seems to be no potential threat to health of human beings. In river bed mining activities, dust will be generated during mining, loading and transportation. The only source of fugitive gaseous emission during mining is vehicles which will be used for transportation. The environmental management for air pollution control includes:

- Plantation will be done along the road-sides and also the vacant land present under Gram Panchayat after consultation with local villagers/authority.
- Dust mask provided to the workers engaged at dust generation points like excavations, loading and unloading points.
- The only air pollution sources are the road transport network of the trucks. The dust suppression measures like water spraying will be done on the roads.

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- Utmost care will be taken to prevent spillage of sand and stone from the trucks.
- Water sprinkling will be done to reduce the emission of dust due to transportation of minerals.
- Overloading will be prevented. The trucks/ tractor trolley will be covered by tarpaulin covers.
- Plantation activities in consultation with village Panchayat along the roads will also reduce the impact of dust in the nearby villages.

9.3 WATER POLLUTION CONTROL MEASURES

During the operational phase of mine no waste water or industrial effluent will be generated. The environmental management for water pollution control includes:

- Water requirements for drinking, plantation and dust suppression will be met by tanker supply on the daily basis.
- Local people will be employed and no permanent housing will be done so no permanent drainage pattern for sewerage system is required as domestic sewage shall be disposed off into septic tank followed by soak pits.
- Mining in the area will be done up to depth of 3.0m maximum from the surface level well above the ground water table, therefore impact on water regime is not anticipated.
- Monitoring of water quality of nearby surface water, ground water and domestic water will be conducted once in every season except monsoon to evaluate the performance of the mitigation measures.

9.4 NOISE POLLUTION CONTROL MEASURES

As there will be no heavy earth moving machinery there will not be any major impact on noise level due to sand mining and other association activities a detailed noise survey has been carried out and results were cross referenced with standards and were found to be well within limits. Blasting technique is not used for sand mining hence no possibility of land vibration. It was found that the proposed mining activity will not have any significant impact on the noise environment of the region. The only impact will be due to transportation of sand and by excavator involve trucks and tractor trolleys.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- Proper maintenance of all machines is being carried out, which help in reducing generation of noise during operations.
- No other equipments accept the Transportation vehicles and Excavator and Loaders (as and when required) for loading is allowed.
- Noise generated by these equipments is intermittent and does not cause much adverse impact.
- Periodical monitoring of noise will be done to adopt corrective actions wherever needed.
- Plantation will be taken up along the approach roads. The plantation minimizes propagation of noise and also arrests dust.

9.5 BIOLOGICAL ENVIRONMENT

Although, there are no significant adverse impacts from the project, the following measures are proposed to minimize anticipated impacts:

- It will be ensured that no mining activity will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species.
- As the mining site has no vegetation, no clearance of vegetation will be done.
- Prior to closure of mining operations / during the rainy season the eroded bank will be restored / reclaimed to minimize negative impacts on aquatic habitats.
- Sprinkling will be done on the haul roads with water to avoid the dust emission, thus avoiding damage to the crops.
- Mining will be carried out on the dry part of the lease area to avoid disturbance to the aquatic habitat and movement of fish species.
- No discard of food, polythene waste etc. will be allowed in the lease area which would distract/attract the wildlife.
- No night time mining will be allowed which may catch the attention of wild life.
- Workers will be made aware of the importance of the wildlife and signage will be displayed at the sensitive areas to caution the workers & other passerby.

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- **Greenery development:** The project will not lead to any tree cutting. However, a social responsibility, greenery will be developed along the both sides of road and the bank of river. Community services will be deployed in raising these plantations. Trees of economic importance and native origin such as fruit trees shall be planted.
- Approx. 340 trees will be planted around haul road during the plan period.
- The trees proposed for plantation are:
- As per Sustainable Sand Management & Mining Guidelines 2016, minimum 05 plant per hectare will be proposed for development of greenbelt but in this project 10 plants per hectare will be proposed for better condition of environment.
- Total Number of plants for cluster of Sand Blocks are given below.

Sand Ghat	Area (Ha)	Plants
Block 06	34.0	34.0*10 Plants= 340 plants
Total Plants		340 plants

Table 9.1:- List of Plant selected for Green Belt Development

	Agro-climatic zone & Sub zone	Middle Genetic Plains, North west alluvial sub zone	
S/n	Scientific name	Common Name	Pollution control features
1	<i>Acacia nilotica</i>	Babul	Tolerant to SO ₂
2	<i>Mangifera indica</i>	Aam	Tolerant to Dust control
3	<i>Tectona grandis</i>	Sagon	Tolerant to Dust control
4	<i>Azadirachta indica</i>	Neem	Tolerant to SO ₂
5	<i>Pithecolobium dulce</i>	Jungle jalebi	Tolerant to SO ₂ and Dust control
6	<i>Scigium cumuni</i>	Jamun	To stop river bank erosion
7	<i>Terminalia arjuna</i>	Arjun	To stop river bank erosion
8	<i>Populus ciliate</i>	Popular	Fast growing, broad leaf

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9.6 LAND USE PLANNING

Degradation of land is not a very significant adverse impact of riverbed mining due to creation of access roads, mining operations, transportation of mined material. In order to prevent the environmental degradation of leased mine area and its surroundings, the following measures shall be taken;

- Mineral will be mined out after leaving sufficient safety zone from the bank as per sustainable sand mining guidelines-2016 for bank stability.
- The pits from where the material will be picked should not get deeper than 3.0 meter & shall follow the normal channel direction of the river.
- No foreign material shall be allowed to remain/spill in river bed and catchment area, or no pits/pockets will be allowed to be filled with such material.
- The mining is planned in non-monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.
- Pits will get replenished naturally every year after monsoon.

9.7 OCCUPATIONAL HEALTH & SAFETY

Occupational safety and health is very closely related to productivity and good employer-employee relationship. The factor of occupational health in Sand Ghat of Shri Anil Singh, M/s Maihar Developers Add. – Flat no. – 902A, Wasundhra Garden, Bariyatu, Moabadi, Dist. Ranchi Jharkhand - 834008, (Sand Block 06) is mainly dust. Safety of employees during operation and maintenance etc. shall be as per Mines rules and regulations.

To avoid any adverse effect on the health of workers due to various pollutants, sufficient measures relating to safety and health will also be practiced:

- Provision of rest shelters for mine workers with amenities like drinking water, portable toilets etc.
- All safety measures like use of safety appliances, such as dust masks, shoes, non breakable goggles as the case may be, shall be ensured. Safety awareness programs, awards, posters, slogans related to safety etc. will be encouraged.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- Training of employees for use of safety appliances and first aid in vocational training center.
- Regular maintenance and testing of all equipment as per manufacturers' guidelines.
- Periodical Medical Examination (PME) of all workers by a Medical Officer.
- First Aid facility will be provided at the mine site.
- Close surveillance of the factors in working environment and work practices which may affect environment and worker's health.
- Working of mine as per approved mining plan and environmental plans.

9.8 SOCIO-ECONOMIC ENVIRONMENT

This project operation will provide livelihood to the poorest section of the society. The overall impact of riverbed mining of sand on the social economics of the area shall be a very positive one, as not only it will generate employment opportunities for local population at mine site for transportation of mined material, etc. It will also give a good boost to the general economy of the area.

The proposed mining activity is expected to provide stimulus to socio-economic activities in the region and thereby accelerate further development processes. However, there is an apprehension that local people may get engaged in illegal activities if the proposed mining operation or the project is shelved or there is inordinate delay in its execution.

9.9 ENVIRONMENT POLICY

Shri Anil Singh, M/s Maihar Developers Add. Flat no. – 902A, Wasundhra Garden, Bariyatu, Moabadi, Dist. Ranchi Jharkhand - 834008, (Sand Block 06) of Sand Ghat believes that responsible environmental stewardship comprises diligent application of well-established natural resource management, controls and practices for the protection of the mined out land, preservation of biodiversity and proper disposal of waste if any following the best environmental practices during the process of mining.

Environmental policy prescribed for standard operating process to bring into focus any violation/deviation of the environment and forest norms/conditions that the company operations will implement operational and risk management practices that provide for



Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

maximum protection of people and the environment. To this end, the owner resolves that company will follow the below mentioned practices:

Operate in accordance with prescribed industry standards while complying with all applicable environmental, health and safety laws and regulations.

