



**DISTRICT SURVEY REPORT (DSR)
OF
SAMBALPUR DISTRICT, ODISHA
FOR
RIVER SAND**

**(FOR PLANNING & EXPLOITING OF MINOR
MINERAL RESOURCES)**



**As per Notification No. S.O. 3611(E) New Delhi,
25th July, 2018
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(MoEF & CC)**

COLLECTORATE, SAMBALPUR

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Sub-Collector
Sambalpur


Sub-Collector
Rairakhol


Sub-Collector
Kuchinda


DFO
Sambalpur


DFO
Rairakhol


DFO
SAMRA (W)
Kuchinda


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Sambalpur Irrigation Division
Sambalpur


Mining Officer
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Sambalpur Circle, Sambalpur


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Sambalpur Circle, Sambalpur

PREFACE

In compliance to the notification issued by the Ministry of Environment and Forest and Climate Change **Notification no. S.O.3611 (E) New Delhi dated 25-07-2018**, the preparation of district survey report of sand mining has been prepared in accordance with Clause II of Appendix X of the notification and procedures and annexures as per MoEF & CC **Enforcement and monitoring guidelines of January,2020**. Every effort has been made to cover sand mining locations, future potential areas and overview of sand mining activities in the district with all its relevant features pertaining to geology and mineral wealth. This report will act as a compendium of available mineral resources, geological set up, environmental and ecological set up of the district and is based on data of various departments like Revenue, Water Resources, Forest, Geology and Mining in the district as well as statistical data of various state Government departments uploaded by the Directorate of Economics & Statistics in their official web site. The main purpose of preparation of District Survey Report is to identify the mineral resources and developing the mining activities in a sustainable manner vis-a-vis all other relevant data of the District.

1.INTRODUCTION

Sambalpur district is situated in the western part of the state of Odisha, India. The historic city of Sambalpur is the district headquarters. The district is located in the Mahanadi River basin. Sambalpur is the connecting city between the states of Chhattisgarh and Odisha. It is used to be known for its importance as a diamond trading centre, Now-a-days, it is mainly known for its textiles, especially the Sambalpuri Saree. The district is surrounded by Deogarh district in the East, Bargarh district in the West, Jharsuguda district in the North and Sonepur and Angul districts in the South.

The district of Sambalpur has a history full of events including Indian freedom struggle representing the different sections of the society. Sambalpur is mentioned in the book of Ptolemy as Sambalaka on the river Manada. Sambalpur district was subsequently divided into four separate districts. Bargarh district was separated in the year 1993 and Jharsuguda & Deogarh districts were separated in 1994. The district covering a geographical area of 6702 sq km lies between 20° 54' to 22° 11' North Latitudes and 83° 49' to 84° 45' East Longitudes.

This gateway to the exotic charms of the western region of Odisha was the cradle of an ancient civilization and is an important landmark in India's cultural history.

Sambalpur was a former princely state of British India. When its ruler died without a direct male heir in 1849, the British seized the state under the doctrine of lapse. It was attached to the British Bengal Presidency, but was later transferred to the Central Provinces in 1862. The district was again transferred back to Bengal in 1905, but the subdivisions of Phuljhar and Chandarpur-Padampur remained with the Central Provinces. Bengal's Odisha division became part of the new province of Bihar and Odisha in the year 1912 and in 1936 became a separate province of Odisha. After Indian Independence in 1947, Odisha became an Indian state.

2.OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT: The district constitutes a part of cratonic area which had been subjected to tectonic and thermal activities. Normally, cratons host a number of metallic as well as non metallic minerals. The following description gives an account of the mineral occurrences in the district.

Diamond: Winning of diamonds from the gravel beds exposed in the Hirakud Dam site is an age old process which is still going on by the local people. This is recovered along with gold panning. The history records that maximum weight of diamonds registered here is 1 (one) carat (200 mg). The colour of the diamond normally is snow white, yellowish and brown. The source of these diamonds is yet to be explored.

Gold:Alluvial gold is being recovered from the recent gravel of all the creeks and rivers of this district. The activity can be seen in the River Mahanadi around Sambalpur, Tikra river in Redhakhhol sub division and Kharla Nala in Kuchinda Sub- Division. An auriferous quartz vein is found to contain 0.08 gm per tonne which have been emplaced in Khondalite suite of rocks around Kuchinda.

Gem stone:The district is bestowed with rich potential of gem stones within Eastern Ghat Supergroup of rocks like (i) aquamarine, zircon, tourmaline and heliodor in Chabati-Beldihi belt, (ii) aquamarine, rhodonite garnet, lolite, and amethyst in Bagdhapa-Tabloi belt (iii) corundum, lolite, green tourmaline and aquamarine are reported in the Meghpal-Ranchipada belt. Rare occurrence of alexandrite is reported from biotite schist at the contact of granite pegmatite and peridotite.

Chrysoberyl:- The known occurrence of chrysoberyl is located around Ranchipara-Meghpal area about 35 km from Sambalpur Town. Small incidence of chrysoberyl including Alexandrite has been mineralized along the contact zone of pegmatite and ultrabasic rocks. The gem stones recovered are shattered and a very few pieces are found to be suitable for cutting and polishing in lapidary unit. Besides, few pieces of green beryl, tourmaline and garnets are also found. The occurrence has been extensively worked out by the local artisans.

Corundum:- Red and pink coloured massive and crystalline variety of corundum is recovered from the colluvial zones located around Meghpal village. Due to its opaque nature, few of them are found to be cabochon variety. In addition, stray occurrences of blue coloured corundums are also found around Redhakhol area.

Aquamarine:-

Gem grade aquamarines are recovered from the extensively developed colluvial zones on either side of the pegmatites intruding into the older metamorphic rocks. The localities of aquamarine occurrences are Charbati, Shradhapur, Barkhol, Kandhal, Tabloi, Jujumura,, Bhimkhoj, Telighana and Badmal. Minor incidence of aquamarine is reported from Bansajal, Bhaluchua, HatiaJoypur, Palsamal, Burhiakata and Chamakhunda.

Heliodor:-

This variety of beryl displaying yellow colour is found along with the other aquamarine around Charbati.

Goshenite:

Transparent, colourless beryl better known as Goshenite are found around Jaripani near Redhakhol and Charbati area in pegmatites intruding into khondalitic rocks. The incidence is erratic.

Zircon:-

Gem quality zircons are mineralized in the contact zone of pegmatite and khondalite around the east of Charbati. The colour of zircon is reddish brown.

Garnet:-

Different variety of gem garnets like rhodolite, almandine, pyrope are found to be associated with khondalite suite of rocks. Rhodolite garnets which are purplish red in colour but shattered are found as pockets around Baghdapa, Deojharan under Jujumura Block. Almandine garnets of red and deep red colour are found to occur around Baghdapa, Deojharan, Badmal in the Redhakhol Sub Division. In addition to these garnets, small pockets of pyrope garnets exhibiting brilliant firey red colour, but are highly fractured barring a few pieces are found unsuitable for cutting and polishing in lapidary units have also been reported .

Manganese:

Low grade manganese ore occurs near Khandhal in Sagmalia Reserve Forest under Redhakhol Sub Division in association with khondalites. But it contains high phosphorous. Manganese ore is also reported to occur in Jamnakira area of Kuchinda Sub Division.

Iron Ore:-

Sporadic occurrences of iron ores are found around Lohakhanda in Kuchinda Sub Division. The iron ore is of low grade and not suitable for iron making in economical scale at present.

Ilmenite:-

Fine grained ilmenite is reported from the area around Mundher with traces of nickel in the Eastern Ghat Suite of rocks.

Coal:-

Coal seams are encountered in the Gondwana Super Group of rocks around Rail and Koing area of Redhakhol Sub Division. Exploration data reveals three numbers of coal seams classified under E & F grade.

Fire clay:-

Fire clay occurrence is located about 0.5 km north east of Bindupur in Redhakhol Sub Division, extending intermittently over a distance of 1.5 km. The clay is grayish white to buff in colour. Besides, low grade fire clay are being mined out in Chandli Reserve Forest around Burla over an area of 25 acres.

