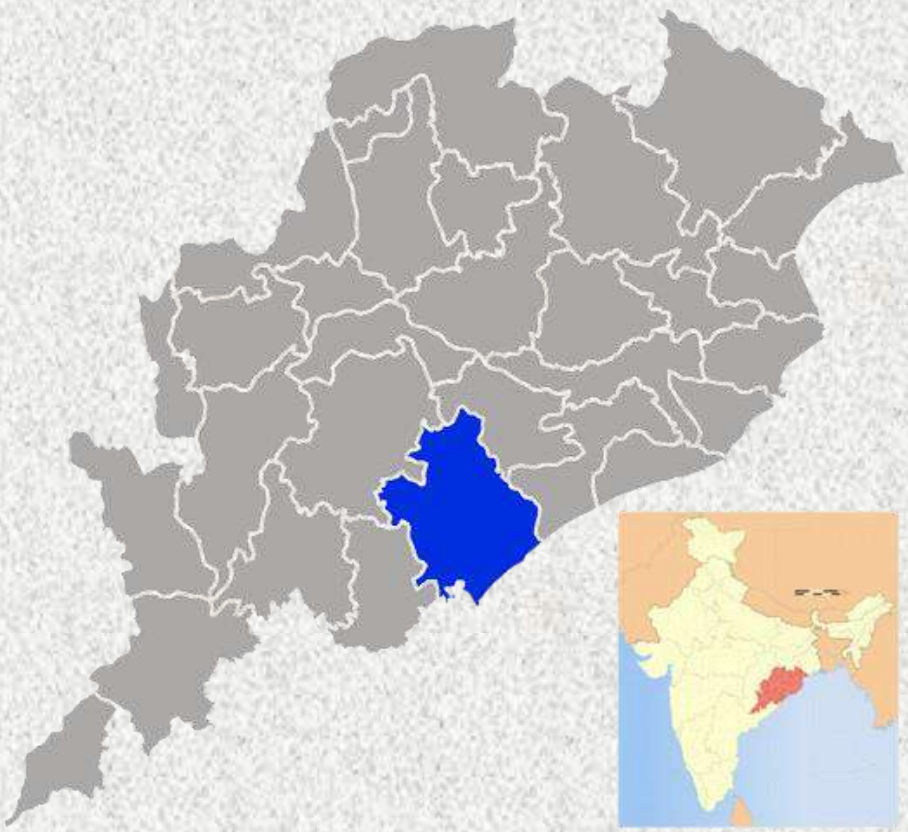
DRAFT

DISTRICT SURVEY REPORT (DSR) OF GANJAM DISTRICT, ODISHA FOR ORDINARY EARTH/BRICK EARTH MINING

As per Notification No. S.O. 141(E),15th January,2016 & S.O. 3611(E), 25th July, 2018, New Delhi ,MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE (MoEF & CC)



COLLECTORATE GANJAM
DECEMBER-2024

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PREFACE

The Erstwhile Ministry of Environment and Forests(MoEF), (the Government of India, made Environmental Clearance (EC) for mining of minerals mandatory through its Notification of 27th January, 1994 under the provisions of Environment Protection Act, 1986. Keeping in view the experience gained in environmental clearance process over a period of one decade, the Ministry came out with Environmental Impact Notification, SO 1533 (E), dated 14th September 2006. The Ministry of Environment, Forests & Climate Change (MoEF&CC), Government of India had amended the said vide notification S.O. 141(E) Dated 15th January, 2016. Now again Ministry of Environment, Forests & Climate Change (MoEF & CC), Government of India amended the notification S.O. 141(E) Dated 15th January, 2016 vide S.O. 3611(E) Dated 25thJuly,2018. It has been made mandatory to obtain environmental clearance for different kinds of development projects as listed in Appendix-X of the Notification. 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 ordinary earth mining has been prepared in accordance with Clause II of Appendix X of the notification. Every effort has been made to cover ordinary earth mining locations, future potential areas and overview of ordinary earth 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 District Survey Report is to identify the mineral resources and developing the mining activities along with other relevant data of the District.

OBJECTIVES

The main objective of the preparation of District Survey Report is to ensure the following

- Identification of mineral wealth in the district.
- Identification of areas of Minor Mineral having the potential mineral where mining can be allowed.
- Identification of areas of proximity to infrastructural structures and installations where mining should be prohibited.

