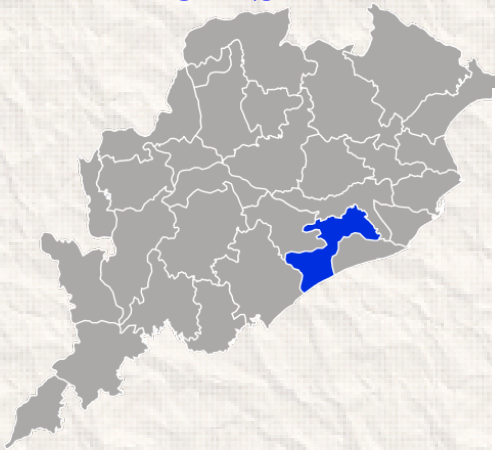




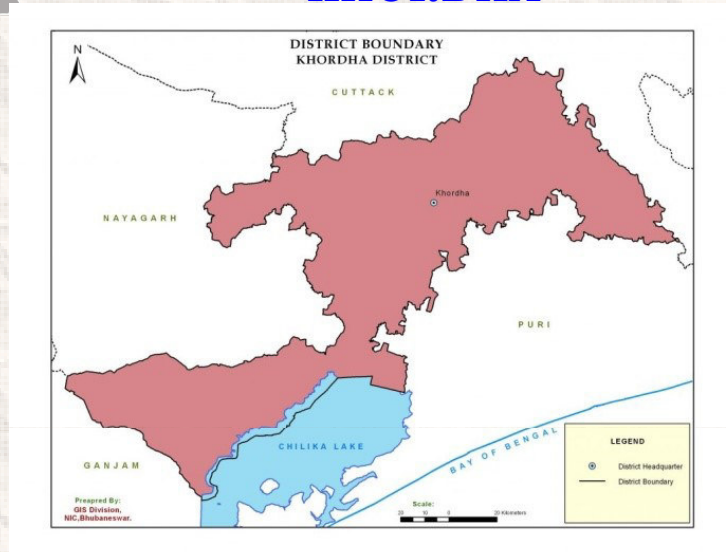
# DISTRICT SURVEY REPORT (DSR) 2020 OF KHORDHA DISTRICT, ODISHA FOR MORRUM

(FOR PLANNING & EXPLOITING OF MINOR  
MINERAL RESOURCES)

**ODISHA**



**KHORDHA**



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

**COLLECTORATE, KHORDHA**

## CONTENT

SL NO	DESCRIPTION	PAGE NO
1	INTRODUCTION	1
2	OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT	2
3	GENERAL PROFILE	2
4	GEOLOGY	4
5	DRAINAGE AND IRRIGATION PATTERN	7
6	LANDUSE PATTERN	7
7	SURFACE WATER & GROUND WATER SCENARIO	8
8	RAINFALL & CLIMATIC CONDITION	8
9	DETAILS OF MINING LEASES	8
10	DETAILS OF ROYALTY COLLECTED	8
11	DETAILS OF PRODUCTION	8
12	MINERAL MAP OF THE DISTRICT	8
13	LIST OF LOI HOLDERS ALONG WITH VALIDITY	9
14	TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT	9
15	QUALITY/GRADE OF MINERAL	9
16	USE OF MINERAL	9
17	DEMAND & SUPPLY OF THE MINERAL	9
18	MINING LEASES MARKED ON THE MAP OF THE DISTRICT	11
19	DETAILS OF AREAS WHERE THERE IS A CLUSTER OF MINING LEASES	11
20	DETAILS OF ECO-SENSITIVE AREA	11
21	IMPACT ON THE ENVIRONMENT (AIR, WATER, NOISE, SOIL FLORA & FAUNAL, LAND USE, AGRICULTURE, FOREST ETC.) DUE TO MINING	11
22	REMEDIAL MEASURES TO MITIGATE THE IMPACT OF MINING ON THE ENVIRONMENT	13
23	RECLAMATION OF MINED OUT AREA (BEST PRACTICE ALREADY IMPLEMENTED IN THE DISTRICT, REQUIREMENT AS PER RULES AND REGULATION, PROPOSED RECLAMATION PLAN)	15
24	RISK ASSESSMENT & DISASTER MANAGEMENT PLAN	16

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)	17
26	PLANTATION OF GREEN BELT DEVELOPMENT IN RESPECT OF LEASES ALREADY GRANTED IN THE DISTRICT	18
27	ANY OTHER INFORMATION	18

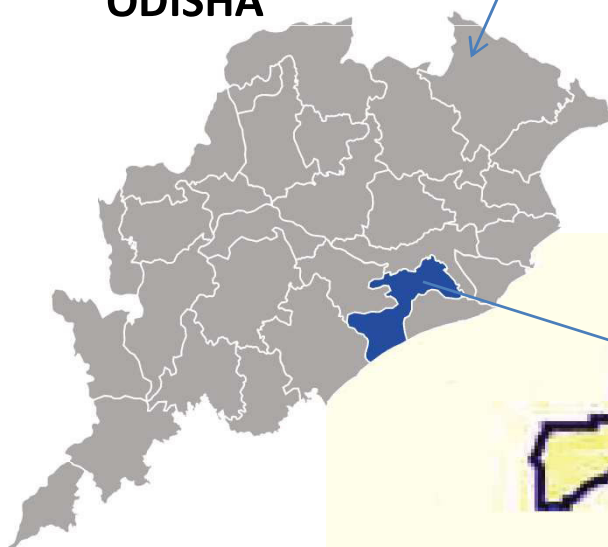
#### LIST OF PLATES

DESCRIPTION	PLATE NO
INDEX MAP OF THE DISTRICT	1
MAP SHOWING TAHASILS	2
ROAD MAP OF THE DISTRICT	3
MINERAL MAP OF THE DISTRICT	4
LEASE/POTENTIAL AREA MAP OF THE DISTRICT	5

