DRAFT ENVIRONMENTAL IMPACT ASSESSMENT

AND

ENVIRONMENTAL MANAGEMENT PLAN

OF

SAND MINING PROJECT ON BADUA RIVER

UNIT NO. – 03 SAND GHAT, DISTRICT - BANKA

SAND BLOCK	**UNIT NO. 03**
PROPOSAL NO	**SIA/BR/MIN/417463/2023**
TOR NO	**SIA/1(a)/2322/2023**
AREA	**27.0 HA**
PRODUCTION	**324000 Cum/Year or 576720 TPA**
LOCATION	**Mauja – Kuswavasila, Block - Chandan, District- Banka, (Bihar)**

APPLICANT

Maticulous Organics Private Limited,
Deependra Singh
Add.- 53, Kantaghar Pachapenda, Ashink Kantaghar Pachapenda, Moradabad U.P.- 244001

PMS
PRESERVING TOMORROW

CONSULTANT
P&M Solution
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A QCI –NABET Accredited Organization
Regional Office: 201, Mangal Market, Raja Bazaar, Patna, Bihar

NABET

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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

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) 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 Badua River (Badua Unit No. 03 Sand Ghat) at Mauja- Kuswavasila, Block- Chandan, District- Banka, (Bihar).

The Proposed Production is 324000 Cum/Year or 576720 Tonnes per annum and Area of the project site is 27.0 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	Badua Unit No. 03	Sand Mining Project on Badua River (Badua Unit No. 03) Sand Ghat at Mauja – Kuswavasila, Block - Chandan, District- Banka, (Bihar).
River	Badua	
Mineral	Sand	
Area (ha)	Badua Unit No. 03	27.0 ha

Production	Badua Unit No. 03	324000 Cum/Year or 576720 TPA
Postal Address	Badua Unit No. 03	Maticulous Organics Private Limited, Deependra Singh Add.- 53, Kantaghar Pachapenda, Ashink Kantaghar, Pachapenda, Moradabad U.P.- 244001
Status of Mine	Fresh application for Environmental Clearance.	
Project Cost	Rs- 3,08,80,000/-	
CER Cost	CER cost will be 2% of the total project cost. This amount will be used for social welfare. CER COST is Rs. 3,08,80,000 x 2% = Rs. 6,17,600/-	

1.2 BRIEF DESCRIPTION OF PROJECT

The proposed project is open cast semi-mechanized/OTFM mining of sand with a proposed production of 576720 TPA for applied lease. Detail has been given below:

The proposed project is over an area 27.0 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
Badua Unit No. 03	27.0	Khata no. – 515, Khasra No. 232	576720 TPA	2,67,30,000/-
Total			576720 TPA	2,67,30,000/-

The proposed mining lease area falls in Survey of India Toposheet 72L/09 & 72L/10. The mine lease co-ordinates and connectivity details are listed below:

Table: 1.2 Mine lease Pillar Co-ordinates (Badua Unit No. 03)

Pillar	Geo Coordinate	
A	24°43'35.71"N	86°37'12.24"E
B	24°43'32.91"N	86°37'12.12"E
C	24°43'12.88"N	86°35'31.39"E
D	24°43'15.44"N	86°35'30.41"E

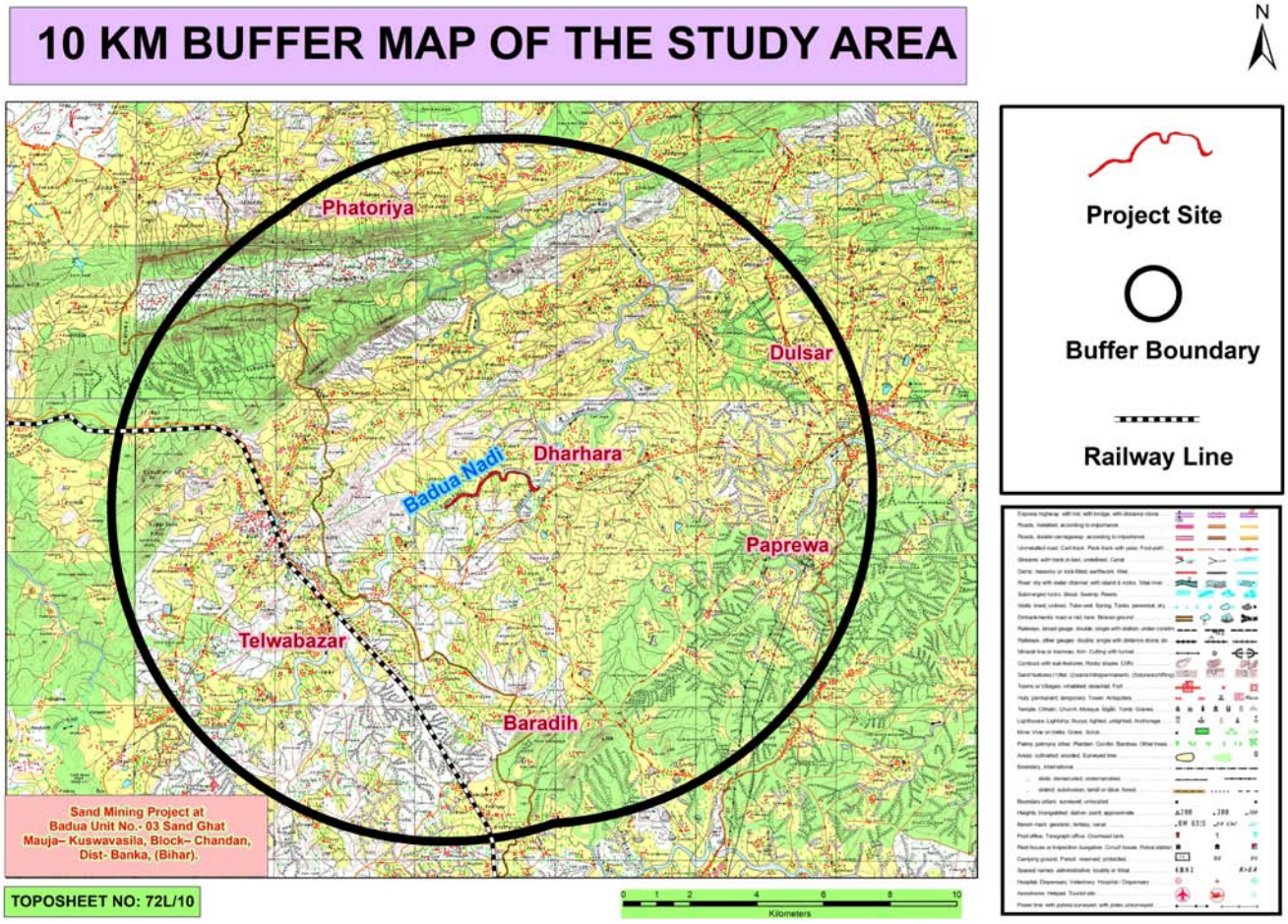


Figure 1.1, 10 km buffer map

Table: 1.3, Connectivity Details given below

<table>
<tr><td>Nearest Habitation/ town</td><td>
<table>
<tr><th>Blocks</th><th>Village</th><th>Distance (Km) Direction</th></tr>
<tr><td>Badua Unit No. 03</td><td>Tola Nonia

Tola Kumaraindih

Tola Akakura</td><td>approx. 0.70 Km in SSE direction.
approx. 0.45 Km in NW direction.

approx. 0.20 Km in SSW direction.</td></tr>
</table>
</td></tr>
<tr><td>Nearest Railway Station</td><td>
<table>
<tr><th>Blocks</th><th>Railway Station</th><th>Distance (Km) Direction</th></tr>
<tr><td>Badua Unit No. 03</td><td>Simultala Railway Station</td><td>Simultala Railway Station, approx. 8.0 km in west direction.</td></tr>
</table>
</td></tr>
<tr><td>Nearest Airport</td><td>
<table>
<tr><th>Blocks</th><th>Airport</th><th>Distance (Km) Direction</th></tr>
<tr><td>Badua Unit No. 03</td><td>Jayprakash Narayan Airport</td><td>Jayprakash Narayan Airport, approx. 182.0 km towards NW direction.</td></tr>
</table>
</td></tr>
<tr><td>Nearest Highway</td><td>NH-333A, Approx. 0.35 KM towards SE direction.
SH – 22, Approx. 8.68 KM towards ENE direction</td></tr>
</table>

1.3 Details of environmental settings

Sl. No.	Particulars	Details
1	Ecological Sensitive Areas	There is no any Ecological Sensitive Areas Like National Park, Wildlife Sanctuaries, etc are found within 10 km of the study area.

	(National Park, Wildlife Sanctuaries)	
2	Nearest water body	The mine site lies on the dry bed of Badua river.
3	Seismic Zone	Zone- IV *Source BMTC 2nd edition https://www.bmtpc.org/disaster%20resistnace%20technolgies/ZONE%20IV.htm*

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 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 Badua Unit No. 03

(ToR File No- SIA/1(a)/ 2322/2023)

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. 2104/M dated. 02.12.2022	**Annexure II, LOI**
3	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.	The documents including mine plan and EIA report submitted are compatible with one another w.r.t. to following information: Mining Lease Area- 27.0 Hectare Lessee: Maticulous Organics Private Limited, (Deependra Singh) Add.- 53, Kantaghar Pachapenda, Ashink Kantaghar Pachapenda, Moradabad U.P.-244001 Waste generation- No waste will be generated. Mining Method-Opencast semi-mechanized/OTFM method	**Annexure- III** Mine plan All details has been complied in chapter-2
4	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).	All Corner Coordinates of mining lease area superimposed on Toposheet Map has been incorporated in EIA/EMP Report.	Refer Chapter 2 Fig: 2.1, Corner Coordinates map

5	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 bodies, streams and rivers and soil characteristics.	The land use map showing salient features of the area is given in the report. The geological map of the mine lease area is also given in the report showing geomorphology	Land-use of the study area Figure 3.1.
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	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.	

	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 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 l0 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,	Land use pattern of 10 km from the periphery of the lease area has been prepared and	Land-use of the study area Figure 3.1 , Table 3.1

	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 preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	incorporated with the report. The study area lies in Badua River. There is no any Wild Life sanctuary & National Park, protected forest within the study area.	10 km buffer map enclosed in Chapter I of EIA Report.
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	There is no forest land within the lease area.	---

	Department to assist the Expert Appraisal Committees.		
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,	The details Impacts & there mitigation measures are given in chapter IV of EIA/EMP Report.	Chapter IV

	detailed mitigative measures required, should be worked out with cost implications and submitted.		
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger / Elephant Reserves / (existing as well as proposed), if any, within l0 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.	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.	Chapter III Section 3.1.6 Biological Environment
18	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	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	Chapter III Section 3.1.6 Biological Environment

	the study area, the necessary plan along with budgetary provisions for their 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	There is no CRZ involved in this project.	

	concerned Coastal Zone Management Authority)		
21	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.	There is no R & R involved in this project.	
22	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	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	Chapter III Section 3.3 Air Environment

	Notification of 2009, water quality, noise level, soil and flora and fauna 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 pre-dominant 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.	basis of prevailing meteorological conditions (Wind direction & wind speed) of the study area. 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. The location of the monitoring sites has been shown in map.	
23	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	A detailed study on Air quality modeling will be incorporated at the time of FEIA.	

	sensitive receptors, if any, and the habitation. The wind roses showing 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 Badua unit 03 is 4.2 or 4.5 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, should be assessed and necessary safeguard measures, if any required, should be provided".	Mining activity will be done on Dry Bed of River so there is no 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.	Chapter II
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	The project site lies on Badua River. No diversion is proposed.	

	brought out.		
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	The mining will be done as per the approved mining plan and 3 meter bgl which ever 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 IX
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a	The projection has been done based on the mineral transportation.	Chapter IV Section 4.6 Traffic

	result of the Project in the present road network (including those outside the 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.	The details of traffic analysis are discussed in the report.	Analysis Fig 4.2, Table 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	Occupational health impact mainly is expected due air pollution due to fugitive dust emission because of movement	Chapter IV

	medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	of vehicles. However appropriate mitigation measures for air pollution control have been given in the report, discussed in Chapter-4 & 8. Each labour will undergo pre-placement medical examination. Thereafter periodical heath check up will be arranged as stated in the report.	Chapter VIII
36	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.	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.	Chapter VIII
37	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 with time to time for implementation.	Socio-economic significance provided to the local community i.e. to the nearby villagers is given in the EIA/EMP Report.	Chapter VII

<table>
<tr><td>38</td><td>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</td><td>The detailed environmental management plan to mitigate the environmental impacts has been mentioned in of the EIA/EMP Report.</td><td>Chapter VIII</td></tr>
<tr><td>39</td><td>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.</td><td>This is a draft EIA report. Public hearing is yet to be conducted.</td><td>--</td></tr>
<tr><td>40</td><td>Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.</td><td>No litigation is pending against the project.</td><td></td></tr>
<tr><td>41</td><td>The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.</td><td>The capital cost & recurring cost for has been earmarked for EMP. Chapter IX
<table><tr><th>Block</th><th>Capital Cost</th><th>Recurring Cost</th></tr><tr><td>Badua unit no 03</td><td>3.70 Lakh</td><td>5.5 lakh</td></tr></table></td><td>Chapter IX</td></tr>
<tr><td>42</td><td>A Disaster management Plan shall be prepared and included in the EIA/EMP Report".</td><td>A Disaster management Plan has been given in EIA report.</td><td>Chapter VI</td></tr>
</table>

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.	

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	

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.	

****

2.0 TYPE OF PROJECT

The project is proposed is for sand Ghat Badua Unit No. 03 for the excavation of sand from the bed of river Badua. The proposed project is opencast semi-mechanized/OTFM mining project.

2.1 NEED FOR THE PROJECT

The project site lies on Badua 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 Badua River (Badua Unit No. 03 Sand Ghat) at Mauja- Kuswavasila, Block- Chandan, District- Banka, (Bihar).

The Proposed Production is 324000 Cum/Year or 576720 Tonnes per annum and Area of the project site is 27.0 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.

Geo Coordinate of Lease Area:

Table 2.1, Mine lease Pillar Co-ordinates (Badua Unit No. 03)

Pillar	Geo Coordinate	
A	24°43'35.71"N	86°37'12.24"E
B	24°43'32.91"N	86°37'12.12"E
C	24°43'12.88"N	86°35'31.39"E
D	24°43'15.44"N	86°35'30.41"E

Badua Unit No. 03 Sand Ghat is well connected by NH-333A, Approx. 0.35 KM towards SE direction. SH – 22, Approx. 8.68 KM towards ENE direction.

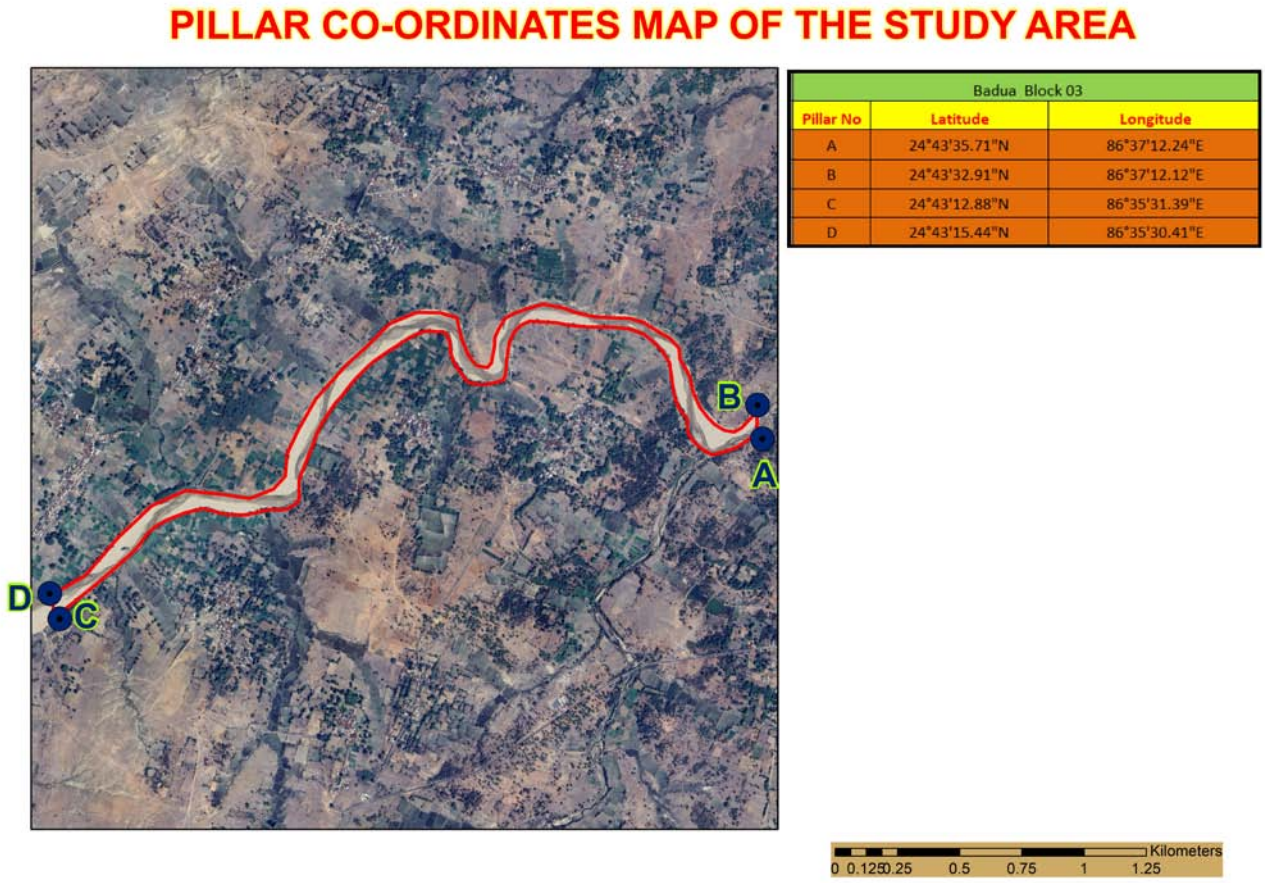


Figure 2.1:- Pillar Coordinate Map of Badua Unit No. 03

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
Badua Unit No. 03	27.0	Khata no. – 515, Khasra No. 232	576720 TPA	2,67,30,000/-
Total			576720 TPA	2,67,30,000/-

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.

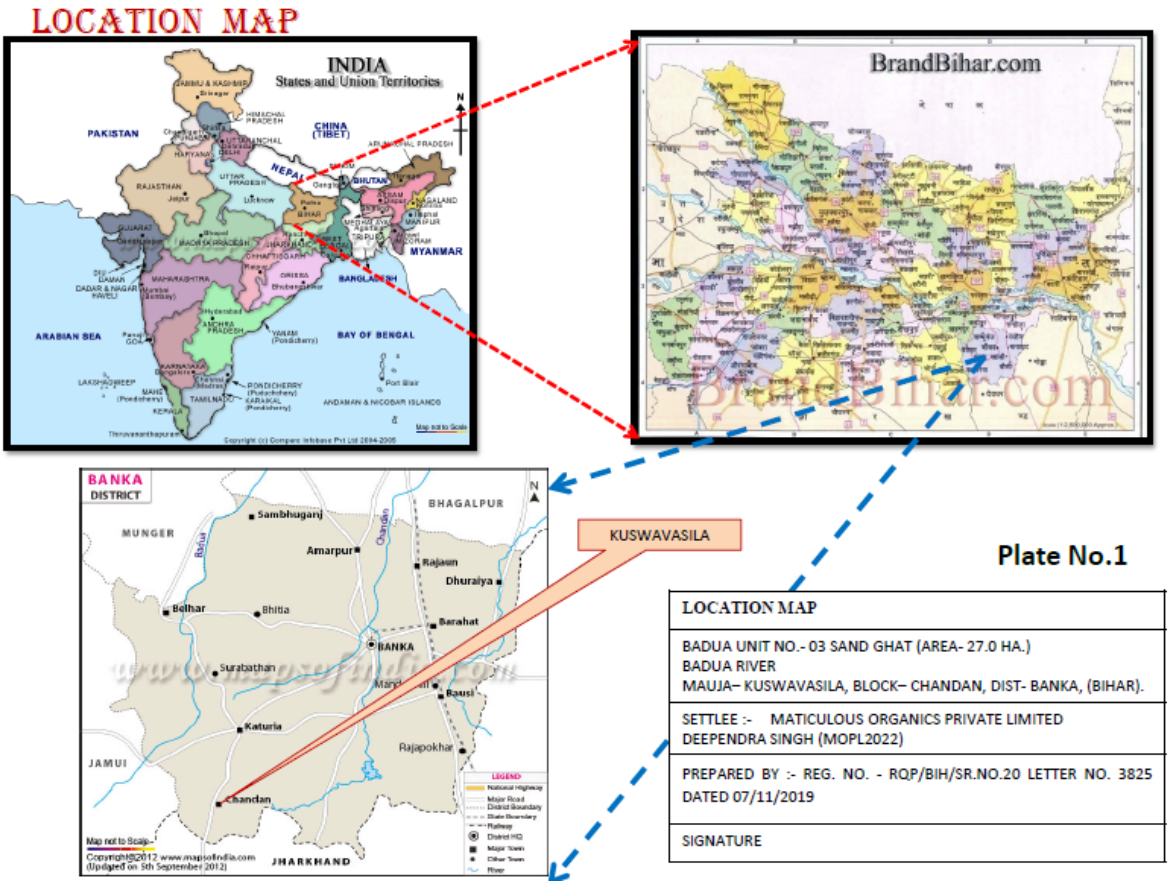


Figure 2.2:- Location map of the project site Badua Unit No. 03

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 Feburary,1991. The district lies between north latitude 24o30'0'' to 25o 07'0'' and east longitude 86o30'00''to 87o12'00''. 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 Amarpur. 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 past of the vast Indo-Gangetic Plain. the elevation of the area above mean sea level ranges from 66AMSL on the north to 110 AMSL 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:

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 isinclusive 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

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
Vindhyans	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

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 course 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.

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 Badua Unit No. 03

Classification	Code	Quantity of Sand
A)Mineral Reserves		Cum
1)Proved Mineral Reserve	111	540000
Total		540000

Replenished quantity of sand = 540000 cum. or 961200 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 (1.78 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 Badua Unit No.- 03 Sand Ghat as below (the bulk density multiply by 1.78)

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
203 - 202	3965	53	1	210145	374058
202 - 201	3955	43	1	170065	302716
Total				380210	676774

Total Mineable Reserve = 380210 CUM or 676774 Tonnes

Table-2.5:- Classification Mineral Reserves

Sand Ghat	Area (Hect)	Geological Reserves (m3)	Mineable Reserves (m3)	Annual Permitted Reserve As per LoI (m3)
Badua Unit No.- 03	27.0	540000	380210	324000

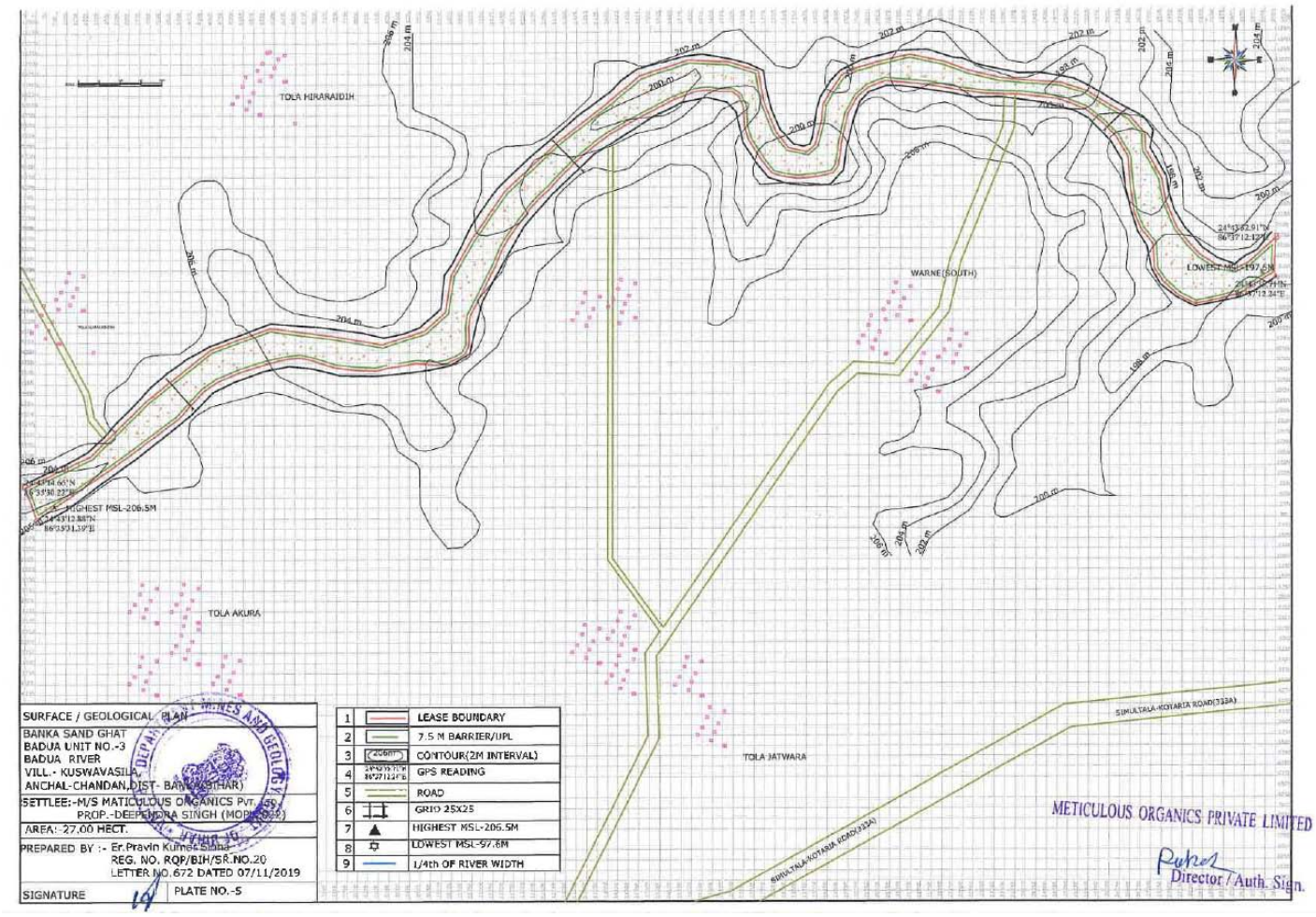


Figure 2.3:- Surface cum Geological Section of Badua Unit No.- 03

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 Badua Unit No 03 Sand Ghat are given below :-

Table 2.6: Year wise Production Details of Badua Unit No.- 03

YEAR	ROM sand (cum)
1st Year	324000
2nd Year	324000
3rd Year	324000
4th Year	324000
5th Year	324000
Total	16,20,000

The annual extractable RBM comes to **324000 CUM or 576720 Tonnes**. It will be replenished after rainy season every year.