01. INTRODUCTION.

Ganjam District came into existence on 1st April 1936. The district is named after the old township and European fort of Ganjam situated on the northern bank of river Rushikulya which was the head quarter of the District during early British administration up to 1815. The name of the town Ganjam or locally pronounced Ganja, has probably been derived from the word "Gunj" of Iranian (Persian) origin which means the granary. There is also another meaning of this word I.e. "The Market". The Ganjam area was a part of ancient Kalinga which was occupied by Ashok in 261 B.C. The period of 1757 was ruled by the French Commander Bussy. In 1759, the French ruler was defeated by English and the District was annexed by them. The office of the District Collector was established in 1794. The District got separated from the Madras Presidency and formed the part of the newly created State of Odisha province with effect from 1.4.1936. Ganjam District is on 19.4 to 20.17 degree North Latitude and 84.7 to 85.12 degree East Longitude. It covers an area of 8070.60 sq km. The district is braodly divided into two divisions, the Coastal plain area in the east and hill and table lands in the west. The eastern ghats run along the western side of the District. The climate of Ganjam is characterized by an equable temperature round the year, particularly in the coastal regions. The District's cold season from December to February is followed by hot season from March to May. The District experiences normal annual rainfall of 1444 mms.Agriculture is a traditional occupation and the way of living of the inhabitants of the Ganjam District. The District is well known for its fertile soil and agricultural productivity. A large variety of crops are grown here like Paddy, Ground nut, Sugar cane, Oil seeds, Ragi, Mung, Biri etc. Because of the agro climatic condition Ganjam is included as the agricultural District.The literacy rate of the ganjam district is above 60 percent. There are many reputed educational institutes in the District like Brahmapur University, Ganjam Law college, Lingaraj Law college, NIST, Khalikote College Brahmapur, R.C.M. Science college Khalikote, Government Science College Chhatrapur, Maharaja Krushna Chandra Gajapati Medical College, Nursing College, and Pharmaceutical Colleges etc.Ganjam District celebrates many festivals round the year. Dola Yatra, Tara Tarini Mela, Thakurani Yatra, Durga Puja, Shiv Ratri, Ratha Yatra, Makar Sankranti, Manabasa Gurubara and Danda Yatra are the famous festivals being celebrated in the District with great enthusiasm. Ganjam District is full of many tourist spots that are visited by a large number of tourists every year like Arjyapalli, Athagadapatna, Balkumari, Brahmapur, Bhairabi (Mantridi), Bhetanai, Biranchi Narayan, Budhakhol-Buguda, Chilika (Rambha), Girisola, Gopalpur sea beach, Taratarini etc.

02. OVERVIEW OF MINING ACTIVITY IN THE DISTRICT.

Over the year the mining activities of the district is multiplying keeing in view of population pressure, different development activities and scientific requirement of the society. The mining activities of the district may be broadly divided into 3 categories, vis: i) Atomic Mineral Exploration and processing 2) Extraction and Processing of Specified Minor Mineral (Decorative Stone) and 3) Extraction of minor mineral other than specified minor mineral such as ordinary earth, Sand, Stone & Morrum.

Mineral Resources Overview:

Sand: The rivers and streams in Ganjam, particularly the Rushikulya, Ghodahada, Bahuda , Badanadi , and Rushikulya, are rich sources of sand deposits. Sand extracted from these waterways is primarily used in construction, especially for producing concrete and plaster. It is essential to the building industry, supporting the development of residential, commercial, and infrastructure projects.

Road Metal/Stone: Ganjam is home to vast reserves of building stones, such as granite, limestone, and various other construction materials. The district boasts numerous quarries that supply stones for use in construction, road building, and other civil engineering projects.

Morrum: Morrum is a type of gravel or loose earth commonly used in construction and road construction. It is primarily extracted from riverbeds and alluvial deposits. Morrum is widely utilized for roadbuilding, particularly in rural and semi-urban areas, and is also used in the construction of embankments and as a foundational material for highways.

Ordinary Earth: The clay-rich soil found in parts of Ganjam is highly suitable for the production of bricks. Clay is commonly extracted for the manufacturing of bricks for both industrial and residential construction. The extracted clay is molded into bricks, which are then fired in kilns. These bricks are vital for the construction of buildings, roads, and other infrastructure.

All the these sources extraction of Minor Mineral are being done as per the approved mining Plan. All the mining activities in the district are open cast working and carried out either manually or semi mechanised manner.

03. GENERAL PROFILE OF THE DISTRICT.

a. Geographical position: Longitude -84.7 to 85.12 ° East
Latitude- 19.4 to 20.17°North

b. Area & Population: -

The district has an area of 8070.60 sq.kms and 35.29 lakhs of population as per 2011 census. The density of population of the district is 429 per sq. kmas against 270 person per sq.km of the state. It has 3227 villages covering 11 blocks, 23 Tahasils and 3 Subdivisions. As per 2011 census the schedule caste population is 6.88 lakhs (19.5%) and schedule tribe population 1.18 lakhs (3.37%). The literacy percentage of the district covers 62.62 against 72.9 of the state.

c. Climate: -

The climate condition of the district is generally hot with high humidity during April to May and cold during December to January. The monsoon generally breaks during the month of June. Annual rainfall of the district was 1109.68 mm in 2018-19 which is less than the normal rainfall (1444 mm).

d. Economy:

The economy of the Ganjam District is supported by both industry and agriculture. The District is well known for its food grain production and its export. The agricultural sector supplies about 75 percent of the total workforce of the Ganjam District. The animal husbandry also adds economical support to the District. There are a considerable section of people who are living on animal rearing. The share of industries in the economic development of Ganjam District is also important. Ganjam District has store a variety of economically important minerals like limestone, soapstone, chinaclay, fireclay, graphite, granite and quartz.

Agriculture forms the backbone of the District's economy, with more than 70 Percent of the population being dependent on it. The district has alluvial soil at the eastern part (coastal region) and late rite soil on the west (hilly table land) with small patches of black cotton soil at the centre and in the north east close to Chilika. This helps in obtaining a substantial agricultural yield. Availability of mineral resources and forest resources also contributes to the District's economy.