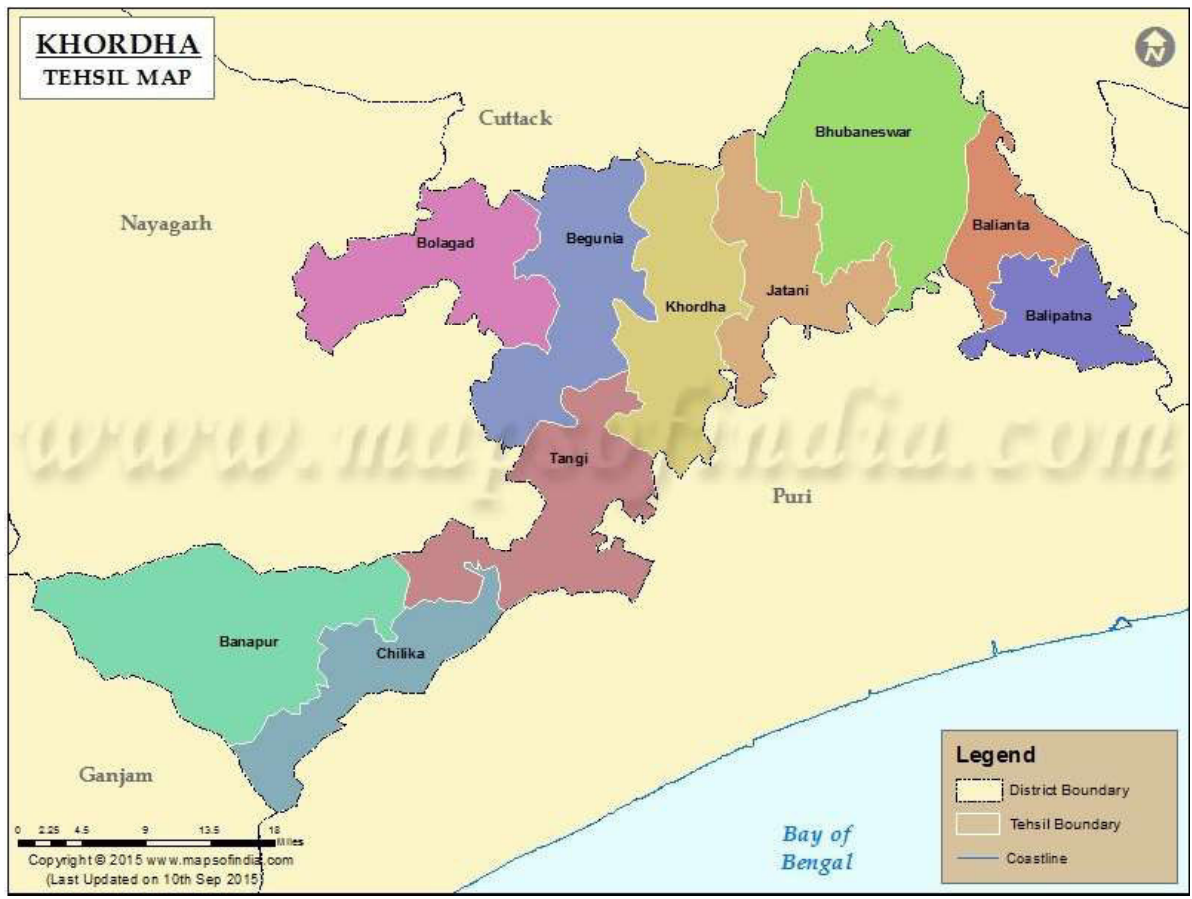
# INDEX MAP



**ODISHA**



### MAP SHOWING THE TAHASILS OF KHORDHA DISTRICT



### MAP SHOWING THE MAJOR ROADS OF KHORDHA DISTRICT

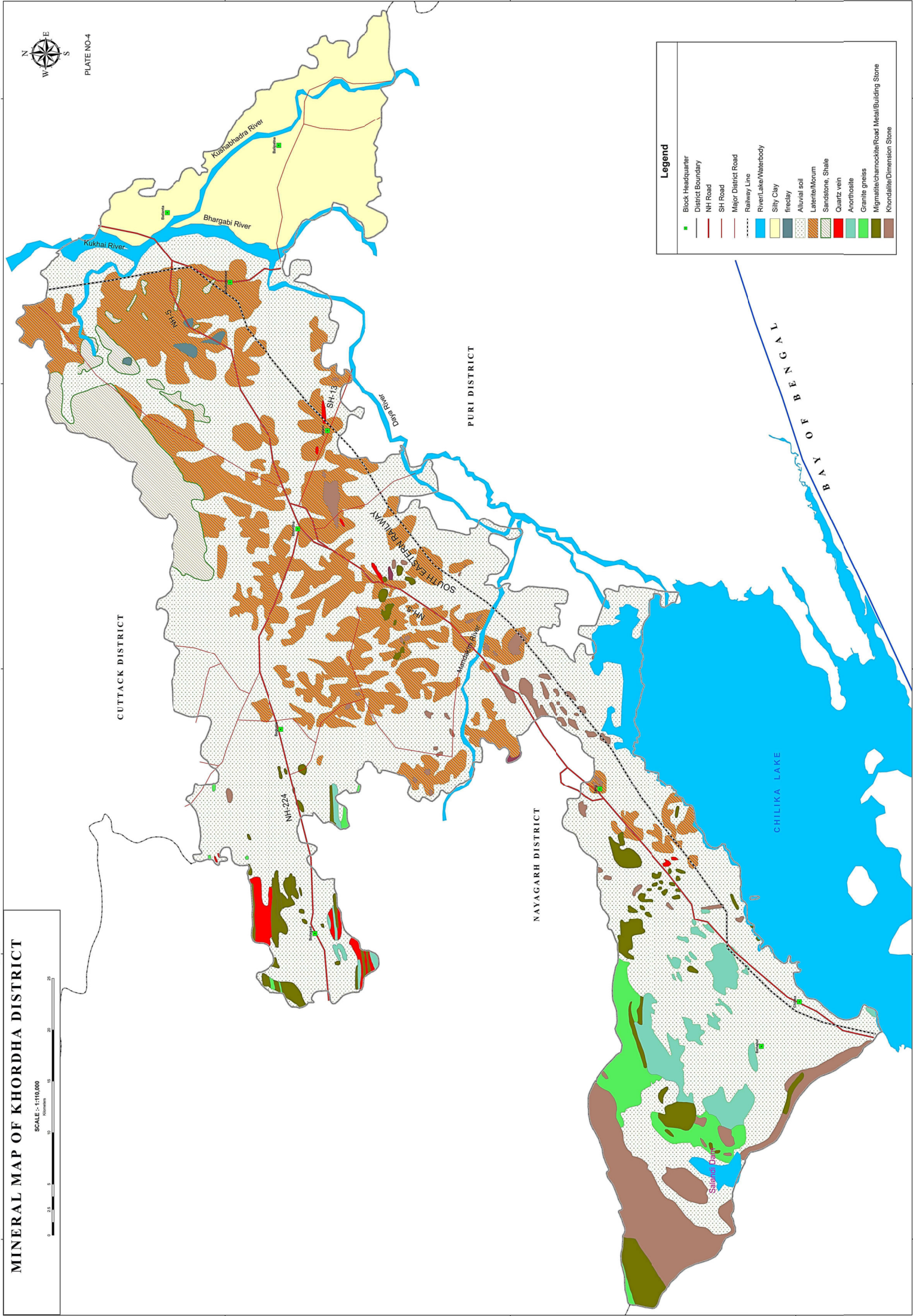


# MINERAL MAP OF KHORDHA DISTRICT

SCALE: 1:110,000

0 2.5 5 10 15 20 Kilometers

PLATE NO-4



## Legend

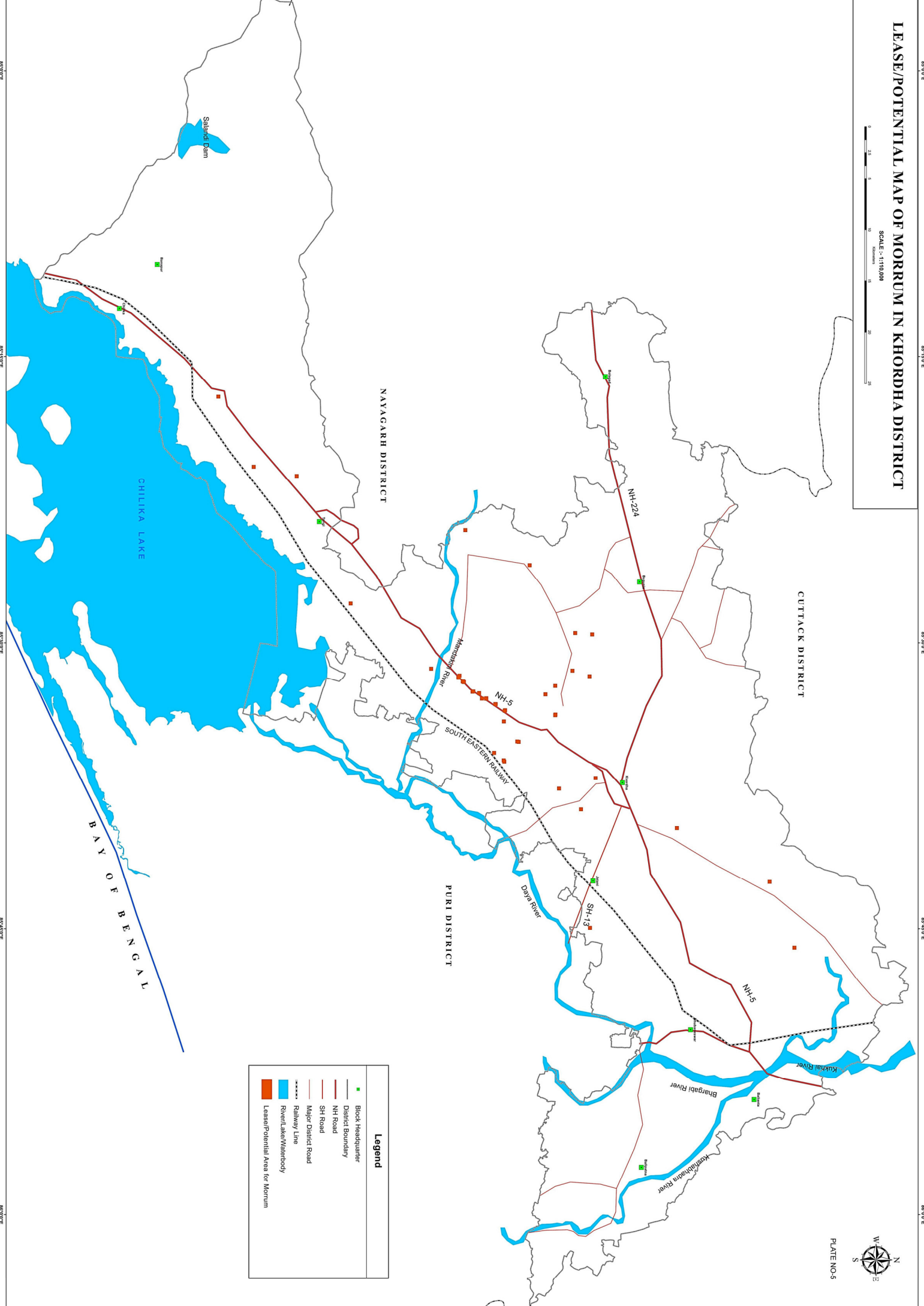
- Block Headquarter
- District Boundary
- NH Road
- SH Road
- Major District Road
- Railway Line
- River/Lake/Waterbody
- Silty Clay
- fireclay
- Alluvial soil
- Laterite/Morum
- Sandstone, Shale
- Quartz vein
- Auriferous
- Granite gneiss
- Migmatite/Charnockite/Road Metal/Building Stone
- Khondalite/Dimension Stone