Clay:-

Sporadic pockets of clay in khondalitic suite of rocks are found around Jhankarpalli, Banjipalli, Choukitikra (Akharkhand Hill) in Kuchinda Sub Division which have been leased out .

Quartzite/ Quartz:-

Quartz and quartzite containing +97% SiO₂ occur around Bodmal ,Charbati and Bamra.

Dimension stones:-

Quarriable exposures of pink and grey colour granites and its variants are located around Badmal, Bhoipali of Kuchinda Sub Division and Sahaspur, Chhachanpalli, Salesingha area of Sambalpur Sub Division. A reserve of 1.17 million cubic meter of granite blocks has been estimated so far.

Other than the above mentioned minerals, minor minerals such as river sand, laterite slabs, building stone/black stone/road metals, morrum, brick earth etc. are also available in the district.

3. GENERAL PROFILE

a. Administrative set up:

SI No	Item	Unit	Magnitude
1	Location		Avg.Elevation 150.75m aMSL
	Longitude	Degree	83°49' to 84°45' East
	Latitude	Degree	20°54' to 22°11' North
2	Geographical area	Sq.Km.	6624
3	Sub-division	Numbers	3
4	Tahsils	Numbers	9
5	C D Blocks	Numbers	9
6	Municipalities	Numbers	1
7	NACs	Numbers	2
8	Police Stations	Numbers	25
9	Gram Panchayats	Numbers	138
10	Villages	Numbers	1313
	Inhabited	Numbers	1229
	Uninhabited	Numbers	84
11	Assembly constituencies	Numbers	4

b Area and Population:

The district has an area of 6,702 sq. km and 10,41,000 of population as per 2011 census. The district accounts for 4.28 percent of the states territory and shares 2.48 percent of the state's population. The density of population of the district is 157 per sq. km as against 2.70 person per sq.km of the state. It has 1313 villages (including 84 uninhabited villages) covering 9 blocks, 9 Tahsils and 3 Subdivisions. As per 2011 census, the schedule caste population is 1,91,827 (18.4 %) and schedule tribe population is 3,55,261 (34.1 %). The literacy percentage of the district covers 76.2 against 72.9 of the state.

c Climate :

The climatic condition of the district is generally hot with high humidity during March to September and cold during October to February. The monsoon generally breaks during the month of 15th June. Average rainfall of the district in last four years was 1436.88 mm which is less than the normal rainfall (1499.5 mm).

e Economy:

The economy of Sambalpur district is basically dependent on agriculture and secondly on forests. Forests play an important role in the economy in terms of contribution to revenue, Domestic Product as well as dependence of people for livelihood. In the past Sambalpur has been a great centre of diamond trade. Kendu leaf (*Diospyros Melanoxylon*) is also produced in Sambalpur. Tendu leaf is one of the most important non-wood forest products of Sambalpur and is also called as green gold of Odisha. Lately industrialisation has come up in the district and the prime industries like coal based thermal power, alumina and steel have been established. The place is famous for its globally renowned textile bounded patterns and fabrics locally known as Baandha. Sambalpur is famous for its Hand loom textile works, popularly known as Sambalpuri Textile. It has earned international fame for its unique pattern, design and texture. Apart from textiles, Sambalpur has a rich tribal heritage and fabulous forest lands.

e Industry: Brief Industrial Profile of Sambalpur dist, Ministry of MSME,2019-20

No. of MSME units set up	Investment (In Rs. Lakhs)	Total Employment generated
13,958	4531.05	13,713
Large Industries- & MSE-16	17,07,107.92	7,121

f. Agriculture:

During the year 2017-18, the net area sown was 192 thousand hectares against 5356 thousand hectares of the state. The production of various crops was as below:

Name	Paddy	Wheat	Maize	Mung	Biri	Kulthi	TILL	Groundnut	Mustard	Potatoes	Jute	Sugarcane
Production in 000 MT	229.47	0.16	9.92	12.96	8.20	0.84	7.01	3.46	2.24	0.00	12.00	3.27

During 2021-22, the total fertilizers used in the district was as produced below:

Type of fertiliser	Nitrogenous	Phosphatic	Pottasic	Total	Consumption Kg/per Ha
Quantity in MT	23,660	10,170	3,530	37,360	160.19

g. Transport & Communication: Unit in km (in 2021-22)

Railway route length	168
No of Rly stations and PH	18
Forest road	739.10
National Highway	268.86
State Highway	158.56
Major district road	138.17
Other dist road	1535.18
Rural road	2646.99
Rural Surface Road	2779.77
Rural Un-Surface Road	2298.98

h. Health:

The medical facilities are provided by different agencies like Govt., Private individuals and voluntary organizations in the district.

Medical college/DHq Hospitals	2 Nos
Sub divisional hospitals including mobile	3 Nos
Bed facilities	1419 Nos
Homoeopathic dispensaries	17 Nos
Ayurvedic dispensaries	15 Nos
CHC	11 Nos
PHC	32Nos
Health Subcenter	167 Nos
Mobile Health Unit	4 Nos.

i. Tourist places:

There are 6 nos. of tourist centres such as Hirakud dam, Huma temple, Samaleswari temple, Ghanteswari (Chipilima), Usakothi, and Deojharan identified by department of Tourism and Culture, Orissa. During 2011, the numbers of Domestic tourists were 848724 and foreign tourists were 348 who visited the tourist spots of the district.

j. Forest areas:

Category of forest	Area in sq km
Reserve Forest	2151.71
Unclassified Forest	1.18
Demarcated Protected Forest (DRF)	363.01
Other forest under Revenue Dept	1115.87
Total	3631.77
% of forest area	54.18

k. Education: As in 2021-22.

Primary School	No. of Schools	706
	Enrolment (No)	29965
	Pupil Teacher Ratio	16.95
Upper Primary School	No. of Schools	529
	Enrolment (No)	64158
	Pupil Teacher Ratio	18.99
General College	Junior	56
	Degree	20
Secondary School	No. of Schools	251
	Enrolment (No)	69820
	Pupil Teacher Ratio	23.22
Literacy Rate, 2011	Male	84.4
	Female	67.9
	Total	76.2

l. Culture & Heritage:

The district experiences many beautiful festivals round the year. Sital Sasthi is observed in the month of June. This festival is the marriage ceremony of Lord Shiva and Parvati. Nuakhai is the most important social festival of the District. Bhajijuntia festival is celebrated on the Mahastami Day of Durga Puja. The Puajuntia festival is observed

by mothers to invoke the grace of Lord Dutibahana for the long life and prosperity of their sons. Other religious festivals which are observed include Shiva Ratri, Dola Yatra, Durga Puja, Janmanstami, Diwali, Ganesh Puja and Saraswati Puja.

Many eminent personalities have taken birth on the soil of the Sambalpur District. Bir Surendra Sai (freedom fighter), Gangadhar Meher (Poet of nature), Bhima Bhoi (celebrated religious and poet), Satya Narayan Bohidar (Pioneer of Sambalpuri language and grammar), Swapneswar Das (accomplished poet and eminent journalist), Gokulanand Panda (Poet of extraordinary calibre), Sunil Mishra (renowned writer of humour and social satire), Braja Mohan Panda (Educationist of repute) and Laxmi Narayan Mishra (Eminent freedom fighter) are the famous personalities of this soil.

