



DISTRICT SURVEY REPORT (DSR)
OF
GAJAPATI DISTRICT, ODISHA
FOR
SAND SAIRAT SOURCES
(DRAFT COPY)

(FOR PLANNING AND EXPLOITING OF MINOR MINERAL RESOURCES)

As per Notification No.- S.O. 3611(E), New Delhi,

25th July, 2018

MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE

(MoEF & CC)

Submitted By:

COLLECTORATE, GAJAPATI

PREAMBLE

Odisha is one of the Major Mineral rich States in India. Gajapati is a unique District in Odisha lies on the Southern most part of the State with rich and varied mineral resource. It is a paradise for Geo-scientists of India and abroad. It has preserved many important rock groups from the earliest of crust formation to the geologically recent times. The land mass constituting the Gajapati District, explorers to many Entrepreneurs on account of its diverse geological setting and rich and varied mineral resources.

In pursuance of MoEF& CC Notification S.O. 141(E) dated 15th Jan. 2016, District Environment Impact Assessment Authority (DEIAA) & District level Expert Appraisal Committee (DEAC) has been formed for Category-B₂ Minor Minerals having area less than or equal to 5ha. Prior to the formation of Odisha Minor Mineral Concession Rule 2004, (OMMCR-2004) the mining operation form in or mineral were carried out in un-scientific manner. Identifying this fact in exercise of power, Conferred by Section 15 by Mines and Minerals (Development and Regulation) Act 1957 as amended in 2015 and all other powers enabling it in that behalf, the industry Mines & Geology Department, Govt. of Odisha framed the aforementioned rule, which has been amended with period of times in the year 2014, 2015 and 2016.

Keeping in view of experience gained in period of decade, the MoEF & CC came out with Environmental Impact Assessment Notification S.O.-1533(E) dated 14th Sept. 2006. It has been made mandatory to obtain environmental clearance for different kinds of development projects as listed in Scheduled-I of notification. Further, pursuance of the order of Hon'ble Supreme Court Petition (C) No. 19628-19629 of 2009, dated 27th Feb, 2012. In the matter of Deepak Kumar etc., Vs State of Haryana and others etc., Prior

Environmental Clearance has now become mandatory for mining of Minor Minerals irrespective of the area of Mining Lease. And also in view of the Hon'ble National Green Tribunal, order dated the 13th Jan, 2015 the matter regarding Sand, Brick Earth, & Burrowed Earth cutting for Road Construction has to take prior E.C. for Mining Lease irrespective of the fact that whether the area involved is more or less than 5 hectares. They also suggested for making a policy on E.C for minor minerals lease in cluster.

MoEF & CC in consultation with State Government has prepared Guidelines on Sustainable Sand Mining & Minor minerals other than sand mining in 2016, detailing the provisions on Environmental Clearance for cluster creation of District Environmental Impact Assessment Authority (DEIAA) & proper monitoring of Minor Minerals mining, using Information Technology to track the mineral out material from source to destination.

DEAC will scrutinize and recommend the prior environmental clearance of mining of minor mineral to DEIAA on basis of District Survey Report. This will model and guiding document which is a compendium of available mineral resources, geographical set up, Environmental and Ecological set up of the District and replenishment of minerals and is based on data of various departments, published reports, Journal and websites. Subsequently, Hon'ble Supreme Court vide their order dt. 18.01.2022 in connection with Civil Appeal Nos. 3661-3662 of 2020, the State of Bihar and others Vrs - Pawan Kumar and others at Paragraph 14". We therefore find it appropriate to substitute the directions issued by Tribunal vide judgment and order dated 14th October, 2020 with the following directions,

- i. The exercise of preparation of DSR for the purpose of mining of the State of Bihar in all the Districts shall be under taken afresh. The Draft DSRs shall be prepared by the Sub-Divisional Committees consisting of the Sub-Divisional Magistrate, Officers from Irrigation Department, State Pollution Control Board or Committee, Forest Department, Geological or Mining Officer. The same shall be prepared by undertaking site visits and also using by modern technology. After the Draft DSRs are prepared the District Magistrate of the concerned Districts shall forward the same for examination and evaluation by the SEAC. The same shall be examined by the SEAC and its report shall be forwarded to SEIAA. The SEIAA will thereafter consider the grant of approval such DSRs.
- ii. Needless to state that while preparing DSRs and appraisal thereof by SEAC and SEIAA. It should be ensured that a strict adherence to the procedure and parameters laid down in the policy of January-2020 should be followed.

The District Survey Report will form the basis for application for Environmental Clearance, preparation of reports and appraisal of projects. District Survey Reports are to be reviewed once in every five years as per statute.

In lieu of above guideline and orders of Hon'ble Supreme Court and in compliance to the orders of Hon'ble NGT, EZ, Kolkata, in connection with O.A No. 63/2020, the Member Secretary of SEIAA, Odisha, Bhubaneswar issued a Letter on 27th December, 2022 to Collector & District Magistrate, Gajapati with a direction "the DSR is to be signed a fresh by the Collector and District Magistrate, along with members of the designated sub-committee consisting of Sub-Divisional Magistrate, and District Level Officers from Irrigation Department, State Pollution Control Board, Forest Department, Geology and / or Mining Department. Keeping in view of the orders of Hon'ble Supreme Court, Hon'ble NGT and directions of SEIAA, Odisha. Bhubaneswar a fresh DSR has been prepared observing all formalities in the year, 2023

The Main objective of the preparation of District Survey Report is to ensure the

following:-

1. Identification of Mineral Resources in the District.
2. Identification of areas of minor minerals having the potentiality where mining can be allowed.
3. Identification of area and proximity to infrastructure and installations where mining should be prohibited.

INTRODUCTION

1.0. Gajapati District at a Glance:

1.1. Location and Geographical Area:

Gajapati district has been named after Shri Krushna Chandra Gajapati Narayan Deo, the Ex- Raja Saheb of Paralakhemundi Estate (The first prime minister of Odisha State), who is remembered for his contribution in formation of a separate Odisha Province and inclusion of Paralakhemundi Estate in Odisha. It got a district status on 2nd October 1992 after bifurcation of Ganjam district. It was a sub-division in Ganjam and yet it is only sub-division in Gajapati district. Paralakhemundi is the District Head Quarter of Gajapati district, spreading over an area of 4325 sq.km lies between 18° 46' North and 19° 39' North latitudes and 83° 48' and 84° 27' East longitudes. The District is surrounded by Andhra Pradesh state in its South, Ganjam District in its East, Rayagada District in its West and Kandhamal in its north side. This District consists of one Sub-Divisions namely Paralakhemundi. There are 7 Tahasils for 7 Blocks, 1534 Villages, 149 Gram Panchayat and 11 Police stations of the District. Paralakhemundi is the main town of the District and is also its centre of economic growth. The primary occupation of people in the District is cultivation. This District is mainly known for cultivation of Maize. Agriculture and Tourism are the major revenue sources of Gajapati District. Gajapati District gains a large amount of its revenue through the agricultural sector. Also agro-Processing and horticulture industries add to the economic wealth of this region. Economy of Gajapati District is agrarian in character. Except a few agro-processing units, there is no major industry in the District. However, some activities of cottage industries like Horn work, Jaikhadi bag, Cane and bamboo work, Ganjappa card and

Mukha Pattachitra, Broom work and Siali leaf plate making and Tibetan Woolen Carpet contribute to the economy of the District. Being an agrarian economy, agriculture is the main stay of the people of Gajapati District. It is in the coastal section of Odisha blessed with hot and humid climate, with alluvium soil and intersected by the perennial rivers, which collectively provides conducive infrastructure for the growth of agriculture in the region. Rice, Pulses, oil seeds like groundnut, mustard, castor and linseed are grown in the District of Gajapati. The District has a rich mineral base of soft stones, lime stone, stone chips are available in the District, which are mainly used in industrial units in the District. The huge deposits of granite stones at different regions provides tremendous scope for development of few more industries based on this resources. Except these, no minerals in large quantity which can be explored for commercial purpose found in the District.

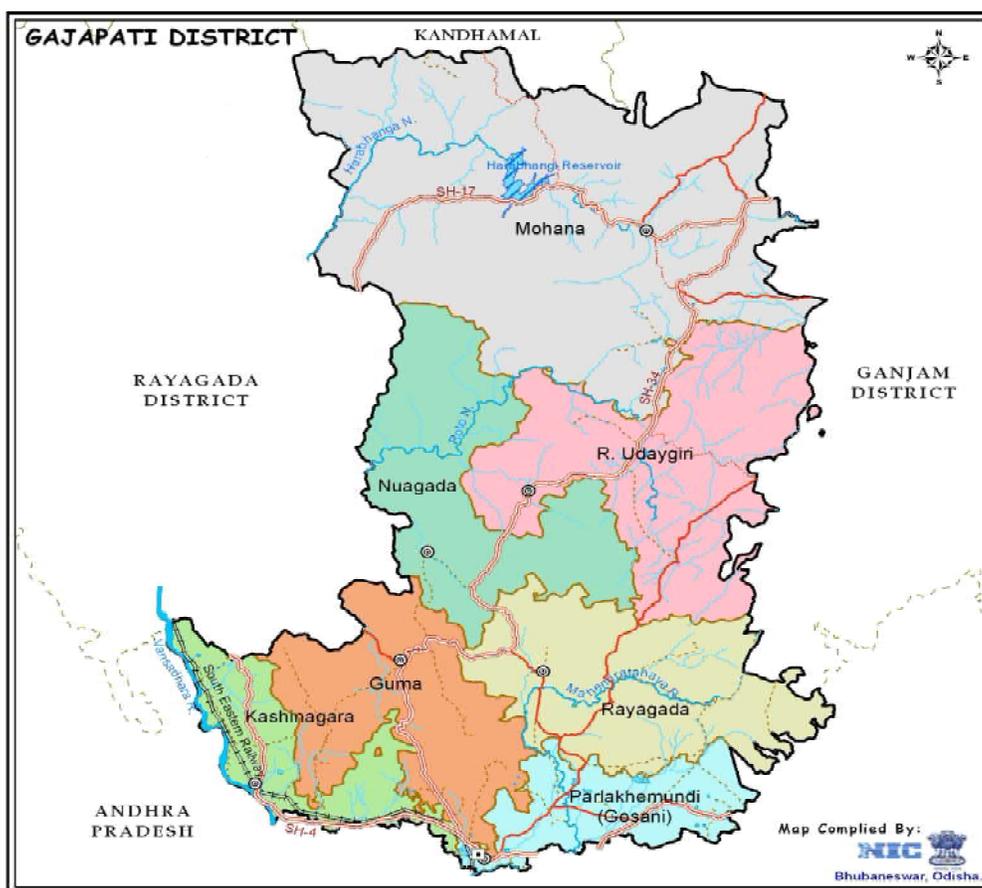
ODISHA



1.2. Administrative Units:-

Paralakhemundi is the administrative headquarter of Gajapati District. It is located at a distance of 194 Km from Bhubaneswar, State capital of Odisha. It has 1534 villages covering 7 Blocks, 7 Tahasil and 1 sub- Division, namely Paralakhemundi . The 7 Blocks and Tahasils are namely,

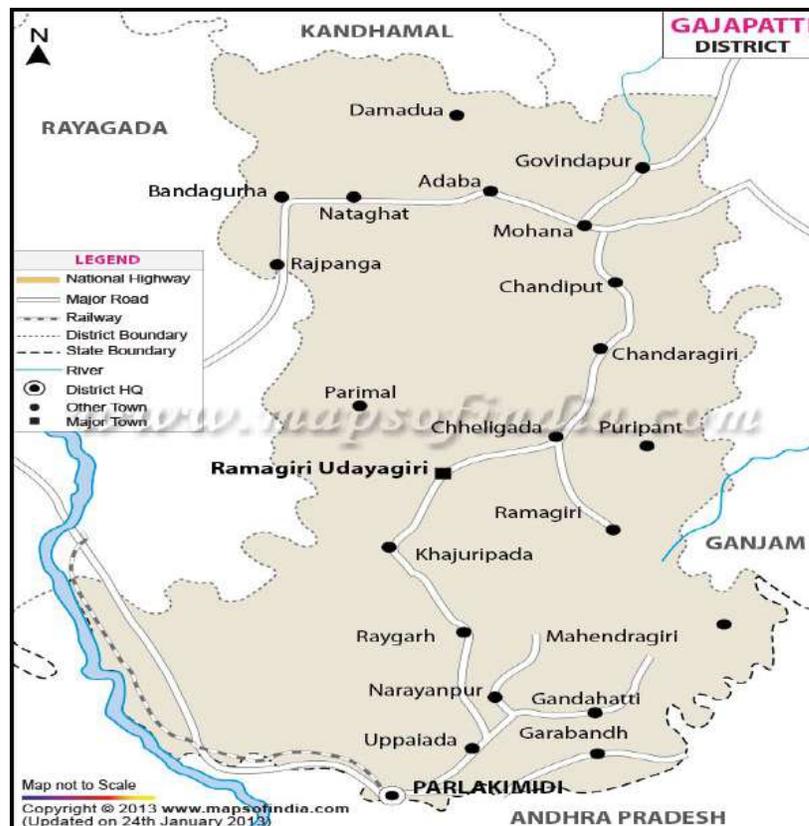
i) Paralakhemundi, ii) Kashinagar, iii) R Udayagiri, iv) Mohana, v) Rayagada, vi) Nuagada, vii) Gumma. Total population of the Gajapati District (2011 census) was 5,77,817 comprising total 2,82,882 male population and 2,94,935 female population. Total SC population of the District is 39,175 and total ST population of the District is 3,13,714.