# LEASE/POTENTIAL MAP OF MORRUM IN KHORDHA DISTRICT

SCALE :- 1:110,000



PLATE NO.5



**Legend**

- Block Headquarter
- District Boundary
- NH Road
- SH Road
- Major District Road
- Railway Line
- River/Lake/Waterbody
- Lease/Potential Area for Morrums



## **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 moorum mining has been prepared in accordance with Clause II of Appendix X of the notification. Every effort has been made to cover moorum mining locations, future potential areas and overview of moorum 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 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 for preparation for district survey report. The main purpose of preparation of the present District Survey Report is to update the possible mineral resources and developing the mining activities along with other relevant data of the district keeping equilibrium with the involved environmental issues.

### **1. INTRODUCTION**

Khordha district has a unique place in history as the last kingdom to be conquered by the British in 1803. Khordha is famous for the Paik revolution of 1817 led by Jai Rajguru and Bakshi Jagabandhu Bidyadhar. The district came into being with effect from 2<sup>nd</sup> October 1992.

Khordha district is located in the south-eastern part of Odisha, adjoining the coastal area. It occupies an area of about 2887.5 sq km. The district is bounded by latitudes 19° 40' to 20° 25' and longitudes is 84° 56' to 86°05' and occupies parts of degree sheets 73 H, L, P & 74 I,A,E. It is surrounded by Cuttack district to the north, Ganjam and part of Puri district to the south, Puri district to the east and Nayagarh district to the west. Bhubaneswar – Vizayanagaram segment of the East-coast railway runs through the district along NE –SW direction. National Highway No. 16 running almost sub-parallel to the East coast railway line, passes through Khordha, the district headquarters and Bhubaneswar the state capital. Khordha is about 30 km from

Bhubaneswar and 12 km from Jatani, the nearest railway station of East coast railway. It has an average elevation of 75 m (246ft).

**2. OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT.**

(a) In khordha district, presently there is one specified minor mineral lease i.e. for decorative stone in Village Tutumberpalli in favour of Sri Maa Granites. The lease area is 3.399 hecets. The lease has been commenced from 22.06.2015 and the lease period is for 20 years. The mining operation of the said lease is currently stopped due to want of Consent to Operate from OSPCB.

There are two other potential sources; one is located at Naranagarh village and the other at Kurumpada village of Khordha Tahasil and both are within the area of ownership of Shree Jagannath Temple Administration, Puri. Both these areas have been reserved by Govt of Odisha for ML to M/s OMC Ltd which would be supplied to Shree Jagannath Temple Administration, Puri for beautification of Puri town.

Another one located at Santasinghpur village over an area of 3.996 hecets has been under PL in favour of Sri Maa Granites which has commenced from dt. 14.02.2017 for 2 years. The final prospecting report along with ML application over the said PL area has been sent to Director of Mines, Odisha, Bhubaneswar for further examination at their end.

(b) Other than specified minor minerals such as river sand, laterite slabs, building stone/black stone/road metals etc. are also available in the district. Most of the building stone/black stone/road metals potentials are located in Khordha, Begunia and Tangi tahasils of the district. Others like laterite, morrum and earth are distributed in almost all tahasils.

**3. GENERAL PROFILE**

Geographical position	Longitude -84° 55' to 86° 5' Latitude- 19° 40' to 20° 25'
Area & Population	The district has an area of 2813 sq. km and 22.52 lakhs of population as per 2011 census. The district accounts for 1.81 percent of the states territory and shares 5.36 percent of the state's population. The density of population of the district is 800 per sq. Km as against 270 person per sq.km of the state. It has 1534 villages (including 178 un-inhabited

	villages) covering 10 blocks. 10 Tahasils and 2 sub-divisions. As per 2011 census the schedule caste population is 297472 (13.2%) and schedule tribe population 115051 (5.1 %). The literacy percentage of the district covers 86.9 against 72.9 of the state.
Climate	The climate condition of 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
Industry & Mining	Khordha is an important centre of handloom industry. The lungi, napkin and saree produced here have an all Odisha market. Besides during the year 2014-15, 2187 nos. of small scale industries have been established with total capital investment of about Rs.10870.89 lakhs with 2176 nos. of Employment generated in the district. The district is also important for mining of minerals like decorative stone (Khondalite), building stone, laterite blocks, morrum & earth.
Power	Consumption of electricity in Khordha district during the year covers 1437.75 million units and revenue villages so far electrified as on 2013-14 is 1343 which constitutes 98.9 % to the total villages of the district.
Tourist Places	There are 19 nos. of tourist center such as Bhubaneswar, Dhauli, Khandgiri & Udayagiri, Nadankanan, Atri, Banapur, Barunei, Bhusandapur, Chilika (Barakul), Hirapur, Jayadev Kenduli, Gadamanitri, Rameswar, Madangiri (Mundiapada), Salia Dam-Barbara Hills, Kosalasuni, Thakuranipitha, Balipatna (Sisu Ananta Pitha), Shree Ananta Purusottam Dev (Jagulaipatna) and Sankat Mochan Mahavir Temple identified by department of Tourism and Culture, Odisha.
Transport & Communication	NH- 162.98 km SH- 25.97km Major district Road- 2555.08 km

	Other district road- 775.74 km Rural road- 1188.89 km Inter village road- 2424.00 km Intra village road- 1471.24 km Besides, 117.39 Kms. of Railway lines with 23 nos. of railway stations and passenger halts are there in the district.
Health	The medical facilities are provided by different agencies like Govt., Private individuals and voluntary organizations in the district. There were 282 nos. of the govt. Allopathic medical institutions with 965 beds facilities, 23 nos. of Homoeopathic dispensaries and 27 nos. of Ayurvedic dispensaries in the district during the year 2013-14.