- Establish and maintain a well-defined environmental, health and safety management system to guide its operations.
- Ensure that all employees, officers and directors understand and adhere to its environmental, health and safety management program.
- Provide operations with the necessary resources, expertise and training to effectively carry out its EHS management programs.
- Engage employees at all levels in programs directed towards minimizing adverse effects on the environment resulting from mining activity.
- Work proactively with governments and the public in the development of cost effective and realistic regulations that promote enhanced environmental, health and safety protection.
- Promote environmental awareness among its employees, their families and the communities in which it operates.
- Require those who provide services and products to practice good environmental stewardship.
- Mitigate its environmental impacts through efficient use of resources, and the reduction of input materials and waste.
- Maintain a high degree of emergency preparedness.

9.10 BUDGET ALLOCATION FOR EMP IMPLEMENTATION

Annual budget for EMC is very essential for successful implementation of EMP. Costs will be both Capital and Recurring cost as given below. The fund allocated will not be diverted for any other purposes and the top management will be responsible for this.

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Table 9.2, Budget of EMP (Block-06)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	--	1.5
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Soil pollution iv) Noise Pollution	--	2.0
3	Plantation and salary for one gardener (part time basis).	3.40	0.5
4	Haul road Maintenance Cost	0.75	1.5
TOTAL		4.15	5.5

Note: *340 plants * 1000 Rs (for each plants including hedges and fences) =Rs 340000/-

- Salary of Labour for haul road maintenance 2 labor*300=600 per day
- 600* 250= 1,50,000/-
- * 2.5 lakh per kilometer (2,50,000 *0.3 km haul road) = 75,000/-

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10.0 INTRODUCTION

10.1 Purpose of the Report

Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR) received from SEIAA, Bihar under EIA notification of the MoEF&CC dated 14th September, 2006 and its subsequent amendment there-off and also the EIA Guidance Manual for Mining of Minerals (Feb, 2010) of MoEF&CC, Govt. of India, for seeking environmental clearance for mining of Sand in the applied mining lease area.

10.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

10.2.1 Identification of Project

The Proposed Sand Mining Project is located on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).

The Proposed Production is 612000 Cum/Year or 1083240 TPA and Area of the project site is 34.0 ha.

As per the Director of Geology, Bihar, the modification of mining plan has been approved .As per EIA notification 2016 and subsequent amendments, the project is coming under category ‘B’ (B1) and the lease area is more than 5.0 Ha, approved Mining Plan, Pre-feasibility Report and EMP are required for Environment Clearance in respect of the said quarry lease. Copy of letter is enclosed as **Annexure No. II**.

10.3 BRIEF DESCRIPTION OF PROJECT

The proposed project is Open Cast Semi-Mechanized Mining of Sand with a proposed production of 612000 CUM or 1083240 Tonnes per annum. The project has been proposed by (Block 06 - Shri Anil Singh, M/s Maihar Developers Add. – Flat no. – 902A, Wasundhra Garden, Bariyatu, Moabadi, Dist. Ranchi Jharkhand.)

The proposed project is over an area 34.0 ha on Chanan River at Mauja- Jitarpur, Anchal-Banka, District- Banka, (Bihar). As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as **Category ‘B-1’**.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

The estimated project cost for the proposed project is **Rs - 10,61,80,000/-** (including auction cost).

The proposed mining lease area falls in Survey of India Toposheet 72L/13 & 72P/01.

The mine lease co-ordinates and connectivity details are listed below:

Table: 10.1 Mine lease Co-ordinates (Block 06)

Pillar	Geo Coordinate	
A	24°51'39.49"N	86°55'56.42"E
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

The details of environmental setting are given in **Table-10.2**.

Table-10.2: Details of Environmental Setting

Sr. No.	Particulars	Details		
1	Location			
a	Village	Mauja – Jitarpur		
b	Tehsil	Banka		
c	District	Banka		
d	State	Bihar		
2	Elevation above	Block No.-06 (85.8 mRL -88.7 mRL)		
3	Nearest National /State Highway	NH-333A, Approx. 1.8 Km towards NW direction. SH-25, Approx.3.0 Km in NW direction.		
4	Nearest Railway station	Blocks	Railway Station	Distance (Km) Direction
		Block 06	Banka Railway	Banka Railway station, approx. 2.10 km towards NW

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Sr. No.	Particulars	Details		
			Station	direction.
5	Nearest Airport	Blocks	Airport	Distance (Km) Direction
		Block 06	Deoghar Airport	Deoghar Airport, approx. 51.0 km towards SW direction.
6	Ecological Sensitive Areas (Wildlife Sanctuaries)	There is no any Ecological Sensitive Areas Like National Park, Wildlife Sanctuaries, etc are found within 10 km of the study area.		
7	Seismic Zone	Zone- IV <i>Source BMTC 2nd edition</i> https://www.bmtpc.org/disaster%20resistnace%20technolgies/ZONE%20IV.htm		

10.4 PROJECT DESCRIPTION

10.4.1 Salient features of mine lease

The salient features of mine lease are given below:

Table-10.3: Salient features of mine lease

Sr. No.	Parameter	Description
1	Name of the Mine	Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar).
2	Mining Capacity	612000 CUM or 1083240 Tonnes per annum
3	Method of mining	Open cast semi-mechanized mining/OTFM
4	Total ML area	34.0 ha
5	Depth of mining	3.0 m depth
6	Manpower	49 persons
9	Water Requirement	4.0 KLD
10	Source of Water	Tanker/ Nearby village.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

10.4.2 Mineral Reserves and production

Slices of height 1.5m & width 6.0 m has been drawn in geological sections to calculate the mineable reserves. The area of each bench level has been calculated & multiplied by strike influence to get the volume. Volume is multiplied by bulk density (1.77 kg/m³) to get Tonnes.

Table 10.4 Classification Mineral Reserves

Sand Ghat	Area (Hect.)	Geological Reserves (m ³)	Mineable Reserves (m ³)	Annual Permitted Reserve As per LoI (m ³)
Chanan Block No. - 06	34.0	1020000	906474	612000

Total Mineable Reserve = 906474 CUM or 1604459 Tonnes.

The annual extractable RBM comes to 612000 CUM or 1083240 Tonnes.

In the lease area the river flow being reduced and sediment load get deposited. During flood season, the area gets replenished with sediments and source of erosion at this location. It is a river bed deposit and mined out area shall be replenished each year during monsoon period and depth of quarry shall be filled back by river sand each year and area will restore its original topography.

10.4.3 Conceptual Plan

Mine Applied Area will be worked for Chanan Block 06 Sand Ghat. However, as the digging depth will be restricted to 3.0 m only. This will be further replenished during rainy season. Sand Ghat will be worked systematically as the width is limited while length is much more. As the lease period is only 5 (Five) years, some of the area will be left un-worked at the end of lease period.

(i) Final Slope Angle to Be Adopted: Height of the bench is limited to 1.5 m while width of individual bench shall be kept 6.0m. River bank side will be protected by working in dry part of the river and by leaving safety distance of the width of the river of 5 meter. Bank side

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

natural slope will not be disturbed. This will prevent collapse of bank and erosion. However, the height of the bank with respect to river bed is varying from 3-4 meters.

(ii) During plan period workings will be carried out in the Sand Ghat at a time of the Applied Area simultaneously. Scattered workings will ensure safety, remove congestion of vehicles and will have better control and management.

(iii) Ultimate Capacity of Dumps: There will be no OB removal / during the plan period. Therefore no proposal has been envisaged for its separate dumping. No outside material will be filled up in the extracted zone.

The conceptual plan & section of each mining plots are attached with mine plan.

10.4.4 Method of Mining

Mining activity will be carried out by open cast semi- mechanized method/OTFM. The operation will be semi-mechanized/OTFM with use of excavators/JCBs truck /tractors combination or Manually etc. The sand will be collected in its existing form.

10.5 AFFORESTATION PROGRAMME

Topsoil if any would be utilized for intensive plantation and greenbelt development, all along the bank of the river. The details of plantation and number of saplings to be planted are given below. Approx. 340 trees will be planted around haul road during the plan period.

10.6 LAND USE PATTERN

The mine lease area is flat river bed and river banks. There is no forest land or agriculture land in the mine lease area. The entire mining lease lies within River.

10.7 BASELINE ENVIRONMENTAL STATUS

10.7.1 Soil Quality

Six soil samples were collected in and around the mine lease area to assess the present soil quality of the region. The pH of the soil indicates that the soil is slightly alkaline in nature. Based on the results, it is evident that the soils are not contaminated by any polluting sources.