1.3 Connectivity Facilities:-

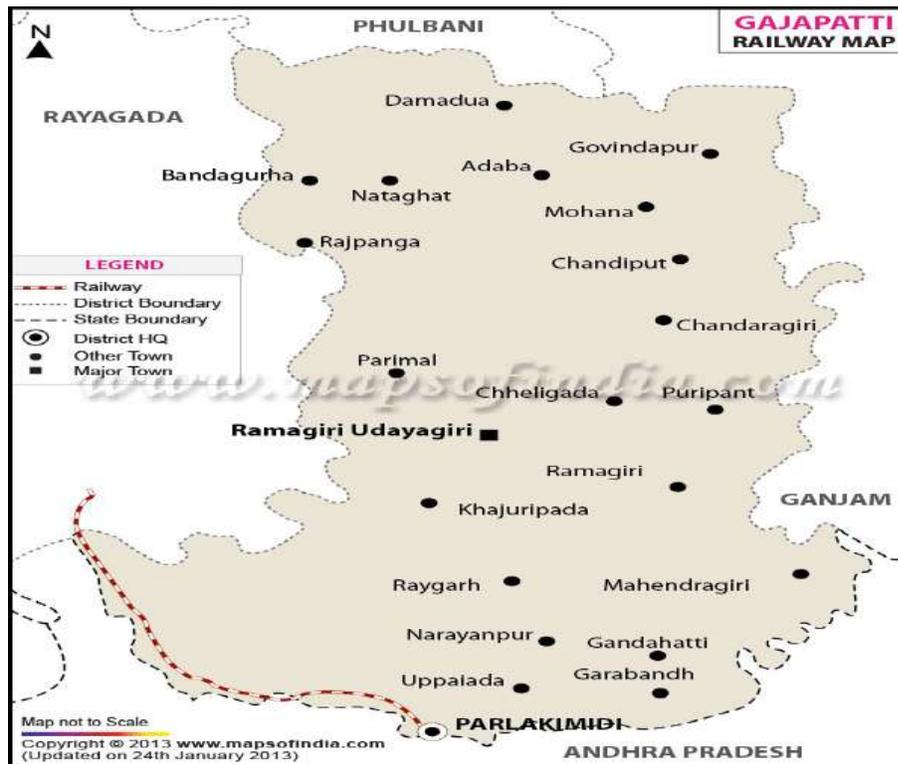
1.3.1 Road Network:

The District is well served by a network of good roads and has been called the motorists paradise. The chief roads emanating from Gajapati town are NH-326A and SH-4 passes the District. Gajapati is 120 Kms from Brahmapur, 206 Kms from Bhubaneswar, 136 Kms from Visakhapatnam. It is also connected with other cities such as Rayagada, Nawarangpur, Malkangiri, Puri, Palasa, Brahmapur and Visakhapatnam via Odisha State Road Transport Corporation and some private transport services.



1.3.2 Rail Network:

Gajapati District is partially connected by Rail link to different places, Paralakhemundi Railway Station is an important station of this district. The distance to Visakhapatnam is approximately 232 km, while the distance to Bhubaneswar is about 206 km; from the city of Gajapati is well connected to many places in the state.



1.3.3 AirNetwork

At present, Gajapati has no connection by Airway. Nearest air port is Biju Patnaik Airport, Bhubaneswar, 200 Kms from Gajapati and Visakhapatnam International Airport (A.P) is 144 Kms from Gajapati district.

2.0 OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT:

2.1 MINERALS:

The district has a variety of mineral occurrences which include Calc-tuffa, China clay, Mica, Lime Kankar, Quartz and feldspars, Red ochre, Pegmatite and Dimension/ decorative stones. Brief description of the mineral occurrences is given below.

2.1.1. China clay:

An occurrence of China clay has been reported near Jhinhira over an area of 200m X 100m with thickness varying from 2m to 6m. The chemical analysis indicates the Al_2O_3 varying from 6.47% to 14.73%, Fe_2O_3 from 1.97% to 3.59% and CaO from 0.58% to 1.15%.

2.1.2 Calc-tufa:

At a distance of about 1.5 km SE Nuagada an occurrence of Calc-tufa has been reported. Another occurrence of Calc-tufa is also found around North of Hatimunda.

2.1.3. Mica:

Muscovite micas associated with pegmatite have been located near Tumbagaon Ranikhoma, Ladrimi near Mohana, Samarasingi, Badarasingi, Jamugada and Adaba etc. having maximum book size of 200m X 50m X 3 cm. Mostly these are stained and cracked and are not large enough to be workable.

2.1.4. Lime Kankar:

About 1 km south of Rakeshpanka village near Durbankula nallah, a small patch of lime kankar has been marked. On analysis, the percentage of CaO is 44% and Silica is 9%. Total recovery may be of 10,000 Cu.m

2.1.5. Quartz & Feldspar:

There are some zoned pegmatite occurrences around Koinpur, Mohana etc. where quartz core and feldspars have been encountered. The quartz analysis to be 98.2% of SiO_2 . The important localities are Tumbagaon, Koinpur, Baligonda Mohana, Uparsahi Ranikhoma etc.

2.1.6. Red Ochre:

At a distance of about 1 km East of Hajipanga, an occurrence of red ochre is reported. The chemical analysis indicates the Fe_2O_3 content of 17.61 to 18.63% and Al_2O_3 14.90 to 31.11%.

2.1.7 Dimension Stone:

Keeping in view the features like colour, consistency, homogeneity in grain size, joint

spacing, outcrop dimension and easy accessibility about 20 potential occurrence of dimension/decorative stones are located in the district around Antarba, Jamurhiha, Poibandha, Khariguma, Bariabandha, Dengama, Kandha, Adaba-I, Kandha, Adaba-II, Narayanpur, Khariguda-I, Khariguda-II, Mandimera and Burhandi, around Laxmipur, Venkatapuram, D.jeypur, Jhinjiriguda, Kharia, Budhanala, Gududum etc. They usually consist of the rock types comprising granite gneiss. The reserve of Dimension stone of Gajapati district is about 70.85 lakh cubic meters. Besides above deposits, the dimension/ decorative stones in the district are also reported around hills to the north of Mohana and the hills near Adava. Other than the above mentioned minerals, minor minerals such as river sand, laterite slabs, building stone/black stone/road metals, morrum, bricks earth etc. are also available in the district.

3.0 GENERAL PROFILE:

a. Administrative set up:

Sl No	Item	Unit	Magnitude
1	Location		
	Longitude	Degree	83 ⁰ 48' to 84 ⁰ 27' East
	Latitude	Degree	18 ⁰ 46' to 19 ⁰ 39' North
2	Geographical area	Sq.km.	4325
3	Sub-division	Numbers	1
4	Tahasils	Numbers	7
5	C D Blocks	Numbers	7
6	Municipalities	Numbers	1
7	NACs	Numbers	1

8	Police Stations	Numbers	11
9	Gram Panchayats	Numbers	149
10	Villages	Numbers	1612
	Inhabited	Numbers	1499
	Uninhabited	Numbers	113
11	Assembly constituencies	Numbers	2

b. Area and Population:

The district has an area of 4325 sq.km. and 5.78 lakh of population as per 2011 census. The district accounts for 2.78 percent of the states territory and shares 1.38 percent of the state population. The density population of the district is 134 sq.km as against 270 person per sq.km. of the state. As per 2011 census the schedule caste population is 39175 (6.80%) and schedule tribe population 31374 (54.3%). The literacy percentage of the district covers 53.5 against 72.90 of the state.

c. Climate:

The climate condition of the district is generally hot and high humidity during April to May and cold during December to January. The monsoon generally breaks during the month of june. Actual average annual rainfall of the district was 1473.93 mm during 2019-20 to 23-24, which higher than the normal rainfall 1403.3mm.

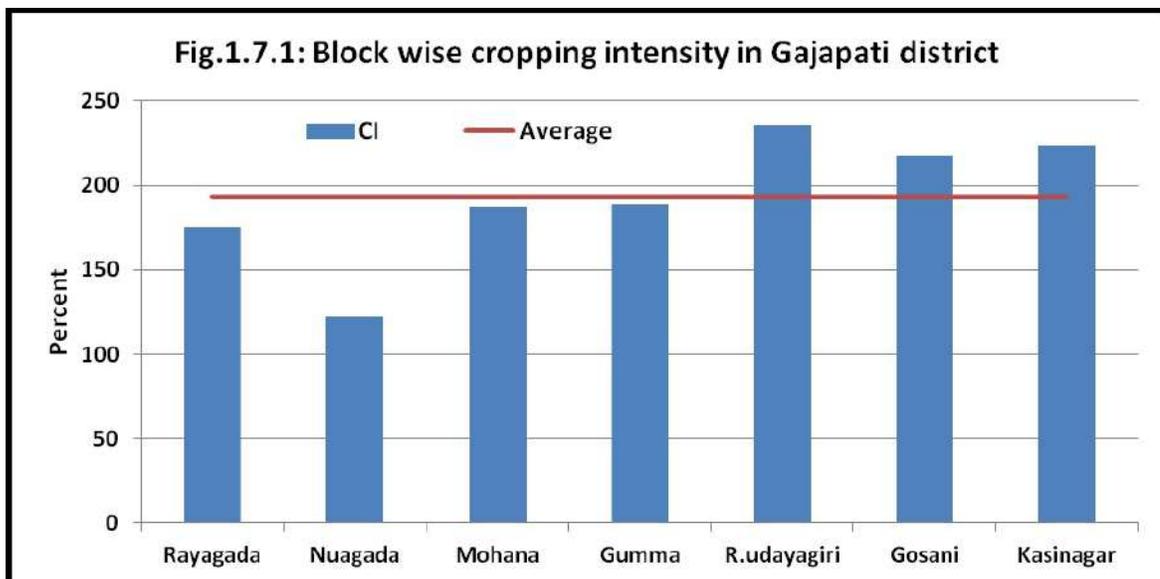
d. Agriculture:

During the year **2023-24** the net area sown was 76 thousand hectares against 5356 thousand hectares of the state. The production of was as below;

Name	Paddy	Wheat	Maize	Mung	Biri	Kulthi	Till	Groundnut	Mustard	Potatoes	Jute	Sugarcane
Production in MT	78230	0.00	30450	2370	4720	250	0.00	2480	450	700	0.00	3870

During 2023-24, the total fertilizers used in the district was about

Type of fertilizer	Nitrogenous	Phosphatic	Potassium	Total	Consumption per ha
Quantity in MT	5373	4565	1492	11430	22.72



e. Power:

Consumption of electricity in the district during the year 2023-24 covers 12.50 million units and villages so far electrified as on Sept 2023, 1514 revenue villages which

constitutes 94% to the total revenue villages of the district.

f. Transport & Communication:

Railway route (14-15) km	47.00
No of Rly stations and PH (14-15)	6
Forest road (17-18) km	104.60
National Highway km (2019)	171.9
State Highway km (2019)	147.912
Major district road km (2019)	67.7
Other dist road km (2019)	205.845
Rural road km (2019)	1237.998
Inter village road km (2019)	3015.99
Intra village road km (2019) (2019)	7229.54
Municipality Paralakhemundi Road km	54.343
NAC, Kashinagar Road km	13.800

g. Health:

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

Govt. Allopathic medical institutions 31 Nos.(Details as in below table)

Block name	DHH	UPHC	CHC	PHC(N)	OH
Gosani Block	1	1	1	3	0
Gumma (T) Block	0	0	1	3	0
Kashinagr Block	0	0	1	2	0
Mohana (T) Block	0	0	2	5	0
Nuagada (T) Block	0	0	1	1	1
R. Udayagiri (T) Block	0	0	1	3	0
R. Udayagiri (T) Block	1	1	1	3	0
Total(31)	2	2	8	20	1

Beds facilities 10 Nos (Details as in below table)

Sl. No.	Name of the Block	Name of the facility	Facility Type	No. of sanction Bed
1	Mohana	CHC Mohana	CHC	30
2	Mohana	CHC Chandragiri	CHC	50
3	R.Udayagiri	CHC R. Udayagiri	CHC	16
4	Nuagada	CHC B.K. Pada	CHC	16
5	Nuagada	CHC Nuagada	CHC	6
6	rayagada	CHC Nuagada	CHC	16
7	Gosani	CHC Gurandi	CHC	6
8	Kashinagar	CHC Kashinagar	CHC	16
9	Gumma	CHC Gumma	CHC	6
10	Paralakhemundi	Paralakhmeundi	DHH	111+50 (MCH Building)

Homoeopathic Dispensaries - 6 Nos.

Ayurvedic Dispensaries - 7 Nos.