#### 4. GEOLOGY

Western & south-western part of the district is occupied by the hilly terrain of Eastern Ghats. The hilly area in the west gradually passes on to the low undulating rugged terrain towards the central part of the district. In the northern, eastern and south-eastern sides, the district is surrounded by the flood plain and deltaic deposits of Mahanadi river basin. Parts of Chilika lake and its set of tributaries are the most conspicuous geomorphic features in the south. Daya, Bhargabi, Kuakhai and Kushabhadra rivers, emerging as distributaries from Mahanadi river system, drain southerly through the eastern flank of the district and merge either with the Chilika lake or with the Bay of Bengal. Kaipadar, about 10 km south west of Khurda, marks a water divide with Ran River flowing northerly to Mahanadi and Mandakini river flowing southerly to Chilika. The highest elevation attained in the district is at 568 mts. in its southwestern corner, while Chilika represents the lowest at mean sea level.

The Major geology in the district can be broadly classified into Eastern Ghat Super Group of Archean to Proterozoic age, Proterozoic intrusive, Gondwana Super Group of Mesozoic and Pleistocene to Holocene age of Quaternary period of Cenozoic Era.

The rocks belonging to EGSG are mostly quartzite, khondalite and their variants, charnockite and pyroxene granulite. They are found mostly on the western

and south western parts of the district. The Eastern Ghat Super Group of rocks have been intruded by plugs/apophyses of anorthosite, popularly known as Banpur anorthosite/ Chilika lake complex, and are found as cluster of anorthosite bodies around Banpur, Rambha and Balugaon region in the southern & western side of Chilika lake and partly within the lake also. This pluton is emplaced in the core of an antiform (Perraju, 1960). Sarkar et al. (1981) deciphered 3 phases of folding ( $F_1$ - $F_3$ ) in the khondalite host rocks and considered emplacement of anorthositic complex syntectonically with  $F_3$ . Xenoliths of metasediments (khondalite and calc-silicate gneisses) and charnockite in anorthosite and locally developed pyroxene hornfels grade skarn zones indicate the intrusive nature of the complex.

The rocks of Eastern Ghat Supergroup show foliation in NE-SW direction. Joint planes, wherever present, follow the same structural alignment. A prominent fault running ENE-WSW is recorded in north-western part of the district. Major lineaments trend in NE-SW direction. The NE-SW trending lineament passing through Baghamari houses a sulphurous hot spring at Atri and is of immense tectonic significance.

Granite gneiss of Archean to Proterozoic age, exposed in the western part of the district, are well foliated and are often garnetiferous. Quartz veins cut across the granulitic country at random.

The exposures belonging to Athgarh formation of Upper Gondwanas (Lower Cretaceous) mostly occur as a cluster forming upland in the north, NE parts of the district, i.e. west of Bhubaneswar. They are comprising dominantly of sandstones classified as quartz arenite, sub-lithic arenite and lithic wacke (Mishra, 1988; Pal, 1990), characteristically lacking in feldspars in clastic components. This also includes conglomerates, grits, carbonaceous shale, variegated shale and fire clay; most of them as small lenticular bodies breaking the monotonous vastness of sandstones. Deep drilling in the coastal Odisha has indicated the extension of the formation below the alluvial cover of the Mahanadi delta and the coastal Tertiary succession (Pandya et al. 2000).

The earliest Quaternary deposit, the Bolgarh formation (Pleistocene age) occupies central and northern part of the district, overlying the khondalite group of rocks. It comprises hard crust laterite, latosol and also residual soil.

Brahmani formation (Pleistocene to Holocene) consists of residual soil and alluvium and occupies an appreciable part of the district and are particularly conspicuous in the eastern and southern part of the district adjoining Chilika lake.

Bankigarh formation (Middle to Late Holocene) is occupied by north and NE part of the district i.e. east of Bhubaneswar. It mostly comprises brownish silty clay and occur in the flood plain / deltaic plains of Mahanadi River basin.

The district lacks any major mineral deposit of economic significance. Few fire clay deposits located in the north-eastern part of the district are the only deposits of minor minerals that are being mined presently by Tata Refractories Ltd. The other deposits that are being profusely exploited as Dimension and decorative stone for construction material/polished slabs and artisan grade of khondalite around Tapanga and Kurumpada area.

Ground water occurs in the porous sedimentary formations and in the fractured igneous and metamorphic rocks in unconfined to confined conditions. The nala and gully erosion in the tributaries and distributaries of Mahanadi river basin and in Chilika lake are quite common.

**Stratigraphy:**

Phanerozoic	Quarternary	Mid to Late Holocene	Bankigarh Fm	Brownish silty clay
		Pleistocene to Holocene	Brahmani/ Mahanadi Fm	Residual soil and alluvium
		Pleistocene	Bolagarh Fm	Laterite/Latosol
	Gondwana Sup Gp	Lr Cretaceous	Athagarh Fm	Sandstone, Shale
Precambrian	Archean to Proterozoic	Eastern Ghat Sup Gp		Quart vein Granite gneiss Anorthosite Chanockite gp of rocks Khondalite gp of rocks Quartzite

## 5. DRAINAGE AND IRRIGATION PATTERN.

The drainage of the district is mainly controlled by rivers like Kuakhai, Kusabhadra, Bhargavi & Daya. Detail of the river system is narrated below.