4.GEOLOGY

The Sambalpur district houses a wide variety of rock types of different ages. They can broadly be classified into Eastern Ghat Supergroup, Bonai Group, Gangpur Group, Chattisgarh Group, intrusive nepheline syenite, Gondwana Supergroup and Quaternary sediment. The rocks belonging to Eastern Ghat Supergroup are mostly quartz-garnet-graphite-sillimanite gneiss and quartzite of Khondalite Group and acid/intermediate charnockite, pyroxene granulite and leptynite of Charnockite Group. The khondalite suite of rocks are found mostly in the southern parts of the district, west of the central Gondwanic graben. The charnockite occurs in the form of massive plutonic massif confined to the central part of the district. The trend of gneissosity in the Eastern Ghat belt swerves from northeasterly in the western part to northwesterly in the eastern part of the district. Granite gneiss, migmatite and augen gneiss form the most conspicuous country rocks in the district, stretching from Panikhimal in the south to as far as Govindpur in the north. It is essentially biotite granite, with composition ranging from granodiorite to occasional alkali granite. Bonai Group is represented by meta-volcanics and sericite quartzite in stratigraphically lower horizons and shale, phyllite, mica schist, quartz sericite schist in the upper horizons. They are mostly found in the northeastern part of the district. Metabasic bodies are occasionally found as intrusives within the meta-sedimentaries of Bonai Group. A very thin strip of sedimentary rocks belonging to Gangpur Group are found near the northern tip of the district. The rock types are basal conglomerate, quartzite, phyllite and mica schist. An isolated outcrop of Chattisgarh Supergroup of rocks occurs west of Mahanadi River. It runs in a N-S direction. A cluster of nepheline syenite

bodies are intruded into the Eastern Ghat Supergroup of rocks near Rairakhol which is responsible for the formation of gemstones in the region. The swarm of NW-SE trending dolerite dykes traverse the gneisses near Badarama Reserve Forest. Rocks of Gondwana Supergroup are hosted in the fault bounded basins occupying the central portion of the district with a NW-SE trend. They are represented by Talchir Formation, Barakar Formation and Mahadeva Formation. Coal bearing horizons are yet to be reported from the Barakars, present in the district. Quaternary sediments are sporadically distributed district. They occur as soil/alluvium in the pediplains and flood plains. Cenozoic laterites occur as small cappings over the altered bedrocks.

STRATIGRAPHY: The geological succession in the district is as follows:

Age	Geological Unit		Litho unit
Pleistone to recent	Quaternary		Soil/ Alluvium
Cenozoic			Laterite
Permian-Triassic	Gondwana Super Group	Mahadev Formation	Red sandstone/ clay
		Barakar Formation	Sandstone & shale
		Talchir Formation	Boulder bed, sandstone, needle shale
			Quartz Vein/ Dolerite dyke
Proterozoics (Undiff.)			Nepheline syenite
Middle- Upper proterozoic	Chhatisgarh Super Group	Chandarpur Formation	Sandstone , quartzite, clay, shale)
			Intrusive granite (equivalent to Gangpur granite)
			Phyllite, mica schist
Lower Proterozoics		Gangpur Group	Basal Conglomerate & quartzite
			Metabasic rocks (Intrusive)
		Upper Bonai Group	shale, mica-schist, phyllite
			sericite quartzite)
Archaean to Lower Proterozoic			Metabasics/metavolcanics
		Lower Bonai Group	Quartzite & Sericite quartzite
			Granite gneiss, Augen gneiss, migmaite
			Acid/intermediate Charnockite
		Charnockite group	Pyroxene granulite
Archaean	Eastern Ghat Super Group		Leptynite
		Khondalite Group	Quartz-garnet-sillimanite gneiss
			Quartzite

5.DRAINAGE AND IRRIGATION PATTERN.

The drainage of the district is mainly controlled by rivers like Mahanadi & Bheden and their tributaries like Bamphei Nadi, Sialjore Nadi, Malti Jore, Gadgadbahaljore etc. Major part of the district is irrigated through canal irrigation from Hirakud dam on river Mahanadi.

6.LAND USE PATTERN

SI No	Land-use	Area in '000Ha
1	Forest Area	363
2	Misc. trees & Grooves	4
3	Permanent Pasture	13
4	Culturable Waste	19
5	Land put to Non Agril Use	38
6	Barren & Unculturable Land	18
7	Current Fallow	5
8	Other Fallow	17
9	Net Area Sown	189
10	Mining	5
	Total Area	670

7.SURFACE & GROUND WATER SCENARIO

The drainage systems i.e. rivers of the district get filled with water during the monsoon and then gradually decrease from the month of January to June of each year. In the summer season, all rivers become almost dry excepting narrow flow of water within the basin.

The variation of ground water table in the district is as follows:

Depth of water level (mbgl)/ Period	April	August	November	January
Minimum	0.45	0.26	0.60	0.41
Maximum	11.8	7.42	9.25	10.0

8. RAINFALL & CLIMATIC CONDITION

The district is generally hot with high humidity during April and May and cold during December and January. The monsoon generally breaks during the month of July and continues till end of October. The temperature goes as high as up to 46°C in the summer and up to 7^o-8^o C during peak winter.

The rainfall statistics in mm of the district for last four years is given below:

Year/ Month	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	TOTAL
20-21	92.3	42.71	321.11	261.22	668.39	110.32	124.84	3.62	0.0	6.43	6.02	10.28	1647.245
21-22	5.0	151.3	198.84	310.11	132.86	261.62	41.33	28.69	72.37	40.77	13.99	0.00	1257.486
22-23	0.39	76.71	126.08	327.26	543.52	173.89	87.86	0.00	0.00	0.00	0.00	37.28	1396.06
23-24	33.4	25.82	306.67	49.38	466.72	297.12	139.7	18.82	32.93	14.88	9.6	50.80	1446.74
24-25	14.7	71.3	157.2	320.4	331.6	261.5	16.87	-	-	-	-	-	1173.57
NORMAL	16.5	32.3	221	429.5	442.4	224.7	54.7	12.7	4.4	14.4	24.5	18.2	1499.5

9. DETAILS OF QUARRY LEASES FOR SAND:

Attached vide **Annexure I to VI**

10. YEAR WISE COLLECTION OF ROYALTY FROM MINOR MINERALS INCLUDING SAND QLS

(in Rs)

2023-24	2024-25 (up to Oct'24)
8,08,65,624	10,92,04,377
Revenue collected through Enforcement measures	
2023-24	2024-25 (up to October.24)
8,08,65,624	10,92,04,377

11. YEAR WISE OF PRODUCTION OF SAND: (in CuM)

2023-24	2024-25 (up to Oct'24)
26,991	15,745

12. MINERAL MAP OF THE DISTRICT

Attached as Plate No 4.

13. LIST OF LOI HOLDERS ALONG WITH VALIDITY

List enclosed as Annexure II

14. TOTAL MINERAL RESOURCE AVAILABLE IN THE DISTRICT

Total resources of sand is approximately **706064.5** cum which may increase after detail investigation.

Details of the potential areas submitted as Annexure III.

15.QUALITY/GRADE OF MINERAL

Road metal/building metals of the district are very much suitable for various construction purposes after its crushing and screening. The in-situ rocks are fractured making these unsuitable for decorative purpose.

16.USE OF MINERAL

Sand quarried in the district is used mainly for various civil construction purposes like road filling, making concrete, making, dams etc.

17.DEMAND & SUPPLY OF THE MINERAL

The tentative annual demand of sand is to the tune of 0.50 to 1 million cum in view of coming up of many large coal mines and mineral based industries in the district and in the surrounding areas.

18.QUARRY LEASES FOR ROAD METALS MARKED ON THE MAP OF THE DISTRICT.

Attached as Plate No 5.

19.DETAILS OF AREAS WHERE THERE IS A CLUSTER OF ROAD METAL QUARRY LEASES:

Cluster may be formed which can only be decided after auctioning of the potential areas.

20.DETAILS OF ECO-SENSITIVE AREA

An area of 11.475 Ha of the district within the jurisdiction of Sambalpur Forest Division comes under Eco-sensitive zone.

21.IMPACT ON THE ENVIRONMENT (AIR, WATER, NOISE, SOIL FLORA & FAUNA , LAND USE , AGRICULTURE, FOREST ETC.) DUE TO MINING

Activities attributed to Mining:-

Generally, the environment impact can be categorized as either primary or secondary. Primary Impacts are those, which are attributed directly to the project. Secondary impacts are those which are indirectly induced and typically include the associated investment and changed pattern of social and economic activities by the proposed action.

The impact has been ascertained for the project assuming that the pollution due to mining activity has been completely spelled out under the base line environmental status for the entire ROM which is proposed to be exploited from the mines.