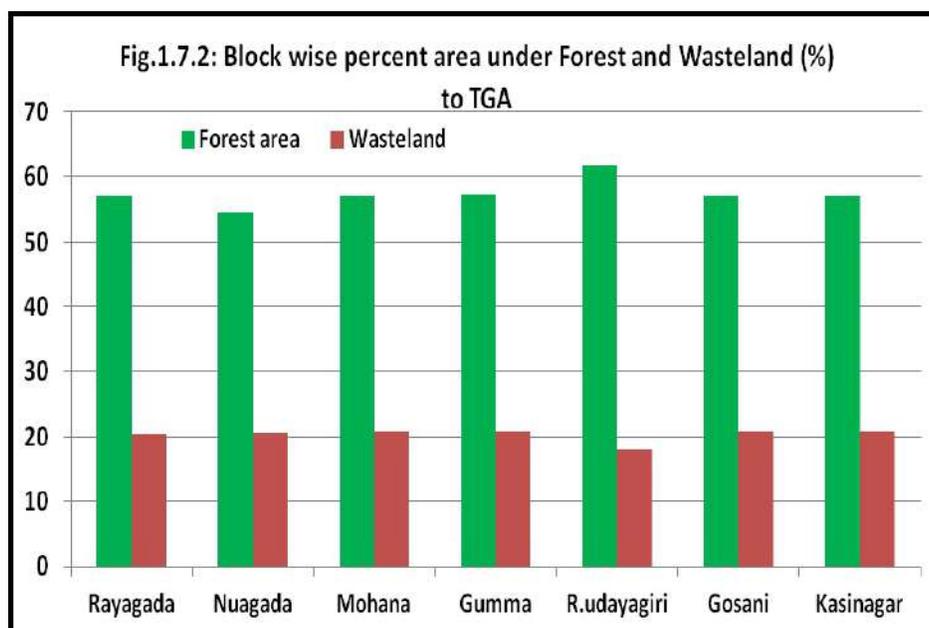
h. Tourist Places:

There are four nos. of tourist spots in Gajapati district namely Paralakhemundi, Mahendragiri, Gandahati waterfall and Harabhangi projects as identified by department of Tourism, Governemnt of Odisha. During 2011, 24133 nos. of domestic tourist were visited to the tourist centers of Gajapati district.

i. Forest Areas:

Category of forest	Area in sq km
Reserve Forest	447.17
Unclassified Forest	0.13
Demarcated Protect Forest (DFR)	57.67
Un-demarcated Protect Forest	1116.67
Other forest under Revenue Dept	794.39

Total	2469.01
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j. Education:

Primary School (2017-18)	No.of Schools	539
	Enrollment No.	49547
	Pupil Teacher Ratio	19.78:1
Upper Primary School	No.of Schools	265
	Enrollment No.	33891
	Pupil Teacher Ratio	17.29:1
General College (2017-18)	Junior	43
	Degree	
Secondary School	No. of Schools	161
	Enrollment No.	18221
	Pupil Teacher Ratio	14.71:1
Literacy Rate, 2011	Male	64.38
	Female	43.18
	Total	53.39

k. Culture & Heritage:

Tribals form majority of the population of Gajapati district. The Saura Community constitutes the largest group among them and Lanjia Saura is considered most primitive in this district. The Saouras are one of the oldest known tribes of India. They are called by various terms such as Savaras, Sabaras, Saura, Sora etc. But here the term Saura is used uniformly as it closely approximates their languages. They are widely distributed from Bundelkhand in the west to Odisha in the east. But they are found in great compactness on the edges of the Eastern ghats in Ganjam, Gajapati and Koraput district of Odisha and Srikakulam district of Andhra Pradesh. The Saouras show their racial affinity to the Proto Australoid physical characters which are dominant among the aborigines of Central and Southern India. Their language is akin to the Kolarian stock which has close resemblance to the forms of speech of the wild tribes of Malayan Peninsula and Nicobar Islands. Their linguistic affinity with the tribes of South-East suggest their migration from the Islands of India Archipelago and Malayan peninsula, unless contrary is proved that India was the cradle-land of the kolan speaking tribes and the South-Eastern countries were colonized by them. The term Saura appears to have two connotations- one derived from Sagoriss, the Scythian word for axe and the other from Saba roye;, the Sanskrit term for carrying a dead boy. Both of them fit well with their habit of carrying an axe always on their shoulders with their primitive occupation of hunting. The epics and purans refer to their devotion to the Hindu religious heroes like Rama and the Jagannath cult. The legend of Viswabasu, a Saura king who worshipped the image of Vishnu in the term of Lord Jagannath indicates the impact of Vaishnavism on the Saors. It is well known that, like other tribal communities, the Sauras are the indigenous, autochthons of India in the sense that they had been long settled in different parts of the country particularly on the plains and river valleys and other fertile areas. Many of the Sauras were in a food gathering economy and a few were perhaps on the threshold of a real food producing economy. On the whole, they were in all respects primitive, wild and under developed.

4.0. Geology:

Geologically the district is a part of the Eastern Ghat Mobile Belt and rocks of charnockite Group, Khondalite Group and Migmatite Group are the main lithounits of this area. These Archean- Proterozoic Eastern ghat Super Group of rocks mark the oldest

rock unit and area represented by acid charnockite, garnet-sillimanite bearing gneiss (Khondalite) and granite gneiss (Migmatite Group). Younger Quartz vein and pegmatite cut across the Eastern Ghat Super Group of rocks in some places. Unclassified Quaternary sediments are found along Vanshadhara river. The Geological succession in the district is as follows:

4.1. STRATIGRAPHY:

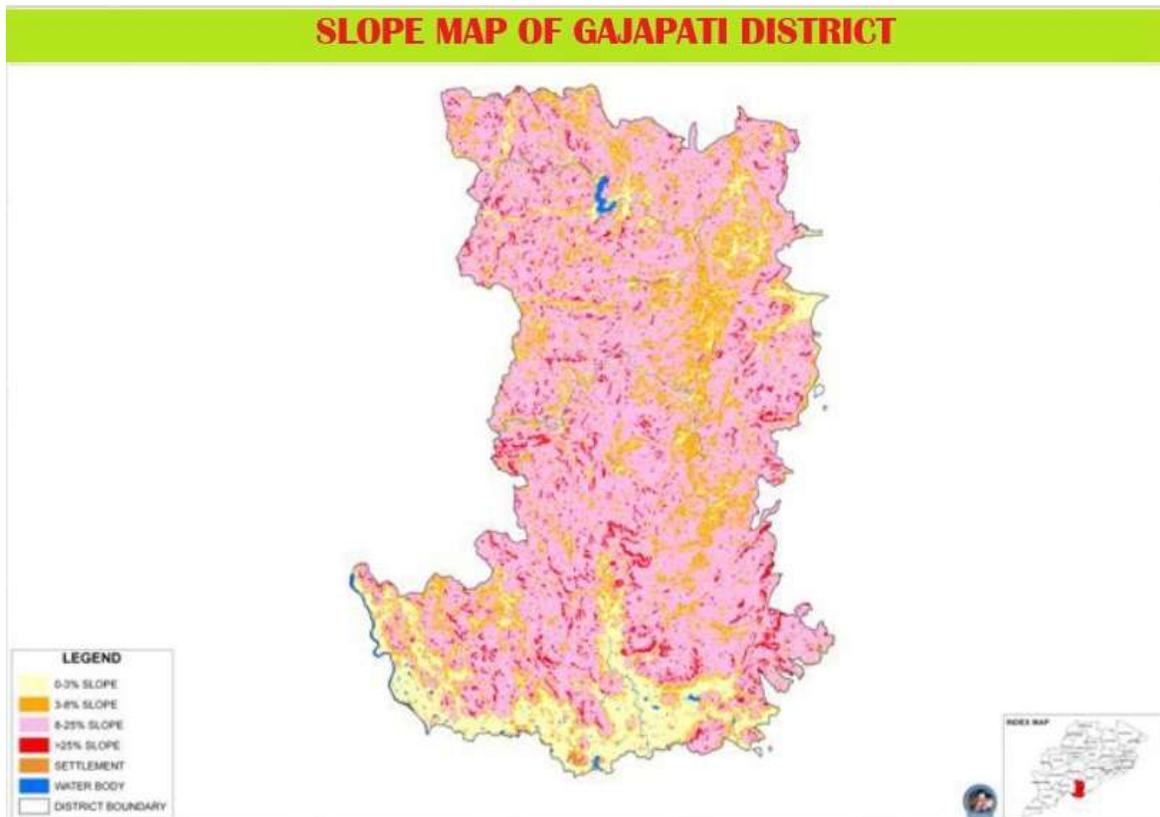
AGE	SUPER GROUP	GROUP	LITHOLOGY
Quaternary (Unclassified)			Clay, silt
Proterozoic (Unclassified)			Quartz vein, pegmatite
		Migmatite Group	Granite gneiss/ Migmatite
Archean to Proterozoic		Charnockite Group	Acid/ Intermediate charnockite
			Basic Charnockite/ Pyroxene granulite
		Khondalite Group	Quartz-garnet- sillimanite schist calc sillicate

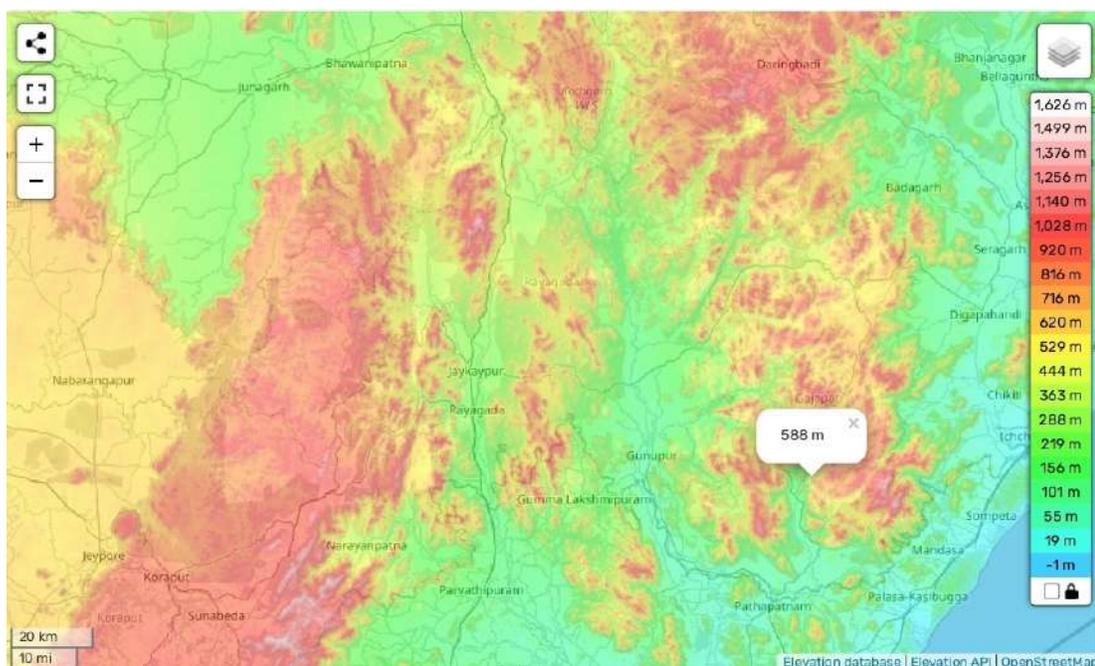
5.0. DRAINAGE AND IRRIGATION PATTERN.

Gajapati district comes under north Eastern Ghats agro climate and type of terrain is mostly undulating. The river Vansadhara along with its tributaries controls the overall drainage of the district. The important tributaries of river Vansadhara are Harabhangi, Badanadi, Mahendratanya etc. are mostly seasonal in nature. The district has limited irrigation facility. There is no major or medium irrigation project has commenced in the district till date. Only minor irrigation and lift irrigation are main source of irrigation. The total cropped area is about 1.33 lakh Ha out of which (28% TCA) is irrigated and (72% TCA) in under rainfed. The block like Gosani and Kashinagar haven higher percentage of irrigation as completed others blocks.

Detail of river/stream/other sand source: Sand mining in the district is confined to the river Vasandhara and its tributaries.

- I. Availability of sand or gravel or aggregate resources – sand- 34,56,654 cum (Annexure II). Gravel- Nil, Aggregate- Nil.
- II. This is the maximum volume of sand which can be quarried out from the sources of the district and has been calculated as 60% of the quantity derived by multiplying the area of the source with 3m thickness as the exact resource of sand is not possible to calculate due flowing water of last monsoon.
- III. Detail of existing mining lease of sand and aggregates- For sand pl refer Annexure I. Aggregate- Nil





ELEVATION MAP OF GAJAPATI DISTRICT

DRAINAGE SYSTEM AND DESCRIPTION OF SALIENT FEATURES OF MAIN REVERS AND STREAMS

Sl. No .	Name of the River	Place of origin	Altitude of origin	Total length in the District (In km)	Area drained (Sq.Km)	% Area drained in the District	Process of Deposition of Sediments	Volume of sand deposited in last 4 years (year wise)	Any important note related to leasing of sand quarry within the river
A	B	C	D	E	F	G	H	I	J
1	Banshad hara	Eastern Ghats of Lanjigada Block and border of Thaumul Rampur of Kalahandi District.	400 mtr	29 km common Boundary (Odisha & Andhrapra desh)	10,830 Sq km	1265 Sq Km (11.68%) approx	Due to flow water in the river sand has been deposited	Not Available	In different places of kasinagar Tahasil in Gajapati District approx. 1,50,000 cum

2	Mahendra Tanaya	Mahendragiri Hills of Gajapati District	1501Mtr	90 Km common Boundary (Odisha & Andhra Pradesh)	90 Km	755 Sq.Km	Due to flow water in the river sand has been deposited	Not Available	In different places of Paralakhemundi & Rayagada Tahasils of Gajapati District approx
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6.0 PROCESS OF DEPOSIT OF SEDIMENTS IN THE RIVERS

Gajapati district comes under north Ghats agro climate and type of terrain is mostly undulating. The river Vasandhara along with its tributaries controls the overall drainage of the district. The important tributaries of river Vasandhara are Harabhangi, Badanadi, Mahendratanaya etc are mostly seasonal in nature. During rainy season the river water carries and which is formed due to disintegration of rock bodies along with other suspensions. After recession of the water flow the sand gets deposited in the locations due to drop in energy.