Abrasives and grinding materials, lime stone (kankar), manganese, monazite, sand and talc are some of the chief economic minerals found in the District. Black granite stones are abundantly available in the District, sustaining the stone crushing and stone polishing units. Matikhala mines, operated by Indian Rare Earths Limited (IRE) is one

mine in the District that exploits sand deposits containing monazite, zircon and rutile illuminate.

The forests of the District provide a wide range of raw materials contributing to its economic growth. Timber, bamboo, tamarind, mahua, resin, kendu leaves, siali leaves, sal leaves, neem and karanja seeds are the main forest products. As regards livestock resources, the rich live stock population of the District contributes in its own way to the District's economic development. This District fulfills the major portion of the total lime needs of the state, with the rich resource of lime shells that its long coast line offers. Ganjam and Humma area and the area near the mouth of river Bahuda and Rushikulya are the rich sources of salt production, catering not only to the needs of the District but also of the state. There are a number of industries functioning in the District. The District also has three industrial estates, located at Brahmapur, Bhanjanagar and Chatrapur respectively.

Most of the educated youths of poor households are migrating to various cities of Gujarat, India for breadwinning. It covers a major migrated population of Ganjam District and affects the district economy significantly.

e. Industry:

The contribution of the mineral to the economy of the district is insignificant. A huge amount of minerals are available in the district such as granite, limestone, soap stone, fire clay, china clay, quartz manganese etc. Basing on the above resources and infrastructure large number of SSI and large and medium sale unity are coming up through out the district. So far only one mine at Matikhalo is being operated by Indian Rare Earth Limited (IREL) to exploit sand deposits containing monazite, zircon. rutile, illuminite etc. The IREL is established in the year 1984 at Arjyapalli. It is also going to establish a thorium, monazaite processing unit and titanium pigment in near future. However, the mining activities of the district has been discussed in previous paragraph of the report.

Similarly, another large scale unit i.e. M/s. Jayashree Chemicals Pvt. Ltd. (Now M/s. Grasim Industry Lid.) was established in the year 1962 which started production in 1967 and it producing caustic soda, chlorine and Hydrochloric acid and sulphur dioxide Gas. Similarly. 2 medium scale enterprises namely M/s. Sudhakar PVC products Pvt. Ltd. and M/s. United Spirits Ltd. at Pitapalli under Chikiti Tahasil and Narayanpur under Konisi Tahasils are existing respectively. Apart from these. different industrial units will come up in the TATA Steel SEZ Ltd. relating to food and beverage. chemical and

chemical product, fabrication metal product, electrical and electronics, construction and mineral products etc.

f. Demography: -

description	Value
Area	8070.60 sq.km
No. of Sub-Division	3
No. of Block	11
No. of Police Station	35
No. of Tahasils	23
No. of Gram Panchayats	503
No. of ULBs	18
No. of Revenue Villages	3227

g. Culture & Heritage:

Ganjam District celebrates many festivals round the year. Dola Yatra, Tara Tarini Mela, Thakurani Yatra, Durga Puja, Shiv Ratri, Ratha Yatra, Makar Sankranti, Manabasa Gurubara and Danda Yatra are the famous festivals being celebrated in the District with great enthusiasm. Ganjam District is full of many tourist spots that are visited by a large number of tourists every year like Arjyapalli, Athagadapatna, Balkumari, Brahmapur, Bhairabi (Mantridi), Bhetanai, Biranchi Narayan, Budhakhol- Buguda, Chilika (Rambha), Girisola, Gopalpur sea beach, Taratarini etc.

h. Transport & Communication: -

The District is well connected by roads, rail, air and water ways. Most of the villages and towns are connected through motorable good roads. The district is served by roads of different categories like National Highways. State Highways. Major District Roads. Other District Roads and classified village roads, the length of each type of roads in the district upto the year 2014-2015 is given below.

Sl. No.	Category of the Road	Length in km.
1	2	3
1	National highways	396 km
2	State Highways	630Km
3	Major District Roads	270Km
4	Other District Roads	867Km
	TOTAL	2150Km

i. National Highways: -

N.H. 16	:	Puintola near Ganjam to Girisola- 85Kms
N.H. 516	:	Connects NH-16 with Gopalpur Port-5.35Kms
N.H. 57	:	Connects Bhanjanagar, Aska & Berhampur – 62 Kms
N.H. 326	:	Connects Aska, Sheragada & Taptapani-53 Kms
N.H. 59	:	Connects Berhampur, Surada & Gajalabadi-191 Kms