10.7.2 Meteorology

Meteorological data at the site was monitored during March 2023 to May 2023 representing pre monsoon season. It was observed that the during study period, temperature ranged from 21 °C to 44 °C.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

10.7.3 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) has been carried out at 9 locations. The minimum and maximum level of PM10 recorded within the study area was in the range of 59.60 $\mu\text{g}/\text{m}^3$ to 88.50 $\mu\text{g}/\text{m}^3$. The Particulate Matter (PM_{2.5}) range of 23.50 $\mu\text{g}/\text{m}^3$ to 50.70 $\mu\text{g}/\text{m}^3$. Sulphur dioxide (SO₂) between 5.30 $\mu\text{g}/\text{m}^3$ to 9.80 $\mu\text{g}/\text{m}^3$. Oxides of Nitrogen (NO₂) between 10.40 $\mu\text{g}/\text{m}^3$ to 23.60 $\mu\text{g}/\text{m}^3$. The results thus obtained indicate that the concentrations of PM10, SO₂ and NO₂ in the ambient air are well within the National Ambient Air Quality (NAAQ) standards for Residential and Rural areas.

10.7.4 Water quality

The Ground water sampling was taken from 05 locations. The analysis results indicate that the pH ranges between 7.93 and 8.21, Total hardness varies from 198 mg/l to 256 mg/l & Total dissolved solids vary from 325 mg/l to 360 mg/l.

The results indicate groundwater is generally in conformity with the drinking water standards (IS: 10500).

10.7.5 Noise Quality

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as 40.43 dB(A) to 49.91 dB(A) respectively. The minimum & maximum noise levels at night time were found to be 36.52 dB (A) & 43.22 dB(A) respectively.

10.7.6 Ecological Environment

Based on the field studies and review of published literature, There is no any Ecological Sensitive Areas Like National Park, Wildlife Sanctuaries, etc are found within 10 km of the study area.

10.8 ANTICIPATED ENVIRONMENTAL IMPACTS

10.8.1 Impact on Air Environment

The proposed mining activities loading and movement of other transport vehicles used in mining will generate dust (SPM/RSPM). Proper water sprinkling shall be carried out at the

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

mine site. The mineral will be transported by road through covered tarpaulin trucks/tippers to reduce the fugitive emission caused by the wind.

10.8.2 Impact on Water Environment

Mining of sand from within or near river has an indirect impact on the physico-chemical habitat characteristics during monsoon season. These characteristics include in stream roughness elements, depth, velocity, turbidity, sediment transport and stream discharge.

The detrimental effects, if any, to biota resulting from bed material mining are caused by following:

- Alteration of flow patterns resulting from modification of the river
- An excess of suspended sediment during monsoon season.

Project activity will be carried out only in the dry part of the Chanan River. Hence, none of the project activities affect the water environment directly. In the project, it is not proposed to divert or truncate any stream in monsoon season only. No proposal is envisaged for pumping of water either from the *River* (in monsoon) or tapping the ground water.

10.8.3 Impact on Water Quality

Analysis results of water samples collected from the buffer zone indicate that the pH, total dissolved solids (TDS) are well below the prescribed limits.

No wastewater generation is envisaged due to the mining operations. The sanitary wastewater will be sent to septic tanks.

10.8.4 Impact on Noise Environment

The proposed mining activity is semi-mechanized/OTFM in nature. No drilling & blasting is envisaged for the mining activity. Hence, the only impact is anticipated is due to movement of vehicles deployed for transportation of minerals. The vehicles will be maintained in good running condition so that noise will be reduced to minimum possible level.

10.8.5 Impact on Land Environment

The proposed extraction of stream bed materials, mining below the existing streambed, and alteration of channel-bed form and shape may lead to several impacts such as erosion of

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

channel bed and banks, increase in channel slope, and change in channel morphology if, the operations are not carried out systematically.

The systematic and scientific removal of sand will not cause bed degradation. The silt and clay generated as waste will be used for plantation or filling up low lying area elsewhere. The mining is planned in non monsoon seasons only, so that the excavated area gets replenished gradually during the monsoons each year.

10.8.6 Impact on flora and fauna

As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated. No mining will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species. The mining site has no vegetation; no clearance of vegetation will be done. Haul roads will be sprinkled with water which would reduce the dust emission, thus avoiding damage to the crops.

10.8.7 Impact on Socio - Economic Aspects

The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc exist within the lease area or in the vicinity. The mining operation will not disturb/ relocate any village or need resettlement. Thus no adverse impact is anticipated. The impact of mining activity in the area is positive on the socio-economic environment of the region. Sand mining will be providing employment to local people whenever there is requirement of manpower.

10.9 ENVIRONMENTAL MANAGEMENT PLAN

- Extraction will be done from the bed leaving safety zone from bank.
- The maximum working depth will remain above ground water table of the area.
- Provide health facilities to the workers & surrounding people in the impact area to reduce the health impacts.
- Ensuring wildlife protection & arranging awareness campaigns for the same.
- Minimize activities that release fine sediment to the river.
- Effective mitigation measures will be adopted to minimize disturbance during transportation & handling of minerals:

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- Establishment of reclamation program with plantation of local/native & fast growing species
- Establishment of restoration plan during the closure of mine at the onset of monsoon season.
- Establishment of effective Disaster Management Plan to take timely precautionary measures to avoid effects of impending disasters.
- Establishment of effective Monitoring Program monitored by Environment Management Cell.

10.10 ENVIRONMENTAL MONITORING PROGRAM

Table 10.5: Post project environmental monitoring

S. No.	Description of Parameters	Schedule of Monitoring
1	Air Quality	24 hourly samples twice a week in each season except monsoon
2	Water Quality (Surface & Groundwater)	Once a season for 4 seasons in a year
3	Soil Quality	Once in a year in project area
4	Noise Level	Twice a year for first two years & then once a year
5	Socio-economic Condition	Once in 3 years
6	Plantation Monitoring	Once in a season

10.11 ENVIRONMENTAL PROTECTION COST

The details of the cost to be incurred for successful monitoring of environmental parameters and implementation of control measures are given in **Table-10.6**.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Table 10.6: Cost of Environmental Protection Measures

Table 10.6 (a), Budget of EMP (Block-06)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	--	1.5
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Soil pollution iv) Noise Pollution	--	2.0
3	Plantation and salary for one gardener (part time basis).	3.40	0.5
4	Haul road Maintenance Cost	0.75	1.5
TOTAL		4.15	5.5

Note: *340 plants * 1000 Rs (for each plants including hedges and fences) =Rs 340000/-

- Salary of Labour for haul road maintenance 2 labor*300=600 per day
- 600* 250= 1,50,000/-
- * 2.5 lakh per kilometer (2,50,000 *0.3 km haul road) = 75,000/-

10.12 ADDITIONAL STUDIES

10.12.1 Risk Assessment

The complete mining operation will be carried out under the management control and direction of a qualified mine manager holding. The DGMS have been regularly issuing standing orders, model, standing orders and circulars to be followed by the mine management in case of disaster, if any.

10.12.2 Disaster Management Plan

Emergency preparedness is an important aspect in the planning of Disaster Management. Personnel would be trained suitably and prepared mentally and physically in emergency response through carefully planned, simulated procedures. Similarly, the key personnel and essential personnel shall be trained in the operations.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

10.12.3 Public Consultation

This is a draft EIA report. Public Hearing will be incorporated in FEIA report.

10.13 PROJECT BENEFITS

Physical Benefits: Road Transport, Market, Enhancement of green cover & Creation of community assets.

Social Benefits: Increase in Employment Potential, Contribution to the Exchequer, Increased Health related activities, Educational attainments & Strengthening of existing community facilities.

Environmental Benefits:

- Controlling river channel and protection of banks.
- Reducing submergence of adjoining agricultural lands due to flooding.
- Reducing aggradation of river level.
- A check on illegal mining activity.

Corporate Social Responsibility

2% of capital cost of the project cost will be allotted for the Corporate Environmental Responsibility as per OM dated 1st May 2018. The following has been proposed considering the needs & demand of the people.

CER cost will be 2% of the total project cost. This amount will be used for social welfare.

CER COST is 10,61,80,000/- x 2% = Rs. 21,23,600/-

For each activity the funds to be earmarked by the proponent will be decided after discussion with the local authority/people and the beneficiaries during Public Hearing. It has been planned to undertake a concurrent evaluation of the activities to be taken up under the CER programme.

10.14 CONCLUSIONS

- The mining operations will meet the compliance requirements of MoEF&CC;
- Community impacts will be beneficial, as the project will generate significant economic benefits for the region;
- Monitoring program will be followed till the mining operations continue.



Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

- With the effective implementation of the Environment Management Plan (EMP) during the mining activities, the proposed project can proceed without any significant negative impact on environment.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

CONSULTANT

Name of the Consultant	P and M Solution
Address	C-88, Sector 65, Noida -201301 – U.P
Credentials	Accredited by QCI/NABET
Consultant accreditation details are given below:	

Quality Council of India
National Accreditation Board for
Education & Training

CERTIFICATE OF ACCREDITATION


P and M Solution
First Floor, C-88, Sector-65, Noida, Uttar Pradesh- 201301

Accredited as Category -A organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA/EMP reports in the following sectors:

Sl. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2.	River Valley projects	3	1 (c)	B
3.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	B
4.	Highways,	34	7 (f)	A
5.	Building and construction projects	38	8 (a)	B
6.	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IA AC Minutes dated December 20, 2019 on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/20/1223 dated February 3, 2020. The accreditation needs to be renewed before the expiry date by P and M Solution, Noida following due process of assessment.


 Sr. Director, NABET
 Dated: February 3, 2020

Certificate No.
 NABET/EIA/1922/IA0053

Valid till
 Dec 10, 2022

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).



National Accreditation Board for Education and Training



QCI/NABET/ENV/ACO/23/2770

June 02, 2023

To

P and M Solution
C-88, Sector-65 Noida
Noida, UP

Sub.: Extension of Validity of Accreditation till Sept 01, 2023 – regarding
Ref.. 1. Certificate no. NABET/EIA/1922/IA0053
2. Request e-mail dated May 30, 2023

Dear Sir/Madam

This has reference to the accreditation of your organization under the QCI-NABET EIA Scheme, the validity of **P and M Solution** is hereby extended till Sept 01, 2023 or completion of the assessment process, whichever is earlier.

The above extension is subject to the submitted documents/required information with respect to your application and timely submission and closure of NC/Obs during the process of assessment.

You are requested not to use this letter after expiry of the above stated date.

With best regards.

(A K Jha)
Sr. Director, NABET

NABET

Project: Sand Mining Project on Chanan River Block No – 06 Sand Ghat at Mauja-Jitarpur, Anchal- Banka, District- Banka, (Bihar).

Consultant Contact Details:

P and M Solution

Address –C-88, Sector 65 Noida

Mobile no. - +8377871554, 8826287364

S No	Name	EC/FAE	DETAILS
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2	Pravin Kumar Sinha	FAE	GEO
3	TapanMajumdar	FAE	HG
4	Subhash Kumar	FAE	SC
5	Manoj Kumar Pandey	FAE	EB
6	R K Tiwary	FAE	RH,AP
7	Rahul kumar	FAE	AQ
8	Abhay Nath Mishra	FAE	SE
9	Hussain Ziauddin	FAE	WP
10	Poonam Kumari Mangalam	FAE	LU
11	Jatin Kumar Srivastava	FAE	NV

EXECUTIVE SUMMARY

FOR

SAND MINING PROJECT ON CHANAN RIVER
BLOCK NO - 06 SAND GHAT, DISTRICT BANKA

At

**Mauza- Jitarpur, Anchal- Banka, District- Banka,
State – Bihar**

SAND BLOCK	BLOCK 06
AREA	34.0 HA
PRODUCTION	612000 Cum/Year or 1083240 TPA

PROJECT PROPONENT

Shri Anil Singh

M/s Maihar Developers

Add. – Flat no. – 902A, Wasundhra Garden,

Bariyatu, Moabadi, Dist. Ranchi

Jharkhand - 834008

Environment Consultant

P and M Solution

(Accredited by QCI/NABET)

Accreditation No. : NABET/EIA/1992/IA0053

C-88, Sector 65 Noida

www.pmsolution.in



EXECUTIVE SUMMARY

INTRODUCTION

As per MoEF & CC, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as **Category 'B1'** project.

Chanan Block No – 06

The project has been proposed by M/s Maihar Developers (Shri Anil Singh). The Proposed Sand Mining Project is located on Chanan River at Block No – 06 Sand Ghat at Mauja- Jitarpur, Anchal- Banka, District- Banka, (Bihar). LOI issued to lessee via letter no 2096/khanan dated. 02.12.2022. The Draft EIA report has been prepared according to EIA notification 2006 and its subsequent amendment thereof. TOR of the proposed project has been issued by SEIAA Bihar dated 28-03-2023.

It has been proposed to mine around 1083240 Tonnes per annum for applied lease. The estimated project cost for the proposed project is **Rs 10,61,80,000/-** (including auction cost).

PROJECT DESCRIPTION

LOCATION

Chanan Block No – 06

The proposed mining lease area falls in Survey of India Toposheet Topo sheet No- 72L/13 & 72P/01. The lease area is located in Mauja- Jitarpur, Anchal- Banka, District- Banka, State- Bihar. The mine lease co-ordinates are listed below:

Pillar	Geo Coordinate	
A	24°51'39.49"N	86°55'56.42"E
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

Area & production: The total ML area is 34.0 Ha. Proposed rate of production will be 1083240 TPA.

Connectivity:

Chanan Block No – 06 Sand Ghat is well connected to the nearest metalled road 300m distance from the lease. NH-333A, Approx. 1.8 Km towards NW direction. SH-25, Approx.3.0 Km in NW direction. Banka Railway station, approx. 2.10 km towards NW direction.

Salient Features of Project

Name of the applicant	Shri Anil Singh M/s Maihar Developers
Address of Lessee	Shri Anil Singh M/s Maihar Developers Add. – Flat no. – 902A, Wasundhra Garden, Bariyatu, Moabadi, Dist. Ranchi Jharkhand - 834008
Name of Mine	Sand Mining Project on Chanan River Block No – 06 Sand Ghat
Village	Mauja- Jitarpur
District & State	Banka, Bihar
Mineral	Sand
Area (ha)	34.0 hectare

MINING

The mining process is opencast semi-mechanized method without drilling & blasting. This is an open-cast mining project. The operation will be semi-mechanized/OTFM with use of excavators/JCBs truck /tractors combination or Manually etc. The sand will be collected in its existing form.

The mining will be done in a rotational way. As the working is going to be methodical i.e. mining will be done in benches. There would be no risk to the employee working in the mines.

Mining will be done in layers.

The deposit will be worked from the surface of the bed up to 3 m bgl or above ground water level, whichever comes first. Hence, at no point of time mining will intersect with ground water table. Mining will be done only during the day time and completely stopped during the monsoon season.

RESERVE AND PRODUCTION

Mineable reserves have been computed up to 3m depth from surface. Benches having height 1.5m & width 6.0m drawn from the ultimate pit limit. Area of each benches have been calculated multiplied by strike influence to get the volume. The volume multiplied by bulk density (1.77 g/cm³) to get the tonnage.

The minerals excavated from the river bed will be replenished gradually during the monsoon season every year. And the area pertaining to paleo channels of the river will be leveled & restored back.

The bench-wise annual exploitation of sand of is given below:

Table:- Summary of minable reserves

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
88-86.5	1656	188	1.5	466992	826576
86.5-85	1646	178	1.5	439482	777884
Total				906474	1604459

Total Mineable Reserve = 906474 CUM or 1604459 Tonnes

Table:- Classification Mineral Reserves

Sand Ghat	Area (Hect)	Geological Reserves (m³)	Mineable Reserves (m³)	Annual Permitted Reserve As per LoI (m³)
Chanan Block No. - 06	34.0	1020000	906474	612000

It is a river bed deposit and mined out area shall be replenished each year during monsoon period and depth of quarry shall be filled back by river sand each year and area will restore its original topography.

SITE FACILITIES AND UTILITIES

Water Supply

Water will be provided to workers for drinking & domestic purpose. Water will also be required for dust suppression. A total water of 4.0 KLD will be required for the proposed project. Fresh

water will be only used for drinking purpose. The water will be supplied from available sources from nearby village.

Temporary Rest Shelter

A temporary rest shelter will be provided for the workers near to the site for rest. In addition, First aid box along with anti-venoms to counteract poison produced by certain species of small insects, if any and sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.

BASELINE ENVIRONMENTAL STATUS

Environmental data has been collected in relation to proposed mining for Air, Noise, Water, Soil, Flora & Fauna. The baseline environment study was carried out over an area with radial distance of 10 km around the mining lease area during Pre monsoon season from March 2023 to May 2023.