7.0. LANDUSE PATTERN:

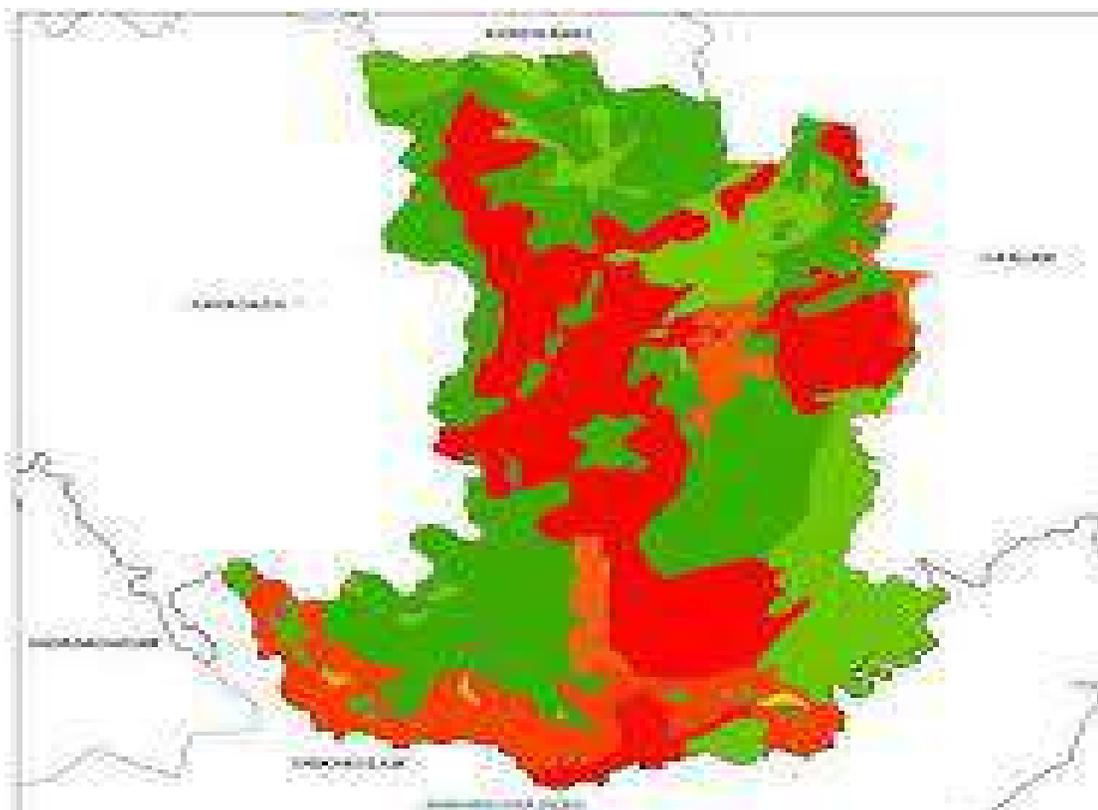


Table 1.7.1 Land use pattern of Gajapati district

S no	Block	Total Geographical Area	Area under Agriculture				Area under Forest	Area under Waste Land	Area under other uses
			Gross Cropped Area	Net Sown Area	Area sown more than once	Cropping Intensity (%)			
			ha.	ha.	ha.	ha.			
1	Rayagada	64950	20023	11414	11115	175	37050	13302	3184
2	Nuagada	74086	12180	10004	12661	122	40261	15232	8589
3	Mohana	59321	19523	10404	10131	188	33814	12321	2782
4	Gumma	59278	19674	10427	10227	189	33938	12366	2547
5	Rudayagiri	42434	17589	7448	7252	236	26206	7620	1160
6	Gosani	59797	27165	12496	10219	217	34111	12424	766
7	Kasinagar	73177	28650	12844	12581	223	41743	15210	3380
Total		433043	144804	75037	74186	193%	247123	88475	22408

8.0. SURFACE WATER & GROUND WATER SCENARIO

The district comes under Eastern ghats climate and type of terrain is mostly undulating. As the terrain is undulated most of the rainfall flows as surface run off to the river or nallas. The ayacut area of this district is only 28% and rests 72% is rain fed. Hence it is highly essential to promote extension activities relating to water harvesting and water management. Similarly, steps have to be taken for creation of major and medium irrigation projects to make optimum utilization of surface water.

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	2.1	0.27	0.7	0.85
Maximum	10.2	7.13	7.29	10.5

9.0. 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 45⁰ C in the summer and up to 7⁰-8⁰ C during peak winter. The rainfall statistics of the district for last four years is given below:

Year/ Month	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Total
20-21	92.22	54.04	228.77	222.22	195.97	162.00	20.61	14.38	0.0	31.57	0.0	0.28	1022.06
21-22	75.16	93.76	97.71	224.28	211.13	389.43	174.3	121.98	48.08	57.9	0.00	12.32	1506.05
22-23	25.63	108.09	138.21	313.17	360.9	302.23	208.09	5.55	5.99	0.13	0.00	97.83	1565.82
23-24	84.95	106.8	118.2	310.13	166.97	269.45	21.26	16.17	28.49	6.89	3.93	43.86	1177.1
Avg.	69.49	90.67	145.72	267.45	233.74	280.77	106.06	41.00	39.52	24.12	0.98	38.57	1338.09

10.0. DETAILS OF SAND MINING LEASES OF GAJAPATI DISTRICT

10.1. DETAILS OF PROPOSED SAND MINING LEASES of PATTALAND/KHATEDAR LAND (Attached as Annexure-I C)

10.2. DETAILS OF EXISTING OPERATIONAL SAND MINING LEASES (Attached as Annexure-II A)

10.3. DETAILS OF EXISTING NON-OPERATIONAL SAND MINING LEASES (Attached as Annexure-II B)

10.4. DETAILS OF PROPOSED SAND MINING LEASES (Attached as Annexure-II C)

10. DETAILS OF ROYALTY COLLECTED

Year-wise calculation of Royalty (Rs) of Sairat Sources

Sl. No.	Name of Tahasil	2020-21	2021-22	2022-23	2023-24
1	Kashinagar	6585988	15441462	12895680	9565098
2	Paralakhemundi	14380492	12133407	15230771	16059249
3	Gumma	7506033	8685277	8609031	5916900
4	Mohana	25662750	12842538	15463643	23703455
5	Nuagada	7582264	6524006	10133820	9754604
6	R. Udayagiri	18486019	23719571	19345789	16274828
7	Rayagada	15228238	22183488	10818870	3513300
	TOTAL	95431784	101529749	92497604	84787434

11. DETAILS OF PRODUCTION OF MINOR MINERAL

Year wise Production of Sand In Cum

Sl. No.	Name of Tahasil	2021-22	2022-23	2023-24
1	Kashinagar	0	0	0
2	Paralakhemundi	0	0	0
3	Gumma	0	0	0
4	Mohana	0	0	0
5	Nuagada	0	0	0
6	R. Udayagiri	0	0	0

7	Rayagada	0	0	0
TOTAL		0	0	0

12. MINERAL MAP OF THE DISTRICT

Attached as plate No.4.

13. LIST OF LOI HOLDERS ALONG WITH VALIDITY

Attached as Annexure II

14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT

Total mineral reserve of sand is 3,55,073 cum which may increase after details investigation. Details of the potential areas submitted as **Annexure III**.

15. QUALITY/GRADE OF MINERAL

Sand from Bansadhara river sources of the district is very much suitable for various construction purpose after its crushing and screening. The insitu rocks are fractured making these unsuitable for decorative purpose.

16. USE OF MINERALS

Sand of the district is used mainly for various construction purpose like road making, concrete making, dams etc.

17. DEMAND & SUPPLY OF THE MINERAL

The tentative annual demand is to the tune of 50,000 cum of sand and is mainly supplied from different Tahasils of the district and adjoining districts of Ganjam and Rayagada and the nearest area of neighbor state Andhra Pradesh.

18. MINING LEASES MARKED ON THE MAP OF THE DISTRICT

Attached as plate No.5

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

Not applicable

20. DETAILS OF ECO-SENSITIVE AREA

**TABLE A: GEO- COORDINATES OF PROMINENT LOCATIONS OF LAKHARY VALLEY
WILDLIFE SANCTUARY**

Direction	Latitude	Longitude
North-	N19 ⁰ 23'37.2"	E 84 ⁰ 22'11.8"
South-	N19 ⁰ 10'30.0"	E 84 ⁰ 23'22.7"
East-	N19 ⁰ 21'51.6"	E 84 ⁰ 28'5.0"
West-	N19 ⁰ 16'31.7"	E 84 ⁰ 15'5.0"

**TABLE A: GEO- COORDINATES OF PROMINENT LOCATIONS OF ECO-
SENSITIVE ZONE**

Direction	Latitude	Longitude
North-	N19 ⁰ 29'8.0"	E 84 ⁰ 22'25.0
South-	N19 ⁰ 21'11.8"	E 84 ⁰ 25'37.5"
East-	N19 ⁰ 7'7.0"	E 84 ⁰ 22'48.0"
West-	N19 ⁰ 19'58.0"	E 84 ⁰ 11'50.0"

List of Villages coming within the Lakhary Valley Wildlife Sanctuary is as below;

Name of the Division	Name of the villages	Name of the Protected Area	Remarks
Divisional Forest Office, Paralakhemundi Division	Gandapadar	Lakhary Valley Wildlife Sanctuary	Villages within uniform 10 km distance of the Boundary of Lakhary Wildlife
	Lokapadar		
	Mohana		
	Betrasingi		
	Anlaguda		
	Benipadar		
	Bandhapada		
	Bandhaguda		
	Kamiliguda		
	Guburiguda		
Bedepur			

	Liliguda		Sanctuary
	Andima		
	Ludru		
	Tunguda		
	Gochhaguda		

21.0. 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 by the project. Secondary impacts are those 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 occurs 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 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 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.

22.0. 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 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 is 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 mine 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 site 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.

23.0. RECLAMATION OF MINED OUT AREA

Necessity of Reclamation & Rehabilitation:

- Exponential growth in mineral production since 1980.
- Mining activities causes physical, chemical, biological and socio- economic changes in the area.
- Surface mining activities disturb the original land profile.
- In India, mineral production comes mostly from open cast mines & hence Land degradation problems are of serious concern.
- An intricate, in-depth and site-specified techniques involving integrated approach is necessary.

Reclamation has three vital roles:

- Reclamation**–Reclamation means return the mined – out land with useful life. It

implies restoring the land to a form and productivity that is useful and in conform it with a prior land use. Reclamation always may not be a single-phase operation.

ii. **Rehabilitation** – Rehabilitation is to bring back the degraded land to a normal stage by a special treatment. It is a process of taking some mitigation measures for disturbed environmental condition created through mining activities.

iii. **Restoration**– Restoration is the process of returning the mined out land being fit to an acceptable environmental condition. However, the general acceptable meaning of the term is bringing the disturbed land to its original form. Restoration is often used to indicate that biological properties of soil are put back to what they were. This is a rate phenomenon.

When active mining ceases, mine facilities and the site are reclaimed and closed. The goal of mine site reclamation and closure should always be to return the site to a condition that most resembles the pre-mining condition. Mines that are notorious for their immense impact on the environment often made impacts only during the closure phase, when active mining operations ceased. These impacts can persist for decades and even centuries.

Mine reclamation and closure plans must describe in sufficient detail how the mining company will restore the site to a condition that most resembles pre-mining environmental quality; how it will prevent—in perpetuity—the release of toxic contaminants from various mine facilities (such as abandoned open pits and tailings impoundments); and how funds will be set aside to insure that the costs of reclamation and closure will be paid for.