ii. National Highways: -

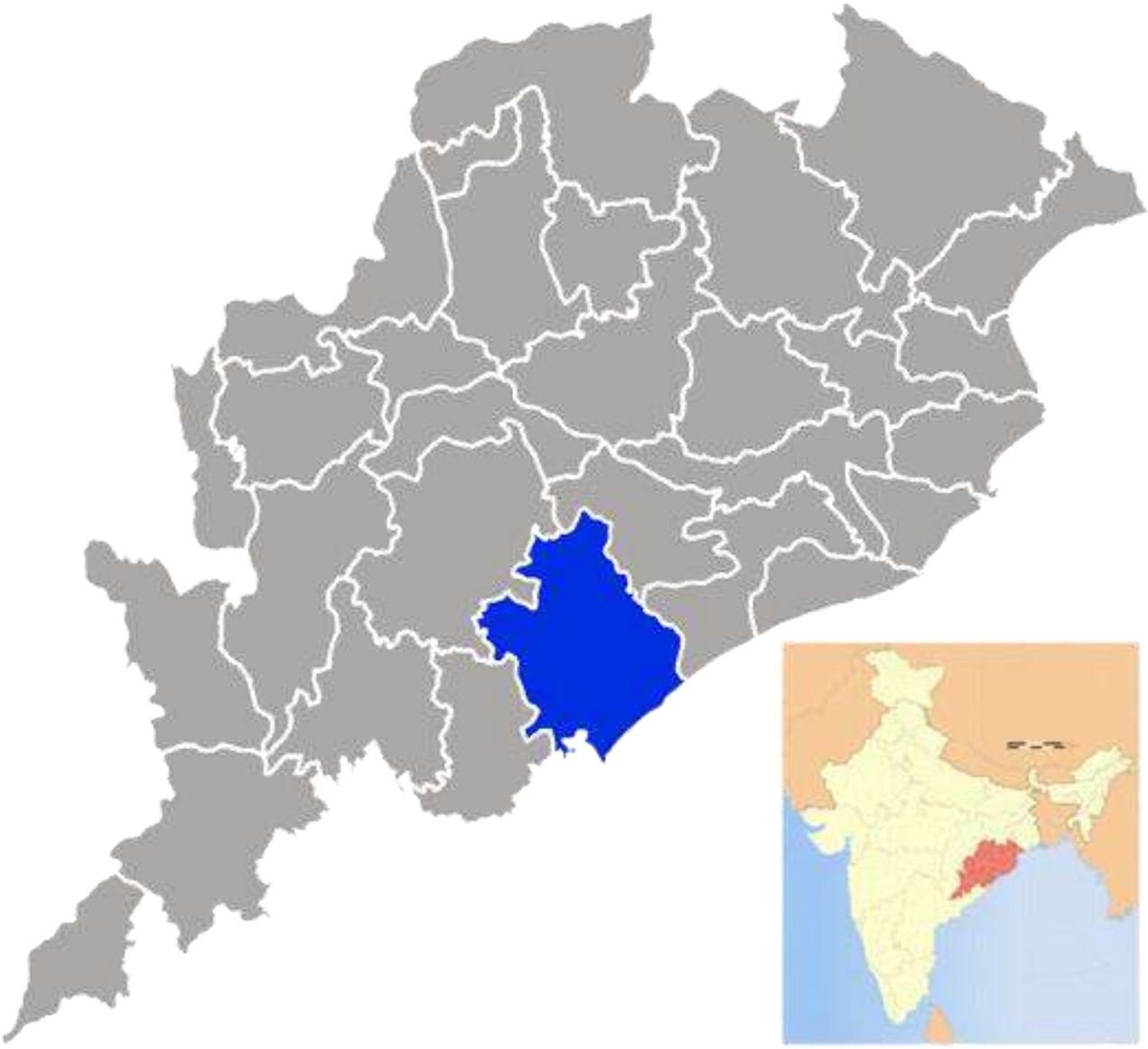
S.H. 7	:	Berhampur to Phulbani – 105 Kms
S.H. 17	:	Berhampur, Digapahandi, Gobindapur, Luhagudi & Raipananga-51Kms
S.H. 21	:	Nayagada, Jagannath Prasad & Bhanjanagar- 44Kms
S.H. 22	:	Berhampur, Tamana, Chikiti, Surangi & Mandarada- 48 Kms
S.H. 26	:	Chatrapur, Ganjam-11 Kms
S.H. 29	:	Chikit, Digapahandi & Aska
S.H. 30	:	Khallikote, Kabisuryanagar, Aska-57 Kms
S.H. 31	:	Humma, kabisuryanagar- 39.2 kms , balipadar & Bellaguntha- 54Kms
S.H. 32	:	Jagannathpur & Purushottampur- 24.7Kms
S.H. 33	:	Balipadar, Korasingi-32.6Kms
S.H. 36	:	Badasnkha, Tarini, Hinjilicut, Sheragada & Surada- 96Kms
S.H. 37	:	Bhanjanagar, Tilisingi, Tarasingi & Dasapalla- 48 Kms

Apart from these NHs & SHs, Measure District Road No. 18,62,65,71,72,95,96,97 are connecting nooks, and corners of the District & gives a good connectivity.