***Source**: Mining Plan*

2.5 Conceptual Mining Plan

Mine Applied Area will be worked for Badua Unit No.- 03 Sand Ghat. However, as the digging depth will be restricted to 2.0 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.

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 Badua River so there will be no impact on surface water.

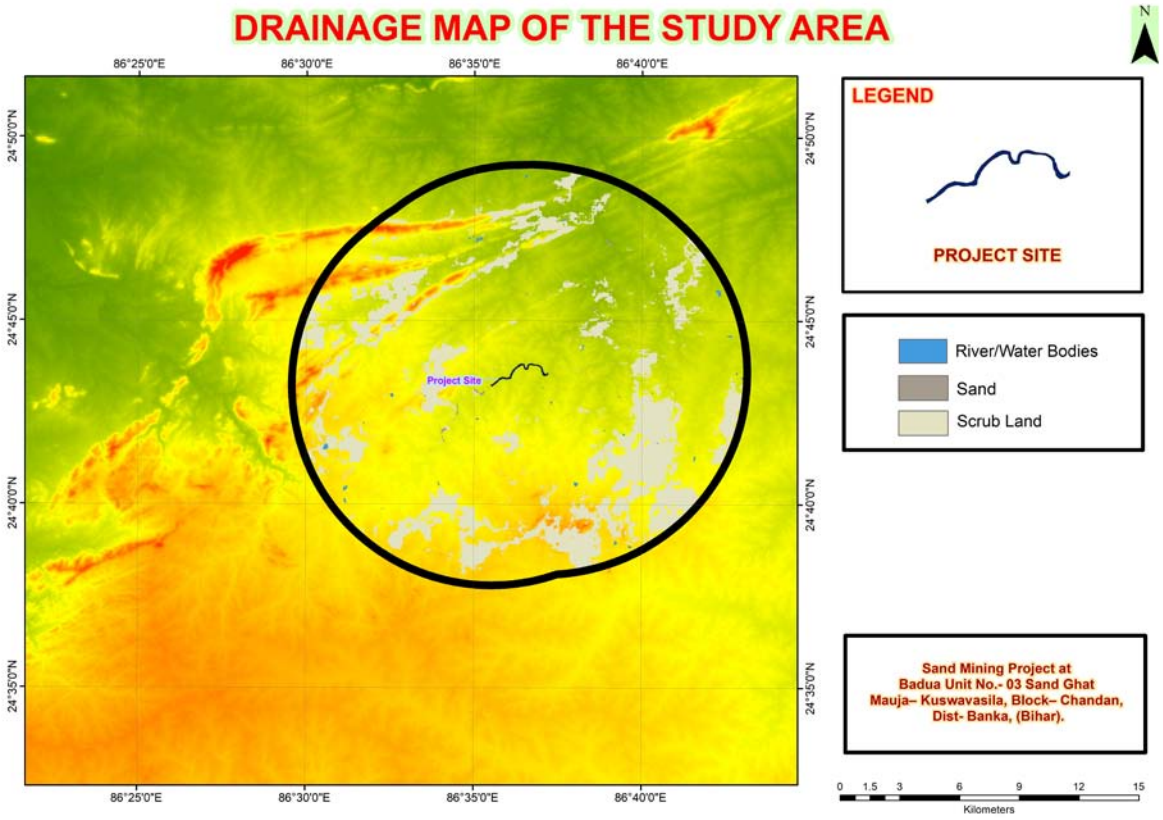


Fig-2.4, Drainage Map

2.7.3 Man power requirement

The manpower requirement for the proposed project will be around 45 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.**

Table 2.7 Manpower Requirement in Badua Unit No.- 03

S. No.	Category	Numbers
1.	Administration	01
2.	Supervisor	02
3.	Skilled	07
4.	Un-skilled	35
TOTAL		**45**

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*45/1000= 0.45 KLD	0.45
Dust Suppression	**Total approach road to be water sprinkled** = 400 m for Badua Unit No.- 03 400 m*6m*0.5 *2 times 2400/1000= 2.40 KLD	2.40
Plantation	270 plant (during plan period) @ 5 L/per plant= 270*5lts= 1350/1000= 1.35 KLD	1.35
Total		**4.2 or 4.5 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.

❖ 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.

- ✓ Installation of respiratory dust samplers (for PM_{10}, $PM_{2.5}$) 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 he 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.

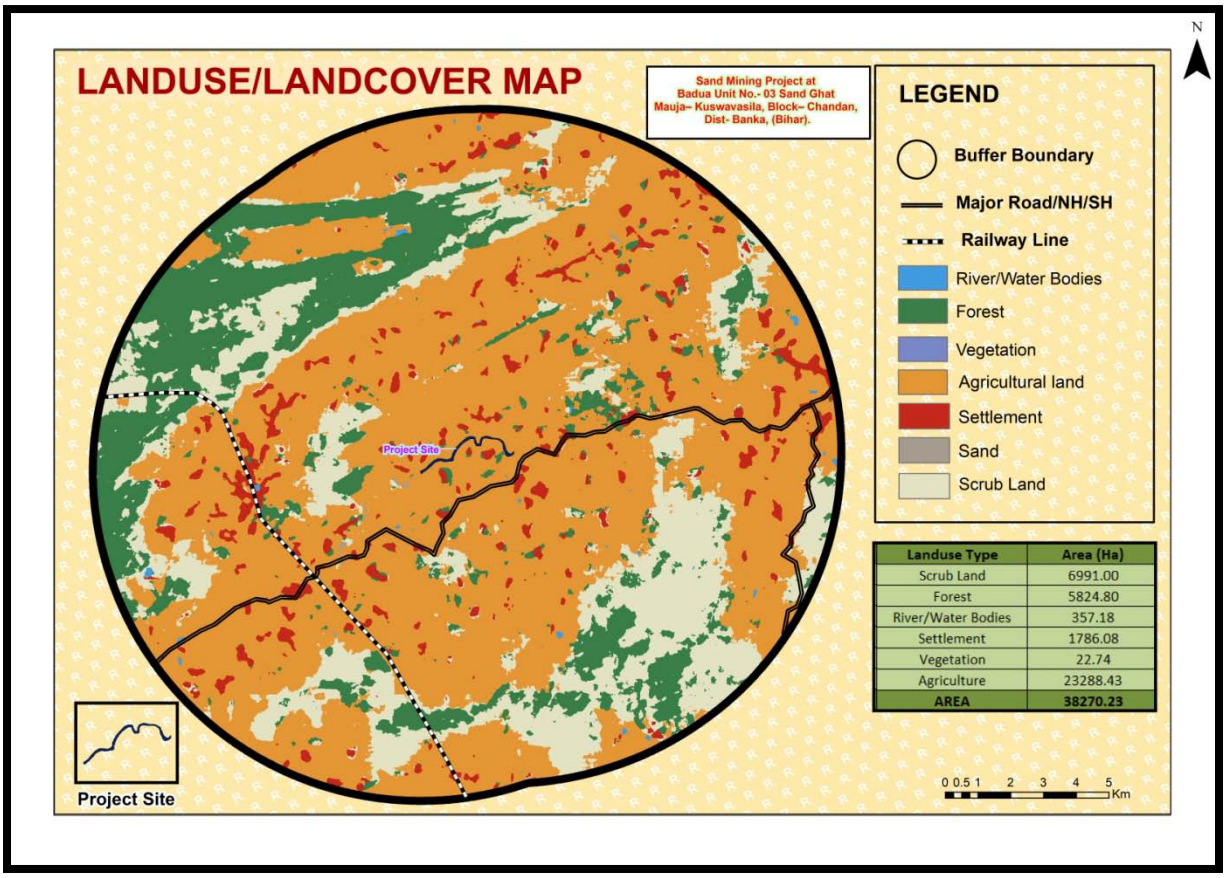
Land cover

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.

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

[redacted]



Landuse Type	Area (Ha)
Scrub Land	6991.00
Forest	5824.80
River/Water Bodies	357.18
Settlement	1786.08
Vegetation	22.74
Agriculture	23288.43
AREA	38270.23

FIGURE 3.1: LAND USE COVER OF THE PROJECT STUDY AREA

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	Mohandih	0.21 km North
GW 2	Bhaironpur	0.87 km East
GW 3	Narayandih	5.15 km East
GW 4	Barmasiya	3.23 Km North
GW 5	Latwa	3.24 Km SW

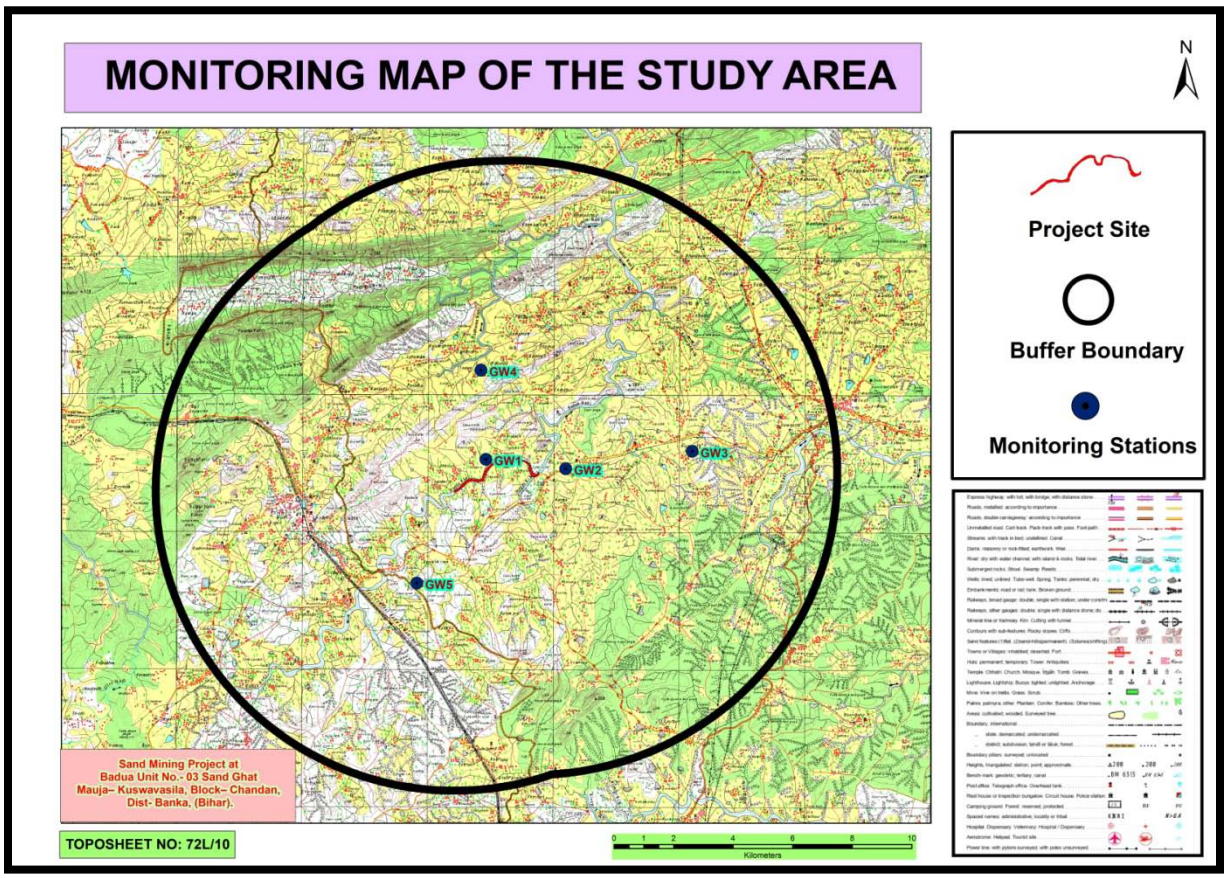


Figure 3.2 Water Sampling Location Map

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	7.34	7.39	7.59	7.41	7.32
6	Total Hardness (as CaCO3)	mg/l	300	600	286	257	334	295	243
7	Iron (as Fe)	mg/l	0.3	1	0.09	0.06	0.07	0.1	0.08
8	Chlorides (as Cl)	mg/l	250	1000	82	113	94	76	102
9	Fluoride (as F)	mg/l	1	1.5	0.5	0.6	0.8	0.5	0.4
10	TDS	mg/l	500	2000	412	461	495	415	443
11	Calcium(as Ca2+)	mg/l	75	200	67	64	76	71	58

12	Magnesium (as Mg2+)	mg/l	30	100	28	23	34	28	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	0.02	0.05	0.03	0.02	0.03
15	Sulphate (as SO4)	mg/l	200	400	17	27	24	23	34
16	Nitrate(as NO3)	mg/l	45	No Relaxation	5	5	8	5	4
17	Phenolic Compounds (as C6H5OH)	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	0.02	0.02	0.04	0.02	0.01
24	Zinc (as Zn)	mg/l	5	15	0.05	0.03	0.06	0.05	0.05
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	<0.01	<0.01	<0.01	<0.01
26	Chromium (as Cr6+)	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 CaCO3	mg/l	200	600	192	180	257	177	169
29	Aluminium (as Al)	mg/l	0.03	0.2	0.04	0.05	0.04	0.04	0.03
30	Boron (as B)	mg/l	1	5	0.2	0.3	0.3	0.2	0.2
	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 7.32 to 7.59
- Total hardness varies from 243 mg/l to 334 mg/l .
- Total dissolved solids vary from 412 mg/l to 495 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; 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.

- 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

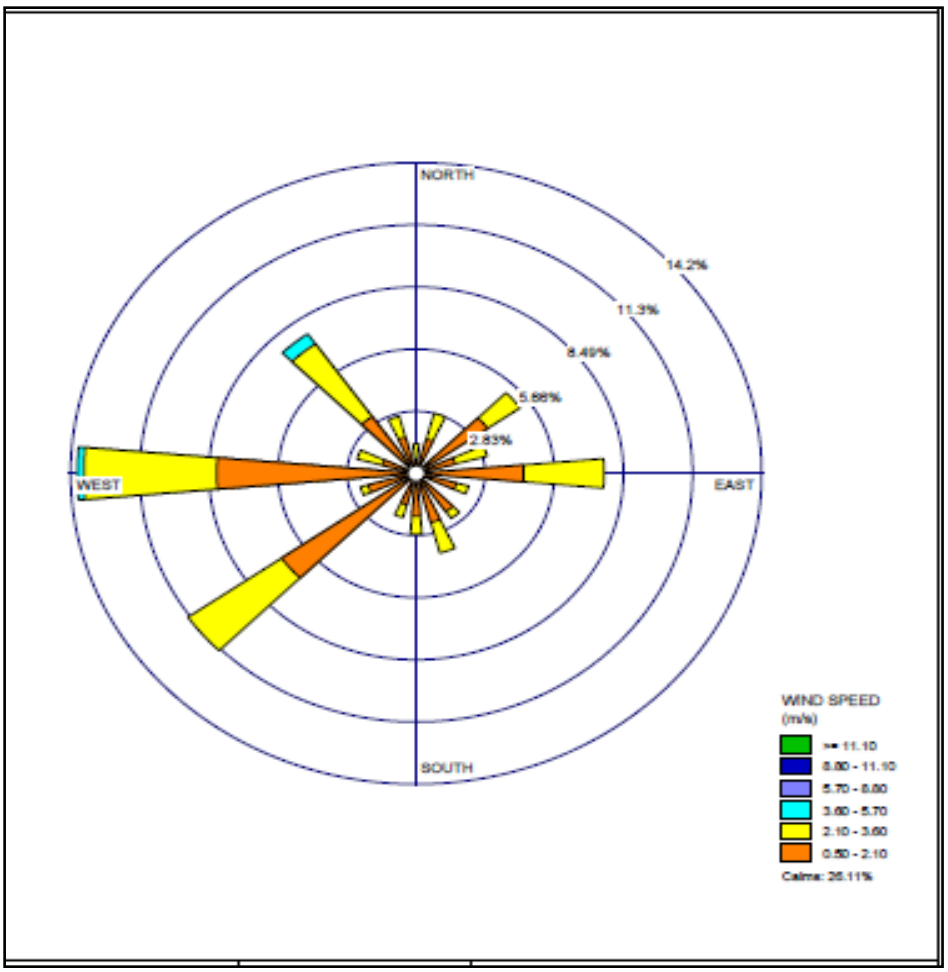


Figure 3.3: Wind Rose Diagram (at site)

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.

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
- 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 (PM_{10}) & $PM_{2.5}$, Sulphur-dioxide (SO_2) and Oxides of Nitrogen (NO_2) 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 98^{th} 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 PollutionControl 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 (Near Mohandih village)	0.21 km North
AAQ 2	Bhaironpur	0.87 km East
AAQ 3	Narayandih	5.15 km East
AAQ 4	Tola Bangawan	5.47 Km West
AAQ 5	Barmasiya	3.23 Km North
AAQ 6	Modikurawa	4.44 Km SE
AAQ 7	Latwa	3.24 Km SW
AAQ 8	Dakna	8.00 Km NE

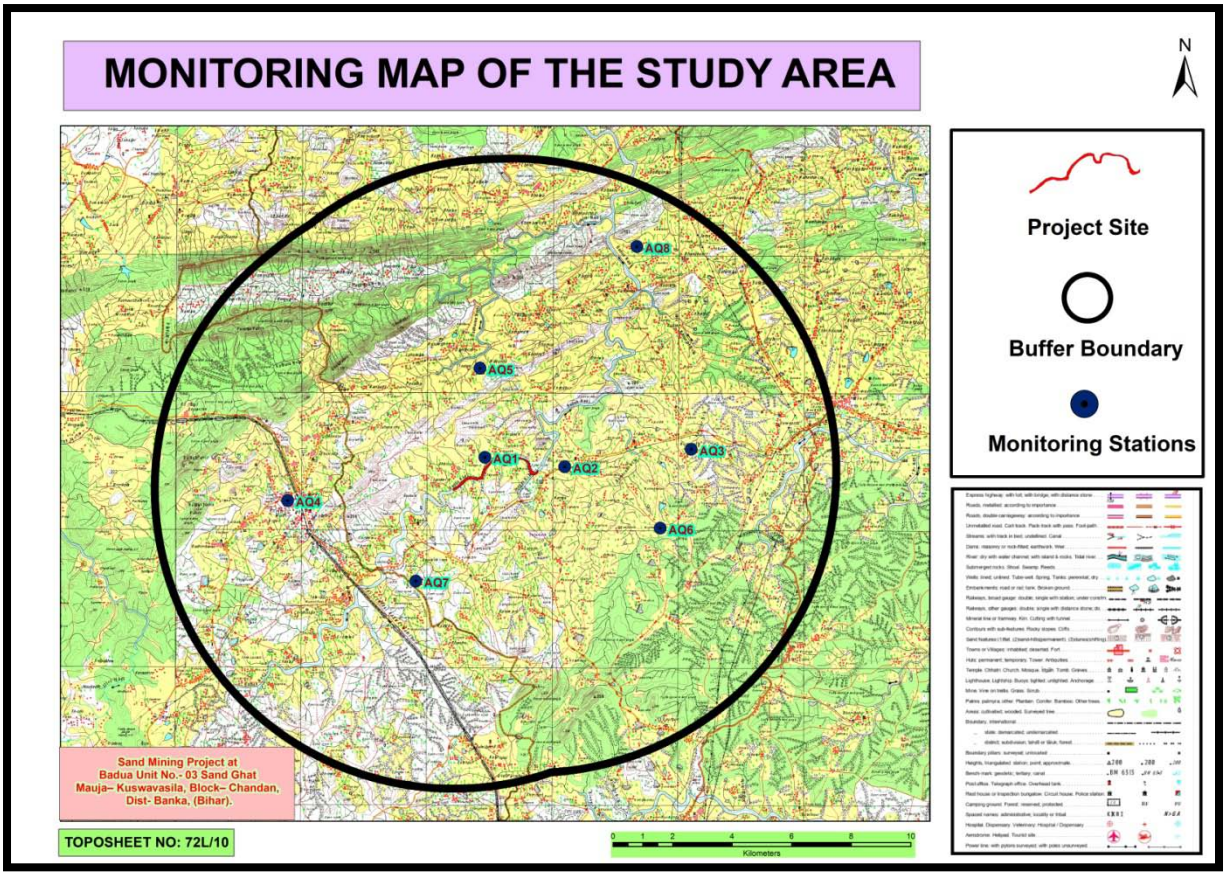


Figure 3.4 Ambient Air Quality Monitoring Stations

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

Location Code	PM2.5 (µg/m^3)				
	Name of the station	Min	Max	Average	98th Percentile
AAQ1	Project Site (Near Mohandih village)	40.2	52.2	45.7	51.5
AAQ2	Bhaironpur	42.0	52.9	48.5	52.6
AAQ3	Narayandih	40.0	51.3	46.3	50.8
AAQ4	Tola Bangawan	41.6	55.2	48.0	54.8
AAQ5	Barmasiya	40.7	50.1	44.6	49.4
AAQ6	Modikurawa	38.0	43.6	41.1	43.4
AAQ7	Latwa	40.8	45.2	42.8	45.0
AAQ8	Dakna	39.8	44.2	41.8	44.0

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

Location Code	PM10 (µg/m^3)				
	Name of the station	Min	Max	Average	98th Percentile
AAQ1	Project Site (Near Mohandih village)	70.5	85.3	79.0	84.6
AAQ2	Bhaironpur	74.9	90.3	83.2	89.5
AAQ3	Narayandih	71.4	85.2	77.8	84.0
AAQ4	Tola Bangawan	75.8	95.7	83.8	94.4
AAQ5	Barmasiya	71.5	91.9	77.6	90.9
AAQ6	Modikurawa	76.2	90.9	83.2	89.8
AAQ7	Latwa	79.2	94.4	86.4	93.3
AAQ8	Dakna	77.3	92.2	84.4	91.1

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

Location Code	SO2 (µg/m^3)				
	Name of the station	Min	Max	Average	98th Percentile
AAQ1	Project Site (Near Mohandih village)	4.2	8.7	5.8	8.1
AAQ2	Bhaironpur	4.9	9.8	6.8	9.5
AAQ3	Narayandih	4.3	9.7	6.2	8.8
AAQ4	Tola Bangawan	5.1	10.0	7.1	9.6
AAQ5	Barmasiya	4.4	9.8	6.2	9.0
AAQ6	Modikurawa	4.8	8.0	6.2	7.9
AAQ7	Latwa	5.8	9.0	7.2	8.9
AAQ8	Dakna	5.1	8.3	6.5	8.2

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

Location Code	NO2 (µg/m^3)				
	Name of the station	Min	Max	Average	98th Percentile
AAQ1	Project Site (Near Mohandih village)	8.1	17.5	11.9	16.6
AAQ2	Bhaironpur	9.4	20.1	14.6	19.2
AAQ3	Narayandih	8.5	17.6	12.7	17.4
AAQ4	Tola Bangawan	9.8	20.4	15.3	20.1
AAQ5	Barmasiya	8.1	19.9	13.2	18.5
AAQ6	Modikurawa	10.3	18.0	13.4	17.4
AAQ7	Latwa	12.3	20.3	15.5	19.6
AAQ8	Dakna	10.9	18.7	14.0	18.0

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 38.0 µg/m^3 to 55.2 µg/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., 60µg/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 70.5 µg/$m^3$to 95.7 µg/m^3 . 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/m^3 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 SO_2 recorded within the study area was 4.2 µg/m^{3}to 10.0 µg/m^3. The 24 hourly average values of SO_2 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/m^3 for Residential, Rural and other areas.

