## DRAFTENVIRONMENTAL IMPACT ASSESSMENT

## AND

## **ENVIRONMENTAL MANAGEMENT PLAN**

### OF

## SAND MINING PROJECT OF PATNA SON 08 SAND GHAT, DISTRICT - PATNA

SAND BLOCK	PATNA SON 08		
PROPOSAL NO	SIA/BR/MIN/ 412501/2022		
<b>TOR NO</b> SIA/1(a)/2247/2023			
AREA	68.16 HA		
PRODUCTION	1226880 CUM OR 2110234 TPA		
LOCATION	MAUJA– JALPURA MASAURHA 2, ANCHAL – PALIGANJ DIST - PATNA, (BIHAR)		
KHASRA NO	2459, 2460, 2461		

## APPLICANT

Devendra Equipment Pro - Kanchan Kumar Singh S/o - Devendra Kumar M/448, Laxmi Niwas, Road No.- 04, Kankarbagh, Patna, Bihar.



CONSULTANT

**P&M Solution** 

C-88, Sector 65, Noida -201301 - U.P

A QCI -NABET Accredited Organization

Regional Office: 201, Mangal Market, Raja Bazaar, Patna, Bihar



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

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Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

#### **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 14<sup>th</sup> September, 2006



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

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 & CLUSTER APPROCH

The Proposed Sand Mining Project was located on Sone River at Patna Son 08, Sand Ghat at Mauza– Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar)

The proposed mining was a cluster of 06 mining lease area of Patna Son 04, Son 05, Son 06, Son 07, Son 08 & Son 09 over an combined area of 284.55 Ha is for river bed sand mining on Sone River at Dist-Patna, Bihar.

**Cluster Situation:** As per District Survey Report Patna the Proposed Sand Ghats of Patna Son 04, Son 05, Son 06, Son 07, Son 08 & Son 09 are comes in cluster situation whose combined cluster area is 284.55 ha. All the lease area of homogeneous minerals is coming within 500 m radius from each other confirming a cluster situation.

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.** 

Sand Block name	Area (Ha.)	Production (in TPA) considering max as 3 meter
Patna Son 04	29.77	1456542
Patna Son 05	45.03	2188458
Patna Son 06	40.98	1991628
Patna Son 07	54.66	2656476
Patna Son 08	68.16	3312576
Patna Son 09	45.95	2233170

The Details of Cluster of lease area given below:



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

Total	284.55	13838850 TPA

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. Patna Son 08 Sand Ghat fall in Mauza– Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar). The details of the project are given below:

Name & Address	Sand Mining Project Patna Son 08 Sand Ghat on		
of the Mine	Patna Son 08 Sone River at Mauza – Jalpura Masaurha 2, Ancha		
		–Paliganj Dist - Patna (Bihar).	
River	Sone		
Mineral	Sand		
Area (Ha.)	Patna Son 08	68.16 Ha.	
Production	Patna Son 08	2110234 TPA	
Postal Address	Patna Son 08	Devendra Equipment Pro - Kanchan Kumar Singh S/o - Devendra Kumar M/448, Laxmi Niwas, Road No 04, Kankarbagh Patna, Bihar.	
Status of Mine	Fresh application for Environmental Clearance.		
Project Cost	Rs- 24,95,65,600 /-		
CER Cost	CSR cost will be 2% of the total project cost. This amount will be used		
	for social welfare.		
	CSR COST is Rs. 24,95,65,600 /- x 2% = Rs. 49,91,312/		

#### **1.2 BRIEF DESCRIPTION OF PROJECT**

The proposed project is open cast semi-mechanized mining of sand with a proposed production of 2110234 Tonnes per annum for all these three applied lease. Detail has been given below:

The proposed project is over an area 68.16 ha for Patna Son 08. Details are summarized in Table no 1.1



#### CHAPTER-I INTRODUCTION

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

As per MoEF, New Delhi Gazette dated 14<sup>th</sup> 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)

Block	Area	Khata No	Khasra No	Production	Auction Cost
Patna Son 08	68.16	590	2459, 2460, 2461	2110234 TPA	23,92,41,600/-
Total				2110234 TPA	23,92,41,600/-

Table: 1.1 Project cost break-up & Production

The proposed mining lease area falls in Survey of India Toposheet 72 C/11 & 72C/15. The mine lease co-ordinates and connectivity details are listed below:

		· · · · · · · · · · · · · · · · · · ·
Pillar No	Latitude (N)	Longitude (E)
1	25.36909482	84.74028129
2	25.36955904	84.74062317
3	25.37049166	84.74085151
4	25.37086148	84.74082511
5	25.37142721	84.74101227
6	25.37168956	84.74121103
7	25.37380343	84.74281258
8	25.37371302	84.74323798
9	25.37262001	84.74838094
10	25.37229477	84.74991127
11	25.3718814	84.75185632
12	25.37187919	84.75185607
13	25.37126277	84.75178752
14	25.36907843	84.75154461
15	25.36692075	84.75130467
16	25.36685925	84.75129783

Table: 1.2 Mine lease Pillar Co-ordinates (Patna Son 08)



#### **INTRODUCTION**

17	25.36655368	84.75126385
18	25.36544951	84.75105067
19	25.36572062	84.75023367
20	25.36761669	84.74464109



Figure 1.1, 10 km buffer map

Nearest Habitation/ town	Blocks	Village	Distance (Km) Direction
	Patna Son	Mashora Jalpura	Jalpura Masaurha 2,
	08		approx. 1.85 Km in ESE
			direction.
		Masaurha	Masaurha approx. 1.60

Table: 1.3, Connectivity Details given below



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Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

		Udaipur	Km in Udain in S c	n SSE direction. our approx. 2.50 Km lirection.
Nearest Railway Station	Blocks	Railway Sta	tion	Distance (Km)
				Direction
	Patna Son (	)8 Bihta Railw	/ay	Garhani Railway
		station		station approx. 24
				Km in NE
				direction.
Nearest Airport	Blocks	Airport		Distance (Km)
				Direction
	Patna Son (	)8 Jayprakas	h	Approx. 45 Km in
		Narayan Air	port,	NE direction.
		Patna		
Nearest Highway	NH 139 Approx	. 1.35 km towards Ea	st direc	tion.
	SH-69 is approx	x 3.20 m in NE directi	on.	

#### 1.3, Details of environmental settings

Sl.	Particulars	Details		
No.				
2	Ecological Sensitive	There is no any Ecological Sensitive Areas Like National		
	Areas	Park, Wildlife Sanctuaries, etc are found within 10 km of the		
	(National Park,	study area.		
	Wildlife Sanctuaries)			
3	Nearest water body	The mine site lies on the dry bed of Sone river.		
4	Seismic Zone	Zone- IV		
		Source BMTC 2 <sup>nd</sup> edition https://www.bmtpc.org/disaster%20resistnace%20technolgies/ZONE%201 II.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: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

#### 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



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

data provided and presentation made, the SEIAA-Bihar has issued the Terms of Reference is attached at 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 Patna Son 08

#### (ToR File No - SIA/1(a)/2247/2023)

S No	тор	Compliance	Reference in the
<b>5.</b> NU	IUK	Compnance	Report
1	Year-wise production details since	This is fresh LOI, Mine is yet to	
	1994 should be given, clearly stating	be opened. It will open only	
	the highest production achieved in any	after getting environmental	
	one year prior to 1994. It may also be	clearance.	
	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.		
2	A copy of the document in support of	State Govt. has given consent	Annexure II, LOI
	the fact that the Proponent is the	for mining vide letter no.	
	rightful lessee of the mine should be	3105/M Patna dated 01/12/2022	
	given.	for Patna Son 08.	
2			A
3	All documents including approved	The documents including mine	Annexure- III
	mine plan, EIA and public hearing	plan and EIA report submitted	Mine plan
	should be compatible with one another	are compatible with one another	L
	in terms of the mine lease area,	w.r.t. to following information:	All details has been
	production levels, waste generation and	Mining Lassa Area 68.16	complied in
	its management and mining technology	Hectare.	chapter-2
	and should be in the name of the	Lessee: Devendra Fauinment	
	lessee.	Pro Kanchan Kumar Singh	
		S/o- Devendra Kumar	



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		Add _ M/448 Laymi Niwas	
		Road No - 04 Kankarbagh	
		Patna, Bihar, 800020	
		,	
		Waste generation-	
		No waste will be generated.	
		Mining Method-Opencast semi-	
4	All corner coordinates of the mine	All Corner Coordinates of	Pafar Chaptar 2
4	All content coordinates of the finite	An corner coordinates of	Kelei Chapter 2
	lease area, superimposed on a High	mining lease area superimposed	Fig: 2.1, Corner
	Resolution Imagery /toposheet,	on Toposheet Map has been	Coordinates man
	topographic sheet, geomorphology and	incorporated in EIA/EMP	e o or annuces map
	geology of the area should be provided.	Report	
	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).		
5	Information should be provided in	The land use map showing	Land-use of the
	Survey of India Toposheet in 1:50,000	salient features of the area is	study area Figure
	scale indicating geological map of the	given in the report.	3.1.
	area, geomorphology of land forms of	The coolected man of the mine	
	the area, existing minerals and mining		
	history of the area, important water	lease area is also given in the	
	bodies, streams and rivers and soil	report showing geomorphology	
	characteristics.		
6	Details about the land proposed for	The Lease area is dry part of	Chapter II & III
	mining activities should be given with	River bed. This is a barren land.	
	information as to whether mining		
	conforms to the land use policy of the	The mining process will be	
	State: land diversion for mining should	done by land use policy of the	
	state, fund diversion for mining should		
	have approved from State land	State & no land diversion has	



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	board or the concerned authority.	been proposed.	
7	It should be clearly stated whether the	Yes, the proponent Company	Chapter VIII
	proponent Company has a well laid	has a well laid down	Section 8.1
	down Environment Policy approved by	Environment Policy. The	Section 6.1
	its Board of Directors? If so, it may be	hierarchical system or	Corporate
	spelt out in the EIA Report with	administrative order of the	Environment
	description of the prescribed operating	company has been given in the	Policy
	processes /procedures to bring into	EIA report.	
	focus any infringement / deviation /		
	violation of the environmental or forest		
	norms / conditions?. The hierarchical		
	system or administrative order of the		
	company to deal with the		
	environmental issues and for insuring		
	compliances with the EC conditions		
	may also be given. The system of		
	reporting of non-compliances /		
	violations of environmental norms to		
	the Board of Directors of the Company		
	and/or shareholders or stakeholders at		
	large, may also be detailed in the EIA		
	Report.		
8	Issues relating to Mine safety	Issue related to mine safety has	
	,including subsidence study in case of	been given in of chapter 7.	
	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.		



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9	The study area will comprise of 10 km	The 10 km zone from periphery	Chapter I
	zone around the mine lease from lease	of the lease has been considered	Eigung 1 1
	periphery and the data contained in the	as the study area. The Buffer	rigure 1.1
	EIA such as waste generation etc.	map of the study area is	
	should be for the life of the	attached with report.	
	mine/lease period.	All the details in the EIA report	
		are for the life of the mine	
		neriod	
		period.	
		The details of mining &	
		production have been given in	
		the report.	
10	Land use of the study area delineating	Land use pattern of 10 km from	Land-use of the
	forest area, agricultural land, grazing	the periphery of the lease area	study area Figure
	land, wildlife sanctuary, national park,	has been prepared and	3.1, Table 3.1
	migratory routes of fauna, water	incorporated with the report.	
	bodies, human settlements and other	The study area lies in Sone	10 km buffer map
	ecological features should be indicated.	River.	enclosed in Chapter
	Land use plan of the mine lease area	No Ecological Sensitive areas	I of EIA Report.
	should be prepared to encompass	found within 10 km study area.	
	preoperational, operational and post		
	operational phases and submitted.		
	Impact, if any, of change of land use		
	should be given.		
11	Details of the land for any Over	There is no overburden outside	
	Burden Dumps outside the mine lease,	the mine lease area.	
	such as extent of land area, distance		
	from mine lease, its land use ,R&R		
	Issues, if any, should be given.		
12	A Certificate from the Competent	There is no forest land within	



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	Authority in the State Forest	the lease area.	
	Department should be provided,		
	confirming the involvement of forest		
	land, if any, in the project area. In the		
	event of any contrary claim by the		
	Project Proponent regarding the status		
	of forests, the site may be inspected by		
	the State Forest Department along with		
	the Regional Office of the Ministry to		
	ascertain the status of forests, based on		
	which, the Certificate in this regard as		
	mentioned above be issued. In all such		
	cases, it would be desirable for		
	representative of the State Forest		
	Department to assist the Expert		
	Appraisal Committees.		
13	Status of forestry clearance for the	No forest land is involved in the	
	broken up area and virgin forestland	lease area, therefore, deposition	
	involved in the Project including	of net present value (NPV) and	
	deposition of net present value (NPV)	compensated Afforestation is	
	and Compensatory afforestation (CA)	not indicated.	
	should be indicated. A copy of the		
	forestry clearance should also be		
	furnished.		
14	Implementation status of recognition of	There is no forest land involved	
	forest rights under the schedule tribes	in the leased out area. Hence,	
	and other traditional forest Dwellers	this act is not applicable for this	
	(Recognition of Forest Rights) Act,	project.	
	2006 should be indicated"		



#### **INTRODUCTION**

15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given	However, the vegetation details of the study area are incorporated with the report.	Chapter III Section 3.1.6 Biological Environment
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	The details Impacts & there mitigation measures are given in chapter IV of EIA/EMP Report.	Chapter IV
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger / Elephant Reserves / (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	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. MAP showing eco sensitive zone is attached in Chapter III (Fig 3.4)	Chapter III Section 3.1.6 Biological Environment



#### **INTRODUCTION**

I			
18	A detailed biological study of the study	Detailed biological study of	Chapter III
	area [core zone and buffer zone (10 km	core zone and buffer zone	
	radius of the periphery of the mine	within 10 km radius of the	Section 3.1.6
	lease)] shall be carried out. Details of	periphery of the mine lease has	Biological
	flora and fauna, endangered, endemic	been carried out for the project.	Environment
	and RET Species duly authenticated,	The same has been incorporated	
	separately for core and buffer zone	in the report.	
	should be furnished based on such		
	primary field survey, clearly indicating		
	the Schedule of the fauna present. In		
	case of any scheduled-I fauna found in		
	the study area, the necessary plan along		
	with budgetary provisions for their		
	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	Proposed project does not come	
	'Critically Polluted' or the Project	under critically polluted area.	
	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.		
20	Similarly, for coastal projects A CRZ	There is no R & R involved in	
	map duly authenticated by one of the	this project.	
	authorized agencies demarcating	1 5	
	LTL.HTL, CRZ area ,location of the		
	mine lease w.r.t CRZ, Coastal		
	features such as mangroves , if any		
	should be furnished.(Note: The Mining		
	Projects falling under CRZ would also		
	need to obtain approval of the		
	concerned Coastal Zone Management		
	Authority)		
21	R&R Plan/compensation details for the	There is no R & R involved in	
	Project Affected People (PAP) should	this project.	
	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.		
22	One season (non-monsoon) [i.e.	Base line study was carried out	Chapter III
	March-May (Summer Season);	for Dec 2022 January 2023,	
	October-December (post monsoon	February 2023 Details are	
	season); December-February (winter	provided in EIA/EMP Report.	
	season)] primary baseline data on	The locations of the monitoring	
	ambient air quality as per CPCB	stations were decided on the	
	Notification of 2009, water quality,	basis of prevailing	
	noise level, soil and flora and fauna	meteorological conditions	
	shall be collected and the AAQ and	(Wind direction & wind speed)	
	other data so compiled presented date-	of the study area.	
	wise in the EIA and EMP Report" Site-	The wind rose has been given in	
	specific meteorological data should	chapter III of EIA/EMP Report.	
	also be collected. The location of the	One location has been selected	
	monitoring stations should be such as	in downwind direction within	
	to represent whole of the study area	500 m from the lease boundary.	
	and justified keeping in view the pre-		
	dominant downwind direction and	The location of the monitoring	
	location of sensitive receptors. There	sites has been shown in map.	
	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.		
23	Air quality modeling should be carried	Air quality modelling detail	
	out for prediction of impact of the	given in EIA/EMP report in	



	project on the air quality of the area. It	Chapter 04.	
	should also take into account the		
	impact of movement of vehicles for		
	transportation of mineral. The details		
	of the model used and input parameters		
	used for modeling should be provided.		
	The air quality contours may be shown		
	on a location map clearly indicating the		
	location of the site, location of		
	sensitive receptors, if any, and the		
	habitation. The wind roses showing		
	pre-dominant wind direction may also		
	be indicated on the map.		
24	The water requirement for the Project,	The water requirement 11.70	Chapter –II
	its availability and source should be	KLD for Patna Son 08	Section 27 Water
	furnished. A detailed water balance	A datailed water holonoo is	Bequirement
	should also be provided. Fresh water	A detailed water balance is	Kequitement
	requirement for the Project should be	being provided in the report.	
	indicated.		
25	Necessary clearance from the	Water requirement will be	Chapter II
	Competent Authority for drawl of	fulfilled by private water tanker.	
	requisite quantity of water for the	So, no clearance is required.	
	Project should be provided.		
26	Description of water conservation	The project do not consume any	
	measures proposed to be adopted in the	process water except for	
	Project should be given. Details of	drinking, dust suppression &	
	rainwater harvesting proposed in the	plantation. Plantation is	
	project, if any required should be	proposed, which will increase	
	provided.	the water holding capacity &	
		help in recharging of ground	



**INTRODUCTION** 

		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	Mining activity will be done on	Chapter II
	quality, both surface and groundwater,	Dry Bed of River so there is no	
	should be assessed and necessary	impact on surface water.	
	safeguard measures, if any required,	Mining will be up to 3 m below	
	should be provided".	ground level or above the	
		ground water table whichever	
		comes first. This will not	
		intersect the ground water table.	
28	Based on actual monitored data , it	The detailed impact and control	
	may clearly be shown whether working	measure w.r.t the quality of	
	will intersect groundwater. Necessary	water in the surrounding area is	
	data and documentation in this regard	discussed under Chapter 4.	
	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.		
29	Details of any stream seasonal or	The project site lies on Sone	
2)	otherwise passing through the lease	river No diversion is proposed	
	area and modification / diversion	nver. No urversion is proposed.	
	area and mountcation / diversion		
	proposed, if any, and the impact of the		
	same on the hydrology should be		
•	brought out.		
30	Information on site elevation, working	The mining will be done as per	
	depth, groundwater table etc. Should	the approved mining plan and 3	
	be provided both in AMSL and bgl. A	meter bgl whichever is comes	
	schematic diagram may also be	first.	
	provided for the same.		
31	A time bound Progressive Greenbelt	Plantation/afforestation will be	Chapter VIII
	Development Plan shall be prepared in	done as per program i.e along	Section 8.2
	a tabular form (indicating the linear	the road sides and near civic	
	and Quantities coverage, plant species	amenities, as per mine plan.	
	and time frame) and Submitted keeping	Post plantation, the area will be	
	in mind the same will have to be	regularly monitored in every	
	executed up front on commencement	season for evaluation of success	
	of the Project. Phase-wise plan of	rate.	
	plantation and compensatory	List of Plant species selected for	
	afforestation should be charted clearly	green belt is detailed in the EIA	
	indicating the area to be covered under	report.	
	plantation and the species to be	The plant species selected for	
	planted. The details of plantation	green belt have a greater	
	already done should be given. The	ecological value and are of good	
	plant species selected for green belt	utility value to the local	
	should have greater ecological value	population. The plant species	
	and should be of good utility value to	are selected by giving emphasis	



	the local population with emphasis on	on local and native species and	
	local and native species and the species	the species which are tolerant to	
	which are tolerant to pollution.	pollution	
32	Impact on local transport infrastructure	The projection has been done	Chapter IV
	due to the Project should be indicated.	based on the mineral	
	Projected increase in truck traffic as a	transportation.	
	result of the Project in the present road		
	network (including those outside the	The details of traffic analysis	
	Project area) should be worked out,	are discussed in the report.	
	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.		
33	Details of the onsite shelter and	A temporary rest shelter will be	Chapter II
	facilities to be provided to the mine	provided for the workers near to	
	workers should be included in the EIA	the site with provisions of	
	Report	water, first aid facility,	
		protective equipments, etc.	
		Details are given in the	
		EIA/EMP Report.	



24	Concentual most mining land use and	Concentual plane and Castions	
54	Conceptual post mining land use and	Conceptual plans and Sections	
	Reclamation and Restoration of mined	are given in Chapter 2.	
	out areas (with plans and with adequate		
	number of sections)should be given in		
	the EIA report.		
35	Occupational Health impacts of the	Occupational health impact	Chapter VII
	Project should be anticipated and the	mainly is expected due air	
	proposed preventive measures spelt out	pollution due to fugitive dust	
	in detail. Details of pre-placement	emission because of movement	
	medical examination and periodical	of vehicles. However	
	medical examination schedules should	appropriate mitigation measures	
	be incorporated in the EMP. The	for air pollution control have	
	project specific occupational health	been given in the report,	
	mitigation measures with required	discussed in Chapter-4.	
	facilities proposed in the mining area	Fach labour will undergo pre-	
	may be detailed.	Lach habbar with andergo pre-	
		placement medical examination.	
		Thereafter periodical heath	
		check up will be arranged as	
		stated in the report. About 4.0	
		lakh has been earmarked for	
		occupational health.	



#### **INTRODUCTION**

36	Public health implications of the	The proposed project being a	Chapter VII
	Project and related activities for the	small scale semi-mechanized	
	population in the impact zone should	mining project, there will be	
	be systematically evaluated and the	hardly any process related	
	proposed remedial measures should be	health implication on the	
	detailed along with budgetary	population of the nearby	
	allocations.	villages except fugitive dust	
		emissions due to transportation.	
		Budgetary allocation is given in	
		Chapter-VIII.	
37	Measures of socio economic	Socio-economic significance	Chapter VI
	significance and influence to the local	provided to the local	
	community proposed to be provided by	community i.e. to the nearby	
	the Project Proponent should be	villagers is given in the	
	indicated. As far as possible,	EIA/EMP Report.	
	quantitative dimensions may be given		
	with time to time for implementation.		
38	Detailed environmental management	The detailed environmental	Chapter VIII
	plan (EMP) to mitigate the	management plan to mitigate	
	environmental impacts which, should	the environmental impacts has	
	inter-alia include the impacts of change	been mentioned in of the	
	of land use, loss of agricultural and	EIA/EMP Report.	
	grazing land, if any, occupational		
	health impacts besides other impacts		
	specific to the proposed Project		
39	Public Hearing points raised and	This is a draft EIA report.	
	commitment of the Project Proponent	Public hearing is yet to be	
	on the same along with time bound	conducted.	
	Action Plan with budgetary provisions		
	to implement the same should be		



#### **INTRODUCTION**

	provided and also incorporated in the		
	final EIA/EMP Report of the Project.		
40	Details of litigation pending against the	No litigation is pending against	
	project, if any, with direction /order	the project.	
	passed by any Court of Law against the		
	Project should be given.		
41	The cost of the Project (capital cost and	The capital cost & recurring	Chapter IX
	recurring cost) as well as the cost	cost has been earmarked for	
	towards implementation of EMP	EMP in Chapter IX	
	should be clearly spelt out.	Canital Recurring	
		Block Cost Cost	
		Patna         6.97         5.5           Son 08         6.97         5.5	
42	A Disaster management Plan shall be	A Disaster management Plan	Chapter VI
	prepared and included in the EIA/EMP	has been given in EIA report.	
	Report".		
43	Benefits of the Project if the Project is	2% of the total cost of the	
	implemented should be spelt out. The	project has been earmarked	
	benefits of the Project shall clearly	towards the Enterprise Social	
	indicate environmental, social,	Commitment which will be	
	economic, employment potential, etc.	used for the development of	
		village.	
44	Besides the above, the below mentione	d general points are also to be fol	llowed:-
		A11 (h	
a	All documents to be properly	All the documents to be	
	referenced with index and continuous	property referenced with index	
	page numberings.	and continuous page	
		numbering.	



-			
b	Where data are presented in the Report	Compiled With EIA report.	
	especially in Tables, the period in		
	which the data were collected and the		
	sources should be indicated.		
с	Project Proponent shall enclose all the	Compiled With EIA report.	
	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.		
d	Where the documents provided are in a	Compiled With EIA report.	
	language other than English, an English		
	translation should be provided.		
e	The Questionnaire for environmental	Compiled With EIA report.	
	appraisal of mining projects as devised		
	earlier by the Ministry shall also be		
	filled and submitted.		
f	While preparing the EIA report, the	Compiled With EIA report.	
	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.		
1			



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Channes if any made in the basis	A	
Changes, if any made in the basic	Agreed	
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.		
As per the circular no. J-	This is new case for Mining. No	
11011/618/2010-IA. II (I) dated	certified compliance is required.	
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.		
The EIA report should also include (i)	Compiled With EIA report.	
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		
	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. 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. 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)	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. 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. 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



**INTRODUCTION** 

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

features of the adjoining area.	

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Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

#### 2.0 TYPE OF PROJECT

The project is proposed is for sand block Patna Son 08 for the excavation of sand from the bed of river Sone. The proposed project is opencast semi-mechanized/OTFM mining project.

#### 2.1 NEED FOR THE PROJECT

The project site lies on Sone 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 was located on Sone River at Patna Son 08, Sand Ghat at Mauza– Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar)

The proposed mining was a cluster of 06 mining lease area of Patna Son 04, Son 05, Son 06, Son 07, Son 08 & Son 09 over an combined area of 284.55 Ha is for river bed sand mining on Sone River at, Dist- Patna, Bihar.

**Cluster Situation:** As per District Survey Report Patna the Proposed Sand Ghats of Patna Son 04, Son 05, Son 06, Son 07, Son 08 & Son 09 are comes in cluster situation whose combined cluster area is 284.55 ha. All the lease area of homogeneous minerals is coming within 500 m radius from each other confirming a cluster situation.

The address of the proponents is given below:

Sand Block name	Area (Ha.)	Production (in TPA) considering max as 3 meter
Patna Son 04	29.77	1456542
Patna Son 05	45.03	2188458
Patna Son 06	40.98	1991628



#### **PROJECT DESCRIPTION**

#### **CHAPTER-2**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

Total	284.55	13838850 TPA
Patna Son 09	45.95	2233170
Patna Son 08	68.16	3312576
Patna Son 07	54.66	2656476

Table: 2.1	Mine lease	Pillar	<b>Co-ordinates</b>	(Patna	Sone 08	)
------------	------------	--------	---------------------	--------	---------	---

Pillar No	Latitude (N)	Longitude (E)
1	25.36909482	84.74028129
2	25.36955904	84.74062317
3	25.37049166	84.74085151
4	25.37086148	84.74082511
5	25.37142721	84.74101227
6	25.37168956	84.74121103
7	25.37380343	84.74281258
8	25.37371302	84.74323798
9	25.37262001	84.74838094
10	25.37229477	84.74991127
11	25.3718814	84.75185632
12	25.37187919	84.75185607
13	25.37126277	84.75178752
14	25.36907843	84.75154461
15	25.36692075	84.75130467
16	25.36685925	84.75129783
17	25.36655368	84.75126385
18	25.36544951	84.75105067
19	25.36572062	84.75023367
20	25.36761669	84.74464109

Patna Sone 08 Sand Ghat is well connected by NH 139. NH 139 Approx. 1.35 km towards East direction.



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).



#### PILLAR CO-ORDINATES MAP OF THE STUDY AREA

Figure 2.1:- Pillar Coordinate map of Patna Sone 08

#### 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.

Block	Area	Khata No	Khasra No	Production	Auction Cost
Patna Son 08	68.16	590	2459, 2460, 2461	2110234 TPA	23,92,41,600/-
Total				2110234 TPA	23,92,41,600/-

As per MoEF, New Delhi Gazette dated 14<sup>th</sup> 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.



#### **PROJECT DESCRIPTION**

#### **CHAPTER-2**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).



Figure 2.2:- Location map of the project site Patna Sone 08.

#### 2.3 TOPOGRAPHY & GEOLOGY

#### 2.3.1 Topography

The Elevation of the applied area for the block is 65.5 ASML to 64.5 ASML in the stretch. The sand deposits of Patna district of Bihar broadly form part and parcel of the flood plains of Ganga River as whole formed since geological ages.

The State of Bihar is transecting by a no. of rivers. The individual river basins and their catchment areas is shown in Fig. no. 1 below.

The various sand mining lease areas (also referred to as sand ghats) lie in the river bed of river Sone which is a major tributary of river Ganga. They are formed in the Quaternary period of central Bihar Plains- the OAG (Older Alluvium Group) forming the highest terrace, in the Sone-Ganga alluvial tract, and NAG (Newer Alluvium Group) forming younger terraces, as Older Flood Plains, are exposed all along the Alluvial Upland.

Source: Mining plan



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#### 2.3.2 GEOMORPHOLOGY

The district forms a part of the Ganga basin and is characterized by a monotonously flat relief with elevation In general, the western part of the district is sloping due north and north-east, with elevation of the land surface varying from 68 m in the south to 48 m in the north, and from 67 m in the west to 45 m in the east. A notable geomorphic feature is the strong natural levee formation or upland all along the southern bank of the Ganga which acts as a natural barrier thereby causing many of the streams flowing from south to run parallel to the course of Ganga before finally joining it further east of the district boundary. **Source:** http://cgwb.gov.in/district\_profile/Bihar/Patna.pdf

#### 2.3.3 REGIONAL GEOLOGY

Regionally the area constitutes a part of the Ganga River Basin. The Sone originates near Amarkantak in Anuppur district of Madhya Pradesh, just east of the headwater of the Narmada River, and flows north-northwest through Shahdol district in Madhya Pradesh state before turning sharply eastward where it encounters the southwest-northeast-Kaimur Range. The Sone parallels the Kaimur hills, flowing east-northeast through Uttar Pradesh, Jharkhand and Bihar states to join the Ganges just west of Patna. Geologically, the lower valley of the Sone is an extension of the Narmada Valley, and the Kaimur Range an extension of the Vindhya range. Anuppur, Chopan, Deori, Rohtasgarh, Dehri, Sonebhadra and Bihta are the major cities situated on Sone River.

Age	Geology	Occurrences
Quaternary	Alluvial Deposits	North Bihar Plain
	(Sand, Clay, Silt,	& Central Bihar Plain
	Fragments)	
Tertiary	Sand Stones & Clay Stones	North Champaran Hills
Gondwana	Coal Measures, Forming a	Banka District
	series of Small outlier	
	basins	

Table 2.2 Showing the Geological Succession and their Occurrences distribution



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Vindhyans	Sandstones, Shales,	Parts of Bahbhua and Rohtas
	Limestones, etc.	dist
Satpura	Schist, Phyllite, Quartzite	Part of Aurangabad, Gaya,
		Nawada, Nalanda,
		Sheikhpura and
		Munger District
Proterozoic	Mica Schist, amphibolites,	Nawada, Jamui and Banka
	quartzite, granite,	
	dolerite and pegmatite	
Archaean	Gneisses, Granites, Schists,	Part of Aurangabad, Gaya,
	Phyllites, quartzite,	Nawada, Jamui,
	amphibolites &	Banka and Bhagalpur
	intrusive all	
	metamorphosed	
	sedimentary and	
	igneous rocks	

Source: Mining Plan

#### 2.3.4 LOCAL GEOLOGY OF THE AREA

The Sone parallels the Kaimur hills, flowing east-northeast through Uttar Pradesh, Jharkhand and Bihar states to join the Ganges just west of Patna. Geologically, the lower valley of the Sone is an extension of the Narmada Valley, and the Kaimur Range an extension of the Vindhya Range.

The sand exposed in the River bed of Sone 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. The following sequences have been observed in the area, i.e. Top soil/ Alluvium followed by sand deposition.