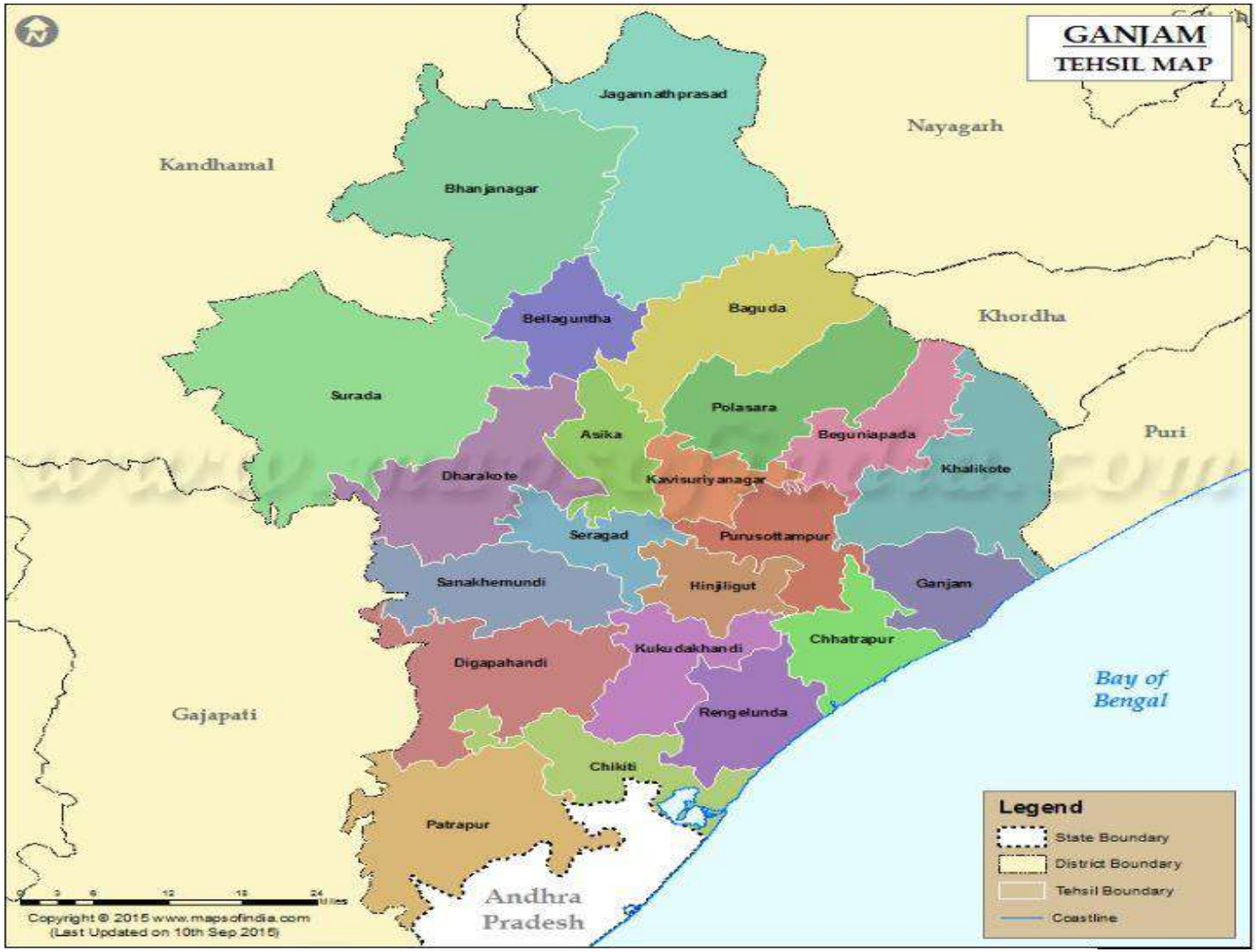
Rail Link:-

The East Coast railways passes through the district of Ganjam. It enters in Khallikote Station in the North and Surala Road Station in the South. The total Railway route length is 79Kms. Further a rail line also connects the mainline of east Coast railways with IREL (India) Ltd., Matikhola as well as Gopalpur port.

INDEX MAP




BASE MAP
GANJAM DISTRICT
7 0 7 14 Kilometers
ORISSA
GANJAM
JAGANNATHPRASAD
Jagannathprasad
BHANJANAGAR
Bhanjanagar
NH 217
BADA N.
LOHARKHANDI R.
Bellaguntha
BELLAGUNTHA
BUGUDA
Buguda
SURADA
Surada
POLASARA
Polsara
BAGHUA R.
KHALLIKOTE
Khalikote
NH 5
CHILIKA LAKE
BEGUNIAPADA
Beguniapada
Asika
DHARAKOTE
Dharakote
KAVISURYANAGAR
Kavisuryanagar
PURUSOTTAMPUR
Purusottampur
SARAGARH
Saragad
RUSHIKULYA R.
GANJAM
Ganjam
SANAKHEMUNDI
Sanakhemundi
GHODAHADA N.
Hinjilicut
HINJILICUT
Kukudakhandi
KUKUDAHANDI
CHHATRAPUR
Chhatrapur
Digapahandi
DIGAPAHANDI
Rangeilunda
RANGEILUNDA
BAY OF BENGAL
Chikiti
CHIKITI
BAHUDA R.
Patrapur
PATRAPUR
LEGEND
District Headquarter
Block Headquarter
District Boundary
Railway
National Highway
River/Waterbody
Prepared By
GIS DIVISION
NIC, BHUBANESWAR