Oxides of Nitrogen (NO_2)

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.

- 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 NO_2 recorded within the study area was in the range of was 8.1 µg/m^{3}to 20.4 µg/m^3.

The 24 hourly average values of NO_2 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/m^3 for Residential, Rural and other areas.

Ambient Air Quality in the Study Area, Free Silica

SiO_2 (µg/m^3)	AQ1	AQ2	AQ3	AQ4	AQ5	AQ6	AQ7	AQ8
Minimum	1.41	1.61	1.54	1.45	1.54	1.47	1.47	1.52

Maximum	1.65	1.80	1.64	1.84	1.90	1.86	1.70	1.73

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 05 locations and analyzed as per CPCB norms. The soil sampling locations are marked in **Figure 3.5** and shown in **Table 3.11.** Thephysico-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 (Near Mohandih village)	0.21 km North
SQ 2	Bhaironpur	0.87 km East
SQ 3	Narayandih	5.15 km East
SQ 4	Barmasiya	3.23 Km North
SQ 5	Latwa	3.24 Km SW

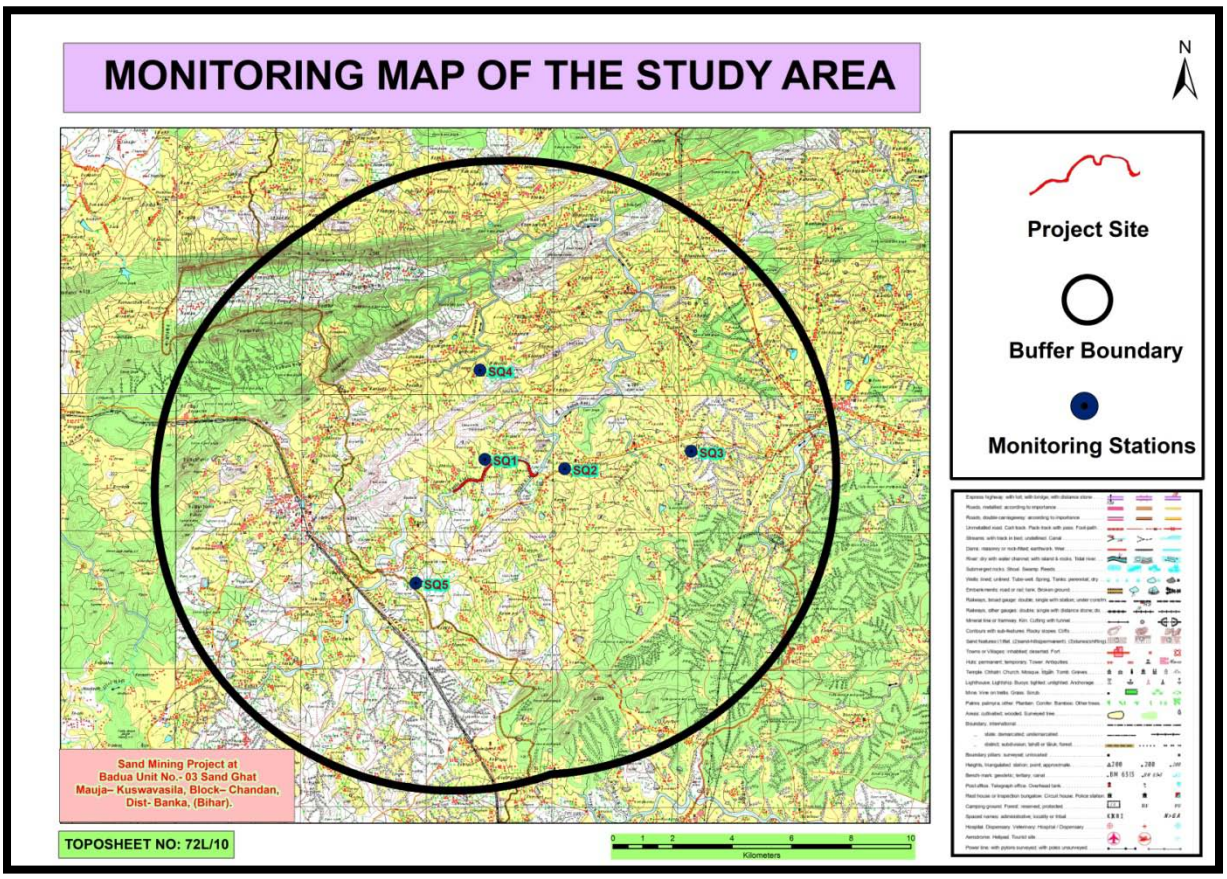


Figure 3.5, Soil Sampling Locations

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	%	0.8	11.5	10.25	14.25	11.27
	clay	%	6.14	12.7	10.24	9.85	10.87
	Sand	%	93.06				
2	pH	-	8.17	7.83	8.23	8.1	7.5
3	Electrical Conductivity	µmhos/cm	124	140	135	155	165
4	Cation exchange capacity	meq/100 gm	13.51	14.52	16.41	19.52	14.41
5	Potassium	mg/kg	48.21	56.34	60.45	44.34	61.45
6	Sodium	mg/kg	20.86	23.41	26.55	33.41	29.55

7	Calcium	mg/kg	2356.47	2514.23	2874.96	2524.23	2974.96
8	Magnesium	mg/kg	182.62	205.37	212.43	210.37	225.43
9	Sodium Absorption Ratio	-	0.11	0.12	0.13	0.16	0.14
10	Water Holding Capacity	%	15.28	16.2	17.46	15.2	16.46
11	Porosity	%	46.82	45.27	44.38	49.27	46.38

Observations:

Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 7.50 to 8.23, which shows that the soil is alkaline in nature. Potassium is found to be from 44.34 meq/100 gm to 61.45 meq/100 gm.

3.5 NOISE ENVIRONNENT

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.**

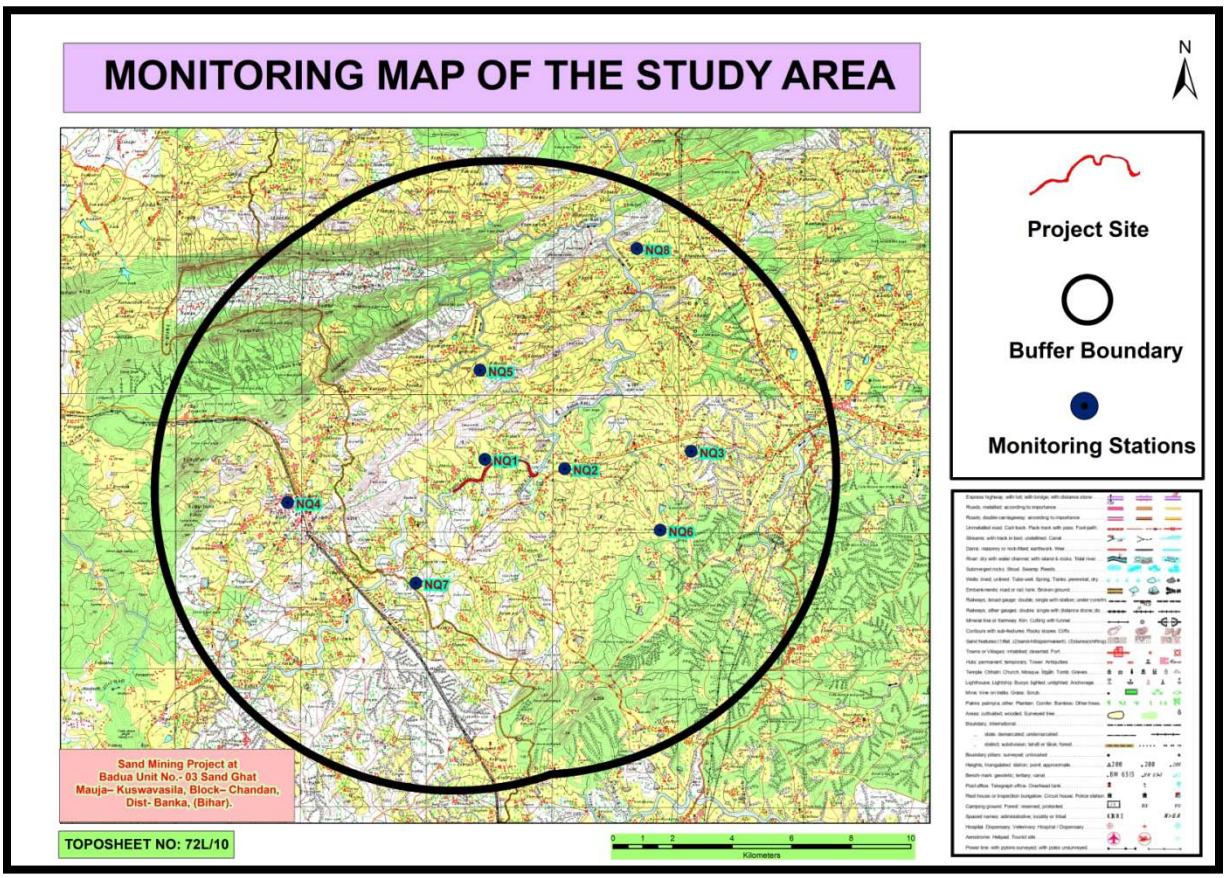


Figure 3.6 Noise Monitoring Stations

Table 3.13: Noise Quality Monitoring Stations

Noise Monitoring Locations		
NQ 1	Project Site (Near Mohandih village)	0.21 km North
NQ 2	Bhaironpur	0.87 km East
NQ 3	Narayandih	5.15 km East
NQ 4	Tola Bangawan	5.47 Km West
NQ 5	Barmasiya	3.23 Km North
NQ 6	Modikurawa	4.44 Km SE
NQ 7	Latwa	3.24 Km SW
NQ 8	Dakna	8.00 Km NE

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	NQ-1	Residential Zone	55	45	50.7	42.3
2	NQ-2	Residential Zone	55	45	52.9	41.1
3	NQ-3	Industrial Zone (Project Site)	75	70	52.4	40.8
4	NQ-4	Silence zone	50	40	48.5	39.1
5	NQ-5	Residential Zone	55	45	52.5	43.3
6	NQ-6	Residential Zone	55	45	51.9	41.5
7	NQ-7	Residential Zone	55	45	53.2	43.3
8	NQ-8	Residential Zone	55	45	52.9	42.1

Results

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as 48.5 dB(A) to 53.2 dB(A) respectively. The minimum & maximum noise levels at night time were found to be 39.1 dB (A) & 43.3 dB(A) respectively.

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.

Forests

The Forest cover in the state, based on interpretation of satellite data of Nov 2008 Jan 2009 is 6845 km^2 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.

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.	*Mangifera indica*	Mango	Anacardiaceae
2.	*Acacia nilotica*	Babool	Fabaceae
3.	*Bombax ceiba*	Semal	Malvaceae
4.	*Dalbergia sissoo*	Sisam	Fabaceae
5.	*Ficus benghalensis*	Bargad	Moraceae
6.	*Ficus religiosa*	Pipal	Moraceae

S. No.	Botanical Name	Common Name	Family
7.	*Azadirachta indica*	Neem	Meliaceae
8.	*Melia azedarach (L.)*	Bakain	Meliaceae
9.	*Syzigium cumini (L.) Skeels*	Jamun	Myrtaceae
10.	*Ziziphus mauritiana Lam.*	Ber	Rahmnaceae
11.	*Emblica officinalis Gaertn.*	Amla	Euphoriaceae
12.	*Tamarindus indica (L.)*	Emli	Caesalpiniaceae
13.	*Aegle marmelos Linn*	Bel	Rutaceae
14.	*Terminalia arjuna*	Arjun	Combretaceae
15.	*Madhuca indica*	Mahua	Sapotaceae
16.	*Neolamarckia cadamba*	Kadamb	Rubiaceae
17.	*Diospyros melanoxylon*	Kend	Ebenaceae
18.	*Terminalia elliptica*	Asan	Combretaceae
19.	*Artocarpus heterophyllus*	Katahal	Moraceae
20.	*Borassus flabellifer*	Tal	Arecaceae

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

Table 3.17 List of Shrubs and Herbs in Study area

S.No.	Botanical name	Local name	Family
1.	*Achyranthes aspera*	Apamarg/Chirchita	Amaranthaceae
2.	*Justicia Adhatoda*	Adusa	Acanthaceae

S.No.	Botanical name	Local name	Family
3.	*Anona squamosa*	Sitaphal	Anonaceae
4.	*Argemone mexicana*	Siarkanta	Papaveraceae
5.	*Calotropis gigantea*	Aak	Apocynaceae
6.	*Colebrookia oppositifolia, Smith.*	Kalabansa	Lamiaceae
7.	*Euphorbia nivulia*	-	Euphorbiaceae
8.	*Holarrhena pubescens*	-	Apocynaceae
9.	*Lantana camara*	Raimuniya	Verbenaceae
10.	*Thevetia peruviana*	Kaner	Apocynaceae
11.	*Bambusa gracilis*	Bamboo	Gramineae
12.	*Butea monosperma*	Palas	Fabaceae
13.	*Hibiscus rosasinensis*	China rose	Malvaceae
14.	*Jasminum sambac*	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
Mammals				
1	Indian hare	*Lepus nigricollis*	IV	LC
2	Fulvous Fruit Bat	*Rousettus leschenaulti*	V	LC
3	Bandicoot Rat	*Bandicota indica*	V	LC

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

Introduction

The proposed sand mine project is situated at Village / Mauja Kuswavasila, Block Chanan, District Banka,Bihar state over an area of 27.0 hectares. The state government has given consent for Sand mining to Maticulous Organics Private Limited, Deependra Singh, Permanent Address-53, Kantaghar Pachapenda, Ashink Kantaghar Pachapenda, Moradabad U.P.- 244001.

This project falls under Category- “B1” as per EIA Notification 2006 (amended till date) of the Ministry of Environment and Forests & Climate Change, New Delhi.

Need for the Project and its Importance to the Country and Region

The project lies on the bed of Badua River. The sediment in the form of river bed material (RBM) deposited in inactive channel the last many years had changed the shape of the Badua bed from a valley to a raised land. Hence, it is necessary to remove the materials so that the stream gets channelized. Due to rapid infrastructure development in India, the demand of construction material has increased. To supply this demand, mining of Sand is done. This project operation will provide employment directly and indirectly to the people residing in vicinity, thus improving the Socio-economic status of the area.

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 onemajor district namedBankaof Biharstate 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;

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 Bankaand Jamui districtsof Bihar state respectively was compiled and placed in the form of tabulation and graphical representation. Entire study area is observed predominantly ruraland 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 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 260 villages lying under Banka District in Bihar state. Overall study area villages are falling mainly under Four (04) no of tehsils namely Chanan (197 villages), Katoria (12 villages), Jhajha (39 villages) and Chakai (12 villages), of Bankaand Jamui district in Bihar state.

There are about 46 villages found as uninhabited villages in the study area. There is no town 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 128356persons of 260villagesof Bankadistrict inBihar state. Male-female wise total population was recorded as 67025 males (52.2%) and 61331(47.8%) females respectively.

Total number of 'Households' was observed as 22831in the 10 km radius study zone. Scheduled Caste ('SC') population was observed as 18014persons consisting of 9381males (52.1%) and 8633 females (47.9%) in the 10km study zone. Scheduled Tribes ('ST') population was also observed as 8428 persons (6.6%) consisting of 4256 males (50.5%) and 4172females (49.5%) in the 10 km study zone.The child population (0-6 Age) of the study

area is recorded as 24595(19.2%) and comprising of 12482 (50.8%)males&12113 (49.2%) females respectively.

Village wise details of population distributionare given as follows in **Table 3.19 & 3.20.**

Table 3.19: 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
Tola Bargunia	209	1193	649	544	208	108	100
Tola Paharpur	17	104	49	55	23	12	11
Tola Kolhaidih	967	4779	2467	2312	827	424	403
Tola Kadua	Uninhabited Village						
Tola Haralwa	41	188	86	102	29	13	16
Tola Kohbara	Uninhabited Village						
Tola Barmasia 1	Uninhabited Village						
Tola Pairu-rai-dih	19	112	56	56	23	10	13
Tola Jhilua	230	1284	643	641	296	134	162
Tola Chhira	226	1482	761	721	349	168	181
Tola Paharpur	166	1007	527	480	174	87	87
Tola Phulhara	221	1275	652	623	239	135	104
Tola Hathia Jharna	Uninhabited Village						
Tola Durgapur	5	25	16	9	5	2	3
Tola Lilabaran	116	530	286	244	106	63	43
Tola Kusumghat	80	452	243	209	72	37	35
Tola Budhnadih	Uninhabited Village						
Tola Singhna	19	104	53	51	22	11	11
Tola Dighibari	68	467	235	232	79	33	46
Tola Barmasia 2	167	951	497	454	177	94	83
Tola Gundra	74	439	236	203	89	44	45
Tola Barakol 1	36	191	95	96	37	16	21
Tola Makunda	23	147	79	68	25	10	15

Tola Kathradih	7	43	25	18	13	7	6
Tola Phuljora	80	457	222	235	92	38	54
Tola Pipradih	Uninhabited Village						
Tola Goura	25	134	71	63	28	15	13
Tola Dari	49	333	175	158	67	30	37
Tola Sikarhar	2	20	11	9	9	4	5
Tola Dhare	Uninhabited Village						
Tola Dumduma	Uninhabited Village						
Tola Kairwa	6	20	8	12	2	1	1
Tola Paisaljori	Uninhabited Village						
Tola Kulhara	Uninhabited Village						
Tola Chhatiani	Uninhabited Village						
Tola Dudhijharna	Uninhabited Village						
Tola Amjhari	Uninhabited Village						
Tola Khamaruadih	27	112	60	52	16	6	10
Tola Auraia	53	248	123	125	43	20	23
Tola Lalchanddih	28	172	92	80	19	10	9
Tola Dhanouchhi	157	918	491	427	149	91	58
Tola Tari	76	445	236	209	81	46	35
Tola Dhaknatari	Uninhabited Village						
Tola Katsakra	97	593	310	283	104	51	53
Tola Pirra	183	1266	697	569	243	142	101
Tola Gohli	31	173	90	83	35	15	20
Tola Sarkanda	98	743	384	359	143	67	76
Tola Jaro Pahri	61	430	233	197	99	48	51
Tola kurumtanr	66	539	278	261	136	68	68
Tola Surangi	48	309	159	150	77	35	42
Tola Chamardiha	72	479	265	214	73	47	26
Tola Asuraha	136	904	455	449	209	107	102
Tola Motidih	Uninhabited Village						
Tola Majhiladih	110	828	440	388	184	94	90

Tola Dharmadih	31	165	87	78	28	11	17
Tola Bakidih	39	276	134	142	64	20	44
Tola Sahdewa	Uninhabited Village						
Tola Majhila dih	74	453	247	206	101	54	47
Tola Nanhuakura	44	233	122	111	68	34	34
Tola Hardi Khurd	61	310	156	154	57	32	25
Tola Hardia Kalan	35	202	110	92	33	19	14
Tola Gundra Diha	Uninhabited Village						
Tola Purni Pararia	24	141	66	75	28	10	18
Tola Karma Tanr	27	134	74	60	16	10	6
Tola Pararia	19	79	43	36	15	9	6
Tola Semratanr	87	406	194	212	76	36	40
Tola Bargoian	45	215	113	102	29	15	14
Tola Dihabara Khurd	32	146	74	72	29	15	14
Tola Dihbara Kalan	68	318	167	151	48	25	23
Tola Jhajhraha	Uninhabited Village						
Tola Raino Jharna	23	112	53	59	17	6	11
Tola Larhania	117	753	392	361	154	76	78
Tola Guhjora	136	757	394	363	124	64	60
Tola Kusumghat	70	402	215	187	75	45	30
Tola Kurawa	Uninhabited Village						
Tola Subhasinghdih	37	183	99	84	41	26	15
Tola Pesarha	35	188	96	92	35	16	19
Tola Berar	55	280	141	139	50	23	27
Tola Salaiya 1	100	452	250	202	99	51	48
Tola Kanodih	113	529	264	265	123	50	73
Tola Tahkwani	267	1610	844	766	322	176	146
Tola Goraiadih	18	66	33	33	12	5	7

Tola Pandwara	Uninhabited Village						
Tola Sejua	Uninhabited Village						
Tola Bharwakura	Uninhabited Village						
Tola Letwakura	Uninhabited Village						
Tola Pesarhakura	Uninhabited Village						
Tola Chandikumarthan	Uninhabited Village						
Tola Musahra dih	53	285	159	126	54	30	24
Tola Laiadih	1	10	6	4	4	3	1
Tola Targaon	57	375	195	180	79	33	46
Tola Paipartargaon	20	134	71	63	27	16	11
Tola Chandwari	155	865	450	415	131	68	63
Tola Kumaraindih	Uninhabited Village						
Tola Manhankharna	Uninhabited Village						
Tola Kesuadih	Uninhabited Village						
Tola Bharsar	114	780	400	380	174	88	86
Tola Sattighat	31	193	109	84	40	26	14
Tola Mohandih	124	760	374	386	176	83	93
Tola Hiraraidih	162	1001	524	477	212	100	112
Tola Akakura	41	231	127	104	32	17	15
Tola Ujradih	18	93	52	41	25	14	11
Tola Tengdhowa	Uninhabited Village						
Tola Kenhuwar	7	29	15	14	10	4	6
Tola Chitakhar	308	1410	728	682	250	118	132
Tola Akluraidih	Uninhabited Village						
Tola Dholdar	70	297	168	129	47	26	21
Tola Dhawa 1	131	607	315	292	112	54	58
Tola TutaKura	Uninhabited Village						
Tola Chunwani	Uninhabited Village						
Tola Ahira	71	403	213	190	67	32	35

Tola Champatari	31	233	128	105	45	24	21
Tola Narainpur	48	292	144	148	56	26	30
Tola Goriamma	115	689	332	357	129	58	71
Tola Pipradih	123	648	351	297	106	53	53
Tola Gobardaha	41	213	119	94	28	9	19
Tola Darhwa	108	573	305	268	98	53	45
Tola Kharna	99	572	310	262	96	46	50
Tola Karwamarni	99	578	305	273	85	42	43
Kurumtanr	30	202	98	104	40	19	21
Surangi	59	419	213	206	79	39	40
Domohan	39	234	115	119	48	24	24
Tola Gajoraidih	50	268	131	137	57	29	28
Tola Amjora	67	382	201	181	76	37	39
Tola Jatwara	61	348	182	166	57	26	31
Tola Pujhardih	32	186	110	76	34	26	8
Tola Tingharwa	22	131	68	63	25	12	13
Tola Alagdamar	26	151	81	70	25	11	14
Tola Barakol 2	37	209	108	101	49	30	19
Tola Bhairopur	135	697	357	340	162	78	84
Tola Nonia	108	611	339	272	123	68	55
Tola Sidhudih	99	468	238	230	96	50	46
Tola Kumhradih	67	315	171	144	63	36	27
Tola Bagra	271	1273	667	606	258	132	126
Tola Mathura	153	897	472	425	179	88	91
Tola Naraindih	233	1171	615	556	217	115	102
Tola Lalpur	116	630	325	305	82	43	39
Tola Agwani	20	136	71	65	27	13	14
Tola Mahestaria	4	38	14	24	11	4	7
Tola Barne	46	270	142	128	52	31	21
Tola Patardih	19	86	52	34	19	13	6
Tola Raghubardih	2	14	4	10	6	1	5

