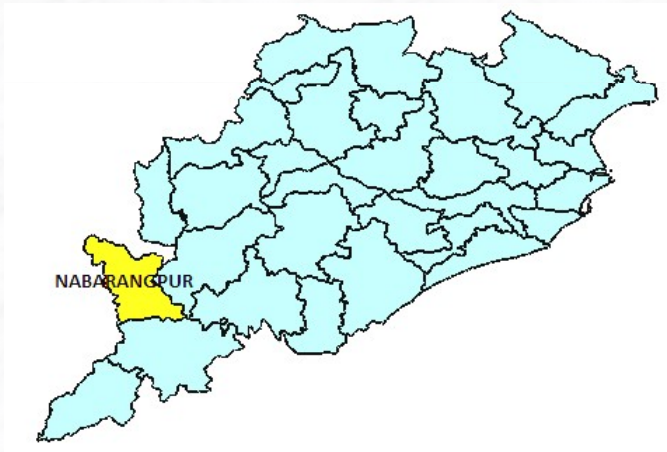




DRAFT DISTRICT SURVEY REPORT (DSR)
OF
NABARANGPUR DISTRICT, ODISHA
FOR
MORRUM

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

ODISHA



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

COLLECTORATE, NABARANGPUR

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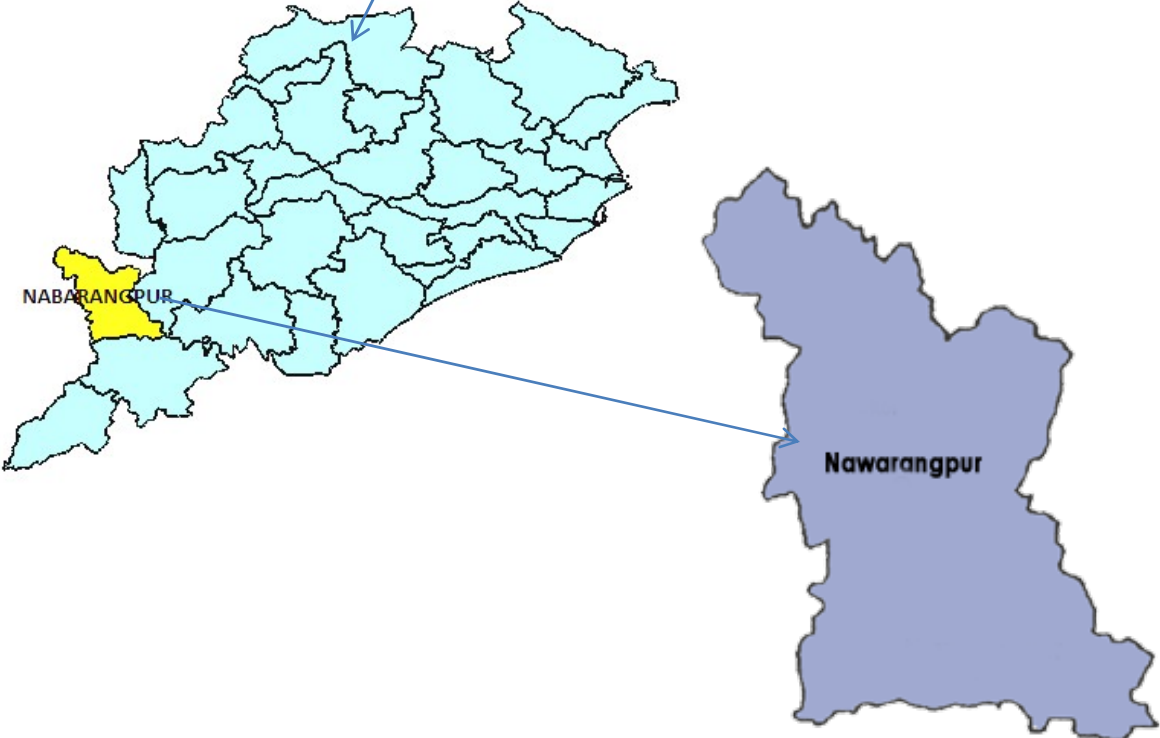
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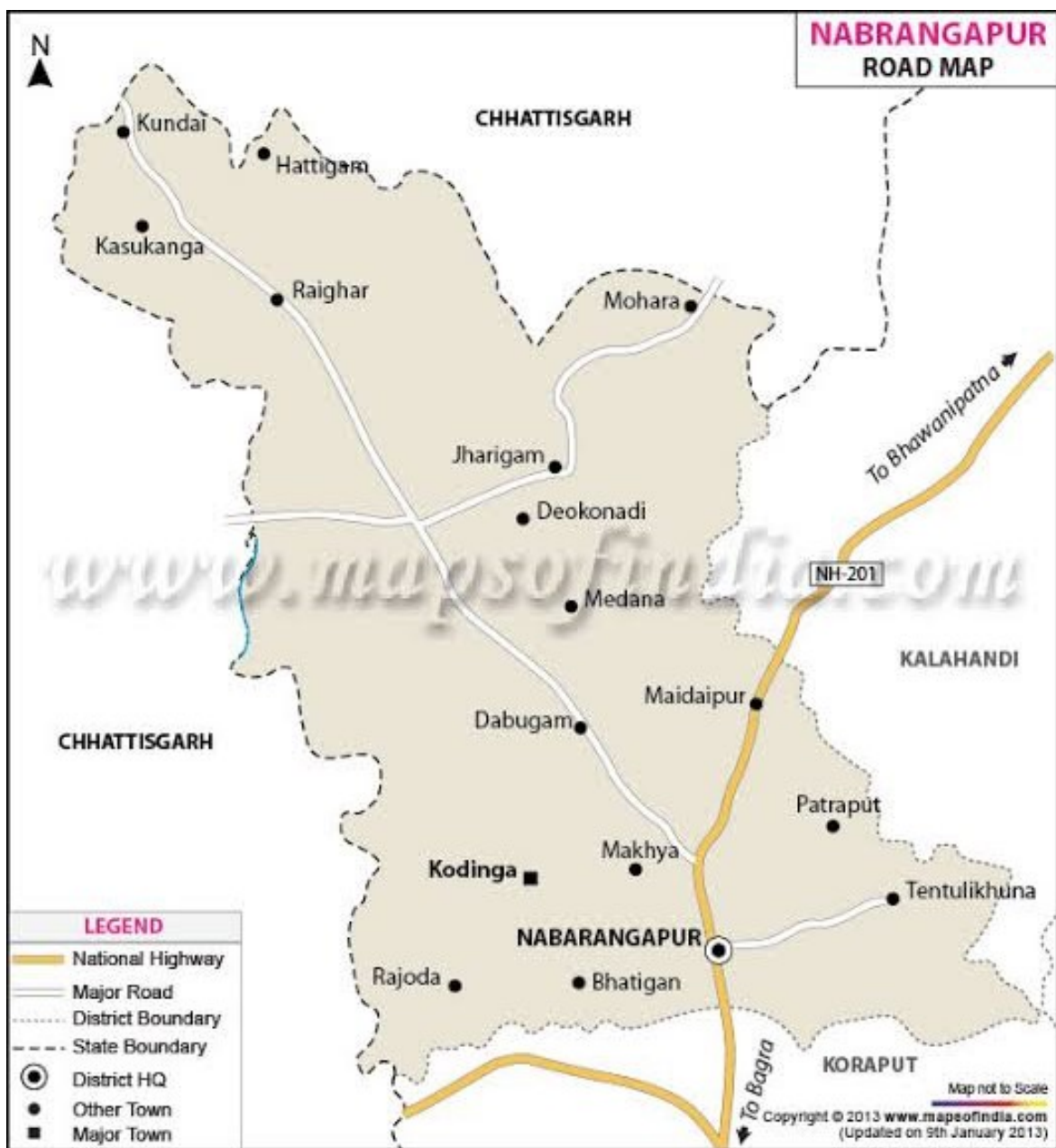
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MAP SHOWING THE TAHASILS OF NABARANGPUR DISTRICT



MAP SHOWING THE MAJOR ROADS OF NABARANGPUR DISTRICT



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 road metal/building stone mining has been prepared in accordance with Clause II of Appendix X of the notification. Every effort has been made to cover morrum mining locations, future potential areas and overview of morrum 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 uploaded by various state Government departments. The main purpose of preparation of District Survey Report is to identify the mineral resources and developing the mining activities along with other relevant data of the District.