GANJAM
TEHSIL MAP
Jagannathprasad
Nayagarh
Kandhamal
Bhanjanagar
Bellaguntha
Baguda
Khordha
Surada
Polasara
Asika
Beguniapada
Puri
Dharakote
Kavisuriyanagar
Khalikote
Seragad
Purusottampur
Sanakhemundi
Hinjiligut
Ganjam
Kukudakhandi
Chhatrapur
Digapahandi
Bay of
Bengal
Gajapati
Rengelunda
Chikiti
Patrapur
Andhra
Pradesh
Legend
State Boundary
District Boundary
Tehsil Boundary
Coastline
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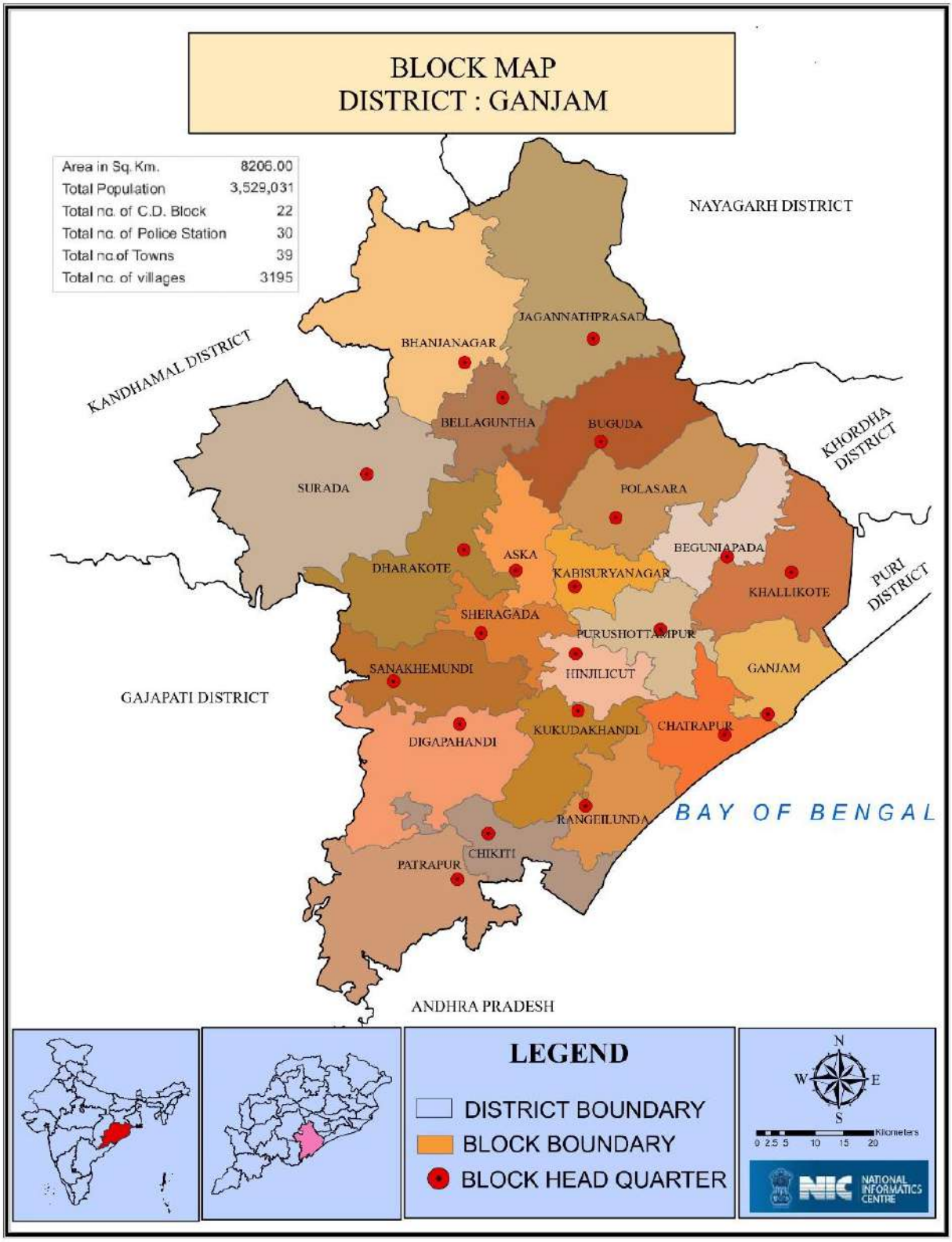
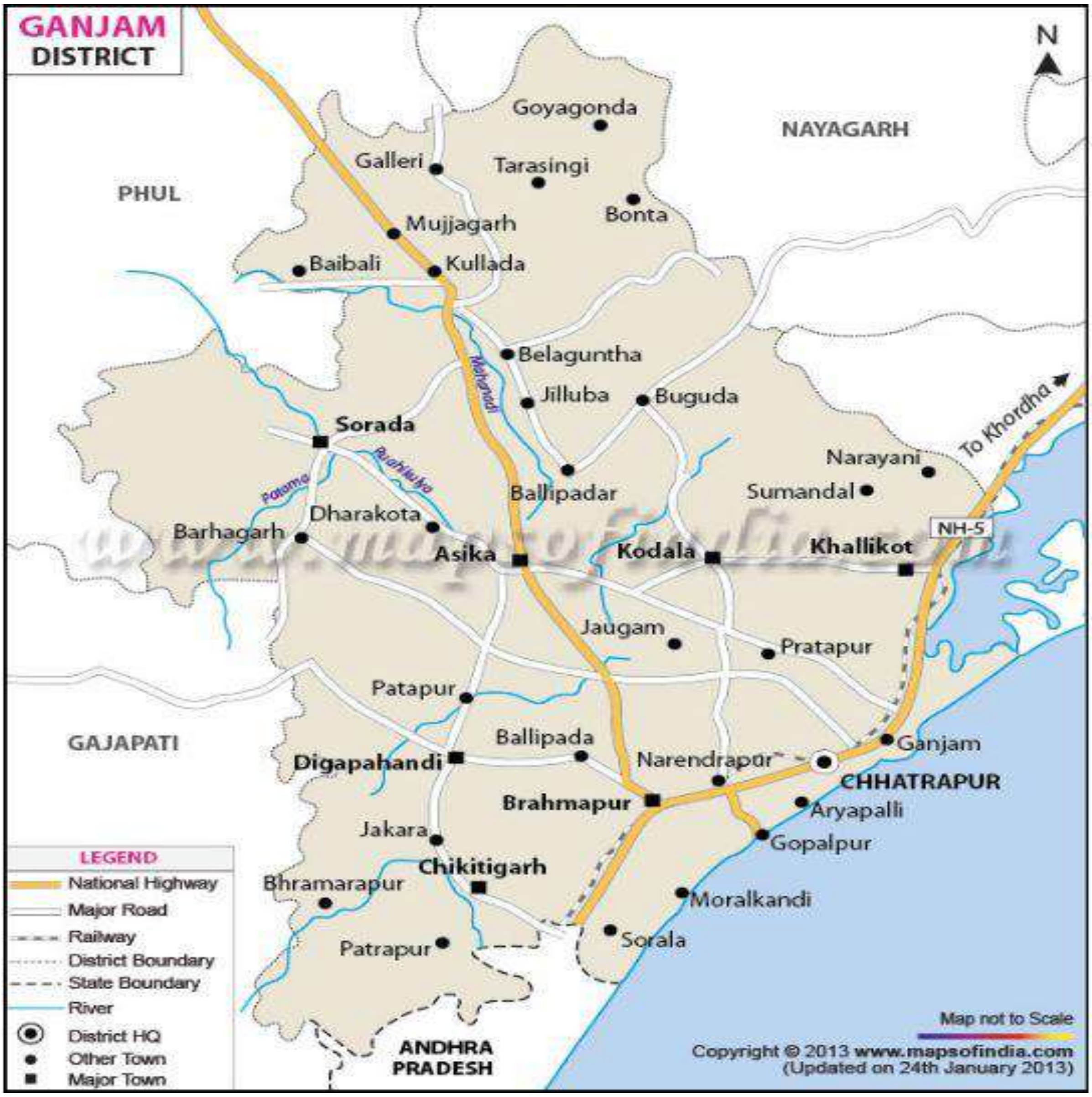