Tola Akakura	92	487	260	227	61	35	26
Tola Bagaia	43	219	109	110	44	25	19
Tola Domohan	130	726	381	345	209	116	93
Tola Kairajor	60	374	191	183	84	41	43
Tola Chandipirha	52	309	153	156	70	30	40
Tola Beharbari	35	218	122	96	39	19	20
Tola Sato	76	455	232	223	80	44	36
Tola Noadih	73	370	189	181	70	38	32
Tola Birajpur	75	358	195	163	79	44	35
Tola Baratanr	69	307	163	144	54	26	28
Tola AjmerRai	8	52	29	23	10	4	6
Tola BabuMahal	65	342	174	168	47	18	29
Tola Mansaraidih	Uninhabited Village						
Tola Dharhara	77	457	252	205	87	56	31
Tola Simsimkura	29	139	73	66	30	19	11
Tola Mehia Simar	42	201	102	99	31	15	16
Tola Titukura	38	168	90	78	33	21	12
Tola Bhairodih	140	657	360	297	122	61	61
Tola Titipathar	Uninhabited Village						
Tola Chugalia	24	101	51	50	24	12	12
Tola Dudhkira	24	135	74	61	25	16	9
Tola Khargawan	Uninhabited Village						
Tola Mathdih	56	388	199	189	95	47	48
Tola Garbhudih	90	414	209	205	84	48	36
Tola Laluakura	Uninhabited Village						
Tola Alakjara	6	33	15	18	7	3	4
Tola HariaKura	20	123	60	63	17	9	8
Tola Kaljuga	9	52	26	26	10	3	7
Tola Majhli	87	447	240	207	77	44	33
Tola Ranga	2	14	7	7	3	2	1
Tola Ganjira	49	284	152	132	58	34	24

Tola Jahgira	36	232	118	114	48	28	20
Tola Suriadih	42	252	132	120	48	24	24
Tola Kaljuga	Uninhabited Village						
Dhanubasar	737	4483	2328	2155	917	462	455
Alkosia	350	1890	999	891	389	206	183
Chihutjor	789	4602	2374	2228	974	490	484
Jogmaran	292	1389	700	689	279	132	147
Tola Kasba	49	327	180	147	72	35	37
Tola Muskrawa	72	407	222	185	93	57	36
Tola Joktaha	81	453	219	234	98	42	56
Pasraha	15	123	66	57	29	18	11
Fatehpur	131	725	386	339	152	87	65
Udaipur	Uninhabited Village						
Kusumjori	222	1302	680	622	266	140	126
Satbhaia	113	700	376	324	117	58	59
Nawadih	4	33	13	20	10	4	6
Jamunia	Uninhabited Village						
Lila Baran	74	425	215	210	71	32	39
Chapridamgi	3	15	8	7	3	1	2
Barahduari	37	255	131	124	38	20	18
Dumarkola	58	363	187	176	58	26	32
Tola Dhawa 2	8	69	40	29	9	6	3
Tola Paharpur	153	808	415	393	179	75	104
Tola Sheikhpura	183	1130	590	540	169	88	81
Domsarni	1066	5627	3018	2609	1094	567	527
Nawada	37	240	131	109	43	20	23
Bhairopur	132	597	306	291	102	47	55
Kolhua	Uninhabited Village						
Tilaiya	148	895	462	433	145	68	77
Kurna	30	151	84	67	32	21	11
Paprewa	120	679	349	330	120	63	57

Dewasi	286	1470	773	697	260	122	138
Bhalua	212	1184	613	571	216	106	110
Tola Dholadanr	9	45	23	22	12	4	8
Tola Salaiya 2	58	292	159	133	74	38	36
Tola Barmasia 3	92	510	266	244	97	52	45
Tola Barakola 1	55	181	93	88	20	10	10
Tola Pachkathia	43	192	100	92	23	10	13
Tola Debiyadih	Uninhabited Village						
Tola Mantari	Uninhabited Village						
Tola Kanaudi	610	3383	1761	1622	739	355	384
Tola Khurandadhorari	480	2926	1519	1407	644	322	322
Tola Khuranda	461	2456	1298	1158	495	252	243
Tola Gopalmaran	85	460	245	215	90	46	44
Tola Bangawan	144	757	402	355	121	65	56
Tola Lilabaran	136	877	450	427	151	82	69
Tola kenuar	46	271	142	129	47	21	26
Tola Tithi Chak	61	357	186	171	80	36	44
Tola Tilauna	100	563	295	268	99	53	46
Tola Bastiyadih	61	395	198	197	58	33	25
Tola Karijhal	102	489	257	232	112	59	53
Tola Bathnabaran	251	1429	702	727	326	150	176
Tola Ghontari	57	311	157	154	53	26	27
Tola Khawa	Uninhabited Village						
Tola Damgitar	81	429	232	197	69	36	33
Tola Nagwe	452	1989	1040	949	390	207	183
Tola Taraun	97	636	324	312	94	47	47
Tola Godaia	291	1695	878	817	291	146	145
Tola Pandua	9	52	24	28	9	3	6
Tola Simaltala	177	976	498	478	164	72	92
Tola Siantanr	279	1660	869	791	279	136	143

Tola Baraundhia	115	668	351	317	130	67	63
Tola Majhiakura	19	137	68	69	28	16	12
Tola Pararia	110	514	264	250	66	33	33
Tola Telwabazar	405	2441	1267	1174	312	164	148
Tola Depura	Uninhabited Village						
Tola Ghasitari	88	560	310	250	108	62	46
Tola Nawadih	128	848	459	389	153	84	69
Tola Dhonrari	124	715	398	317	107	60	47
Tola Chiraiya	237	1601	842	759	281	148	133
Tola Gadi Telwa	337	1702	890	812	333	171	162
Tola Arpathal	Uninhabited Village						
Tola Telwa	100	567	290	277	116	55	61
Tola Burhiabari	101	668	345	323	120	65	55
Tola Pathal Chapti	75	518	285	233	67	40	27
Tola Babudih	49	309	148	161	75	31	44
Tola Ahardih	Uninhabited Village						
Tola Barakola 2	26	155	77	78	28	13	15
Tola Rattidih	16	109	52	57	17	7	10
Tola Salaia	29	174	81	93	35	10	25
Tola Arapathal	39	274	163	111	51	31	20
Tola Bhunra	85	580	311	269	107	56	51
Tola Bajpedih	31	206	115	91	41	23	18
Tola Babudih	41	237	120	117	39	19	20
Tola Asanghatia	57	313	161	152	78	36	42
Tola Basatpur	36	240	133	107	43	24	19
Tola Jamuniatanr	19	120	57	63	28	12	16
TOTAL (10km)	**22831**	**128356**	**67025**	**61331**	**24595**	**12482**	**12113**

Source-Census of India, 2011

Table 3.20: Village-wise SC & STPopulation Distribution (10km)

Name of Village/Town	Total Population	Scheduled Castes			Scheduled Tribes		
		Persons	Males	Females	Persons	Males	Females
Tola Bargunia	1193	242	128	114	0	0	0
Tola Paharpur	104	0	0	0	0	0	0
Tola Kolhaidih	4779	118	62	56	618	293	325
Tola Kadua	Uninhabited Village						
Tola Haralwa	188	0	0	0	0	0	0
Tola Kohbara	Uninhabited Village						
Tola Barmasia 1	Uninhabited Village						
Tola Pairu-rai-dih	112	0	0	0	0	0	0
Tola Jhilua	1284	0	0	0	21	14	7
Tola Chhira	1482	281	147	134	1	1	0
Tola Paharpur	1007	106	62	44	405	217	188
Tola Phulhara	1275	265	127	138	0	0	0
Tola Hathia Jharna	Uninhabited Village						
Tola Durgapur	25	0	0	0	0	0	0
Tola Lilabaran	530	140	80	60	0	0	0
Tola Kusumghat	452	0	0	0	0	0	0
Tola Budhnadih	Uninhabited Village						
Tola Singhna	104	104	53	51	0	0	0
Tola Dighibari	467	0	0	0	0	0	0
Tola Barmasia 2	951	681	349	332	2	1	1
Tola Gundra	439	0	0	0	0	0	0
Tola Barakol 1	191	109	51	58	0	0	0
Tola Makunda	147	0	0	0	0	0	0
Tola Kathradih	43	0	0	0	0	0	0
Tola Phuljora	457	7	4	3	39	20	19
Tola Pipradih	Uninhabited Village						
Tola Goura	134	0	0	0	0	0	0

Tola Dari	333	2	1	1	0	0	0
Tola Sikarhar	20	0	0	0	0	0	0
Tola Dhare	Uninhabited Village						
Tola Dumduma	Uninhabited Village						
Tola Kairwa	20	0	0	0	0	0	0
Tola Paisaljori	Uninhabited Village						
Tola Kulhara	Uninhabited Village						
Tola Chhatiani	Uninhabited Village						
Tola Dudhijharna	Uninhabited Village						
Tola Amjhari	Uninhabited Village						
Tola Khamaruadih	112	0	0	0	0	0	0
Tola Auraia	248	0	0	0	0	0	0
Tola Lalchanddih	172	0	0	0	0	0	0
Tola Dhanouchhi	918	283	153	130	3	2	1
Tola Tari	445	0	0	0	0	0	0
Tola Dhaknatari	Uninhabited Village						
Tola Katsakra	593	0	0	0	0	0	0
Tola Pirra	1266	0	0	0	0	0	0
Tola Gohli	173	0	0	0	0	0	0
Tola Sarkanda	743	0	0	0	0	0	0
Tola Jaro Pahri	430	0	0	0	0	0	0
Tola kurumtanr	539	0	0	0	0	0	0
Tola Surangi	309	0	0	0	0	0	0
Tola Chamardiha	479	472	260	212	5	4	1
Tola Asuraha	904	0	0	0	0	0	0
Tola Motidih	Uninhabited Village						
Tola Majhiladih	828	142	64	78	0	0	0
Tola Dharmadih	165	0	0	0	0	0	0
Tola Bakidih	276	0	0	0	0	0	0
Tola Sahdewa	Uninhabited Village						
Tola Majhila dih	453	6	4	2	0	0	0

Tola Nanhuakura	233	87	46	41	0	0	0
Tola Hardi Khurd	310	0	0	0	14	5	9
Tola Hardia Kalan	202	0	0	0	0	0	0
Tola Gundra Diha	Uninhabited Village						
Tola Purni Pararia	141	0	0	0	0	0	0
Tola Karma Tanr	134	0	0	0	0	0	0
Tola Pararia	79	73	39	34	0	0	0
Tola Semratanr	406	0	0	0	397	190	207
Tola Bargoian	215	0	0	0	201	106	95
Tola Dihabara Khurd	146	0	0	0	42	20	22
Tola Dihbara Kalan	318	0	0	0	0	0	0
Tola Jhajhraha	Uninhabited Village						
Tola Raino Jharna	112	0	0	0	112	53	59
Tola Larhania	753	169	86	83	0	0	0
Tola Guhjora	757	754	391	363	0	0	0
Tola Kusumghat	402	138	75	63	0	0	0
Tola Kurawa	Uninhabited Village						
Tola Subhasinghdih	183	131	73	58	0	0	0
Tola Pesarha	188	0	0	0	0	0	0
Tola Berar	280	22	9	13	0	0	0
Tola Salaiya 1	452	2	1	1	0	0	0
Tola Kanodih	529	0	0	0	0	0	0
Tola Tahkwani	1610	239	118	121	0	0	0
Tola Goraiadih	66	66	33	33	0	0	0
Tola Pandwara	Uninhabited Village						
Tola Sejua	Uninhabited Village						
Tola Bharwakura	Uninhabited Village						
Tola Letwakura	Uninhabited Village						

Tola Pesarhakura	Uninhabited Village						
Tola Chandikumarthan	Uninhabited Village						
Tola Musahra dih	285	139	78	61	0	0	0
Tola Laiadih	10	0	0	0	0	0	0
Tola Targaon	375	0	0	0	0	0	0
Tola Paipartargaon	134	0	0	0	0	0	0
Tola Chandwari	865	71	35	36	0	0	0
Tola Kumaraindih	Uninhabited Village						
Tola Manhankharna	Uninhabited Village						
Tola Kesuadih	Uninhabited Village						
Tola Bharsar	780	153	82	71	0	0	0
Tola Sattighat	193	0	0	0	0	0	0
Tola Mohandih	760	56	25	31	0	0	0
Tola Hiraraidih	1001	113	59	54	0	0	0
Tola Akakura	231	0	0	0	0	0	0
Tola Ujradih	93	41	24	17	0	0	0
Tola Tengdhowa	Uninhabited Village						
Tola Kenhuwar	29	0	0	0	0	0	0
Tola Chitakhar	1410	18	8	10	0	0	0
Tola Akluraidih	Uninhabited Village						
Tola Dholdar	297	0	0	0	0	0	0
Tola Dhawa 1	607	0	0	0	0	0	0
Tola TutaKura	Uninhabited Village						
Tola Chunwani	Uninhabited Village						
Tola Ahira	403	0	0	0	0	0	0
Tola Champatari	233	0	0	0	0	0	0
Tola Narainpur	292	0	0	0	0	0	0
Tola Goriamma	689	35	18	17	0	0	0
Tola Pipradih	648	0	0	0	0	0	0

Tola Gobardaha	213	209	117	92	1	0	1
Tola Darhwa	573	81	43	38	0	0	0
Tola Kharna	572	144	80	64	0	0	0
Tola Karwamarni	578	576	303	273	1	1	0
Kurumtanr	202	55	22	33	0	0	0
Surangi	419	0	0	0	0	0	0
Domohan	234	234	115	119	0	0	0
Tola Gajoraidih	268	0	0	0	0	0	0
Tola Amjora	382	214	113	101	0	0	0
Tola Jatwara	348	37	16	21	0	0	0
Tola Pujhardih	186	0	0	0	0	0	0
Tola Tingharwa	131	0	0	0	0	0	0
Tola Alagdamar	151	69	34	35	0	0	0
Tola Barakol 2	209	33	17	16	0	0	0
Tola Bhairopur	697	662	337	325	2	2	0
Tola Nonia	611	14	6	8	0	0	0
Tola Sidhudih	468	0	0	0	0	0	0
Tola Kumhradih	315	0	0	0	0	0	0
Tola Bagra	1273	413	208	205	1	1	0
Tola Mathura	897	322	172	150	247	119	128
Tola Naraindih	1171	401	217	184	309	158	151
Tola Lalpur	630	38	18	20	393	207	186
Tola Agwani	136	0	0	0	0	0	0
Tola Mahestaria	38	0	0	0	0	0	0
Tola Barne	270	0	0	0	0	0	0
Tola Patardih	86	0	0	0	86	52	34
Tola Raghubardih	14	0	0	0	0	0	0
Tola Akakura	487	0	0	0	376	198	178
Tola Bagaia	219	86	46	40	0	0	0
Tola Domohan	726	0	0	0	0	0	0
Tola Kairajor	374	0	0	0	147	77	70

Tola Chandipirha	309	0	0	0	6	3	3
Tola Beharbari	218	0	0	0	0	0	0
Tola Sato	455	0	0	0	450	230	220
Tola Noadih	370	0	0	0	0	0	0
Tola Birajpur	358	0	0	0	0	0	0
Tola Baratanr	307	0	0	0	130	67	63
Tola AjmerRai	52	0	0	0	48	26	22
Tola BabuMahal	342	195	101	94	120	55	65
Tola Mansaraidih	Uninhabited Village						
Tola Dharhara	457	0	0	0	0	0	0
Tola Simsimkura	139	0	0	0	26	13	13
Tola Mehia Simar	201	1	1	0	200	101	99
Tola Titukura	168	0	0	0	0	0	0
Tola Bhairodih	657	80	49	31	2	0	2
Tola Titipathar	Uninhabited Village						
Tola Chugalia	101	95	48	47	0	0	0
Tola Dudhkira	135	0	0	0	0	0	0
Tola Khargawan	Uninhabited Village						
Tola Mathdih	388	0	0	0	0	0	0
Tola Garbhudih	414	0	0	0	332	158	174
Tola Laluakura	Uninhabited Village						
Tola Alakjara	33	0	0	0	0	0	0
Tola HariaKura	123	0	0	0	122	59	63
Tola Kaljuga	52	0	0	0	0	0	0
Tola Majhli	447	27	15	12	0	0	0
Tola Ranga	14	0	0	0	0	0	0
Tola Ganjira	284	0	0	0	0	0	0
Tola Jahgira	232	11	5	6	0	0	0
Tola Suriadih	252	0	0	0	0	0	0
Tola Kaljuga	Uninhabited Village						
Dhanubasar	4483	386	198	188	83	43	40

Alkosia	1890	0	0	0	0	0	0
Chihutjor	4602	481	260	221	503	251	252
Jogmaran	1389	0	0	0	744	366	378
Tola Kasba	327	79	42	37	0	0	0
Tola Muskrawa	407	0	0	0	166	92	74
Tola Joktaha	453	0	0	0	178	82	96
Pasraha	123	0	0	0	0	0	0
Fatehpur	725	0	0	0	8	4	4
Udaipur	Uninhabited Village						
Kusumjori	1302	774	390	384	1	1	0
Satbhaia	700	15	7	8	0	0	0
Nawadih	33	0	0	0	0	0	0
Jamunia	Uninhabited Village						
Lila Baran	425	0	0	0	0	0	0
Chapridamgi	15	0	0	0	15	8	7
Barahduari	255	130	69	61	0	0	0
Dumarkola	363	0	0	0	24	12	12
Tola Dhawa 2	69	0	0	0	0	0	0
Tola Paharpur	808	284	143	141	130	61	69
Tola Sheikhpura	1130	843	439	404	2	2	0
Domsarni	5627	1738	922	816	581	310	271
Nawada	240	0	0	0	0	0	0
Bhairopur	597	100	51	49	0	0	0
Kolhua	Uninhabited Village						
Tilaiya	895	200	99	101	1	1	0
Kurna	151	150	84	66	0	0	0
Paprewa	679	417	215	202	0	0	0
Dewasi	1470	167	88	79	140	67	73
Bhalua	1184	57	25	32	0	0	0
Tola Dholadanr	45	0	0	0	0	0	0
Tola Salaiya 2	292	0	0	0	0	0	0

Tola Barmasia 3	510	227	111	116	0	0	0
Tola Barakola 1	181	24	12	12	0	0	0
Tola Pachkathia	192	0	0	0	35	18	17
Tola Debiyadih	Uninhabited Village						
Tola Mantari	Uninhabited Village						
Tola Kanaudi	3383	0	0	0	224	105	119
Tola Khurandadhorari	2926	161	86	75	0	0	0
Tola Khuranda	2456	212	112	100	260	136	124
Tola Gopalmaran	460	37	22	15	126	64	62
Tola Bangawan	757	262	149	113	3	1	2
Tola Lilabaran	877	0	0	0	0	0	0
Tola kenuar	271	0	0	0	0	0	0
Tola Tithi Chak	357	0	0	0	0	0	0
Tola Tilauna	563	0	0	0	0	0	0
Tola Bastiyadih	395	0	0	0	0	0	0
Tola Karijhal	489	4	4	0	0	0	0
Tola Bathnabaran	1429	0	0	0	65	31	34
Tola Ghontari	311	0	0	0	48	25	23
Tola Khawa	Uninhabited Village						
Tola Damgitar	429	0	0	0	0	0	0
Tola Nagwe	1989	454	229	225	0	0	0
Tola Taraun	636	0	0	0	0	0	0
Tola Godaia	1695	20	7	13	1	1	0
Tola Pandua	52	8	5	3	0	0	0
Tola Simaltala	976	11	8	3	0	0	0
Tola Siantanr	1660	98	50	48	21	21	0
Tola Baraundhia	668	0	0	0	0	0	0
Tola Majhiakura	137	0	0	0	0	0	0
Tola Pararia	514	0	0	0	0	0	0
Tola Telwabazar	2441	74	38	36	0	0	0

Tola Depura	Uninhabited Village						
Tola Ghasitari	560	0	0	0	0	0	0
Tola Nawadih	848	0	0	0	0	0	0
Tola Dhonrari	715	0	0	0	0	0	0
Tola Chiraiya	1601	749	389	360	0	0	0
Tola Gadi Telwa	1702	224	113	111	66	32	34
Tola Arpathal	Uninhabited Village						
Tola Telwa	567	202	95	107	0	0	0
Tola Burhiabari	668	0	0	0	0	0	0
Tola Pathal Chapti	518	0	0	0	23	12	11
Tola Babudih	309	0	0	0	102	48	54
Tola Ahardih	Uninhabited Village						
Tola Barakola 2	155	0	0	0	0	0	0
Tola Rattidih	109	0	0	0	0	0	0
Tola Salaia	174	0	0	0	0	0	0
Tola Arapathal	274	0	0	0	0	0	0
Tola Bhunra	580	98	54	44	0	0	0
Tola Bajpedih	206	49	26	23	0	0	0
Tola Babudih	237	0	0	0	0	0	0
Tola Asanghatia	313	17	11	6	19	9	10
Tola Basatpur	240	0	0	0	0	0	0
Tola Jamuniatanr	120	0	0	0	0	0	0
TOTAL (10km)	**128356**	**18014**	**9381**	**8633**	**8428**	**4256**	**4172**

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 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 907females 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 915females for every 1000 males in the study area. The child (0-6 yr age) sex ratio of the stud area was observed as 970 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 3.7.**

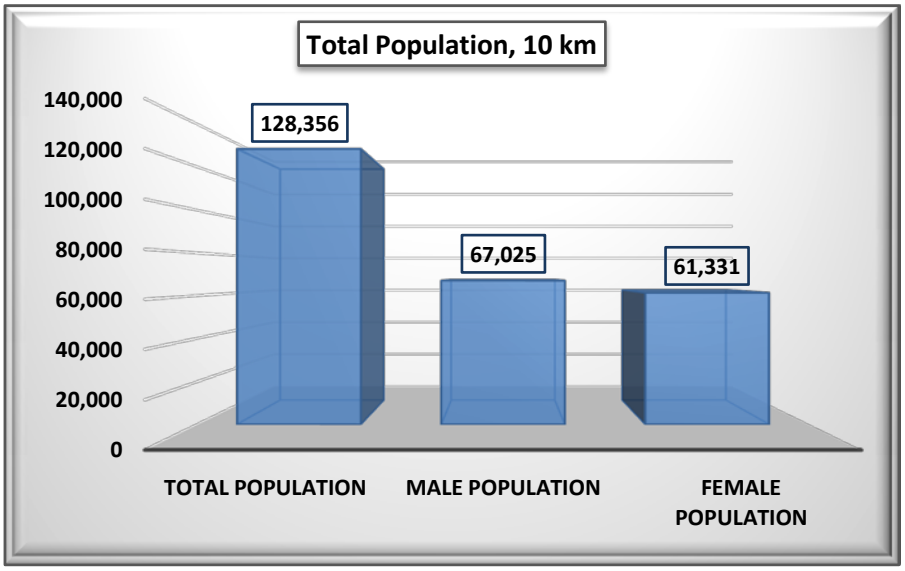


Figure 3.7: Male-Female Wise Population Distribution

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 18014persons consisting of 9381 males and 8633females respectively in the study area which accounts as 14.0% to the total population (128356persons) of the study area. Scheduled Tribes ('ST') population was observed as 8428 persons,accounts as 6.6% to the total population of the study zone consisting of 4256males and 4172females in the 10km radius study zone.It implies that the rest 79.4% of the total population belongs to the general category.

Male-female wise distribution of 'SC' & 'ST' population in the study area is graphically shown in **Figure 3.8 & 3.9** as follows.