Impact on Ambient Air Quality:

Mining operation are carried out by opencast manual, semi mechanized/ mechanized methods generating dust particles due to various activities like excavation, loading, handling of mineral and transportation. The air quality in the mining areas depends upon the nature and concentration of emissions and meteorological conditions.

The major air pollutants due to mining activities include:-

- Particulate matter (dust) of various sizes.
- Gases, such as sulphur dioxide, oxides of nitrogen, carbon monoxide etc from machine & vehicular exhaust.

Dust is the single air pollutant observed in the open cast mines. Diesel operating drilling machines, blasting and movement of machineries/ vehicles produce NO_x, SO₂ and CO emissions, usually at low levels. Dust can be of significant nuance for surrounding land user and potential health risk in some circumstances.

Impact on water quality:

Sometimes, the mining operation leads to intersection of the water table causing ground water depletion. Due to the interference with surface water sources like river, nallah etc drainage pattern of the area is altered.

Impact on Noise level:

Noise pollution mainly due to operation and occasional plying of machineries. These actives will create noise pollution in the surrounding area.

Impact on Land :

The topography of the area will change certain changes due to mining activity which may cause some alteration to the entire eco system.

Impact on Flora & Fauna:

The impact on biodiversity is difficult to quantify because of its diverse and dynamic characteristics.

Mining activities generally result in the deforestation, land degradation, water, air and noise pollution which directly or indirectly affect the fauna and flora status of the project area.

However, occurrence and magnitude of these impacts are entirely dependent upon the project location, mode of operation and technology involved.

22. REMEDIAL MEASURES TO MITIGATE THE IMPACT OF MINING ON THE ENVIRONMENT:-

Air

Mitigation measures suggested for air pollution controls are to be based on the baseline ambient air quality of the project/cluster area and would include measures such as:

- Dust generation shall be reduced by using sharp teeth of shovels.
- Wet drilling shall be carried out to contain the dust particles.
- Controlled blasting techniques shall be adopted.
- Water spraying on haul roads, service roads and overburden dumps will help in reducing considerable dust pollution.
- Proper and regular maintenance of mining equipment's have to be undertaken.
- Transport of materials in trucks are to be covered with tarpaulin.
- The mine pit water can be utilized for dust suppression in and around mine area.
- Information on wind direction and meteorology are to be considered during planning, so that pollutants, which cannot be fully suppressed by engineering techniques, will be prevented from reaching the nearby agricultural land, if any.
- Comprehensive greenbelt around overburden dumps and periphery of the mining projects/clusters has to be carried out to reduce the fugitive dust transmission from the project area in order to create clean & healthy environment.

Water

- Construction of garland drains and settling tanks to divert surface run –off of the mining area to the natural drainage.
- Construction of check dams/ gully plugs at strategic places to arrest silt wash off from broken up area.
- Retaining walls with weep hole are to be constructed around the mine boundaries to arrest silt wash off.
- The mined out pits shall be converted in to the water reservoir at the end of mine life. This will help in recharging ground water table by acting as a water harvesting structure.
- Periodic analysis of mine pit water and ground water quality in nearby villages are to be undertaken.
- Domestic sewage from site office & urinals/latrines provided within ML/QL areas is to be discharged in septic tank followed by soak pits.

Noise

- Periodic maintenance of machineries, equipments shall be ensured to keep the noise generated within acceptable limit.
- Development of thick green belt around mining/cluster area, haul roads to reduce the noise.
- Provision of earplugs to workers exposed to high noise generating activities like blasting, excavation site etc. Workers and operators at work sites will be provided with earmuffs.
- Conducting periodical medical checkup of all workers for any noise related health problems.
- Proper training to personnel to create awareness about adverse noise related effects.
- Periodic noise monitoring at locations within the mining area and nearby habitations to assess efficacy of adopted control measures.
- During blasting, optimum spacing, burden and charging of holes will be made under the supervision of competent qualified mines foreman,blasting supervisor, mate etc.

Biological Environment

- Development of green belt/gap filling saplings in the safety barrier left around the quarry area/ cluster area.
- Carrying out thick greenbelt with local flora species predominantly with long canopy leaves on the inactive mined out upper benches.
- Development of dense poly culture plantation using local floral species in the mining areas at conceptual stage if the mining operation is not continued much below the general ground level.
- Adoption of suitable air pollution control measures as suggested above.
- Transport of materials in trucks covered with tarpaulin.

23. RECLAMATION OF MINED OUT AREA (BEST PRACTICE ALREADY IMPLEMENTED IN THE DISTRICT, REQUIREMENT AS PER RULES AND REGULATION, PROPOSED RECLAMATION PLAN) :-

As per statute, all mines/quarries are to be properly reclaimed before final closure of the mine. Reclamation of exhausted mines are planned to be undertaken in below three possible means:

1. If, substantial amount of waste is there, the exhausted quarry can be fully or partly back filled using the stored waste. The back filled areas are to be brought under plantation of local species.
2. If the generation of waste is much less as in the case of minor mineral mining, the exhausted quarries can be reclaimed by
 - a. Plantation on the broken up surface if the depth of quarry is not much below the surrounding surface level.
 - b. Converted to water reservoir after stabilization of the slopes if the exhausted quarry continues much below the surrounding surface level. It is preferred to cordon the water reservoir either through wire fencing or retaining wall with plantation from the safety point of view.

Most of the quarry/mining lease areas are yet to be exhausted from ore point of view. Hence, reclamation would be taken up only after exhaustion of the ore/mineral content from these areas. The exhausted minor mineral quarries of the district have been converted to water reservoirs.

24. RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

The only risk involved related to mining of minor mineral excepting natural calamities is slope failure and probable accidents due to high and ill maintained bench walls. This can only be addressed through making of regular benches and undertaking mining in benching pattern.

The disaster management plan (DMP) is supposed to be a dynamic, changing, document focusing on continual improvement of emergency response planning and arrangements.

The disaster management plan is to be aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated through rehearsal/induction conducted by the respective department from time to time.

General responsibilities of employees' during an emergency:

During an emergency, it becomes more enhanced and pronounced when an emergency warning is raised, the worker in charge, should adopt safe and emergency shut down and attend to any prescribed duty. If no such responsibility is assigned, the workers should adopt a safe course to assembly point and wait instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of DMP.

Co-ordination with local authorities:

The Mine Manager who is responsible for emergency will always keep a vehicle ready at site. In case of any eventuality, the victim will be taken to the nearby hospitals after carrying out the first aid at the site. The Manager should collect and have adequate information on the nearby hospitals, fire station, police station, village panchayat heads, taxi stands, medical shops, district revenue authorities etc. and use them efficiently during the case of emergency.

25. DETAILS OF THE OCCUPATIONAL HEALTH ISSUES IN THE DISTRICT. (LAST FIVE- YEAR DATA OF NUMBER OF PATIENTS OF SILICOSIS & TUBERCULOSIS IS ALSO NEEDS TO BE SUBMITTED):-

As per the guidelines of the Mine Rules, 1995, occupational health safety has been stipulated by the ILO/WHO. The proponents will take necessary precautions to fulfil the stipulations. Normal sanitary facilities have to be provided within the lease area. The management will carry out periodic health checkup of workers.

Occupational hazards involved in mines are related to dust pollution, noise pollution, blasting and injuries from moving machineries & equipment and fall from high places. DGMS has given necessary guidelines for safety against these occupational hazards. The management has to strictly follow these guidelines.

All necessary first aid and medical facilities are to be provided to the workers. The mine shall be well equipped with personal protective equipment (PPE). Further, all the necessary ported equipments such as helmet, safety goggles, earplugs, earmuffs etc are to be provided to mine workers as per Mines Rules. All operators and mechanics are to be trained to handle fire fighting equipments.

Details of occupational health issues in the district since last 3 years.

TUBERCULOSIS DATA (NTEP)

YEAR	No of Tuberculosis patients
2019	1540
2020	1200
18-19	1335

There is no case of Silicosis found in Sambalpur within the time frame mentioned above.