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 season. Only during rainy season 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 somewhat extreme in nature, i.e., quite hot during the summer and fairly cold during the winter. January is the coldest month. The temperature starts rising from March and reaches its peak in May. Rain starts sometime in mid June and lasts till mid September. Maximum rains occur during the monsoon months of July and August. Sometimes winter rains occur in Jan-February. The normal annual rainfall in the district is around 1076 mm.

Source <a href="http://cgwb.gov.in/district\_profile/Bihar/Patna.pdf">http://cgwb.gov.in/district\_profile/Bihar/Patna.pdf</a>

# 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 1m from surface has been considered as proved reserves.

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserves	111	2044800
Total	2044800	

 Table-2.2:- Proved Mineral Reserves of Patna Son 08

Total Geological Reserve = 2044800 cum. or 3517056 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  $(1.72 \text{ g/cm}^3)$  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 palaeo channels of the river will be leveled & restored back.

Table-2.4:- Summary of minable reserves of Patna Sone 08 Sand Ghat as below (the bulk density multiply by 1.72)

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
65-63.5	1060	629	1.5	1000110	1720189
63.5-62	1050	619	1.5	974925	1676871
Total				1975035	3397060

Total Mineable Reserve = 1975035 CUM or 3397060 Tonnes



#### **PROJECT DESCRIPTION**

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Figure 2.3:- Surface cum Geological Section of Patna Sone 08

# 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, SSMG -2016, and EMGSM – 2020.
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 6 m width will be maintained for mining blocks as per guideline M.M.R-12019, 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 Patna Sone 08 are given below :-



YEAR	ROM sand (cum)	ROM sand (Tones)
1 <sup>st</sup> Year	1226880	2110234
2 <sup>nd</sup> Year	1226880	2110234
3 <sup>rd</sup> Year	1226880	2110234
4 <sup>th</sup> Year	1226880	2110234
5 <sup>th</sup> Year	1226880	2110234
Total	6134400	10551170

 Table 2.3 Year wise Production Details of Patna Sone 08

#### Source: Mining Plan

# 2.5 Conceptual Mining Plan

Mine Applied Area will be worked for Patna Sone 08 Sand Ghat. However, as the digging depth will be restricted to 3.0 m only. This will be further replenished during rainy season. Sand Ghat will be worked systematically as the width is limited while length is much more. As the lease period is only 5 (Five) years, some of the area will be left un-worked at the end of lease period.

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

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

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

# 2.6.0 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 top soil is present in the mining area as it is riverbed. Small amount of domestic waste will be generated by the workers at the site, which will be disposed off through proper municipal way. No other waste generation is expected. No waste will be thrown into the streams or left on the banks. Separate bins will be kept within the lease area for domestic wastes.

# **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 Sone River so there will be no impact on surface water.



# **CHAPTER-2**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).



Fig-2.4, Drainage map

# 2.7.3 Man power requirement

The manpower requirement for the proposed project will be around 71 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 2.8**.

S. No.	Category	Numbers
1.	Administration	1
2.	Supervisor	4
3.	Skilled	20
4.	Un-skilled	46
	TOTAL	71

 Table 2.4 Manpower Requirement in Patna Sone 08



# 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:

Activity	Calculation	Round off Figure in KLD
Drinking	@ 10 lpcd per labor 10*71/1000= 0.71 KLD	0.71
Dust Suppression	Total approach road to be water sprinkled = 1260 m 1260 m*6m*0.5 *2 times/1000= 7.56 KLD	7.56
Plantation682 plant (during plan period)@ 5 L/per plant= 682*5lts= 3410/1000= 3.41KLD		3.41
	11.68~11.70	

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



#### **CHAPTER-2**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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 Dec 2022,Jan-Feb 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
- $\checkmark$  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

#### **BASELINE DATA DESCRIPTION**

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- ✓ 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.
- $\checkmark$  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 (Dec 2022, Jan-Feb 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**.

#### **BASELINE DATA DESCRIPTION**

#### **Chapter-III**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

Landuse Type	Area (Ha)	Area (%)
Scrub Land	2524.18	6.27
Forest	321.56	0.80
River/Water Bodies	1602.27	3.98
Settlement	4183.99	10.40
Sand	1635.87	4.07
Agriculture	29971.18	74.48
AREA	40239.05	100.00

<b>Table 3.1:</b>	Land Use	Cover of	the Project	<b>Study Area</b>
				,



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

# **BASELINE DATA DESCRIPTION**

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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 Dec 2022 to February 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.

Water (Ground) Monitoring Locations				
GW 1	Mahabalipur	0.5 Km,ESE		
GW 2	Jalpura	4.70 Km,NE		
GW 3	Kori	6.11 Km,NW		
GW 4	Bargaon	5.83 Km, WSW		
GW 5	Shrirampur	4.23 Km, SE		



Figure 3.2 Water Sampling Location Map

A

# **BASELINE DATA DESCRIPTION**

**Project:** Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

S. No.	Parameter	GW1	GW2	GW3	GW4	GW5	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
Physical	l Parameters			L				
1.	pH (at 25 °C)	7.46	7.61	7.70	7.65	7.66	6.5-8.5	-
2.	Colour (Hazen Unit)	<5	<5	<5	<5	<5	5	15
3.	Turbidity (NTU)	<1	<1	<1	<1	<1	1	5
4.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-
Chemical	l Parameters							
6.	Total Hardness as CaCO <sub>3</sub> (mg/L)	205	215	244	304	350	200	600
7.	Calcium as Ca (mg/L)	42.80	35.10	30.50	28.60	40.20	75	200
8.	Alkalinity as CaCO <sub>3</sub> (mg/L)	145.02	151.38	162.12	157.34	163.70	200	600
9.	Chloride as Cl (mg/L)	33.94	38.58	37.52	34.66	41.65	250	103000
10.	Cyanide as CN (mg/L)	< 0.02	<0.02	< 0.02	< 0.02	< 0.02	0.05	No Relaxation
11.	Magnesium as Mg (mg/L)	12.56	9.67	8.94	10.12	11.36	30	100
12.	Total Dissolved Solids (mg/L)	364.0	385	436.0	351.35	421.0	500	2000
13.	Sulphate as SO <sub>4</sub> (mg/L)	30.49	36.57	28.27	25.89	32.24	200	400
14.	Fluoride as F (mg/L)	0.59	0.83	0.56	0.076	0.11	1.0	1.5
15.	Nitrate as NO <sub>3</sub> (mg/L)	7.54	8.87	6.94	8.62	6.65	45	No Relaxation
16.	Iron as Fe (mg/L)	0.116	0.154	0.172	0.132	0.124	0.3	No Relaxation
17.	Aluminium as Al (mg/L)	<0.03	<0.03	<0.03	< 0.03	<0.03	0.03	0.2
18.	Boron (mg/L)	< 0.1	<0.1	< 0.1	<0.1	< 0.1	0.5	1.0
19.	Chromium as Cr (mg/L)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05	No Relaxation
20.	Conductivity ( µS/cm)	568	601	680	548	656	1.500	-
21.	Phenolic Compounds (mg/L)	< 0.001	< 0.001	< 0.001	<0.001	< 0.001	0.001	0.002
22.	Mineral Oil (mg/L)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.5	No Relaxation

# Table 3.3 Ground Water Quality Monitoring Result

# **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

23.	Anionic Detergents	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.2	1.0
	as MBA (mg/L)							
24.	Zinc as Zn (mg/L)	0.134	0.141	0.122	0.157	0.154	-	15
25.	Copper as Cu (mg/L)	<0.1	<0.1	<0.1	<0.1	<0.1	0.05	1.5
26.	Manganese as Mn (mg/L)	< 0.10	< 0.10	< 0.10	<0.10	< 0.10	0.1	0.3
27.	Cadmium as Cd (mg/L)	< 0.001	< 0.001	< 0.001	<0.001	< 0.001	0.003	No Relaxation
28.	Lead as Pb (mg/L)	< 0.01	< 0.01	< 0.01	< 0.001	< 0.01	0.01	No Relaxation
29.	Selenium as Se (mg/L)	< 0.01	< 0.01	< 0.01	<0.01	< 0.01	0.01	No Relaxation
30.	Arsenic as As (mg/L)	< 0.01	< 0.01	< 0.01	<0.01	< 0.01	0.01	No Relaxation
31.	Mercury as Hg (mg/L)	<0.001	< 0.001	<0.001	< 0.001	< 0.001	0.001	No Relaxation
32.	Total Coliform (MPN/100 mL)	<2/100ml	<2/100m l	<2/100ml	<2/100ml	<2/100ml	Absent/250ml	
		М	icrobiologica	al Parameters				
33.	<i>E. coli</i> (CFU/100mL)	Absent	Absent	Absent	Absent	Absent	Absen	t/250ml

# **Observation:**

Analysis of results of ground water reveals the following: -

- pH varies from 7.46at to 7.70.
- Total hardness varies from 205 mg/l to 350 mg/l.
- Total dissolved solids vary from 351.38 mg/l to 436 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**

Three surface water samples were collected from the study area. The location of surface water samples is given in Table 3.3 (iii). The physio-chemical analysis of the these samples are given in the Table 3.3 (iv)

Surface Water Monitoring Locations					
SW1	Project Site				
SW 2	River Son (Upstream)				
SW 3	River Son (Upstream) Near village				
	Chaukitola				

 Table 3.4: Surface water sampling locations

#### **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

SW 4	River Son (Downstream)	
SW 5	Pond near Fatehpur Village	5.59 Km,ENE

#### Table 3.5: Physio-chemical properties of surface water

TEST RESULTS									
S. No	Parameter	Test Method	Units	SW1	SW2	SW3	SW4	SW5	
1.	pH (at 25 <sup>0</sup> C)	IS:3025(Part-11)		7.37	7.61	7.29	7.11	7.62	
2.	Temperature	IS:3025(Part-9)	<sup>0</sup> C	24.0	23.0	24.0	22.0	24.0	
3.	Turbidity	IS:3025(Part-10)	NTU	1.83	2.4	1.93	1.36	15.6	
4.	Electric Conductivity @25 <sup>0</sup> C	IS:3025(Part-14)	µS/cm	318	410	350	217	312	
5.	Sulphate (SO <sub>4</sub> )	IS:3025(Part-24)	mg/l	11.6	48.2	14.0	10.9	12.01	
6.	Nitrate (NO <sub>3</sub> )	IS:3025(Part-34)	mg/l	5.7	3.8	6.21	4.65	6.60	
7.	Total Hardness (as CaCO3)	IS:3025(Part-21)	mg/l	182	290	210.5	134.0	132	
8.	Chloride (as Cl)	IS:3025(Part-32)	mg/l	8.92	9.41	9.87	8.98	12.4	
9.	Fluoride (as F)	APHA 4500F	mg/l	0.4	0.6	0.12	0.14	0.21	
10.	$COD (as O_2)$	APHA-5220 B	mg/l	23.41	21.54	23.69	24.81	25.0	
11.	Iron (as Fe)	IS:3025(Part-53)	mg/l	0.351	1.18	0.492	0.3	0.164	
12.	Dissolve Oxygen	IS-3025(Part-38)	mg/l	7.12	8.62	8.7	8.2	6.2	
13.	Total Dissolved Solid	IS:3025(Part-16)	mg/l	190.8	190.7	190.9	190.5	200	
14.	BOD (3 days at 27 <sup>0</sup> C)	IS:3025 (P-44)	mg/l	2.9	2.19	2.12	2.17	5.20	
15.	Calcium (as Ca)	IS:3025(Part-40)	mg/l	72.5	71.84	45.96	59.86	46.49	
16.	Magnesium (as Mg)	IS:3025(Part-46)	mg/l	13.96	16.97	9.7	12.50	17.50	
17	Lead (as Pb)	IS:3025(Part-47)	mg/l	BDL (<0.01)					
18	Copper (as Cu)	IS:3025(Part-42)	mg/l	BDL (<0.05)					
19	Zinc (as Zn)	IS:3025(Part-49)	mg/l	BDL (<0.01)					
20	Manganese (as Mn)	IS:3025(Part-59)	mg/l	BDL (<0.10)					
21	Sodium (as Na)	IS:3025(Part-45)	mg/l	26.0	54.0	27.4	26.0	23.5	
22	Potassium (as K)	IS:3025(Part-45)	mg/l	1.2	4.0	1.8	1.6	1.8	
23	Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025(Part-23)	mg/l	176	210	180	172	155	
24	Phosphate (as P)	IS:3025(Part-31)	mg/l	0.24	0.36	0.25	0.19	0.21	
25	Nitrite (as NO <sub>2</sub> )	IS:3025(Part-34)	mg/l	0.15	0.22	0.18	0.14	0.14	
26	Total Suspended Solid	IS:3025(Part-17)	mg/l	8.04	9.41	8.70	10.2	12.4	
27	Faecal Coliform	IS-1622	MPN/100 ml	1400	2100	1200	1500	1000	
28	Total Coliform	IS-1622	MPN/100 ml	1800	4000	1500	2200	1800	

#### **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

# **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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 3.4** below:

Designated-Best-	Class of	Criteria
Use	water	
Drinking Water Source	А	Total Coliforms Organism MPN/100ml shall be 50
without conventional		or less
treatment but after		pH between 6.5 and 8.5
disinfection		Dissolved Oxygen 6mg/l or more Biochemical
		Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing	В	Total Coliforms Organism MPN/100ml shall be 500
(Organized)		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	С	Total Coliforms Organism MPN/100ml shall be
after conventional		5000 or less;
treatment and		pH between 6 to 9;
disinfection		Dissolved Oxygen 4mg/l or more Biochemical
		Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild	D	pH between 6.5 to 8.5
life and Fisheries		Dissolved Oxygen 4mg/l or more Free Ammonia
		(as N) 1.2 mg/l or less
Irrigation, Industrial	Е	pH between 6.0 to 8.5
Cooling, Controlled		Electrical Conductivity at 25°C micro mhos/cm
Waste disposal		Max.2250
		Sodium absorption Ratio Max. 26
		Boron Max. 2mg/l

# Table 3.6, Water quality criteria as per Central Pollution Control Board

#### **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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.

#### 3.2.2 Result & Conclusion:

#### Surface water Observation:

- The analysis results indicate that the pH ranges between 7.11 and 7.62.
- Dissolved Oxygen (DO) was observed in the range of 6.2 to 8.7 mg/l against the minimum requirement of 4 mg/l.
- BOD values were observed to be in the range of 2.17 to 5.20 mg/l.
- Total Coliform examination of surface water samples revealed the presence of total coliform in range of 4000 MPN/100 ml to 1500 MPN/100 ml.

Based on the results it is evident that most of the parameters of the samples comply with 'Category 'C' standards of CPCB (Table 3.5) are indicating their suitability for only Drinking water source after conventional treatment and disinfections.

#### **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 winter 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-3.7, Summarized project site meteorological data for Winter Season

	Temperatu	re °C	Wind Speed (Km/H)		
Month	Min	Max	Min	Max	

# **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

DEC 2022	10	20	1	24
JANUARY 2023	05	19	1	26
FEBRUARY 2023	12	22	2	32



Figure 3.3: Wind Rose Diagram (at site)

# 3.3.1 Secondary Data Collected from IMD

Secondary data from IMD- Patna 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- Patna is about 40 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. The collected data is tabulated in **Table-3.6** 

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 10 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-3.7** 

#### **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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<sub>2</sub>) and Oxides of Nitrogen (NO<sub>2</sub>) 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<sup>th</sup> percentiles have been computed from the observed field data for all sampling stations and are given **Table-3.8**, **Table-3.9**, **Table-3.10 Table 3.11**. These are compared with the standards prescribed by Central PollutionControl Board (CPCB) for industrial, residential and rural zone.

Air Monitoring Locations					
Location ID	Location name	Distance (Km) and Direction			
AAQ 1	Project Site	-			
AAQ 2	Near Azimabad Village	4.99 Km, SW			
AAQ 3	Mahabalipur	4.63 Km,S			
AAQ 4	Paliganj	6.39 Km, SE			
AAQ 5	Jalpura	1.56 Km,E			
AAQ 6	Kori	5.49 Km,NW			
AAQ 7	Bargaon	8.37 Km, SW			
AAQ 8	Shrirampur	8.0 Km, S			
AAQ 9	Turkaul	4.47 Km, N			
AAQ 10	Muzaffarpur	9.96 Km, SW			

 Table 3.8: Ambient Air Quality Monitoring Stations

# **BASELINE DATA DESCRIPTION**

# **Chapter-III**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).



Figure 3.4 Ambient Air Quality Monitoring Stations Table-3.9: Ambient Air Quality in the Study Area PM2.5

Location Code	PM2.5 (μg/m <sup>3</sup> )					
	Name of the station	Min	Max	Average	<b>98</b> <sup>th</sup>	
				_	Percentile	
AAQ1	Project Site	26.29	41.28	32.49	40.42	
A A O 2	Nora Arianta I	25.22	40.54	20.04	20.00	
AAQ2	Near Azimabad	25.23	40.54	30.94	39.99	
	Village					
AAQ3	Mahabalipur	34.21	43.69	39.08	42.85	
AAQ4	Paliganj	27.06	41.21	34.12	41.19	
AAQ5	Jalpura	25.72	38.63	30.38	38.44	
AAQ6	Kori	26.37	38.91	32.07	38.91	
AAQ7	Bargaon	28.42	40.27	34.40	39.74	
AAQ8	Shrirampur	30.23	43.51	37.41	43.35	
AAQ9	Turkaul	28.94	39.75	34.80	39.35	
AAQ10	Muzaffarpur	25.41	34.68	30.12	33.88	

# Table-3.10: Ambient Air Quality in the Study Area PM10

# **BASELINE DATA DESCRIPTION**

**Project:** Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

Location Code	PM10 (μg/m <sup>3</sup> )					
	Name of the station	Min	Max	Average	98 <sup>th</sup> Percentile	
AAQ1	Project Site	66.85	86.64	75.43	86.03	
AAQ2	Near Azimabad Village	64.26	77.38	70.77	77.36	
AAQ3	Mahabalipur	64.86	78.64	72.15	78.29	
AAQ4	Paliganj	54.34	76.28	66.64	75.72	
AAQ5	Jalpura	51.28	73.41	63.40	72.38	
AAQ6	Kori	53.45	74.92	65.62	74.41	
AAQ7	Bargaon	53.92	75.29	62.29	73.10	
AAQ8	Shrirampur	56.71	77.38	66.10	76.73	
AAQ9	Turkaul	65.82	76.52	70.16	76.47	
AAQ10	Muzaffarpur	50.92	72.68	60.98	72.61	

# Table-3.11: Ambient Air Quality in the Study Area SO2

Location	SO2 (μg/m <sup>3</sup> )					
	Name of the station	Min	Max	Average	98 <sup>th</sup> Percentile	
AAQ1	Project Site	6.28	7.35	6.90	7.35	
AAQ2	Near Azimabad Village	7.1	8.68	7.96	8.65	
AAQ3	Mahabalipur	6.28	12.97	8.24	12.00	
AAQ4	Paliganj	7.06	9.78	8.47	9.77	
AAQ5	Jalpura	6.23	7.87	7.02	7.74	
AAQ6	Kori	6.63	7.96	7.40	7.94	
AAQ7	Bargaon	6.27	9.24	7.90	9.23	
AAQ8	Shrirampur	7.29	9.38	8.35	9.35	
AAQ9	Turkaul	7.25	10.15	8.84	10.13	
AAQ10	Muzaffarpur	7.84	10.12	9.04	10.08	

# Table-3.12: Ambient Air Quality in the Study Area NO2

Location Code	NO2 (μg/m <sup>3</sup> )					
	Name of the station	Min	Max	Average	98 <sup>th</sup> Percentile	
AAQ1	Project Site	8.72	11.53	10.20	11.48	

#### **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

AAQ2	Near Azimabad	12.45	15.21	13.72	15.21
	Village				
AAQ3	Mahabalipur	14.65	19.87	17.40	19.84
AAQ4	Paliganj	10.25	13.53	12.14	13.53
AAQ5	Jalpura	8.15	10.49	9.19	10.49
AAQ6	Kori	8.03	10.95	9.80	10.94
AAQ7	Bargaon	8.63	14.18	11.89	14.10
AAQ8	Shrirampur	10.27	13.06	11.81	13.05
AAQ9	Turkaul	12.26	15.58	13.96	15.48
AAQ10	Muzaffarpur	12.14	16.87	14.40	16.67

#### 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 25.23  $\mu$ g/m<sup>3</sup> to 43.69  $\mu$ g/m<sup>3</sup>. Table 3.3 were compared with the National Ambient Air Quality Standards (NAAQS) and found that all sampling stations recorded in the study area are within the applicable limits i.e.,  $60\mu$ g/m<sup>3</sup> for PM<sub>2.5</sub> 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  $50.92 \ \mu g/m^3$  to  $86.64 \ \mu g/m^3$ . 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.,  $100 \ \mu g/m^3$  for PM10 in industrial, residential, rural and other areas.

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

#### 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<sub>2</sub> recorded within the study area was 6.23  $\mu g/m^3$  to 12.97  $\mu g/m^3$ .

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  $\mu$ g/m<sup>3</sup> for Residential, Rural and other areas.

#### **Oxides of Nitrogen (NO2)**

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

• Emissions from vehicular movements in the study area.

Oxides of Nitrogen in the presence of sunlight will undergo reactions with a number of organic compounds to produce all the effects associated with photochemical smog. NO2 has inherent ability to produce deleterious effects by themselves like toxicity. It causes asphyxiation when its concentration is great enough to reduce the normal oxygen supply from the air. The minimum and maximum level of NO2 recorded within the study area was in the range of was  $8.03 \,\mu\text{g/m}^3$ to  $19.87 \,\mu\text{g/m}^3$ .

The 24 hourly average values of NO<sub>2</sub> 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  $\mu$ g/m<sup>3</sup> for Residential, Rural and other areas.

Location Code	Free silica (μg/m <sup>3</sup> )					
	Name of the station	Min	Max			
AAQ1	Project Site	1.25	1.45			
AAQ2	Near Azimabad Village	1.50	1.85			
AAQ3	Mahabalipur	1.30	1.55			
AAQ4	Paliganj	1.40	1.61			
AAQ5	Jalpura	1.31	1.42			
AAQ6	Kori	1.36	1.45			
AAQ7	Bargaon	1.40	1.80			
AAQ8	Shrirampur	1.35	1.63			
AAQ9	Turkaul	1.38	1.66			
AAQ10	Muzaffarpur	1.20	1.50			

Ambient Air Quality in the Study Area, Free Silica

# 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 10 locations and analyzed as per CPCB norms. The soil sampling locations are marked in **Figure 3.5** and shown in **Table 3.12**. Thephysico-chemical characteristic of these soil samples is given in **Table 3.13**.

Cable 3.13: Description	of soil	sampling	locations
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Soil monitoring locations					
SQ 1	Project Site	-			
SQ 2	Near Azimabad Village	4.99 Km, SW			
SQ 3	Mahabalipur	4.63 Km,S			
SQ 4	Paliganj	6.39 Km, SE			
SQ 5	Jalpura	1.56 Km,E			
SQ 6	Kori	5.49 Km,NW			

Chapter-II	[				]	BA	SE	LINE	DATA	A DESC	CRIPTION
		-	 ~ ~	 2		~		7			

SQ 7	Bargaon	8.37 Km, SW
SQ 8	Shrirampur	8.0 Km, S



Figure 3.5, Soil Sampling Locations

Table 3.14 (a) :Physico-chemica	l properties of soil (SQ1-SQ4)
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		Location	SQ1	SQ2	SQ3	SQ4
Sr. No.	Parameters	Units	Results	Results	Results	Results
1	pН	-	7.89	7.54	8.23	7.80
2	Conductivity	µmhos/cm	518.0	460.0	440.0	521.0
3	Sodium (as Na)	mg/kg	64.70	75.40	78.21	64.80
4	Water holding capacity	%	32.0	28.6	28.8	30.1
5	Potassium (as K)	mg/kg	298.0	260.5	254.0	278.2
6	Sand	%	85.00	86.50	89.00	85.40
7	Clay	%	8.00	4.80	3.60	4.60
8	Silt	%	7.00	8.70	7.40	10.0
9	Calcium (as Ca)	mg/kg	454.00	441.00	445.00	542.00
10	Magnesium (as Mg)	mg/kg	168.10	173.09	153.56	203.34
11	SAR	-	0.95	1.49	1.55	1.40
12	CEC	meq/100gm	2.12	2.12	2.34	2.20
13	Phosphorus (as P)	mg/kg	10.80	12.50	12.76	12.44
14	Organic carbon	%	0.43	0.41	0.35	0.42
15	Porosity	%	38.00	36.89	45.6	35.6

# **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

16	Permeability	cm/hr	1.82	1.60	1.88	1.76
17	Bulk Density	kg/cm <sup>3</sup>	1.41	1.44	1.38	1.45
18	Total Kjeldahl	%	0.026	0.034	0.039	0.028
	Nitrogen (TKN)					

#### Table 3.14 (B) : Physico-chemical properties of soil (SQ5-SQ8)

		Location	SQ5	SQ6	SQ7	SQ8
Sr. No.	Parameters	Units	Results	Results	Results	Results
1	pН	-	7.64	7.51	7.49	7.35
2	Conductivity	µmhos/cm	398.0	410.0	421.0	374.0
3	Sodium (as Na)	mg/kg	58.21	78.63	71.91	56.20
4	Water holding capacity	%	34.45	32.87	35.18	32.10
5	Potassium (as K)	mg/kg	241.03	197.46	238.20	249.50
6	Sand	%	61.00	64.00	68.00	64.00
7	Clay	%	18.00	22.00	19.00	22.00
8	Silt	%	21.00	16.00	13.00	16.00
9	Calcium (as Ca)	mg/kg	298.06	240.35	276.12	280.00
10	Magnesium (as Mg)	mg/kg	67.29	65.91	63.75	74.10
11	SAR	-	0.97	0.94	0.98	1.08
12	CEC	meq/100gm	2.15	2.27	2.17	2.27
13	Phosphorus (as P)	mg/kg	10.84	10.93	11.23	12.80
14	Organic carbon	%	0.46	0.46	0.48	0.48
15	Porosity	%	40.98	42.81	38.63	46.20
16	Permeability	cm/hr	1.95	1.83	1.92	1.97
17	Bulk Density	kg/cm <sup>3</sup>	1.38	1.42	1.35	1.28
18	Total Kjeldahl Nitrogen (TKN)	%	0.041	0.036	0.025	0.045

#### **Observations:**

Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 7.35 to 8.23, which shows that the soil is alkaline in nature. Potassium is found to be from 197 mg/kg to 298 mg/kg.

# **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 3.15.** The noise level monitoring locations are marked in **Figure 3.6** and shown in **Table 3.14**.

# **BASELINE DATA DESCRIPTION**

# **Chapter-III**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).



**Figure 3.6 Noise Monitoring Stations** 

Noise Monitoring Locations					
NQ 1	Project Site	-			
NQ 2	Near Azimabad Village	4.99 Km, SW			
NQ 3	Mahabalipur	4.63 Km,S			
NQ 4	Paliganj	6.39 Km, SE			
NQ 5	Jalpura	1.56 Km,E			
NQ 6	Kori	5.49 Km,NW			
NQ 7	Bargaon	8.37 Km, SW			
NQ 8	Shrirampur	8.0 Km, S			
NQ 9	Turkaul	4.47 Km, N			
NO 10	Muzaffarpur	9.96 Km. SW			

**Table 3.15: Noise Quality Monitoring Stations** 

#### **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

			Equivalent Noise Level, dB (A)					
			Limi	t (as per				
S No	Locat	ions	C	РСВ	Observe	ed value Leq,		
5.110.	Locat	10115	Guidel	ines),Leq,	Ċ	lB(A)		
			d	B(A)				
			DAY*	NIGHT*	DAY*	NIGHT*		
1	Project Site	Industrial Zone	75	70	58.9	46.4		
2	Near Azimabad Village	Residential Zone	55	45	50.2	43.0		
3	Mahabalipur	Residential Zone	55	45	50.4	40.2		
4	Paliganj	Residential Zone	55	45	51.1	40.1		
5	Jalpura	Residential Zone	55	45	52.0	41.5		
6	Kori	Residential Zone	55	45	51.5	38.8		
7	Bargaon	Residential Zone	55	45	50.6	36.4		
8	Shrirampur	Residential Zone	55	45	52.3	40.6		
9	Turkaul	Residential Zone	55	45	53.4	42.5		
10	Muzaffarpur	Residential Zone	55	45	50.1	41.8		

**Table 3.16: Noise Monitoring Results** 

#### Results

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as 58.9 dB(A) to 50.1 dB(A) respectively. The minimum & maximum noise levels at night time were found to be 46.4 dB(A) & 36.4 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**

#### **3.6.1.1 Introduction**

The ecological study reflects the potential of a regional ecosystem and its biological components. In India, the biological diversity of plants and animals varies from region to region on account of their diversity and density. Producers (plants), consumers (animals), and decomposers (microbes) govern the whole cycle of ecology. Plant and animals both are interdependent on each other.

The biological study is essential to understand the impact of any developmental project on the existing flora and fauna present in the study area. Hence, studies on various aspects of the ecosystem play an important role in identifying sensitive issues for undertaking appropriate action to mitigate the impact if required.

The Environment baseline data generation report in respect of flora-fauna has been prepared to assess the current ecology & biodiversity scenario of the area; and to carry out Environmental Management Plan based on the proposed project activities. The plan will identify and address the environmental and ecological conservation implications of the area. Conservation of biodiversity is essential for sustainable development.

The main objective of the ecological survey is aimed to find out the baseline status of flora and fauna (terrestrial and aquatic ecosystem) of the study area before the start of Sand Mining Project, On Son River at Son Block No.-08 Sand Ghat.

#### 3.6.2 Description of the study area

The Proposed Sand Mining Project was located on Son River at Mauza– Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

The proposed mining was a cluster of 06 mining lease area of Patna Son 04, Son 05, Son 06, Son 07, Son 08 & Son 09 over an combined area of 284.55 Ha is for river bed sand mining on Sone River at, Dist- Patna, Bihar.

# 3.6.2.1 Description of Eco-sensitive zones in the Study Area (Wildlife Sanctuary/ National Parks/Animal or Elephant Corridors/ Protected Wetlands etc.)

There are no National parks, Biosphere Reserves, Wildlife corridors, Tiger/Elephant reserves (existing as well as proposed), within 5 km from the present project.

# **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

Also, areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value are doesn't exist in the core and buffer zone of the present project. On the other hand, the proposed alignment will cross over some riverine channel in the core zone. Adequate structure for cross drainage shall be constructed in order to maintain the natural hydrology and protection of all forms of biota found there in all the water bodies of the area. Apart from the above, the proposed project the area will promote tourism activities due to the existing Beraila Wildlife Sanctuaries (Bird Sanctuary).

#### 3.6.3 Drainage /Water Bodies of the Study Area

Apart from these, some seasonal (monsoon-fed) riverine streams and Nallas are also present in the study area. Few ponds are also recorded nearby the different villages mainly used for fish farming, Cattle feeding, Irrigation purpose by the villagers, etc.

# Scope and Objectives of the Study

The above study aims in identifying potential impacts on flora and fauna and to suggest relevant compensatory and mitigatorymeasures to protect/conserve biodiversity in the likely impacted area due to the project activity. Following points to be covered under the scope of work:

- Survey of terrestrial & aquatic flora & fauna for core & buffer zone separately.
- Details of endemic species found in the study area and their IUCN status, Schedule status (as per WPA, 1972).
- Survey of the study area in terms of features like breeding &spawning grounds, habitats, flight paths, and the migratory path of the animals.
- Survey of flora covering types e.g. agriculture crop, commercial crop, plantation, natural vegetation/forest type, grass land. The endangered & endemic species of flora & fauna beside any other flora, if present are also to be identified.
- The survey has been covering total listing of the faunal population. The survey has also covered endangered, endemic, migratory & detail of aquatic fauna.
- The assessment of potential damage to terrestrial & aquatic flora and fauna. The impact should be categorized as primary & secondary, temporary and long term, unavoidable & risk transboundary impacts, possible irreversible change.