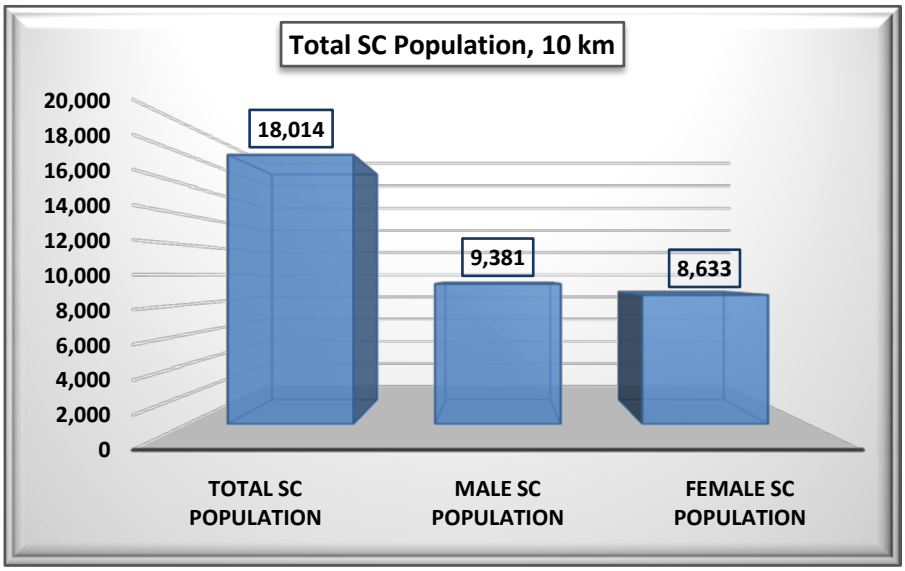


Figure 3.8: Scheduled Caste Population in the Study Area

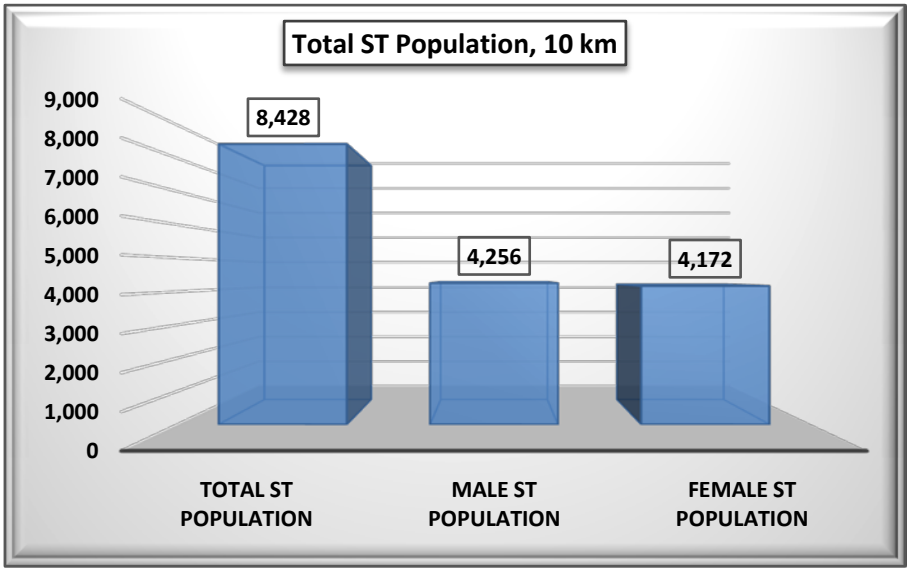


Figure 3.9: Scheduled Tribes Population in the Study Area

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 3.21.** Total literate's population was recorded as 49553 persons (38.6%) in the study area.**Table 3.21** reveals that Male-Female wise literates are observed as 33353 & 16200 persons respectively, implies that the 'Literacy Rate' is recorded as 38.6% with male-female wise percentages being 26.0% &12.6% respectively.

The Male-Female wise graphical representation of literates &illiterate's population in study area villages/town is shown in **Figure 3.10.**

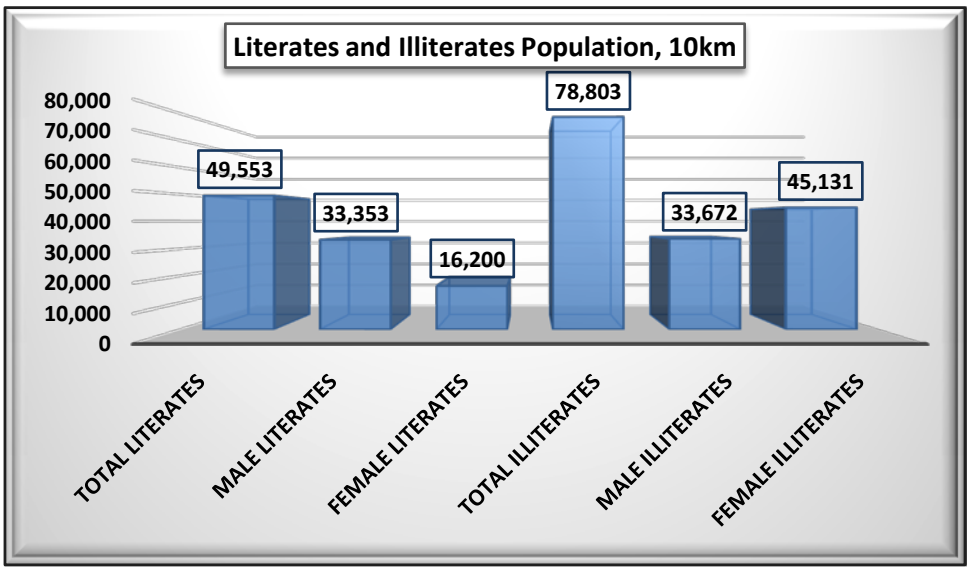


Figure 3.10: Male-Female Wise Distribution of Literates & Illiterates

Table 3.21: Male-Female Wise Literates and Illiterates (10km)

Name of Village/Town	Total Population	Literates			Illiterates		
		Persons	Males	Females	Persons	Males	Females
Tola Bargunia	1193	386	257	129	807	392	415
Tola Paharpur	104	35	17	18	69	32	37
Tola Kolhaidih	4779	1862	1251	611	2917	1216	1701
Tola Kadua	Uninhabited Village						
Tola Haralwa	188	72	44	28	116	42	74
Tola Kohbara	Uninhabited Village						
Tola Barmasia 1	Uninhabited Village						
Tola Pairu-rai-dih	112	36	27	9	76	29	47
Tola Jhilua	1284	258	195	63	1026	448	578
Tola Chhira	1482	468	324	144	1014	437	577
Tola Paharpur	1007	354	247	107	653	280	373
Tola Phulhara	1275	476	304	172	799	348	451

Tola Hathia Jharna	Uninhabited Village						
Tola Durgapur	25	9	9	0	16	7	9
Tola Lilabaran	530	106	74	32	424	212	212
Tola Kusumghat	452	206	125	81	246	118	128
Tola Budhnadih	Uninhabited Village						
Tola Singhna	104	15	11	4	89	42	47
Tola Dighibari	467	133	105	28	334	130	204
Tola Barmasia 2	951	344	238	106	607	259	348
Tola Gundra	439	182	138	44	257	98	159
Tola Barakol 1	191	56	39	17	135	56	79
Tola Makunda	147	72	52	20	75	27	48
Tola Kathradih	43	16	12	4	27	13	14
Tola Phuljora	457	189	130	59	268	92	176
Tola Pipradih	Uninhabited Village						
Tola Goura	134	29	21	8	105	50	55
Tola Dari	333	89	59	30	244	116	128
Tola Sikarhar	20	2	2	0	18	9	9
Tola Dhare	Uninhabited Village						
Tola Dumduma	Uninhabited Village						
Tola Kairwa	20	14	7	7	6	1	5
Tola Paisaljori	Uninhabited Village						
Tola Kulhara	Uninhabited Village						
Tola Chhatiani	Uninhabited Village						
Tola Dudhijharna	Uninhabited Village						
Tola Amjhari	Uninhabited Village						
Tola Khamaruadih	112	12	9	3	100	51	49
Tola Auraia	248	43	35	8	205	88	117
Tola Lalchanddih	172	35	25	10	137	67	70
Tola Dhanouchhi	918	319	222	97	599	269	330
Tola Tari	445	209	131	78	236	105	131
Tola Dhaknatari	Uninhabited Village						

Tola Katsakra	593	240	158	82	353	152	201
Tola Pirra	1266	355	240	115	911	457	454
Tola Gohli	173	23	17	6	150	73	77
Tola Sarkanda	743	327	221	106	416	163	253
Tola Jaro Pahri	430	115	88	27	315	145	170
Tola kurumtanr	539	114	84	30	425	194	231
Tola Surangi	309	51	43	8	258	116	142
Tola Chamardiha	479	168	125	43	311	140	171
Tola Asuraha	904	185	124	61	719	331	388
Tola Motidih	Uninhabited Village						
Tola Majhiladih	828	205	153	52	623	287	336
Tola Dharmadih	165	58	42	16	107	45	62
Tola Bakidih	276	80	62	18	196	72	124
Tola Sahdewa	Uninhabited Village						
Tola Majhila dih	453	85	69	16	368	178	190
Tola Nanhuakura	233	22	17	5	211	105	106
Tola Hardi Khurd	310	31	23	8	279	133	146
Tola Hardia Kalan	202	63	49	14	139	61	78
Tola Gundra Diha	Uninhabited Village						
Tola Purni Pararia	141	17	13	4	124	53	71
Tola Karma Tanr	134	45	38	7	89	36	53
Tola Pararia	79	25	18	7	54	25	29
Tola Semratanr	406	77	45	32	329	149	180
Tola Bargoian	215	46	26	20	169	87	82
Tola Dihabara Khurd	146	25	13	12	121	61	60
Tola Dihbara Kalan	318	62	41	21	256	126	130
Tola Jhajhraha	Uninhabited Village						
Tola Raino Jharna	112	21	16	5	91	37	54
Tola Larhania	753	238	172	66	515	220	295
Tola Guhjora	757	326	222	104	431	172	259
Tola Kusumghat	402	109	81	28	293	134	159

Tola Kurawa	Uninhabited Village						
Tola Subhasinghdih	183	69	50	19	114	49	65
Tola Pesarha	188	77	46	31	111	50	61
Tola Berar	280	126	81	45	154	60	94
Tola Salaiya 1	452	231	167	64	221	83	138
Tola Kanodih	529	154	136	18	375	128	247
Tola Tahkwani	1610	702	486	216	908	358	550
Tola Goraiadih	66	27	21	6	39	12	27
Tola Pandwara	Uninhabited Village						
Tola Sejua	Uninhabited Village						
Tola Bharwakura	Uninhabited Village						
Tola Letwakura	Uninhabited Village						
Tola Pesarhakura	Uninhabited Village						
Tola Chandikumarthan	Uninhabited Village						
Tola Musahra dih	285	53	39	14	232	120	112
Tola Laiadih	10	2	2	0	8	4	4
Tola Targaon	375	110	83	27	265	112	153
Tola Paipartargaon	134	37	26	11	97	45	52
Tola Chandwari	865	383	261	122	482	189	293
Tola Kumaraindih	Uninhabited Village						
Tola Manhankharna	Uninhabited Village						
Tola Kesuadih	Uninhabited Village						
Tola Bharsar	780	258	207	51	522	193	329
Tola Sattighat	193	107	67	40	86	42	44
Tola Mohandih	760	406	247	159	354	127	227
Tola Hiraraidih	1001	376	268	108	625	256	369
Tola Akakura	231	76	60	16	155	67	88
Tola Ujradih	93	23	19	4	70	33	37
Tola Tengdhowa	Uninhabited Village						
Tola Kenhuwar	29	4	4	0	25	11	14

Tola Chitakhar	1410	646	421	225	764	307	457
Tola Akluraidih	Uninhabited Village						
Tola Dholdar	297	192	124	68	105	44	61
Tola Dhawa 1	607	159	120	39	448	195	253
Tola TutaKura	Uninhabited Village						
Tola Chunwani	Uninhabited Village						
Tola Ahira	403	250	143	107	153	70	83
Tola Champatari	233	140	79	61	93	49	44
Tola Narainpur	292	151	95	56	141	49	92
Tola Goriamma	689	221	122	99	468	210	258
Tola Pipradih	648	360	255	105	288	96	192
Tola Gobardaha	213	92	70	22	121	49	72
Tola Darhwa	573	241	167	74	332	138	194
Tola Kharna	572	245	173	72	327	137	190
Tola Karwamarni	578	229	162	67	349	143	206
Kurumtanr	202	82	55	27	120	43	77
Surangi	419	214	150	64	205	63	142
Domohan	234	95	64	31	139	51	88
Tola Gajoraidih	268	132	69	63	136	62	74
Tola Amjora	382	92	73	19	290	128	162
Tola Jatwara	348	190	126	64	158	56	102
Tola Pujhardih	186	77	64	13	109	46	63
Tola Tingharwa	131	54	37	17	77	31	46
Tola Alagdamar	151	87	49	38	64	32	32
Tola Barakol 2	209	67	42	25	142	66	76
Tola Bhairopur	697	265	200	65	432	157	275
Tola Nonia	611	191	130	61	420	209	211
Tola Sidhudih	468	208	139	69	260	99	161
Tola Kumhradih	315	127	85	42	188	86	102
Tola Bagra	1273	660	417	243	613	250	363
Tola Mathura	897	317	221	96	580	251	329

Tola Naraindih	1171	572	372	200	599	243	356
Tola Lalpur	630	306	201	105	324	124	200
Tola Agwani	136	50	35	15	86	36	50
Tola Mahestaria	38	14	7	7	24	7	17
Tola Barne	270	89	59	30	181	83	98
Tola Patardih	86	29	23	6	57	29	28
Tola Raghubardih	14	6	3	3	8	1	7
Tola Akakura	487	224	142	82	263	118	145
Tola Bagaia	219	58	47	11	161	62	99
Tola Domohan	726	187	141	46	539	240	299
Tola Kairajor	374	112	74	38	262	117	145
Tola Chandipirha	309	59	46	13	250	107	143
Tola Beharbari	218	132	88	44	86	34	52
Tola Sato	455	219	141	78	236	91	145
Tola Noadih	370	111	73	38	259	116	143
Tola Birajpur	358	122	89	33	236	106	130
Tola Baratanr	307	105	72	33	202	91	111
Tola AjmerRai	52	22	17	5	30	12	18
Tola BabuMahal	342	169	107	62	173	67	106
Tola Mansaraidih	Uninhabited Village						
Tola Dharhara	457	67	44	23	390	208	182
Tola Simsimkura	139	49	31	18	90	42	48
Tola Mehia Simar	201	112	62	50	89	40	49
Tola Titukura	168	59	40	19	109	50	59
Tola Bhairodih	657	393	243	150	264	117	147
Tola Titipathar	Uninhabited Village						
Tola Chugalia	101	25	16	9	76	35	41
Tola Dudhkira	135	84	50	34	51	24	27
Tola Khargawan	Uninhabited Village						
Tola Mathdih	388	68	50	18	320	149	171
Tola Garbhudih	414	109	61	48	305	148	157

Tola Laluakura	Uninhabited Village						
Tola Alakjara	33	12	8	4	21	7	14
Tola HariaKura	123	62	34	28	61	26	35
Tola Kaljuga	52	15	11	4	37	15	22
Tola Majhli	447	129	90	39	318	150	168
Tola Ranga	14	5	3	2	9	4	5
Tola Ganjira	284	59	47	12	225	105	120
Tola Jahgira	232	36	19	17	196	99	97
Tola Suriadih	252	45	36	9	207	96	111
Tola Kaljuga	Uninhabited Village						
Dhanubasar	4483	1666	1139	527	2817	1189	1628
Alkosia	1890	766	541	225	1124	458	666
Chihutjor	4602	1526	1020	506	3076	1354	1722
Jogmaran	1389	314	219	95	1075	481	594
Tola Kasba	327	100	79	21	227	101	126
Tola Muskrawa	407	100	78	22	307	144	163
Tola Joktaha	453	120	80	40	333	139	194
Pasraha	123	43	30	13	80	36	44
Fatehpur	725	297	179	118	428	207	221
Udaipur	Uninhabited Village						
Kusumjori	1302	514	336	178	788	344	444
Satbhaia	700	304	244	60	396	132	264
Nawadih	33	9	6	3	24	7	17
Jamunia	Uninhabited Village						
Lila Baran	425	102	68	34	323	147	176
Chapridamgi	15	3	3	0	12	5	7
Barahduari	255	100	61	39	155	70	85
Dumarkola	363	152	108	44	211	79	132
Tola Dhawa 2	69	30	25	5	39	15	24
Tola Paharpur	808	337	226	111	471	189	282
Tola Sheikhpura	1130	597	377	220	533	213	320

Domsarni	5627	2355	1524	831	3272	1494	1778
Nawada	240	111	84	27	129	47	82
Bhairopur	597	123	76	47	474	230	244
Kolhua	Uninhabited Village						
Tilaiya	895	368	246	122	527	216	311
Kurna	151	73	47	26	78	37	41
Paprewa	679	151	87	64	528	262	266
Dewasi	1470	628	434	194	842	339	503
Bhalua	1184	585	376	209	599	237	362
Tola Dholadanr	45	14	12	2	31	11	20
Tola Salaiya 2	292	99	81	18	193	78	115
Tola Barmasia 3	510	102	75	27	408	191	217
Tola Barakola 1	181	60	35	25	121	58	63
Tola Pachkathia	192	73	50	23	119	50	69
Tola Debiyadih	Uninhabited Village						
Tola Mantari	Uninhabited Village						
Tola Kanaudi	3383	1109	835	274	2274	926	1348
Tola Khurandadhorari	2926	1066	751	315	1860	768	1092
Tola Khuranda	2456	935	655	280	1521	643	878
Tola Gopalmaran	460	162	107	55	298	138	160
Tola Bangawan	757	333	195	138	424	207	217
Tola Lilabaran	877	361	270	91	516	180	336
Tola kenuar	271	112	75	37	159	67	92
Tola Tithi Chak	357	92	61	31	265	125	140
Tola Tilauna	563	217	147	70	346	148	198
Tola Bastiyadih	395	202	127	75	193	71	122
Tola Karijhal	489	60	38	22	429	219	210
Tola Bathnabaran	1429	450	305	145	979	397	582
Tola Ghontari	311	85	44	41	226	113	113
Tola Khawa	Uninhabited Village						

Tola Damgitar	429	40	32	8	389	200	189
Tola Nagwe	1989	890	630	260	1099	410	689
Tola Taraun	636	343	240	103	293	84	209
Tola Godaia	1695	900	600	300	795	278	517
Tola Pandua	52	24	15	9	28	9	19
Tola Simaltala	976	661	392	269	315	106	209
Tola Siantanr	1660	784	508	276	876	361	515
Tola Baraundhia	668	335	224	111	333	127	206
Tola Majhiakura	137	69	42	27	68	26	42
Tola Pararia	514	152	99	53	362	165	197
Tola Telwabazar	2441	1745	999	746	696	268	428
Tola Depura	Uninhabited Village						
Tola Ghasitari	560	307	209	98	253	101	152
Tola Nawadih	848	467	307	160	381	152	229
Tola Dhonrari	715	319	217	102	396	181	215
Tola Chiraiya	1601	838	517	321	763	325	438
Tola Gadi Telwa	1702	815	535	280	887	355	532
Tola Arpathal	Uninhabited Village						
Tola Telwa	567	183	106	77	384	184	200
Tola Burhiabari	668	279	186	93	389	159	230
Tola Pathal Chapti	518	256	163	93	262	122	140
Tola Babudih	309	82	44	38	227	104	123
Tola Ahardih	Uninhabited Village						
Tola Barakola 2	155	63	42	21	92	35	57
Tola Rattidih	109	64	37	27	45	15	30
Tola Salaia	174	75	51	24	99	30	69
Tola Arapathal	274	117	94	23	157	69	88
Tola Bhunra	580	238	178	60	342	133	209
Tola Bajpedih	206	69	56	13	137	59	78
Tola Babudih	237	79	56	23	158	64	94
Tola Asanghatia	313	107	80	27	206	81	125

Tola Basatpur	240	126	88	38	114	45	69
Tola Jamuniatanr	120	60	36	24	60	21	39
TOTAL (10km)	**128356**	**49553**	**33353**	**16200**	**78803**	**33672**	**45131**
Source-Census of India, 2011							

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 inorder 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 23920 (19.0%) and 27070(21.0%) to the total population (128356), while the remaining 77366(60.0%) 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 3.22.**

Table 3.22: Village-wise Occupational Pattern (10km)

Name of the Village/Town	MAIN WORK_P	MAIN_CL_P	MAIN_AL_P	MAIN_HH_P	MAIN_OT_P	MARG WORK_P	MARG_CL_P	MARG_AL_P	MARG_HH_P	MARG_OT_P
Tola Bargunia	121	10	104	0	7	344	120	224	0	0
Tola Paharpur	17	0	17	0	0	0	0	0	0	0
Tola Kolhaidih	420	75	315	2	28	2041	1213	665	7	156
Tola Kadua	Uninhabited Village									
Tola Haralwa	54	3	50	0	1	5	0	3	0	2
Tola Kohbara	Uninhabited Village									
Tola Barmasia 1	Uninhabited Village									
Tola Pairu-rai-dih	3	3	0	0	0	50	14	33	1	2
Tola Jhilua	160	8	143	0	9	223	5	217	0	1
Tola Chhira	153	6	134	0	13	377	29	345	0	3
Tola Paharpur	190	43	138	0	9	134	0	134	0	0
Tola Phulhara	266	138	79	1	48	279	22	70	169	18
Tola Hathia Jharna	Uninhabited Village									
Tola Durgapur	2	1	0	1	0	12	3	2	0	7
Tola Lilabaran	83	9	17	41	16	231	32	14	145	40
Tola Kusumghat	66	14	45	0	7	97	10	87	0	0

Tola Budhnadih	Uninhabited Village									
Tola Singhna	0	0	0	0	0	32	4	28	0	0
Tola Dighibari	8	1	4	0	3	147	18	126	1	2
Tola Barmasia 2	11	2	1	0	8	447	2	317	59	69
Tola Gundra	16	2	7	0	7	95	42	53	0	0
Tola Barakol 1	36	15	21	0	0	87	2	85	0	0
Tola Makunda	3	3	0	0	0	44	27	16	0	1
Tola Kathradih	11	5	6	0	0	5	0	4	0	1
Tola Phuljora	111	58	52	0	1	159	2	157	0	0
Tola Pipradih	Uninhabited Village									
Tola Goura	35	17	18	0	0	32	15	17	0	0
Tola Dari	91	54	37	0	0	42	19	23	0	0
Tola Sikarhar	4	2	2	0	0	4	4	0	0	0
Tola Dhare	Uninhabited Village									
Tola Dumduma	Uninhabited Village									
Tola Kairwa	1	0	0	0	1	11	4	1	0	6
Tola Paisaljori	Uninhabited Village									
Tola Kulhara	Uninhabited Village									
Tola Chhatiani	Uninhabited Village									

Tola Dudhijharna	Uninhabited Village									
Tola Amjhari	Uninhabited Village									
Tola Khamaruadih	0	0	0	0	0	68	68	0	0	0
Tola Auraia	0	0	0	0	0	149	149	0	0	0
Tola Lalchanddih	40	29	5	0	6	48	18	23	0	7
Tola Dhanouchhi	201	97	40	45	19	251	145	97	2	7
Tola Tari	166	162	3	1	0	22	6	13	2	1
Tola Dhaknatari	Uninhabited Village									
Tola Katsakra	23	17	2	0	4	196	0	196	0	0
Tola Pirra	40	23	1	0	16	368	240	117	2	9
Tola Gohli	0	0	0	0	0	95	9	86	0	0
Tola Sarkanda	59	32	1	0	26	99	3	96	0	0
Tola Jaro Pahri	28	4	19	0	5	0	0	0	0	0
Tola kurumtanr	108	1	98	0	9	29	0	26	0	3
Tola Surangi	83	1	81	0	1	4	0	4	0	0
Tola Chamardiha	141	133	2	0	6	3	2	1	0	0
Tola Asuraha	154	77	62	0	15	65	0	64	0	1
Tola Motidih	Uninhabited Village									
Tola Majhiladih	2	0	0	0	2	267	144	120	1	2

Tola Dharmadih	2	1	1	0	0	41	3	37	0	1
Tola Bakidih	3	1	2	0	0	77	12	65	0	0
Tola Sahdewa	Uninhabited Village									
Tola Majhila dih	266	4	246	6	10	5	0	5	0	0
Tola Nanhuakura	136	132	0	3	1	3	1	0	0	2
Tola Hardi Khurd	105	38	66	0	1	4	1	2	0	1
Tola Hardia Kalan	64	53	5	0	6	1	0	0	1	0
Tola Gundra Diha	Uninhabited Village									
Tola Purni Pararia	4	0	3	0	1	46	8	38	0	0
Tola Karma Tanr	36	30	6	0	0	5	1	4	0	0
Tola Pararia	22	1	21	0	0	1	0	1	0	0
Tola Semratanr	116	12	102	1	1	30	2	22	4	2
Tola Bargoian	58	34	23	0	1	2	0	1	0	1
Tola Dihabara Khurd	34	1	33	0	0	18	5	7	6	0
Tola Dihbara Kalan	91	37	53	0	1	1	0	1	0	0
Tola Jhajhraha	Uninhabited Village									
Tola Raino Jharna	30	3	27	0	0	0	0	0	0	0
Tola Larhania	39	0	0	0	39	380	94	58	5	223
Tola Guhjora	20	2	5	0	13	402	211	190	0	1