Meteorology

The Summarized Meteorological Data for the Monitoring Period March 2023 to May 2023. is given below:

Month	Temperature °C		Wind Speed (Km/Hr)	
	Min	Max	Average	Max
March 2023	21	38	10.4	21.0
April 2023	26	44	13.2	25.1
May 2023	28	43	14.7	27.8

Table Baseline Environmental Status

Attribute	Baseline status
Ambient Air Quality	Ambient Air Quality Monitoring reveals that the minimum & maximum concentrations of PM _{2.5} amongst all the 09 AQ monitoring stations were found to be 23.50µg/m ³ to 50.70 µg/m ³ respectively; PM ₁₀ was in the range of 59.60 µg/m ³ to 88.50 µg/m ³ As far as the gaseous pollutants SO ₂ and NO ₂ are concerned, the prescribed CPCB limit of 80 µg/m ³ for residential and rural areas has never been surpassed at any station.
Noise Levels	The results of the monitoring program indicated that both the daytime and night time levels of noise were well within the

	prescribed limits of NAAQS, at all the 09 locations monitored.
Water Quality	The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by IS: 10500.
Soil Quality	Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 7.74 to 8.16, which shows that the soil is slightly alkaline in nature.
Ecology and Biodiversity	There is no Ecological Sensitive Areas are found within 10 km of the study area.

ANTICIPATED ENVIRONMENTAL IMPACTS

Impact on Air Environment

The proposed mining activities loading and movement of other transport vehicles used in mining will generate dust (SPM/RSPM). Proper water sprinkling shall be carried out at the mine site. The mineral will be transported by road through covered tarpaulin trucks/tippers to reduce the fugitive emission caused by the wind.

Impact on Water Environment

Mining of sand from within or near *river* has an indirect impact on the physico-chemical habitat characteristics during monsoon season. These characteristics include in stream roughness, elements, depth, velocity, turbidity, sediment transport and stream discharge.

The detrimental effects, if any, to biota resulting from bed material mining are caused by following:

- Alteration of flow patterns resulting from modification of the *river*
- An excess of suspended sediment during monsoon season.

Project activity will be carried out only in the dry part of the Chanan River. Hence, none of the project activities affect the water environment directly. In the project, it is not proposed to divert or truncate any stream in monsoon season only. No proposal is envisaged for pumping of water either from the *River* (in monsoon) or tapping the ground water.

Impact on Land Environment

The proposed extraction of stream bed materials, mining below the existing streambed, and alteration of channel-bed form and shape may lead to several impacts such as erosion of channel bed and banks, increase in channel slope, and change in channel morphology if, the operations are not carried out systematically.

The systematic and scientific removal of sand will not cause bed degradation. The silt and clay generated as waste will be used for plantation or filling up low lying area elsewhere. The mining is planned in non monsoon seasons only, so that the excavated area gets replenished gradually during the monsoons each year.

Impact on Noise Environment

The proposed mining activity is semi-mechanized in nature. No drilling & blasting is envisaged for the mining activity. Hence, the only impact is anticipated is due to movement of vehicles deployed for transportation of minerals. The vehicles will be maintained in good running condition so that noise will be reduced to minimum possible level.

Impact on Biological Environment

As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated. No mining will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species. The mining site has no vegetation; no clearance of vegetation will be done. Haul roads will be sprinkled with water which would reduce the dust emission, thus avoiding damage to the crops.

Impact on Socio Economic Environment

The impact of mining activity in the area is positive on the socio-economic environment of the region. Sand mining will be providing employment to local people whenever there is requirement of manpower.

POST PROJECT ENVIRONMENTAL MONITORING

S.No.	Description of Parameters	Schedule of Monitoring
1	Air Quality	24 hourly samples twice/thrice a week in each season except monsoon
2	Water Quality (Surface & Groundwater)	Once a season for 4 seasons in a year

3	Soil Quality	Once in a year in project area
4	Noise Level	Twice a year for first two years & then once a year
5	Socio-economic Condition	Once in 3 years
6	Plantation Monitoring	Once in a season

ADDITIONAL STUDIES

Public Hearing

Public hearing is yet to be conducted.

Risk Assessment

The complete mining operation will be carried out under the management control and direction of a qualified mine manager holding. The DGMS have been regularly issuing standing orders, model standing orders and circulars to be followed by the mine management in case of disaster, if any. Moreover, mining staff will be sent to refresher courses from time to time to keep them alert.

Disaster Management Plan

Emergency preparedness is an important aspect in the planning of Disaster Management. Personnel would be trained suitably and prepared mentally and physically in emergency response through carefully planned, simulated procedures. Similarly, the key personnel and essential personnel shall be trained in the operations.

PROJECT BENEFITS

Physical Benefits: Road Transport, Market, Enhancement of green cover & Creation of community assets.

Social Benefits: Increase in Employment Potential, Contribution to the Exchequer, Increased Health related activities, Educational attainments & Strengthening of existing community facilities.

Environmental Benefits:

- Controlling *river* channel and protection of banks.
- Reducing submergence of adjoining agricultural lands due to flooding.
- Reducing aggradation of *river* level.
- A check on illegal mining activity.

CORPORATE SOCIAL RESPONSIBILITY

2% of capital cost of the project cost will be allotted for the Corporate Environmental Responsibility as per OM dated 1st May 2018. The following has been proposed considering the needs & demand of the people.

CSR cost will be 2% of the total project cost. This amount will be used for social welfare. CSR COST is Rs.10,61,80,000/-x 2% = Rs. 21,23,600/-

For each activity the funds to be earmarked by the proponent will be decided after discussion with the local authority/people and the beneficiaries during Public Hearing. It has been planned to undertake a concurrent evaluation of the activities to be taken up under the CER programme.

❖ PLANTATION:

- The project will not lead to any tree cutting. However, asocial responsibility, greenery will be developed along the both sides of road and the bank of river. Community services will be deployed in raising these plantations. Trees of economic importance and native origin such as fruit trees shall be planted.
- Approx. 340 trees will be planted around haul road during the plan period.
- The trees proposed for plantation are:
- As per Sustainable Sand Management & Mining Guidelines 2016,minimum 05 plant per hectare will be proposed for development of greenbelt but in this project 10 plants per hectare will be proposed for better condition of environment.
- Arjun, Jamun, Neem, Mango etc trees will be planted.

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

- Extraction will be done from the bed leaving safety zone from bank.
- The maximum working depth will remain above ground water table of the area.

- Provide health facilities to the workers & surrounding people in the impact area to reduce the health impacts.
- Ensuring wildlife protection & arranging awareness campaigns for the same.
- Minimize activities that release fine sediment to the *river*.
- Effective mitigation measures will be adopted to minimize disturbance during transportation & handling of minerals
- Establishment of reclamation program with plantation of local/native & fast growing species
- Establishment of restoration plan during the closure of mine at the onset of monsoon season.
- Establishment of effective Disaster Management Plan to take timely precautionary measures to avoid effects of impending disasters.
- Establishment of effective Monitoring Program monitored by Environment Management Cell.

BUDGET ALLOCATION FOR EMP IMPLEMENTATION

Table, Budget of EMP (Block-06)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	--	1.5
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Soil pollution iv) Noise Pollution	--	2.0
3	Plantation and salary for one gardener (part time basis).	3.40	0.5
4	Haul road Maintenance Cost	0.75	1.5
TOTAL		4.15	5.5

Note: *340 plants * 1000 Rs (for each plants including hedges and fences) =Rs 340000/-

- Salary of Labour for haul road maintenance 2 labor*300=600 per day
- 600* 250= 1,50,000/-
- * 2.5 lakh per kilometer (2,50,000 *0.3 km haul road) = 75,000/-

CONCLUSION

Based on the EIA study it is observed that there will be an increase in the dust pollution, which will be controlled by sprinkling of water and plantation. There will be an insignificant impact on ambient environment and ecology due to the mining activities moreover the mining operation will lead to direct and indirect employment generation in the area. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released from the premises of the Mine. Monitoring program will be followed till the mining operations continue. Hence, it can be summarized that the development of the mine will have a positive impact on the socio-economic environment of the area and lead to sustainable development of the region.