# 3.6.4 Methodology/ Data Collection

A primary field survey was carried out within a 10 km radius of the proposed project in winter period (Dec-Feb 2023). Both terrestrial and aquatic ecosystems have been studied to understand the biological environment. Secondary data were collected from authentic sources like the Forests Department, Fisheries Department, Agriculture Department of Son , and available published literature.

#### **3.6.5 Flora (Aquatic and Terrestrial)**

For the collection of data for aquatic flora, the methodology prescribed in the standard book of Adoni (1985), NEERI (1998), and APHA (2015) has been adopted. A total of 05 sampling sites were selected for the collection of samples to analyze the aquatic flora.

On the other hand, for the terrestrial data, community analysis was carried out during the summer season. For the collection of terrestrial data, a total of 05 sampling points were selected. At every sampling site, quadrates of 10m X 10m (100 sq.m.) size were randomly laid to study tree species. The circumference of all the adult individuals [( circumference at breast height (CBH)] was measured with Freeman's tape. The study of communities was carried out by using qualitative characteristics, and quantitative characteristics. Qualitative characteristic mainly involved presence/absence of the species,

genera, and family. This showed the community structures, composition and other characteristic can be readily described by visual observation without actual measurements. The quantitative analysis involved the structure and composition of vegetation across vegetation types and compared in terms of frequency, density, abundance, and basal area of tree species.

#### 3.6.6 Fauna (Aquatic and Terrestrial)

For the collection of data for aquatic fauna, the methodology prescribed in the standard book of Adoni (1985), NEERI (1998), and APHA (2015) has been adopted. A total of 05 sampling points were selected for the collection of samples to identify the the aquatic fauna.

On the other hand, for the terrestrial data, the assessment of fauna was done by an extensive field survey in the area at 05 locations. During the survey, the Line Transect method was used for the study of mammals and Transact & Patch sampling were used for Amphibians, visual encountered methods was used for reptiles and butterflies. The presence of wildlife was also confirmed from the animal calls, footmarks, excreta, and from the local inhabitants depending on the animal sightings and the frequency of their visits in the project area which

was later confirmed from the different government offices like the forest department or wildlife department, etc.

Observations of birds were made during a walk-through in the chosen transect for sighting birds. The number of birds observed in each sampling location was listed. Birds were noted and identified with the help of binocular and standard field identification guides.

#### **3.6.7 Sampling Sites**

A total of 05 sampling site were selected for the terrestrial vegetation, avian fauna, and other terrestrial animals like reptiles, mammals, etc. For the collection of samples and data of aquatic flora and fauna, 05 separate sampling sites were also selected at different locations in the study area.

#### 3.6.8Flora of the Study Area

The core zone of the proposed project area doesn't have any major natural forest land.

A major part of the core and buffer zone of the project is agricultural land having some major vegetation in the form of agro forestry. Vegetation patterns in villages and surrounding areas are slightly different from the rest of the areas in the Patna District. The common species grown near the villages are mostly edible, fruits bearing or useful plants. Purposely planted tree patches (mostly fruit-bearing) are available nearby several villages in the study area. The most dominant tree species in the study area are *Aegle marmelos* (Bel), *Azadirachta indica* (Neem), *Emblica officinalis* (Amla), *Dalbergia sissoo* (Sisam), *Ficus bengalensis* (Bargad), *Musa paradisiacal* (Kela), *Syzygiumcumini* (Jamun), *Cassia siamea* (Kasod/Siris), *Litchi chinensis* (Litchi), *Mangifera indica* (Aam) and in case of shrubs *Antigonum leptopus*, *Ricinus communis*, *Lantana camara*, *Jatropha gossipifolia* and *Cassia auriculata* etc. The most dominant species in the study area of both the district was *Mangifera indica* (Aam) and its different varieties.

#### 3.6.9 Flora of Core zone

#### **3.6.9.1** Terrestrial Flora of Core zone (Natural vegetation etc.).

There is no flora found in the core zone

#### 3.6.9.2 Agricultural Crops/ Commercial Crops of the Core zone and Buffer Zone

Details of the agricultural vegetation and commercial crops were collected from the 09 selected sites of the core (Patna district) and the details are given in table 4. These crops are Page | III 65

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similar to the crops of buffer zone also. So, the same information is applicable for the core and buffer zone.

S.No.	Botanical Name	Local/Trade Name	Family Name						
1	Zey mays	Makkha/Maize							
2	Triticum aestivum	Wheat	Poaceae						
3	Oryza sativa	Paddy							
4	Cicer arietinum	Channa	Fabacea						
5	Coriander sativum	Dhaniya	Apiaceae						
6	Abelmoschus esculentus	Bhendi	Amaranthacea						
7	Mamordica charanta	Karela	Cucurbiataceae						
8	Capsicum annum	Mirchi							
9	Lycopersicon lycopersicum	Tomato							
10	Solanum melongena	Brinjal	Solanaceae						
11	Capsicum annuum	Mirchi	-						
12	Solanum tuberosum	Potato							
13	Allium cepa	Onian	Amaryllidaceae						
14	Cajanus cajan	Pigeon pea	Fabaceae						
15	Carica papaya	Papaya	Caricaceae						
16	Okra	Ladyfinger/ Bhindi	Malvaceae						
17	Lagenaria siceraria	Bottle gourd/ Lauki	Cucurbitaceae						
	Source: Present Survey Data Supported by District Agriculture Department, Patna								

# Table 3.18: List of Crops seasonally planted by respective farmers in the Core and Buffer Zone

#### 3.6.9.3 Aquatic Flora of Core zone (Phytoplankton/ Macrophytes).

Aquatic floral details of the core zone were collected from 08 selected sites of the study area. Some sites were located buffer zone adjacent to the present alignment, however some were located in the core & buffer zone. Details of phytoplankton and macrophytic vegetation of the core and the buffer zone are given in tables 3.19, 3.20 & 3.21, and Figures 3.10 & 3.11.

**Phytoplankton:**Most of thethe phytoplankton species recorded from the core zone was similar to the buffer zone also. So, the same information is applicable for the core and buffer

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zone. Phytoplankton species were collected and identified from 08 selected sampling sites of the study area. A total of 69 phytoplankton species were recorded from the different water bodies of the study area, out of which 27 species were of class Chlorophyceae, 17 species of Cyanophyceae, 19 species of Bacillariophyceae, and 6 species of Euglenophyceae. Details of Phytoplankton species are given in table 3.19.

r	1	Г	r	1			1		r –		T
										Schedu	
S.N.	Taxonomic Details									le	IU
		S-	Status	CN							
		1	2	3	4	5	6	7	8	in	Sta
										WPA	fus
										(1072)	<b>cu</b> s
										(1972)	
	Chlorophyceae									NA	NA
1	Arthrodesmus sp.	+		+	+		+		+	NA	NA
2	Ankistrodesmus falcatus		+	+			+	+	+	NA	NA
3	Chlorococcum sp.	+	+	+			+		+	NA	NA
4	Closteriopsis sp.	+	+		+	+		+		NA	NA
5	Cosmarium formii	+	+	+	+	+	+		+	NA	NA
6	Cosmarium margaritatum	+		+	+		+	+		NA	NA
7	Crucigenia sp.	+	+	+	+		+			NA	NA
8	Chlorella vulgaris	+		+	+	+			+	NA	NA
9	Oocystis crassa	+	+			+	+	+	+	NA	NA
10	Pediastrum simplex			+	+	+				NA	NA
11	Scenedesmus armatus	+	+	+		+	+	+	+	NA	NA
12	Scenedesmus bijugatus	+		+	+	+	+		+	NA	NA
13	Spirogyra sp.	+	+	+		+	+	+		NA	NA
14	Tetraedron trigonum				+		+		+	NA	NA
15	Tetrastrum sp.	+	+	+		+	+		+	NA	NA
16	Ulothrix sp.	+	+	+	+	+	+	+		NA	NA
17	Ulothrix zonata	+		+		+	+		+	NA	NA
18	Volvox sp.	+	+	+		+	+			NA	NA

Table 3.19: List of Phytoplankton species present in different water bodies in study area
(Core and Buffer Zone).

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	Total	19	15	23	16	17	24	12	17		
	Cyanophyceae									NA	NA
1	Anabaena sp.		+	+	+	+	+		+	NA	NA
2	Anabaena circinalis	+	+	+	+	+	+	+		NA	NA
3	Aphanocapsa sp.	+		+	+	+	+	+	+	NA	NA
4	Aphanothece sp.	+	+		+	+			+	NA	NA
5	Chroococcus sp.	+		+	+	+	+	+		NA	NA
6	Gloeocapsa sp.	+	+	+			+		+	NA	NA
7	<i>Lyngbya</i> sp.	+	+		+	+	+	+	+	NA	NA
8	Merismopedia sp.	+	+	+		+	+	+	+	NA	NA
9	Merismopedia tenuissima	+		+	+	+	+			NA	NA
10	Microcystis sp.		+		+			+	+	NA	NA
11	Microcystis aeruginosa	+		+			+			NA	NA
12	Nostoc sp.		+		+	+	+	+	+	NA	NA
	Total	12	11	11	12	13	15	9	12		
	Bacillariophyceae									NA	NA
1	Amphora ovalis	+				+	+		+	NA	NA
2	Amphora sp.	+	+	+	+	+		+		NA	NA
3	<i>Cyclotella</i> sp.			+		+	+	+	+	NA	NA
4	Cymbella affinis	+		+	+		+		+	NA	NA
5	Eunotia major	+	+		+	+		+		NA	NA
6	Fragillaria pinnata		+	+		+	+		+	NA	NA
7	Gomphonema sp.	+			+		+	+	+	NA	NA
8	Gomphonema lanceolatum	+	+	+	+	+			+	NA	NA
9	Melosira sp.	+	+	+	+	+	+			NA	NA
10	Navicula similis	+	+	+	+		+	+	+	NA	NA
11	Navicula subrhyncocephala	+	+		+		+		+	NA	NA
12	Nitzschia palea	+	+		+	+	+			NA	NA
13	Pinnularia sp.	+	+	+				+	+	NA	NA
14	Synedra acus	+				+	+		+	NA	NA
15	Synedra ulna		+		+	+	+	+	+	NA	NA
	Total	16	12	9	13	11	15	10	13		1
	Euglenophyceae									NA	NA
<u> </u>											
--	-----------------------------	-------	------	--------	--------	-------	-------	------	-------	-----------	-------
Project	: Sand Mining Project Patna	Sone	08 S	and (	Ghat	on So	one R	iver	at Ma	auza – Ja	lpura
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1	Euglena acus	+	+	+	+	+	+	+	+	NA	NA
2	<i>Euglena</i> sp.	+			+	+	+		+	NA	NA
3	<i>Euglepha</i> sp.	+	+	+	+	+	+	+	+	NA	NA
4	Phacus sp.		+				+			NA	NA
5	Phacus caudatus	+			+	+	+	+	+	NA	NA
6	Trachelomonas sp.	+	+	+	+	+	+	+		NA	NA
	Total	5	4	3	5	5	6	4	4		
	Source: Primary Survey Data	of P&	M Sc	olutio	n Pvt.	Ltd.,	Noid	a	11		

## Table 3.20: Site wise Qualitative list of Phytoplankton species recorded from the Core

Class	S-1	S-2	<b>S-3</b>	S-4	S-5	<b>S-6</b>	S-7	<b>S-8</b>
Chlorophyceae	19	15	23	16	17	24	12	17
Bacillariophyceae	16	12	9	13	11	15	10	13
Euglenophyceae	5	4	3	5	5	6	4	4
Total No. of Species	52	42	46	46	46	60	35	46

and Buffer Zone

**Macrophytes:** The aquatic vegetation recorded from the core zone was similar to the aquatic vegetation of the buffer zone also. So, the same information is applicable for the core and buffer zone. The maximum number of aquatic vegetation was recorded at sites 06 and 08 due to the perennial nature of the water bodies. On the other hand, other water bodies support less vegetation due to a lack of water (monsoon-fed streams), and moisture. The details of Macrophytes species are given in table 3.21.

Table 3 21. List of Ao	matic Macronhytic yea	etation of Core and	l Ruffer Zone
1 abit J.21. List of At	juane macrophyne veg	ciation of Core and	

S.No.	Name of the Taxa	Family Name	IUCN	S 1	S-	<b>S-</b>	<b>S-</b>	<b>S-</b>	<b>S-</b>	\$ 7	S-
			Status	5-1	2	3	4	5	6	5-7	8
1	Azolla pinnata	Salviniaceae	LC	+	+	+	+	+	+	+	+
2	Cyperus alopecuroides	Cyperaceae	LC	+	+			+	+	+	+
3	Cyperus difformis	Cyperaceae	LC	+		+	+		+	+	+
4	Eichhornia crassipes	Pontederiaceae	LC	+	+	+		+	+		+
5	Hydrilla verticillata		LC				+			+	+

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		Hydrocharitaceae									
6	Ipomea aquatica	Convolvulaceae	LC		+	+	+	+	+		+
7	Ipomea carnea	Convolvulaceae	LC	+	+	+	+		+	+	+
8	Lemna minor	Araceae	LC	+	+			+	+	+	+
9	Ludwigia parviflora	Onagraceae	LC	+	+	+	+		+	+	+
10	Nelumbo sp.	Nelumbonaceae	LC		+			+			
11	Nymphoides aquatica	Menyanthaceae	LC	+		+		+	+	+	+
12	Phragmites karka	Poaceae	LC						+		
13	Pistia stratiotes	Araceae	LC		+		+			+	+
14	Polygonum glabrum	Polygonaceae	LC	+	+	+		+	+	+	+
15	Typha latifolia	Typhaceae	LC						+		+
16	Typha orientalis	Typhaceae	LC		+		+	+	+	+	
	Total No. of Species		9	8	8	8	9	13	11	13	

#### 3.6.10 Flora of Buffer zone

#### 3.6.10.1 Terrestrial Flora of Buffer zone (Natural vegetation/Commercial vegetation).

During the present survey, a total of 77 species of plant species were observed from the study area. Out of 77 plant species, 42 species of tree, 18 species of shrubs/herbs, 6 species of climbers, and 10 species of Grass species were recorded from the buffer zone of the present study area. The below-mentioned vegetation details have been collected from the Core as well as Buffer zone of the present study area. All the details have been furnished based on the field survey at different locations and data supported by the Department of Forest, Patna of Bihar. The details of vegetation of the buffer zone is given in Table 3.22.

S.No.	Botanical Name	Common/ Hindi Name	Name of family
	Trees		
1	Acacia nilotica	Babool	Mimosaceae
2	Acacia nilotica	Desi babool	Fabaceae
3	Acacia leucophloea	Safed babul	Mimosaceae
4	Aegle marmelos	Bel	Rutaceae

Table 3.22: List of Trees, Shrubs, Herbs and Grasses observed in Buffer Zone

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5	Ailanthus excels	Adusa	Simaroubaceae
6.	Albizzia amara	Siris	Mimosoideae
7	Albizzia lebbeck	Sirish	Mimosaceae
8	Alstonia scholaris	Saptaparni	Apocynaceae
9	Anogeissus latifolia	Dhaura,	Combretaceae
10	Anthocephalus cadamba	Kadamb	Rubiaceae
11	Artocorpus heterophyllus	Jack fruit	Moraceae
12	Azadirachta indica	Neem	Meliaceae
13	Bauhinia racemosa	Apta	Leguminosae
14	Bauhinia variegata L.	Kachnar	Leguminosae
15	Bombax ceiba	Semal	Malvaceae
16	Bombax malabaricum	Semal tree	Malvaceae
17	Borassus flabellifer	Nariyal	Palmae
18	Butea monosperma	Palas	Leguminosae
19	Dalbergia latifolia	Shisam	Leguminosae
20	Dalbergia sissoo	Shisam	Leguminosae
21	Delonix regia	Gulmohar	Fabaceae
22	Dendrocalamus strictus	Bamboo	Poaceae
23	Diospyros melanoxylon	Tendu	Ebenaceae
24	Ficus benghalensis	Bargad	Moraceae
25	Ficus religiosa	Pipal	Moraceae
26	Madhuca longifolia	Mohua tree	Sapotaceae
27	Magnifera indica	Aam	Anacardiaceae
28	Melia azedarach	Bukkam Neem	Meliaceae
29	Moringa olerifera	Munga	Moringanaceae
30	Nerium oleamder	Kaner	Apocynaceae
31	Phoenix sylvestris	Date palm	Arecaceae
32	Phyllanthus emblica	Awla	Euphorbiaceae
33	Pisidium guava	Guava	Myrtaceae
34	Pongamia pinnata	Karanj	Leguminosae
35	Prosopis juliflora	Vilayati babool	Fabaceae
36	Sarracca indica	Ashok	Annonaceae
37	Shorea robusta	Sal	Depterocarpaceae

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38	Syzygium cumini	Jamun	Myrtaceae
39	Tectona grandis	Sagwan	Verbenaceae
40	Terminalia arjuna	Arjun	Combretaceae
41	Terminalia chebula	Harhar	Combretaceae
42	Zizyphus jujube	Ber	Rhamnaceae
Shrub	& Herbs		
43	Acanthospermum hispidum	Kanti	Asteraceae
44	Acheranthus aspera	Aghada	Amaranthaceae
45	Argemone mexicana	Pila dhtura	Papaveraceae
46	Baugainvellia glabra	Paper flower	Nyctaginaceae
47	Calotropis procera	Aakra	Asclepiadaceae
48	Cassia auriculata	Tarwar	Fabaceae
49	Cassia tora	Tarota /Takla	Caesalpiniaceae
50	Chenopodium album	manure weed	Amaranthaceae
51	Dalura metel	Dhotra	Solanaceae
52	Ipomoea carnea	Besharam	Convolvulaceae
53	Jatropha gossipifolia	cotton-leaf	Euphorbiaceae
54	Lantana camara	Ghaneri	Verbenaceae
55	Mimosa pudica	Chui Mui	Mimosaceae
56	Ocimum sanctum	Tulsi	Labiatae
57	Parthenium hysterophorus	Gajar grass	Asteraceae
58	Ricinus communis	Arand	Euphorbiaceae
59	Ricinus communis	castor oil plant	Euphorbiaceae
60	Tridax procumbens	Kambarmodi	Asteraceae
Grasse	S		
61	Apluda mutica	Mauntian grass	Poaceae
62	Commelina benghalensis	Bokna	Commelinaceae
63	Cynodon dactylon	Doob	Poaceae
64	Cyperus rotundus	Motha	cyperaceae
65	DactylSeptemberenum aegyptium	Crow foot grass	Poaceae
66	Pennisetum purpureum	Elephant grass	Poaceae
Climbo	ers		
67	Antigonon leptopus	Anantalata	Polygonaceae
	•	-	

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68	Bougainvillea glabra	Booganbel	Nyctaginaceae			
69	Celastrus paniculata	Kujari	Celastraceae			
70	Cissampelos pareira	Khariya lata	Menispermaceae			
71	Clitoria ternatea	Blue pea	Fabaceae			
72	Coccinia grandis	Jungli Kundru	Cucurbitaceae			
73	Combretum indicum	Madhu Malati	Combretaceae			
74	Cuscuta reflexa	Amarbel	Convolvulaceae			
75	Cuscuta reflexa	Amar bel	Convolvulaceae			
76	Ipomoea cairica	Neeli Bel	Convolvulaceae			
77	Tilospora cordifolia	Giloy	Menispermaceae			
Source: Primary data of P&M Solution, Noida and data supported by the Department of						
Forest, Patna district of Bihar.						

#### 3.6.10.2 Agricultural vegetation/ Commercial vegetation of the Buffer zone.

The variety of Crops and cropping patterns in the core and the buffer zone was the same in the study area. Vegetation details of the buffer zone were collected from 05 selected sites (TS-1 to TS-05) and the details are given in Table 3.17.

#### 3.6.10.3 Aquatic Flora of Buffer zone (Phytoplankton/ Macrophytes/ Aquatic Weeds)

**Phytoplankton:** The diversity of Phytoplankton species was similar in the core and buffer zone. The details of macrophytic vegetation of the buffer zone are given in Table 3.19 & 3.20 and Figure 3.10.

**Macrophytes:**The diversity of aquatic macrophytes was similar in both core and buffer zone. The details of macrophytic vegetation of the buffer zone are given in Table 3.21 and Figure 3.11.

#### 3.6.11 Fauna of the Study Area

Proposed alignment passing through the rural and purely in the agricultural field. At some places, it will cross from adjacent to some villages in the study area. The study area is devoid of any natural forest, so, major wildlife animals are rarely found in the area. Only some moving animals were observed. Domesticated animals mainly constitute the faunal population within the project area.

The assessment of fauna was done on the bases of secondary data collected from different government offices like the forest department, wildlife department, etc. The presence of Page | III 73

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wildlife was also confirmed by the local inhabitants depending on the animal sightings and the frequency of their visits in the project area.

During the present study period, a large number of local birds are noticed in the buffer zone of the study area. But, there are no bird habitats like nesting, breeding, and foraging patterns are noticed in the core zone.

#### 3.6.12 Fauna of the Core Zone

# **3.6.12.1** Terrestrial fauna of core zone (Mammals/Reptiles/amphibians/birds/insects etc.).

The domesticated animals like; Buffalo (*BuSands bubalis*); Ass (*Equus hemionus*), Cow (*Bos primigenius*); Goat (*Capra aegagrus*) Horse (*Equus caballus*); and Dog (*Canis lupus familaris*) were observed moving in different parts of the study area (including core and buffer zone), especially nearby town and villages. Other mammals and reptiles found in the study area are listed in Table 3.23.

S. No.	Common Name	Scientific Name	Family	Schedule status (as per WPA- 1972)	IUCN status
Mamm	als				
1.	Jungle cat	Fellis chaus	Felidae	II	LC
2.	Five striped palm squirrel	Funambulus pennanti	Sciuridae	IV	LC
3.	Indian Fulvous Fruit- Bat	Rousettus leschenaultia	Pteropodidae	V	LC
4.	Indian Field Mouse	Mus booduga	Muridae	V	LC
5.	Common House Rat	Rattus rattus	Muridae	V	LC
6.	Bandicoot Rat	Bandicotabengalensis	Muridae	V	LC
7.	Indian Grey Mongoose	Herpestesedwardsi edwardsi	Herpestidae	II	LC
Reptile	es & Amphibians				
8.	Garden lizard	Calotes versicolor	Agamidae	IV	NE

#### Table 3.23: List of Mammals/Reptiles/Amphibians/Birds recorded from the Core Zone

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9	King cobra	Ophiophagus hannah	Elapidae	II	LC			
10	Cobra	Naja naja	Elapidae	II	LC			
11.	Pit viper	Crotolus sp	Viperadae	II	LC			
12	Garden lizard	Calotes versicolor	Agamidae	IV	NE			
Bird S	Bird Species							
1	Acridotheres tristis	Myna	Sturnidae	IV	LC			
2	Acridotheres tristis	Common myna	Sturnidae	IV	LC			
3	Amandava amandava	Red munia	Estrildidae	IV	LC			
4	Ardea cinerea	Grey heron	Ardeidae	IV	LC			
6	Bubulcus ibis	Cattle egret	Ardeidae	IV	LC			
7	Columba livia	Pigeon	Columbidae	IV	LC			
	Corvus	Jungle crow	Corvidae	IV	IC			
5	macrorhynchos	Jungle crow	Corvidae	1.4	LC			
6	Corvus splendens	Crow	Corvidae	V	LC			
7	Gallinule chloropus	Common moorhen	Rallidae	IV	LC			
8	Milvus migrans	Black Kite	Accipitridae	IV	LC			
9	Passer domesticus	House sparrow	Passeridae	IV	LC			
10	Pycnonotus cafer	Red-vented bulbul	Pycnonotidae	IV	LC			
11	Saxicoloides fulicatus	Indian robin	Psittaculidae	IV	LC			
12	Turdoides caudate	Common babbler	Leiothrichidae	IV	LC			
IUCN	IUCN Status =LC: Least Concern, NE: Not Evaluated.							
Source	Primary Survey data of	P&M Solution, Noida and	the data supported by I	Department	of			
Forest,	Forest, Patna district of Bihar							

S. No.	Common Name	Scientific Name	Family	IUCN Status
1.	Plain Tiger	Danaus chrysippus	Nymphalidae	LC
2.	Common emigrant	Catopsilia pomona	Pieridae	LC
3.	Common crow	Euploea core	Nymphalidae	LC
4.	Small grass yellow	Eurema brigitta	Pieridae	LC
Source:P	Primary Survey data of P&M S	Solution, Noida and the data	supported by Dep	partment of
Forest, 1	Patna district of Bihar			

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## 3.6.12.3 Aquatic Fauna of Core zone (Zooplankton/ Macro-invertebrates/ Fishes/ Amphibians/ Turtles etc.)

All the aquatic fauna recorded from the core zone were also recorded from the buffer zone and most of the sampling sites are the same for the core and buffer zone as given in table 3.17. So, the list of aquatic fauna of the core zone is merged with the details of the buffer zone and is given in Table 3.25 to 3.27.

#### 3.6.12.4 Fauna of Buffer zon

To prepare a detailed report on the status of faunal biodiversity of the present study area (1 km buffer) of Patna district of Bihar and to assess the impacts due to digging/ leveling of alignment route/ construction of bridge/ operational activity which evolves suitable mitigation measures to protect & conserve biodiversity following components were studied: terrestrial biodiversity, wildlife survey (diversity), habitat study (feeding, breeding, roosting areas), distribution of birds, rare & endangered species of the study area.

The fauna of the study area (Core and Buffer zone) vary upon the local topography and different types of habitats. The fauna of the study area has been categorized into two categories based on their habitat, i.e.

(i) Aquatic fauna and

(ii) Terrestrial fauna.

During the present survey, there are some seasonal, perennial and private water body was observed along with the proposed alignment, which will be affected due to the present project activities. The alignment of the project will cross a few seasonal and perennial streams.

# **3.6.12.6** Terrestrial Fauna of Buffer zone (Mammals/Reptiles/Amphibians/Birds/ Insects etc.)

The major part of the study area lies under agricultural fields and barren land which restricts the wildlife habitat significantly. There is neither any wildlife sensitive area nor any corridor for the movement of wildlife in the study area. A list of the animals of the study area has been prepared on the basis of the survey and also inquire from the local people. The animals, thus recorded were cross-checked with Wildlife (Protection) Act, 1972 for their schedule status. Faunal details of thestudy area are given in Tables 3.25 to 3.27.

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

#### i. Mammals and Reptiles/ Amphibians

The domesticated animals like Goat (*Capra aegagrus*); Buffalo (*BuSands bubalis*); Cow (*Bos primigenius*); Horse (*Equus caballus*); Ass (*Equus hemionus*) and Dog (*Canis lupus familaris*) were observed moving in different parts of the study area, especially nearby town and villages. Other mammals and reptiles found in the study area are listed in Table 3.25.

S. No.	Common Name	Scientific Name	Family	Status as per WPA- 1972	IUCN status
		Mammals		1	
1	Bandicota bengalensis	Bandicoot Rat	Sciuridae	IV	LC
2	Canis aurius	Jackal	Pteropodidae	V	LC
3	Fellis chaus	Jungle cat	Soricidae	IV	LC
4	Funambulus palmarum	Three-striped Squirrel	Suidae	III	LC
5	Funambulus pennanti	Five striped palm squirrel	Hyaenidae	III	LC
6	Herpestes edwardsi	Indian Grey Mongoose	Canidae	II	LC
7	Hyaena hyaena	Stripped hyena	Leporidae	V	LC
8	Lepus nigricollis	Indian Hare	Canidae	II	LC
9	Mus booduga	Indian Field Mouse	Sciuridae	IV	LC
10	Presbytis entellus	Common langur	Cercopithecidae	II	LC
11	Pteropus giganteus	Indian Flying Fox	Pteropodidae	V	LC
12	Rattus rattus	Common House Rat	Muridae	V	LC
13	Rousettus leschenaultia	Indian Fulvous Fruit- Bat	Muridae	V	LC
14	Suncus murinus	Grey musk Shrew	Muridae	V	LC

#### Table 3.25: List Mammals, Reptiles and Amphibians recorded from the Buffer Zone

## **BASELINE DATA DESCRIPTION**

**Project:** Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

15	Sus scrofa	Wild Boar	Canidae	III	LC
16	Vulpes bengalensis	Indian fox	Felidae	II	LC
Repti	les and Amphibians				
1	Bufo melanostictus	Common toad	Bufonidae	IV	LC
2	Bungarus caeruelus	Krait	Elapidae	IV	NE
3	Calotes versicolor	Garden lizard	Agamidae	IV	NE
4	Crotolus sp.	Pit viper	Viperadae	II	LC
5	Enhydris enhydris	Smooth water snake	Homalopsidae	IV	LC
6	Euphlyctis hexadactyla	Common frog	Dicroglossidae	IV	LC
7	Hemidactylus flaviviridis	House Gecko	Gekkonidae		NE
8	Naja naja	Cobra	Elapidae	II	LC
9	Ophiophagus hannah	King cobra	Elapidae	II	LC
10	Ptyas mucosa	Rat Snake	Colubridae	II	NE
11	Rana temporaria	Common frog	Ranidae	IV	LC
12	Varanus sp.	Monitor lizzard	Varanidae	II	LC
IUCN	Status =LC: Least Concer	rn, VU: Vulnerable. N	<b>Γ</b> : Near Threatened,	NE: Not Ev	aluated,
Sourc	e:Primary Survey data of P	&M solution, Noida an	nd the data supported	l by Departn	nent of
Forest	., Patna District.				

#### ii. Avian Fauna

#### Table 3.26: Avian Fauna observed from the study area (01 KM Buffer area)

S.No	Scientific Name	Common Name	Family	Schedule Status (WPA- 1972	IUCN Status
1	Acridotheres tristis	Myna	Sturnidae	IV	LC
2	Acridotheres tristis	Common myna	Sturnidae	IV	LC
3	Alcedo atthis	Small blue kingfisher	Alcedinidae	IV	LC
4	Amandava amandava	Red munia	Estrildidae	IV	LC
5	Ardea cinerea	Grey heron	Ardeidae	IV	LC

**Project:** Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

6	Ardeola grayii	Indian pond heron	Ardeidae	IV	LC
7	Athene brama	Spotted Owlet	Strigidae	IV	LC
8	Bubulcus ibis	Cattle egret	Ardeidae	IV	LC
9	Centropus sinensis	Crow pheasant	Cuculidae	IV	LC
10	Ceryle rudis	Pied kingfisher	Alcedinidae	IV	LC
11	Charadrius dubius	Little ringed plover	Charadriidae	IV	LC
12	Ciconia episcopus	White-necked stork	Ciconidae	IV	NT
13	Cinnyris asiaticus	Purple Sunbird	Psittaculidae	IV	LC
14	Columba livia	Pigeon	Columbidae	IV	LC
15	Corvus macrorhynchos	Jungle crow	Corvidae	IV	LC
16	Corvus splendens	Crow	Corvidae	V	LC
17	Dicrurus adsimilis	Black drango	Dicruridae	IV	LC
18	Egretta alba	Larger egret	Ardeidae	IV	LC
19	Egretta garzetta	Little egret	Ardeidae	IV	LC
20	Francolinus pondicerianus	Titar	Phasianidae	IV	LC
21	Gallinule chloropus	Common moorhen	Rallidae	IV	LC
22	Gallus gallus	Jungle hen	Phasianidae	IV	LC
23	Halcyon smymensis	White-throated kingfisher	Alcedinidae	IV	LC
24	Milvus migrans	Black Kite	Accipitridae	IV	LC
25	Passer domesticus	House sparrow	Passeridae	IV	LC
26	Phalacrocorax carbo	Great cormorant	Phalacrocoracidae	IV	LC
27	Phalacrocorax niger	Little cormorant	Phalacrocoracidae	IV	LC
28	Pluvialis fulva	Pacific golden plover	Charadriidae	IV	LC
29	Pseudibis papillosa	Red-naped ibis	Threskiornithidae	IV	LC
30	Psittacula krameri	Rose ringed Parakeet	Psittacidae	IV	LC
31	Pycnonotus cafer	Red-vented bulbul	Pycnonotidae	IV	LC
32	Saxicoloides fulicatus	Indian robin	Psittaculidae	IV	LC
IUCN S	Status =LC: Least Conce	rn, VU: Vulnerable.	1 1		<b>I</b>

**Source:** Primary Survey data of P&M Solution and the data supported by Department of Forest, Son, Bihar.

**Chapter-III** 

#### **Chapter-III**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

#### iii. Butter Flies

 Table 3.27: Butterflies observed from the Buffer zone of the study area

S.No.	Scientific Name	Common Name	Family	IUCN Status
				Status
1	Catopsilia pomona	Common emigrant	Pieridae	LC
2	Chlosyne lacinia	Sunflower/Bordered Patch	Nymphalidae	LC
3	Danaus chrysippus	Plain Tiger	Nymphalidae	LC
4	Danaus genutia	Stripped Tiger	Nymphalidae	LC
5	Euploea core	Common crow	Nymphalidae	LC
Source	Primary Survey data of P&M	Solution and the data supported by	y Department of I	Forest,
Son, Bi	har.			