Tola Kusumghat	58	19	29	10	0	185	43	119	20	3
Tola Kurawa	Uninhabited Village									
Tola Subhasinghdih	19	14	1	4	0	88	19	58	11	0
Tola Pesarha	2	1	1	0	0	102	17	73	11	1
Tola Berar	78	39	27	0	12	0	0	0	0	0
Tola Salaiya 1	135	59	60	10	6	0	0	0	0	0
Tola Kanodih	99	28	3	64	4	261	57	3	195	6
Tola Tahkwani	257	78	87	64	28	416	188	130	81	17
Tola Goraiadih	39	0	39	0	0	0	0	0	0	0
Tola Pandwara	Uninhabited Village									
Tola Sejua	Uninhabited Village									
Tola Bharwakura	Uninhabited Village									
Tola Letwakura	Uninhabited Village									
Tola Pesarhakura	Uninhabited Village									
Tola Chandikumarthan	Uninhabited Village									
Tola Musahra dih	1	1	0	0	0	88	31	56	0	1
Tola Laiadih	1	0	0	1	0	0	0	0	0	0
Tola Targaon	2	1	0	0	1	114	32	82	0	0

Tola Paipartargaon	1	0	0	0	1	38	11	27	0	0
Tola Chandwari	191	53	125	1	12	107	62	7	0	38
Tola Kumaraindih	Uninhabited Village									
Tola Manhankharna	Uninhabited Village									
Tola Kesuadih	Uninhabited Village									
Tola Bharsar	187	181	3	2	1	180	5	173	1	1
Tola Sattighat	72	30	41	0	1	3	0	3	0	0
Tola Mohandih	6	1	0	0	5	364	49	188	14	113
Tola Hiraraidih	201	63	8	49	81	54	14	21	1	18
Tola Akakura	58	47	0	0	11	0	0	0	0	0
Tola Ujradih	21	2	3	7	9	14	0	12	1	1
Tola Tengdhowa	Uninhabited Village									
Tola Kenhuwar	8	6	0	0	2	0	0	0	0	0
Tola Chitakhar	287	102	7	10	168	68	1	57	0	10
Tola Akluraidih	Uninhabited Village									
Tola Dholdar	82	0	40	0	42	0	0	0	0	0
Tola Dhawa 1	151	2	45	5	99	15	4	4	0	7
Tola TutaKura	Uninhabited Village									
Tola Chunwani	Uninhabited Village									

Tola Ahira	114	31	79	0	4	0	0	0	0	0
Tola Champatari	64	8	56	0	0	1	0	1	0	0
Tola Narainpur	67	52	14	0	1	49	2	46	1	0
Tola Goriamma	270	97	87	70	16	14	0	12	1	1
Tola Pipradih	107	5	65	0	37	142	87	49	0	6
Tola Gobardaha	71	46	23	0	2	17	2	15	0	0
Tola Darhwa	6	0	1	0	5	141	141	0	0	0
Tola Kharna	41	15	1	15	10	205	127	75	0	3
Tola Karwamarni	2	0	0	0	2	351	177	174	0	0
Kurumtanr	36	31	0	0	5	75	0	71	1	3
Surangi	54	48	0	0	6	167	1	108	3	55
Domohan	9	4	0	0	5	75	65	9	1	0
Tola Gajoraidih	23	23	0	0	0	57	0	54	0	3
Tola Amjora	115	35	13	61	6	105	4	0	96	5
Tola Jatwara	56	51	2	0	3	38	0	38	0	0
Tola Pujhardih	66	53	7	3	3	37	1	6	28	2
Tola Tingharwa	21	20	1	0	0	13	0	9	0	4
Tola Alagdamar	19	18	1	0	0	18	1	17	0	0
Tola Barakol 2	30	29	1	0	0	19	1	18	0	0

Tola Bhairopur	379	11	5	338	25	6	1	0	4	1
Tola Nonia	221	215	0	5	1	20	15	1	1	3
Tola Sidhudih	9	7	0	0	2	126	56	59	5	6
Tola Kumhradih	7	0	0	0	7	75	62	13	0	0
Tola Bagra	670	341	283	1	45	8	3	2	1	2
Tola Mathura	107	98	0	0	9	140	0	138	1	1
Tola Naraindih	566	135	416	0	15	26	1	25	0	0
Tola Lalpur	48	1	24	1	22	243	1	154	2	86
Tola Agwani	44	0	44	0	0	28	0	28	0	0
Tola Mahestaria	7	0	0	0	7	10	1	3	0	6
Tola Barne	43	0	4	0	39	94	0	5	2	87
Tola Patardih	29	13	2	1	13	15	1	5	3	6
Tola Raghubardih	2	0	0	0	2	3	0	0	0	3
Tola Akakura	421	3	412	0	6	11	1	6	0	4
Tola Bagaia	171	0	170	0	1	4	0	4	0	0
Tola Domohan	331	325	1	0	5	4	3	1	0	0
Tola Kairajor	200	149	47	2	2	1	0	1	0	0
Tola Chandipirha	137	93	43	1	0	42	1	40	1	0
Tola Beharbari	112	35	72	3	2	4	1	3	0	0

Tola Sato	223	50	160	2	11	7	5	0	0	2
Tola Noadih	87	66	19	0	2	2	1	1	0	0
Tola Birajpur	77	54	16	0	7	18	1	16	0	1
Tola Baratanr	161	130	25	0	6	6	2	3	1	0
Tola AjmerRai	20	15	1	0	4	6	1	5	0	0
Tola BabuMahal	150	12	122	0	16	1	0	1	0	0
Tola Mansaraidih	Uninhabited Village									
Tola Dharhara	237	118	115	0	4	2	1	1	0	0
Tola Simsimkura	4	2	0	0	2	76	0	0	0	76
Tola Mehia Simar	9	0	0	0	9	98	0	6	3	89
Tola Titukura	14	2	0	0	12	97	0	0	0	97
Tola Bhairodih	64	13	0	1	50	261	106	147	2	6
Tola Titipathar	Uninhabited Village									
Tola Chugalia	0	0	0	0	0	57	0	56	1	0
Tola Dudhkira	69	8	53	0	8	5	0	5	0	0
Tola Khargawan	Uninhabited Village									
Tola Mathdih	71	1	56	1	13	38	0	2	0	36
Tola Garbhudih	1	0	0	0	1	205	0	202	1	2
Tola Laluakura	Uninhabited Village									

Tola Alakjara	0	0	0	0	0	15	0	15	0	0
Tola HariaKura	19	0	12	0	7	27	0	7	0	20
Tola Kaljuga	1	0	1	0	0	16	0	12	0	4
Tola Majhli	132	69	61	0	2	119	3	116	0	0
Tola Ranga	0	0	0	0	0	4	0	4	0	0
Tola Ganjira	132	0	65	67	0	1	0	1	0	0
Tola Jahgira	52	0	52	0	0	53	0	52	1	0
Tola Suriadih	116	0	113	3	0	8	0	8	0	0
Tola Kaljuga	Uninhabited Village									
Dhanubasar	333	203	22	17	91	951	82	700	15	154
Alkosia	39	28	2	0	9	431	14	408	3	6
Chihutjor	509	82	204	53	170	1043	315	635	29	64
Jogmaran	494	46	425	19	4	148	0	141	0	7
Tola Kasba	0	0	0	0	0	184	0	184	0	0
Tola Muskrawa	0	0	0	0	0	218	0	217	1	0
Tola Joktaha	1	0	0	0	1	237	27	202	2	6
Pasraha	2	2	0	0	0	57	40	16	0	1
Fatehpur	8	0	0	0	8	386	44	259	77	6
Udaipur	Uninhabited Village									

Kusumjori	114	58	7	0	49	378	122	241	1	14
Satbhaia	17	7	3	0	7	322	85	231	0	6
Nawadih	0	0	0	0	0	13	13	0	0	0
Jamunia	Uninhabited Village									
Lila Baran	83	48	8	0	27	133	99	18	1	15
Chapridamgi	3	3	0	0	0	8	8	0	0	0
Barahduari	30	19	3	0	8	86	34	49	0	3
Dumarkola	160	34	126	0	0	0	0	0	0	0
Tola Dhawa 2	17	15	2	0	0	11	2	9	0	0
Tola Paharpur	179	86	55	28	10	52	2	33	17	0
Tola Sheikhpura	267	94	133	1	39	49	1	0	0	48
Domsarni	523	210	149	94	70	1632	207	1397	9	19
Nawada	4	0	3	0	1	68	0	68	0	0
Bhairopur	177	27	137	1	12	65	3	62	0	0
Kolhua	Uninhabited Village									
Tilaiya	101	5	88	2	6	260	7	248	3	2
Kurna	12	0	8	1	3	36	1	33	0	2
Paprewa	214	179	1	13	21	31	8	7	3	13
Dewasi	174	134	38	0	2	632	299	263	0	70

Bhalua	228	123	55	50	0	365	273	68	20	4
Tola Dholadanr	0	0	0	0	0	17	1	7	0	9
Tola Salaiya 2	49	11	29	5	4	24	10	8	0	6
Tola Barmasia 3	109	101	4	0	4	217	214	2	0	1
Tola Barakola 1	62	29	17	14	2	29	1	12	15	1
Tola Pachkathia	55	54	0	1	0	55	0	0	55	0
Tola Debiyadih	Uninhabited Village									
Tola Mantari	Uninhabited Village									
Tola Kanaudi	663	13	34	470	146	636	6	218	158	254
Tola Khurandadhorari	705	17	117	167	404	388	12	131	119	126
Tola Khuranda	601	216	279	4	102	432	14	275	54	89
Tola Gopalmaran	99	1	70	3	25	112	4	89	13	6
Tola Bangawan	251	52	130	46	23	23	2	4	2	15
Tola Lilabaran	237	1	227	0	9	36	0	29	6	1
Tola kenuar	63	36	0	24	3	31	0	0	31	0
Tola Tithi Chak	102	0	54	0	48	0	0	0	0	0
Tola Tilauna	55	1	14	0	40	223	0	32	7	184
Tola Bastiyadih	55	0	13	15	27	66	0	51	5	10

Tola Karijhal	142	4	0	2	136	98	0	0	8	90
Tola Bathnabaran	351	288	45	4	14	18	12	5	0	1
Tola Ghontari	164	5	159	0	0	3	0	3	0	0
Tola Khawa	Uninhabited Village									
Tola Damgitar	126	2	124	0	0	3	0	3	0	0
Tola Nagwe	337	9	275	17	36	519	122	317	19	61
Tola Taraun	203	143	59	1	0	6	4	0	0	2
Tola Godaia	463	14	72	28	349	298	19	262	2	15
Tola Pandua	5	4	0	0	1	3	1	1	1	0
Tola Simaltala	139	15	8	3	113	127	4	63	0	60
Tola Siantanr	182	52	4	2	124	437	58	194	72	113
Tola Baraundhia	28	1	1	4	22	265	18	98	43	106
Tola Majhiakura	2	0	1	0	1	46	15	21	1	9
Tola Pararia	83	22	55	2	4	171	9	148	10	4
Tola Telwabazar	582	7	114	14	447	142	1	52	22	67
Tola Depura	Uninhabited Village									
Tola Ghasitari	159	158	0	1	0	9	0	0	9	0
Tola Nawadih	136	38	92	3	3	52	14	32	4	2
Tola Dhonrari	166	37	125	2	2	27	3	24	0	0

Tola Chiraiya	239	9	22	199	9	319	3	267	47	2
Tola Gadi Telwa	508	132	190	102	84	136	3	28	96	9
Tola Arpathal	Uninhabited Village									
Tola Telwa	55	2	17	7	29	132	1	75	36	20
Tola Burhiabari	178	0	171	0	7	2	0	1	0	1
Tola Pathal Chapti	143	140	1	0	2	0	0	0	0	0
Tola Babudih	56	0	55	0	1	89	2	83	2	2
Tola Ahardih	Uninhabited Village									
Tola Barakola 2	66	32	34	0	0	1	0	1	0	0
Tola Rattidih	23	7	4	11	1	29	8	9	7	5
Tola Salaia	7	1	2	0	4	88	1	51	35	1
Tola Arapathal	19	3	8	0	8	145	7	82	46	10
Tola Bhunra	223	60	43	0	120	113	59	33	1	20
Tola Bajpedih	16	15	1	0	0	120	95	16	0	9
Tola Babudih	16	13	0	0	3	135	123	6	0	6
Tola Asanghatia	17	13	0	0	4	173	156	8	0	9
Tola Basatpur	54	24	29	0	1	69	19	43	3	4
Tola Jamuniatanr	34	32	0	0	2	29	29	0	0	0
TOTAL (10km)	**23920**	**7870**	**9529**	**2333**	**4188**	**27070**	**6854**	**15031**	**2010**	**3175**

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:

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 in household industries, **MARG_OT_P :** Marginal other workers Population

Distribution of work participation rate of the study area population is shown in **Table 3.23** as follows;

Table 3.23: Distribution of Work Participation Rate (10km)

Occupation Class	**Year, 2011**
Main Workers	**23920 (19.0%)**
Male	17593(73.5%)
Female	6327(26.5%)
Marginal Workers	**27070(21.0%)**
Male	16183(59.8%)
Female	10887(40.2%)
Non-Workers	**77366(60.0%)**
Male	33249 (43.0%)
Female	44117(57.0%)
Total Population (10km)	**128356**
Source: Census of India Records, 2011	

Graphical representation of Workers Scenario is given below as **Figure 3.11.**

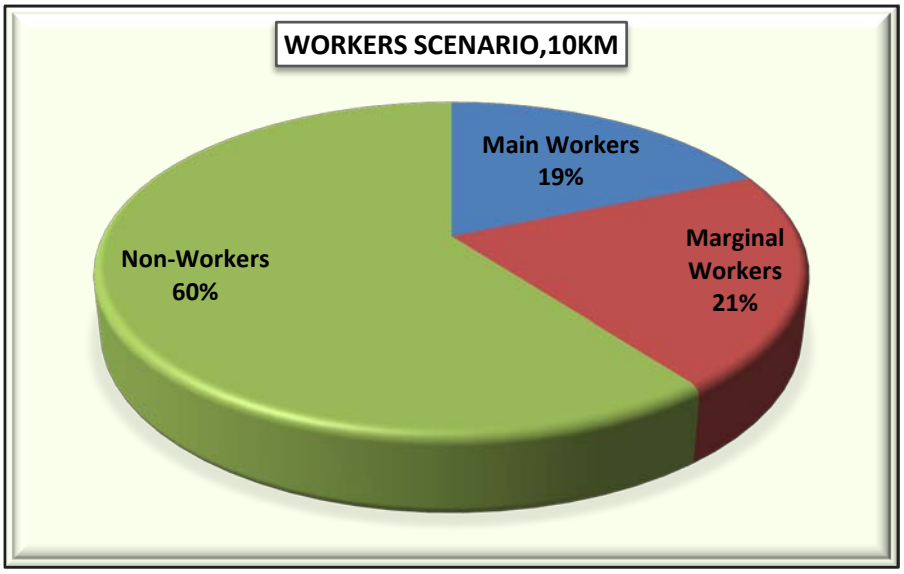


Figure 3.11: Workers Scenario of Study Area

Composition of Main Workers:

The 'Main Workers' were observed as 23920persons (19.0%) to the total population (128356) of the study area and its composition is made-up of Casual laborers as 7870 (33.0%), Agricultural laborers as 9529(40.0%), Household workers 2333(10.0%) and other workers as 4188(17.0%) respectively.

Composition of Main workers is shown below as **Figure 3.12.**

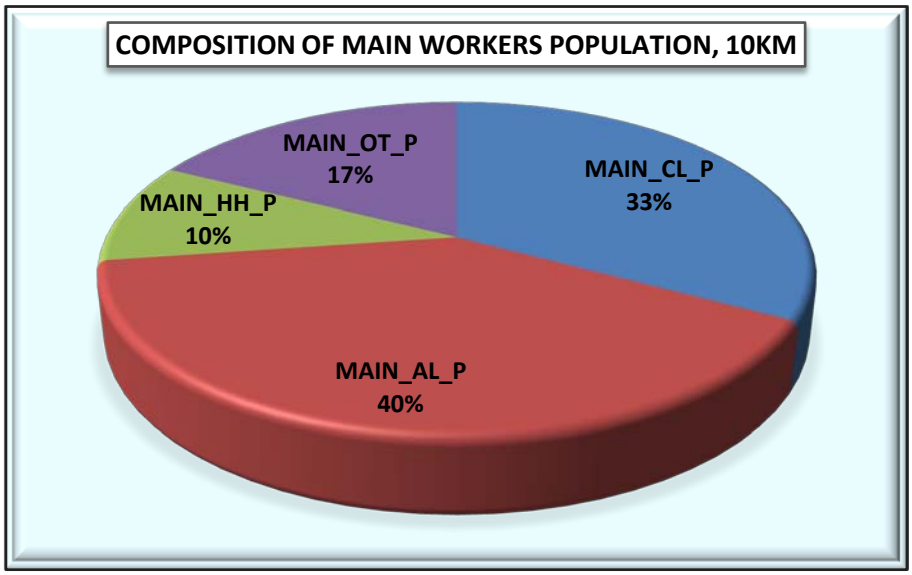


Figure 3.12: Composition of Main Workers Population

Composition of Marginal Workers:

The total marginal workers are observed as 27070 which constitute 21.0% to the total population (128356) comprising of Marginal Casual Laborers as 6854 (25.0%), Marginal Agricultural Laborers as 15031(56.0%), Marginal Household laborers as 2010 (7.0%) and marginal other workers were also observed as 3175 (12.0%) of the total marginal workers respectively.

Details about marginal workers in the study area are tabulated in **Table 3.23.** Composition of Marginal workers is shown in **Figure 3.13** as follows.

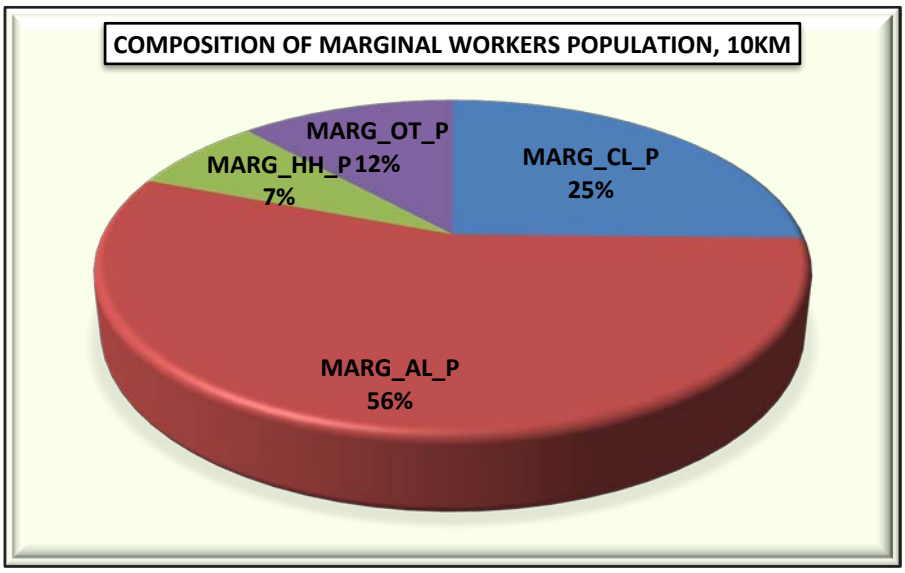


Figure 3.13: Composition of Marginal Workers

Composition of Non-Workers:

The total Non-worker's population was observed as 77366which accounts60.0% to the total population (128356) of the study area. Male-female wise Non-worker's population was recorded as 33249 Males (43.0%) and 44117Females (57.0%) respectively.

Details about Total Non-workers in the study area are compiled in **Table 3.24.** Graphical representation of Non-worker's population is shown as follows in **Figure 3.14.**

Table 3.24: Composition of Non-Workers

Non-Workers Population		
Persons	**Males**	**Females**
77366	33249 (43.0%)	44117(57.0%)

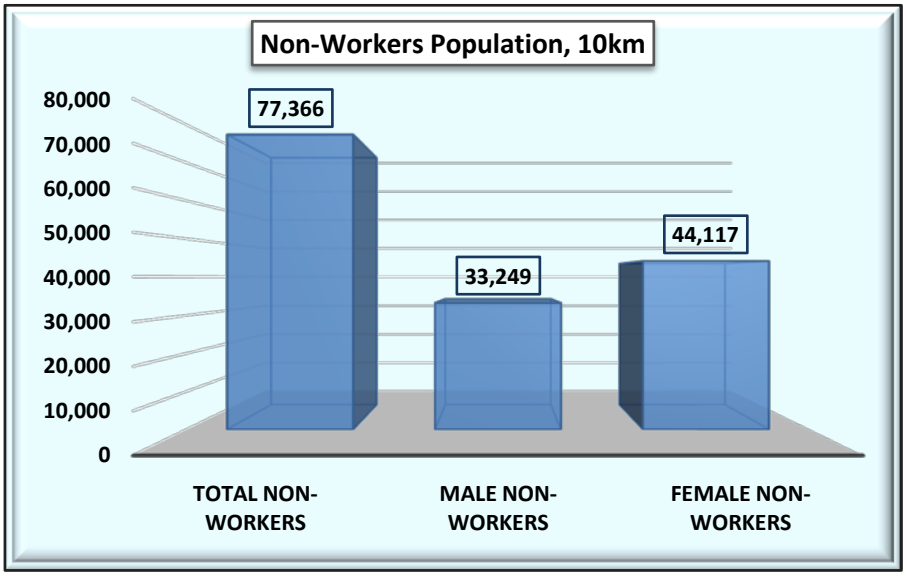


Figure 3.14: Composition of Non-Workers

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 both, Banka and Jamui Districts 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 260 villages lying under Banka District in Bihar state. Overall study area villages are falling mainly under Four (04) no of tehsils namely Chanan (197 villages), Katoria (12 villages), Jhajha (39 villages) and Chakai (12 villages), of Banka and Jamui district in Bihar state.

There are about 46 villages found as uninhabited villages in the study area. There is no town found in the 10km radial study zone.

Educational Facilities

There isa total no. of105 Primary schools existing in the 10km radius study area.About 48 no of Middle schools are foundin the study area. About04 no ofHigher Secondary School (SS) andonly oneSenior Secondary School (SSS) facility is available in the study area. The 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 Tilka Manjhi 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, no of primary health center& community health centre existin the study area; most of the study area villages depend upon the towns & district HQ of the study area having such facility. Only 08no of Primary Health Sub-Centers exists in the villages of the study area. Only 03no of Mother & Child Welfare Centersarefound in the study area. Noallopathic hospitaland medical dispansaries exists 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 260 villages,only48 villages (18.5%)are served with River/Canal water in the study area. As per the census records 2011, only 15 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 14 villages(5.4%) were foundserving 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 Simultala station, situated at approx. 8.0 km in west direction. Site is well connected by National Highway & State Highwayroadalsopassing in the area. Nearest Town/City/District Headquarters of Banka (NP) located at 34.80km in NE direction. Nearest airport is Jai Prakash Narayan International Airport Patna is located at 182km away in NW direction.