S L NO	NAME OF RIVER	PLECE OF ORIGIN	ALTITUDE OF ORIGIN	TOTAL LENGTH IN THE DISTRICT (IN Km)	Area drained (sq.km)	%GE AREAS DRAINED IN THE DISTRICT	PROCESS OF DEPOSITION OF SEDIMENTS
1	Kushabhadra	Bhubanapur (khorda dist)	11.8m	30.0km	212.32sq.km	48.86%	Slow (7000 cum from 15-16 to 18-19)
2	Bhargavi	Balakati ( khordha dist )	7.80 m	14.0 km	Nil	Nil	Slow(25000 cum from 15-16 to 18-19)
3	Kuakhi	Mukameswra	25.92 m	26.500	21.85	45.60	Moderate
4	Daya	Nathapur	18.180 m.	10.100	10.10	51.80%	slow
5	Malaguni	Baunshagarh (nayagarh dist)	21.20m	35	8.40	62.50%	slow
6	Hada	Hatibari (Nayagarh dist)	19.80m	14	0.92	60.87%	No deposition
7	Kusumidhar	Randa (khordha dist)	60m	33	1.32	100.00%	No deposition

During the year 2013-14, it is reported by District Agriculture Officer that the irrigation potential created during Kharif and Rabi are 52655 hectares and 20346 hectares respectively from all sources.

## 6. LANDUSE PATTERN

SI No	Landuse	Area in '000Ha
1	Forest Area	62
2	Misc.Tree & Groves	10
3	Permanent Pasture	5
4	Culturable Waste	8
5	Land Put to Non Agril Use	45
6	Barren & Unculturable Land	15
7	Current Fallow	21
8	Other Fallow	6
9	Net Area Sown	108
10	Mining	1
	Geographical Area	281

## 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	0.4	0.10	0.10	0.06
Maximum	14.2	6.20	9.15	12.60

## 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<sup>o</sup>-8<sup>o</sup> C during peak winter.

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

MONTH – WISE RAINFALL (mm) DATA OF KHORDHA DISTRICT (LAST 5 YEARS)													
Year/ Month	April	May	June	July	August	Sept	Oct	Nov	Dec	Jan	Feb	March	Total
15-16	72.2	14.7	135.2	225.1	252.9	198.9	43.3	4.8	3.6	0.6	3.5	9.2	964
16-17	0.7	87.9	138.64	262.83	291.25	299.37	75.9	15.4	0	0.7	0	52.7	1225.39
17-18	10.26	17.58	164.93	402.23	313.31	239.07	249.3	59.96	20.02	0	0	0	1476.66
18-19	51.89	136.37	162.23	577.66	296.79	333.66	234	2	17.02	11	8.6	11.8	1843.02
19-20	23.48	185.59	140.48	370.29	317.46	426.77	328.23	2.12	0	12.2	50.32	28.47	15792.93
Avg.	31.706	88.428	2929.8	367.622	294.342	299.554	186.146	16.856	8.128	4.9	12.484	20.434	4260.4

## 9. DETAILS OF MINING LEASES

Attached in the Annexure.

## 10. DETAILS OF ROYALTY COLLECTED

Sl.No	Name Of Tahasil	2015-16	2016-17	2017-18	2018-19	2019-20
1	Khordha	0	0	0	0	0
2	Bolagarh	0	0	0	0	0
3	Tangi	0	0	0	0	0
4	Chilika	0	0	0	0	420
5	Begunia	0	0	0	0	0



<b>6</b>	Jatni	0	0	0	0	0
<b>7</b>	Balianta	0	0	0	0	0
<b>8</b>	Balipatana	0	0	0	0	0
<b>9</b>	Bhubaneswar	0	0	0	0	0
<b>10</b>	Balugaon	0	0	0	0	0
<b>TOTAL</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>420</b>

Penalty collected in Rs

Sl.No	Name Of Tahasil	2019-20
1	Chilika	99580

## 11. DETAILS OF PRODUCTION OF MINOR MINERAL

Yearwise Production of Morrum in cum

Sl.No	Name Of Tahasil	2015-16	2016-17	2017-18	2018-19	2019-20
<b>1</b>	Khordha	0	0	0	0	0
<b>2</b>	Bolagarh	0	0	0	0	0
<b>3</b>	Tangi	0	0	0	0	0
<b>4</b>	Chilika	0	0	0	0	12
<b>5</b>	Begunia	0	0	0	0	0
<b>6</b>	Jatni	0	0	0	0	0
<b>7</b>	Balianta	0	0	0	0	0
<b>8</b>	Balipatana	0	0	0	0	0
<b>9</b>	Bhubaneswar	0	0	0	0	0
<b>10</b>	Balugaon	0	0	0	0	0
<b>TOTAL</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>

## 12. MINERAL MAP OF THE DISTRICT

Attached as Plate No 4.

## 13. LIST OF LOI HOLDERS ALONG WITH VALIDITY

Attached in the Annexure.

## 14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT

Total mineral reserve of moorum is 3971431 cum which may increase after detail investigation.

Details of the potential areas submitted as Annexure.

List of co-ordinates of the sources is attached as Annexure.

## 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 2 lakh cum of moorum and will be mainly supplied from Khordha, Jatani, Begunia, Banapur and Tangi tahasils of the district.

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

Attached as Plate No 5.

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

Nil

## **20. DETAILS OF ECO-SENSITIVE AREA**

Eco-Sensitive Zone of Chandaka-Damapada Wildlife Sanctuary, Nandankanan zoo and Chilika are located within the district.

## **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 machines and movement of machineries/ vehicles produce NOx , 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 actives 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 it's 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.
- 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 haul roads, excavation sites 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.