26. PLANTATION ALONG GREEN BELT BARRIER IN RESPECT OF LEASES ALREADY GRANTED IN THE DISTRICT

As most of the minor mineral mines/quarries of the district are yet to be exhausted of their mineral resource, no sort of reclamation measures including plantation has been undertaken excluding gap plantation of local species in the peripheral safety zones of the quarries/ clusters and in some of the haul roads.

27. ANY OTHER INFORMATION

Nil

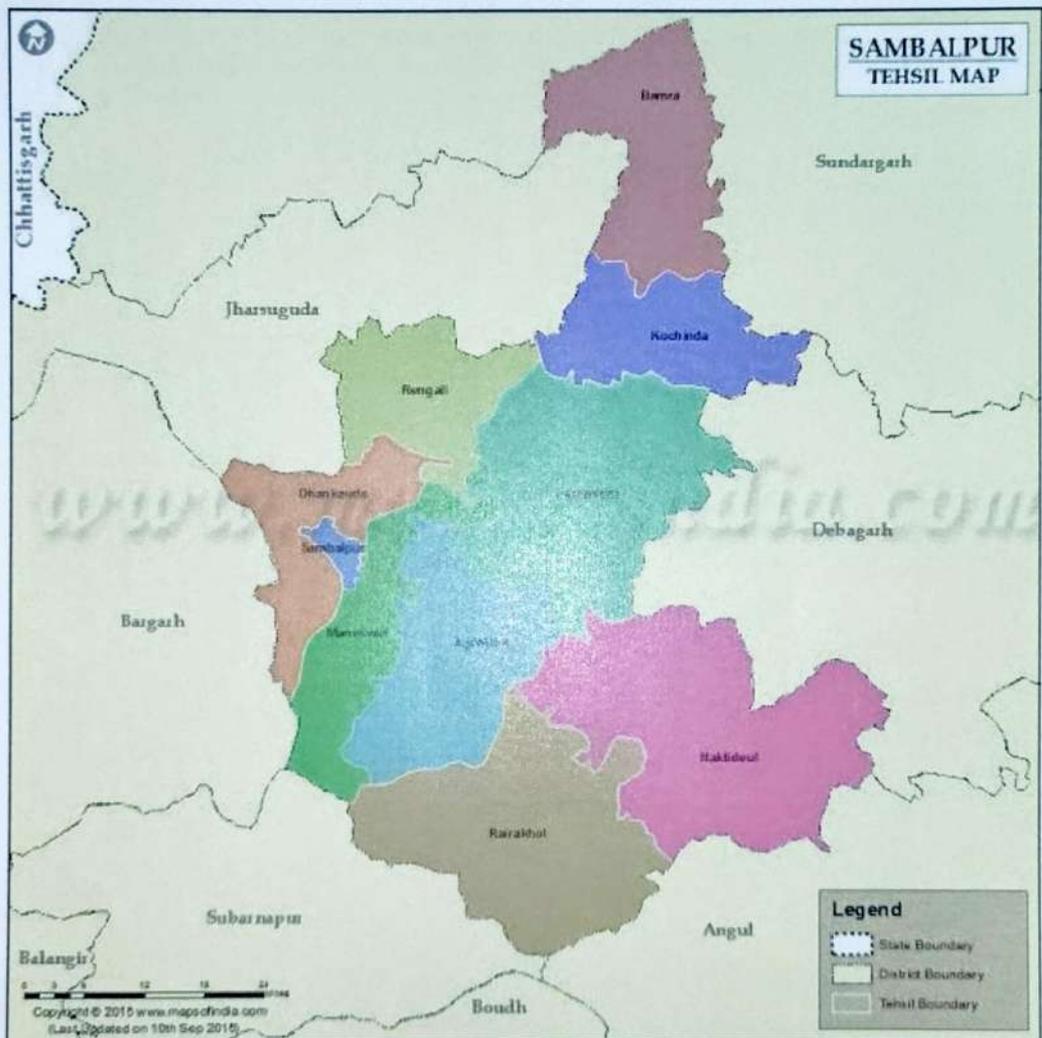
INDEX MAP



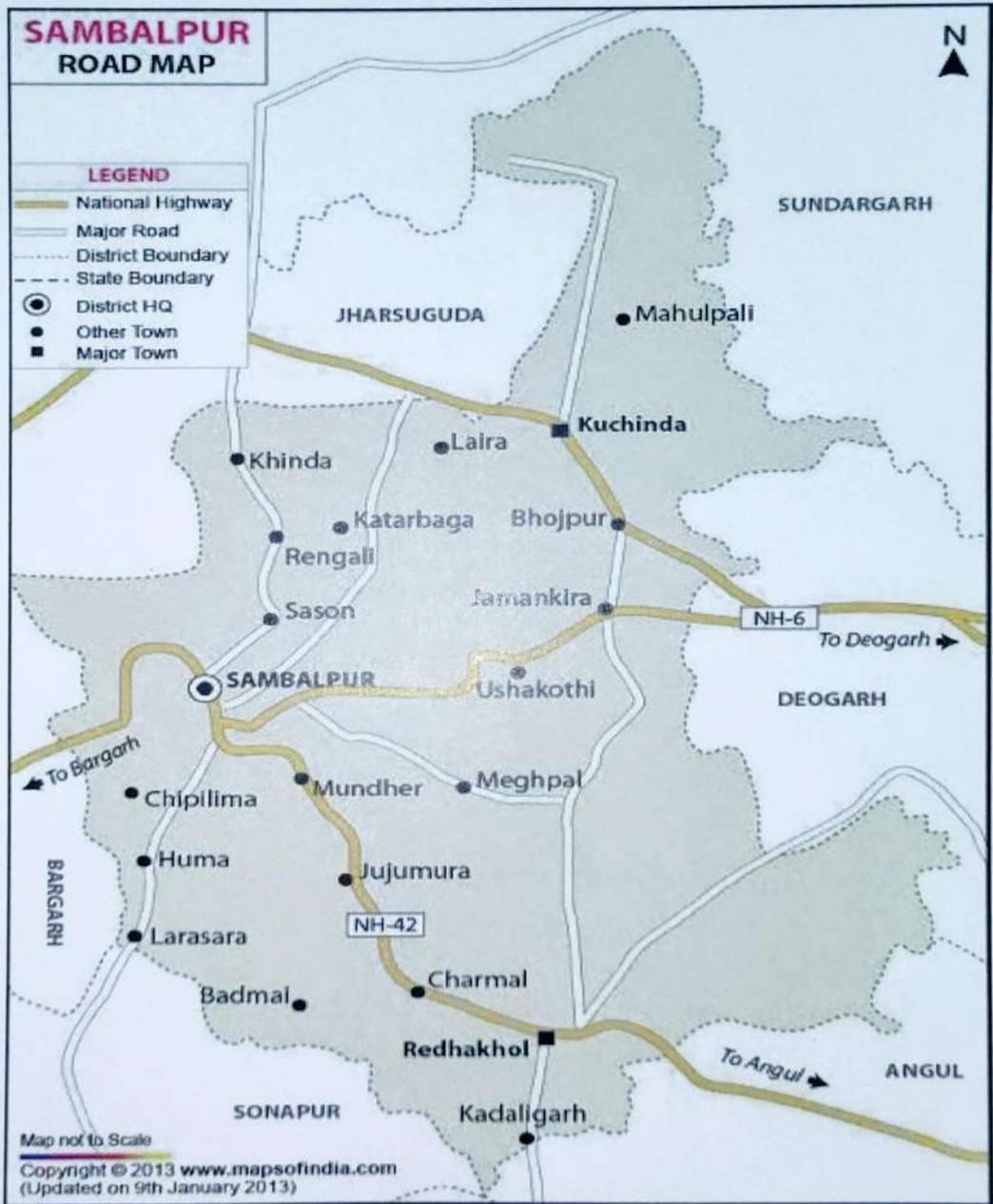
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MAP SHOWING THE TAHASILS OF SAMBALPUR DISTRICT