## 3.6.12.7 Aquatic Fauna of Buffer zone (Zooplankton/Macroinvertebrates/Fishes/Amphibians /Turtles etc.)

Aquatic fauna is referred to as any form of an animal that has adapted to living in the aquatic environments such as rivers, lakes, ponds, dams, streams, etc.). Son River and its adjoining streams are formed the drainage in the study area. Few other seasonal water bodies like village ponds, streams, and nallas are also present in the study area. In general, faunal account of any water bodies can be divided into following categories, *i.e.*,

- (i) zooplankton,
- (ii) Macro-invertebrates/Insects/Benthos
- (iii) Fishes

(iv) Amphibians/ Reptiles/ etc.

Details of Zooplankton; Macro-invertebrates/insects/benthos; Amphibians/Reptiles and Fishes recorded from the different water bodies of the study area (Patna district) are given in Tables 3.28 to 3.31.

#### i. Zooplankton

Zooplankton is commonly found in all types of aquatic habitats. These are recognized as secondary producers and considered as one of the best tools for the environmental monitoring program. During the present study period, a total of 49 zooplankton species was recorded and identified comprising of class Protozoa (8 species), Rotifera (20 species), Cladocera (10 species), Copepoda (8 species), and Ostracoda (3 species). The details of the zooplankton diversity of different habitats are given in Table 3.28 and Fig 3.12.

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## Table 3.28: Zooplankton species found in the different water bodies situated in the

										Schedule	
C N-	No	S-	Status in	IUCN							
<b>5.</b> No.	Name of the Taxa	1	2	3	4	5	6	7	8	WPA	Status
										(1972)	
	Protozoa		I	1	1	1		1	I		
1	Arcella sp.	+	+	+		+	+		+	NA	NA
2	Arcella discoides	+	+	+	+	+	+	+	+	NA	NA
3	Arcella vulgaris	+	+	+	+	+	+	+	+	NA	NA
4	Centropyxis sp.	+	+	+	+	+	+	+		NA	NA
5	Centropyxis ecornis		+			+	+		+	NA	NA
6	Euglypha sp.	+		+	+	+	+	+	+	NA	NA
7	Metopus sp.		+	+	+		+			NA	NA
8	<i>Opercularia</i> sp.	+	+	+		+			+	NA	NA
	Total	8	9	8	7	8	9	5	8		
-	Rotifera								1		
1	Anuraeopsissp.	+		+	+	+	+	+	+	NA	NA
2	Anuraeopsis fissa				+	+	+	+	+	NA	NA
3	Asplanchna sp.	+	+	+		+	+	+	+	NA	NA
4	Asplanchna brightwelli		+		+	+	+	+	+	NA	NA
5	Brachionus sp.	+		+	+	+	+	+		NA	NA
6	Brachionus angularis		+						+	NA	NA
7	Brachionus calyciflorus	+	+	+	+		+	+	+	NA	NA
8	Brachionus quadridentata		+	+	+		+	+		NA	NA
9	Brachionus falcatus	+			+	+	+	+		NA	NA
10	Brachionus forficula	+		+		+	+		+	NA	NA
11	Cephlodella gibba	+	+		+	+	+	+		NA	NA
12	<i>Filinia</i> sp.	+					+	+	+	NA	NA
13	Filinia longiseta		+	+		+		+	+	NA	NA
14	Keratella sp.	+		+		+			+	NA	NA
15	Keratella Cochlearis	+	+	+	+	+	+	+	+	NA	NA
16	Monostyla quadridentatus		+	+						NA	NA

Chap	ter-III				B	ASE		NE I	DAT	A DESCRI	PTION
Projec	t: Sand Mining Project Pat	na So	one 0	8 Sa	nd (	Ghat	on S	Sone	Rive	r at Mauza -	– Jalpura
Masau	rha 2, Anchal –Paliganj Dist -	Patna	(Bih	ar).							
17	<i>Mytilina</i> sp.	+	ĺ		+	+	+	+	+	NA	NA
18	Polyarthra vulgaris	+		+		+			+	NA	NA
19	Testudinella patina		+		+		+	+		NA	NA
20	Trichocerca sp.	+		+		+	+		+	NA	NA
	Total	15	11	13	13	15	18	16	16		
	Cladocera										
1	Alona sp.	+	+	+	+	+	+	+	+	NA	NA
2	Alona intermediate		+		+		+	+		NA	NA
3	Bosmina sp.	+		+	+	+	+	+	+	NA	NA
4	Bosmina longirostris	+		+			+	+		NA	NA
5	Ceriodaphnia sp.		+	+		+	+		+	NA	NA
6	Chydorus sphaericus	+	+		+		+	+		NA	NA
7	Daphnia sp.	+		+	+		+	+		NA	NA
8	<i>Leydgia</i> sp.		+	+		+	+		+	NA	NA
9	Moina daphnia	+			+		+	+	+	NA	NA
10	Simocephalus sp.	+	+	+		+			+	NA	NA
	Total	9	7	8	7	6	11	8	7		
	Copepoda										
1	Cyclops sp.	+	+	+	+	+	+	+	+	NA	NA
2	Diaptomus sp.	+	+	+	+	+	+		+	NA	NA
3	Eucyclops sp.	+	+	+			+	+	+	NA	NA
4	Heleodiaptomus viduus	+	+			+	+			NA	NA
5	Mesocyclops sp.	+	+		+		+	+	+	NA	NA
6	Nauplius larvae	+	+	+	+	+	+	+	+	NA	NA
7	Neodiaptomus sp.		+		+		+		+	NA	NA
8	Nitzii amphibia	+	+	+	+	+	+	+		NA	NA
	Total	10	10	8	9	7	11	7	9		
	Ostracoda										
1	Cyprinotus sp.	+		+	+	+	+	+	+	NA	NA
2	Cypris sp.	+	+	+	+		+	+	+	NA	NA
3	Stenocypris malcolmsoni	+	+	+	+	+	+		+	NA	NA
	Total	4	3	4	4	3	4	3	4		

Source: Primary Survey data of P&M Solution, Noida.

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#### ii. Macro-invertebrates (Insects/Benthos)

Macro-invertebrates are commonly found in all types of aquatic habitats such as streams, rivers, wetlands, lakes, and ponds. The term macro-invertebrate is used for those animals that have no backbone and can be seen with the naked eye. These animals generally include insects, crustaceans, mollusks, and annelids. They are significant within the food chain as larger animals such as fish and birds rely on them as a food source. None of the macro-invertebrate species have been observed under the of Rare, Endangered, and threatened category. Various macro-invertebrate species were collected and identified from the present study area and listed in Table 3.29.

Insecta										
Baetis nymph		+	+	+	+	+	+	+	NA	NE
Caenid mayfly	+			+		+			NA	NE
Chironomus plumosus	+	+	+	+	+	+	+	+	NA	NE
Chironomus sp.	+	+	+	+	+	+	+	+	NA	NE
Damsel flies nymphs	+			+		+			NA	NE
Hirudineria sp.	+	+	+			+	+	+	NA	NE
Limnodrillus hoffmeisteri	+					+			NA	NE
Mayflies nymphs		+		+		+	+	+	NA	NE
Mosquitos larvae	+	+	+	+	+	+	+	+	NA	NE
Ranatra elongata	+	+			+	+	+	+	NA	NE
Total	12	10	10	11	9	16	11	11		
Mollusca										
Bellamya bengalensis	+		+	+	+	+	+	+	NA	NE
Corbicula fluminalis		+	+	+	+	+	+	+	NA	NE
Corbicula sp.	+	+	+	+	+	+			NA	NE
Gyraulus convexiculus	+		+			+	+	+	NA	NE
Gyraulus sp.	+	+		+	+	+		+	NA	NE
Lymnaea acuminata	+		+		+		+	+	NA	NE
Lymnaea sp.	+	+	+	+	+	+	+		NA	NE
Melanoides lineatus		+	+			+		+	NA	NE
	InsectaBaetis nymphCaenid mayflyChironomus plumosusChironomus sp.Damsel flies nymphsHirudineria sp.Limnodrillus hoffmeisteriMayflies nymphsMosquitos larvaeRanatra elongataTotalMolluscaBellamya bengalensisCorbicula fluminalisCorbicula sp.Gyraulus convexiculusGyraulus sp.Lymnaea acuminataLymnaea sp.Melanoides lineatus	InsectaBaetis nymphCaenid mayfly+Chironomus plumosus+Chironomus sp.+Damsel flies nymphs+Hirudineria sp.+Limnodrillus hoffmeisteri+Mayflies nymphsMosquitos larvae+Ranatra elongata+Corbicula fluminalisCorbicula sp.+Gyraulus convexiculus+Lymnaea acuminata+Lymnaea sp.+Melanoides lineatus	InsectaBaetis nymph+Caenid mayfly+Chironomus plumosus+Chironomus sp.+Chironomus sp.+Damsel flies nymphs+Hirudineria sp.+Limnodrillus hoffmeisteri+Mayflies nymphs+HMayflies nymphs+HMosquitos larvae++Ranatra elongata++Corbicula fluminalis+Corbicula sp.++Gyraulus convexiculus++Lymnaea acuminata++Melanoides lineatus++Melanoides lineatus+	InsectaBaetis nymph++Caenid mayflyChironomus plumosusChironomus spDamsel flies nymphsHirudineria spMayflies nymphsMayflies nymphsMayflies nymphsMosquitos larvaeTotal121010MolluscaBellamya bengalensisGyraulus convexiculusLymnaea acuminataMelanoides lineatus	InsectaBaetis nymph+++Caenid mayfly+++Chironomus plumosus+++++Chironomus sp.+++++Damsel flies nymphs+++++Hirudineria sp.+++++Mayflies nymphs++++Mayflies nymphs++++Mosquitos larvae+++++Ranatra elongata++101011Mollusca101111Mollusca++++Gyraulus convexiculus+++++Gyraulus sp.+++++Lymnaea acuminata+++++Melanoides lineatus++++	Insecta         Baetis nymph       +       +       +       +         Caenid mayfly       +       -       +       +         Chironomus plumosus       +       +       +       +         Chironomus sp.       +       +       +       +         Damsel flies nymphs       +       +       +       +         Hirudineria sp.       +       +       +       +         Limnodrillus hoffmeisteri       +       +       +       +         Mayflies nymphs       +       +       +       +         Mosquitos larvae       +       +       +       +         Mosquitos larvae       +       +       +       +         Mollusca       +       +       +       +         Bellamya bengalensis       +       +       +       +         Gyraulus convexiculus       +       +       +       +         Gyraulus sp.       +       +       +       +         Lymnaea acuminata       +       +       +       +         Melanoides lineatus       +       +       +       +	Insecta         Baetis nymph       +       +       +       +       +         Caenid mayfly       +       -       +       +       +         Chironomus plumosus       +       +       +       +       +         Chironomus sp.       +       +       +       +       +         Damsel flies nymphs       +       +       +       +       +         Hirudineria sp.       +       +       +       +       +         Mayflies nymphs       +       +       +       +       +         Mayflies nymphs       +       +       +       +       +         Mayflies nymphs       +       +       +       +       +         Mosquitos larvae       +       +       +       +       +         Molnusca       +       +       +       +       +       +         Bellamya bengalensis       +       +       +       +       +       +         Gyraulus convexiculus       +       +       +       +       +       +         Lymnaea acuminata       +       +       +       +       +       +       +	Insecta         Baetis nymph       I       +       +       +       +       +       +         Caenid mayfly       +       I       I       +       +       +       +         Chironomus plumosus       +       +       +       +       +       +       +       +         Chironomus sp.       +       +       +       +       +       +       +       +         Damsel flies nymphs       +       +       +       +       +       +       +       +         Hirudineria sp.       +       +       +       +       +       +       +       +         Mayflies nymphs       +       +       +       +       +       +       +       +         Mosquitos larvae       +       +       +       +       +       +       +       +         Ranatra elongata       +       +       10       10       11       9       16       11         Mollusca       -       -       -       +       +       +       +       +       +       +       +       +       +       +       +       +       +       +	Insecta         Baetis nymph       I       +       +       +       +       +       +       +       +         Caenid mayfly       +       I       I       +       I       +       I       +       I         Chironomus plumosus       +       +       +       +       +       +       +       +       I         Chironomus sp.       +       +       +       +       +       +       I       I       I         Damsel flies nymphs       +       I       I       I       I       I       II       II       II       II       III       III       III       III       III       III       III       III       IIII       IIII       IIII       IIII       IIII       IIII       IIII       IIII       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Insecta         Baetis nymph       +       +       +       +       +       +       NA         Caenid mayfly       +       -       +       +       +       +       NA         Chironomus plumosus       +       +       +       +       +       +       +       NA         Chironomus sp.       +       +       +       +       +       +       +       NA         Chironomus sp.       +       +       +       +       +       +       +       NA         Damsel flies nymphs       +       +       +       +       +       +       NA         Hirudineria sp.       +       +       +       +       +       NA         Mayflies nymphs       -       +       +       +       NA         Masquitos larvae       +       +       +       +       NA         Ranatra elongata       +       +       +       +       +       NA         Mollusca       -       -       -       +       +       NA         Corbicula fluminalis       +       +       +       +       NA       NA         Gyraulus convexi

 Table 3.29: Macro-invertebrates recorded from the Core and Buffer zone

Chapter-IIIBASELINE DATA DESCRIPTIONProject: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura<br/>Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

10	Unio tigridis			+	+		+	+	+	NA	NE
	Total	9	8	12	10	8	13	9	11		
	Source: Primary Survey data of P&M Solution, Noida.										

#### iii. Amphibians

Amphibians and reptiles are commonly found at places along the margin of aquatic and terrestrial systems. The presence of water bodies like rivers, streams, etc. in the study area are providing shelter to many amphibian species. Some of the commonly reported amphibian species in the present study areas are given in Table 3.30.None of the Amphibians and Reptiles have been observed under the Rare, Endangered, and threatened category. Also, none of them are under the Schedule-I category as per Wildlife Protection Act, 1972.

S. No	English Name	Scientific Name	S- 1	S- 2	S- 3	S- 4	S- 5	S- 6	S- 7	S- 8	Schedule Status (WPA,1972)	IUCN Status
1	Bufo melanostictus	Common toad	+	+	+	+	+	+	+	+	IV	LC
2	Bungarus caeruleus	Common Krait	+	+	+	+	+	+	+	+	IV	LC
3	Bungarus fasciatus	Banded Krait	+	+	+	+	+	+	+	+	IV	LC
4	Euphlyctis cyanophlyctis	Indian skipper frog	+	+	+	+	+	+	+	+	IV	LC
5	Hoplobatrachus tigerinus	(Indian bullfrog).	+	+	+	+	+	+	+	+	IV	LC
6	Chamelion calcarata	Chameleon	+	+	+	+	+	+	+	+	Π	LC
7	Naja naja	Indian Cobra	+	+	+	+	+	+	+	+	II	LC
Not	e:DD=Data Deficient,	LC=Least Concern, N	E=N	lot E	valu	ated.						

Table 3.30: Amphibians and Reptilesrecorded from the Core and Buffer zone

**Source:** Primary Survey data of P&M Solution, Noida and Data supported by data of Department of Forest, Patna District, Bihar.

#### (iii) Fishes

The study area of the present Project development project has several lentic and lotic water bodies in which few are perennial and most of the water bodies are seasonal or monsoon fed. Jammuaririver is a major lotic system in the study area. Some private ponds are also present Page | III 84

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in the study area which are mainly used for the culture of fishes. All these water bodies support fish species. Fishes found in the study area are listed in Table 3.31 and their site wise species variation is shown in Fig. 3.14.

## Table 3.31: Fish Fauna found in different seasonal and perennial water bodies in the study area

												Schedule
C M-	Name of the Torre	Earrily Norra	S-	IUCN	Status in							
<b>S</b> . <i>I</i> VO.	Name of the Taxa	Family Name	1	2	3	4	5	6	7	8	Status	WPA
												(1972)
1	Catla catla	Cyprinidae	+	+	+	+		+		+	VU	NA
2	Channa stiatus	Chandadae					+	+	+		LC	NA
3	Channa punctatus	Chandadae			+	+	+		+	+	LC	NA
4	Labeo bata	Cyprinidae		+		+				+	LC	NA
5	Labeo rohita	Cyprinidae	+		+	+		+			LC	NA
6	Macrobrachium malcomsoni	Palaemonidae	+		+	+	+	+	+	+	LC	NA
7	Mystus bleekri	Bagridae		+			+	+			LC	NA
8	Mystus tengara	Bagridae	+	+	+	+	+	+	+	+	LC	NA
9	Puntius sarana	Cyprinidae			+			+	+	+	LC	NA
10	Puntius sophore	Cyprinidae	+	+	+		+			+	LC	NA
11	Puntius stigma	Cyprinidae			+	+		+			LC	NA
12	Puntius ticto	Cyprinidae		+	+	+			+	+	LC	NA
		Total	7	7	10	9	7	10	6	9		

Note: VU= Vulnerable, LC= Least Concern and NA= Not Application.

**Source:** Primary Survey data of P&M Solution, Noida and data supported by Department of Fisheries, Patna District, Bihar.

#### 3.6.13 Observations of Present Study (Flora & Fauna)

#### 3.6.13.1 Flora

Most of the parts of the present study area (Patna district) are agricultural fields, villageland.

The forest of the district comprises tropical deciduous vegetation due to high temperature and Page | III 85

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humidity. No any rare, endangered and threatened floral species have been observed from the core and buffer zone of the present study.

#### 3.6.13.2Fauna

There are no National parks, Sanctuaries, Biosphere Reserves, Wildlife corridors, Tiger/Elephant reserves (existing as well as proposed), within 1 km buffer area as well as 5 km of the project area.No any endangered and threatened faunal species were observed from the core and buffer zone of the present study area. On the other hand, there is no any Schedule-I fauna was recorded as per the Wildlife (Protection) Act, 1972. However, care will be taken during the developmental activities if found any.

#### **3.7 Socio-Economic Environment**

#### **Demography& Socio-Economic Features**

#### Demography

Demography is one of the important indicators of environmental health of an area. It includes population, sex ratio, number of households, literacy, population density, etc. In order to assess the Demographic & Socio-economic features of the area, Census data 2011, for 3 major districts named Patna, Bhojpur and Arwal of Biharstate was compiled and placed in the form of tabulation and graphical representation.

#### **Demography of the Patna District**

As per the census records 2011, Patna district has a population of 5,838,465 persons followed by 3,078,512 males and 2,759,953 females respectively. Out of the total population of the district, about 43.0% population lived in urban areas while 57.0% live in rural areas. The decadal Variation of the district has been seen at 23.7% during the decade 2001-11. The Urban area of the district has attained a higher decadal Variation of 28.2% as compared to that of rural area at 20.6%.

As per 2011 census sex ratio of the district is 897 females per 1,000 males. The same for rural and urban areas of the district stands at 904 and 887 respectively. As per the census records 2011, the sex ratio of population in the age group 0-6, which works out to 909, is much higher than the sex ratio of the total population (897) in the district of Patna. While the sex ratio of (0-6) population in the rural areas of the district is 923, the sex ratio of (0-6) population for the urban areas is only 883.

The district occupies an area of 3,202 square kilometres. 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 15.77 and 0.16% respectively. For rural areas, the respective proportion of scheduled castes and scheduled tribes to the total population of the district comes out to be 19.98 and 0.06% respectively. Similarly,in urban areas, the percentage of scheduled castes and scheduled tribe's population of the district comes out to 10.21 and 0.27% respectively.

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It is also observed from the census records 2011, that the district has registered a literacy rate of 70.68%. As regards to rural and urban areas of the district the literacy rates have been registered 62.38 & 80.98% respectively. The gap in the male-female literacy rates has been 16.52% point as it is 78.48% male and 61.96% 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 23.49% for main workers and 8.75% for marginal workers. Proportion of non workers in the district is 67.77%.

#### Mother Tongue

Spoken language, which is medium of conversation, is an important attribute of population. The Census of India has been the richest source of language data collected and published during the successive decennial censuses over a century. During 2001 census, as in the previous censuses, the mother tongue as returned by each individual was collected.

The population of the Patna district during 2001 was 4,718,592. As per distribution of different mother tongues (languages mentioned under 8th Schedule of Constitution of India) as returned during the 2001 Census for Patna district, Hindi, the main mother tongue of the district was returned by 91.7% (43,26,641 persons) of the population. The corresponding percentage for the Urdu, the second most prominent language spoken in Patna district, was 6.5% (307,130 persons). Speakers of other Scheduled languages were very thin in number than the two described above.

#### Religion

The population of the Patna district during 2011 was 5,838,465. Hindus constitute 91.74% (5,356,075 persons) of the population in the district followed by Muslims 7.54% (439,952 persons). All other four major religious communities have almost negligible percentages

#### 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 3 major districts named Patna, Bhojpurand Arwal of Bihar state respectively was compiled and placed in the form of tabulation and graphical representation. Entire study area is observed predominantly rural except one town named Arwal (NP).

#### **Purpose of the Study**

Socio-economic study was conducted to establish the baseline demographic features and impacts due to this '*SandGhatMining Project*', 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 156 villagesand one town named Arwal (NP) / (25 wards) lying under Patna, Bhojpur and Arwal in Bihar state. Overall Page | III 87

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

study area villages are falling mainly underTen (10) tehsils namelyDulhin Bazar (05 villages) and Paliganj (40 villages) of Patna district, Koilwar (01 village), Sandesh (23 villages), Udwant Nagar (03 villages), Charpokhari (02 villages), Agiaon (34 villages) and Sahar (11 villages) of Bhojpur district, Arwal (16 villages & 01 town) and Karpi (10 villages) of Arwal district respectivelyin Bihar state.There are eleven (11) villages of 3 major districtsnamed Patna, Bhojpur and Arwal in Biharstate found as uninhabited villages in the study area.

#### Population Distribution within 10 km radial Study Zone

As per the Census Records 2011, the total population of 10 km study zone was recorded as 3,49,713persons of 156villagesof 3 majorconcerneddistricts named Patna, Bhojpur and Arwal inBihar state. Male-female wise total population was recorded as 1,81,528 males (52.0%) and 1, 68,185(48.0%) females respectively.

Total number of 'Households' was observed as 56,704in the 10 km radius study zone. Scheduled Caste ('SC') population was observed as 67,330persons consisting of 34,718males (51.6%) and 32,612 females (48.4%) in the 10km study zone. Scheduled Tribes ('ST') population was also observed as 93 persons (0.03%) consisting of 43 males (46.2%) and 50females (53.8%) in the 10 km study zone. The child population (0-6 Age) of the study area is recorded as 60,873(17.4%) and comprising of 31,549 (51.8%)males&29,324 (48.2%) females respectively.

Village wise details of population distributionare given as follows in Table 3.32 & 3.33

Name of Village/Town	No of	Tot	al Populat	tion	Child Population (0-6 Yea				
Tunic of Vinage, Town	Households	Persons	Male	Female	Persons	Male	Female		
Lahladpur	284	2047	1086	961	322	172	150		
Raghunathpur 1	474	3026	1593	1433	482	256	226		
Kanpa	480	3194	1713	1481	560	297	263		
Saidabad	556	3730	1933	1797	564	288	276		
Anharipur	77	568	302	266	97	52	45		
Gona	516	3500	1816	1684	545	292	253		
Habaspur	509	2893	1493	1400	531	269	262		
Chandni	51	345	188	157	64	35	29		
Barda	203	1517	769	748	284	146	138		
Gopalpur	192	1008	540	468	166	95	71		
Bara 1	347	1776	922	854	302	157	145		
Baijalpur	100	778	420	358	138	78	60		
Nisarpura	543	3458	1791	1667	629	334	295		
Kab	1658	10141	5277	4864	1656	831	825		
Dorwan	363	2521	1300	1221	369	190	179		
Fatehpur 1	339	2324	1245	1079	496	275	221		
Dhama Chak			Uninh	abited Villa	ige				
Bharbhesar	102	533	280	253	100	57	43		
Alipur	333	2039	1045	994	355	187	168		
Raksia	346	1849	939	910	311	166	145		
Khapuri	180	1099	578	521	174	88	86		
Ganipur		Uninhabited Village							
Bhadsara	1436	8834	4633	4201	1525	756	769		
Bhalua	232	1331	696	635	213	116	97		
Sadawe	823	4762	2501	2261	798	458	340		
Andehri	183	1125	527	598	212	96	116		

Гаble 3.32 : Vil	lage-wise Popu	ulation Distribut	t <b>ion</b> (10km)
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**Project:** Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

Baduri	158	895	447	448	146	76	70
Paipura Khurd	183	1088	553	535	205	115	90
Rajipur	765	4509	2315	2194	859	418	441
Saraiya	452	2670	1392	1278	581	310	271
Achhua	534	3052	1556	1496	525	285	240
Masaurhi	283	1547	745	802	295	147	148
GulliTanr	248	1490	767	723	281	133	148
Amarpura	182	988	479	509	155	77	78
Bali Pakar	595	3185	1631	1554	512	265	247
Kalvanpur	517	3450	1866	1584	583	321	262
Jalpura	216	1570	828	742	245	140	105
Masaurha	442	2413	1203	1210	397	207	190
Udaipur	367	2130	1073	1057	391	191	200
Mohbalipur	1251	6863	3466	3397	1273	640	633
Ranipur	258	1584	828	756	263	140	123
Fatehpur 2	276	1630	856	774	265	143	122
Hasanpur	62	269	128	141	40	20	20
DariapurPem	302	1697	880	817	290	142	148
Paipura Kalan	304	1783	877	906	295	137	158
Ijarta	186	1117	536	581	182	78	104
Ďharahra	792	4538	2421	2117	673	354	319
DariapurAnant	309	1791	919	872	281	148	133
Nirakpur Pali	1977	11798	6170	5628	2066	1091	975
Kalupur	66	387	210	177	69	41	28
Akhtiarpur Pali	614	3776	1970	1806	661	386	275
Kurkuri	701	4444	2248	2196	763	386	377
Bibipur	198	1157	576	581	192	103	89
HarpurAnkuri	581	2810	1342	1468	576	287	289
Sarsi	385	2471	1293	1178	401	225	176
Muhammadpur	264	1452	751	701	262	128	134
MohibalipurChak			Uninh	abited Villa	ige		
Habsapur	103	712	370	342	120	66	54
Pipardaha	652	4007	2055	1952	792	395	397
Belaunra	550	3078	1617	1461	500	274	226
Kansopur	197	1393	726	667	262	144	118
Bela	240	1729	887	842	283	149	134
Lakhnipur	195	1196	623	573	209	107	102
Akbarpur	682	4399	2330	2069	665	342	323
Aida	209	1010	505	505	158	82	76
Thakuri	205	1271	671	600	197	110	87
Sikaria	916	4768	2444	2324	910	471	439
Sedura	261	1787	900	887	334	163	171
Taranpur	290	1777	905	872	355	161	194
Chauri	153	917	472	445	157	81	76
Khanpura	312	1597	841	756	315	169	146
Mankurha	278	1799	912	887	298	164	134
Torni	250	1363	674	689	298	133	165
Rampur Nagwan	710	4535	2348	2187	827	428	399
Mera	418	2449	1254	1195	441	232	209
Madaripur	196	1208	622	586	200	103	97
Nirakhpur	283	1621	860	761	280	170	110
Siddhipur	148	1093	574	519	244	125	119
Raghunathpur 2	196	1377	709	668	233	121	112
Yusuf AlipurChak			Uninh	abited Villa	ige		
Patauna	341	2184	1115	1069	376	182	194
ChhotkiMasaurhi	396	2346	1238	1108	526	279	247
Samaya NO 2 (KurmiChaksamaya)	1103	7962	4272	3690	1481	782	699
Nasratpur	548	3279	1734	1545	511	271	240