कार्यकारी सारांश

रेत खनन परियोजना चानन नदी ब्लॉक नंबर 06 रेत घाट के लिए

मौजा - जितारपुर,
अंचल- बाँका, जिला - बाँका, (बिहार)

रेत ब्लॉक	ब्लॉक नं 06
क्षेत्र	34.0 हेक्टेयर
उत्पादन	1083240 टन प्रति वर्ष

आवदेन कर्ता

श्री अनिल सिंह
मेसर्स मैहर डेवलपर्स
पता: फ्लैट न- 902ए, वसुंधरा गार्डन, बरियातू,
मोआबादी, जिला- रांची झारखण्ड - 834008



एनवायरनमेंट कन्सल्टेंट
पी & एम सल्यूशन



(क्वालिटी कौंसिल ऑफ़ इंडिया द्वारा मान्यता प्राप्त)
सी-88 सेक्टर 65 नॉएडा उत्तर-प्रदेश

www.pmsolution.in

Accreditation No. : NABET/EIA/1992/IA0053

कार्यकारी सारांश

❖ परिचय

MoEF & CC (एमओईएफ एंड सीसी), नई दिल्ली राजपत्र दिनांक 14 सितंबर 2006 और उसमें समय समय पर किये गए संशोधन के अनुसार, प्रस्तावित खनन परियोजना को श्रेणी 'बी1' परियोजना के रूप में वर्गीकृत किया गया है।

चानन ब्लॉक नंबर - 06

परियोजना के प्रस्ताव मेसर्स मैहर डेवलपर्स (श्री अनिल सिंह) ने दिया है। प्रस्तावित रेत खनन परियोजना मौजा- जितारपुर, अंचल- बाँका, जिला - बाँका, (बिहार) में ब्लॉक संख्या - 06 रेत घाट पर चानन नदी पर स्थित है। पत्र संख्या 2096/खनन दिनांक 02.12.2022 के माध्यम से पट्टेदार को एलओआई जारी किया गया।

ईआईए अधिसूचना 2006 और इसके बाद के संशोधन के अनुसार ड्राफ्ट ईआईए रिपोर्ट तैयार की गई है। प्रस्तावित परियोजना का टीओआर SEIAA बिहार दिनांक 28-03-2023 द्वारा जारी किया गया है।

आवेदित पट्टे के लिए प्रति वर्ष लगभग 1083240 टन खनन प्रस्तावित किया गया है, प्रस्तावित परियोजना के लिए अनुमानित परियोजना लागत 10,61,80,000/- रुपये (नीलामी लागत सहित) है।

❖ परियोजना विवरण

स्थान:

चानन ब्लॉक नंबर - 06

प्रस्तावित खनन पट्टा क्षेत्र सर्वे ऑफ इंडिया टोपोशीट टोपो शीट संख्या 72L/13 & 72P/01 के अंतर्गत आता है। पट्टा क्षेत्र मौजा- जितारपुर, अंचल- बाँका, जिला- बाँका, राज्य- बिहार में स्थित है। खान पट्टा समन्वय नीचे सूचीबद्ध हैं:

स्तंभ	अक्षांश / देशांतर	
A	24°51'39.49"N	86°55'56.42"E
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

❖ **क्षेत्र और उत्पादन:** कुल क्षेत्रफल 34.0 हेक्टेयर है। उत्पादन की प्रस्तावित दर 1083240 टीपीए होगी।

❖ संयोजकता

चानन ब्लॉक नंबर 06 रेत घाट पट्टे से 0.30 कि.मी. की दूरी पर निकटतम पक्की सड़क से अच्छी तरह से जुड़ा हुआ है। NH-333A लगभग 1.80 किमी उत्तर पश्चिम दिशा की ओर है SH-25 लगभग 3.0 किमी पश्चिम दिशा की ओर है बाँका रेलवे स्टेशन, लगभग 2.10 किमी उत्तर पश्चिम दिशा की ओर है।

परियोजना की मुख्य विशेषताएं

आवेदक का नाम	श्री अनिल सिंह मेसर्स मैहर डेवलपर्स
पट्टेदार का पता	श्री अनिल सिंह मेसर्स मैहर डेवलपर्स पता: फ्लैट न- 902ए, वसुंधरा गार्डन, बरियातू, मोआबादी, जिला- रांची झारखण्ड - 834008
नाम	रेत खनन परियोजना चानन नदी ब्लॉक नंबर 06 रेत घाट
गाँव	मौजा - जितारपुर
जिला और राज्य	बाँका, बिहार
खनिज	रेत
क्षेत्र (हेक्टेयर)	34.0 हेक्टेयर

❖ ड्रिलिंग

ड्रिलिंग और ब्लास्टिंग की आवश्यकता नहीं है।

❖ खनिज का उपयोग

रेत का उपयोग निर्माण कार्यवो में किया जाता है सड़क निर्माण में भी इसका उपयोग किया जाता है

❖ खनन

खनन प्रक्रिया ड्रिलिंग और ब्लास्टिंग के बिना खुली अर्ध-मशीनीकृत विधि है। यह एक ओपन कास्ट माइनिंग प्रोजेक्ट है। उत्खनन/जेसीबी ट्रक/ट्रैक्टर संयोजन या मैनुअल आदि के उपयोग के साथ संचालन अर्ध-मशीनीकृत/ओटीएफएम होगा। रेत को अपने मौजूदा रूप में एकत्र किया जाएगा।

खनन रोटेशनल तरीके से किया जाएगा। चूंकि काम व्यवस्थित होने जा रहा है यानी बेंचों में खनन किया जाएगा। खदान में काम करने वाले कर्मचारी को कोई खतरा नहीं होगा। खनन परतों में किया जाएगा।

निक्षेप को संस्तर की सतह से 3 एमबीजीएल या भूजल स्तर से ऊपर, जो भी पहले आए, तक कार्य किया जाएगा। इसलिए, किसी भी समय खनन भूजल स्तर को नहीं काटेगा। खनन केवल दिन के समय किया जाएगा और मानसून के मौसम में पूरी तरह बंद कर दिया जाएगा।

❖ रिजर्व और उत्पादन

खनन योग्य भंडार की गणना सतह से 3 मीटर की गहराई तक की गई है। टनभार प्राप्त करने के लिए वॉल्यूम को बल्क डेंसिटी (1.77 g/cm³) से गुणा किया जाता है।

हर साल मानसून के मौसम के दौरान नदी तल से उत्खनन किए गए खनिजों की फिर से भरपाई (रिप्लेनिशमेंट) हो जाएगी। नदी के पैलियो चैनल से संबंधित क्षेत्र को समतल करके वापस बहाल किया जाएगा।

बेंचवार रेत का वार्षिक दोहन नीचे दिया गया है:

तालिका: खनन योग्य भंडार का सारांश

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
88-86.5	1656	188	1.5	466992	826576
86.5-85	1646	178	1.5	439482	777884
कुल				1369500	2355540

कुल खनन योग्य रिजर्व = 906474 घन मीटर या 1604459 टन

तालिका: वर्गीकरण खनिज भंडार

रेत ब्लॉक	क्षेत्रफल (हेक्टेयर)	भूवैज्ञानिक भंडार (m ³)	खनन योग्य भंडार (m ³)	LoI के अनुसार वार्षिक अनुमत रिजर्व (m ³)
चानन ब्लॉक नं 06	34.0	1020000	906474	612000

यह नदी तल जमा है और खनन क्षेत्र हर साल मानसून अवधि के दौरान फिर से भर जाएगा और खदान की गहराई हर साल नदी की रेत से भर जाएगा (रिप्लेनिशमेंट) और क्षेत्र अपनी मूल स्थलाकृति बहाल को कर देगा।

❖ **साइट सुविधाएं और उपयोगिताएँ**

• **जलापूर्ति**

श्रमिकों को पीने व घरेलू उपयोग के लिए पानी उपलब्ध कराया जाएगा। धूल के दमन के लिए भी पानी की आवश्यकता होगी। प्रस्तावित परियोजना के लिए 4.0 केएलडी के जल की आवश्यकता होगी। ताजे पानी का उपयोग केवल पीने के उद्देश्य के लिए किया जाएगा। आसपास के गांव के उपलब्ध स्रोतों से पानी की आपूर्ति की जाएगी।

- **अस्थायी विश्राम गृह**

विश्राम के लिए स्थल के पास श्रमिकों के लिए एक अस्थायी विश्राम आश्रय प्रदान किया जाएगा। इसके अलावा, छोटे कीड़ों की कुछ प्रजातियों द्वारा उत्पादित जहर का मुकाबला करने के लिए एंटी-वेनम के साथ प्राथमिक उपचार बॉक्स, यदि कोई हो और श्रमिकों के लिए स्वच्छता सुविधा जैसे सेप्टिक टैंक या सामुदायिक शौचालय की सुविधा प्रदान की जाएगी।

- **आधारभूत पर्यावरणीय स्थिति**

वायु, ध्वनि, जल, मिट्टी, वनस्पति एवं जीव-जन्तुओं के लिए प्रस्तावित खनन के संबंध में पर्यावरणीय डाटा एकत्र किया गया है। बेसलाइन पर्यावरण अध्ययन मार्च 2023 से मई 2023 तक प्री मानसून सीजन के मौसम के दौरान खनन पट्टा क्षेत्र के आसपास 10 किमी की रेडियल दूरी वाले क्षेत्र में किया गया था।