## **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.

#### **TUBERCULOSIS DATA RNTCP KHORDHA**

<b>YEAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>TOTAL</b>
<b>15-16</b>	95	85	83	93	87	75	86	79	78	92	88	84	<b>1025</b>
<b>16-17</b>	96	84	86	88	78	69	104	103	98	118	115	128	<b>1167</b>
<b>17-18</b>	127	113	130	142	102	105	97	83	84	121	102	140	<b>1346</b>
<b>18-19</b>	160	156	124	121	119	116	98	124	123	117	142	130	<b>1530</b>
<b>19-20</b>	162	142	119	152	140	156	138	130	120	150	150	142	<b>1701</b>
<b>TOTAL</b>	640	580	542	596	526	521	523	519	503	598	597	624	<b>6769</b>
<b>AVG.</b>	<b>128</b>	<b>116</b>	<b>108</b>	<b>119</b>	<b>105</b>	<b>104</b>	<b>105</b>	<b>104</b>	<b>101</b>	<b>120</b>	<b>119</b>	<b>125</b>	<b>1354</b>

There is no case of Silicosis found in khordha 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



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			16			17
SL NO	NAME OF TAHASIL	NAME OF SOURCE	STATUS	KHATA NO	PLOT NO	AREA IN AC/HA	NAME OF MINOR MINERAL	NAME OF LESSEE	ADDRESS & CONTACT NO OF LESSEE	DATE OF REGISTRATION OF LEASE DEED	NO & DATE OF GRANT OF ENV CLEARANCE	NAME OF SUCCESSFUL BIDDER	ADDRESS & CONTACT NO OF SUCCESSFUL BIDDER	LONGITUDE			LATITUDE			RESERVE IN CUMAS PER MINING PLAN
														DEGREE	MINUTE	SECOND	DEGREE	MINUTE	SECOND	
1	Khordha (SJTA)	Dakshineswar Gha	LOI	536/3	240	4.98 Ha.	MORRUM					Sri Raiballav Mohanty	Radhaballav Sahi, Khordha	85	29	34.12	20	9	34.83	61482
2	Khordha (SJTA)	Nijagarhtapangka	LOI	832/1	2054	2.48 Ha.	MORRUM					Sri Jagadish Sankar Sahoo	Satya Multiplex Pvt. Ltd., At-N6/321, IRC Village, Nayapalli,	85	36	14.13	20	4	58.53	40000
3	Khordha (SJTA)	Nijagarhtapangka	LOI	832/1	2056 (P)	2.47 Ha.	MORRUM					Raja Kishore Dash	Plot No-663, Bijipur, Toman	85	36	10.11	20	4	56.39	55098

													do, Khordh a								
4	Khord ha (SJTA)	Narsh inghp rasad Ka	LOI	377 /6	76	4.68 Ha.	MOR RUM						Sri Jag adis h San kar Sah oo	Sat ya Multi plex Pvt. Ltd., At- N6/32 1, IRC Villag e, Naya palli,	85	35	46 .7 8	20	4	26 .0 9	72808
5	Khord ha (SJTA)	Palla	New	930	16 45	0.60 7Ha.	MOR RUM								85	37	6. 35	20	9	45 .1 8	13354
6	Khord ha (SJTA)	Mund aamb a	New	271 /77	46 8/ 96 6	1.35 2 Ac	MOR RUM								85	31	43 .1	20	2	37 .7	12036
7	Khord ha (SJTA)	Mund aamb a	New	64	46 9	2.08 5 Ac	MOR RUM								85	31	49 .3	20	2	33 .7	18564
8	Khord ha (SJTA)	Mund aamb a	New	268 /37 5	46 9/ 12 56	1.04 3 Ac	MOR RUM								85	31	50	20	2	34 .2	9286
9	Khord ha (SJTA)	Jankia	New	389 /50 6	38 /2 58 0	0.28 1 Ac	MOR RUM								85	32	1. 9	20	2	49 .2	2501

10	Khordha (SJTA)	Mundaamba	New	268/226	47/1108	0.651 Ac	MORRUM							85	32	2.6	20	2	48.9	5797
11	Khordha (SJTA)	Kalibeti	New	268/378	46/1257	1.042 Ac	MORRUM							85	32	2.1	20	2	48.2	9277
12	Khordha (SJTA)	Mundaamba	New	389/523	38/298	0.281 Ac	MORRUM							85	32	2.1	20	2	47.9	2501
13	Khordha (SJTA)	Guntuni	New	389/498	220/1832/2573	0.164 Ac	MORRUM							85	32	3.1	20	2	50.4	1461
14	Khordha (SJTA)	Guntuni	New	389/281	49/2194	0.080 Ac	MORRUM							85	32	3.7	20	2	51.2	713
15	Khordha (SJTA)	Motalahanga	New	485	477	0.290 Ac	MORRUM							85	32	4.1	20	2	51.4	2583
16	Khordha (SJTA)	Motalahanga	New	489	1041	6.060 Ac	MORRUM							85	32	34.2	20	3	18.1	53953
17	Khordha (SJTA)	MotaGodipada	New	518/96	143	0.270 Ac	MORRUM							85	32	33.4	20	3	21	2405
18	Khordha (SJTA)	MotaGodipada	New	11	607	0.140 Ac	MORRUM							85	32	38.5	20	3	39.3	1247
19	Khordha	Mota	New	385	215,	1.970 Ac	MORRUM							85	32	39.4	20	3	39.3	17538

	(SJTA)				29 5														
20	Khord ha (SJTA)	Godip ada	New	518 /11 9		0.25 7 Ac	MOR RUM						85	32	55 .8	20	3	47 .8	2288
21	Khord ha (SJTA)	Lahan ga	New	518 /13 8	42	0.50 0 Ac	MOR RUM						85	32	55 .3	20	4	1. 1	4451
22	Khord ha (SJTA)	Mota	New	460	20 1, 27 7, 27 8, 31 6, 34 3, 34 6, 37 5, 37 6, 37 7, 38 0, 38 2, 11 60	3.54 5 Ac	MOR RUM						85	32	55 .6	20	4	1. 5	31561
23	Khord ha (SJTA)	Mota	New	312	12 99	0.14 5 Ac	MOR RUM						85	32	56 .1	20	4	1. 4	1291
24	Khord ha	Goda	New	533	41	0.32 5 Ac	MOR RUM						85	32	56 .1	20	4	1. 2	2893