**Chapter-III** 

## **BASELINE DATA DESCRIPTION**

	Chilhauns	782	5054	2596	2458	1018	520	498
$\begin{array}{                                    $	Turkaul	591	3817	2066	1751	663	352	311
Abpura         531         3321         1752         1569         563         300         263           Salempur         139         543         291         252         85         50         35           Sandesh         1037         6874         3573         3301         1219         616         603           Pappura         54         483         255         228         82         35         47           Kanharpur         209         1319         729         590         182         110         72           Chela         377         2139         1115         1024         365         188         177           Parpura         97         594         335         259         66         36         30           Basauri         69         484         254         230         74         38         36           Gaighat         Uninhabited Village         Uninhabited Village         191         1475         540         273         267           Datampur         318         1942         1015         927         343         168         142           Chauria         Uninhabited Village         Uninhabited Village	Jansara	100	1018	542	476	168	83	85
Salempur         139         543         291         252         85         50         35           Sandesh         1037         6874         3573         3301         1219         616         603           Panpura         54         483         255         228         82         35         47           Kanharpur         209         1319         729         590         182         110         72           Chela         377         2139         1115         1024         365         188         177           Pancepur         97         594         335         259         66         36         30           Basauri         69         484         254         230         74         38         36           Gaighat         Uninhabited Village         Uninhabited Village         291         Bischiaon         476         294         1519         1475         540         273         267           Dharampur         318         1942         1015         927         343         168         172           Daleganj         225         1802         939         863         360         192         168      D	Ahpura	531	3321	1752	1569	563	300	263
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Salempur	139	543	291	252	85	50	35
Panpura         54         483         255         228         82         35         47           Kanharpur         209         1319         729         590         182         1110         72           Chela         377         2139         1115         1024         365         188         177           Panrepur         97         594         335         259         66         36         30           Basauri         69         484         254         230         74         38         36           Gaighat         Uninhabited Village         Uninhabited Village         Uninhabited Village         317         291           Bhanpura         489         3371         1786         1585         608         317         291           Bhanpura         476         2944         1015         927         343         168         175           Surungapur         252         1760         900         856         282         140         142           Chaura         Uninhabited Village         Uninhabited Village         168         175         306         231           Parura Rampur         417         2522         1336         <	Sandesh	1037	6874	3573	3301	1219	616	603
Kanharpur         209         1319         729         590         182         110         72           Chela         377         2139         1115         1024         365         188         177           Panrepur         97         594         335         259         66         36         30           Basauri         69         484         254         230         74         38         36           Gaighat         Uninhabited Village         Uninhabited Village         1017         540         273         267           Dharampur         489         3371         1786         1585         608         317         291           Dihra         489         3371         1786         1582         608         317         267           Dharampur         252         1756         900         856         282         140         142           Chauria         Uninhabited Village         Uninhabited Village         132         289         140         142         142           Daleiganj         225         1802         939         863         360         192         168           Parura Rampur         417         2522	Panpura	54	483	255	228	82	35	47
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Kanharpur	209	1319	729	590	182	110	72
Parrepur         97         594         335         259         66         36         30           Basauri         69         484         254         230         74         38         36           Gaighat         Uninhabited Village         Uninhabited Village         1786         1585         608         317         291           Bichhiaon         476         2994         1519         1475         540         273         267           Dharampur         318         1942         1015         927         343         168         175           Surungapur         252         1756         900         856         282         140         142           Chauria         Uninhabited Village         Uninhabited Village         213         156         86         70         192         168           Parura         535         3739         1955         1784         621         332         289           Udaibhanpur         23         156         86         70         19         11         8           Bartiar         305         1788         942         846         330         184         146           Kosdihra	Chela	377	2139	1115	1024	365	188	177
Basauri         69         484         254         230         74         38         36           Gaighat         Uninhabited Village         Uninhabited Village         Uninhabited Village           Dihra         489         3371         1786         1585         608         317         291           Bichhiaon         476         2994         1519         1475         540         273         267           Dharampur         318         1942         1015         927         343         168         175           Surungapur         252         1756         900         856         282         140         142           Chauria         Uninhabited Village         Dalelganj         225         1802         939         863         360         192         168           Parura Rampur         417         2522         1336         1186         537         306         231           Patrura         535         3739         1955         1784         621         332         289           Udaibhapur         23         156         86         70         19         11         8           Bara 2         171         997	Panrepur	97	594	335	259	66	36	30
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Basauri	69	484	254	230	74	38	36
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Gaighat			Uninha	abited Villa	ge		
Dhra         489         3371         1786         1585         608         317         291           Bichhiaon         476         2994         1519         1475         540         273         267           Dharampur         318         1942         1015         927         343         168         175           Surungapur         252         1756         900         856         282         140         142           Chauria         Uninhabited Village         Uninhabited Village         168         360         192         168           Parura Rampur         417         2522         1336         1186         537         306         231           Parura         535         3739         1955         1784         621         332         289           Udaibhanpur         23         156         86         70         19         11         8           Bara 2         171         997         514         483         166         92         74           Bartiar         305         1788         942         846         330         184         146           Kori         1067         6821         3434	Bhanpura			Uninha	abited Villa	ge		
Bitchnaon         476         2994         1519         1475         540         273         267           Dharampur         318         1942         1015         927         343         168         175           Surungapur         252         1756         900         856         282         140         142           Chauria         Uninhabited Village         Uninhabited Village         142         332         289           Dalelganj         225         1802         939         863         360         192         168           Parura Rampur         417         2522         1336         1186         537         306         231           Parura         535         3739         1955         1784         621         332         289           Udaibhanpur         23         156         86         70         19         11         8           Bara 2         171         997         514         483         166         92         74           Kori         1067         6821         3434         3387         1208         589         619           Baranhpur         18         84         45         39	Dihra	489	3371	1786	1585	608	317	291
Dharampur         318         1942         1015         927         34.3         168         175           Surungapur         252         1756         900         856         282         140         142           Chauria         Uninhabited Village         Uninhabited Village           168         175           Dalelganj         225         1802         939         863         360         192         168           Parura Rampur         417         2522         1336         1186         537         306         231           Parura Rampur         23         156         86         70         19         11         8           Bara 2         171         997         514         483         166         92         74           Bartiar         305         1788         942         846         330         184         146           Kori         1067         6821         3434         3387         1208         589         619           Baranhpur         18         84         45         39         12         7         5           Khandaul         846         5179         2686         2493	Bichhiaon	476	2994	1519	1475	540	273	267
Surungapur         252         1756         900         856         282         140         142           Chauria         Uninhabited Village         Uninhabited Village         142           Dalelganj         225         1802         939         863         360         192         168           Parura Rampur         417         2522         1336         1186         537         306         231           Parura         535         3739         1955         1784         621         332         289           Udaibhanpur         23         156         86         70         19         11         8           Bara 2         1711         997         514         483         166         92         74           Bartiar         305         1788         942         846         330         184         146           Kosdihra         116         766         394         372         149         74         75           Kori         1067         6821         3434         3387         1208         589         619           Baranbur         1067         6821         3434         1384         169         176 </td <td>Dharampur</td> <td>318</td> <td>1942</td> <td>1015</td> <td>927</td> <td>343</td> <td>168</td> <td>175</td>	Dharampur	318	1942	1015	927	343	168	175
Chaura         Uninhabited Village           Dalelganj         225         1802         939         863         360         192         168           Parura Rampur         417         2522         1336         1186         537         306         231           Parura         535         3739         1955         1784         621         332         289           Udaibhanpur         23         156         86         70         19         11         8           Bara 2         171         997         514         483         166         92         74           Bartiar         305         1788         942         846         330         184         146           Kosdihra         116         766         394         372         149         74         75           Kori         1067         6821         3434         3387         1208         589         619           Baranhpur         18         84         45         39         12         7         5           Kodihra         116         762         5036         2682         2354         762         387         375           Bhatau	Surungapur	252	1756	900	856	282	140	142
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Chauria		1000	Uninha	abited Villa	ge	10.0	4.40
Parura Rampur417252213561186537306231Parura535373919551784621332289Udaibhanpur23156867019118Bara 21719975144831669274Bartiar3051788942846330184146Kodihra1167663943721497475Kori10676821343433871208589619Baranhpur188445391275Khandaul846517926862493791429362Phulari762503626822354762387375Bhatauli431248213241158345169176ChancharUninhabited VillageRaman Sanrh837561330032610890478412Patkhaulia855522732791035449Pinjroi1106893343551125854MahadeopurUninhabited VillageUninhabited Village154493243230Baga472269713161381473243230555273725BalraUninhabited VillageUninhabited VillageUninhabited Village543493	Dalelganj	225	1802	939	863	360	192	168
Parura535 $3739$ 1955 $1784$ $621$ $332$ $289$ Udaibhanpur23156867019118Bara 21719975144831669274Bartiar3051788942846330184146Kosdihra1167663943721497475Kori10676821343433871208589619Baranhpur188445391275Khandaul846517926862493791429362Phulari762503626822354762387375Bhatauli431248213241158345169176ChancharUninhabited VillageUninhabited Village412Patkhaulia855522732791035449Pinjroi1106893343551125854MahadeopurUninhabited VillageUninhabited Village5Baga472269713161381473243230BhikhamChak8391623725BalraUninhabited VillageUninhabited Village55Dihra1069815054761758887MahpurUninhabited VillageUninhabited Village5	Parura Rampur	417	2522	1336	1186	537	306	231
Udabhapur23156867019118Bara 21719975144831669274Bartiar3051788942846330184146Kosdihra1167663943721497475Kori10676821343433871208589619Baranhpur188445391275Khandaul846517926862493791429362Phulari762503626822354762387375Bhatauli431248213241158345169176ChancharUninhabited VillageUninhabited Village412Patkhaulia855522732791035449Pinjroi1106893343551125854MahadeopurUninhabited VillageUninhabited Village3151151KherkaranpurUninhabited VillageUninhabited Village5054761758887BalraUninhabited VillageUninhabited VillageUninhabited Village5834341130AhinanChak83916237255BalraUninhabited VillageUninhabited Village588734341130Ahina106981505476175 <td>Parura</td> <td>535</td> <td>3739</td> <td>1955</td> <td>1784</td> <td>621</td> <td>332</td> <td>289</td>	Parura	535	3739	1955	1784	621	332	289
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Udaibhanpur	23	156	86	70	19	11	8
Bartar $305$ $1/88$ $942$ $846$ $330$ $184$ $146$ Kosilira116 $766$ $394$ $372$ $149$ $74$ $75$ Kori1067 $6821$ $3434$ $3387$ $1208$ $589$ $619$ Baranhpur18 $84$ $45$ $39$ $12$ $7$ $5$ Khandaul $846$ $5179$ $2686$ $2493$ $791$ $429$ $362$ Phulari $762$ $5036$ $2682$ $2354$ $762$ $387$ $375$ Bhatauli $431$ $2482$ $1324$ $1158$ $345$ $169$ $176$ ChancharUninhabited VillageRaman Sanrh $837$ $5613$ $3003$ $2610$ $890$ $478$ $412$ Patkhaulia $85$ $552$ $273$ $279$ $103$ $54$ $49$ Pinjroi110 $689$ $334$ $355$ $112$ $58$ $54$ MahadeopurUninhabited VillageAhimanChak $230$ $1457$ $736$ $721$ $282$ $131$ $151$ KhemkaranpurUninhabited VillageBaga $472$ $2697$ $1316$ $1381$ $473$ $243$ $230$ BhikhamChak $8$ $39$ $16$ $23$ $7$ $2$ $5$ BalraUninhabited VillageUninhabited VillageDihra $106$ $981$ $505$ $476$ $175$ $88$ $87$ MahpurUninhabited VillageUninhabited Village <td>Bara 2</td> <td>171</td> <td>997</td> <td>514</td> <td>483</td> <td>166</td> <td>92</td> <td>74</td>	Bara 2	171	997	514	483	166	92	74
Koschhra         116         766         394         372         149         74         75           Kori         1067         6821         3434         3387         1208         589         619           Baranhpur         18         84         45         39         12         7         5           Khandaul         846         5179         2686         2493         791         429         362           Phulari         762         5036         2682         2354         762         387         375           Bhatauli         431         2482         1324         1158         345         169         176           Chanchar         Uninhabited Village         Uninhabited Village          837         5613         3003         2610         890         478         412           Patkhaulia         85         552         273         279         103         54         49           Pinjroi         110         689         334         355         112         58         54           Mahadeopur         Uninhabited Village         Uninhabited Village         37         2         5           Baga         472<	Bartiar	305	1788	942	846	330	184	146
Kori         1067         6821         3434         3387         1208         589         619           Baranhpur         18         84         45         39         12         7         5           Khandaul         846         5179         2686         2493         791         429         362           Phulari         762         5036         2682         2354         762         387         375           Bhatauli         431         2482         1324         1158         345         169         176           Chanchar         Uninhabited Village         Uninhabited Village          837         5613         3003         2610         890         478         412           Patkhaulia         85         552         273         279         103         54         49           Pinjroi         110         689         334         355         112         58         54           Mahadeopur         Uninhabited Village          472         2697         1316         1381         473         243         230           Baga         472         2697         1316         1381         473         243	Kosdihra	116	766	394	372	149	7/4	75
Baranhpur         18         84         45         39         12         7         5           Khandaul         846         5179         2686         2493         791         429         362           Phulari         762         5036         2682         2354         762         387         375           Bhatauli         431         2482         1324         1158         345         169         176           Chanchar         Uninhabited Village         Uninhabited Village         837         5613         3003         2610         890         478         412           Patkhaulia         85         552         273         279         103         54         49           Pinjroi         110         689         334         355         112         58         54           Mahadeopur         Uninhabited Village         Uninhabited Village         4131         151         51           Khemkaranpur         Uninhabited Village         Uninhabited Village         56         23         7         2         5           Balra         Uninhabited Village         Uninhabited Village         505         476         175         88         87	Kori	1067	6821	3434	3387	1208	589	619
Khandaul         846         5179         2686         2493         791         429         362           Phulari         762         5036         2682         2354         762         387         375           Bhatauli         431         2482         1324         1158         345         169         176           Chanchar         Uninhabited Village         Uninhabited Village         Uninhabited Village         106         9176         412           Patkhaulia         85         552         273         279         103         54         49           Pinjroi         110         689         334         355         112         58         54           Mahadeopur         Uninhabited Village         Uninhabited Village         4131         151           Khemkaranpur         Uninhabited Village         Uninhabited Village         362         131         151           Baga         472         2697         1316         1381         473         243         230           BhikhamChak         8         39         16         23         7         2         5           Balra         Uninhabited Village         Uninhabited Village         Uninhabited Villa	Baranhpur	18	84	45	39	12	120	5
Phulari         762         5036         2682         2334         762         387         375           Bhatauli         431         2482         1324         1158         345         169         176           Chanchar         Uninhabited Village         Uninhabited Village         Uninhabited Village         112         54         412           Patkhaulia         85         552         273         279         103         54         49           Pinjroi         110         689         334         355         112         58         54           Mahadeopur         Uninhabited Village         Uninhabited Village         8         54         54         55         55         55         112         58         54           Mahadeopur         Uninhabited Village         Uninhabited Village         8         54         54         55         55         55         55         55         55         55         55         55         55         55         57         56         56         56         56         56         56         57         57         58         54         55         51         55         57         57         58         57	Khandaul	846	5179	2686	2493	791	429	362
Bhatauli       431       2482       1324       1158       345       169       176         Chanchar       Uninhabited Village         Raman Sanrh       837       5613       3003       2610       890       478       412         Patkhaulia       85       552       273       279       103       54       49         Pinjroi       110       689       334       355       112       58       54         Mahadeopur       Uninhabited Village       Uninhabited Village       151       Khemkaranpur       Uninhabited Village         Baga       472       2697       1316       1381       473       243       230         BhikhamChak       8       39       16       23       7       2       5         Balra       Uninhabited Village       Uninhabited Village       Uninhabited Village       S8       8       39       16       23       7       2       5         Balra       Uninhabited Village       Uninhabited Village       Uninhabited Village       Uninhabited Village       Uninhabited Village         Dihra       106       981       505       476       175       88       87         Mahpur	Phulari	762	5036	2682	2354	762	387	375
Chanchar         Bigstress         Oninhabited Village           Raman Sanrh         837         5613         3003         2610         890         478         412           Patkhaulia         85         552         273         279         103         54         49           Pinjroi         110         689         334         355         112         58         54           Mahadeopur         Uninhabited Village         Uninhabited Village         54         49         55         55         55         55         55         55         55         54         55         54         55         54         55         55         55         55         57         56         72         58         54           Mahadeopur         Uninhabited Village         Uninhabited Village         56         73         73         243         230           Baga         472         2697         1316         1381         473         243         230           BhikhamChak         8         39         16         23         7         2         5           Balra         Uninhabited Village         Uninhabited Village         505         476         175         <	Bhatauli	431	2482	1324	1158	345	169	176
Raman Sanrh         837         5613         3003         2610         890         478         412           Patkhaulia         85         552         273         279         103         54         49           Pinjroi         110         689         334         355         112         58         54           Mahadeopur         Uninhabited Village         Uninhabited Village         131         151           Khemkaranpur         Uninhabited Village         Uninhabited Village         230         1457         736         721         282         131         151           Khemkaranpur         Uninhabited Village         Uninhabited Village         243         230         1457         736         721         282         131         151           Baga         472         2697         1316         1381         473         243         230           BhikhamChak         8         39         16         23         7         2         5           Balra         Uninhabited Village         Uninhabited Village         Uninhabited Village         Village           Dihra         106         981         505         476         175         88         87	Chanchar	027	5(12	Uninha	abited Villa	lge	470	410
Patknaulia         85         552         275         279         103         54         49           Pinjroi         110         689         334         355         112         58         54           Mahadeopur         Uninhabited Village         Uninhabited Village         151         51         51         51         51         51         53         54         54         54         54         54         54         54         54         54         54         54         54         54         54         54         54         54         54         54         55         112         58         54         54         54         54         55         112         58         54         54         55         54         54         55         54         56         54         56         54         56         54         56         56         56         57         72         25         56         54         50         54         64         50         54         57         57         58         87         56         54         56         54         56         54         56         56         56         50         476         <	Raman Sanrh	837	5613	3003	2610	890	4/8	412
Prinjrol       110       689       334       355       112       58       54         Mahadeopur       Uninhabited Village       Uninhabited Village       131       151         AhimanChak       230       1457       736       721       282       131       151         Khemkaranpur       Uninhabited Village       Uninhabited Village       136       1381       473       243       230         Baga       472       2697       1316       1381       473       243       230         BhikhamChak       8       39       16       23       7       2       5         Balra       Uninhabited Village       Uninhabited Village       106       981       505       476       175       88       87         Mahqur       Uninhabited Village       Uninhabited Village       106       981       505       476       175       88       87         Mahpur       Uninhabited Village       Uninhabited Village       134       130         Ahila       407       2477       1280       1197       488       245       243         Kheri       248       1706       858       848       330       160       170	Patkhaulia	85	552 (80	273	219	103	54	49 54
Manadeopur         Oninhabited Village           AhimanChak         230         1457         736         721         282         131         151           Khemkaranpur         Uninhabited Village         Uninhabited Village         230         1457         736         721         282         131         151           Baga         472         2697         1316         1381         473         243         230           BhikhamChak         8         39         16         23         7         2         5           Balra         Uninhabited Village         Uninhabited Village          5	Pinjroi Mahadaanun	110	089	334 Uninh	555 abita d Willa	112	58	54
AnimanChak       230       1437       736       721       282       131       131         Khemkaranpur       Uninhabited Village       Uninhabited Village       Uninhabited Village       230         Baga       472       2697       1316       1381       473       243       230         BhikhamChak       8       39       16       23       7       2       5         Balra       Uninhabited Village       Uninhabited Village       Uninhabited Village       8       87         Dihra       106       981       505       476       175       88       87         Mahpur       Uninhabited Village       Uninhabited Village       130       130       130         Kharainacha       243       1544       821       723       264       134       130         Ahila       407       2477       1280       1197       488       245       243         Kheri       248       1706       858       848       330       160       170	AhimanChalt	220	1457	726		ige	121	151
Baga       472       2697       1316       1381       473       243       230         BhikhamChak       8       39       16       23       7       2       5         Balra       Uninhabited Village         Dihra       106       981       505       476       175       88       87         Mahpur       Uninhabited Village       Uninhabited Village       5       3       5       5       3       5       5       5	Khamkarannur	230	1437	750 Uninh	721 abited Ville	202	151	131
Baga       472       2697       1310       1381       473       243       230         BhikhamChak       8       39       16       23       7       2       5         Balra       Uninhabited Village         Dihra       106       981       505       476       175       88       87         Mahpur       Uninhabited Village         Kharainacha       243       1544       821       723       264       134       130         Ahila       407       2477       1280       1197       488       245       243         Kheri       248       1706       858       848       330       160       170	Riemkaranpur	472	2607	1316	1281	.ge 173	243	230
Balra         Uninhabited Village           Dihra         106         981         505         476         175         88         87           Mahpur         Uninhabited Village         Uninhabited Village         Village         Village         Village           Kharainacha         243         1544         821         723         264         134         130           Ahila         407         2477         1280         1197         488         245         243           Kheri         248         1706         858         848         330         160         170	Daga BhikhamChak	472	2097	1510	23	475	243	230
Dana         106         981         505         476         175         88         87           Dihra         106         981         505         476         175         88         87           Mahpur         Uninhabited Village           Kharainacha         243         1544         821         723         264         134         130           Ahila         407         2477         1280         1197         488         245         243           Kheri         248         1706         858         848         330         160         170	Balra	0	39	IUninh	23 abited Villa	/ (TP	2	5
Mahpur         Uninhabited Village           Kharainacha         243         1544         821         723         264         134         130           Ahila         407         2477         1280         1197         488         245         243           Kheri         248         1706         858         848         330         160         170	Dihra	106	981	505	176	175	88	87
Kharainacha         243         1544         821         723         264         134         130           Ahila         407         2477         1280         1197         488         245         243           Kheri         248         1706         858         848         330         160         170	Mahnur	100	701	Uninh	abited Villa	0e	00	07
Ahila         407         2477         1280         1197         488         245         243           Kheri         248         1706         858         848         330         160         170	Kharainacha	243	1544	821	723	264	134	130
Kheri         248         1706         858         848         330         160         170	Ahila	407	2477	1280	1197	488	245	243
	Kheri	248	1706	858	848	330	160	170
Bargaon   1711   10748   5650   5098   1873   942   931	Bargaon	1711	10748	5650	5098	1873	942	931
Megharia         227         1278         599         679         260         133         127	Megharia	227	1278	599	679	260	133	127
Kamaria         271         2004         1029         975         330         170         160	Kamaria	271	2004	1029	975	330	170	160
Kirkiri         686         4247         2194         2053         785         398         387	Kirkiri	686	4247	2194	2053	785	398	387
Narainaganj 58 279 159 120 63 35 28	Narainaganj	58	279	159	120	63	35	28
BarhampurMehdanra         511         3044         1568         1476         473         252         221	BarhampurMehdanra	511	3044	1568	1476	473	252	221
Chilhar         685         4188         2221         1967         711         379         332	Chilhar	685	4188	2221	1967	711	379	332
Tara Chak         256         1748         927         821         283         153         130	Tara Chak	256	1748	927	821	283	153	130
Karbasin         450         2846         1450         1396         566         291         275	Karbasin	450	2846	1450	1396	566	291	275
Gordiha 166 1218 641 577 189 92 97	Gordiha	166	1218	641	577	189	92	97
Amarpur Uninhabited Village	Amarpur		-	Uninha	abited Villa	ge		
Nadhi 511 3469 1845 1624 579 316 263	Nadhi	511	3469	1845	1624	579	316	263
Nonaur 744 4691 2469 2222 820 433 387	Nonaur	744	4691	2469	2222	820	433	387

Ch	apter	-III			BASE	LINE I	DATA	<b>DESCRIP</b>	ΓΙΟΝ
-									

Dhobha	271	1713	877	836	310	150	160		
Khaneth	291	1732	887	845	302	148	154		
Misraulia	149	757	394	363	122	63	59		
Lahauripur			Uninha	abited Villa	ge				
Panwar	450	3236	1676	1560	617	304	313		
Rudarpur	64	434	221	213	77	33	44		
Ekauni	44	269	126	143	55	24	31		
Koriam	703	3935	1994	1941	728	349	379		
Bara 3	199	998	522	476	109	64	45		
Satpura 233 1307 665 642 161 77									
Konika	370	1964	1034	930	405	212	193		
Sakri	436	2561	1351	1210	351	182	169		
Dhoraha	211	1250	662	588	239	127	112		
Chakia	197	1152	589	563	191	102	89		
TOTAL (10km)	56704	349713	181528	168185	60873	31549	29324		
	Source-C	ensus of Inc	lia, 2011						

Table 3.33: Village-wise SC & STPopulation Distribution (10km)

Name of Village	<b>Total Population</b>	Sch	eduled Ca	astes	Sche	eduled T	ribes
	-	Persons	Males	Females	Persons	Males	Females
Lahladpur	2047	261	152	109	0	0	0
Raghunathpur 1	3026	130	71	59	0	0	0
Kanpa	3194	838	434	404	1	0	1
Saidabad	3730	649	325	324	25	13	12
Anharipur	568	0	0	0	0	0	0
Gona	3500	918	460	458	0	0	0
Habaspur	2893	749	390	359	0	0	0
Chandni	345	0	0	0	0	0	0
Barda	1517	577	283	294	0	0	0
Gopalpur	1008	314	163	151	0	0	0
Bara 1	1776	319	156	163	1	0	1
Baijalpur	778	0	0	0	0	0	0
Nisarpura	3458	775	394	381	1	0	1
Kab	10141	2234	1139	1095	2	1	1
Dorwan	2521	166	94	72	0	0	0
Fatehpur 1	2324	117	66	51	3	2	1
Dhama Chak			Uninhabi	ted Village			
Bharbhesar	533	28	18	10	0	0	0
Alipur	2039	552	270	282	0	0	0
Raksia	1849	834	416	418	0	0	0
Khapuri	1099	302	152	150	0	0	0
Ganipur			Uninhabi	ted Village			
Bhadsara	8834	1413	744	669	8	3	5
Bhalua	1331	262	136	126	0	0	0
Sadawe	4762	664	350	314	0	0	0
Andehri	1125	238	103	135	0	0	0
Baduri	895	96	48	48	0	0	0
Paipura Khurd	1088	253	129	124	0	0	0
Rajipur	4509	1281	654	627	0	0	0
Saraiya	2670	984	525	459	0	0	0
Achhua	3052	385	204	181	1	1	0
Masaurhi	1547	309	154	155	0	0	0
GulliTanr	1490	0	0	0	0	0	0
Amarpura	988	5	1	4	0	0	0
Bali Pakar	3185	1288	642	646	0	0	0
Kalyanpur	3450	329	177	152	0	0	0

## Chapter-III BASELINE DATA DESCRIPTION

Jalpura	1570	91	45	46	0	0	0
Masaurha	2413	600	310	290	0	0	0
Udaipur	2130	75	44	31	0	0	0
Mohbalipur	6863	1729	878	851	2	2	0
Ranipur	1584	198	110	88	1	1	0
Fatehpur 2	1630	803	413	390	1	0	1
Hasanpur	269	54	23	31	0	0	0
DarianurPem	1697	853	438	415	1	0	1
Painura Kalan	1783	307	150	156	0	0	0
liarta	1117	374	160	214	0	0	0
Dharahra	/538	/36	229	217	1	0	1
Darianur Darianur Anant	1701	430	22)	207	0	0	0
Nirakour Pali	11708	1814	036	878	1	0	1
Kalupur	387	124	68	56	0	0	0
Alphiarpur Dali	3776	3/1	172	160	0	0	0
Kurkuri	3770	563	284	270	0	0	0
Ruikuli	1157	220	159	162	0	0	0
	2910	924	138	102	1	0	0
naipurAlikuri Soroi	2010	034 507	219	432	1	1	0
Saisi Muhammadaur	24/1	39/	518	219	0	0	0
Iviunammaapur	1452	148	/6	12	0	0	U
WiohibalipurChak	710	40	Uninhabi	ted Village	0		0
Habsapur	712	49	26	23	0	0	0
Pipardaha	4007	1484	756	728	1	1	0
Belaunra	3078	757	406	351	0	0	0
Kansopur	1393	96	46	50	0	0	0
Bela	1729	36	17	19	0	0	0
Lakhnipur	1196	446	229	217	1	0	1
Akbarpur	4399	858	428	430	0	0	0
Ajda	1010	237	117	120	0	0	0
Thakuri	1271	534	281	253	0	0	0
Sikaria	4768	1542	766	776	1	0	1
Sedura	1787	197	93	104	0	0	0
Taranpur	1777	836	425	411	1	1	0
Chauri	917	184	98	86	1	0	1
Khanpura	1597	630	320	310	0	0	0
Mankurha	1799	283	156	127	4	2	2
Torni	1363	180	87	93	0	0	0
Rampur Nagwan	4535	534	277	257	6	2	4
Mera	2449	588	305	283	0	0	0
Madaripur	1208	119	68	51	0	0	0
Nirakhpur	1621	332	177	155	1	1	0
Siddhipur	1093	652	355	297	0	0	0
Raghunathpur 2	1377	288	146	142	0	0	0
Yusuf AlipurChak			Uninhabi	ted Village			
Patauna	2184	909	466	443	1	1	0
ChhotkiMasaurhi	2346	548	303	245	0	0	0
Samaya NO 2 (KurmiChaksamaya)	7962	1213	656	557	0	0	0
Nasratpur	3279	335	176	159	0	0	0
Chilhauns	5054	946	473	473	0	0	0
Turkaul	3817	335	193	142	0	0	0
Jansara	1018	0	0	0	0	0	0
Ahpura	3321	695	364	331	0	0	0
Salempur	543	293	153	140	0	0	0
Sandesh	6874	1826	929	897	1	0	1
Pannura	483	0	0	0	0	0	0
Kanharpur	1210	0 06	51	15	0	0	0
Chela	2130	772	300	32/	0	0	0
Panrenur	50/	0	0	0	0	0	0
1 anopu	374	U	U	U	U	U	U

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Basauri	484	0	0	0	0	0	0
Gaighat			Uninhabi	ted Village			
Bhanpura			Uninhabi	ted Village			
Dihra	3371	793	431	362	0	0	0
Bichhiaon	2994	527	272	255	0	0	0
Dharampur	1942	329	171	158	0	0	0
Surungapur	1756	0	0	0	0	0	0
Chauria			Uninhabi	ted Village			
Dalelganj	1802	180	89	91	0	0	0
Parura Rampur	2522	740	382	358	0	0	0
Parura	3739	413	218	195	9	3	6
Udaibhanpur	156	0	0	0	0	0	0
Bara 2	997	0	0	0	0	0	0
Bartiar	1788	402	214	188	0	0	0
Kosdihra	766	0	0	0	0	0	0
Kori	6821	1098	554	544	0	0	0
Baranhpur	84	0	0	0	0	0	0
Khandaul	5179	231	115	116	0	0	0
Phulari	5036	586	297	289	0	0	0
Bhatauli	2482	540	275	265	0	0	0
Chanchar			Uninhabi	ted Village			
Raman Sanrh	5613	887	476	411	0	0	0
Patkhaulia	552	257	126	131	0	0	0
Pinjroi	689	0	0	0	0	0	0
Mahadeopur			Uninhabi	ted Village			
AhimanChak	1457	77	44	33	0	0	0
Khemkaranpur	0	0	0	0	0	0	0
Baga	2697	295	140	155	0	0	0
BhikhamChak	39	0	0	0	0	0	0
Balra			Uninhabi	ted Village			
Dihra	981	0	0	0	0	0	0
Mahpur			Uninhabi	ted Village			
Kharainacha	1544	591	307	284	0	0	0
Ahila	2477	360	190	170	0	0	0
Kheri	1706	138	75	63	0	0	0
Bargaon	10748	987	531	456	1	0	1
Megharia	1278	122	61	61	0	0	0
Kamaria	2004	98	49	49	0	0	0
	4247	201	102	99	0	0	0
Inarainaganj	279	181	100	81	0	0	0
BarnampurMendanra Chilhor	<u> </u>	410	210	200	0	0	0
Cillinar Torro Chole	4188	1095	J// 149	318 149	0	0	0
Tara Chak	1748	290	148	148	0	0	0
Gordiba	2040	093	34ð 115	120	1	0	1
	1218	235	II3 Uninhohi	120	0	0	0
Amarpur	2460	001	Uninnadi 491	ted village	0	0	0
Nanaur	3409 4601	017	481	405	11	0	0
Dhabha	4091	221	401	430	0	/	4
Khanath	1/15	231 500	266	2/2	1	1	0
Misraulia	757	209	162	243 146	1	1	0
Labauripur	151	509	I 105	140 ted Village	U	U	U
Danwar	3726	1065	561	504	0	0	0
I allwal Rudarnur	3230 /2/	0	0	0	0	0	0
Ekauni	434	0	0	0	0	0	0
Koriam	209	1100	560	540	0	0	0
Bara 3	008	109	18	57	0	0	0
Satoura	1307	105	80	107	0	0	0
	1.JU/	1 120	1 02	107	U	0	0

Chapter-III		]	BASEL	INE D	ATA I	DESCRI	PTION
<b>Project:</b> Sand Mining Proj Masaurha 2, Anchal –Paligan	ect Patna Sone ( j Dist - Patna (Bił	08 Sand	Ghat on	Sone 1	River at	t Mauza -	- Jalpura
, <u>,</u>							
Konika	1964	848	436	412	0	0	0
Sakri	2561	958	499	459	0	0	0

425

256

240

125

185

131

32612

0

2

93

0

0

43

0

2

50

**349713 67330 34718** Source-Census of India, 2011

1250

1152

#### Sex Ratio

Dhoraha

TOTAL (10km)

Chakia

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 predetermination 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 897females per 1000 males in the District. The same was recorded as 926females for every 1000 males in the study area. The child (0-6 yr age) sex ratio of the study area was observed as 929 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 **Table 3.34 & Figure 3.7** 





#### 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 67,330 persons consisting of 34,718 males and 32,612 females respectively in the study area which accounts as 19.3% to the total population (3,49,713 persons) of the study area. Scheduled Tribes ('ST') population was observed as 93 persons, accounts as 0.03% to the total population of the study zone consisting of 43 males and 50 females in the 10 km radius study zone. It implies that the rest 80.7% 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.

#### **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).



Figure 3.8 :Scheduled Caste 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 3.34** Total literate's population was recorded as1,92,491 persons (55.0%) in the study area. **Table 3.34** reveals that Male-Female wise literates are observed as 1,18,392&74,099 persons respectively, implies that the 'Literacy Rate' is recorded as 55.0% with male-female wise percentages being 34.0% &21.2% respectively.