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-Ghaghrighat 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 Broadguage is serving since British Period. Railway has sanctioned the following Projects;

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 allpurposes. About 49villages (19.0%) of the study area are electrified for domestic purpose, 44villages (17.0%) for agricultural purpose, commercial & for all purposes in the study area.Out of 260 villages in the study area, 117villages (45.0%) including 46uninhabited villages (17.7%)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 extended 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 3.25** as follows;

Table 3.25: Village wise Basic Amenities Availability (10km)

Name of the Village/Town	Educational				Medical							Drinking Water						CT	Communication & Transport				Approach to the Village				Power Supply				Nearest Town Distance, km
	P	M	SS	SSS	CHC	PHC	PHSC	MCWC	H	D	FWC	T	W	HP	TW	R	Tk		PO	PTO	BS	RS	PR	KR	NW	FP	ED	EAg.	EC	EA	
Tola Bargunia	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Banka,41km
Tola Paharpur	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	2	2	2	2	Banka,38km
Tola Kolhaidih	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	1	1	1	2	2	2	2	Banka,48km
Tola Kadua	Uninhabited Village																														Banka,48km
Tola Haralwa	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	Banka,48km
Tola Kohbara	Uninhabited Village																														Banka,48km
Tola Barmasia	Uninhabited Village																														Banka,48km
Tola Pairu-rai-dih	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	2	2	2	2	Banka,55km
Tola Jhilua	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	1	1	1	2	2	2	2	Banka,55km
Tola Chhira	0	0	0	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Banka,55km

Tola Paharpur	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	1	2	2	2	2	2	2	1	2	1	2	2	2	2	Banka,60km
Tola Phulhara	1	1	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	Banka,63km
Tola Hathia Jharna	Uninhabited Village																													Banka,63km
Tola Durgapur	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	2	2	1	2	2	2	2	Banka,62km
Tola Lilabaran	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	Banka,60km
Tola Kusumghat	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	2	2	2	2	Banka,48km
Tola Budhnadih	Uninhabited Village																													Banka,48km
Tola Singhna	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	Deoghar, Jharkhand,50km
Tola Dighibari	1	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	Banka,55km
Tola Barmasia 2	1	1	0	0	0	0	0	0	0	0	0	2	2	2	1	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	Banka,65km
Tola Gundra	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	Deoghar, Jharkhand,46km
Tola Barakol	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	2	2	2	2	Banka,56km
Tola Makunda	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	2	2	2	2	Deoghar, Jharkhand,48km
Tola Kathradih	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	2	2	2	2	Deoghar, Jharkhand,55km

Tola Phuljora	1	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	Deoghar, Jharkhand,48km
Tola Pipradih	Uninhabited Village																														Deoghar, Jharkhand,48km
Tola Goura	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Banka,55km
Tola Dari	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	Deoghar, Jharkhand,50km
Tola Sikarhar	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Deoghar, Jharkhand,51km
Tola Dhare	Uninhabited Village																														Deoghar, Jharkhand,51km
Tola Dumduma	Uninhabited Village																														Deoghar, Jharkhand,51km
Tola Kairwa	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	Banka,60km
Tola Paisaljori	Uninhabited Village																														Banka,60km
Tola Kulhara	Uninhabited Village																														Banka,60km
Tola Chhatiani	Uninhabited Village																														Banka,60km
Tola Dudhijharna	Uninhabited Village																														Banka,60km

Tola Amjhari	Uninhabited Village																														Banka,60km
Tola Khamaruadih	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	2	2	2	Deoghar, Jharkhand,51km
Tola Auraia	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	Deoghar, Jharkhand,50km
Tola Lalchanddih	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Deoghar, Jharkhand,51km
Tola Dhanouchhi	1	1	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	2	2	2	Deoghar, Jharkhand,50km
Tola Tari	0	0	0	0	0	0	0	0	0	0	0	2	2	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	Deoghar, Jharkhand,49km
Tola Dhaknatari	Uninhabited Village																														Deoghar, Jharkhand,49km
Tola Katsakra	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Deoghar, Jharkhand,48km
Tola Pirra	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	2	2	2	1	1	2	1	1	1	1	1	Deoghar, Jharkhand,47km
Tola Gohli	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	Banka,42km

Tola Sarkanda	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Banka,42km
Tola Jaro Pahri	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Banka,42km
Tola kurumtanr	1	1	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	Banka,45km
Tola Surangi	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	1	1	1	1	Banka,42km
Tola Chamardiha	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Banka,41km
Tola Asuraha	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	Banka,43km
Tola Motidih	Uninhabited Village																														Banka,43km
Tola Majhiladih	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	Banka,42km
Tola Dharmadih	0	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	2	2	2	2	Banka,43km
Tola Bakidih	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	Banka,43km
Tola Sahdewa	Uninhabited Village																														Banka,43km
Tola Majhila dih	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	2	2	2	2	Deoghar, Jharkhand,50km
Tola Nanhuakura	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	Deoghar, Jharkhand,47km
Tola Hardi Khurd	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	Banka,15km
Tola Hardia Kalan	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	2	2	2	Banka,15km
Tola Gundra Diha	Uninhabited Village																														Banka,15km

Tola Purni Pararia	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	2	2	2	2	Banka,15km
Tola Karma Tanr	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	2	2	2	Jhajha,16km
Tola Pararia	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jhajha,14km
Tola Semratanr	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	Jhajha,12km
Tola Bargoian	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	Jhajha,13km
Tola Dihabara Khurd	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	2	2	2	2	Jhajha,14km
Tola Dihbara Kalan	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	Jhajha,17km
Tola Jhajhraha	Uninhabited Village																													Jhajha,17km
Tola Raino Jharna	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	Jhajha,15km
Tola Larhania	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	2	2	2	2	Banka,30km
Tola Guhjora	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	Banka,30km
Tola Kusumghat	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	Banka,30km
Tola Kurawa	Uninhabited Village																													Banka,30km
Tola Subhasinghdih	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	Banka,30km
Tola Pesarha	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	2	2	2	2	Banka,30km
Tola Berar	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	1	2	1	2	1	2	2	2	2	Banka,30km
Tola Salaiya	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	2	2	2	2	Banka,30km
Tola Kanodih	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	Banka,30km

Tola Tahkwani	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	1	2	2	2	2	2	2	1	2	1	2	2	2	2	Banka,30km
Tola Goraiadih	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	2	2	2	2	Banka,30km
Tola Pandwara	Uninhabited Village																													Banka,30km
Tola Sejua	Uninhabited Village																													Banka,30km
Tola Bharwakura	Uninhabited Village																													Banka,30km
Tola Letwakura	Uninhabited Village																													Banka,30km
Tola Pesarhakura	Uninhabited Village																													Banka,30km
Tola Chandikumarthan	Uninhabited Village																													Banka,30km
Tola Musahra dih	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	Banka,30km
Tola Laiadih	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Banka,30km
Tola Targaon	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	Banka,30km
Tola Paipartargaon	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	Banka,30km
Tola Chandwari	1	1	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	Banka,30km
Tola Kumaraindih	Uninhabited Village																													Banka,30km
Tola Manhankharna	Uninhabited Village																													Banka,30km
Tola Kesuadih	Uninhabited Village																													Banka,30km
Tola Bharsar	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	Banka,44km

Tola Sattighat	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	2	2	2	2	Banka,44km
Tola Mohandih	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	2	2	2	2	Banka,42km
Tola Hiraraidih	1	1	0	0	0	0	1	1	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Banka,41km
Tola Akakura	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	Banka,42km
Tola Ujradih	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	Banka,44km
Tola Tengdhowa	Uninhabited Village																														Banka,44km
Tola Kenhuwar	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	2	2	2	2	Banka,44km
Tola Chitakhar	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	1	1	1	1	1	2	2	2	2	'Deoghar, Jharkhand,44km
Tola Akluraidih	Uninhabited Village																														'Deoghar, Jharkhand,44km
Tola Dholdar	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	'Deoghar, Jharkhand,45km
Tola Dhawa	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	'Deoghar, Jharkhand,46km
Tola TutaKura	Uninhabited Village																														'Deoghar, Jharkhand,46km
Tola Chunwani	Uninhabited Village																														'Deoghar,

																															Jharkhand,46km
Tola Ahira	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	'Deoghar, Jharkhand,25km
Tola Champatari	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	2	2	1	1	1	1	1	'Deoghar, Jharkhand,25km
Tola Narainpur	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	'Deoghar, Jharkhand,25km
Tola Goriamma	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	1	1	1	1	'Deoghar, Jharkhand,25km
Tola Pipradih	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	2	2	2	2	'Deoghar, Jharkhand,25km
Tola Gobardaha	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	2	2	2	2	'Deoghar, Jharkhand,36km
Tola Darhwa	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	2	2	2	2	'Deoghar, Jharkhand,30km
Tola Kharna	1	2	0	0	0	0	1	1	0	0	1	2	2	1	1	1	2	2	1	2	2	2	1	1	2	1	2	2	2	2	'Deoghar, Jharkhand,36km
Tola Karwamarni	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	'Deoghar,

																														Jharkhand,23km
Kurumtanr	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	1	2	1	1	2	1	2	2	2	2	'Deoghar, Jharkhand,29km
Surangi	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	'Deoghar, Jharkhand,30km
Domohan	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	2	2	2	2	'Deoghar, Jharkhand,33km
Tola Gajoraidih	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	2	2	1	2	2	2	2	'Deoghar, Jharkhand,22km
Tola Amjora	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	2	2	2	2	'Deoghar, Jharkhand,26km
Tola Jatwara	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	2	2	2	2	'Deoghar, Jharkhand,20km
Tola Pujhardih	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	'Deoghar, Jharkhand,20km
Tola Tingharwa	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	2	2	2	2	'Deoghar, Jharkhand,26km
Tola Alagdamar	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	2	2	2	2	'Deoghar,

																														Jharkhand,21km
Tola Barakol	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	2	2	2	2	'Deoghar, Jharkhand,25km
Tola Bhairopur	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	'Deoghar, Jharkhand,25km
Tola Nonia	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	2	2	2	2	'Deoghar, Jharkhand,25km
Tola Sidhudih	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	2	2	2	2	'Deoghar, Jharkhand,23km
Tola Kumhradih	1	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	'Deoghar, Jharkhand,23km
Tola Bagra	1	1	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	'Deoghar, Jharkhand,26km
Tola Mathura	1	1	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	'Deoghar, Jharkhand,24km
Tola Naraindih	1	1	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	'Deoghar, Jharkhand,22km
Tola Lalpur	1	1	1	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	'Deoghar,

																														Jharkhand,25km
Tola Agwani	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	2	2	2	2	1	2	1	1	1	1	1	'Deoghar, Jharkhand,20km
Tola Mahestaria	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	'Deoghar, Jharkhand,20km
Tola Barne	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	2	2	2	2	'Deoghar, Jharkhand,20km
Tola Patardih	0	0	0	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	'Deoghar, Jharkhand,19km
Tola Raghubardih	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	'Deoghar, Jharkhand,19km
Tola Akakura	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	2	2	2	2	'Deoghar, Jharkhand,18km
Tola Bagaia	0	0	0	0	0	0	0	0	0	0	0	2	2	2	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	'Deoghar, Jharkhand,25km
Tola Domohan	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	'Deoghar, Jharkhand,28km
Tola Kairajor	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	2	2	2	2	'Deoghar,

																														Jharkhand,28km
Tola Chandipirha	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	2	2	2	2	'Deoghar, Jharkhand,32km
Tola Beharbari	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	1	1	1	1	'Deoghar, Jharkhand,30km
Tola Sato	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	2	2	2	2	'Deoghar, Jharkhand,30km
Tola Noadih	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	'Deoghar, Jharkhand,32km
Tola Birajpur	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	2	2	2	2	2	'Deoghar, Jharkhand,40km
Tola Baratanr	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	'Deoghar, Jharkhand,41km
Tola Ajmer Rai	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	Banka,26km
Tola Babu Mahal	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	2	2	2	2	'Deoghar, Jharkhand,38km
Tola Mansaraidih	Uninhabited Village																													'Deoghar, Jharkhand,38km

Tola Dharhara	1	1	0	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	'Deoghar, Jharkhand,40km
Tola Simsimkura	1	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	2	2	2	2	'Deoghar, Jharkhand,39km
Tola Mehia Simar	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	2	2	2	2	'Deoghar, Jharkhand,38km
Tola Titukura	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	2	2	2	2	'Deoghar, Jharkhand,38km
Tola Bhairodih	1	1	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	'Deoghar, Jharkhand,40km
Tola Titipathar	Uninhabited Village																														'Deoghar, Jharkhand,40km
Tola Chugalia	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	2	2	2	2	'Deoghar, Jharkhand,39km
Tola Dudhkira	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	2	2	2	2	'Deoghar, Jharkhand,37km
Tola Khargawan	Uninhabited Village																														'Deoghar, Jharkhand,37km

Tola Mathdih	1	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	2	2	2	'Deoghar, Jharkhand,38km
Tola Garbhudih	1	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	2	2	2	'Deoghar, Jharkhand,35km
Tola Laluakura	Uninhabited Village																													'Deoghar, Jharkhand,35km
Tola Alakjara	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	'Deoghar, Jharkhand,32km
Tola HariaKura	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	'Deoghar, Jharkhand,35km
Tola Kaljuga	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	'Deoghar, Jharkhand,35km
Tola Majhli	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	2	2	2	2	'Deoghar, Jharkhand,35km
Tola Ranga	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	'Deoghar, Jharkhand,35km
Tola Ganjira	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	2	2	2	2	'Deoghar, Jharkhand,34km

Tola Jahgira	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	'Deoghar, Jharkhand,34km
Tola Suriadih	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	2	2	2	2	'Deoghar, Jharkhand,35km
Tola Kaljuga	Uninhabited Village																													'Deoghar, Jharkhand,35km
Dhanubasar	1	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	2	2	2	2	'Deoghar, Jharkhand,40km
Alkosia	1	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	2	2	2	2	'Deoghar, Jharkhand,40km
Chihutjor	1	1	0	0	0	0	1	1	0	1	1	2	2	1	1	2	1	2	2	2	1	2	2	1	2	1	1	2	2	2	'Deoghar, Jharkhand,40km
Jogmaran	1	1	0	0	0	0	1	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	'Deoghar, Jharkhand,33km
Tola Kasba	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	'Deoghar, Jharkhand,40km
Tola Muskrawa	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	1	1	1	1	'Deoghar, Jharkhand,33km

Tola Joktaha	0	0	0	0	0	0	1	0	0	1	0	2	2	1	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	'Deoghar, Jharkhand,35km
Pasraha	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	2	2	2	2	'Deoghar, Jharkhand,34km
Fatehpur	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	2	2	2	2	1	2	1	2	2	2	2	'Deoghar, Jharkhand,28km
Udaipur	Uninhabited Village																														'Deoghar, Jharkhand,28km
Kusumjori	1	1	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	'Deoghar, Jharkhand,32km
Satbhaia	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	'Deoghar, Jharkhand,34km
Nawadih	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	'Deoghar, Jharkhand,34km
Jamunia	Uninhabited Village																														'Deoghar, Jharkhand,34km
Lila Baran	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	'Deoghar, Jharkhand,33km

Chapridamgi	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	2	2	2	2	'Deoghar, Jharkhand,33km
Barahduari	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	2	2	2	2	'Deoghar, Jharkhand,30km
Dumarkola	1	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	2	2	2	2	'Deoghar, Jharkhand,18km
Tola Dhawa	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	'Deoghar, Jharkhand,18km
Tola Paharpur	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	'Deoghar, Jharkhand,25km
Tola Sheikhpura	2	0	0	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	'Deoghar, Jharkhand,24km
Domsarni	1	1	0	0	0	0	1	0	0	0	0	2	2	1	1	1	1	2	1	2	1	2	1	1	2	1	1	1	1	1	'Deoghar, Jharkhand,30km
Nawada	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	2	1	2	2	2	2	Banka,32km
Bhairopur	1	0	0	0	0	0	1	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Banka,39km
Kolhua	Uninhabited Village																													Banka,39km
Tilaiya	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Banka,40km

Kurna	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	Banka,38km
Paprewa	1	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	'Deoghar, Jharkhand,28km
Dewasi	2	1	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	'Deoghar, Jharkhand,24km
Bhalua	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	1	2	1	2	1	1	2	1	1	1	1	1	'Deoghar, Jharkhand,27km
Tola Dholadanr	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	1	2	1	2	2	1	1	1	1	1	Banka,39km
Tola Salaiya	0	0	0	0	0	0	0	0	0	0	0	2	1	1	2	2	1	2	2	2	1	2	1	1	2	1	1	1	1	1	'Deoghar, Jharkhand,22km
Tola Barmasia	0	0	0	0	0	0	0	0	0	0	0	2	1	2	1	2	1	2	2	2	2	2	2	2	2	1	2	2	2	2	Banka,27km
Tola Barakola	1	1	1	1	0	0	0	0	0	0	0	2	2	1	1	2	2	2	1	1	2	2	1	1	1	1	2	2	2	2	Jhajha,12km
Tola Pachkathia	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	1	2	1	2	1	2	1	2	2	2	2	Jhajha,12km
Tola Debiyadih	Uninhabited Village																													Jhajha,12km
Tola Mantari	Uninhabited Village																													Jhajha,12km
Tola Kanaudi	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	1	2	1	2	1	1	2	1	1	1	1	1	Jhajha,28km
Tola Khurandadhorari	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	1	1	1	1	Jhajha,27km

Tola Khuranda	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	1	2	2	2	1	1	2	1	1	2	2	2	Jhajha,18km
Tola Gopalmaran	1	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	2	2	2	2	Jhajha,18km
Tola Bangawan	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	1	1	1	2	1	1	1	1	1	Jhajha,18km
Tola Lilabaran	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jhajha,18km
Tola kenuar	1	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	2	2	2	2	Jhajha,26km
Tola Tithi Chak	1	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	2	2	2	2	Jhajha,18km
Tola Tilauna	1	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	Jhajha,18km
Tola Bastiyadih	1	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	2	2	2	2	Jhajha,18km
Tola Karijhal	1	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	2	2	2	2	Jhajha,20km
Tola Bathnabaran	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jhajha,18km
Tola Ghontari	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	1	1	1	2	1	1	1	1	1	Jhajha,28km
Tola Khawa	Uninhabited Village																														Jhajha,28km
Tola Damgitar	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	Jhajha,29km
Tola Nagwe	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	1	2	2	1	1	2	1	1	2	2	2	Jhajha,30km
Tola Taraun	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	Jhajha,30km
Tola Godaia	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	Jhajha,30km
Tola Pandua	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	Jhajha,27km
Tola Simaltala	1	1	1	0	0	0	1	0	0	0	0	2	2	1	2	2	2	2	1	2	1	1	1	2	2	1	1	1	1	1	Jhajha,30km

Tola Siantanr	2	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	2	2	2	2	Jhajha,20km
Tola Baraundhia	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	Jhajha,30km
Tola Majhiakura	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	2	2	2	2	Jhajha,30km
Tola Pararia	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	1	1	2	2	2	1	2	1	2	2	2	2	Jhajha,30km
Tola Telwabazar	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	1	2	2	2	1	1	2	1	1	2	2	2	Jhajha,30km
Tola Depura	Uninhabited Village																													Jhajha,30km
Tola Ghasitari	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Jhajha,30km
Tola Nawadih	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	1	2	2	2	1	2	1	2	2	2	2	Jhajha,31km
Tola Dhonrari	1	1	1	1	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	Jhajha,31km
Tola Chiraiya	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jhajha,29km
Tola Gadi Telwa	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	Jhajha,30km
Tola Arpathal	Uninhabited Village																													Jhajha,30km
Tola Telwa	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	1	2	2	2	1	2	2	1	2	2	2	2	Jhajha,30km
Tola Burhiabari	1	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	2	2	2	2	Jhajha,35km
Tola Pathal Chapti	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	2	2	2	2	Jhajha,32km
Tola Babudih	1	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	2	2	2	2	'Deoghar, Jharkhand,31km
Tola Ahardih	Uninhabited Village																													'Deoghar,

																														Jharkhand,31km
Tola Barakola	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	2	2	2	'Deoghar, Jharkhand,30km
Tola Rattidih	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	2	1	2	1	2	2	2	'Deoghar, Jharkhand,25km
Tola Salaia	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	2	2	2	'Deoghar, Jharkhand,26km
Tola Arapathal	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	1	2	2	2	2	2	2	1	2	1	2	2	2	'Deoghar, Jharkhand,26km
Tola Bhunra	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	2	1	2	1	2	2	2	'Deoghar, Jharkhand,26km
Tola Bajpedih	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	2	1	2	1	2	2	2	'Deoghar, Jharkhand,40km
Tola Babudih	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	2	2	2	'Deoghar, Jharkhand,25km
Tola Asanghatia	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	2	2	1	2	2	2	2	'Deoghar, Jharkhand,25km
Tola Basatpur	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	1	1	2	1	2	2	2	'Deoghar,

																														Jharkhand,27km
Tola Jamuniatanr	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	'Deoghar, Jharkhand,25km
TOTAL (10km)	**105**	**48**	**4**	**2**	**0**	**0**	**8**	**3**	**0**	**2**	**2**	*Status for Availability and Non-Availability is shown as A (1) & NA (2) respectively*																		
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. -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.

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 Budhist 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 Amrit

Manthan (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.

Lakshdeepa 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 to 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 understands Nath Communitity. 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.

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

Village Lachhmipur - The village is situated about 29 kms South-East of Block headquaters at Katoria on the river Chandan. It is noted as the erstwhile seat of the Rajas Lachhimipur, 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.

Employment Generation

The total direct manpower requirement for the proposed mining operation will be around 45. Significant Indirect employments are also expected due to the associated activities. This projectoperation will provide livelihood to the poorest section of the society. Depending upon the General shifts working, following will be the proposed manpower.

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

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.

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 Badua 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 x 10-3 g/s/m^2 based on moisture 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 over burden by trucks operated per hour on haul road. Emission of PM10 due to transportation of sand on haul road was 1.65 x 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 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 northeasterly & 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.

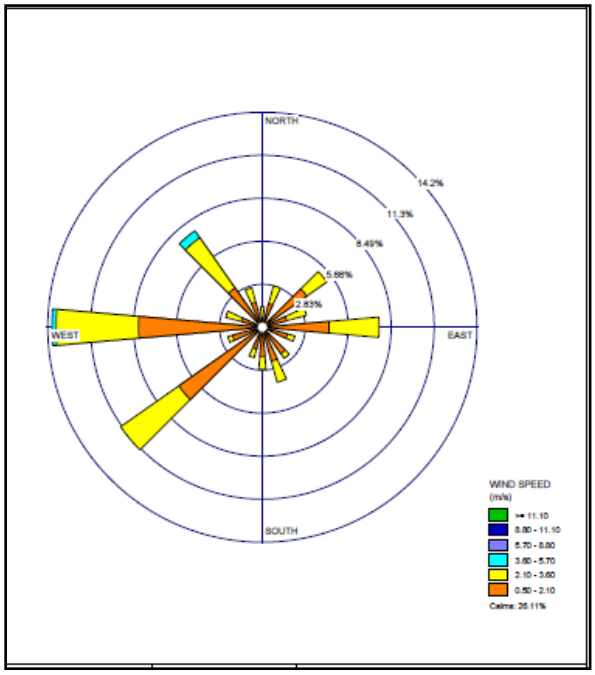


Figure 4.1: Wind Rose Diagram

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.
- ✓ 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 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
6.0	92	

4.0	95	between any figure and lower figure as indicated in column (1), the permissible sound is to be determined by extrapolation or proportionate scale. 2. No exposure in excess of 115 dB (A) is permissible.
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 Badua 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.

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.

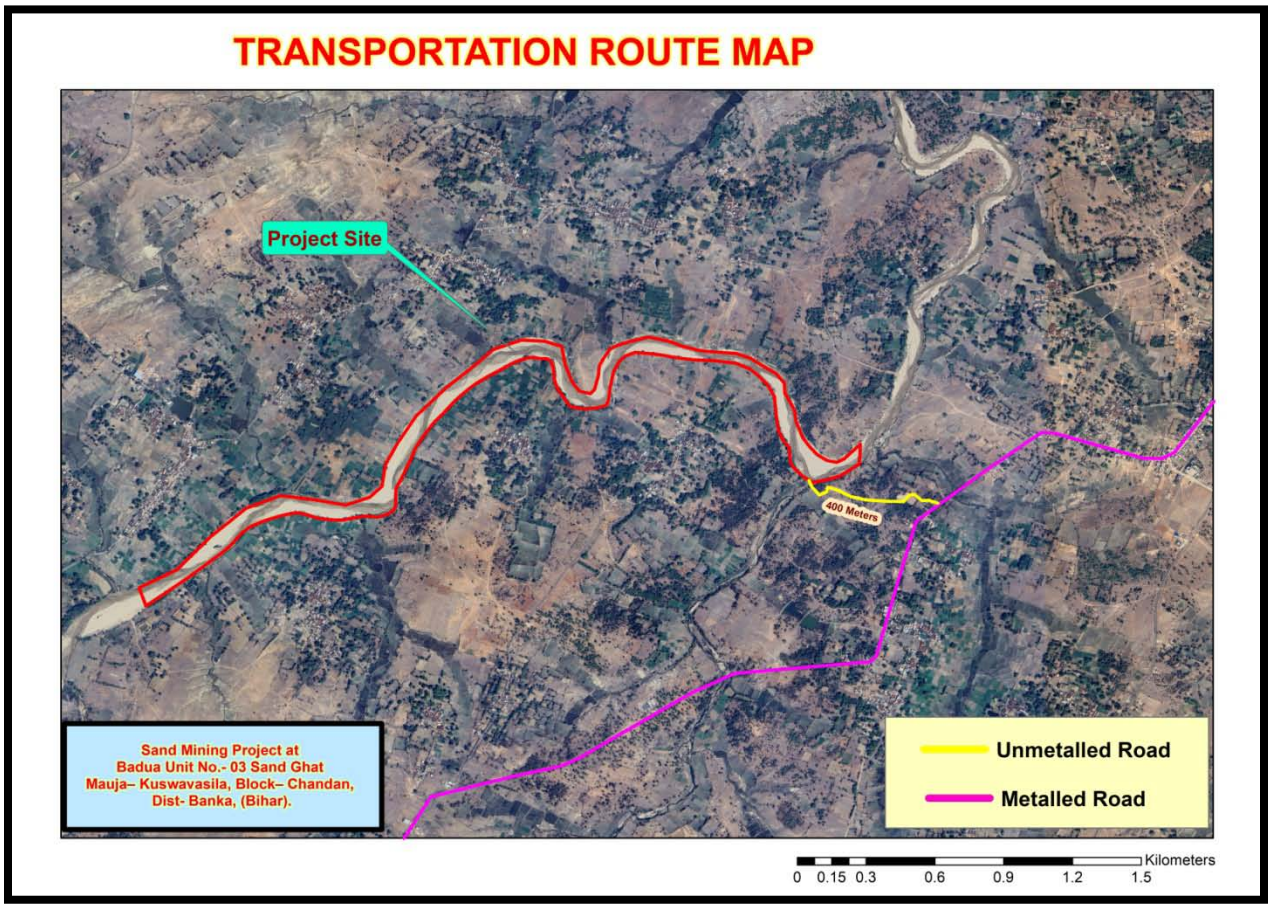


FIGURE 4.2 MAP SHOWING EVACUATION ROUTE

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	15000	0.16	A

Source: Capacity as per IRC: 64-1990

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 **Unit No. 03**

Proposed Capacity of Mine/annum : 576720 TPA

No. of working days : 250 days

Proposed Capacity of mine/day : 2306.88 or 2307

Truck Capacity : 16 tonnes

No. of trucks deployed/day : 144.18 or 144

Increase in PCU/day (144*3) : 432

Table 4.2 (ii): Modified Traffic Scenario & LOS

Road	V	C	Modified V/C Ratio	LOS
National Highway (NH-333A)	2500+432=2932	15000	0.195	A

Results

From the above analysis it can be seen that the LOS has changed from 0.16 to 0.195 at Highway intersection that remains 'A' i.e 'Excellent'. 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

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.