Proposed future land use after reclamation:

- a. Forestry,
- b. Recreation,
- c. Water Reservoir,
- d. Crop Land,
- e. Residential / Commercial,
- f. Fish & wild life Habitat,

- g. Undeveloped Land,
- h. Grazing / Pasture Land

Statutory Requirement:

As per the Mineral Conservation Development Rule, 2017, the following rules must be borne in mind by the mine owner/agent/manager, which is a part of reclamation activities – Rule 22 Mine Closure Plan Rule - 23, Submission of Progressive Mine Closure Plan Rule - 24, Submission of Final Mine Closure Plan Rule - 26, Responsibility of holder of mining lease Rule - 27, Financial assurance Rule - 35, Sustainable Mining

24.0. RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN:

Mining activity because of the very nature of the operation, complexity of the systems, procedures and methods always involves some amount of hazards. Hazard identification and risk analysis is carried for identification of undesirable events that can lead to a hazard, the analysis of hazard mechanism by which this undesirable event could occur and usually the estimation of extent, magnitude and likelihood of harmful effects. The activities which can cause high risk related to face stability and the person blasting the shots. It was observed that on a working face of the mine, there were large cracks and unsupported rocks were present, which can lead to a serious hazard and injure workers engaged in loading operation and machineries because of rock falls or slides. This type of condition turns out because of improper dressing of the bench and improper supervision. To avoid the hazards due to fall of rocks the face must be examined, made suitable for working and the remedial measures must be taken to make it safe if there is any doubt that a collapse could take place. Working of the face should be in the direction considering the geology of the area such that face and quarry side remain stable. Another major risk identified in mines is due to the firing of explosive by an unqualified person. In the mines there is a problem of fly rocks and the village is located close to the mine and so it is rated high as it can affect many people. Explosives by nature have the potential for the most serious and catastrophic accident. Planning of round of shots, holes correctly drilled, direction logged, weight of explosive suitable for good fragmentation are the few of the steps necessary to ensure its safe use and if the shots are not properly designed can result in misfires, early ignition and flying rocks. No person is allowed to use

explosives without being properly trained in its handling. In the mine a large numbers of heavy vehicles were in operation and the roads were not proper for haulage purpose. The haulage roads were not even and were not wide enough for the crossing purpose and hence the chances of hazards are very high. The main hazards arising from the use large earth moving vehicles are incompetent drivers, brake failure, lack of all-around visibility from the driver position, vehicle movements particularly reversing, roll over, and maintenance. Those most at risk are the driver and pedestrians likely to be struck by the vehicle, and drivers of smaller vehicles, which cannot be seen from the cabs of large vehicles. Edge protection is always necessary to prevent inadvertent movement over the edge of roadway or a bench. Seat belt will protect driver in case of roll. Good maintenance and regular testing are necessary to reduce the possibility of brake failure. Access to the vehicles should always be restricted to those people necessary for the work in hand. The use of personal protective equipment and proper arrangements is essential to check if the person is wearing protective equipment or not. The personal protective equipment includes helmet, non-skid safety boots, safety glasses, earmuffs etc. The required personal protective equipment should be provided and used in a manner that protects the individual from injury. Few minor injuries which can be prevented are slip, trip, or fall hazards; hazards due to rock falls and collapse of unstable rocks, atmosphere containing toxic or combustible gases; protects from chemical or hazardous material etc. A disaster management plan should be prepared for taking care of for any disaster. Other risk which are included in this category are noise, as it occurs and it can lead to permanent disability. There are problems related to road traffic in and out issuers; inappropriate exposure of moving machines; mechanical failure and because of large number of moving trucks and dumpers there is large quantity of dust present in road ways which affects the operators and can lead to accidents causing injury. They are in acceptable range because of pre-cautions measures taken but no step is taken. It can cause hazard hence steps should be taken to reduce the hazards such as for dust suppression system should be installed. Other problems like occurrence of lots of mosquitoes in the area due to un-hygienic conditions which affect the human health causing malaria, dengue etc. and causing a person to be hospitalized.

Disaster in the mines like fires, explosions, entrapments, and inundations can occur anytime, so emergency preparedness is a must. The Disaster management plan and risk assessment

in the mines will include all sorts of above-mentioned emergency and the extent that this plan will be implemented will depend on the nature and scope of the emergency. The basic purpose of Disaster management plan and risk assessment to ensure that mine rescue and recovery activities are conducted safely for rescue and survivors. According to MMR act 1961 a standard operating procedure should be drawn for involvement different category of staff and officers. The SOP should be updated Periodically to reduce the chaos and response to the emergency should be quick and smooth. The responsible person should be familiar with his responsibility during the mock drills. One or two standby should be there to replace the person in Emergency situation. Rescue operations should not include the survivors for any assistance.

First Information of Disaster / Emergency should go to the attendance clerk on duty. Duties of attendance Clerk (Emergency Siren) the attendance clerk or other designated person should on getting information of major accident, sound a hooter or a siren immediately declaring a state of emergency at the mine and then to contact the manager and on his advice to call key personnel using the information listed in the Emergency Organization Chart. It is important that all telephone calls are recorded in a telephone log book. Duties of Other Officials should be displayed and handed over to all concerned. Copy the same should be kept at Manager's Office for ready reference. Establishment of Control Room at Unit Level, Area Level and Company Level is essential. Control Room should keep the contact information about-

- Company Manager
- Company owner/Administrative officer.
- District Administration

- Govt. Hospitals in Nearby Localities,
- Private Nursing Homes of Localities

Attendance roaster and duty charge register should be properly maintained so the record of missing people can be obtained.

25.0. DETAILS OF THE OCCUPATIONAL HELTH ISSUE IN THE DISTRICT:

The persons employed in the mines are exposed to a number of hazards at work which adversely affect their health. Some of the important ones are dust, noise, heat, humidity, vibration etc. In recent times, there has been increasing awareness among mining industry and the workers about occupational diseases such as Coal Worker's Pneumoconiosis, Silicosis, Manganese Poisoning, Hearing Impairment etc. caused by exposure to health hazards at work. Almost all occupational diseases are known to cause permanent disablement and there is no effective treatment. However, most of the occupational diseases can be prevented by adopting proper occupational health measures and engineering control on air borne dust at work place.

Following diseases have been notified as the diseases connected with mining operations for the purpose of sub-section (1) of Section 25 of the Mines Act, 1952:

S.R.O. 1306 dated the 21st July, 1952

1. Silicosis
2. Tuberculosis
3. Cancer of lung or the stomach or the pleura and peritoneum (i.e.mesothelioma)

25 S.O. 399 (E) dated 21st February, 2011

1. Noise Induced Hearing Loss
2. Contact Dermatitis caused by direct contact with chemical.

3. Pathological manifestations due to radium or radioactive substances

System of Detection of Occupational Diseases in Mines:

In order to detect occupational diseases the industry is required to conduct medical examinations and health surveillance of workers as per the provisions of Mines Act. The present efforts of mines management are concentrated on detection of silicosis, Pneumoconiosis and other notified diseases. Very little attention is paid to other occupational diseases. The essential features of health surveillance programme required to be carried out in mines are:

- (a) Initial Medical Examination of persons to be employed in mines.
- (b) Periodic Medical Examination once every five years. General physical examination, chest radiographs, lung function tests and audiometry.
- (c) Classification of chest radiographs of workers as per ILO Classification.
- (d) Medical examination within one year of superannuation. Evaluation of all cases of suspected pneumoconiosis by Pneumoconiosis Medical Board.
- (e) Maintenance of medical records till the person is in service and 10 years thereafter. The cases of silicosis detected during health surveillance programme are referred to Pneumoconiosis Medical Board of the mining companies for evaluation and certification. If certified, the case is notified to the enforcement authority and evaluated for disability and payment of compensation. Many cases of silicosis and other pneumoconiosis go undetected and a large number of cases of silicosis are mis-diagnosed due to lack of training of medical professionals.

26. PLANTATION GREEN BELT DEVELOPMENT IN RESPECT OF LEASE ALREADY GRANTED IN THE DISTRICT:

During mining operation green belt development through plantation is most important

for environment safeguard, which should be supervision by mining department. Different type of species should be planted near lease periphery to keep environment clean at post mining period through reclamation. Where specific usefulness of land could be decided, afforestation is normally planned through the site could have been considered for better possibilities of land use.

27. CONCLUSION:

To meet the requirement of minerals in the present scenario, it is proposed to identify such potential areas at certain interval and get the data bank of DSR to be updated regularly. The insitu mining activity in any area is on one hand bring revenue and employment (Direct and indirect) and on other hand if not done properly potential pollution and ecological imbalance increases, the ability of the ecosystem can also be reduced. Particulate matter transported by the wind as a result of excavations, blasting, transportation of materials, heavy equipment used raise these particulate levels; and Gas emissions from the combustion of fuels in stationary and mobile sources, explosions, and mineral processing. All these activities indirectly affected the biodiversity of area. Larger potential and smaller areas have been identified in Gajapati District on the basis of geological study carried out during field observation, which can be considered for mining concession after all the parameters for statutory clearances are verified by consulting with concerned authorities.

ANNEXURE-I

DETAILS OF SAND/M-SAND SOURCES:

A. Rivers:

River Name/M-Sand Plant	Total Stretch of River in KM	Type of River (Perennial/Non-Perennial)
Bansadhara River	230 Km	Perennial
Mahendra Tanaya River	90 Km	Perennial

B. De-Siltation Location:

Name of Reservoir/Dams	Maintain by State Govt./PSU etc.	Location	District	Tehsil	Village	Size
Harabhangi Dam	State Government	Harabhangi	Gajapati	Mohana	Harabhangi	NA

C. Patta Lands/Khatedari Lands:

Attached as Annexure- I (C)

D. M-Sand Plants:

Plant name	Owner	District	Tehsil	Village	Geo-Location	Quantity (Tonne/Annum)
Not Applicable for Gajapati District						

Annexure-I (C)**Proposed Sand Sairat Sources in Private Land of**

SL.NO	Name of Owner	Name of Minor Minerals	Area in Acre	District	Tehsil	Village	Agriculture Land (Yes/No)
1	M nandakishore & Others	Sand	12.468	Gajapati	Kashinagar	Vanna	NO
2	B Santa Rao & Others	Sand	3.698	Gajapati	Kashinagar	Vanna	NO
3	M Appa Rao, M Kameya & M Ramarao	Sand	2.665	Gajapati	Kashinagar	Vanna	NO
4	M Basant Rao	Sand	1.37	Gajapati	Kashinagar	Vanna	NO
5	Y Anusaya Amma	Sand	0.66	Gajapati	Kashinagar	Vanna	NO
6	Sudadu samu	Sand	1.33	Gajapati	Kashinagar	Vanna	NO
7	S Rakam Ramulu	Sand	0.405	Gajapati	Kashinagar	Vanna	NO
8	Bhogapuram Anu Modi	Sand	1.515	Gajapati	Kashinagar	Vanna	NO
9	Kambali Meena Rao, Kambali Cheena	Sand	1.84	Gajapati	Kashinagar	Vanna	NO
10	Potenaru Jameya	Sand	1.195	Gajapati	Kashinagar	Vanna	NO

MINERAL CONCESSION DETAILS IN RESPECT OF EXISTING OPERATIONAL SAND SAIRAT SOURCES OF GAJAPATI DISTRICT

SL.NO	Name of Tahasil	Name of River & Village	Name of Minor Minerals	Name of Lessee	Address & Contact no. of Lessee	Mining lease grant order no. date	Area of Lease in Hectare	Location of Resources		Period of QL		Date of commencement of Mining	Period of Mining Lease (1st/2ndRenewal Status)	(Working/Non-working Temp. Working)	Captive/Non-captive	Letter no & Grant of EC	Longitude	Latitude	Method of Mining	LOI Issued	Existing / Proposed	Minable mineral Reserve(cu.m.)
								Khata No	Plot No.	FROM	TO											
1	Kashinagar	Banshadhara River / Budura	Budura Sand Bed	Janakidevi Mishra	Bhubaneswar	5454, Dtd. 10/11/2021	6.000	225	188	2022	2027	08.04.2024	NA	Working	Non-Captive	EC22B001OR169956 /24.11.2022	83°50'46.83"- 83°50'37.56"	18°52'55.10"- 18°52'45.28"	Open Cast/Semi-Mechanized	LOI Issued	Existing	100000
									189													
2	Kashinagar	Banshadhara/ Idudi	Idudi-I Sand Bed	P Raja Rao	Hadubhangi	490, Dtd. 29/11/2019	9.047	361	1389	2021	2026	09.02.2021	NA	Working	Non-Captive	9775/SEIAA, 25.11.2020	83°51'20.40"- 83°51'10.90"	18°51'32.50"- 18°51'37.90"	Open Cast/Semi-Mechanized	LOI Issued	Existing	85625
									1367													
3	Kashinagar	Banshadhara/ Idudi	Idudu-II Sand Bed	A. Gopal Rao	Hadubhangi	2896, Dtd. 15/09/2020	9.847	361	1	2021	2026	20.04.2021	NA	Working	Non-Captive	587/SEIAA, 15.02.2021	83°50'58.40"- 83°50'51.60"	18°51'51.40"- 18°51'59.80"	Open Cast/Semi-Mechanized	Yes	Existing	107772
									1332													
4	Kashinagar	Banshadhara River / Purtiguda	Purtiguda Sand Bed	Bansidhara Swain	Brahmanigaon, Cuttack	5440, Dtd. 09/11/2021	22.109	522	1285	2024	2029	NA	NA	Working	Non-Captive	EC24B0107OR5206265 N / Dtd.12.06.2024	83°49'33.20"- 82°49'26.59"	18°57'27.18"- 18°57'15.58"	Open Cast/Semi-Mechanized	Yes	Existing	57442
									1286													
5	Paralakhemundi	Sailada	Sailada Sand Bed	Gadi Savitri	Paralakhemundi	2344, Dtd. 17/06/2020	5.000	160	194	2021	2026	27/10/2021	NA	Working	Non-Captive	783/SEIAA, 09.03.2021	84°10'33.90"- 84°10'13.60"	18°51'31.20"- 18°51'10.20"	Open Cast/Manual	Yes	Existing	33075
									531													
6	Paralakhemundi	Uppalada	Uppalada Sand Bed	K Yogendar Rao	Paralakhemundi	284, Dtd. 20/01/2021	3.187	376	579	2022	2027	26.09.2022	NA	Working	Non-Captive	NA	84°10'42.37"- 84°10'30.45"	18°49'56.56"- 18°49'48.43"	Open Cast/Manual	Yes	Existing	16720
									536													