1. INTRODUCTION

Situated in the greeneries of south-western Odisha, Nabarangpur district is a very spectacular one, functioning since 02.10.1992 (State Government Notification No.DRC- (44/93/14218/R). Prior to that, it was a vast sub-division of the erstwhile Koraput district. Its boundary stretches in the north to Raipur and west to Bastar district of Chhatisgarh. The east side of Nabarangpur touches Kalahandi and Rayagada districts and south to the Koraput district. The river Indravati forms the border between Nabarangpur and Koraput Districts. Nabarangpur District covers an area of 5294 sq km. The district is situated at 81⁰52' to 82⁰53' East longitudes and 19⁰09' to 20⁰05' North latitudes. The city of Nabarangpur is the district headquarters. Most of its population is tribal, and most of the land is forested and is located in the southwest corner of Odisha.

2. OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT.

Iron ore: Iron ore occurrence of the district is reported near Hirapur, in the Podagad hill range. The occurrence has Fe₂O₃ content varying from 55.80% to 66.72%. It is a deposit with 6 nos. of Banded Iron Formations (BIF) with possible reserve of 2.65 Million tonnes.

Limestone: Lime stone occurrences in the district of Nabarangpur are found at Teliguda, Binsuli Dongariguda, Kakadaguda, Siraguda, Chittabeda etc. These are mostly stromatolitic limestones with a resource of about 2.28 million tonne. The CaO content varies from 21.01 % to 45.13 %, MgO content 0.94 % to 19.72 %.

Quartz vein: Quartz vein occurrences have been reported from Debadhara, Pandaripakna, Sanakarka, Valiapada, Amadhara. The SiO₂ content varies from 94.46 % to 99.84 %. Five million tonne of Quartzite have also been reported from the area.

Chinaclay: Chinaclay occurrences have been located around Tangini, Debadhara, Chandandhara, etc. with a resource of about 1.33 million tonne. The Al₂O₃ content ranges between 21.74% to 29.22%. However, it is highly siliceous with SiO₂ content of 25.45% to 67.06%.

Calc tufa: Calc tufa occurrences have been reported from Jalaguda. The dimension is 40 m x 20 m x 15 m with a probable reserve of 0.018 million tonne. The CaO content varies from 47.60 % to 55.44%. SiO₂ content varies from 0.14 % to 4.34% MgO content of the occurrence is 0.26 % to 0.56%.

Gemstones: Transparent almandine and rhodolite garnets are recovered from the gravel beds encountered around Petfulla & Hatibadi localities. Green coloured beryl is found in the zoned pegmatites around Kendumunda . Agate is found in the form of bands around Kenduguda.

Copper: Incidence of copper mineralization in the form of veinlets varying in thickness from 0.2 cm to 1 cm is noticed in the calcareous rocks encountered around Teliguda and Varhaiguda. Copper mineralisations are identified as Malachite and Azurite.

Dimension / Decorative stones: Nabarangpur district has a rich store house of dimension / decorative stone occurrences. The most important locations are Tohra, Cheptiamba, Jamranda, Bhalujharan, Keopani, Kandasara, Samarchachara and Chacha. About 2,38,000 million tonne of dimension / decorative stone have also been reported from the district. Lithologically they are granites, amphibolite, dolerite, meta-basics & pink granites.

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		
	Longitude	Degree	81 ^o 52' to 82 ^o 53' East
	Latitude	Degree	19 ^o 09' to 20 ^o 05' North
2	Geographical area	Sq.Km.	5291
3	Sub-division	Numbers	1
4	Tahasils	Numbers	10
5	C D Blocks	Numbers	10
6	Municipalities	Numbers	2
7	NACs	Numbers	-
8	Police Stations	Numbers	13
9	Gram Panchayats	Numbers	189
10	Villages	Numbers	891
	Inhabited	Numbers	868
	Uninhabited	Numbers	23
11	Assembly constituencies	Numbers	4

b. Area and Population:

As per 2011 census, the total population of Nabarangpur district is 12,20,946 comprising above 11,33,321 rural and 87,625 urban population. The SC and ST population works out to 14.5 % and 55.8 % respectively. The district is predominantly inhabited by tribals like Kandha, Paraja, Soura etc. The density of population per sq.km is 231 with decadal growth of 19.0 for the district, as against population density of 270 person per sq.km and decadal growth of 14.0 for the state. It has 901 census villages (including 25 un-inhabited villages) covering 10 Blocks and 10 Tahasils. The literacy percentage of the district is 46.4 against 72.9 of the state.