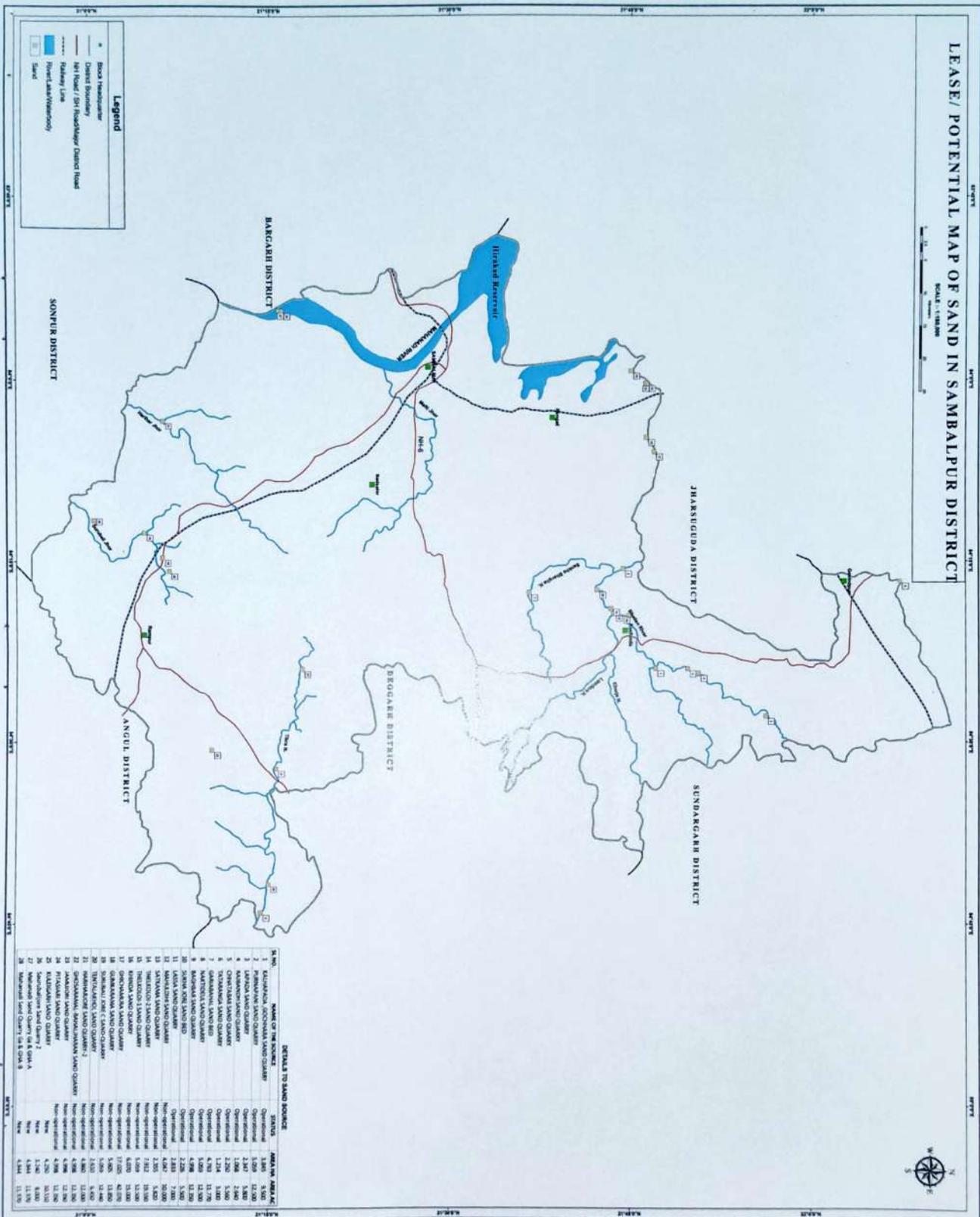


MAP SHOWING THE MAJOR ROADS OF SAMBALPUR DISTRICT



LEASE/POTENTIAL MAP OF SAND IN SAMBALPUR DISTRICT

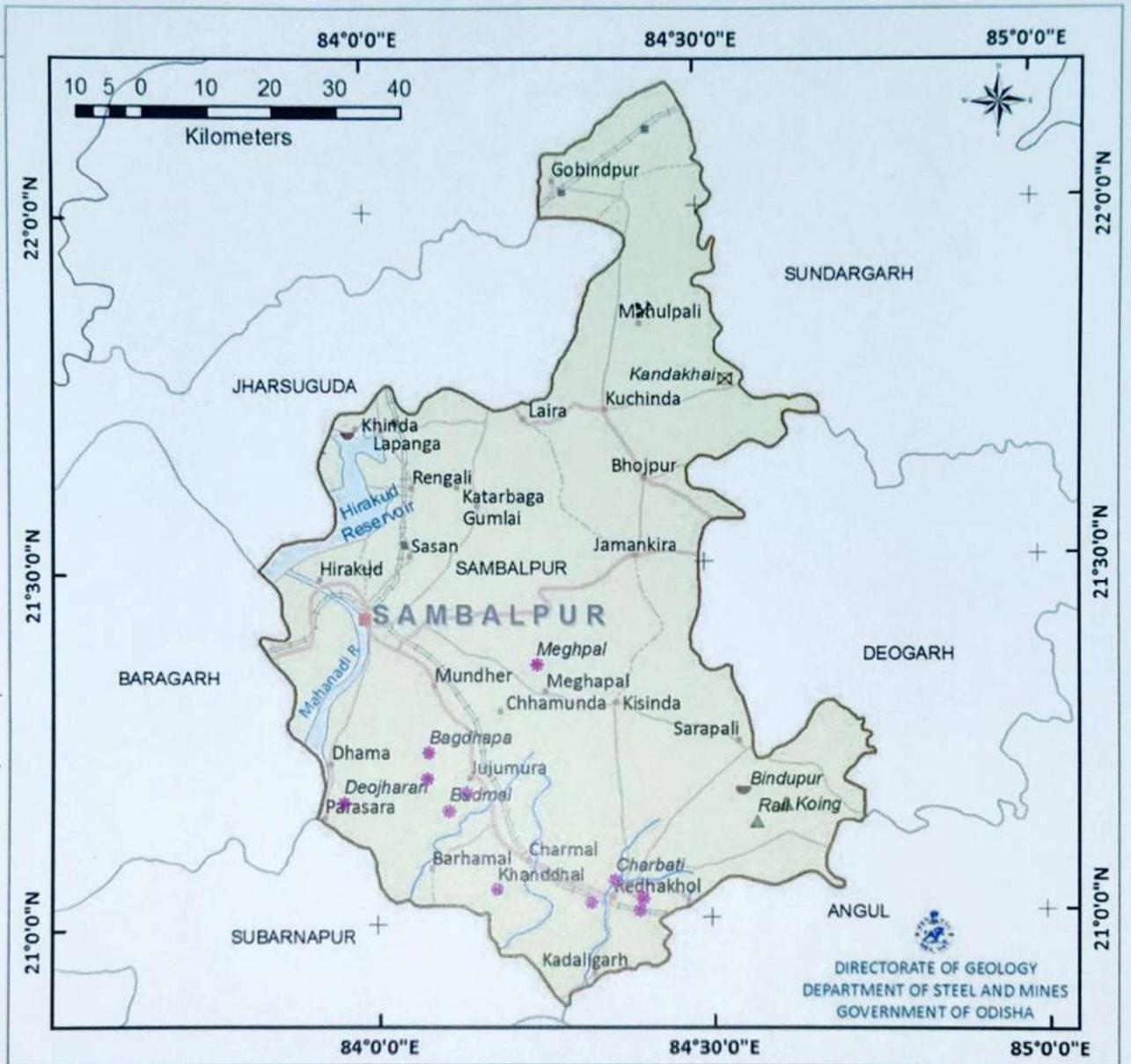
SCALE: 1:100,000



DETAILS TO SAND SOURCE

S. NO.	SL. NO.	NAME OF THE SOURCE	STATUS	AREA IN HECTARES
1	1	BARAGARH SAND QUARRY	Operational	3,800
2	2	BARAGARH SAND QUARRY	Operational	3,500
3	3	BARAGARH SAND QUARRY	Operational	2,847
4	4	BARAGARH SAND QUARRY	Operational	2,490
5	5	BARAGARH SAND QUARRY	Operational	2,220
6	6	BARAGARH SAND QUARRY	Operational	3,500
7	7	BARAGARH SAND QUARRY	Operational	4,700
8	8	BARAGARH SAND QUARRY	Operational	11,700
9	9	BARAGARH SAND QUARRY	Operational	5,000
10	10	BARAGARH SAND QUARRY	Operational	12,500
11	11	BARAGARH SAND QUARRY	Operational	2,200
12	12	BARAGARH SAND QUARRY	Operational	2,800
13	13	BARAGARH SAND QUARRY	Operational	4,800
14	14	BARAGARH SAND QUARRY	Operational	30,000
15	15	BARAGARH SAND QUARRY	Operational	2,000
16	16	BARAGARH SAND QUARRY	Operational	10,000
17	17	BARAGARH SAND QUARRY	Operational	2,000
18	18	BARAGARH SAND QUARRY	Operational	10,000
19	19	BARAGARH SAND QUARRY	Operational	10,000
20	20	BARAGARH SAND QUARRY	Operational	10,000
21	21	BARAGARH SAND QUARRY	Operational	10,000
22	22	BARAGARH SAND QUARRY	Operational	10,000
23	23	BARAGARH SAND QUARRY	Operational	10,000
24	24	BARAGARH SAND QUARRY	Operational	10,000
25	25	BARAGARH SAND QUARRY	Operational	10,000
26	26	BARAGARH SAND QUARRY	Operational	10,000
27	27	BARAGARH SAND QUARRY	Operational	10,000
28	28	BARAGARH SAND QUARRY	Operational	10,000

MINERAL MAP OF SAMBALPUR DISTRICT



Legend

- | | | | |
|--|-------------------|--|-----------------|
| | District Boundary | | Railway Line |
| | National Highway | | Railway Station |
| | Minor Road | | River |
| | Major Road | | Waterbody |

Mineral Occurrence

- | | |
|--|-----------------|
| | Coal |
| | Dimension Stone |
| | Fireclay |
| | Gemstone |

DIRECTORATE OF GEOLOGY
DEPARTMENT OF STEEL AND MINES
GOVERNMENT OF ODISHA

Details of Sand/M-Sand Sources**a) Rivers :**

River Name/M-Sand Plant	Total Stretch of River (in KM)	Type of River (Perennial or Non-perennial)
Not applicable for Sambalpur District		

b) De-siltation Location: (Lakes/Ponds/Dams etc.)

Name of Reservoir/Dams	Maintain/Controlled by State Govt./PSU etc.	Location	District	Tehsil	Village	Size (Ha)
Not applicable for Sambalpur District						

c) Patta Lands/Khatedari Land :

Owner	Sy. No	Area (Ha)	District	Tehsil	Village	Agriculture Land (Yes/No)
Not applicable for Sambalpur District						

d) M-Sand Plants :

Plant Name	Owner	District	Tehsil	Village	Geo-location	Quantity Tonnes/Annum
Not applicable for Sambalpur District						

Note : For inclusion of M-Sand Plant/Patta Land in DSR the plant/landowners need to submit the request to the Mining Department with complete details. Inclusion in DSR does not give them the right to operate the M-Sand Plant/Sand Mining lease.