13	Rayagada	Mohana	11	10	9	8	7
Mahendra Tanaya/Burujango	Khasada	Mohana	Mohana	Harabhangi/Karadapankal	Harabhangi/Chapatapanka	Harabhangi/Karchabadi	Paralakhemundi
Burujango Sand Bed	Khasada Sand Bed	Mohana Sand Bed	Mohana Sand Bed	Karadapankal Sand Bed	Chapatapanka Sand Bed	Kharabadi sand Bed	Bomika Bed
Anita Mohankuda	Purna Chandra Chandragiri	Balaram Sahu	Purna Chandra Nayak	Chandragiri	Mohana	Jagannath Sahu	Anita Mohankuda
Paralakhemundi	Chandragiri	Mohana	Chandragiri	Mohana	Mohana	Mohana	Paralakhemundi
1322, Dtd. 20/06/2020	2378, Dtd.03/07/2019	2157, Dtd.11/06/2019	5354, Dtd. 13/10/2022	2158, Dtd. 11/06/2019	2159, Dtd. 11/06/2019	2182, Dtd. 17/07/2020	
9.227	3.100	2.800	4.200	3.985	4.536	4.023	
492	26	315	7	18	98	152	
2612	231	115	65	2	182	201/731	454
2023	2021	2021	2023	2021	2022	2021	195
2028	2026	2026	2028	2026	2027	2026	
14.03.2023	12.04.2021	12.04.2021	22.12.2023	12.04.2021	30.07.2022	13.03.2023	
NA	NA	NA	NA	NA	NA	NA	
Working	Working	Working	Working	Working	Working	Working	
Non-Captive	Non-Captive	Non-Captive	Non-Captive	Non-Captive	Non-Captive	Non-Captive	
EC22B001OR 155737, 03.12.2022	708/SEIAA, 30.03.2021	776/SEIAA, 09.03.2021	EC23B001OR 138790	778/SEIAA, 09.03.2021	2613/SEIAA, 04.09.2021	15855/SEIAA, 01.07.2021	
84°08'37.24"-84°09'28.77"	84°14'27.10"-84°14'12.40"	84°15'53.52"-84°15'21.17"	84°70'32.40"-84°70'15.30"	84°13'38.11"-84°13'23.64"	84°12'10.47"-84°11'47.12"	84°10'11.14"-84°10'05.80"	
18°53'01.12"-18°53'31.68"	19°14'53.20"-19°14'53.60"	18°26'44.19"-18°26'44.15"	19°31'14.30"-19°31'28.30"	19°26'51.52"-19°27'12.17"	19°28'60.13"-19°28'16.26"		
Opencast / Manual	Opencast / Manual	Opencast / Manual	Opencast / Manual	Opencast / Manual	Opencast / Manual	Opencast / Manual	
Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Existing	Existing	Existing	Existing	Existing	Existing	Existing	
21755	21800	5700	4214	6750	5800	18596	

ANNEXURE-II (B)

MINERAL CONCESSION DETAILS IN RESPECT OF EXISTING NON-OPERATIONAL SAND SAIRAT SOURCES OF GAJAPATI DISTRICT

SL.NO	Name of Tahasil	Name of River & Village	Name of Minor Minerals	Name of Lessee	Address & Contact no. of Lessee	Mining lease grant order no. date	AREA OF LEASE IN HECTARE	Location of Resources		Period of QL		Period of Mining Lease (1st/2nd/Renewal)	Date of commencement of Mining Operation	Status (Working/Non-working Temp. Working)	Captive/Non-captive	Letter no & Grant of EC	Longitude	Latitude	Method of Mining	LOI Issued	Existing / Proposed	Minable mineral Reserve(cu.m.)
								Khata No	Plot No.	FROM	TO											
1	Kashinagar	Banshadhara River / Khandva	Khandva Sand Bed	Under Auction Process	NA	NA	27.531	699	2386 2387	2025	2030	NA	NA	NON-WORKING	Non-Captive	NA	83°49'13.13"- 83°49'21.82"	18°57'45.44"- 18°58'14.84"	Open Cast/Semi-Mechanized	LOI Issued	Existing	165000
2	Kashinagar	Banshadhara/Kittingi	Kittingi Sand Bed	Narayan Biswal	Baranga, Cuttack	5453, Dtd. 10/11/2021	15.968	222	751 665	2024	2029	1st Renewal	NA	NON-WORKING	Non-Captive	NA	83°50'55.10"- 83°51'07.43"	18°54'02.57"- 18°54'19.43"	Opencast/Semi-Mechanised	LOI Issued	Existing	118416
3	Kashinagar	Banshadhara/Bathva	Bathva Sand Bed	Manoj Kumar Behera	Bargarh	1157/ Dtd. 02.11.2024	10.5	256	1 1687	2025	2029	NA	NA	NON-WORKING	Non-Captive	NA	83°50'53.93"- 83°51'04.01"	18°53'37.34"- 18°53'46.80"	Opencast/Semi-Mechanised	LOI Issued	Existing	15000
4	Paralakhemundi	Mahendra Tanaya / Kerandi	Kerandi Sand Bed	G Venket Ravana	Paralakhemundi	7325/ Dtd. 31/12/2019	4.876	172	32	2024	2029	NA	NA	NON-WORKING	Non-Captive	EC24B001OR183722 /17.02.2024	84°07'29.6"- 84°07'21.9"	18°46'28.10"- 18°46'17.30"	Opencast / Manual	LOI Issued	Existing	96740
5	Paralakhemundi	Mahendra Tanaya/ Buguda & Mahadeipur	Buguda- Mahadeipur Sand Bed	G Venket Ravana	Paralakhemundi	7325/ Dtd. 31/12/2019	10.117	20 143	1 1	2023	2028	NA	NA	NON-WORKING	Non-Captive	NA	84°10'02.80"- 84°09'05.00"	18°53'17.20"- 18°52'39.50"	Opencast / Manual	LOI Issued	Existing	65380
6	Paralakhemundi	Mahendra Tanaya/ Bada Deula	Bada Deula Sand Quarry	G Venket Ravana	Paralakhemundi	NA	7.062	105	190	2023	2028	NA	NA	NON-WORKING	Non-Captive	NA	84°10'19.90"- 84°10'05.30"	18°52'08.70"- 18°51'52.80"	Opencast / Manual	LOI Issued	Existing	16500

7	Mohana	Harabhangi/ Rajabasa	Rajabasa Sand	Purna Chandra	Chandragiri	5354, Dtd. 13/10/20 22	4.53	7	19	2023	2028	NA	NA	NON- WORKING	Non-Captive	NA	84°06'23.50"- 84°06'41.30"	19°31'56.10"- 19°32'18.40"	Opencast / Manual	LOI Issued	Existing	5020
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**MINERAL CONCESSION DETAILS IN RESPECT OF PROPOSED SAND SAIRAT SOURCES OF
GAJAPATI DISTRICT**

SL.NO	Name of Tahasil	Name of Minor Minerals	Name of Village	Name of Lessee	Address & Contact no. of Lessee	Mining lease grant order no. date	AREA OF LEASE IN HECTARE	Location of Resources		Period of QL		Period of Mining lease (1st/2nd Renewal)	Date of commencement of Mining Status	(Working/Non-working Temp. Captive/Non-captive	Letter no & Grant of EC	Longitude	Latitude	Method of Mining	LOI Issued	Existing/Proposed	Minable mineral Reserve(cu.m.)	
								Khata No	Plot No.	FROM	TO											Mineral Potential
1	Kashi nagar	Badigan Sand Quarry	Badigan	New	NA	NA	50.91	339	1746 2144 2175	NA	NA	NA	NA	New	Non-Captive	NA	83°47'37.08"- 83°48'3.97"	19°0'1.45"- 19°0'31.24"	Open Cast/Manual	NA	PROPOSED	250000
2	Kashinagar	Gouri Sand Quarry	Gouri	New	NA	NA	45.09	550	1, 2 1764 1765 1766 1997	NA	NA	NA	NA	New	Non-Captive	NA	83°49'28.20"- 83°49'48.10"	18°55'54.12"- 18°56'14.35"	Open Cast/Manual	NA	PROPOSED	250000
3	Kashinagar	Palsing Sand Quarry	Palsing	New	NA	NA	35.257	222	1 552 628/1004	NA	NA	NA	NA	New	Non-Captive	NA	83°47'48.63"- 83°47'57.5"	19°13'52.1"- 19°14'08.7"	Open Cast/Manual	NA	PROPOSED	200000
4	Kashinagar	Kashinagar NAC Sand Bed	Kashinagar	New	NA	NA	56.58	3126	3814 3816	NA	NA	NA	NA	New	Non-Captive	NA	83°47'48.60"- 83°47'57.45"	19°13'52.1"- 19°14'08.7"	Open Cast/Manual	NA	PROPOSED	180000
5	Kashinagar	Kidigam Sand C	Kidigam	New	NA	NA	37.72	580	1949 1950 2309 2310	NA	NA	NA	NA	New	Non-Captive	NA	83°47'48.63"- 83°47'57.5"	19°13'52.1"- 19°14'08.7"	Open Cast/Manual	NA	PROPOSED	150000

CLUSTER & CONTIGUOUS CLUSTER DETAILS OF SAND SAIRAT SOURCES OF GAJAPATI DISTRICT

Sl. NO.	River Name	Cluster No.	Quarry No.	Name of Tahasil	Name of Minor Minerals in Cluster	Location (River Bed / Patta Land)	Distance Between Leases in Meter	Village	Khata No.	Plot No.	Area of Lease in Hectare	Total Cluster Area in Hectare	Total Mineral Excavation In Ton.	LOI Issued (Yes / NO)	Existing / Proposed
1	Banshadhara River	1	1	Kashinagar	Idudi Sand Bed-I	River Bed	400	Idudi	361	1389	4.047	8.094	3125000	Yes	Existing
2			2	Kashinagar	Idudi Sand Bed - II	River Bed		Idudi	361	1332	4.047			Yes	Existing
3		2	1	Kashinagar	Khandava Sand Bed	River Bed	100	Khandava	699	2386 2387	27.531	49.64	285000	No	Existing
4			2	Kashinagar	Purtiguda Sand Bed	River Bed		Purtiguda	522	1285 1286	22.109			Yes	Existing
5	Mahendranaya River	3	1	Rayagada	Burujango Sand Bed	River Bed	50	Burujango	493	2513 2612	9.227	30.429	142500	Yes	Existing
6			2	Paralakhemundi	Bomika Sand Bed	River Bed		Burujango	152	454 195 201/73 1	4.023			Yes	Existing
7			3	Paralakhemundi	Buguda Mahadeipur Sand Bed	River Bed		Buguda & Mahadeipur	20 143	1 1	10.117			Yes	Existing
8			4	Paralakhemundi	Badadeula Sand Bed	River Bed		Badadeula	105	190	7.062			Yes	Existing

ANNEXURE-IV(A)

TRANSPORTATION ROUTES FOR INDIVIDUAL LEASES OF SAND SAIRATS IN GAJAPATI DISTRICT

SL.NO	Name of Tahasil	Source Name	Lease No.	Transportation Route No.	No. of Tippers/Day of Lease	No. of Tippers / Day of All the Lease on route	Length of route in KM.	Type of Road (Black Topped/ Unpaved)	Recommendation for Road (Black Topped/ Unpaved)	Road will be constructed by Govt / Lease Owner	Route Map & Location
1	Kashinagar	Budura Sand Bed	1	Village Road Linked to NH 326	15	15	0.28	Un-Paved	Un-Paved	Lease Owner	Attached
2	Kashinagar	Badigam Sand Bed	1	Haulage Road linked to RD Road	15	15	0.45	Un-Paved	Un-Paved	Lease Owner	Attached
3	Kashinagar	Gouri Sand Bed	1	Haulage Road linked to RD Road	15	30	0.75	Un-Paved	Un-Paved	Lease Owner	Attached
4	Kashinagar	Palasingi Sand Bed	1	Haulage Road linked to RD Road	NA	NA	0.3	Un-Paved	Un-Paved	Lease Owner	Attached
5	Kashinagar	Kashinagar NAC Sand Bed	1	Haulage Road linked to RD Road	15	15	0.25	Un-Paved	Un-Paved	Lease Owner	Attached
6	Kashinagar	Kidigam Sand Bed	1	Haulage Road linked to RD Road	10	10	0.4	Un-Paved	Un-Paved	Lease Owner	Attached

7	Kashinagar	Bathva Sand Bed	1	Haulage Road linked to RD Road	3	18	0.175	Un-Paved	Un-Paved	Lease Owner	Attached
8	Kashinagar	Purtiguda Sand Bed	1	Haulage Road linked to RD Road	15	15	0.75	Un-Paved	Un-Paved	Lease Owner	Attached
9	Kashinagar	Khandva Sand Bed	1	Haulage Road linked to RD Road	33	33	0.25	Un-Paved	Un-Paved	Lease Owner	Attached
10	Kashinagar	Kitting Sand Bed	1	Haulage Road linked to RD Road	15	18	0.775	Un-Paved	Un-Paved	Lease Owner	Attached
11	Kashinagar	Idudi-1 Sand Bed	2	Haulage Road linked to RD Road	15	39	0.42	Un-Paved	Un-Paved	Lease Owner	Attached
12	Kashinagar	Idudi-2 Sand Bed	2	Haulage Road linked to RD Road	24	39	0.16	Un-Paved	Un-Paved	Lease Owner	Attached
13	Paralakhemundi	Kerandi Sand Bed	1	Haulage Road linked to RD Road	1	1	0.375	Un-Paved	Un-Paved	Lease Owner	Attached
14	Paralakhemundi	Uppalada Sand Bed	1	Village Road Linked to NH 326	2	2	0.68	Un-Paved	Un-Paved	Lease Owner	Attached