BLOCK MAP
DISTRICT : GANJAM
Area in Sq. Km. 8206.00
Total Population 3,529,031
Total no. of C.D. Block 22
Total no. of Police Station 30
Total no.of Towns 39
Total no. of villages 3195
NAYAGARH DISTRICT
KANDHAMAL DISTRICT
KHORDHA DISTRICT
PURI DISTRICT
GAJAPATI DISTRICT
ANDHRA PRADESH
BAY OF BENGAL
JAGANNATHPRASAD
BHANJANAGAR
BELLAGUNTHA
BUGUDA
SURADA
POLASARA
ASKA
DHARAKOTE
KABISURYANAGAR
BEGUNIAPADA
KHALLIKOTE
SHERAGADA
PURUSHOTTAMPUR
SANAKHEMUNDI
HINJILICUT
GANJAM
KUKUDAKHANDI
CHATRAPUR
DIGAPAHANDI
RANGEILUNDA
CHIKITI
PATRAPUR
LEGEND
DISTRICT BOUNDARY
BLOCK BOUNDARY
BLOCK HEAD QUARTER
N
W
E
S
Kilometers
0 2.5 5 10 15 20
NATIONAL INFORMATICS CENTRE


GANJAM
DISTRICT
N
NAYAGARH
PHUL
GAJAPATI
ANDHRA
PRADESH
Goyagonda
Galleri
Tarasingi
Bonta
Mujjagarh
Baibali
Kullada
Belaguntha
Jilluba
Buguda
Sorada
Ballipadar
Narayani
Sumandal
Dharakota
Barhagarh
Asika
Kodala
Khallikot
NH-5
To Khordha
Jaugam
Pratapur
Patapur
Ballipada
Digapahandi
Narendrapur
Ganjam
CHHATRAPUR
Brahmapur
Aryapalli
Gopalpur
Jakara
Chikitigarh
Bhramarapur
Moralkandi
Patrapur
Sorala
LEGEND
National Highway
Major Road
Railway
District Boundary
State Boundary
River
District HQ
Other Town
Major Town
Map not to Scale
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(Updated on 24th January 2013)

04. GEOLOGY OF THE DISTRICT.

The rock formations in the district include khondalite, basic pyroxene granulites, amphibolites, porphyroblastic and non-porphyroblastic granite gneiss. garnetiferous granite grieiss, granodiorite, ptynite, pegmatite and quartz veins. Of all those rocks, khondalite suites of rocks are considered to be the oldest from the available field relations. Pyroxene granulite, and its metavariants and granite constitute the charnockite group, the definite or absolute statigraphic position of which is not yet established. But for the present, they are considered to be younger in age than the khondalite group of rocks.