****

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.

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 (SO_2) and Nitrogen Dioxide (NO_2) 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.

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

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:

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.

- ✓ 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.

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

Table7.2, Qualitative Risk Assessment

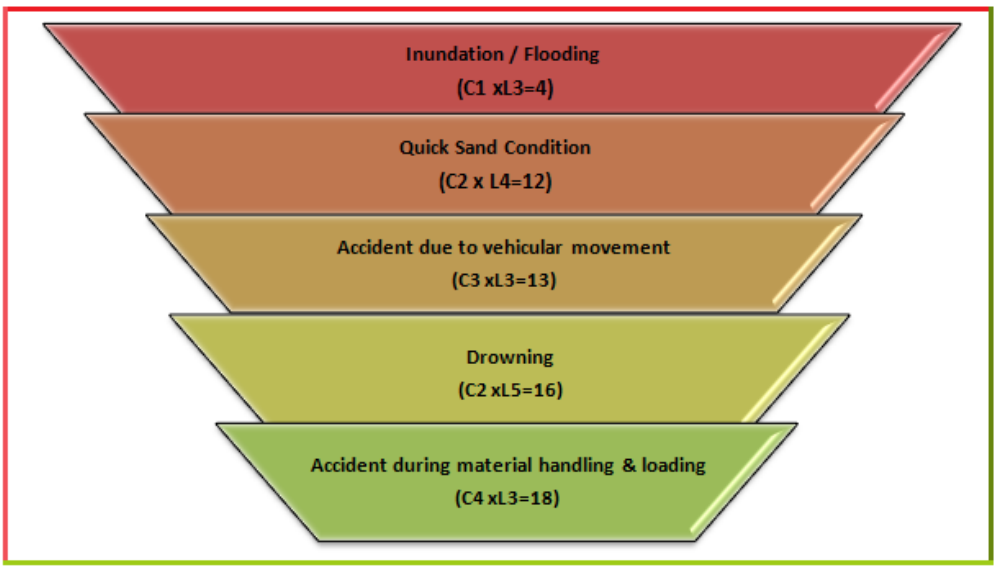
Risk Rank **Likelihood Consequence**	**L1** **Almost certain**	**L2** **Likely**	**L3** **Possible**	**L4** **Unlikely**	**L5** **Rare**
C1 **Catastrophic**	**1**	**2**	**4**	**7**	**11**

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**

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:

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.

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/repaired 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.

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:

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 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.

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 **45 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 Badua 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 & 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.

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 on Badua River Unit No. – 03 Sand Ghat at Mauja - Kuswavasila, Block - Chandan, 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 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 Badua 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 Badua 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

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

a. Protection of banks

b. Reducing submergence of adjoining agricultural lands due to flooding.

c. Reducing aggradations of river level.
d. Protection of crops being cultivated along the bank.
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 Rs. 3,08,80,000 x 2% = Rs. 6,17,600/-

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:

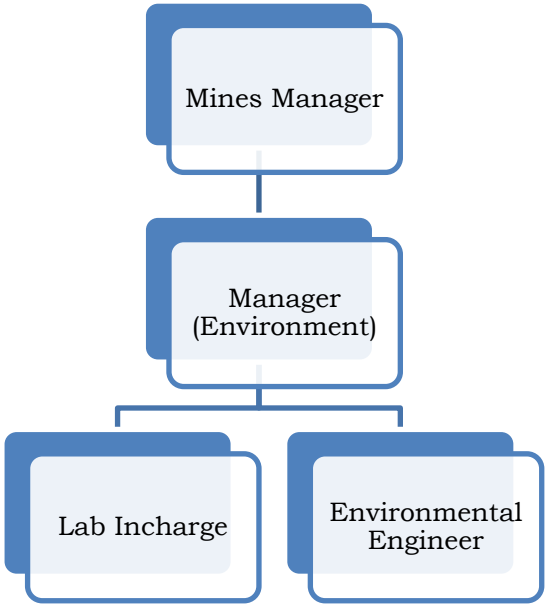

Figure 9.1 Environment Management Cell

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.

- 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 3.0 mmaximum 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.

- 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.
- **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. 270 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
Unit No. 03	27.0	27.0*10 Plants= 270 plants
Total Plants		270 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	*Acacia nilotica*	Babul	Tolerant to SO_2
2	*Mangiferaindica*	Aam	Tolerant to Dust control
3	*Tectonagrandis*	Sagon	Tolerant to Dust control
4	*Azadirachtaindica*	Neem	Tolerant to SO_2
5	*Pithecolibiumducle*	Jungle jalebi	Tolerant to SO_2 and Dust control
6	*Scigiumcumuni*	Jamun	To stop river bank erosion
7	*Terminaliaarjuna*	Arjun	To stop river bank erosion
8	*Populus ciliate*	Popular	Fast growing, broad leaf

9.6 LAND USE PLANNING

Deg6radation 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 Maticulous Organics Private Limited, Deependra Singh, Add.- 53, Kantaghar Pachapenda, Ashink Kantaghar, Pachapenda, Moradabad U.P.- 244001, (Sand Unit No. 03) 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.

- 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

Maticulous Organics Private Limited, Deependra Singh, Add.- 53, Kantaghar Pachapenda, Ashink Kantaghar, Pachapenda, Moradabad U.P.- 244001, (Sand Unit No. 03) 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

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.

Table 9.2, Budget of EMP (Unit No. -03)

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).	2.70	0.5
4	Haul road Maintenance Cost	1.0	1.5
TOTAL		**3.70**	**5.5**

Note: *270 plants * 1000 Rs (for each plants including hedges and fences) =Rs 2,70,000/-

- 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 *0.40 km haul road) = 1,00,000/-

****

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 Badua River (Badua Unit No. 03 Sand Ghat) at Mauja- Kuswavasila, Block- Chandan, District- Banka, (Bihar).

The Proposed Production is 324000 Cum/Year or 576720 Tonnes per annum and Area of the project site is 27.0 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/OTFM mining of sand with a proposed production of 576720 TPA for applied lease. The project has been proposed by (Maticulous Organics Private Limited, Deependra Singh, Add.- 53, Kantaghar Pachapenda, Ashink Kantaghar, Pachapenda, Moradabad U.P.- 244001)

The proposed project is over an area 27.0 ha on Badua River at Mauja – Kuswavasila, Block - Chandan, 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'.

The estimated project cost for the proposed project is Rs - 3,08,80,000/- (including auction cost).

The proposed mining lease area falls in Survey of India Toposheet 72L/09 & 72L/10.

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

Table: 10.1 Mine lease Co-ordinates (Badua Unit No. 03)

Pillar	Geo Coordinate	
A	24°43'35.71"N	86°37'12.24"E
B	24°43'32.91"N	86°37'12.12"E
C	24°43'12.88"N	86°35'31.39"E
D	24°43'15.44"N	86°35'30.41"E

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 – Kuswavasila
b	Block	Chandan
c	District	Banka
d	State	Bihar
2	Elevation above	Badua Unit No.- 03 (206.5 AMSL to 197.6 AMSL)
3	Nearest National /State Highway	NH-333A, Approx. 0.35 KM towards SE direction. SH – 22, Approx. 8.68 KM towards ENE direction
4	Nearest Railway station	**Blocks** / **Railway Station** / **Distance (Km) Direction** **Badua Unit No. 03** / Simultala Railway Station / Simultala Railway Station, approx. 8.0 km in west direction.
5	Nearest Airport	**Blocks** / **Airport** / **Distance (Km)**

Sr. No.	Particulars	Details
		<table><tr><td></td><td></td><td>**Direction**</td></tr><tr><td>**Badua Unit No. 03**</td><td>Jayprakash Narayan Airport</td><td>Jayprakash Narayan Airport, approx. 182.0 km towards NW direction.</td></tr></table>
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 *Source BMTC 2nd edition 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 Badua River (Badua Unit No. 03) Sand Ghat at Mauja – Kuswavasila, Block - Chandan, District- Banka, (Bihar).
2	Mining Capacity	324000 Cum/Year or 576720 TPA
3	Method of mining	Open cast semi-mechanized mining/OTFM
4	Total ML area	27.0 ha
5	Depth of mining	3.0 m depth
6	Manpower	45 persons
9	Water Requirement	4.5 KLD
10	Source of Water	Tanker/ Nearby village.

10.4.2 Mineral Reserves 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 (1.78 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 10.4 Classification Mineral Reserves

Sand Ghat	Area (Hect)	Geological Reserves (m3)	Mineable Reserves (m3)	Annual Permitted Reserve As per LoI (m3)
Badua Unit No.- 03	27.0	540000	380210	324000

Total Mineable Reserve = 380210 CUM or 676774 Tonnes.

The annual extractable RBM comes to 324000 Cum/Year or 576720 TPA.

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 Badua Unit No.- 03 Sand Ghat. However, as the digging depth will be restricted to 2.0 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.

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. 270 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

Five 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 ^{0}C to 44 ^{0}C.

10.7.3 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) has been carried out at 08 locations. The Particulate Matter (PM_{10}) conc. ranged of 70.5 µg/m^{3}to 95.7 µg/m^3. The Particulate Matter ($PM_{2.5}$) ranged from 38.0 µg/m^3 to 55.2 µg/m$^{3.}$ Sulphur dioxide (SO_2) between 4.2 µg/m^{3}to 10.0 µg/m$^{3.}$ Oxides of Nitrogen (NO_2) between 8.1 µg/m^{3}to 20.4 µg/m^3**.** The results thus obtained indicate that the concentrations of PM10, SO_2 and NO_2 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 7.32 to 7.59**,** total hardness varies from 243 mg/l to 334 mg/l, total dissolved solids vary from 412 mg/l to 495 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 48.5 dB(A) to 53.2 dB(A) respectively. The minimum & maximum noise levels at night time were found to be 39.1 dB (A) & 43.3 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 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 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:
- 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**.

Table 10.6: Cost of Environmental Protection Measures

Budget of EMP (Unit No. -03)

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).	2.70	0.5
4	Haul road Maintenance Cost	1.0	1.5
TOTAL		**3.70**	**5.5**

Note: *270 plants * 1000 Rs (for each plants including hedges and fences) =Rs 2,70,000/-

- 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 *0.40 km haul road) = 1,00,000/-

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.

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 Rs. 3,08,80,000 x 2% = Rs. 6,17,600/-

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.
- 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.

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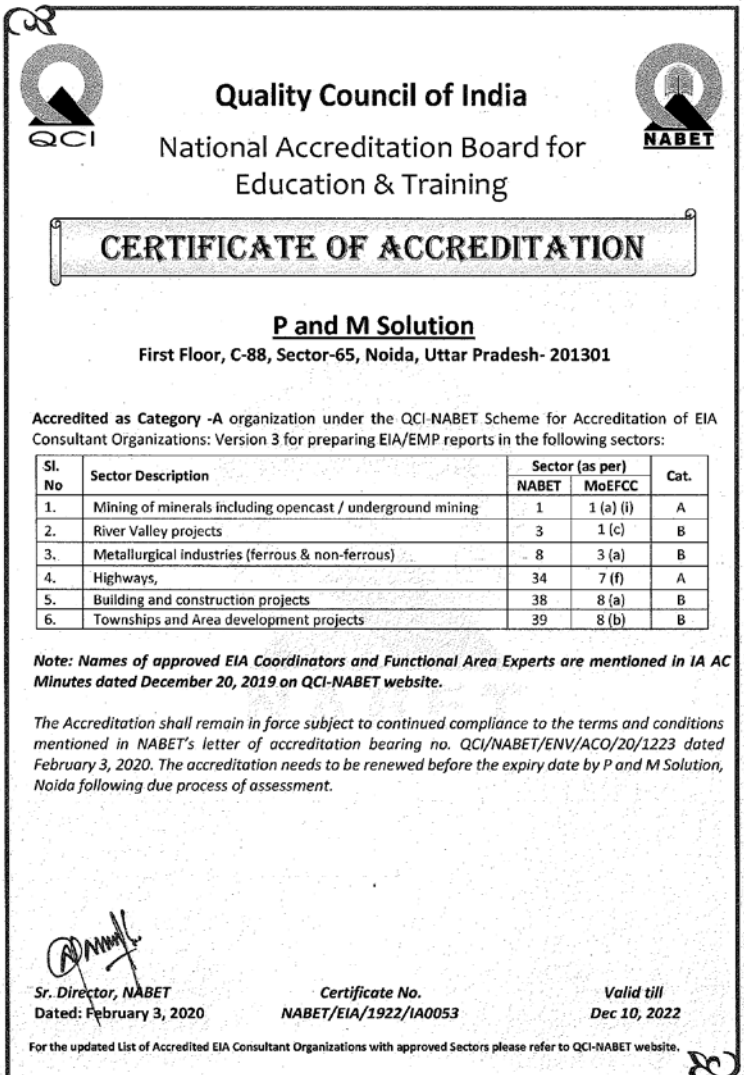
Project: Sand Mining Project on Badua River Unit No. – 03 Sand Ghat at Mauja- Kuswavasila, Block - Chandan, District- Banka, (Bihar).

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) NABET	Sector (as per) MoEFCC	Cat.
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 *Certificate No.* *Valid till*

Dated: February 3, 2020 *NABET/EIA/1922/IA0053* *Dec 10, 2022*

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

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

Institute of Town Planners India, 6th Floor, 4-A, Ring Road, I.P Estate, New Delhi-110 002, India
Tel. : +91-11-233 23 416, 417, 418, 419, 420, 421, 423 E-mail : ceo.nabet@qcin.org Website : www.qcin.org

Project: Sand Mining Project on Badua River Unit No. – 03 Sand Ghat at Mauja- Kuswavasila, Block - Chandan, 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
1	Pravin Kumar Sinha	EC	EC
2	Pravin Kumar Sinha	FAE	GEO
3	Tapan Majumdar	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

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EXECUTIVE SUMMARY

FOR

SAND MINING PROJECT ON BADUA RIVER UNIT NO. – 03 SAND GHAT, DISTRICT BANKA

At

Mauza- Kuswavasila, Block - Chandan, District- Banka, State – Bihar

SAND BLOCK	**UNIT NO. 03**
AREA	**27.0 HA**
PRODUCTION	**324000 Cum/Year or 576720 TPA**

PROJECT PROPONENT

Maticulous Organics Private Limited,
(Deependra Singh)
Add.- 53, Kantaghar Pachapenda, Ashink Kantaghar Pachapenda, Moradabad U.P.- 244001

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.

Badua Unit No. - 03

The project has been proposed by Maticulous Organics Private Limited, Deependra Singh. The Proposed Sand Mining Project is located on Badua River at Unit No. 03 Sand Ghat at Mauja- Kuswavasila, Block - Chandan, District- Banka, (Bihar). LOI issued to lessee via letter no 2104/M 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 22-02-2023.

It has been proposed to mine around 576720 Tonnes per annum for applied lease. The estimated project cost for the proposed project is **Rs 3,08,80,000/-** (including auction cost).

PROJECT DESCRIPTION

LOCATION

Badua Unit No. – 03

The proposed mining lease area falls in Survey of India Toposheet Topo sheet No- 72L/09 & 72P/10. The lease area is located in Mauja- Kuswavasila, Block- Chandan, District- Banka, State- Bihar. The mine lease co-ordinates are listed below:

Pillar	Geo Coordinate	
A	24°43'35.71"N	86°37'12.24"E
B	24°43'32.91"N	86°37'12.12"E
C	24°43'12.88"N	86°35'31.39"E
D	24°43'15.44"N	86°35'30.41"E

Area & production: The total ML area is 27.0 Ha. Proposed rate of production will be 576720 TPA.

Connectivity:

Badua Unit No. 03 Sand Ghat is well connected to the nearest metalled road 400 m distance from the lease. NH-333A, Approx. 0.35 KM towards SE direction. SH – 22, Approx. 8.68 KM towards ENE direction. Simultala Railway Station, approx. 8.0 km in west direction.

Salient Features of Project

Name of the applicant	Maticulous Organics Private Limited, Deependra Singh
Address of Lessee	Maticulous Organics Private Limited, Deependra Singh Add.- 53, Kantaghar Pachapenda, Ashink Kantaghar Pachapenda, Moradabad U.P.- 244001
Name of Mine	Sand Mining Project on Badua River Unit No – 03 Sand Ghat
Village	Mauja- Kuswavasila
District & State	Banka, Bihar
Mineral	Sand
Area (ha)	27.0 hectare

MINING

The mining process is opencast semi-mechanized/ OTFM 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 (1.78 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
203 - 202	3965	53	1	210145	374058
202 - 201	3955	43	1	170065	302716
Total				380210	676774

Total Mineable Reserve = 380210 CUM or 676774 Tonnes

Table-:- Classification Mineral Reserves

Sand Ghat	Area (Hect)	Geological Reserves (m3)	Mineable Reserves (m3)	Annual Permitted Reserve As per LoI (m3)
Badua Unit No.- 03	27.0	540000	380210	324000

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 4.50 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	Min	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 PM2.5 amongst all the 08 AQ monitoring stations were found to be 38.0 µg/m^3 to 55.2 µg/m^3 respectively; PM10 was in the range of 70.5 µg/$m^3$to 95.7 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 08 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 7.50 to 8.23, 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 Badua 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. 3,08,80,000 x 2% = Rs. 6,17,600/-

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. 270 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 (Badua Unit No.- 03)

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).	2.70	0.5
4	Haul road Maintenance Cost	1.0	1.5
TOTAL		**3.70**	**5.5**

Note: *270 plants * 1000 Rs (for each plants including hedges and fences) =Rs 2,70,000/-

- 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 *0.40 km haul road) = 1,00,000/-

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.

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कार्यकारी सारांश

रेत खनन परियोजना
बदुआ नदी यूनिट सं०- 03 रेत घाट
के लिए

मौजा - कुसवावसीला,
ब्लॉक-चान्दन, जिला - बाँका, (बिहार)

रेत ब्लॉक	बदुआ यूनिट सं०- 03
क्षेत्र	27.0 हेक्टेयर
उत्पादन	576720 टन प्रति वर्ष

आवदेन कर्ता

मैटिकुलस ऑर्गेनिक्स प्राइवेट लिमिटेड,
(दीपेंद्र सिंह)
पता.- 53, कांताघर पचपेंडा, आशिंक कांटाघर,
पचपेंडा, मुरादाबाद उ.प्र.- 244001

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।

बदुआ यूनिट सं०- 03

परियोजना के प्रस्ताव मैटिकुलस ऑर्गेनिक्स प्राइवेट लिमिटेड,(दीपेन्द्र सिंह) ने दिया है। प्रस्तावित रेत खनन परियोजना मौजा- कुसवावसीला, ब्लॉक-चान्दन, जिला- बाँका, (बिहार) में बदुआ यूनिट सं०- 03 रेत घाट पर बदुआ नदी पर स्थित है। पत्र संख्या 2104/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 22-02-2023 द्वारा जारी किया गया है।

आवेदित पट्टे के लिए प्रति वर्ष लगभग 576720 टन खनन प्रस्तावित किया गया है, प्रस्तावित परियोजना के लिए अनुमानित परियोजना लागत 3,08,80,000/- रुपये (नीलामी लागत सहित) है।

❖ परियोजना विवरण

स्थान:

बदुआ यूनिट सं०- 03

प्रस्तावित खनन पट्टा क्षेत्र सर्वे ऑफ इंडिया टोपोशीट टोपो शीट संख्या 72L/09 & 72L/10 के अंतर्गत आता है। पट्टा क्षेत्र मौजा- कुसवावसीला, ब्लॉक- चान्दन, जिला- बाँका, राज्य- बिहार में स्थित है। खान पट्टा समन्वय नीचे सूचीबद्ध हैं:

स्तंभ	अक्षांश / देशांतर	
A	24°43'35.71"N	86°37'12.24"E
B	24°43'32.91"N	86°37'12.12"E

C	24°43'12.88"N	86°35'31.39"E
D	24°43'15.44"N	86°35'30.41"E

❖ **क्षेत्र और उत्पादन**: कुल क्षेत्रफल 27.0 हेक्टेयर है। उत्पादन की प्रस्तावित दर 576720 टीपीए होगी।

❖ संयोजकता

बदुआ यूनिट सं०- 03 रेत घाट पट्टे से 0.40 कि.मी. की दूरी पर निकटतम पक्की सड़क से अच्छी तरह से जुड़ा हुआ है। NH-333A लगभग 0.35 किमी उत्तर दक्षिण पूर्व की ओर है SH-22 लगभग 8.68 किमी पूर्व उत्तर पूर्व दिशा की ओर है बाँका रेलवे स्टेशन, लगभग 8.0 किमी सिमुलतला पश्चिम दिशा की ओर है।

परियोजना की मुख्य विशेषताएं

आवेदक का नाम	मैटिकुलस ऑर्गेनिक्स प्राइवेट लिमिटेड, (दीपेंद्र सिंह)
पट्टेदार का पता	मैटिकुलस ऑर्गेनिक्स प्राइवेट लिमिटेड, (दीपेंद्र सिंह) पता.- 53, कांताघर पचपेंडा, आशिंक कांटाघर, पचपेंडा, मुरादाबाद उ.प्र.- 244001
नाम	रेत खनन परियोजना बदुआ नदी यूनिट सं०- 03 रेत घाट
गाँव	मौजा - कुसवावसीला
जिला और राज्य	बाँका, बिहार
खनिज	रेत
क्षेत्र (हेक्टेयर)	27.0 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 मैन्युअल 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 (1.78 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 जाएग। 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
203 - 202	3965	53	1	210145	374058
202 - 201	3955	43	1	170065	302716
कुल				380210	676774

कुल खनन योग्य रिजर्व = 380210 घन मीटर या 676774 टन

तालिका: वर्गीकरण खनिज भंडार

रेत ब्लॉक	क्षेत्रफल (हेक्टेयर)	भूवैज्ञानिक भंडार (m3)	खनन योग्य भंडार (m3)	LoI के अनुसार वार्षिक अनुमत रिजर्व (m3)
बदुआ यूनिट सं०- 03	27.0	540000	380210	324000

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 4.50 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 08 AQ निगरानी स्टेशनों में PM2.5 की न्यूनतम और अधिकतम सांद्रता क्रमशः 38.0 µg/m3 से 52.2 µg/m3 पाई गई; PM10, 70.5 µg/m3to 95.7 µg/m3 की सीमा में था जहां तक गैसीय प्रदूषकों SO2 और NO2 का संबंध है, आवासीय और ग्रामीण क्षेत्रों के लिए 80 µg/m3 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 08 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 7.50 से 8.23 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 बदुआ 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। कार्मिकों 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 सुदृढ़ीकरण।

❖ 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।

बदुआ यूनिट सं०- 03 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. 3,08,80,000 /-x 2% = रु. 6,17,600/-

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 270 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 (बदुआ यूनिट सं०- 03**)**

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)	2.70	0.5
4	परिवहन सड़क रखरखाव लागत	1.0	1.5
TOTAL		**3.70**	**5.5**

नोट: *270 पौधे * 1000 रुपये (हेज और बाड़ सहित प्रत्येक पौधे के लिए) = 270000/- 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*0.40 किमी लंबी सड़क) = 1,00,000/-

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।

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