15	Paralakhemundi	Sailada Sand Quarry	1	Village Road Linked to NH 326	3	3	1.5	Un-Paved	Un-Paved	Lease Owner	Attached
16	Paralakhemundi	Buguda-Mahadeipur Sand Bed	1	Haulage Road Linked RD Road	3	3	0.2	Un-Paved	Un-Paved	Lease Owner	Attached
17	Paralakhemundi	Bomika Sand Bed	1	Village Road Linked to NH 326	2	2	3.5	Un-Paved	Un-Paved	Lease Owner	Attached
18	Paralakhemundi	Bada Deula Sand Bed	1	Village Road Linked to NH 326	3	3	2.5	Un-Paved	Un-Paved	Lease Owner	Attached
19	Rayagada	Burujango Sand Bed	1	Village Road Linked to NH 326	1	1	3.5	Black Topped	Black Topped	Lease Owner	Attached
20	Mohana	Kharchabadi Sand Bed	1	Haulage Road Linked SH-17 Road	1	1	0.05	Un-Paved	Un-Paved	Lease Owner	Attached
21	Mohana	Chapatpanka Sand Bed	1	Haulage Road Linked to NH-326 Road	1	1	0.185	Un-Paved	Un-Paved	Lease Owner	Attached
22	Mohana	Rajabasa Sand Bed	1	Haulage Road linked to RD Road	1	2	0.41	Un-Paved	Un-Paved	Lease Owner	Attached
23	Mohana	Karadapankal Sand Bed	1	Haulage Road linked to RD Road	1	2	0.26	Un-Paved	Un-Paved	Lease Owner	Attached

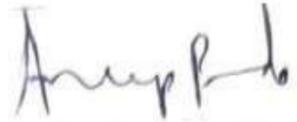
24	Mohana	Mohana Sand Bed	1	Haulage Road linked to NH-325 Road	1	1	0.95	Un-Paved	Un-Paved	Lease Owner	Attached
25	Mohana	Khasada Sand Bed	1	Haulage Road linked to RD Road	1	1	0.4	Un-Paved	Un-Paved	Lease Owner	Attached

ANNEXURE-IV(B)

TRANSPORTATION ROUTES FOR CLUSTER LEASES OF SAND SAIRATS IN GAJAPATI DISTRICT

SL.NO	Name of Tahasil	Source Name	Cluster No.	Transportation Route No.	No. of Tippers/ Day of Lease	No. of Tippers / Day of All the Lease on route	Length of route in KM.	Type of Road (Black Topped/ Unpaved)	Recommendation for Road (Black Topped/ Unpaved)	Road will be constructed by Govt / Lease Owner	Route Map & Location
1	Kashinagar	Idudi Sand Bed 1	1	Haulage Road linked to RD Road	15	39	0.42	Un-Paved	Un-Paved	Lease Owner	Attached
2	Kashinagar	Idudi Sand Bed 2		Haulage Road linked to RD Road	24	39	0.165	Un-Paved	Un-Paved	Lease Owner	Attached
3	Kashinagar	Khandva Sand Bed	2	Haulage Road linked to RD Road	33	33	0.25	Un-Paved	Un-Paved	Lease Owner	Attached
4	Kashinagar	Purtiguda Sand Bed		Haulage Road linked to RD Road	15	15	0.75	Un-Paved	Un-Paved	Lease Owner	Attached
5	Paralakhemundi	Bomika Sand Bed	3	Haulage Road Linked RD Road	3	6	3.5	Un-Paved	Un-Paved	Lease Owner	Attached
6	Paralakhemundi	Buguda Mahadeipur Sand Bed		Haulage Road Linked RD Road	3	6	0.2	Un-Paved	Un-Paved	Lease Owner	Attached
7	Paralakhemundi	Badadeula Sand Quarry		Village Road Linked to NH 326	3	4	2.5	Un-Paved	Un-Paved	Lease Owner	Attached

8	Rayagada	Burujango Sand Quarry	Village Road Linked to NH 326	1	4	3.5	Black Topped	Black Topped	Lease Owner	Attached
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Sub- collector, Gajapati



RO, SPCB, RAYAGADA



Executive Engineer,
Irrigation/WR, Gajapati



Deputy Director of Mines,
Berhampur

Brahmananda Gahoo
(FRO, Devayiroi)

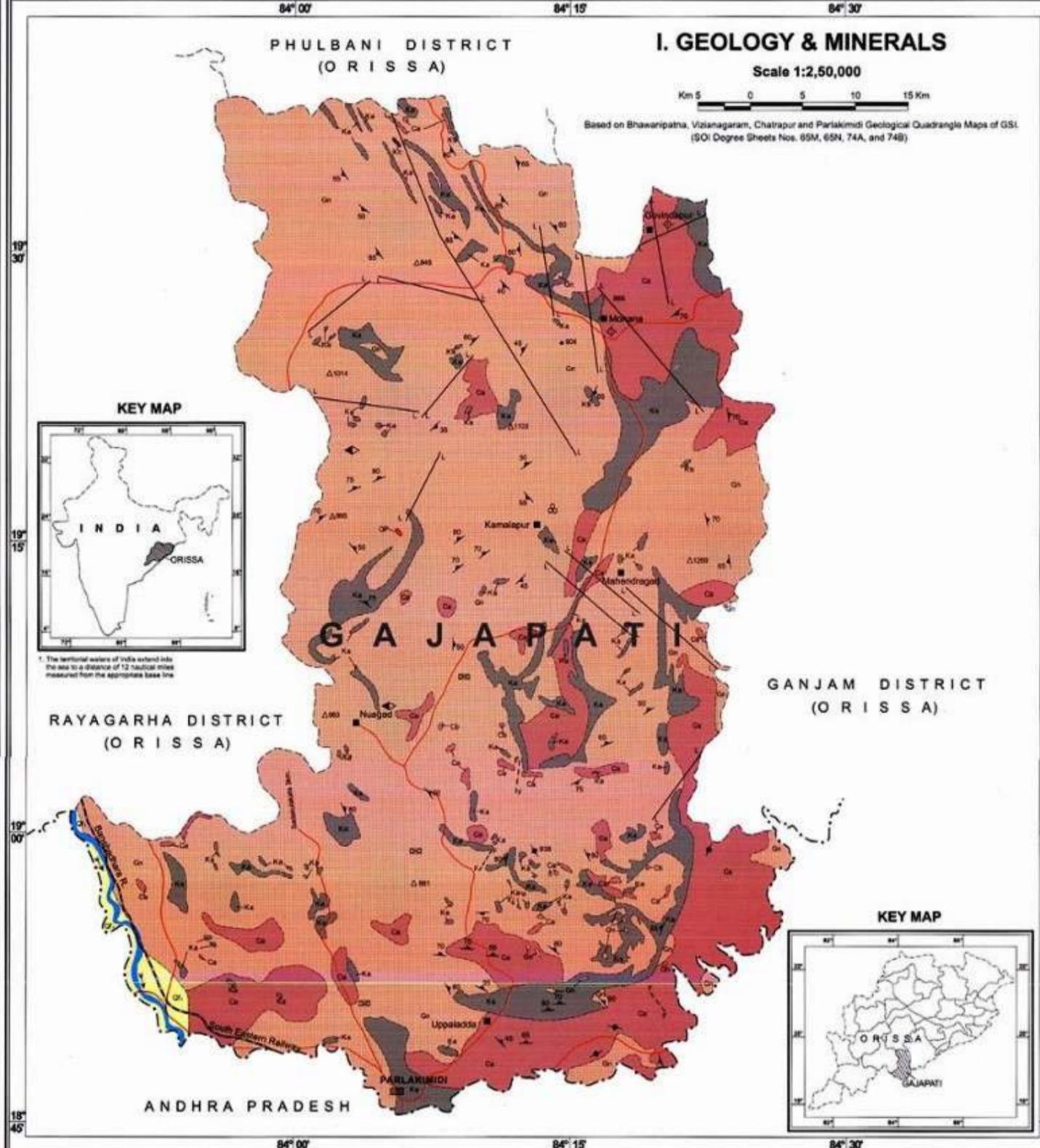
Divisional Forest Officer/ ACF



Geologist, Office of the Joint Director,
Geology(SZ), Berhampur



Mining Officer,
Gajapati



EXPLANATORY NOTE

Gajapati, bounded by latitude 18°45' - 19° 40' N and longitude 83°45' - 84°30' E is a part of erstwhile Ganjam district and falls within part of SOI degree sheet 65M, 65N, 74A & 74B, covering an area of 2,351.11 Sq. km. The district is bounded in the north by Phulbani district, in the east by Ganjam district, in the south by Srikakulam district, Andhra Pradesh and in the west by Rayagadha district. The district headquarters Parlakimundi, is connected by bus to Bhubaneswar and Berhampur. The nearest railroad is Palasa in Andhra Pradesh, which comes in the main line of South Eastern Railway. The temperature of the area varies from 16°C in winter to 48°C in peak summer. Average annual rainfall of the area is 1323.55 mm. Its total population is 575,890 (2011 census).

Geomorphologically the district comprises four geomorphic units, i.e., i) Ridges and hills without valleys ii) Planation surface iii) Colluvial footsteps and iv) Low lying flats. Major part of the area is composed of ridges or hills with valleys in between. Other geomorphic units are occurring as small patches. Banashadara river drains part of the western part of the district. The district is more or less covered with dense jungle and high hills. Many reserve forests cover the district. The main slope of the district is from north to south.

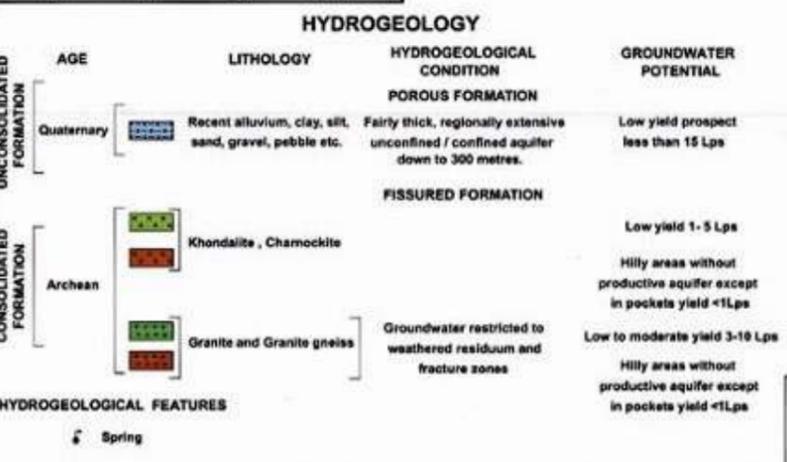
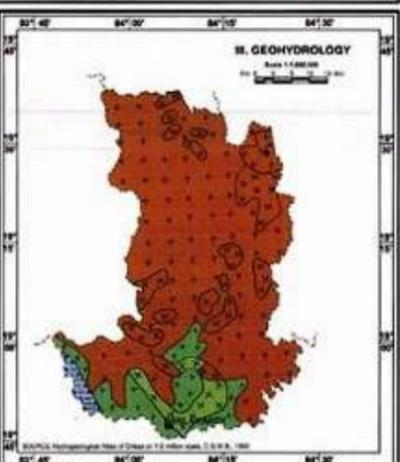
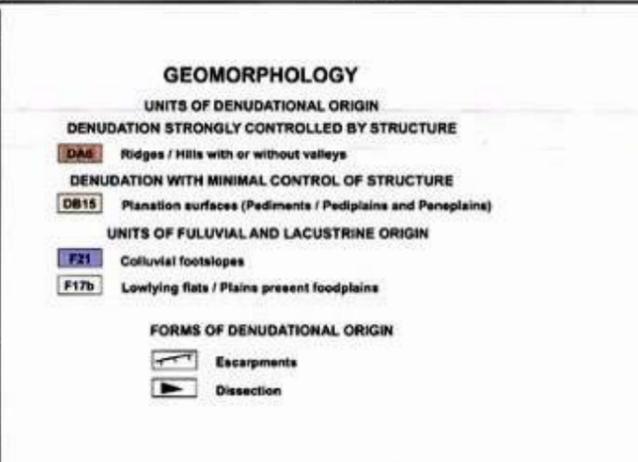
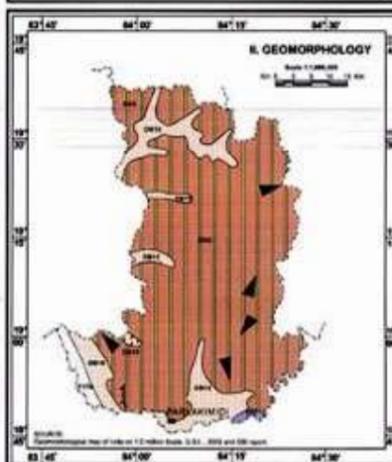
Geologically the district is a part of the Eastern Ghat Mobile Belt and rocks of Charnockite Group, Khondalite Group and Migmatite Group are the main lithounits of this area. These Archaean - Proterozoic Easternghat Super Group of rocks mark the oldest rock unit and are represented by acid charnockite, garnet - sillimanite bearing gneiss (Khondalite) and granite gneiss (Migmatite Group). Younger Quartz vein and pegmatite cut across the Easternghat Super Group of rocks in some places. Unclassified Quaternary sediments are found along Banashadara river. Structurally the area is affected by numerous faults and lineaments in the northern part. The trend of this faults is NW - SE.