c. Climate :

Nabarangpur district falls under East Coast Plains and Hills as per the GOI's Agro-Climatic Zonal Planning. Entire district except Dabugan block, falls under 'Eastern Ghat High lands'. Dabugan block falls under 'Western undulating lands'. The climate is subtropical to temperate. It is characterized by hot and dry summer, cool and humid monsoon and cold and dry winter. The district has different types of soils like red and laterite. The soil PH is neutral to alkaline and its salinity is normal. In 2011 Normal rainfall of the district was 1569.5 mm and the actual rainfall was 1432.8 mm.

d. Economy:

Predominantly an agricultural District, Nabarangpur has more than 90 per cent of its inhabitants depending on farming for their livelihood. The farming community largely depends on rains due to lack of irrigation facility. National Horticulture Mission is taking lots of steps to improve the cultivation of many fruits and vegetables in the district. Nabarangpur District is a treasure of many natural resources like iron, chlorite, mica, quartz etc. Heeraput village near Umerkote contains a fair deposit of hematite and limonite, each of which possesses about 60% iron. Similarly, Tentulikhunti area of Nabarangpur has fairly large deposits of granite. The north of Nabarangpur District, up to the boarder of Kalahandi, has rock beds covering layers of coarse white quartz. Though industrially this district is not that developed, all these minerals found in the District sustains the various industries in other parts of the country.

e. Industry:

No. of MSME units set up	Investment (In Rs. crores)	Employment Generated				Employment of women
		SC	ST	General	Total	
1321	6819.08	1633	1512	1117	4262	20

f. Agriculture:

During the year 2017-18 the net area sown was 186 thousand hectares against 5356 thousand hectares of the state. The production of was as below:

Name	Paddy	Wheat	Maize	Mung	Biri	Kulthi	TIL	Groundnut	Mustard	Potatoes	Jute	Sugar cane
Production in 000 MT	466.14	0.23	219.94	4.06	3.00	0.05	0.21	11.42	0.46	0.00	6.00	295.19

During 2017-18, the total fertilizers used in the district was about

Type of fertiliser	Nitrogenous	Phosphatic	Pottasic	Total	Consumption per Ha
Quantity in MT	26515	7369	4614	38498	151.03

g. Power:

consumption of electricity in Nawarangapur district upto 31st March 2011 was 65.341 Million Units & So far only 458 revenue villages are electrified as on February' 2011 which constitutes 52.3% to the total villages of the district.

h. Transport & Communication:

Railway route length (14-15) km	-
No of Rly stations and PH(14-15)	-
Forest road (17-18) km	136.46
National Highway (16-17) km	42.00
State Highway (17-18) km	122.59
Major district road (17-18) km	63.80
Other dist road (17-18) km	420.95
Rural road(17-18) km	1904.60
Inter village road (16-17) km	3822.17
Intra village road (16-17) km	2351.57

i. Health:

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

Sub divisional hospitals including mobile	13 No
Beds facilities	360 No
Homoeopathic dispensaries	22 No
Ayurvedic dispensaries	16 No

j. Tourist places:

There are 18 nos. of tourist spots in this district, out of which 5 nos. of tourist centre such as Kelia Lord Siva Temple, Nabarangpur, Papdahandi, Podagada and Umerkote has been identified by Department of Tourism and Culture, Odisha. During 2011 the numbers of Domestic tourists were 364145 who visited the tourist spots of the district.

k. Forest areas:

Category of forest	Area in sq km
Reserve Forest	535.34
Unclassified Forest	0.07
Demarcated Protected Forest (DRF)	685.77
Undemarcated Protected Forest	0
Other forest under Revenue Dept	1241.55
Total	2462.73

l. Education:

Primary School (2017-18)	No. of Schools	1224
	Enrolment (No)	146516
	Pupil Teacher Ratio	30.11
Upper Primary School 2017-18	No. of Schools	624
	Enrolment (No)	77431
	Pupil Teacher Ratio	29.50
General College 2017-18	Junior	26
	Degree	8

Secondary School	No. of Schools	235
	Enrolment (No)	28916
	Pupil Teacher Ratio	34.22
Literacy Rate, 2011	Male	57.3
	Female	35.8
	Total	46.4

m. Culture & Heritage:

Mondei is the widely celebrated festival of Nabarangpur district. This festival is usually celebrated after the harvesting of crops. Most areas of Nabarangpur District experience the first arrival of monsoon much before the rest of the state. While the rest of Orissa gets rain due to monsoon from the Bay of Bengal, the whole of Nabarangpur gets it straight from the Arabian Sea, through the Southwest direction.