Annexure - II

List of Potential Mining Lease (Existing & Proposed):

Sl No	Name of the source	Name of the Tahasil	Status	Type of Mineral	Mouza	Khata No.	Plot No.	Total Area in Hectare	Total Area in Acres	Kissam	Nadi name	Name of Lessee	Address & Contact No of Lessee	Date of Registration of Lease Deed	No & Date of Grant of Clearance	Name of Successful Bidder	Address S & T No of Successful Bidder	Latitude	Longitude	Minable Reserve	Cluster
1	KALHAP ADA GOCHH SAND QUARRY	Kuchinda	Operational	SAND	KALHAP ADA	89, 188	4(P), 2783(P)	3.845	9.50	NADI	BHEDEN	BEDARY AS SAHU	943752916	17.12.20 AA, 30/06/2021	1498/SEI AA, 30/06/2021		21°47'7.90008"N	84°23'52.32283"E	3440		
2	PURNAPA HIRAND QUARRY	Kuchinda	Operational	SAND	PURNAPANI	163	3416(p)	5.059	12.50	NADI	BHEDEN	RAKUM AR AGASTY	9556583225	07.08.2024	4796/SEI AA, 30/06/2022		21°44'25.95172"N	84°15'34.07871"E	23223		
3	LAPADA SAND QUARRY	Bamra	Operational	SAND	LAPADA	125	170/162 0(P), 214/162 1(P)	2.347	5.80	NADI	BHEDEN	MOTILAL NAYAK	7608843972	03.08.2022	4796/SEI AA, 30/06/2022		21°56'19.78845"N	84°27'50.86651"E	15921		
4	RAIBAN DH SAND QUARRY	Bamra	Operational	SAND	RAIBAN DHA	103	95(P)	1.068	2.64	NADI	BHEDEN	ARUN KUMAR NAYAK	8018420572	03.08.2022	4726/SEI AA, 30/06/2022		21°49'48.03978"N	84°23'54.54524"E	7456		
5	CHHATA BAR SAND QUARRY	Bamra	Operational	SAND	CHHATA BAR	60	699(P)	2.250	5.56	NADI	BHEDEN	ARUN KUMAR NAYAK	8018420572	09.09.2022	5118/SEI AA, 12/08/2022		21°50'43.32007"N	84°24'16.76013"E	16173		
6	TATARA NGA SAND QUARRY	Bamra	Operational	SAND	TATARA NGA	66	1(P)	1.214	3.00	NADI	SAFEI	MOTILAL NAYAK	7608843972	09.09.2022	5132/SEI AA, 12/08/2022		22°7'23.11496"N	84°16'39.29873"E	8852		
7	GARIABA HAL SAND BED	Jamankir	Operational	SAND	GARIABA HAL	88	422, 1(P)	4.763	11.77	NADI	SANKHA BHANGUNI	RAJIB KUMAR NAYAK	9777060949	16.11.2021	2482/SEI AA, 04/09/2021		21°36'36.54136"N	84°17'34.48562"E	5060		
8	NAKTIDEUL SAND QUARRY	Naktideul	Operational	SAND	NAKTIDEUL	174	2(P)	5.059	12.50	NADI	CHAMPALIN	ABULIN PRADHAN	9777658304	11.08.2021	1975/SEI AA, 05/08/2021		21°53'33.06310"N	84°32'14.03029"E	49308		
9	BAGHBAR SAND QUARRY	Naktideul	Operational	SAND	BAGHBAR AR	115	197, 219(P)	4.998	12.35	NADI	TIMIRA	SARODI KUMAR BEHERA	9937729917	17.11.2020	EC22800 IOR1475 30, 17/08/2022		21°14'16.13348"N	84°44'11.37432"E	28098		
10	SUKHA JORE SAND BED	Rairakhol	Operational	SAND	Chamal	154	1646	2.226	5.50	JORA		MD ALI HUSAIN	9437148876	30.09.2021	3019/SEI AA, 28/09/2021		21°53'55.1311"N	84°14'39.49248"E	8067	Cluster -2	
11	LASSA SAND QUARRY	Kuchinda	Operational	SAND	LASSA	87	1(P)	2.833	7.00	NADI	BHEDEN	RAJIB KUMAR NAYAK	9777060949	27.04.2022	164 MINIB/1 2-2021, 11/03/2022		21°53'25.07607"N	84°18'53.89916"E	19737		
12	MAHULDI HI SAND QUARRY	Kuchinda	Non-operation	SAND	MAHULDI HI	86	1(p), 469(p)	4.047	10.00	NADI	BHEDEN						21°43'38.34813"N	84°19'17.33526"E	4000		