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

#### **Chapter-III**



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

Name of Village	Total		Literates	Illiterates				
	Population	Persons	Males	Females	Persons	Males	Females	
Lahladpur	2047	1241	783	458	806	303	503	
Raghunathpur 1	3026	1861	1176	685	1165	417	748	
Kanpa	3194	1843	1148	695	1351	565	786	
Saidabad	3730	2454	1461	993	1276	472	804	
Anharipur	568	301	201	100	267	101	166	
Gona	3500	2101	1275	826	1399	541	858	
Habaspur	2893	1510	950	560	1383	543	840	
Chandni	345	177	119	58	168	69	99	
Barda	1517	724	437	287	793	332	461	
Gopalpur	1008	530	313	217	478	227	251	
Bara 1	1776	982	598	384	794	324	470	
Baijalpur	778	428	288	140	350	132	218	
Nisarpura	3458	1688	1058	630	1770	733	1037	
Kab	10141	6091	3611	2480	4050	1666	2384	
Dorwan	2521	1417	855	562	1104	445	659	
Fatehpur 1	2324	791	500	291	1533	745	788	
Dhama Chak			Uninha	abited Villa	age			
Bharbhesar	533	190	121	69	343	159	184	
Alipur	2039	1024	585	439	1015	460	555	
Raksia	1849	1138	615	523	711	324	387	
Khapuri	1099	651	385	266	448	193	255	
Ganipur			Uninha	abited Villa	age			
Bhadsara	8834	4868	3013	1855	3966	1620	2346	
Bhalua	1331	810	476	334	521	220	301	
Sadawe	4762	2834	1684	1150	1928	817	1111	
Andehri	1125	598	367	231	527	160	367	
Baduri	895	500	303	197	395	144	251	
Paipura Khurd	1088	637	366	271	451	187	264	
Rajipur	4509	2403	1489	914	2106	826	1280	
Saraiya	2670	1099	697	402	1571	695	876	
Achhua	3052	1706	999	707	1346	557	789	

Chapter-III	<b>BASELINE DATA DESCRIPTION</b>
Drojecti Sand Mining Droject Data	Sone 08 Sand Chot on Sone Diver at Maura Jahuna

Masaurhi	1547	885	493	392	662	252	410
GulliTanr	1490	624	431	193	866	336	530
Amarpura	988	588	323	265	400	156	244
Bali Pakar	3185	1727	1025	702	1458	606	852
Kalyanpur	3450	1731	1136	595	1719	730	989
Jalpura	1570	1085	622	463	485	206	279
Masaurha	2413	1425	831	594	988	372	616
Udaipur	2130	1066	693	373	1064	380	684
Mohbalipur	6863	3804	2316	1488	3059	1150	1909
Ranipur	1584	917	555	362	667	273	394
Fatehpur 2	1630	842	513	329	788	343	445
Hasanpur	269	133	83	50	136	45	91
DariapurPem	1697	720	481	239	977	399	578
Paipura Kalan	1783	1031	620	411	752	257	495
liarta	1117	557	320	237	560	216	344
Dharahra	4538	3024	1771	1253	1514	650	864
DariapurAnant	1791	1095	642	453	696	277	419
Nirakpur Pali	11798	6962	4033	2929	4836	2137	2699
Kalupur	387	179	112	67	208	98	110
Akhtiarpur Pali	3776	2360	1382	978	1416	588	828
Kurkuri	4444	2692	1596	1096	1752	652	1100
Bibipur	1157	704	420	284	453	156	297
HarpurAnkuri	2810	1381	813	568	1429	529	900
Sarsi	2471	1549	939	610	922	354	568
Muhammadpur	1452	656	411	245	796	340	456
MohibalipurChak	1102	000	Uninha	bited Vill	lge	510	100
Habsapur	712	460	263	197	252	107	145
Pipardaha	4007	1851	1205	646	2156	850	1306
Belaunra	3078	1656	1008	648	1422	609	813
Kansopur	1393	708	445	263	685	281	404
Bela	1729	988	601	387	741	286	455
Lakhnipur	1196	561	340	221	635	283	352
Akbarpur	4399	2781	1673	1108	1618	657	961
Ajda	1010	579	349	230	431	156	275
Thakuri	1271	736	444	292	535	227	308
Sikaria	4768	2561	1523	1038	2207	921	1286
Sedura	1787	1123	636	487	664	264	400
Taranpur	1777	828	535	293	949	370	579
Chauri	917	472	309	163	445	163	282
Khanpura	1597	664	403	261	933	438	495
Mankurha	1799	934	567	367	865	345	520
Torni	1363	575	385	190	788	289	499
Rampur Nagwan	4535	2230	1410	820	2305	938	1367
Mera	2449	1195	704	491	1254	550	704
Madaripur	1208	575	380	195	633	242	391
Nirakhpur	1621	823	524	299	798	336	462
Siddhipur	1093	419	279	140	674	295	379
Raghunathpur 2	1377	801	501	300	576	208	368
Yusuf AlipurChak		I	Uninha	bited Villa	age	_	·
Patauna	2184	1257	727	530	927	388	539
ChhotkiMasaurhi	2346	1166	712	454	1180	526	654
Samaya NO 2 (KurmiChaksamava)	7962	3860	2418	1442	4102	1854	2248
Nasratpur	3279	1719	1072	647	1560	662	898
		•			-		-

## **BASELINE DATA DESCRIPTION**

Chilhauns	5054	2585	1763	822	2469	833	1636					
Turkaul	3817	2201	1396	805	1616	670	946					
Jansara	1018	511	385	126	507	157	350					
Ahpura	3321	2040	1247	793	1281	505	776					
Salempur	543	253	154	99	290	137	153					
Sandesh	6874	4021	2453	1568	2853	1120	1733					
Panpura	483	304	196	108	179	59	120					
Kanharpur	1319	866	520	346	453	209	244					
Chela	2139	1037	672	365	1102	443	659					
Panrepur	594	176	132	44	418	203	215					
Basauri	484	316	201	115	168	53	115					
Gaighat			Uninha	abited Villa	age							
Bhanpura	Uninnabited Village											
Dihra	3371	887										
Bichhiaon	2994 1562 993 569 1432		1432	526	906							
Dharampur	1942	1016	611	405	926	404	522					
Surungapur	1756	977	636	341	779	264	515					
Chauria	1100	711	Uninhs	abited Vills	age	<i>2</i> 0 T	515					
Dalelgani	1802	953	636	317	849	303	546					
Parura Rampur	2522	1266	780	486	1256	556	700					
Parura	3739	2052	1251	801	1687	704	983					
Udaibhannur	156	57	43	14	99	43	56					
Bara 2	997	678	393	285	319	121	198					
Bartiar	1788	1009	640	369	779	302	477					
Kosdibra	766	353	246	107	413	148	265					
Kori	6821	35/19	2761	1288	3272	1173	205					
Baranhnur	84	59	38	21	25	7	18					
Khandaul	5179	2624	1657	967	2555	1029	1526					
Phulari	5036	3194	1990	1204	1842	692	1150					
Bhatauli	2482	1427	928	499	1012	396	659					
Chanchar	2102	1127	Uninha	bited Vill	loco	570	007					
Raman Sanrh	5613	3301	2080	1221	2312	923	1389					
Patkhaulia	552	318	189	129	234	84	150					
Piniroi	689	436	240	196	253	94	150					
Mahadeopur	007	430	Uninhs	bited Ville	200	74	157					
AhimanChak	1457	727	475	252	730	261	469					
Khemkarannur	1437	121	Uninha	bited Vills		201	-07					
Baga	2697	1668	948	720	1029	368	661					
BhikhamChak	39	20	9	11	19	7	12					
Balra			Uninha	bited Villa	age	,						
Dihra	981	524	351	173	457	154	303					
Mahpur	,,,,	02.	Uninha	bited Villa	age	10.	000					
Kharainacha	1544	850	544	306	694	277	417					
Ahila	2477	1261	810	451	1216	470	746					
Kheri	1706	1041	629	412	665	229	436					
Bargaon	10748	5758	3670	2088	4990	1980	3010					
Megharia	1278	711	401	310	567	198	369					
Kamaria	2004	1085	696	389	919	333	586					
Kirkiri	4247	2532	1498	1034	1715	696	1019					
Narainagani	279	75	55	20	204	104	100					
BarhampurMehdanra	3044	1553	958	595	1491	610	881					
Chilhar	4188	2377	1437	940	1811	784	1027					
Tara Chak	1748	998	637	361	750	290	460					

Chapter-III	<b>BASELINE DATA DESCRIPTION</b>
Project: Sand Mining Project Patna Sone 08 Sa	and Ghat on Sone River at Mauza – Jalpura
Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).	

Karbasin	2846	1563	953	610	1283	497	786					
Gordiha	1218	589	402	187	629	239	390					
Amarpur	Uninhabited Village											
Nadhi	3469 1911 1253 658 1558 592											
Nonaur	4691	2639	1645	994	2052	824	1228					
Dhobha	1713	818	513	305	895	364	531					
Khaneth	1732	950	582	368	782	305	477					
Misraulia	757	430	253	177	327	141	186					
Lahauripur	Uninhabited Village											
Panwar	3236	870	1143									
Rudarpur	434	275	160	115	159	61	98					
Ekauni	269	112	71	41	157	55	102					
Koriam	3935	2196	1368	828	1739	626	1113					
Bara 3	998	778	442	336	220	80	140					
Satpura	1307	848	507	341	459	158	301					
Konika	1964	1008	634	374	956	400	556					
Sakri	2561	1762	1069	693	799	282	517					
Dhoraha	1250	664	438	226	586	224	362					
Chakia	1152	597	347	250	555	242	313					
TOTAL (10km)	349713	192491	118392	74099	157222	63136	94086					
	Source-C	ensus of Ind	lia 2011									

#### **Economic Profile of Patna District:**

Patna has long been a major agricultural hub and centre of trade. Its most active exports are grain, sugarcane, sesame, and medium-grained Patna rice. There are several sugar mills in and around Patna. It is an important business and luxury brand centre of eastern India.

The economy of Patna has seen sustained economic growth since 2005. The economy has been spurred by growth in the Fast-Moving Consumer Goods industry, the service sector, along with Green revolution businesses. In 2009, the World Bank stated Patna as the second best city in India to start up a business. As of 2015, GDP per capita of Patna is₹1,06,000 and its GDP growth rate is 7.29 per cent.

Patna is the 21st fastest growing city in the world, and the fifth fastest growing city in India, and is expected to grow at an average annual rate of 3.72%.

#### 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 80,241(23.0%) and 42,640(12.0%) to the total population (3,49,713), while the remaining 2,26,832(65.0%) 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 3.35** 

## **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

Table 3.35 :Village-wise Occupational Pattern (10km)

Name of the Village	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
Lahladpur	432	202	99	5	126	587	105	388	9	85
Raghunathpur 1	572	247	223	34	68	696	175	317	129	75
Kanpa	767	242	319	45	161	461	26	278	78	79
Saidabad	413	82	203	14	114	702	102	353	51	196
Anharipur	124	2	61	1	60	5	0	1	0	4
Gona	912	194	195	49	474	435	23	235	17	160
Habaspur	709	392	223	16	78	670	230	259	152	29
Chandni	85	37	48	0	0	89	0	83	6	0
Barda	485	122	212	51	100	356	43	164	115	34
Gopalpur	291	158	40	7	86	121	2	107	5	7
Bara 1	392	148	55	109	80	238	24	171	17	26
Baijalpur	392	105	27	146	114	38	2	1	16	19
Nisarpura	1020	357	354	152	157	567	143	389	12	23
Kab	3344	1042	1174	101	1027	865	167	389	74	235
Dorwan	521	82	230	8	201	175	7	98	4	66
Fatehpur 1	501	226	121	20	134	331	20	129	16	166
Dhama Chak					Uninhab	ited Village				
Bharbhesar	10	9	0	0	1	147	146	1	0	0
Alipur	869	33	787	6	43	94	10	41	33	10
Raksia	724	14	666	2	42	80	31	43	0	6
Khapuri	158	56	28	6	68	163	3	106	29	25
Ganipur					Uninhab	ited Village				
Bhadsara	1816	630	901	26	259	1270	622	473	29	146
Bhalua	441	116	262	5	58	113	29	53	8	23
Sadawe	1556	445	363	37	711	448	43	187	31	187
Andehri	459	17	309	26	107	76	8	27	4	37
Baduri	227	10	46	0	171	49	14	10	3	22
Paipura Khurd	552	302	204	32	14	77	1	34	26	16
Rajipur	1230	39	287	4	900	387	32	281	9	65
Saraiya	845	385	399	19	42	138	10	87	23	18
Achhua	805	206	503	7	89	577	79	474	6	18
Masaurhi	247	72	138	4	33	231	10	204	1	16
GulliTanr	213	0	168	0	45	151	1	106	0	44

## **BASELINE DATA DESCRIPTION**

Amarpura	306	17	214	39	36	38	9	10	12	7
Bali Pakar	891	315	480	7	89	180	13	36	7	124
Kalyanpur	877	155	665	1	56	318	11	236	1	70
Jalpura	166	89	20	1	56	240	160	42	1	37
Masaurha	404	183	137	22	62	597	98	360	70	69
Udaipur	240	48	64	33	95	542	38	436	39	29
Mohbalipur	993	386	249	52	306	967	94	725	51	97
Ranipur	402	126	201	4	71	130	26	82	1	21
Fatehpur 2	304	28	230	5	41	331	1	316	5	9
Hasanpur	38	17	13	0	8	52	8	41	0	3
DariapurPem	354	84	221	12	37	481	35	245	13	188
Paipura Kalan	540	211	298	1	30	10	8	2	0	0
Ijarta	178	35	87	8	48	216	2	207	2	5
Dharahra	1175	227	323	37	588	302	40	135	67	60
DariapurAnant	506	321	160	3	22	98	56	41	1	0
Nirakpur Pali	2627	237	478	171	1741	1047	93	412	25	517
Kalupur	92	47	34	0	11	51	1	47	0	3
Akhtiarpur Pali	772	250	291	94	137	419	62	194	40	123
Kurkuri	1198	529	543	1	125	107	11	77	0	19
Bibipur	252	57	88	1	106	105	5	96	0	4
HarpurAnkuri	587	257	193	1	136	370	17	279	0	74
Sarsi	672	232	326	7	107	33	13	7	0	13
Muhammadpur	226	31	186	2	7	86	48	18	9	11
MohibalipurChak					Uninhab	ited Village				
Habsapur	381	72	273	1	35	10	5	1	0	4
Pipardaha	870	204	604	1	61	517	67	409	13	28
Belaunra	634	325	253	7	49	695	7	621	36	31
Kansopur	313	156	133	3	21	18	0	11	0	7
Bela	117	26	60	8	23	837	39	319	418	61
Lakhnipur	362	83	247	22	10	31	4	25	1	1
Akbarpur	1520	360	866	40	254	271	13	198	14	46
Ajda	237	80	149	4	4	9	1	7	1	0
Thakuri	307	73	200	3	31	10	1	4	2	3
Sikaria	1109	369	644	6	90	337	42	287	6	2
Sedura	186	53	110	4	19	505	19	442	21	23
Taranpur	297	69	192	4	32	298	8	284	0	6

## **BASELINE DATA DESCRIPTION**

Chauri	173	31	124	0	18	103	2	99	1	1		
Khanpura	445	139	251	0	55	4	1	1	1	1		
Mankurha	476	100	315	17	44	184	50	132	1	1		
Torni	360	80	249	7	24	54	2	51	1	0		
Rampur Nagwan	731	184	474	2	71	944	145	730	26	43		
Mera	826	175	601	0	50	50	3	24	1	22		
Madaripur	293	19	229	11	34	190	41	109	10	30		
Nirakhpur	519	7	444	14	54	345	154	186	0	5		
Siddhipur	425	39	369	1	16	29	2	8	16	3		
Raghunathpur 2	446	37	284	17	108	22	1	10	1	10		
Yusuf AlipurChak	Uninhabited Village											
Patauna	831	235	476	7	113	38	6	24	4	4		
ChhotkiMasaurhi	57	9	18	1	29	568	35	444	35	54		
Samaya NO 2 (KurmiChaksamaya)	2476	444	1737	42	253	663	59	539	15	50		
Nasratpur	438	76	281	15	66	359	202	90	33	34		
Chilhauns	556	118	184	10	244	660	82	340	8	230		
Turkaul	501	120	256	40	85	432	11	334	55	32		
Jansara	425	12	385	5	23	105	3	19	2	81		
Ahpura	1022	119	699	101	103	111	25	41	16	29		
Salempur	16	0	4	0	12	244	43	200	0	1		
Sandesh	1591	106	507	344	634	684	42	290	66	286		
Panpura	123	1	111	0	11	5	0	4	0	1		
Kanharpur	240	68	105	0	67	109	10	72	0	27		
Chela	368	186	113	3	66	365	135	212	4	14		
Panrepur	138	24	80	17	17	16	6	2	2	6		
Basauri	128	95	32	0	1	0	0	0	0	0		
Gaighat					Uninhab	ited Village						
Bhanpura		-			Uninhab	ited Village						
Dihra	484	242	83	29	130	469	15	446	0	8		
Bichhiaon	389	178	38	9	164	559	80	341	14	124		
Dharampur	161	113	15	7	26	493	24	449	3	17		
Surungapur	431	123	273	4	31	465	176	170	1	118		
Chauria	Uninhabited Village											
Dalelganj	287	99	131	6	51	163	41	105	3	14		
Parura Rampur	336	27	267	10	32	883	10	806	26	41		
Parura	944	155	497	157	135	579	70	324	34	151		

Udaibhanpur	24	24	0	0	0	1	1	0	0	0		
Bara 2	329	144	93	54	38	53	0	6	38	9		
Bartiar	539	132	163	158	86	211	14	119	23	55		
Kosdihra	154	125	8	0	21	38	4	30	1	3		
Kori	2100	166	1545	52	337	154	4	131	4	15		
Baranhpur	15	8	5	0	2	11	2	9	0	0		
Khandaul	783	329	331	7	116	767	26	632	11	98		
Phulari	912	150	515	5	242	658	200	294	11	153		
Bhatauli	239	39	147	20	33	335	27	276	11	21		
Chanchar	Uninhabited Village											
Raman Sanrh	1313	452	596	77	188	549	124	171	36	218		
Patkhaulia	113	30	70	0	13	5	0	2	1	2		
Pinjroi	126	79	18	0	29	0	0	0	0	0		
Mahadeopur					Uninhab	ited Village						
AhimanChak	223	37	91	46	49	269	14	208	17	30		
Khemkaranpur					Uninhab	ited Village						
Baga	233	12	123	3	95	328	66	232	9	21		
BhikhamChak	4	0	2	0	2	5	1	2	0	2		
Balra					Uninhab	ited Village						
Dihra	28	20	2	1	5	282	79	195	3	5		
Mahpur					Uninhab	ited Village						
Kharainacha	515	273	26	52	164	329	33	260	19	17		
Ahila	713	213	186	189	125	375	83	229	22	41		
Kheri	482	164	156	101	61	177	43	48	33	53		
Bargaon	2075	541	1148	70	316	2079	188	1515	46	330		
Megharia	192	55	41	45	51	90	13	67	7	3		
Kamaria	378	230	112	10	26	327	36	126	10	155		
Kirkiri	780	57	175	23	525	196	8	35	20	133		
Narainaganj	82	26	53	0	3	7	3	3	0	1		
BarhampurMehdanra	861	177	453	21	210	509	80	238	115	76		
Chilhar	767	190	242	44	291	318	14	248	39	17		
Tara Chak	435	272	121	1	41	385	19	343	2	21		
Karbasin	898	115	481	191	111	249	12	135	13	89		
Gordiha	36	16	6	3	11	625	74	515	10	26		
Amarpur					Uninhab	ited Village						
Nadhi	815	271	495	6	43	339	170	130	15	24		

### **BASELINE DATA DESCRIPTION**

<b>Project:</b>	Sand M	lining	Project	Patna	Sone	<b>08</b>	Sand	Ghat	on	Sone	River	at	Mauza	_	Jalpura
Masaurh	a 2, Anch	al –Pa	<b>liganj D</b> i	ist - Pa	tna (B	ihaı	r).								

Nonaur	1009	336	470	12	191	421	107	293	7	14
Dhobha	397	119	258	2	18	181	3	135	2	41
Khaneth	440	333	52	0	55	309	288	15	1	5
Misraulia	168	22	113	1	32	33	0	9	3	21
Lahauripur	Uninhabited Village									
Panwar	1053	235	764	13	41	331	39	268	1	23
Rudarpur	182	93	76	8	5	68	5	10	0	53
Ekauni	57	37	18	1	1	7	5	2	0	0
Koriam	705	153	425	12	115	287	9	260	5	13
Bara 3	242	123	62	14	43	8	1	3	2	2
Satpura	363	59	231	8	65	55	14	33	6	2
Konika	474	37	403	0	34	334	2	330	0	2
Sakri	523	215	213	2	93	199	0	184	0	15
Dhoraha	332	46	241	32	13	140	4	132	4	0
Chakia	251	42	144	0	65	106	0	80	0	26
TOTAL (10km)	80241	21282	38383	3697	16879	42640	6454	26696	2685	6805
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 workers

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
#### **BASELINE DATA DESCRIPTION**

#### Chapter-III

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

Distribution of work participation rate of the study area population is shown in**Table 3.36** as follows;

Occupation Class	Year, 2011
Main Workers	80,241 (23.0%)
Male	61,292(76.4%)
Female	18,949(23.6%)
Marginal Workers	42,640(12.0%)
Male	24,742(58.0%)
Female	17,858(42.0%)
Non-Workers	2,26,832(65.0%)
Male	95,454 (42.0%)
Female	1,31,378(58.0%)
Total Population (10km)	3,49,713
Source: Census of India	Records, 2011

<b>Table 3.36</b>	:Distribution	of Work	<b>Participation</b>	Rate(10km)
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Graphical representation of Workers Scenario is given below as Figure 3.11





#### **Composition of Main Workers:**

The 'Main Workers' were observed as 80,241 persons (23.0%) to the total population (3,49,713) of the study area and its composition is made-up of Casual laborers as 21,282 (26.0%), Agricultural laborers as 38,383(48.0%), Household workers 3,697(5.0%) and other workers as 16,879(21.0%) respectively.

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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 42,640 which constitute 12.0% to the total population (3,49,713) comprising of Marginal Casual Laborers as 6,454 (15.0%), Marginal Agricultural Laborers as 26,696(63.0%), Marginal Household laborers as 2,685 (6.0%) and marginal other workers were also observed as 6,805 (16.0%) of the total marginal workers respectively.

Details about marginal workers in the study area are tabulated in**Table 3.37**.Composition of Marginal workers is shown in**Figure 3.13** as follows.



Figure 3.13 : Composition of Marginal Workers

**Composition of Non-Workers:** 

#### **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

The total Non-worker's population was observed as 2, 26,832which accounts65.0% to the total population (3,49,713) of the study area. Male-female wise Non-worker's population was recorded as 95,454 Males (42.0%) and 1,31,378Females (58.0%) respectively.

Details about Total Non-workers in the study area are compiled in**Table 3.37** Graphical representation of Non-worker's population is shown as follows in**Figure3.14** 

	Non-Workers Population	
Persons	Males	Females
2,26,832	95,454 (42.0%)	1,31,378(58.0%)

#### Table 3.37 :Composition of Non-Workers



#### 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 Patna, Bhojpur and ArwalDistricts 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 156 villages lying under Patna, Bhojpur and Arwal Districts in Bihar state. Overall study area villages are falling mainly under Eight (08) tehsils namely Bikram (11 villages), Dulhin Bazar (20 villages), Paliganj (50 villages), Masaurhi (01 village) and Ghoswari (01 village) of Patna district, Sandesh (41 villages), Agiaon (25 villages) of Bhojpur district and Arwal (07 villages) of Arwal district respectively in Bihar state. There are fourteen (14) villages of 3 major districts named Patna, Bhojpur and Arwal in Bihar state found as uninhabited villages in the study area. There is no town found in the 10km radial study zone.

#### **Educational Facilities**

#### **BASELINE DATA DESCRIPTION**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

There is total no. of167 Primary schools existing in the 10km radius study area. About 138 no of Middle schools are found in the study area. About112Higher Secondary School (SS) and fifteen (15)Senior 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. No town was found in the 10 km radial study area.

#### Availability of University Education in Patna District

University education facility is available in the district. Many courses are studied in these universities. These universities are Patna University, Chankaya Law University, Extension center of Magadh University, Regional Study Center of Indira Gandhi Open University, Regional Center of Maulana Azad Urdu University, Nalnda Open University etc.

#### **Medical Facilities**

The medical facilities are provided by different agencies like Govt. & Private individuals and voluntary organizations in the study area. As per the census 2011, only 15primary health centersexistin the study area; most of the study area villages depend upon the towns & district HQ of the study area having such facility. No community health centre exists in the study area. Only twenty-nine (29)Primary Health Sub-Centers exists in the villages of the study area. Only eighteen(18) no of Mother & Child Welfare Centersarefound in the study area. Noallopathic hospitalexists in the study area. Only ten (10)medical dispansaries are found in the study area villages are served by average medical facilities. Specialized medical facilities are available only in towns and District Headquarter (HQ) only.

#### **Potable Water 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. About 49 villages(31.4%) 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.

Only 5villages werefound with railway station facility in the study area.Nearest railway station isGarhaniRailway station in WNWdirection from the mine lease area site. Nearest town is Jehanabad in ESEdirection. District Headquarters Patna, is situated towards ENE direction.

Site is well connected by Nearest National Highway (NH-139) is passing towards ESEDirection from the site.Nearest airport is Jayprakash Narayan International Airport Patna, in Bihar state, situated at about >40.0km in ENE direction from the mine lease area site.

#### **Communication, Road & Transport Facilities**

#### **BASELINE DATA DESCRIPTION**

#### **Chapter-III**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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. About 50 villages(32.3%) 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.

Only twovillages named Paipura Khurd andSikaria underDulhin Bazar and Paliganj tehsil of Patna district wasfound with railway station facility in the study area.Nearest railway station isBihtaRailway station in NE direction from the mine lease area site. Nearest town is Bihta, in NEdirection. District Headquarters Patna, is situated towards NE direction.

Site is well connected by Nearest National Highway (NH-139) is passing towards EastDirection from the site.Nearest airport is Jayprakash Narayan International Airport Patna, in Bihar state, situated at about 48.0km in NE direction from the mine lease area site.

#### Communication

Roads - The district of Patna 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 and Municipalities. It is also connected with the interior of the district by metalled road. Five National Highway (NH) and Three State Highway (SH) cross the district. NH-2, NH-19, NH-30, NH-31 and NH-83 pass through the district. SH-1, SH-2 and SH-4 also pass through the district.

Railways - The district of Patna has a railway communication system. It is served by East Central Railway.

The main line of the East Central Railway passes through the entire length of the district running parallel to the Ganges. There are two railway lines running across the district from north to south, viz., the Patna – Gaya Branch and Bakhtiyarpur- Rajgir line. The third Fatuha - Islampur line is under construction. All three are branches of the East Central Railway. With the opening of the famous Patna-Hajipur Bridge (Mahatma Gandhi Setu), the ferry service connecting the capital with the North-Eastern Railway System has ceased to function.

Airways - Patna is connected by air to Calcutta, Delhi and Mumbai and a few other places by daily flights. There is an aerodrome near Phulwarisharif and another at Bihta.

Boats – The Ganges is navigable throughout the year and there is considerable boat traffic for transporting cargo. The smaller rivers, e.g., Punpun and Dardha become navigable only during the rains when they are used for transporting agricultural produce to the grain market at Fatuah. A ferry service has been started from Haldiya to Allahabad for transportation. The National Waterway-1 also passes through the district.

#### **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. Patna town is the hub of commercial activities of the district. Its central position at the junction of the three great rivers, viz., the Sone, the Gandak and the Ganges gives it an additional advantage for the purpose of transport by river. The city proper comprises the large business quarters such as Marufganj, Mansurganj, the Chawkwith Mirchaiganj, Maharajganj and other petty bazars. Marufganj is by far the most important of any of the marts in the city. Besides the city of Patna, other important trade centres in the district are Dinapur, Barh, Mokameh, Fatwah and Masaurhi. In Patna district, trade consists mainly of export of pulses, dry chilies, castor seed, milk products and vegetables and import of cotton textiles, iron and steel products, cement, coal and consumer goods.

#### Mines and Minerals

The geological formation of the entire district of Patna is alluvial built-up with the alluvium brought down by the Ganges and deposited by it and its tributaries. No mineral of any kinds is found in the district except sand.

#### **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 51villages (32.7%) of the study area are electrified for domestic purpose, only 26villages (16.7%) for agricultural purpose, 21villages (13.5%) for commercial purpose and for all purposes in the study area.Out of 156 villages in the study area, 105villages (72.3%) including 14uninhabited villages (9.0%) are not electrified for any purpose in the study area.

The district Patna receives its entire power supply from the Barauni Thermal Power Station, the Patratu Thermal Power Station and NTPC. All the 12 towns of Patna district have electricity. In rural areas also, the pace of electrification has been comparatively fast. In terms of proportion Patna is, better provided with electricity than many other districts of the State. The Government is paying full attention to provide electricity to villages under the Rural Electrification Scheme. The main consumption of electricity in the rural areas is for agricultural purposes. Total numbers of villages electrified in the district are 1012.