	(SJTA)																			
25	Khordha (SJTA)	Malipada	New	655		1.114 Ac	MORRUM							85	32	55.9	20	4	1.8	9918
26	Khordha (SJTA)	Malipada	New	434	1925	0.780 Ac	MORRUM							85	32	55	20	4	2	6945
27	Khordha (SJTA)	Kanpur	New	107		1.948 Ac	MORRUM							85	33	13.6	20	4	31.2	17343
28	Khordha (SJTA)	Malipada	New	207	313	1.000 Ac	MORRUM							85	33	13.6	20	4	30	8903
29	Khordha (SJTA)	Gudum	New	280	68	0.377 Ac	MORRUM							85	33	13.4	20	4	29.7	3357
30	Khordha (SJTA)	Government Land	New	282	468	10.000 Ac	MORRUM							85	33	32.9	20	5	0.7	89032
31	Khordha (SJTA)	Nijigarh Tapaning	New	226		2.745 Ac	MORRUM							85	34	7.9	20	4	56.8	24440
32	Khordha (SJTA)	Nijigarh Tapaning	New	832/1	2052, 1012	43.535 Ac	MORRUM							85	33	34.2	20	4	59.6	387605
33	Khordha (SJTA)	Mundaamba	New	68		0.755 Ac	MORRUM							85	35	11	20	5	39.3	6721
34	Khordha (SJTA)	Lahanga.	New	430	61	0.880 Ac	MORRUM							85	35	12	20	5	43.5	7834

35	Khordha (SJTA)	Malipada	New	72 6/2	13 45	35.4 10 Ac	MOR RUM							85	33	46 .3	20	7	39 .4	215264
36	Khordha (SJTA)	Kaipadar	New	124 7/1 1	19 03 , 19 09 , 19 27 , 19 20	44.1 15 Ac	MOR RUM							85	33	48 .2	20	7	38 .7	292768
37	Khordha (SJTA)	Baniyatangi	New	696 /24	12 23 , 12 24	24.6 80 Ac	MOR RUM							85	37	39 .4	20	7	50 .2	119734
38	Khordha (SJTA)	Kaipadar	New	124 7/1 1	23 55 , 23 56	40.9 5 Ac.	MOR RUM							85	32	42 .6	20	7	8	264588
39	Khordha (SJTA)	Dakshineswar	New	536 /3, 537	18 54 , 19 14 , 19 15 , 18 95 , 19 06	89.6 2 Ac.	MOR RUM							85	29	29 .6	20	8	41 .6	497940

40	Khordha (SJTA)	Dalatala	New	214/1	569,567	60.11 Ac.	MORRUM							85	31	27.5	20	8	32.6	435260		
41	Khordha (SJTA)	Radhakantpur	New	250/1	1,3	44.640Ac.	MORRUM							85	31	45.3	20	9	26.4	297320		
42	Jatani (SJTA)	Kantiana	New	1036/53	3641	33.460 Ac.	MORRUM							85	44	58.2	20	9	28.1	14299		
43	Khordha	Kalibeti Morrum quarry	New	282	468	Ac.10.000	MORRUM							20	2	48.6	85	32	15.8	80000		
44	Jatani	Palasapur	LOI	363	129	5 AC	MORRUM							M/s Agrawal Infrabu Ltd.	1 <sup>st</sup> Floor, VR Plaza, Link Road, Bilaspur, CG	85	3	48.7	20	14	59.84	120428
45	Jatani	Paniora	LOI	315	1112	1.845 ac.	MORRUM							M/s Agrawal Infrabu	1 <sup>st</sup> Floor, VR Plaza, Link Road,	85	39	44.1	20	14	1.26	53250

												ild Pvt Ltd.	Bilasp ur, CG								
46	Jatani	Harid amad a	LOI	311	10 4	5 AC	MOR RUM					M /s Agr aw al Infr abu ild Pvt Ltd.	1 <sup>st</sup> Floor, V R Plaza , Link Road , Bilasp ur, CG	85	38	45 .1 6	20	8	59 .8 3	209109	
47	Bhub anes war	Jaga nnat h Prasa d	LOI	46 6	23 11	2.30 Ac	MOR RUM					M /s Agr aw al Infr abu ild Pvt Ltd.	1 <sup>st</sup> Floor, V R Plaza , Link Road , Bilasp ur, CG	85	46	0. 13	20	20	10 .1 2	26232	
48	Bhub anes war	Bhag abati pur	LOI	21 9	28 3	5.00 Ac	MOR RUM					Hem anta Kum ar Routr ay	Aigini a, Bhub anes war, Khord ha	85	42	33 .7 7	20	18	52 .4 3	42699	



																					Mob: 94370 16451															
49	Tangi	Talag adakhudi	New	226	15 5( P)	2.00 Ac	MOR RUM									85	21	15 .3 5	19	54	5. 45	12000														
50	Tangi	Gaya bandha	New	309 /10 1,3 09/ 112	60 5/ 12 20  75 1	1.05 0 Ac, 0.51 0 Ac	MOR RUM									85	31	21 .3 8	20	0. 4	44 .3 4	12526														
51	Tangi	Gop alprasad	LOI	714	60 5	4.80 0 Ac	MOR RUM						Prah allad Biswal	At- Kaithip alla, Dist- Khord ha		85	20	46 .4	19	51	50 .6	69930														
52	Tangi	Rasul pur	LOI	286	88 7	4.37 5 Ac	MOR RUM						Nare ndra Nath Sing h	At- Jaripa da Dist Cutta ck		85	27	57 .2	19	56	55 .5	73738														
53	Banpur	Bada padar	New	33 0	15 8	6.50 0 Ac	MOR RUM									85	17	6. 92	19	49	59 .2 9	54000														
54	Begunia	Khadi padar	New	31 7	10 23	14.9 87	MOR RUM									85	24	6. 2	20	2	56 .0 8	48520														
55	Begunia	Manik apur atana	New	14 3	15 4	0.42 Ac.	MOR RUM									85	25	56 .4 5	20	6	18 .1 9	1360														
56	Begunia	Kuru ma	New	50 4	58 1	13.3 75	LATE RITE									85	28	12 .6	20	05	49 .4	43280														

						Ac.										4			1	
<b>TOTAL</b>																			39,71,431	