- **मौसम-विज्ञान**

निगरानी अवधि मार्च 2023 से मई 2023 के लिए संक्षिप्त मौसम संबंधी डेटा नीचे दिया गया है:

महीना	तापमान °C		हवा की गति (किमी/घंटा)	
	न्यूनतम	अधिकतम	न्यूनतम	अधिकतम
मार्च 2023	21	38	10.4	21.0
अप्रैल 2023	26	44	13.2	25.1
मई 2023	28	43	14.7	27.8

आधारभूत पर्यावरणीय स्थिति

गुण	आधारभूत स्थिति
एम्बिएंट(परिवेशी) वायु गुणवत्ता	एम्बिएंट (परिवेशी) वायु गुणवत्ता निगरानी से पता चलता है कि सभी 09 AQ निगरानी स्टेशनों में PM2.5 की न्यूनतम और

	अधिकतम सांद्रता क्रमशः 23.50 µg/m ³ से 50.70 µg/m ³ पाई गई; PM ₁₀ , 59.60 µg/m ³ to 88.50 µg/m ³ की सीमा में था जहां तक गैसीय प्रदूषकों SO ₂ और NO ₂ का संबंध है, आवासीय और ग्रामीण क्षेत्रों के लिए 80 µg/m ³ की निर्धारित CPCB सीमा किसी भी स्टेशन पर पार नहीं की गई है।
शोर का स्तर	निगरानी कार्यक्रम के परिणामों ने संकेत दिया कि निगरानी किए गए सभी 09 स्थानों पर शोर के दिन और रात दोनों समय एनएएक्यूएस की निर्धारित सीमा के भीतर थे।
पानी की गुणवत्ता	सभी स्रोतों से भूजल पीने के उद्देश्यों के लिए उपयुक्त रहता है क्योंकि सभी घटक IS: 10500 द्वारा प्रख्यापित पेयजल मानकों द्वारा निर्धारित सीमा के भीतर हैं।
मिट्टी की गुणवत्ता	चिन्निहित किए गए स्थानों से एकत्र किए गए नमूने इंगित करते हैं कि मिट्टी रेतीली प्रकार की है और पीएच मान 7.74 से 8.16 के बीच है, जो दर्शाता है कि मिट्टी प्रकृति में थोड़ी क्षारीय है।
पारिस्थितिकी और जैव विविधता	अध्ययन क्षेत्र के 10 कि.मी. के भीतर कोई भी पारिस्थितिक संवेदनशील क्षेत्र नहीं है
सामाजिक आर्थिक	नदी तल पर रेत खनन परियोजना के कार्यान्वयन से स्थानीय लोगों को प्रत्यक्ष और अप्रत्यक्ष दोनों तरह के रोजगार के अवसर मिलेंगे। अध्ययन क्षेत्र में शिक्षा, स्वास्थ्य, आवास, पानी, बिजली आदि को और बेहतर किया जा सकता है। उम्मीद है कि प्रस्तावित खनन परियोजना और संबद्ध औद्योगिक और व्यावसायिक गतिविधियों के कारण इसमें काफी हद तक और सुधार होगा।

❖ अनुमानित पर्यावरणीय प्रभाव

• वायु पर्यावरण पर प्रभाव

प्रस्तावित खनन गतिविधियां खनन में प्रयुक्त अन्य परिवहन वाहनों की लोडिंग और आवाजाही से धूल (SPM/RSPM) उत्पन्न होगी। खदान स्थल पर उचित जल छिड़काव किया जाएगा। हवा से होने वाले

क्षणिक उत्सर्जन को कम करने के लिए खनिज को ढके हुए तिरपाल ट्रकों/टिप्परों के माध्यम से सड़क मार्ग से ले जाया जाएगा।

• जल पर्यावरण पर प्रभाव

नदी के भीतर या उसके पास से रेत के खनन का मानसून के मौसम के दौरान भौतिक-रासायनिक आवास विशेषताओं पर अप्रत्यक्ष प्रभाव पड़ता है। इन विशेषताओं में धारा खुरदरापन, तत्व, गहराई, वेग, मैलापन, तलछट परिवहन और धारा निर्वहन शामिल हैं।

संस्तर सामग्री खनन से उत्पन्न बायोटा पर हानिकारक प्रभाव, यदि कोई हो, निम्नलिखित के कारण होते हैं:

- नदी के परिवर्तन के परिणामस्वरूप प्रवाह पैटर्न में बदलाव
- मानसून के मौसम में निलम्बित तलछट की अधिकता।

परियोजना गतिविधि केवल चानन नदी के शुष्क भाग में की जाएगी। इसलिए, परियोजना की कोई भी गतिविधि सीधे तौर पर जल पर्यावरण को प्रभावित नहीं करती है। परियोजना में केवल मानसून के मौसम में किसी धारा को मोड़ने या काट देने का प्रस्ताव नहीं है। नदी (मानसून में) या भूजल दोहन से पानी की पंपिंग के लिए किसी प्रस्ताव की परिकल्पना नहीं की गई है।

❖ भूमि पर्यावरण पर प्रभाव

स्ट्रीम बेड सामग्री का प्रस्तावित निष्कर्षण, मौजूदा स्ट्रीमबेड के नीचे खनन, और चैनल-बेड फॉर्म और आकार में परिवर्तन से चैनल बेड और बैंकों के क्षरण, चैनल ढलान में वृद्धि, और चैनल आकारिकी में परिवर्तन जैसे कई प्रभाव हो सकते हैं, यदि, संचालन व्यवस्थित रूप से नहीं किया जाता है।

रेत के व्यवस्थित और वैज्ञानिक तरीके से हटाने से क्यारियों का क्षरण नहीं होगा। कचरे के रूप में उत्पन्न गाद और मिट्टी का उपयोग वृक्षारोपण के लिए या निचले इलाकों को कहीं और भरने के लिए किया जाएगा।

खनन की योजना गैर-मानसून मौसम में ही बनाई जाती है, ताकि उत्खनित क्षेत्र प्रत्येक वर्ष मानसून के दौरान धीरे-धीरे भर जाए (रिप्लेनिशमेंट)।

❖ शोर पर्यावरण पर प्रभाव

प्रस्तावित खनन गतिविधि प्रकृति में अर्ध-मशीनीकृत है। खनन गतिविधि के लिए कोई ड्रिलिंग और ब्लास्टिंग परिकल्पित नहीं है। इसलिए, केवल खनिजों के परिवहन के लिए तैनात वाहनों की आवाजाही के कारण प्रभाव का अनुमान लगाया गया है। वाहनों को अच्छी चालू स्थिति में रखा जाएगा ताकि शोर को न्यूनतम संभव स्तर तक कम किया जा सके।

❖ जैविक पर्यावरण पर प्रभाव

चूंकि प्रस्तावित खनन वैज्ञानिक तरीके से किया जाएगा, इसलिए ज्यादा महत्वपूर्ण प्रभाव का अनुमान नहीं है। जलीय जीवन पर प्रभाव को कम करने के लिए मानसून के मौसम के दौरान कोई खनन नहीं किया जाएगा जो कि कई प्रजातियों के लिए मुख्य रूप से प्रजनन का मौसम है। खनन स्थल पर कोई वनस्पति नहीं है; वनस्पति की सफाई नहीं की जाएगी। ढोने वाली सड़कों पर पानी का छिड़काव किया जाएगा जिससे धूल का उत्सर्जन कम होगा और इस प्रकार फसलों को होने वाले नुकसान से बचा जा सकेगा।

❖ सामाजिक आर्थिक पर्यावरण पर प्रभाव

क्षेत्र में खनन गतिविधि का प्रभाव क्षेत्र के सामाजिक-आर्थिक वातावरण पर सकारात्मक है। रेत खनन से स्थानीय लोगों को जब भी श्रमबल की आवश्यकता होगी रोजगार उपलब्ध होगा।

पोस्ट प्रोजेक्ट पर्यावरण निगरानी

क्रम संख्या	पैरामीटर्स का विवरण	निगरानी की अनुसूची
1	हवा की गुणवत्ता	मानसून को छोड़कर प्रत्येक मौसम में सप्ताह में दो बार/तीन बार 24 घंटे के नमूने
2	जल गुणवत्ता (सतह और भूजल)	साल में 4 सीजन के लिए एक बार
3	मिट्टी की गुणवत्ता	परियोजना क्षेत्र में वर्ष में एक बार

4	शोर स्तर	साल में दो बार पहले दो साल और फिर साल में एक बार
5	सामाजिक-आर्थिक स्थिति	3 साल में एक बार
6	वृक्षारोपण निगरानी	एक बार एक मौसम में