Cluster & Contiguous Cluster details

River Name	Cluster No.	Lease No.	Location (Riverbed/Patta Land)	Village	Area (in Ha)	Total Excavation (Ton)	Total Mineral Excavation (Ton)
THELKOLOI-2 SAND QUARRY	1	NA	River Bed	THELKOLOI	7.912	NA	NA
THELKOLOI-1 SAND QUARRY		NA	River Bed	THELKOLOI	5.059	NA	NA
SUKHA JORE	2	NA	River Bed	CHARMAL	2.226	NA	NA
SARUBALI JORE		NA	River Bed	SARUBALI JORE	3.24	NA	NA

Contiguous Clusters:

River Name	Contiguous Cluster No.	Cluster No.	Number of leases in the cluster	Location (Riverbed/Patta Land)	Distance between clusters	Village	Area of Cluster (Ha)	Total Mineral Excavation (Ton)
NO CONTIGUOUS CLUSTER FOR SAND QUARRY FOR SAMBALPUR DISTRICT								

Transportation Routes for individual leases and leases in cluster

Name of source	Lease No	Transportation Route No	Number of tippers / day of lease	Number of tippers / day of all lease on route	Length of Route in KM	Type of Road (Black Topped / unpaved)	Recommendation for road (Black Topped / unpaved)	The road will be constructed by Govt. / Lease Owner	Route Map & Location
KALHAPADA ,GOCHHARA SAND QUARRY	NA	VILLAGE ROAD	4	6	6	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
PURNAPANI SAND QUARRY	NA	VILLAGE ROAD	3	5	4	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
LAPADA SAND QUARRY	NA	VILLAGE ROAD	3	5	2	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
RAJBANDH SAND QUARRY	NA	VILLAGE ROAD	2	4	3	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
CHHATABAR SAND QUARRY	NA	VILLAGE ROAD	2	4	3	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
TATARANGA SAND QUARRY	NA	VILLAGE ROAD	3	5	4	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
GARIABAHAL SAND BED	NA	VILLAGE ROAD	4	6	2	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
NAKTIDEUL SAND QUARRY	NA	VILLAGE ROAD	3	5	3	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
BAGHBAR SAND QUARRY	NA	VILLAGE ROAD	4	6	2	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
SUKHAJORE SAND BED	NA	VILLAGE ROAD	3	5	3	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
LASSA SAND QUARRY	NA	VILLAGE ROAD	3	5	2	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
MAHULDIHI SAND	NA	VILLAGE	4	6	5	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED

23	JAMBUDOR 1 SAND QUARRY	Non- Naktised operation	SAND	JAMBORI	171	1(P)	4.998	12.35	NADI	TIKIRA									21°14'54.235697"N	84°41'48.82516"E	23976
24	PTASARI SAND QUARRY	Non- Naktised operation	SAND	PTASARI	17	360(P)	4.998	12.35	NADI										21°14'43.85395"N	84°17'35.716526"E	19938.75
25	KULEGAR H SAND QUARRY	New	SAND	KULEGAR H	236	2653(p)	4.25	10.51	NADI	BHEDEN									21°42'17.09733"N	84°17'20.93826"E	20391.5
26	Saurubali jore Sand Quarry 2	New	SAND	Saurubali jore	78	292/P	3.24	8	NADI										21°5'36.90376"N	84°15'46.34567"E	25160
27	Mahana di Sand Quarry Ga & GHA - A	New	SAND	Mahana di	1	136, 34.5.19, 26.27	4.844	11.97	NADI										21°15'42.98"N	83°54'15.33"E	60000
28	Mahana di Sand Quarry Ga & GHA - B	New	SAND	Mahana di	1	136, 34.5.19, 26.27	4.844	11.97	NADI										21°15'25.85"N	83°54'23.85"E	60000
TOTAL																					76684.5



Mining Officer cum Competent Authority
Sambalpur

Mining Officer
Sambalpur Circle, Sambalpur

Final List of Cluster & Contiguous Cluster details

River Name	Cluster No.	Lease No.	Location (Riverbed/Patta Land)	Village	Area (in Ha)	Total Excavation (Ton)	Total Mineral Excavation (Ton)
THELKOLAI-2 SAND QUARRY	1	NA	River Bed	THELKOLAI	7.912	NA	NA
THELKOLAI-1 SAND QUARRY		NA	River Bed	THELKOLAI	5.059	NA	NA
SUKHA JORE	2	NA	River Bed	CHARMAL	2.226	NA	NA
SARUBALI JORE		NA	River Bed	SARUBALI JORE	3.24	NA	NA

Contiguous Clusters:

River Name	Contiguous Cluster No.	Cluster No.	Number of leases in the cluster	Location (Riverbed/Patta Land)	Distance between clusters	Village	Area of Cluster (Ha)	Total Mineral Excavation (Ton)
NO CONTIGUOUS CLUSTER FOR SAND QUARRY FOR SAMBALPUR DISTRICT								

Final List of Transportation Routes for individual leases and leases in cluster

Name of source	Lease No	Transportation Route No	Number of tippers / day of lease	Number of tippers / day of all lease on route	Length of Route in KM	Type of Road (Black Topped / unpaved)	Recommendation for road (Black Topped / unpaved)	The road will be constructed by Govt. / Lease Owner	Route Map & Location
KALHAPADA, GOCHHARA SAND QUARRY	NA	VILLAGE ROAD	4	6	6	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
PURNAPANI SAND QUARRY	NA	VILLAGE ROAD	3	5	4	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
LAPADA SAND QUARRY	NA	VILLAGE ROAD	3	5	2	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
RAJBANDH SAND QUARRY	NA	VILLAGE ROAD	2	4	3	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
CHHATABAR SAND QUARRY	NA	VILLAGE ROAD	2	4	3	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
TATARANGA SAND QUARRY	NA	VILLAGE ROAD	3	5	4	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
GARIABAHAL SAND BED	NA	VILLAGE ROAD	4	6	2	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
NAKTIDEUL SAND QUARRY	NA	VILLAGE ROAD	3	5	3	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
BAGHBAR SAND QUARRY	NA	VILLAGE ROAD	4	6	2	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
SUKHA JORE SAND BED	NA	VILLAGE ROAD	3	5	3	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
LASSA SAND QUARRY	NA	VILLAGE ROAD	3	5	2	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
MAHULDIHI SAND	NA	VILLAGE	4	6	5	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED

Transportation Routes for individual leases and leases in cluster

QUARRY	ROAD	4	6	3	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
SATKAMA SAND QUARRY	VILLAGE ROAD	4	6	3	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
THEKOLOI-2 SAND QUARRY	VILLAGE ROAD	2	4	4	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
THEKOLOI-1 SAND QUARRY	VILLAGE ROAD	3	5	6	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
KHINDA SAND QUARRY	VILLAGE ROAD	4	6	6	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
GHICHAMURA SAND QUARRY	VILLAGE ROAD	5	7	4	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
GUMKARAMA SAND QUARRY	VILLAGE ROAD	3	5	2	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
SURUBALI JORE C SAND QUARRY	VILLAGE ROAD	1	3	3	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
TENTALAKHOL SAND QUARRY	VILLAGE ROAD	5	7	3	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
HARIHARJORE SAND QUARRY-2	VILLAGE ROAD	4	6	4	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
GHOSARAMAL-BAHALHARAN SAND QUARRY	VILLAGE ROAD	3	5	2	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
JAMUJORI SAND QUARRY	VILLAGE ROAD	2	4	3	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
PITASARI SAND QUARRY	VILLAGE ROAD	5	7	2	UNPAVED	UNPAVED	UNPAVED	LEASE OWNER	MAP ATTACHED
KULEGARH SAND QUARRY	VILLAGE ROAD	3	5	3	UNPAVED	UNPAVED	UNPAVED	NEW	MAP ATTACHED
SAURUBALJORE SAND QUARRY 2	VILLAGE ROAD	5	7	2	UNPAVED	UNPAVED	UNPAVED	NEW	MAP ATTACHED
MAHANADI SAND QUARRY GA & GHA	VILLAGE ROAD	5	7	2	UNPAVED	UNPAVED	UNPAVED	NEW	MAP ATTACHED