Village/town wise Basic Infrastructure and Amenities availabilities data for the entire study area is compiled and presented in**Table 3.38** as follows;

## **BASELINE DATA DESCRIPTION**

**Project:** Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

#### Table 3.38 Village wise Basic Amenities Availability

Name of the Village	Ec	ducat	tiona	ıl			N	Medio	cal				Dri	ıkir	ng V	Vat	er	C T	C	om ]	munica <sup>.</sup> Franspo	tion & rt	Aj t	ppro he V	ach illag	to e	Po	wer	Sup	ply	Nearest Town & Distance, km
	Р	M	SS	SS S	C H C	P H C	P H SC	MC WC	H	D	F W C	T	W	H P	T W	R	Tŀ	2	P O	P T O	BS	RS	PR	KR	NŴ	F P	E D	E Ag.	E C	E A	
Lahladpur	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	Bikram,15km
Raghunathpur 1	3	3	3	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	1	2	2	2	2	1	2	2	2	2	Bikram,6km
Kanpa	1	1	1	0	0	0	1	0	0	0	0	2	1	1	2	2	2	2	2	2	1	2	1	2	2	1	2	2	2	2	Bikram,7km
Saidabad	2	2	2	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	1	2	1	2	1	1	2	1	2	2	2	2	Bikram,8km
Anharipur	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	2	2	1	1	2	2	2	Bikram,10km
Gona	1	1	1	0	0	1	1	1	0	1	1	2	2	1	2	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Bikram,10km
Habaspur	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	1	2	2	2	1	1	1	1	1	2	2	2	Bikram,7km
Chandni	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	1	2	2	2	2	1	2	2	2	2	Bikram,10km
Barda	1	1	1	0	0	0	0	0	0	0	0	2	1	1	1	1	2	2	2	2	2	2	2	1	2	1	1	1	1	1	Bikram,7km
Gopalpur	1	1	1	0	0	1	1	1	0	1	1	2	2	1	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Bikram,7km
Bara 1	1	1	1	0	0	0	0	0	0	0	0	2	1	1	1	1	2	2	2	2	1	2	2	1	2	1	1	1	1	1	Bikram,7km
Baijalpur	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	1	2	2	2	1	1	2	1	1	1	1	1	Masaurhi,24km
Nisarpura	1	2	2	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	1	2	1	1	2	1	1	1	1	1	Masaurhi,27km
Kab	1	1	1	2	0	1	1	1	0	1	1	2	1	1	1	2	2	2	1	1	1	2	1	2	1	1	1	1	1	1	Masaurhi,24km
Dorwan	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	1	1	1	2	2	2	Masaurhi,21km
Fatehpur 1	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	2	2	2	2	2	2	1	1	1	1	1	Masaurhi,13km
Dhama Chak														Uni	nha	bite	d V	illag	ge												Masaurhi,12km
Bharbhesar	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	1	2	1	1	2	1	1	1	1	1	Masaurhi,19km
Alipur	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	Masaurhi,19km
Raksia	2	1	1	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	1	2	1	1	2	1	1	1	1	1	Masaurhi,21km
Khapuri	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	1	1	1	1	2	2	2	Masaurhi,22km
Ganipur														Uni	nha	bite	d V	illag	ge												Masaurhi,18km
Bhadsara	5	5	5	2	0	0	1	0	0	0	0	2	1	1	1	2	2	2	1	2	1	2	1	1	2	1	1	1	1	1	Masaurhi,20km
Bhalua	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	1	1	1	2	2	2	Masaurhi,21km
Sadawe	1	1	1	0	0	0	1	0	0	0	0	2	2	1	2	1	2	2	1	2	2	2	1	1	1	1	1	2	2	2	Masaurhi,21km
Andehri	1	1	1	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	Masaurhi,23km
Baduri	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	1	2	2	2	2	1	2	1	1	1	1	1	Masaurhi,23km
Paipura Khurd	2	2	2	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	1	1	1	1	2	1	1	1	1	1	Masaurhi,24km
Rajipur	1	1	1	1	0	0	0	0	0	0	0	2	2	1	1	2	2	2	1	2	2	2	2	1	1	1	1	1	1	1	Masaurhi,25km
Saraiya	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Masaurhi,27km
Achhua	1	1	1	0	0	0	1	0	0	0	0	2	2	1	1	1	2	2	1	2	2	2	1	1	2	1	1	1	1	1	Masaurhi,22km

# **BASELINE DATA DESCRIPTION**

Masaurhi	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2	2	Jehanabad,20km
GulliTanr	1	1	1	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	Jehanabad,19km
Amarpura	1	1	1	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	Jehanabad,20km
Bali Pakar	1	1	1	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jehanabad,21km
Kalyanpur	1	1	1	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	Jehanabad,25km
Jalpura	1	1	1	0	0	1	1	1	0	1	1	2	2	1	2	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jehanabad,28km
Masaurha	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	1	2	2	2	1	1	2	1	2	2	2	2	Jehanabad,28km
Udaipur	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jehanabad,30km
Mohbalipur	4	4	4	1	0	0	1	0	0	0	0	2	1	1	2	1	2	2	1	2	1	2	1	1	1	1	1	2	2	2	Jehanabad,28km
Ranipur	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	1	2	2	1	1	2	1	1	2	2	2	Jehanabad,27km
Fatehpur 2	1	1	1	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	Jehanabad,25km
Hasanpur	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	1	2	2	2	Jehanabad,25km
DariapurPem	2	2	2	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Jehanabad,26km
Paipura Kalan	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	2	2	2	1	1	1	1	2	2	2	2	Jehanabad,25km
Ijarta	1	1	1	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	Jehanabad,25km
Dharahra	5	5	5	1	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	1	2	2	1	1	1	1	2	2	2	2	Jehanabad,24km
DariapurAnant	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Jehanabad,25km
Nirakpur Pali	5	5	5	4	0	0	1	1	0	0	1	2	1	1	1	2	2	2	1	1	1	2	1	1	2	1	1	2	2	2	Jehanabad,24km
Kalupur	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	1	2	2	2	2	1	1	1	1	1	Jehanabad,21km
Akhtiarpur Pali	1	1	1	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	Jehanabad,23km
Kurkuri	2	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	1	2	1	2	1	2	2	1	2	2	2	2	Jehanabad,26km
Bibipur	1	1	1	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	Jehanabad,28km
HarpurAnkuri	1	1	1	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	1	2	2	2	1	2	2	1	1	2	2	2	Jehanabad,29km
Sarsi	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	2	2	2	1	2	2	1	1	1	1	1	Jehanabad,29km
Muhammadpur	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	1	2	1	1	1	1	1	1	1	1	Jehanabad,30km
MohibalipurChak													I	Uni	nhał	oite	d Vi	llag	ge												Jehanabad,26km
Habsapur	1	1	1	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	Jehanabad,27km
Pipardaha	1	1	1	0	0	0	0	0	0	0	0	2	1	1	2	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jehanabad,25km
Belaunra	1	2	2	0	0	0	1	0	0	0	0	2	2	1	2	1	2	2	1	2	2	2	1	1	2	1	2	2	2	2	Jehanabad,29km
Kansopur	1	1	1	0	0	0	0	0	0	0	0	2	1	1	2	1	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Jehanabad,29km
Bela	1	1	1	0	0	0	0	0	0	0	0	2	1	1	2	1	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Jehanabad,30km
Lakhnipur	1	1	1	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	Jehanabad,30km
Akbarpur	1	1	1	0	0	1	1	1	0	1	1	2	2	1	2	1	2	2	1	2	2	2	1	2	2	1	2	2	2	2	Jehanabad,29km
Ajda	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Jehanabad,28km
Thakuri	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Jehanabad,26km
Sikaria	2	1	1	0	0	0	0	0	0	0	0	2	1	1	1	1	2	2	1	2	1	1	1	2	1	1	2	2	2	2	Jehanabad,26km
Sedura	1	1	1	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	Jehanabad,26km
Taranpur	1	1	1	0	0	0	0	0	0	0	0	2	1	1	2	1	2	2	2	2	2	2	2	1	1	1	1	2	2	2	Jehanabad.25km

# **BASELINE DATA DESCRIPTION**

Chauri	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	Jehanabad,25km
Khanpura	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	1	2	2	2	2	2	2	1	1	1	2	2	Jehanabad,22km
Mankurha	1	1	1	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	2	2	Jehanabad,24km
Torni	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	1	2	2	2	2	1	2	2	2	2	Jehanabad,24km
Rampur Nagwan	1	2	2	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	1	2	2	1	2	2	2	2	Jehanabad,24km
Mera	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	Jehanabad,22km
Madaripur	1	1	1	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	Jehanabad,20km
Nirakhpur	1	1	1	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	Jehanabad,22km
Siddhipur	1	1	1	0	0	0	0	1	0	0	1	2	1	1	1	1	2	2	1	2	1	1	1	1	1	1	1	1	2	2	Jehanabad,22km
Raghunathpur 2	1	1	1	0	0	0	0	1	0	0	1	2	1	1	1	1	2	2	1	2	1	2	1	1	1	1	1	1	1	1	Jehanabad,20km
Yusuf AlipurChak													1	Unii	nhat	oited	d Vi	illa	ge												Jehanabad,20km
Patauna	1	1	1	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	Jehanabad,19km
ChhotkiMasaurhi	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	1	1	1	2	1	1	2	2	2	Masaurhi,4km
KurmiChak	2	1	1	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	2	2	1	2	1	1	2	2	2	2	Mokameh,17km
Nasratpur	1	1	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	1	2	1	2	1	1	2	1	2	2	2	2	Arrah,26km
Chilhauns	2	1	1	0	0	0	1	0	0	0	0	2	2	1	2	2	2	2	1	2	1	2	1	1	2	1	2	2	2	2	Arrah,30km
Turkaul	2	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	2	1	2	1	1	2	1	1	2	2	2	Arrah,30km
Jansara	1	1	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	Arrah,30km
Ahpura	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	1	1	2	1	1	2	1	1	1	2	2	Arrah,30km
Salempur	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Arrah,32km
Sandesh	1	0	1	1	0	1	1	1	0	1	1	2	2	1	2	1	1	2	1	1	1	2	1	1	2	1	1	2	2	2	Arrah,30km
Panpura	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Arrah,30km
Kanharpur	1	1	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	Arrah,32km
Chela	1	1	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	Arrah,30km
Panrepur	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Arrah,30km
Basauri	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Arrah,30km
Gaighat													I	Unii	nhat	oited	d Vi	illa	ge												Arrah,30km
Bhanpura													I	Unii	nhat	oited	d Vi	illa	ge												Arrah,30km
Dihra	1	1	0	0	0	1	1	1	0	1	1	2	2	1	1	1	2	2	1	1	2	2	1	1	1	1	2	2	2	2	Arrah,22km
Bichhiaon	1	1	0	0	0	1	1	1	0	0	1	2	2	1	2	2	2	2	1	2	2	2	1	1	1	1	2	2	2	2	Arrah,22km
Dharampur	2	1	0	0	0	1	1	1	0	0	1	2	2	1	1	2	2	2	1	2	2	2	1	1	1	1	2	2	2	2	Arrah,22km
Surungapur	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	Arrah,30km
Chauria													1	Unii	nhat	oited	d Vi	illa	ge												Arrah,30km
Dalelganj	1	1	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	Arrah,30km
Parura Rampur	1	1	0	0	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	Arrah,25km
Parura	1	1	0	0	0	0	1	0	0	1	0	2	2	1	2	1	1	2	1	1	1	2	1	1	1	1	2	2	2	2	Arrah,30km
Udaibhanpur	0	0	0	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	Arrah,25km

## **BASELINE DATA DESCRIPTION**

Bara 2	1	1	0	0	0	0	0	0	0	0	0	2	2	1	11	2	1	2	2	2	2	2	11	1	1	11	2	2	2	2	Arrah 24km
Bartiar	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	Arrah 24km
Kosdihra	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	Arrah 30km
Kori	1	1	1	0	0	0	1	0	0	0	0	2	2	1	1	2	2	2	1	1	1	2	1	1	2	1	1	2	2	2	Arrah 30km
Baranhpur	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Arrah 28km
Durumpur	U	Ū	0		0	0	0	0	0	0		2	1	1	1	2	2	2	2	2	2		1	1	2	1	2	2	2		/ muii,20km
Khandaul	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	2	1	1	2	1	1	2	1	1	1	2	2	Arrah,30km
Phulari	3	1	1	0	0	0	1	0	0	0	0	2	2	1	2	2	2	2	1	2	1	2	1	1	2	1	1	2	2	2	Arrah,30km
Bhatauli	1	1	1	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	1	2	2	2	1	1	2	1	2	2	2	2	Arrah,20km
Chanchar				_	-								I	Uni	nhat	oite	d Vi	llag	ge					_	_						Arrah,16km
Raman Sanrh	1	1	1	0	0	0	1	0	0	1	0	2	2	1	1	1	2	2	1	2	2	2	1	1	2	1	2	2	2	2	Arrah,20km
Patkhaulia	1	0	0	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Arrah,30km
Pinjroi	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Arrah,30km
Mahadeopur													Ţ	Unii	nhat	oite	d Vi	llag	ge												Arrah,30km
AhimanChak	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	1	2	1	1	2	1	2	2	2	2	Arrah,30km
Khemkaranpur													J	Uni	nhat	oite	d Vi	llag	ge												Arrah,22km
Baga	2	1	0	0	0	0	1	0	0	0	0	2	2	1	1	2	2	2	1	2	2	2	1	1	2	1	2	2	2	2	Arrah,30km
BhikhamChak	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	1	2	1	1	2	1	2	2	2	2	Arrah,30km
Balra													Ţ	Uni	nhat	oite	d Vi	llag	ge											1	Arrah,30km
Dihra	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	Arrah,30km
Mahpur													Ī	Uni	nhat	oite	d Vi	llag	ge							_					Arrah,30km
Kharainacha	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Arrah,24km
Ahila	1	1	0	0	0	0	1	0	0	0	0	2	1	1	1	1	2	2	1	1	2	2	1	1	2	1	2	2	2	2	Arrah.30km
Kheri	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	Arrah,32km
Bargaon	5	1	1	2	0	1	1	1	0	0	1	2	2	1	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2	2	Arrah.30km
Megharia	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	1	1	2	2	1	2	2	1	2	2	2	2	Arrah.35km
Kamaria	1	1	0	0	0	0	0	0	Õ	0	0	2	1	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	Arrah.35km
Kirkiri	3	1	0	0	0	1	1	1	0	0	1	2	1	1	2	1	2	2	1	2	2	2	1	2	2	1	2	2	2	2	Arrah 35km
Narainagani	0	0	1	1	0	0	0	0	0	0	0	2	2	1	1	1	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Arrah 40km
BarhampurMehdanra	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	Arrah 25km
Chilhar	2	1	1	0	0	1	1	1	0	0	1	2	2	1	2	1	2	2	1	1	2	2	2	2	2	1	2	2	2	2	Arrah 25km
Tara Chak	1	1	0	0	0	1	1	1	0	1	1	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Arrah 30km
Karbasin	1	1	0	0	0	1	1	1	0	0	1	2	2	1	2	2	2	2	1	2	1	2	1	1	2	1	2	2	2	2	Arrah 30km
Gordiha	1	1	0	0	0	0	0	0	0	0	0	$\frac{2}{2}$	$\frac{2}{2}$	1	1	1	2	2	2	2	2	2	1	1	2	1	$\frac{2}{2}$	2	2	2	Arrah 30km
Amarpur	1	1	U	0	0	0	0	0	U	U	U	2	<u> </u>	I Inii	nhał	nite	d Vi	11ac	1 <u>2</u>		2	2	1	1	2	11	2	2	2		Arrah 30km
Nadhi	1	1	0	0	Ο	0	0	0	0	0	0	2	2	1	2	2	2 1	12	2	2	1	2	1	1	2	1	2	2	2	2	Arrah 32km
Nonaur	3	1	1	0	0	0	0	0	0	0	0	$\frac{2}{2}$	$\frac{2}{2}$	1	1	1	2	$\frac{2}{2}$	$\frac{2}{2}$	$\frac{2}{2}$	1	2	2	2	1	1	$\frac{2}{2}$	2	$\frac{2}{2}$	$\frac{2}{2}$	Arrah 32km
Dhobha	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	$\frac{2}{2}$	2	$\frac{2}{2}$	2	2	1	1	2	$\frac{1}{1}$	$\frac{2}{2}$	2	$\frac{2}{2}$	$\frac{2}{2}$	Arroh 25km
Diloula	1	1	U	10	10	10	0	0	0	0	0	- 2	4	1	1	-	-	14	4	-	4	~	1	1		1	2	~	-	4	ranan,23Kiii

# **BASELINE DATA DESCRIPTION**

Khaneth	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	2	2	2	1	2	2	1	2	2	2	2	Arrah.18km
Misraulia	1	0	0	0	0	0	0	0	0	0	0	2	1	1	2	2	2	2	2	2	1	2	1	1	2	1	2	2	2	2	Arrah,22km
Lahauripur													τ	Unii	nhat	oited	l Vi	llag	e												Arrah,22km
Panwar	1	1	0	0	0	0	0	0	0	0	0	2	2	1	1	2	2	2	1	2	2	2	2	2	2	1	2	2	2	2	Arrah,18km
Rudarpur	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	2	2	2	2	Arrah,18km
Ekauni	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	Arrah,19km
Koriam	1	1	1	0	0	1	1	1	0	0	1	2	2	1	2	1	2	2	2	2	2	2	1	2	2	1	2	2	2	2	Arwal,6km
Bara 3	1	0	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	1	2	2	2	1	1	1	1	2	2	2	2	Arwal,8km
Satpura	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	Arwal,8km
Konika	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	Arwal,7km
Sakri	1	1	0	0	0	0	0	0	0	0	0	2	2	1	2	1	2	2	1	2	2	2	1	1	2	1	2	2	2	2	Arwal,4km
Dhoraha	Dhoraha       1       1       0       0       0       0       0       0       0       2       2       1       1       2       1       1       1       1       2       2       2       2       1       1       1       1       1       2       2       2       2       1       1       1       1       1       2       2       2       2       1       1       1       1       1       2       2       2       2       1       1       1       1       1       2       2       2       2       1       1       1       1       1       2       2       2       2       1       1       1 <th1< th="">       1       <th1< th=""> <th1< th=""></th1<></th1<></th1<>																														
Chakia	Chakia       1       1       0																														
Status for Availability and Non-Availability is shown as A (1) & NA (2)																															
status jor Availability and Non-Availability is shown as A (1) & NA (2) respectively																															
TOTAL(10km)	167	138	112	15	0	15	29	18	0	10	18																				
							Sou	rce-l	ittp:	//w1	ww.	cens	susir	ndia	ı.go	v.in	/201	100	ensu	s/dc	hb/DC	HB.html									
Abbreviations:											_			_				_		_											
Educational Facilities: P-Pi	rimary	Sch	ool, l	M-N	lidd	le S	cho	ol, S	S-Hi	ghe	r Se	con	Idar	y So	choc	ols,	SSS	-Se	nior	Sec	condary	School									
Medical Facilities: CHC-Co	ommu	nity I	Healt	h Co	entro	e, Pl	HC-I	Prim	ary	Hea	lth	Cen	tre,	PH	SC-	Prir	nary	/ He	ealth	Sut	b-Centi	re, MCV	C-I	Mate	ernity	y an	id C	hild	Weli	fare	Centre, H-Hospital, D-
Dispensary, FWC-Family W	elfare	Cent	tre		7 11 7	<b>11</b> 7 4	т	ID I	r 1	р		TU	, m	1 1	<b>NT</b> T 1	1 337		р	п.			וידרוי	117			1	р.	1.			
Drinking water Facilities:	1-1ap	o wai	ter, v	V - W	ell	wat	er, F	IP-E	and	Pu	mp,	1 W	-1u	be	wei	IW	ater	, K-	·K1V	er w	vater, I	K-Tank	wa	ter, C	J-01	iner	Dri	nkin	g w	ater	Facility, CI-
Community Toilet																															
Communication & Transport Facilities: PO-Post Office, SPO-Sub-Post Office, PTO-Post & Telegraph Office, TelTelephone Connection, MobMobile Phone Coverage, BS- Bus Services, RS-Railways Services																															
Annroach to Village PR-P	aved F	cs 20ads	KR	-Ku	ichh	a Ra	her	FP_I	Foot	Pat	h																				
Power Supply: ED-Power S	lupplv	for I	), ISI Dome	estic	use	E E	Ag	-Pov	ver S	Supi	n blvt	or /	Agri	cul	tura	l us	e. E	C- I	Pow	er si	upply f	or Com	nerc	ial r	ise. I	EA-	Eleo	etrici	tv fo	or A	All Purposes
Nearest Town & Distance.	km:	a for	< 5 I	Km,	b fc	or 5-	10 k	Cm a	nd c	for	10-	- kn	n of	nea	rest	pla	ice v	vhe	re fa	cilit	ty is av	ailable i	s giv	ven.					- , - ,		r

#### **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;

**Baikatpur** -It is a village in Fatwah block, situated on the southern bank of the Ganges. It is noted for its Shiva temple said to have been built by Raja Man Singh, the famous General of Akbar's army. Weekly fairs are held on every Monday in the month of Shravana (July-August) and an annual fair on the occasion of Shivaratri.

**Banarsi** -The village lies on the southern bank of the Ganges about 3 kms. north of Barh railway station. It is noted for its old temple of Umanath. A large annual fair is held on the occasion of Shivaratri.

**Bharatpura -** The village is situated 14 kms. south of Bikram on the Bihta- Pali road. It is noted for its old library which has about 2,500 rare and old books, manuscripts and Tamraptras (copper plates).

**Bihta** -The village lies on the main line of the Eastern Railway about 25 kms. west of Patna. It is the headquarters of the block bearing the same name and has a large rice market. A large annual fair is held on the occasion of Shivaratri at Bihta.

**Bijpura -** It is a village situated about 14 kms. east of Taregna railway station. It is famous for its Kanhaiya-asthan built in the beginning of the 19th century.

**BirOiara** - The village is situated about 10 kms. east of Nadwan railway station. It is noted for its Shiva temple containing a four feet high image. Large fairs are held here on the occasion of Shivaratri and Basant Panchmi

**Goraila** - The village is situated 5 kms. south of the block headquarters at Naubatpur. It is famous for the tomb of the father of MakhdumSaheb of Biharsharif. It is a place of pilgrimage for the Mohammadans

**Naubatpur** - The village is the headquarters of the block bearing the same name. It has an Arya Samaj temple, built in thebeginning of this century.

**Nawada -** A village situated about 6 kms. north-east of Barh railway station. It contains an old tomb of a Muslim saint which is held in high reverence not only by the Muslims but also by the Hindus.

**Nisarpura -** It is a village situated on the bank of river Punpun about 1.5 kms. south of the block headquarters at Naubatpur. It is noted for its large fairs held on the occasion of Makar Sankranti and Bisua

**Pakri** - The village, situated on the river Punpun, is the headquarters of Punpun block. A large number of Hindu pilgrimscongregate here during Pitripaksh, the second fortnight of Bhadrapad (September- October) to offer oblation totheir deceased ancestors.

**Seonar -** The village is situated about 1.5 kms. west of Mokameh. It is famous for its temple of Nilkanth Mahadeo. Anannual fair is held in the village on the occasion of Shivaratri.

**Ular** - The village lies about 13 kms. south of Bikram on the Bihta-Pali road. It is famous for its temple of Sun-God. Anannual fair is held here on the occasion of Chhat in the month of Kartik every year.

**Patna -** Patna is the largest town and headquarters of Patna district, Patna division and Bihar State. It lies on the main lineof the Eastern Railway and is well connected by road. It is mainly an administrative and educational centre. It has, however, a few ancient and sacred places as also places of tourist interest, the details of which are indicated below:

**Phulwari** - Phulwari town is situated on Patna-Khagaul road and is the headquarters of the block bearing the same name. It is an important place for the Muslims as it contains an old Khankah where the hairs of Prophet Mohammad are preserved. Every year on the occasion of Fateh-Duaz-Dahum (the birthday of the prophet) a large fair is held. It attracts an all India gathering. Phulwarisharif also has an old mosque built of red stone and known as Sangi-Masjid, believed to have been built by Emperor Humayun in 1533 AD.

**Maner** - The town is situated at about 27 km west of Patna on Patna-Arrah road and is the headquarters of the block bearing the same name. The village derives its name from King Maniar, the remains of whose fortress still exist. It is traditionally believed that the marriage party of Lord Rama halted at Maner both on the outward and inward journeys from Ayodhya to Janakpur. The village has a magnificent tomb of the Muslim saint MakhdumSaheb, said to have been constructed by Emperor Jehangir in 1660 AD.

#### Social and Cultural Events

Fairs and festivals are held regularly in the district. Sombari Mela is held in the immediate vicinity of the Patna Civil Court building on each Monday in the month of Shravana. (July-August). The main articles put up for sale during this fair are furnitures, utensils and plants of fruits and flowers. The Chhat festival is one of the most important and auspicious religious event for Patna district in general and Patna town in Particular. On the occasion the Sun God is worshipped. All ghats of Patna and all roads leading to these ghats are illuminated with sea of human heads moving around during this festival.

#### 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.

#### 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 socioeconomic 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 landuse 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 Son 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<sup>2</sup> 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 Dec to feb 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



### Chapter-4 Anticipated Environmental Impact And Mitigation Measures Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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.

#### 4.3.4 Model Results

The Air Quality Impact Prediction has been done by using "Industrial Source Complex Short Term version 3 (ISCST3), of USEPA". The main sources of air pollution with regard to the proposed project for the purpose of estimation of increase in PM10 are identified due to –

- (i) Loading/unloading of ore
- (ii) Transportation of ore by trucks on the Haul roads from mining benches.

Combined impact of PM10 was considered due to mining activities occurred simultaneously on various sampling locations is given in below table:



#### **Chapter-4**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

#### Table 4.1 Incremental Concentration of PM10 in the Study Area

Location	Location name	Distance	<b>98</b> <sup>th</sup>	Incremental	Total Value
ID		(Km) and	Percentile	Value	
		Direction			
AAQ 1	Project Site	-	86.03	8.0	94.03
AAQ 2	Near Azimabad	4.99 Km, SW	77.36	< 0.001	77.36
	Village				
AAQ 3	Mahabalipur	4.63 Km,S	78.29	1.6	79.89
AAQ 4	Paliganj	6.39 Km, SE	75.72	< 0.001	75.72
AAQ 5	Jalpura	1.56 Km,E	72.38	< 0.001	72.38
AAQ 6	Kori	5.49 Km,NW	74.41	< 0.001	74.41
AAQ 7	Bargaon	8.37 Km, SW	73.10	< 0.001	73.10
AAQ 8	Shrirampur	8.0 Km, S	76.73	2.4	79.13
AAQ 9	Turkaul	4.47 Km, N	76.47	< 0.001	76.47
AAQ 10	Muzaffarpur	9.96 Km, SW	72.61	< 0.001	72.61

#### **Chapter-4**

# Anticipated Environmental Impact And Mitigation Measures

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).



Figure 4-1, Iso-pleth of PM10

(Iso-pleth of PM10 is 8.0  $\mu\text{g/m}^3$  occurred near the project site at 2000 m x2000 m grid network during

- i) ii) loading and unloading and
- ii) iii) Transportation of ore over the haul road.

#### **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:

 $\checkmark$  Water sprinkling will be done on the haul roads twice in a day.



## Chapter-4 Anticipated Environmental Impact And Mitigation Measures

**Project:** Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

- ✓ Deploying PUC certified vehicles to reduce their emissions
- $\checkmark$  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.
- $\checkmark$  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



# Chapter-4 Anticipated Environmental Impact And Mitigation Measures

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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:

Maximumallowable duration	Sound pressure dB(A)	Remarks
per day in hour		
(1)	(2)	(3)
8.0	90	1. For any period of
6.0	92	exposure falling in
4.0	95	between any figure and
3.0	97	lower figure as
2.0	100	indicated in column
1 1/2	102	(1), the permissible
1	105	sound is to be
3⁄4	107	determined by
1/2	110	extrapolation or
		proportionate scale.
1/4	115	2. No exposure in excess
-74	115	of 115 dB (A) is
		permissible.

 Table 4.1, Damage risk criteria for hearing loss OSHA regulations

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 Son 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**



# Chapter-4 Anticipated Environmental Impact And Mitigation Measures

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

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.



# Chapter-4 Anticipated Environmental Impact And Mitigation Measures

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).



# TRANSPORTATION ROUTE MAP

FIGURE 4.1 MAP SHOWING EVACUATION ROUTE FOR PATNA SON 08

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	& I	OS f	for B	lock (	08
1 abic 4.4 (1).	L'AISUNG	11 ann	Stellario	a I	1081		IUCK V	90

Road	V	С	Existing V/C Ratio	LOS
National Highway (NH-139)	2500	15,000	0.16	А

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.



#### **Chapter-4**

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# **Anticipated Environmental Impact And Mitigation Measures**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza - Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

V/C	LOS	Performance
0.0 - 0.2	А	Excellent
0.2 - 0.4	В	Very Good
0.4 - 0.6	С	Good / Average / Fair
0.6 - 0.8	D	Poor
0.8 - 1.0	Е	Very Poor

*Reference: ENVIS* Technical Report, IISc, Bangalore. ~

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ck 08
: 2110234 TPA
: 250 days
: 8440.93
: 16 tonnes
: 527.55 or 528
: 1584

#### Table 4.2 (ii): Modified Traffic Scenario & LOS

Road	V	С	Modified V/C Ratio	LOS
National Highway (NH-139)	2500+1584=4084	15000	0.27	В

#### Results

From the above analysis it can be seen that the LOS has changed from 0.16 to 0.27 at Highway intersection that is from 'A' to 'B' i.e from Excellent' to 'Very Good' respectively. 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.



#### TRAFFIC MANAGEMENT FOR PROJECTS IN CLUSTER

#### Production Details of Cluster of project(As per DSR):

Sand Block name	Area (Ha.)	Production (in TPA) considering max as 3 meter
Patna Son 04	29.77	1456542
Patna Son 05	45.03	2188458
Patna Son 06	40.98	1991628
Patna Son 07	54.66	2656476
Patna Son 08	68.16	3312576
Patna Son 09	45.95	2233170
Total	284.55	13838850 TPA

#### Table 4.2 (i): Existing Traffic Scenario & LOS for

Proposed Cluster of Patna Son 04, Son 05, Son 06, Son 07, Son 08 & Son 09

Road	V	С	Existing V/C Ratio	LOS
National Highway (NH-139)	2500	15,000	0.16	А

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	А	Excellent
0.2 - 0.4	В	Very Good
0.4 - 0.6	С	Good / Average / Fair
0.6 - 0.8	D	Poor
0.8 - 1.0	Е	Very Poor

Reference: ENVIS Technical Report, IISc, Bangalore.

During Mine operation for Proposed Cluster of Patna Son 04, Son 05, Son 06, Son 07, Son 08 &

Son 09

Proposed Capacity of Mine/annum : 13838850 TPA



# Chapter-4Anticipated Environmental Impact And<br/>Mitigation MeasuresProject: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura<br/>Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).No. of working days: 250 days

No. of working days	: 250 days
Proposed Capacity of mine/day	: 55355.4 or say 55356 TPD
Truck Capacity	: 16 tonnes
No. of trucks deployed/day	: 3459.75 or 3460
Increase in PCU/day (3460*3)	: 10380

#### Table 4.2 (ii): Modified Traffic Scenario & LOS

Road	V	С	Modified V/C Ratio	LOS
National Highway (NH-139)	2500+10380=8926	15000	0.85	В

#### Results

From the above analysis it can be seen that the LOS has changed from 0.16 to 0.85 at Highway intersection that is from 'A' to 'E' i.e from Excellent' to ' Very Poor' respectively, as per classification. Hence, there will not so much adverse affect on the proposed evacuation roads due to additional traffic. Traffic management has been proposed as given below.

#### **Traffic Management:**

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

\*\*\*\*\*



#### 5.0 ANALYSIS OF ALTERNATIVE TECHNOLOGY AND SITE

#### 5.1 Site Alternatives under Consideration

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

#### 5.2 Analysis of Alternative Technology

#### 5.2.1 Choice of Method of Mining

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

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

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

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

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

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Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

#### 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.



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

- 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<sub>2</sub>) and Nitrogen Dioxide (NO<sub>2</sub>) 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 <sub>10</sub>	Gravimetric method	IS 5182 (Part-XXIII)
Sulphur Dioxide	Improved West and Gaeke	IS-5182 (Part-II)
Nitrogen Dioxide	Modified Jacob & Hochheiser	IS-5182 (Part-VI)

#### Water quality monitoring

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

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



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#### Soil quality monitoring

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

#### Noise level monitoring

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

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

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

#### Socio-economic Survey

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

#### **Plantation Monitoring Programme**

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

#### 6.3 MONITORING SCHEDULE

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

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

#### Table 6.2, Details of monitoring schedule



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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

#### 6.4 MONITORING SCHEDULE - IMPLEMENTATION

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

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

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

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

#### 6.5 BUDGET ALLOCATION FOR MONITORING

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



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Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

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

Table 6.3	Budget for	monitoring
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#### 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:

- $\checkmark$  Elimination of hazards.
- ✓ Substitute something safer.
- ✓ Use engineering/design controls.



- $\checkmark$  Use administrative controls such as safe work procedures.
- $\checkmark$  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

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

# Table 7.1, Risk Likelihood Table for Guidance

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

Risk Rank	L1	L2	L3	L4	L5
Likelihood Consequence	Almost certain	Likely	Possible	Unlikely	Rare
C1					
Catastrophic	1	2	4	7	11
C2					
Major	3	5	8	12	16
C3	6	9	13	17	20

Table7.2, Qualitative Risk Assessment



Moderate					
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 sandmining 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: Bhojpur 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 Lakhisarai 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 **71 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 Son 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.
- 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 Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (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.

\*\*\*\*\*\*



#### 8.0 GENERAL

Various benefits are envisaged while planning for the mining of sand from Son 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 Son 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.



S. No.	Activities recommended for	Tentative cost
	communities level services	(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.	0.50
	Total	2.5

#### **Table-8.1, Budget for Public Health**

- 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.

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

Table 8.2, Budget for Occupational Health

# 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.

CSR cost will be 2% of the total project cost. This amount will be used for social welfare. CSR COST is 24,95,65,600 / x 2% = Rs. 49,91,312/.

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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Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

#### 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:



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

- 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 3.0mmaximum from the surface level well above the ground water table, therefore impact on water regime is not anticipated.
- Monitoring of water quality of nearby surface water, ground water and domestic water will be conducted once in every season except monsoon to evaluate the performance of the mitigation measures.