4. GEOLOGY

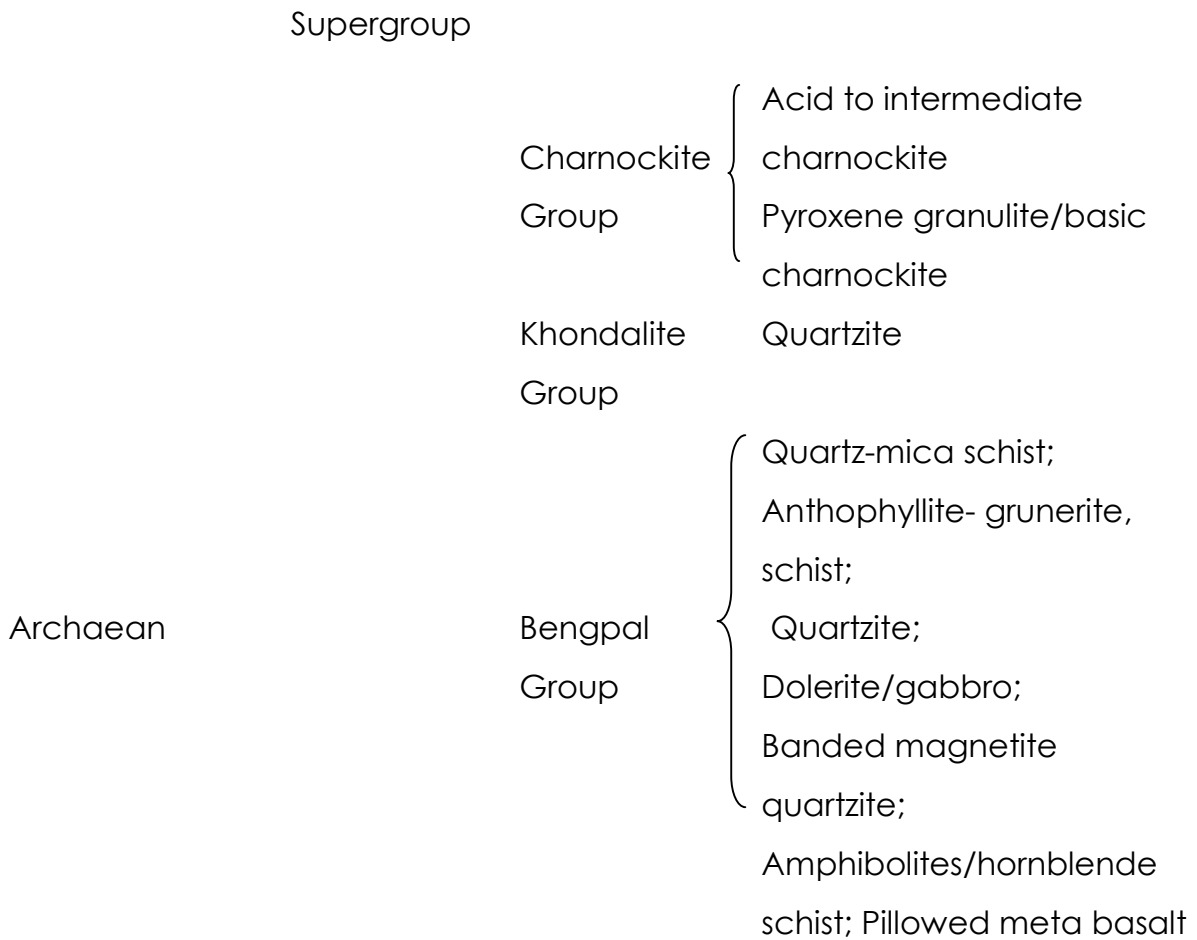
Geologically the district exposes various lithostratigraphic unit having varied litho assemblages. The oldest unit is Bengpal Group, followed by khondalite Group, charnockite Group, lithounits and Indravati Group of Archaean to Neoproterozoic in age. Rocks of Bengpal Group consisting of quartz-mica schist, anthophyllite-grunerite schist, quartzite, banded magnetite quartzite, amphibolites and hornblende schist and pillowed metabasalt crop out over the western and southern part of the area. These rocks occur as small bands and lenses or as linear bands within granite. Quartzite belonging to khondalite Group of Eastern Ghat Supergroup occurs in the form of hills and ridges as well as low mounds amidst granite gneisses in the south eastern part of the area. The khondalite-charnockite association is exposed only along the eastern apart of the district. Both basic as well as acid to intermediate charnockite are present in the area. Peninsular gneiss is found mainly in the eastern part of the area. Major rock of the area is unclassified granite and Tel granite of Palaeo Proterozoic age. The granites cover the entire pediplain and peneplain region of the northern part of the district while in the southern