Groundwater occurs within fracture zones of the granitic terrain and within confined and unconfined aquifers in the western part near Banashadara river. The area mainly comprises hard rocks (i.e. khondalite, charnockite and granite) where ground water is restricted to weathered residuum and fracture zones. Major part of the area is having very low yield except a small patch in the southwestern part where the yield is moderate to high.

Geotechnically the area comprises basement crystalline having low permeability and medium to high bearing capacity. This type of rock has very good foundation characteristic. The district has got an existing major irrigation project at Ramhandi and an ongoing major irrigation project at Harbhangi.

The district is seismologically stable as it falls within zone I of the earthquake zonation map of India. One hot spring is situated at the eastern part of the area. Sheet erosion, rill and gully erosion and bank erosion are the major natural hazards of the district. Southern part of the district is a drought prone area.

So far mineral resources of this district are concerned no important mineral deposit is found in this district. Few occurrences of mica are found within the granite suite. Few clay pockets are found near Kamalapur (19°15'-84°14') and kankar is found at Gobindpur (19°30' - 84°18') and Mohana (19°29' - 84°15'). Workable deposits of dimension stone occur around Uppalada (18°45' - 84°14') and also in the central part of the district.



GEOTECHNICAL CHARACTERISTICS

MORPHOLOGIC / MORPHOTECTONIC UNIT	ENGINEERING GEOLOGIC PROVINCE	ROCK TYPES			
		Lithology	Permeability	Bearing capacity compressive strength (Kg/cm ²)	Foundation characteristics
Penoplain, Plateau and residual hills	Basement crystalline	Granite, charnockite, rhyolite	Low	High (1000-2000)	Very good
		Gneiss, khondalite, high grade schist, Intrusive	Low	Medium (within 500)	Good

NATURAL HAZARD

- Sheet erosion - Common in pediplain
- Rill and gully erosion - hilly areas with pediplain
- Bank erosion

GEOTECHNICAL PROJECT

- Harbhangi - On going major irrigation project
- Ramhandi stage I - Existing major irrigation project

- Hot spring
- Seismic Zone

Compiled by : A.K. Mishra, (Sr.) Geologist
 Scrutiny & Editing by : Srinanda Mukharjee, (Sr.) Geologist
 Under the supervision of : Tripti Roychoudhury, Director, M & C Divn., GSI, ER.
 Under the overall guidance by : Dr. Srinivas Madabhushi, Dy. Director General, ER, GSI, Kolkata 2011

DISTRICT BOUNDARY

KANDHAMAL

GAJAPATI DISTRICT
ODISHA

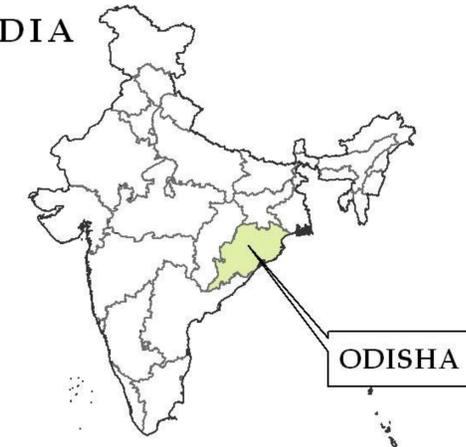
ODISHA



RAYAGADA
DISTRICT

GANJAM
DISTRICT

INDIA



GAJAPATI

LEGEND

-  District Head Quarter
-  District Boundary

ANDHRA
PRADESH

Parlakhemundi

Map Compiled By:



Bhubaneswar, Odisha.

Scale:

9 4.5 0 9 Kilometers

Data Source:
District Administration

BLOCK BOUNDARY



KANDHAMAL

GAJAPATI DISTRICT
ODISHA

Mohana

RAYAGADA
DISTRICT

GANJAM
DISTRICT

Nuagada

R. Udaygiri

Guma

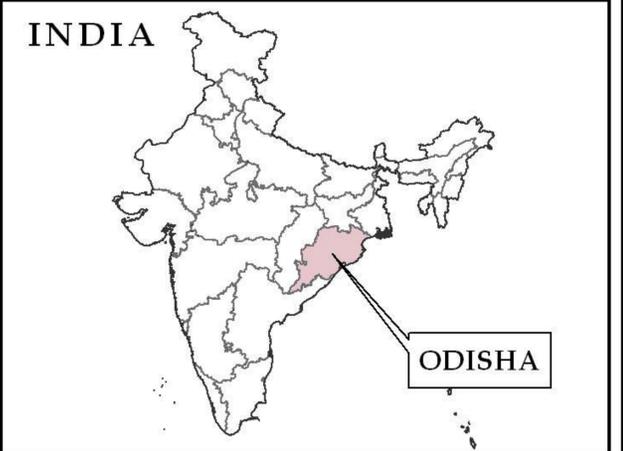
Rayagada

Kashinagara

Parlakhemundi
(Gosani)

ANDHRA
PRADESH

Map Compiled By:



LEGEND

- ⊙ Block Head Quarter
- District Boundary
- Block Boundary

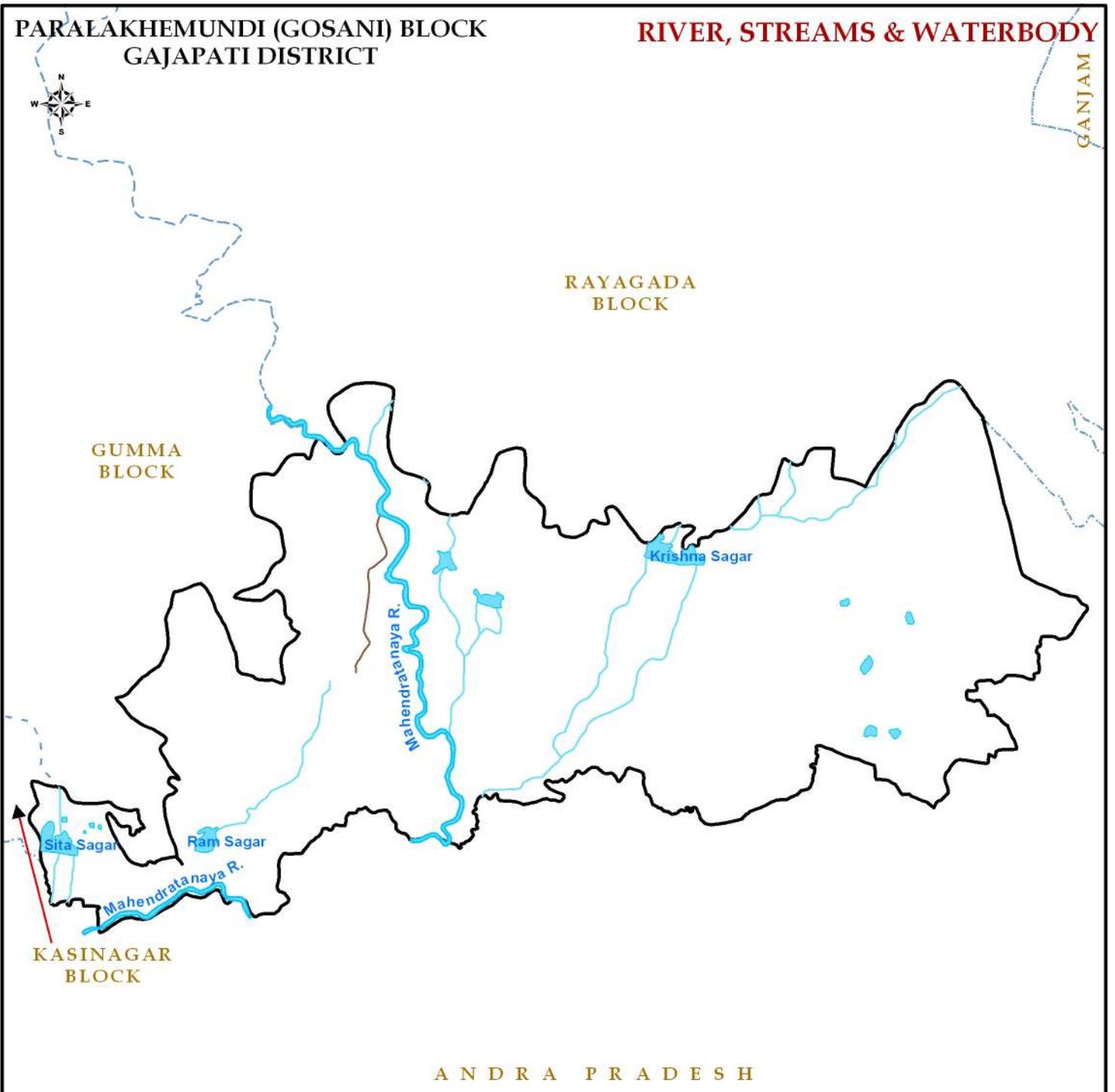
Scale:



Data Source:
District Administration

**PARALAKHEMUNDI (GOSANI) BLOCK
GAJAPATI DISTRICT**

RIVER, STREAMS & WATERBODY



Data Source:
Survey of India & LISS-III Image

INDIA	ODISHA	GAJAPATI	LEGENDS	<p>Scale:</p>
<p>ODISHA</p>	<p>GAJAPATI</p>	<p>PARALAKHEMUNDI</p>	<ul style="list-style-type: none"> Block Boundary Stream Nala River/Waterbody 	<p>Map Complied By:</p> <p>Bhubaneswar, Odisha.</p>

**KASINAGAR BLOCK
GAJAPATI DISTRICT**

RIVER, STREAMS & WATERBODY



RAYAGADA
DISTRICT

NUAGADA
BLOCK

GUMMA
BLOCK

Vansadhara R.

ANDRA PRADESH

PARALAKHEMUNDI
(GOSANI) BLOCK

Data Source:

Survey of India & LISS-III Image

INDIA	ODISHA	GAJAPATI	LEGENDS	Scale: 2.5 1.25 0 2.5 Kilometers
<p>ODISHA</p>	<p>GAJAPATI</p>	<p>KASI NAGAR</p>	<ul style="list-style-type: none"> Block Boundary Stream River/Waterbody 	<p>Map Complied By:</p> <p>NIC Bhubaneswar, Odisha.</p>

**MOHANA BLOCK
GAJAPATI DISTRICT**

RIVER SYSTEM



**KANDHAMAL
DISTRICT**

**GANJAM
DISTRICT**



Data Source:
Survey of India & LISS-III Image

INDIA	ODISHA	GAJAPATI	LEGENDS	<p>Scale:</p>
<p>ODISHA</p>	<p>GAJAPATI</p>	<p>MOHANA</p>	<ul style="list-style-type: none"> Block Boundary Stream River/Waterbody Reservoir 	<p>Map Complied By:</p> <p>NIC Bhubaneswar, Odisha.</p>

**PARALAKHEMUNDI (GOSANI) BLOCK
GAJAPATI DISTRICT**

**ROAD & RAILWAY
NETWORK**

GANJAM



RAYAGADA
BLOCK

GUMMA
BLOCK

KASINAGAR
BLOCK

ANDRA PRADESH

Data Source:

Survey of India & District Administration

INDIA	ODISHA	GAJAPATI	LEGENDS	Scale:
			<ul style="list-style-type: none"> Habitation Railway Station Block Boundary Village Boundary State Highway Road Railway Line GP Road 	
			<p>Map Complied By:</p> <p>NIC Bhubaneswar, Odisha.</p>	

**KASINAGAR BLOCK
GAJAPATI DISTRICT**

RIVER, STREAMS & WATERBODY



RAYAGADA
DISTRICT

NUAGADA
BLOCK

GUMMA
BLOCK

Vansadhara R.

ANDRA PRADESH

PARALAKHEMUNDI
(GOSANI) BLOCK

Data Source:

Survey of India & LISS-III Image

INDIA	ODISHA	GAJAPATI	LEGENDS	Scale: 2.5 1.25 0 2.5 Kilometers
<p>ODISHA</p>	<p>GAJAPATI</p>	<p>KASINAGAR</p>	<ul style="list-style-type: none"> Block Boundary Stream River/Waterbody 	<p>Map Complied By:</p> <p>NIC Bhubaneswar, Odisha.</p>

**MOHANA BLOCK
GAJAPATI DISTRICT**

RIVER SYSTEM



**KANDHAMAL
DISTRICT**

**GANJAM
DISTRICT**



Data Source:
Survey of India & LISS-III Image

INDIA	ODISHA	GAJAPATI	LEGENDS	Scale: 2.5 1.25 0 2.5 Kilometers
<p>ODISHA</p>	<p>GAJAPATI</p>	<p>MOHANA</p>	<ul style="list-style-type: none"> Block Boundary Stream River/Waterbody Reservoir 	<p>Map Complied By: NIC Bhubaneswar, Odisha.</p>