# 9.4 NOISE POLLUTION CONTROL MEASURES

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



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

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

# 9.5 **BIOLOGICAL ENVIRONMENT**

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

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



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- **Greenery development:** The project will not lead to any tree cutting. However, 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. 682 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 5 plant per hectare will be proposed for development of greenbelt but in this cluster of projects 10 plants per hectare will be proposed for better condition of environment.
- Total Number of plants for cluster of Sand Bloks are given below.

Sand Ghat	Area (Ha)	Plants
Block Son 08	68.16	68.16*10 Plants= 682 plants
Total Plants		682 plants

	Agro-climatic zone & Sub	Middle Genetic Plains, North west alluvial sub zone	
S/n	Scientific name	Common Name	Pollution control features
1	Mangiferaindica	Aam	Tolerant to Dust control
2	Tectonagrandis	Sagon	Tolerant to Dust control
3	Ficusbenghalensis	Bargad	Tolerant to Dust control
4	Scigiumcumuni	Jamun	To stop river bank erosion
5	Terminaliaarjuna	Arjun	To stop river bank erosion
6	Populus ciliate	Popular	Fast growing, broad leaf
7	Ficusreligiosa	Peepal	Dust particles absorbance
8	Acacia nilotica	Babul	Tolerant to SO <sub>2</sub>
9	Azadirachtaindica	Neem	Tolerant to SO <sub>2</sub>
10	Pithecolibiumducle	Jungle jalebi	Tolerant to SO <sub>2</sub> and Dust control

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



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# 9.6 LAND USE PLANNING

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

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

# 9.7 OCCUPATIONAL HEALTH & SAFETY

Occupational safety and health is very closely related to productivity and good employeremployee relationship. The factor of occupational health in Sand Ghat of Devendra Equipment Pro - Kanchan Kumar Singh S/o - Devendra Kumar M/448, Laxmi Niwas, Road No.- 04, Kankarbagh, Patna, Bihar. (Sand Block 08) is mainly dust. Safety of employees during operation and maintenance etc. shall be as per Mines rules and regulations.

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

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



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

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

# 9.8 SOCIO-ECONOMIC ENVIRONMENT

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

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

# 9.9 ENVIRONMENT POLICY

Devendra Equipment Pro - Kanchan Kumar Singh S/o - Devendra Kumar M/448, Laxmi Niwas, Road No.- 04, Kankarbagh, Patna, Bihar. (Sand Block 08) of Sand Ghat believes that responsible environmental stewardship comprises diligent application of well-established natural resource management, controls and practices for the protection of the mined out land, preservation of biodiversity and proper disposal of waste if any following the best environmental practices during the process of mining.

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



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar).

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

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

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

# 9.10 BUDGET ALLOCATION FOR EMP IMPLEMENTATION

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



# **ENVIRONMENTAL MANAGEMENT PLAN**

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	Nil	1.5
2	Pollution Monitoring i) Air pollution ii) Water pollution iv) Noise Pollution		2.0
3	Plantation and salary for one gardener (part time basis).	6.82	0.5
4	Haul road Maintenance Cost	3.15	1.5
TOTAL		6.97	5.5

#### Table 9.2, Budget of EMP (Block-08)

Note: \*682 plants \* 1000 Rs (for each plants including hedges and fences) =Rs 682000/-

- 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 \*1.26 km haul road) =Rs. 3,15,000/-

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#### **10.0 INTRODUCTION**

# **10.1 Purpose of the Report**

Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR) received from SEIAA, Bihar under EIA notification of the MoEF&CC dated 14<sup>th</sup> 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 was located on Sone River at Patna Son 08, Sand Ghat at Mauza– Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar)

The proposed mining was a cluster of 06 mining lease area of Patna Son 04, Son 05, Son 06, Son 07, Son 08 & Son 09 over an combined area of 284.55 Ha is for river bed sand mining on Sone River at, Dist- Patna, Bihar.

**Cluster Situation:** As per District Survey Report Patna the Proposed Sand Ghats of Patna Son 04, Son 05, Son 06, Son 07, Son 08 & Son 09 are comes in cluster situation whose combined cluster area is 284.55 ha. All the lease area of homogeneous minerals is coming within 500 m radius from each other confirming a cluster situation.

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, Prefeasibility 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 Details of cluster is given below:

Sand Block name	Area (Ha.)	Production (in TPA) considering max as 3 meter
Patna Son 04	29.77	1456542
Patna Son 05	45.03	2188458
Patna Son 06	40.98	1991628

Total	284.55	13838850 TPA
Patna Son 09	45.95	2233170
Patna Son 08	68.16	3312576
Patna Son 07	54.66	2656476

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. Block Patna Son 08, Sand Ghat fall in Sand Ghat, Mauja– Jalpura Masaurha 2, Anchal–Paliganj Dist - Patna (Bihar) over an area of 68.16 hectares.

# **10.3 BRIEF DESCRIPTION OF PROJECT**

The proposed project is Open Cast Semi-Mechanized Mining of Sand with a proposed cluster production of 2110234 Tonnes per annum. The project has been proposed by (Patna Son 08 - Devendra Equipment, Pro - Kanchan Kumar Singh S/o - Devendra Kumar M/448, Laxmi Niwas, Road No.- 04, Kankarbagh, Patna, Bihar.

The proposed project is over an area 68.16 ha on Son River at Mauza – Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar). As per MoEF, New Delhi Gazette dated 14<sup>th</sup> September 2006 and amended thereof, the proposed mining project is categorized as **Category 'B-1'.** The estimated project cost for the proposed project is Patna Son **08** - **Rs**-24,95,65,600 /- (including auction cost).

The proposed mining lease area falls in Survey of India Toposheet 72 C/11 & 72C/15.

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

Pillar No	Latitude (N)	Longitude (E)		
1	25.36909482	84.74028129		
2	25.36955904	84.74062317		
3	25.37049166	84.74085151		
4	25.37086148	84.74082511		
5	25.37142721	84.74101227		
6	25.37168956	84.74121103		
7	25.37380343	84.74281258		
8	25.37371302	84.74323798		
9	25.37262001	84.74838094		
10	25.37229477	84.74991127		

 Table: 10.1 Mine lease Co-ordinates (Patna Son 08)

# **SUMMARY & CONCLUSION**

**Project:** Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

11	25.3718814	84.75185632
12	25.37187919	84.75185607
13	25.37126277	84.75178752
14	25.36907843	84.75154461
15	25.36692075	84.75130467
16	25.36685925	84.75129783
17	25.36655368	84.75126385
18	25.36544951	84.75105067
19	25.36572062	84.75023367
20	25.36761669	84.74464109

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

Sr.	Dortioulors	Details			
No.	r ar ucular s	Details			
1	Location				
a	Village	Mauza – Jalpur	ra Masaurha 2		
b	Tehsil	Paliganj			
с	District	Patna			
d	State	Bihar	Bihar		
2	Elevation	Patna Son 08 (65.5 mRL - 64.5 mRL)			
	above				
3	Nearest	NH 139 Approx. 1.35 km towards East direction.			
	National	SH-69 is approx 3.20 m in NE direction.			
	Highway/State				
	Highway				
4	Nearest	Blocks	<b>Railway Station</b>	Distance (Km) Direction	
	Railway	Patna Son	Bihta Railway	Garhani Railway station	
	station	08 station approx. 24 Km in		approx. 24 Km in NE in	
	station	East direction.		East direction.	
5	Nearest	Blocks	Airport	Distance (Km) Direction	
	Airport	Patna Son	Jayprakash	Approx. 45 Km in NE	
	1	08	Narayan Airport,	direction.	
			Patna		

**Table-10.2: Details of Environmental Setting** 



Sr. No.	Particulars	Details
6	Ecological	There is no any Ecological Sensitive Areas Like National
	Sensitive	Park, Wildlife Sanctuaries, etc are found within 10 km of the
	Areas	study area.
	(Wildlife	
	Sanctuaries)	
7	Seismic Zone	Zone- IV
		Source BMTC 2 <sup>nd</sup> edition
		https://www.bmtpc.org/disaster%20resistnace%20technolgies/ZONE%20
		IV.htm

#### **10.4 PROJECT DESCRIPTION**

#### **10.4.1 Salient features of mine lease**

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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 Patna Sone 08 Sand Ghat	
		on Sone River at Mauza – Jalpura Masaurha 2,	
		Anchal -Paliganj Dist - Patna (Bihar) over an	
		area of 68.16 hectares.	
2	Mining Capacity	1226880 cum/year or 2110234 TPA	
3	Method of mining	Open cast semi-mechanized mining/OTFM	
4	Total ML area	68.16 ha	
5	Depth of mining	3 m depth	
6	Manpower	71 persons	
9	Water Requirement	Patna Son 08 – 11.70 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  $(1.72 \text{ g/cm}^3)$  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 palaeo channels of the river will be leveled & restored back.

Sand Ghat	Area (Hect)	Geological Reserves (m3)	Mineable Reserves (m3)	Annual Mineable Permitted Reserve As per LoI (m3)
Patna Sone 08	68.16	2044800	1975035	1226880

**Table 10.4 Classification Mineral Reserves** 

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 Patna Son 08 Sand Ghat. However, as the digging depth will be restricted to 3.0 m only. This will be further replenished during rainy season. Sand Ghat will be worked systematically as the width is limited while length is much more. As the lease period is only 5 (Five) years, some of the area will be left un-worked at the end of lease period.

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



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

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

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

# **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. 682 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**

Three 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 Dec 2022 to Jan-Feb 2023 representing winter season. It was observed that the during study period, temperature ranged from 06  $^{0}$ C to 25.0  $^{0}$ C.

# 10.7.3 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) has been carried out at 10 locations. The Particulate



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

Matter (PM<sub>10</sub>) conc. ranged of 50.92  $\mu$ g/m<sup>3</sup>to 86.64  $\mu$ g/m<sup>3</sup>. The Particulate Matter (PM<sub>2.5</sub>) ranged from 25.23  $\mu$ g/m<sup>3</sup> to 43.69  $\mu$ g/m<sup>3</sup>. Sulphur dioxide (SO<sub>2</sub>) between 6.23  $\mu$ g/m<sup>3</sup> to 12.97  $\mu$ g/m<sup>3</sup>.Oxides of Nitrogen (NO<sub>2</sub>) between 8.03  $\mu$ g/m<sup>3</sup> to 19.87  $\mu$ g/m<sup>3</sup>. The results thus obtained indicate that the concentrations of PM10, SO<sub>2</sub> and NO<sub>2</sub> in the ambient air are well within the National Ambient Air Quality (NAAQ) standards for Residential and Rural areas.

# **10.7.4 Water quality**

To assess the physical and chemical properties of water in the region, water samples from 05 locations were collected from various water sources around the mine lease area. The pH was varying for ground waters from 7.46 to 7.70. The total dissolved solids are varying from **351.38 mg/l to 436 mg/l**.

The Surface water sampling was taken from 5 locations The analysis results indicate that the pH ranges between 7.11 and 7.62. Dissolved Oxygen (DO) was observed in the range of 6.2 to 8.7 mg/l against the minimum requirement of 4 mg/l. BOD values were observed to be in the range of 2.17 to 5.20 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 58.9 dB(A) to 50.1 dB(A) respectively. The minimum & maximum noise levels at night time were found to be 46.4 dB(A) & 36.4 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 Son 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

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

- 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

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 &	Once a season for 4 seasons in a year
	Groundwater)	
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

# Table 10.5: Post project environmental monitoring

# **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

# Table 10.6 (a), Budget of EMP (Patna Son 08)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	Nil	1.5

2	Pollution Monitoring i) Air pollution ii) Water pollution iv) Noise Pollution		2.0
3	Plantation and salary for one gardener (part time basis).	6.82	0.5
4	Haul road Maintenance Cost	3.15	1.5
TOTAL		6.97	5.5

Note: \*682 plants \* 1000 Rs (for each plants including hedges and fences) =Rs 682000/-

- 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 \*1.26 km haul road) =Rs. 3,15,000/-

# **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.

Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

#### **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 1<sup>st</sup> 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 24,95,65,600 /-x 2% = Rs. 49,91,312/-. 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.

\*\*\*\*\*\*
**Project:** Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (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:

20	National Accreditation Bo Education & Training	ard fo	or <u>•</u>	ABI
9	CERTIFICATE OF ACCREI	DITA	TION	
crea	<u>P and M Solution</u> First Floor, C-88, Sector-65, Noida, Uttar Pra dited as Category -A organization under the QCI-NABET Sc Itant Organizations: Version 3 for preparing EIA/EMP reports	desh- 20 heme for in the follo	1301 Accreditation	on of
SI.	Sector Description	Sector	(as per)	Cat.
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2.	River Valley projects	3	1 (c)	В
3.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	В
1.	Highways.	34	7 (f)	A
5.	Building and construction projects	38	8 (a)	В
<i>5</i> .	Townships and Area development projects	39	8 (b)	В
inut e Ad enti bruc bruc bida	es dated December 20, 2019 on QCI-NABET website. creditation shall remain in force subject to continued compli- oned in NABET's letter of accreditation bearing no. QCI/N ary 3, 2020. The accreditation needs to be renewed before the following due process of assessment.	ance to the IABET/ENV expiry dat	e terms and I/ACO/20/1. e by P and N	condin 223 d A Solu



Project: Sand Mining Project Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).



**National Accreditation Board for Education and Training** 



March 07, 2023

QCI/NABET/ENV/ACO/23/2698

То

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

Sub.: Extension of Validity of Accreditation till June 06, 2023 – regarding Ref.. Certificate no. NABET/EIA/1922/IA0053

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 June 06, 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, 6<sup>th</sup> 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 Patna Sone 08 Sand Ghat on Sone River at Mauza – Jalpura Masaurha 2, Anchal – Paliganj Dist - Patna (Bihar).

**Consultant Contact Details:** 

P and M Solution

Address –C-88, Sector 65 Noida

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S No	Name	EC/FAE	DETAILS
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4	Subhash Kumar	FAE	SC
5	Manoj Kumar Pandey	FAE	EB
6	R K Tiwary	FAE	RH,AP
7	Rahul kumar	FAE	AQ
8	AbhayNath Mishra	FAE	SE
9	HussainZiauddin	FAE	WP
10	PoonamKumariMangalam	FAE	LU
11	Jatinkumarsrivastava	FAE	NV

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# **EXECUTIVE SUMMARY**

# FOR

SAND MINING PROJECT OF PATNA SON 08 SAND GHAT, DISTRICT - PATNA

# At

Mauja– Jalpura Masaurha 2 , Anchal –Paliganj , Dist - Patna ,State - Bihar Area : 68.16 Ha. Production: 2110234 TPA

> PROJECT PROPONENT : Devendra Equipment Pro - Kanchan Kumar Singh S/o - Devendra Kumar M/448, Laxmi Niwas, Road No.- 04, Kankarbagh, Patna, Bihar.

> > **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 14<sup>th</sup> September 2006 and amended thereof, the proposed mining project is categorized as **Category 'B1'** project.

#### <u>Patna Son – 08</u>

The project has been proposed by Devendra Equipment, Pro - Kanchan Kumar Singh. The Proposed Sand Mining Project was located on Son River at Patna Son 08 Sand Ghat at Mauza-Jalpura Masaurha 2, Anchal –Paliganj Dist - Patna (Bihar). LOI issued to lessee via letter no 3105/M, Patna dated 01.12.2022. 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 27-01-2023.

**Cluster Situation:** As per District Survey Report Patna the Proposed Sand Ghats of Patna Son 04, Son 05, Son 06, Son 07, Son 08 & Son 09 are comes in cluster situation whose combined cluster area is 284.55 ha. All the lease area of homogeneous minerals is coming within 500 m radius from each other confirming a cluster situation.

The Details of cluster is given below:

Sand Block name	Area (Ha.)	Production (in TPA) considering max as 3 meter
Patna Son 04	29.77	1456542
Patna Son 05	45.03	2188458
Patna Son 06	40.98	1991628
Patna Son 07	54.66	2656476
Patna Son 08	68.16	3312576
Patna Son 09	45.95	2233170
Total	284.55	13838850 TPA

It has been proposed to mine around 2110234 TPA for applied lease. The estimated project cost for the proposed project is **Rs 24,95,65,600** /- (including auction cost)

#### **PROJECT DESCRIPTION**

#### **LOCATION**

#### Patna Son 08

The proposed mining lease area falls in Survey of India Toposheet Topo sheet No- 72 C/11, 72C/15. The lease area is located in Mauza – Jalpura Masaurha 2, Anchal –Paliganj, Dist-Patna, State- Bihar. The mine lease co-ordinates are listed below:

Pillar No	Latitude (N)	Longitude (E)
1	25.36909482	84.74028129
2	25.36955904	84.74062317
3	25.37049166	84.74085151
4	25.37086148	84.74082511
5	25.37142721	84.74101227
6	25.37168956	84.74121103
7	25.37380343	84.74281258
8	25.37371302	84.74323798
9	25.37262001	84.74838094
10	25.37229477	84.74991127
11	25.3718814	84.75185632
12	25.37187919	84.75185607
13	25.37126277	84.75178752
14	25.36907843	84.75154461
15	25.36692075	84.75130467
16	25.36685925	84.75129783
17	25.36655368	84.75126385
18	25.36544951	84.75105067
19	25.36572062	84.75023367
20	25.36761669	84.74464109

Area & production: The total ML area is 68.16 Ha. Proposed rate of production will be 2110234 TPA.

#### **Connectivity:**

#### Patna Son 08

Patna Block 08 Sand Ghat is well connected to the nearest metalled road 1.26 km distance from the lease. NH-139 Approx. 1.35 km towards East direction. SH-69 is approx 3.20 Km in NE direction Bihta Railway station at distance of approx. 24.0 Km in NE direction. JPN International Airport Patna, Approx. 45 Km in NE direction.

#### **Salient Features of Project**

Name of the applicant	Devendra Equipment		
	Pro - Kanchan Kumar Singh		
Address of Lessee	Devendra Equipment		
	Pro - Kanchan Kumar Singh		
	S/o - Devendra Kumar		
	M/448, Laxmi Niwas, Road No 04, Kankarbagh, Patna,		
	Bihar.		
Name of Mine	Sand Mining Project Patna Son 08 Sand Ghat on Son River		
Village	Mauza – Jalpura Masaurha 2		
District & State	Patna, Bihar		
Mineral	Sand		
Area (ha)	68.16 hectare		

#### Patna Son 08

#### MINING

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

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

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

#### **RESERVE AND PRODUCTION**

The area of each bench level has been calculated & multiplied by strike influence to get the volume. Volume is multiplied by bulk density(1.72) to get tonnes.

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

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
65-63.5	1060	629	1.5	1000110	1720189
63.5-62	1050	619	1.5	974925	1676871
Total				1975035	3397060

**Table Patna Son 08** 

Total Mineable Reserve = 1975035 CUM or 3397060 Tonnes

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 cluster water of 11.70 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 winter season from Dec 2022 to Jan-Feb 2023

#### Meteorology

The Summarized Meteorological Data for the Monitoring Period Dec 2022 to Jan-Feb 2023) is given below:

	Temperature °C		Wind Speed (Km/Hr)		
Month	Min	Max	Min	Max	
DEC 2022	10	20	1	24	
JANUARY 2023	05	19	1	26	
FEBRUARY 2023	12	22	2	32	

#### **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 10 AQ			
	monitoring stations were found to be 25.23 $\mu g/m^3$ to 43.69 $\mu g/m^3$			
	respectively; PM10 was in the range of 50.92 $\mu$ g/m <sup>3</sup> to 86.64 $\mu$ g/m <sup>3</sup>			
	As far as the gaseous pollutants $SO_2$ and $NO_2$ are concerned, the			
	prescribed CPCB limit of 80 $\mu$ g/m <sup>3</sup> 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 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.			
	Surface water analysis from River Son results it is evident that most			
	of the parameters of the samples comply with 'Category B'			
	standards of CPCB, indicating their suitability for outdoor bathing.			

Soil Quality	Samples collected from identified locations indicate the soil is
	sandy type and the pH value ranging from 7.35 to 8.23, which
	shows that the soil is slightly alkaline in nature.
Ecology an	There is no Eco-Sensitive Areas in the study area.
Biodiversity	

#### ANTICIPATED ENVIRONMENTALIMPACTS

#### **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 Son 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.

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 &	Once a season for 4 seasons in a year
	Groundwater)	
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

#### POST PROJECT ENVIRONMENTAL MONITORING

#### 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 1<sup>st</sup> May 2018. The following has been proposed considering the needs & demand of the people.

CER cost for **Patna Son 08** will be 2% of the total project cost. This amount will be used for social welfare. CSR COST is 24,95,65,600 / x 2% = Rs. 49,91,312/ x.

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. 682 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 5 plant per hectare will be proposed for development of greenbelt but in this cluster of projects 10 plants per hectare will be proposed for better condition of environment.
- Peepal, Arjun, Jamun, Banyan, 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**

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	Nil	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).	6.82	0.5
4	Haul road Maintenance Cost	3.15	1.50
	TOTAL	6.97	5.5

#### Table, Budget of EMP (Patna Son 10)

Note: \*682 plants \* 1000 Rs (for each plants including hedges and fences) =Rs 682000/-

• 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 \*1.26 km haul road) =Rs. 3,15,000/-

#### **CONCLUSION**

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

\*\*\*\*\*

# कार्यकारी सारांश

रेत खनन परियोजना (पटना सोन 08 रेत घाट) जिला- पटना के लिए मौजा-जलपुरा मसौर्हा 2, अंचल-पालीगंज, जिला-पटना, बिहार क्षेत्रफल- 68.16 हेक्टेयर उत्पादन: 2110234 टीपीए

# आवदेन कर्ता

**देवेन्द्र इक्विपमेंट** प्रो. कंचन कुमार सिंह पुत्र - देवेन्द्र कुमार पता- एम/448, लक्ष्मी निवास, रोड नंबर- 04, कंकरबाग, पटना, बिहार







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# <u>कार्यकारी सारांश</u>

# ♦ 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।

#### पटना सोन 08

परियोजना के प्रस्ताव देवेन्द्र इक्विपमेंट, प्रो. कंचन कुमार सिंह ने दिया है। प्रस्तावित रेत खनन परियोजना मौजा- जलपुरा मसौर्हा 2, अंचल-पालीगंज, जिला-पटना (बिहार) में ब्लॉक संख्या पटना सोन 08 रेत घाट सोन नदी पर स्थित है। पत्र संख्या 3105/एम दिनांक 01.12.2022 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 27-01-2023 द्वारा जारी किया गया है।

क्लस्टर स्थिति: जिला सर्वेक्षण रिपोर्ट पटना के अनुसार पटना सोन 04, सोन 05, सोन 06, सोन 07, सोन 08 एवं सोन 09 प्रस्तावित बालू घाट क्लस्टर स्थिति में आते हैं जिनका संयुक्त क्लस्टर क्षेत्र 284.55 हेक्टेयर है। खनिजों का समस्त पट्टा क्षेत्र एक दूसरे से 500 मीटर के दायरे में आ रहा है जो एक क्लस्टर स्थिति की पुष्टि करता है।

क्लस्टर का विवरण नीचे दिया गया है:

ब्लॉक का नाम	क्षेत्र (हे),	उत्पादन (टीपीए)
पटना सोन 04	29.77	1456542
पटना सोन 05	45.03	2188458
पटना सोन 06	40.98	1991628
पटना सोन 07	54.66	2656476
पटना सोन 08	68.16	3312576

पटना सोन 09	45.95	2233170
कुल	284.55	13838850

आवेदित पट्टे के लिए लगभग 2110234 टन प्रति वर्ष खनन प्रस्तावित किया गया है, प्रस्तावित परियोजना के लिए अनुमानित परियोजना लागत 24,95,65,600 /- रुपये (नीलामी लागत सहित) है।

#### 🔹 परियोजना विवरण

#### स्थिति:

#### पटना सोन 08

प्रस्तावित खनन पट्टा क्षेत्र सर्वे ऑफ इंडिया टोपोशीट टोपो शीट संख्या- 72 C/11, 72C/15 के अंतर्गत आता है। पट्टा क्षेत्र मौजा- मौजा-जलपुरा मसौर्हा 2, अंचल- पालीगंज, जिला-पटना, राज्य- बिहार में स्थित है। खान पट्टा समन्वय नीचे सूचीबद्ध हैं:

स्तंभ	अक्षांश (एन)	देशांतर (ई)
1	25.36909482	84.74028129
2	25.36955904	84.74062317
3	25.37049166	84.74085151
4	25.37086148	84.74082511
5	25.37142721	84.74101227
6	25.37168956	84.74121103
7	25.37380343	84.74281258
8	25.37371302	84.74323798
9	25.37262001	84.74838094
10	25.37229477	84.74991127
11	25.3718814	84.75185632
12	25.37187919	84.75185607
13	25.37126277	84.75178752
14	25.36907843	84.75154461
15	25.36692075	84.75130467
16	25.36685925	84.75129783

17	25.36655368	84.75126385
18	25.36544951	84.75105067
19	25.36572062	84.75023367
20	25.36761669	84.74464109

कोत्र और उत्पादन: कुल क्षेत्रफल 68.16 हेक्टेयर है। उत्पादन की प्रस्तावित दर 2110234 टीपीए होगी।

# 🔹 संयोजकता

#### पटना सोन 08

पटना सोन 08 रेत घाट पट्टे से 1.26 कि.मी. की दूरी पर निकटतम पक्की सड़क से अच्छी तरह से जुड़ा हुआ है। NH-139 लगभग 1.35 किमी पूर्व दिशा में है SH-69 लगभग 3.20 कि.मी. उत्तर पश्चिम दिशा में है बिहटा रेलवे स्टेशन, लगभग 24.0 किमी उत्तर पश्चिम दिशा की ओर है। जेपीएन इंटरनेशनल एयरपोर्ट पटना, लगभग 45 कि.मी. उत्तर पूर्व दिशा में है।

# परियोजना की मुख्य विशेषताएं

#### पटना सोन 08

आवेदक का नाम	देवेन्द्र इक्विपमेंट
	प्रो. कंचन कुमार सिंह
पट्टेदार का पता	देवेन्द्र इक्विपमेंट
	प्रो. कंचन कुमार सिंह
	पुत्र - देवेन्द्र कुमार
	पता- एम/448, लक्ष्मी निवास, रोड नंबर- 04,
	कंकरबाग, पटना, बिहार
नाम	रेत खनन परियोजना (पटना सोन 03 रेत घाट) मौजा- जलपुरा
	मसौर्हा 2, जिला-पटना (बिहार)
गाँव	मौजा - जलपुरा मसौर्हा 2
जिला और राज्य	पटना, बिहार

खनिज	रेत
क्षेत्र (हेक्टेयर)	68.16 हेक्टेयर

#### \$ ड्रिलिंग

ड्रिलिंग और ब्लास्टिंग की आवश्यकता नहीं हैं।

#### 🔅 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 (1.72 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:

ब्लॉक नं: पटना सोन 03

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
65-63.5	1060	629	1.5	1000110	1720189
63.5-62	1050	619	1.5	974925	1676871
कुल				1975035	3397060

कुल खनन योग्य रिजर्व = 1975035 घन मीटर या 3397060 टन

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 11.70 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 दिसंबर 2022 से जनवरी-फरवरी 2023 तक सर्दियों के मौसम के दौरान खनन पट्टा क्षेत्र के आसपास 10 किमी की रेडियल दूरी वाले क्षेत्र में किया गया था।

## • मौसम विज्ञान

निगरानी अवधि दिसंबर 2022 से जनवरी-फरवरी 2023 के लिए संक्षिप्त मौसम संबंधी डेटा नीचे दिया गया है:

	तापमान °C		हवा की गति (किमी/घंटा)	
भहान।	न्यूनतम	अधिकतम	न्यूनतम	अधिकतम
दिसम्बर 2022	10	20	1	24
जनवरी 2023	05	19	1	26
फरवरी 2023	12	22	2	32

# आधारभूत पर्यावरणीय स्थिति

गुण	आधारभूत स्थिति
एम्बिएंट(परिवेशी) वायु गुणवत्ता	एम्बिएंट (परिवेशी) वायु गुणवत्ता निगरानी से पता
	चलता है कि सभी 10 AQ निगरानी स्टेशनों में
	PM2.5 की न्यूनतम और अधिकतम सांद्रता क्रमशः
	25.23 µg/m3 से 43.69 µg/m3 पाई गई; PM10
	50.92 µg/m3to 86.64 µg/m3 की सीमा में था जहां
	तक गैसीय प्रदूषकों SO2 और NO2 का संबंध है,

	$2\pi - \pi - \pi + 2 + \pi - \pi + 2 + \pi + 2 +$
	अविसिथि और बीमीण क्षेत्री के लिए 80 µg/m3 की
	निर्धारित CPCB सीमा किसी भी स्टेशन पर पार नही
	की गई है।
शोर का स्तर	निगरानी कार्यक्रम के परिणामों ने संकेत दिया कि
	निगरानी किए गए सभी 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।
	सोन नदी के सतही जल विश्लेषण के परिणामों से
	यह स्पष्ट होता है कि नमूनों के अधिकांश पैरामीटर
	सीपीसीबी के 'श्रेणी बी' मानकों का अन्पालन करते
	हैं, जो इंगित करता है यह जल स्नान के लिए
	उपयुक्त 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 7.35 से 8.23 के बीच है, जो दर्शाता
	है कि मिट्टी प्रकृति में थोड़ी क्षारीय है।
पारिस्थितिकी और जैव विविधता	अध्ययन क्षेत्र में कोई पर्यावरण-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।
X C
अध्ययन क्षेत्र म 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 सोन 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।

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

# पोस्ट प्रोजेक्ट पर्यावरण निगरानी

# 🔅 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 लाभः रोजगार क्षमता में वृद्धि, राजकोष में योगदान, स्वास्थ्य संबंधी गतिविधियों में वृद्धि, शैक्षिक उपलब्धियां और मौजूदा सामुदायिक सुविधाओं का सुदृढ़ीकरण।

# पर्यावरणीय लाभः

- 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।

पटना सोन 08 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 24,95,65,600 x 2%= रु. 49,91,312/-.

प्रत्येक गतिविधि के लिए प्रस्तावक द्वारा निर्धारित की जाने वाली धनराशि का निर्धारण जन सुनवाई के दौरान स्थानीय प्राधिकारी/लोगों 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।
- लगभग। योजना अवधि में हॉल रोड के आसपास 682 पौधे रोपे जाएंगे।
- वृक्षारोपण के लिए प्रस्तावित पेड़ हैं:
- सस्टेनेबल सैंड मैनेजमेंट एंड माइनिंग गाइडलाइंस 2016 के अनुसार ग्रीनबेल्ट के विकास के लिए प्रति हेक्टेयर न्यूनतम 5 पौधे प्रस्तावित किए जाएंगे लेकिन पर्यावरण की बेहतर स्थिति के लिए परियोजनाओं के इस समूह में 10 पौधे प्रति हेक्टेयर प्रस्तावित किए जाएंगे।
- पीपल, अर्जुन, जामुन, बरगद, नीम, आम आदि के पेड़ लगाए जाएंगे।

# पर्यावरण प्रबंधन योजना (ईएमपी)

- > रिवर बैंक से स्रक्षा 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।
- अनिजों 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
- अासन्न 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

क्रम संख्या	विवरण	पूंजी लागत (लाख)	आवर्ती लागत (लाख)
1	प्रदूषण नियंत्रण और धूल दमन	Nil	1.5
2	प्रदूषण निगरानी i) वायु प्रदूषण ii) मृदा प्रदूषण iii) जल प्रदूषण iv) ध्वनि प्रदूषण		2.0
3	वृक्षारोपण और वेतन एक माली के लिए (अंशकालिक आधार पर)	6.82	0.5
4	परिवहन सड़क रखरखाव लागत	3.15	1.50
कुल		6.97	5.5

#### टेबल, ईएमपी का बजट (ब्लॉक - पटना सोन 08)

नोट: \*682 पौधे \* 1000 रुपये (हेज और बाड़ सहित प्रत्येक पौधे के लिए) = 6,82,000/- 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\*1.26 किमी लंबी सड़क) = 3,15,000/-

# 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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