part these occur as high hills. Intrusives like pegmatite, quartz vein and dolerite dykes are present in the western and southwestern part of the area. The Indravati Group belonging to Chattishgarh Supergroup of rocks is composed of Tirathgarh and Jagdalpur Formation. Tirathgarh Formation consists of sandstone and conglomerate and Jagdalpur Formation is composed of grey purple shale and shale with limestone. Few occurrences of laterite of Cainozoic age have been observed in the area.

STRATIGRAPHY:

The geological succession in the district is as follows:

Age	Super Group	Group	Litho units
Cainozoic			Laterite
Meso to Neo Proterozoic	Chattishgarh Super Group	Indravati Group	<ul style="list-style-type: none"> Limestone stone with shale Grey purple shale Sandstone with conglomerate
Paleo- proterozoic			<ul style="list-style-type: none"> Dolerite/Gabbro Pegmatite/ vein quartz Unclassified granite
Archaean to Proterozoic	Eastern Ghat	Migmatite Group	Granite gneiss



5. DRAINAGE AND IRRIGATION PATTERN.

The drainage of the district is mainly controlled by the river Indravati and its tributaries.

Major part of the district is irrigated through canal irrigation from the dam on river Indravati.

6. LANDUSE PATTERN

SI No	Landuse	Area in '000Ha
1	Forest Area	246
2	Misc. trees & Grooves	13
3	Permanent Pasture	8
4	Culturable Waste	15

5	Land put to Non Agril Use	43
6	Barren & Unculturable Land	9
7	Current Fallow	0
8	Other Fallow	8
9	Net Area Sown	186
10	Mining	1
	Geographical Area	529

7. SURFACE WATER & GROUND WATER SCENARIO

The drainage systems i.e. rivers of the district gets filled with water during the monsoon and the gradually it decreases 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	3.3	0.55	1.0	2.0
Maximum	10.4	4.25	5.20	7.90

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 45°C in the summer and up to 7^o-8^o C during peak winter.

The rainfall statistics 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
15-16	37.04	39.93	218.86	343.29	224.64	142.20	16.38	0.23	31.85	0.63	24.98	42.59	1122.62
16-17	1.93	44.25	126.63	267.16	389.86	143.23	98.26	4.90	NIL	8.43	NIL	22.44	1107.09
17-18	1.23	35.76	201.05	213.38	213.05	143.69	109.87	16.90	NIL	NIL	NIL	0.10	935.03
18-19	74.34	80.10	123.42	333.20	299.31	295.03	114.29	2.70	50.95	0.40	27.00	24.60	1425.34
Avg.	28.63	50.01	167.49	289.25	281.72	181.04	84.70	6.18	20.70	2.36	13.00	22.43	1147.52

9. DETAILS OF MINING LEASES

Attached as Annexure I.

10. DETAILS OF ROYALTY COLLECTED (Rs)

Sl.No	Name Of Tahasil	2015-16	2016-17	2017-18	2018-19
1	Jharigam	0	0	66906	0
Total		0	0	66906	0

11. DETAILS OF PRODUCTION OF MINOR MINERAL (cum)

Sl.No	Name Of Tahasil	2015-16	2016-17	2017-18	2018-19
1	Jharigam	0	0	1593	0
Total		0	0	1593	0

12. MINERAL MAP OF THE DISTRICT

Attached as Plate No 4.