❖ अतिरिक्त अध्ययन

• सार्वजनिक सुनवाई

जन सुनवाई अभी बाकी है।

❖ जोखिम आकलन

पूर्ण खनन कार्य एक योग्य खदान प्रबंधक होल्डिंग के प्रबंधन नियंत्रण और निर्देशन में किया जाएगा। डीजीएमएस नियमित रूप से स्थायी आदेश, मॉडल स्थायी आदेश और आपदा, यदि कोई हो, के मामले में खान प्रबंधन द्वारा पालन किए जाने वाले परिपत्र जारी करता रहा है। साथ ही खनन कर्मचारियों को सतर्क रखने के लिए समय-समय पर रिफ्रेशर कोर्स में भेजा जाएगा।

❖ आपदा प्रबंधन योजना

आपदा प्रबंधन की योजना में आपातकालीन तैयारी एक महत्वपूर्ण पहलू है। कर्मियों को उचित रूप से प्रशिक्षित किया जाएगा और सावधानीपूर्वक नियोजित, सिम्युलेटेड प्रक्रियाओं के माध्यम से आपातकालीन प्रतिक्रिया में मानसिक और शारीरिक रूप से तैयार किया जाएगा। इसी तरह, प्रमुख कर्मियों और आवश्यक कर्मियों को संचालन में प्रशिक्षित किया जाएगा।

❖ परियोजना लाभ

- **भौतिक लाभ:** सड़क परिवहन, बाजार, हरित आवरण में वृद्धि और सामुदायिक संपत्तियों का निर्माण।
- **सामाजिक लाभ:** रोजगार क्षमता में वृद्धि, राजकोष में योगदान, स्वास्थ्य संबंधी गतिविधियों में वृद्धि, शैक्षिक उपलब्धियां और मौजूदा सामुदायिक सुविधाओं का सुदृढीकरण।

❖ पर्यावरणीय लाभ:

- ❖ नदी चैनल को नियंत्रित करना और बैंकों की सुरक्षा करना।
- ❖ बाढ़ के कारण आसपास की कृषि भूमि के डूबने को कम करना।
- ❖ नदी के स्तर के उन्नयन को कम करना।
- ❖ अवैध खनन गतिविधि पर एक जांच।

❖ कॉर्पोरेट की सामाजिक जिम्मेदारी

दिनांक 1 मई 2018 के कार्यालय ज्ञापन के अनुसार परियोजना लागत की पूंजीगत लागत का 2% कॉर्पोरेट पर्यावरणीय उत्तरदायित्व के लिए आवंटित किया जाएगा। लोगों की जरूरतों और मांग को ध्यान में रखते हुए निम्नलिखित प्रस्तावित किया गया है।

चानन रेत घाट 06 के लिए सीईआर (CER) लागत कुल परियोजना लागत का 2% होगी। इस राशि का उपयोग समाज कल्याण के लिए किया जाएगा। सीएसआर (CSR) लागत रु. 10,61,80,000/-x 2% = रु. 21,23,600/-

प्रत्येक गतिविधि के लिए प्रस्तावक द्वारा निर्धारित की जाने वाली धनराशि का निर्धारण जन सुनवाई के दौरान स्थानीय प्राधिकारी/लोगों एवं हितग्राहियों से चर्चा के बाद किया जायेगा। सीईआर कार्यक्रम के तहत की जाने वाली गतिविधियों का समवर्ती मूल्यांकन करने की योजना बनाई गई है।

❖ वृक्षारोपण:

- परियोजना से कोई पेड़ नहीं कटेगा। तथापि, असामाजिक उत्तरदायित्व, सड़क के दोनों ओर और नदी के किनारे हरियाली विकसित की जाएगी। इन वृक्षारोपण को बढ़ाने के लिए सामुदायिक सेवाओं को तैनात किया जाएगा। आर्थिक महत्व के पेड़ और देशी मूल के पेड़ जैसे फलों के पेड़ लगाए जाएंगे।
- योजना अवधि में हॉल रोड के आसपास लगभग 340 पौधे रोपे जाएंगे।
- वृक्षारोपण के लिए प्रस्तावित पेड़ हैं:

- सस्टेनेबल सैंड मैनेजमेंट एंड माइनिंग गाइडलाइंस 2016 के अनुसार ग्रीनबेल्ट के विकास के लिए न्यूनतम 05 पौधा प्रति हेक्टेयर प्रस्तावित किया जाएगा लेकिन इस परियोजना में पर्यावरण की बेहतर स्थिति के लिए 10 पौधे प्रति हेक्टेयर प्रस्तावित किया जाएंगे।
- अर्जुन, जामुन, नीम, आम आदि के पेड़ लगाए जाएंगे।

पर्यावरण प्रबंधन योजना (ईएमपी)

- रिवर बैंक से सुरक्षा क्षेत्र छोड़कर नदी तल से निकासी की जाएगी।
- अधिकतम काम करने की गहराई क्षेत्र के भूजल तालिका के ऊपर रहेगी।
- स्वास्थ्य प्रभावों को कम करने के लिए प्रभाव क्षेत्र में श्रमिकों और आसपास के लोगों को स्वास्थ्य सुविधाएं प्रदान किया जायेगा ।
- वन्यजीव संरक्षण सुनिश्चित करना और उसी के लिए जागरूकता अभियान की व्यवस्था किया जायेगा।
- नदी में महीन तलछट छोड़ने वाली गतिविधियों को किया जायेगा।
- खनिजों के परिवहन और प्रबंधन के दौरान गड़बड़ी को कम करने के लिए प्रभावी शमन उपाय अपनाए जाएंगे
- स्थानीय/देशी और तेजी से बढ़ने वाली प्रजातियों के वृक्षारोपण के साथ सुधार कार्यक्रम की स्थापना किया जायेगा
- मानसून के मौसम की शुरुआत में खान के बंद होने के दौरान बहाली योजना की स्थापना किया जायेगा
- आसन्न आपदाओं के प्रभाव से बचने के लिए समय पर एहतियाती उपाय करने के लिए प्रभावी आपदा प्रबंधन योजना की स्थापना।
- पर्यावरण प्रबंधन प्रकोष्ठ द्वारा प्रभावी निगरानी कार्यक्रम की स्थापना किया जायेगा।

❖ ईएमपी कार्यान्वयन के लिए बजट आवंटन

टेबल, ईएमपी का बजट (ब्लॉक -06)

क्रम संख्या	विवरण	पूंजी लागत (लाख)	आवर्ती लागत (लाख)
1	प्रदूषण नियंत्रण और धूल दमन	Nil	2.0
2	प्रदूषण निगरानी i) वायु प्रदूषण ii) मृदा प्रदूषण iii) जल प्रदूषण iv) ध्वनि प्रदूषण	--	2.0
3	वृक्षारोपण और एक माली के लिए वेतन (अंशकालिक आधार पर)	3.40	0.5
4	परिवहन सड़क रखरखाव लागत	0.75	1.5
TOTAL		4.15	5.5

नोट: *340 पौधे * 1000 रुपये (हेज और बाड़ सहित प्रत्येक पौधे के लिए) = 340000/- रुपये

- ढोना सड़क रखरखाव के लिए श्रम का वेतन 2 श्रमिक*300=600 प्रति दिन
- 600* 250= 1,50,000/-
- *2.5 लाख प्रति किलोमीटर (2,50,000*0.30 किमी लंबी सड़क) = 75,000/-

निष्कर्ष

ईआईए अध्ययन के आधार पर यह देखा गया है कि धूल प्रदूषण में वृद्धि होगी, जिसे पानी के छिड़काव और वृक्षारोपण द्वारा नियंत्रित किया जाएगा। खनन गतिविधियों के कारण (एम्बिएंट) परिवेशी पर्यावरण और पारिस्थितिकी पर नगण्य प्रभाव पड़ेगा, इसके अलावा खनन संचालन से क्षेत्र में प्रत्यक्ष और अप्रत्यक्ष रोजगार सृजन होगा। क्षेत्र के चारों ओर हरित पट्टी का विकास एक प्रभावी प्रदूषण न्यूनीकरण तकनीक के साथ-साथ खान परिसर से निकलने वाले प्रदूषकों को नियंत्रित करने के लिए भी किया जाएगा। खनन कार्य जारी रहने तक निगरानी कार्यक्रम का पालन किया जाएगा। इसलिए, यह संक्षेप में कहा जा सकता है कि खान के विकास से क्षेत्र के सामाजिक-आर्थिक वातावरण पर सकारात्मक प्रभाव पड़ेगा और क्षेत्र के सतत विकास को बढ़ावा मिलेगा।