13. LIST OF LOI HOLDERS ALONG WITH VALIDITY

Not applicable.

14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT

Total mineral reserve of moorum is 20,578 cum which may increase after detail investigation.

Details of the potential areas submitted as Annexure II.

15. QUALITY/GRADE OF MINERAL

Morum of the district is very much suitable for filling purposes particularly of road.

16. USE OF MINERAL

Morum of the district is used mainly in the road construction purpose apart from some domestic constructions.

17. DEMAND & SUPPLY OF THE MINERAL

The tentative annual demand is to the tune of 50, 000 cum of moorum and will be mainly supplied from different tahasils of the district.

18. MINING LEASES MARKED ON THE MAP OF THE DISTRICT.

19. DETAILS OF AREAS WHERE THERE IS A CLUSTER OF MINING LEASES

Not applicable

20. DETAILS OF ECO-SENSITIVE AREA

Not applicable.

21.IMPACT ON THE ENVIRONMENT (AIR, WATER, NOISE, SOIL FLORA & FAUNAL , 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 by 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

Mining operation are carried out by opencast manual, semi mechanized/ mechanized methods generating dust particles due to various activities likes, 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 surrounding land user and potential health risk in some circumstances.

Water Impact

Sometimes the mining operation leads to intersect 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.

Noise Impact

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

Impact on Land environment

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 faunal 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 diction 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 to 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 checks 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. Worker 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, 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 laves 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 mine 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 backfilled using the stored waste. The backfilled 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 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 savage 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 Manger who is responsible for emergency will always keep a jeep 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 Manger should collect and have adequate information of 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 OCCUPATION 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 proponent's will take necessary precautions to fulfill 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 ets are to be provided to mine workers as per Mines Rules. All operators and mechanics are to be trained to handle fire fighting equipments.

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

26. PLANTATION OF GREEN BELT DEVELOPMENT 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 content 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

ANNEXURE I

MORRUM SAIRATS ALREADY LEASED OUT AND EXECUTED

Sl. No.	Name of Tahasil	Name of Minor Mineral	Name of village	Name of lessee	Address & contact No of lessee	Mining lease grant order No & date	Period of QL		Date of commencement of mining operation	Status (working/non-working/Temporary working for deponment)	Captiv e or Non - captiv e	Lt No & date of grant of EC	Location of Resource (GPS co-ordinates or Khata & Plot No) (Sketch map to be attached)	Method of mining	Area leased for mineral concession (in sq m)	Mine able mineral potential as per approved mining plan (in cum)
							From	To								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Jharigam	Morrur Quarry	Kenuguda	Sibaram satpathy	Chaitabeda	10.04.2017	2015-16	2019-20	30.06.2017	Working	Non - Captiv e	712/10.04.2017	Khata-27, Plot no-151	OC	0.538 Ha.	1593 cum

ANNEXURE II**POTENTIAL LATERITE SOURCE OF DISTRICT**

Sl. No.	Name of Tahasil	Name of village	Status	Name of Minor Mineral	Location of the Source (Total Hillock) recommended for mineral concession (GPS co-ordinates or Khata & Plot No) (Sketch map to be attached)	Area of the mineral potential patch (in sq m)	Average height of potential patch (in m)	Mineral potential (in cum)
1	2	3	4	5	6	7	8	9
1	Jharigam	Kenuguda	Running	Morum Quarry	Khata-27, Plot no-151	0.538 Ha.	5	20578

MINERAL MAP OF NABARANGAPUR DISTRICT

SCALE :- 1:150,000



PLATE NO-4

20°0'0"N

19°45'0"N

19°30'0"N

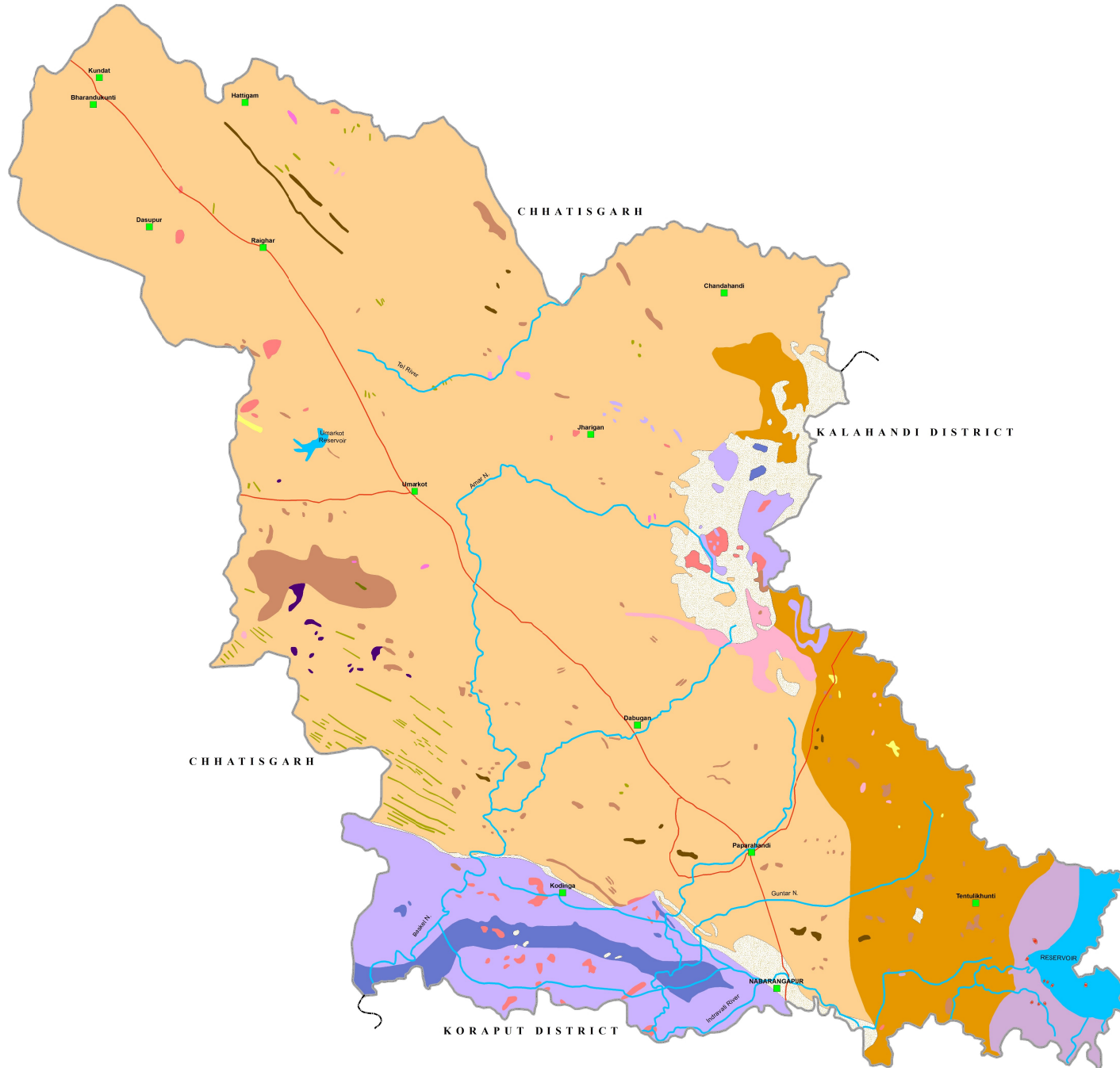
19°15'0"N

20°0'0"E

82°30'0"E

82°45'0"E

83°0'0"E



Legend

- Block Headquarter
- District Boundary
- NH Road / SH Road/Major District Road
- Railway Line
- River/Lake/Waterbody
- Acid to intermediate charnockite
- Amphibolite/hornblende schist
- Anthophyllite-grunerite schist
- Banded magnetite quartzite
- Dolerite / Gabbro
- Dolerite/Gabbro
- Granite gneiss
- Grey purple shale
- Laterite
- Limestone with shale
- Pegmatite/Vein quartz
- Pillowed metabasalt
- Pyroxene granulite/basic charnockite
- Quartz-mica schist
- Quartzite
- Sandstone with conglomerate
- Tel Granite
- Unclassified granite

82°0'0"E

82°15'0"E

82°30'0"E

82°45'0"E

83°0'0"E