Geological Formation:

From the available information the following stratigraphical sequence has been arrived at.

(a) Khondalite Group:

The khondalite forms a very conspicuous feature of the geology of Ganjam and the khondalite group of rocks consists of quartz-graphitesillimanite schists and gneisses, quartz-garnet rock, garnetiferous quartzite and calc-silicate rocks. These occur as conformable bands and inclusion within the granite gneiss and hypersthenes granite. In length, these may vary from a few meters to several. Quartz-Silliminite rock with or without graphite is best developed arming the khondalite group of rocks: garnetiferrous quartzite is the transition between this and quartzite.

Quartz-Silliminite (+ graphite) rock in hand specimen is fawn to buff coloured. medium to fine grained contains lots of garnet and flakes of graphite, at places garnets are surrounded by clusters of fibrous silliminite. Quartz garnei rock and gametiferous quartzite are of same mineralogical composition and vary in colour from grayish to brown. The calc-silicate rocks are white to grey coloured, extremely fine grained and compact and consists of pyroxene, feldspar, scapolite, garnet spene and sometimes spinel. The plagioclase-composition varies from albote to aligoclase. K-feldspar occurs as irregular grains with perthitic intergrowth.

(**b) Charnockite Group:-**

Charnockite group comprises pyroxene granulite and its metavariants (amphibolites) and hypersthene granulites (Acid charnockite). Pyroxene granulite occurs as bands, lantfclet and patches within acid charnockite. it is dark coloured, hard and compact equigranular and consists of pyrozene, feldspar, biotite and garnet.

Amphibolite occurs as inclusions within the garnetiferous urafilis gneiss. The rock is dark coloured medium grained with faint schistosity. Amphibole is of dark green variety here and is formed probably from pyrogene by retrogression.

(c) Acid Charnokite (Hypersthene Granulite):-

The rock is medium to fine grained. Light greasy green to greasy grey in colour. hard compact non-fissile, massive. of ferrosillite with spheroidal weathering and sometimes displays a crude foliation. It is composed essentially of hypersthenes, plagioclase, orthoclase and sometimes diopside, biotite, garmet, microcline are rare. Apatite and zircon constitute the accessories.

(d) Leptynite:-

Leptynite is medium to coarse grained rock composed of feldspars associated with quartz which are speared and elongated with granoblastic texture. Besides quartz, it contains biotite, garnet, k-feldspar, plagioclase, sillimanite, magnetite. apatite and zircon.

(e) Garnetiferous Granite Gneiss:-

The rock is leucocratic with minor coarse grained, porphyroblastic, with feldspar porphyroblasts garnets evenly distributed and biolite arranged in linear fashion giving a gneissese structure.

(f) Laterite: -

Latorite occurs as capping over granite gneiss and charnockite at many places. It is highly cavernous and ferruginous. The thickness of the laterite profile varies from 3 m. to 15 m.

MINERAL RESOURCES

(g) Clay:-

Pockets of kaoline derived from the weathering of gneisses have been noticed near Samtarpalli (19° 42': 84° 51°) and Jillinda (19° 42': 84° 571). The occurrence of clay at Samtarpalli is slightly gritty and is whitish grey in colour. The linear shrinkage is roughly about 12.5 per cent and it turns to yellowish grey.

(h) Monazite, Illuminate, etc. (Sand Concentrates)

Large numbers of small deposits of natural black sand concentrates consisting of Rutile Monazite, imonite, zircon, sillimanite, garnet and rutile have been reported between the Rushikulya river mouth (Agasthi-Nuagan) to Gopalpur spreading in 2.887.76 hectares. The Indian Rare Earth (1) Ltd.. Matikhalo. Chatrapur (a Central Government PSU) was granted mining lease (Odisha Sands Complex) in March-1979 for a period of 20 years from 21.03.1979 to 20.03.1999 over an area of 2877.760 hectares. Subsequently, the mining lease was renewed for another 20 years from 21.03.1999 to 20.03.2019 over an area of 2464.054 hectares for mining of beach sand minerals and producing minerals Rutile Monazite, Imonite, Zircon, Sillimanite. Garnet and Rutile. Further the lease has been extended upto 31.03.2047 for beach sand mining of atomic minerals like Rutile Monazite, Imonite, Zircon, Sillimanite, Garnet and Rutile.

Stratigraphy:

Age	Super Group	Group	Lithology
Holocene			Beach sand and sand dunes soil cover
Cenozoic			Laterite
Proterozoic		Miggmatite Group	Quartz-vein and pegmatite Anorthite
			Granetiferous Gneiss
Archean to Proterozoic	Eastern Ghat Supergroup	Charnockite	Basic charnockite
			Acidic Charnockite
		Khondalite Group	Kodurite Calc-silicate rock Quartzite
			Quartz-granet-sillimanite Schist

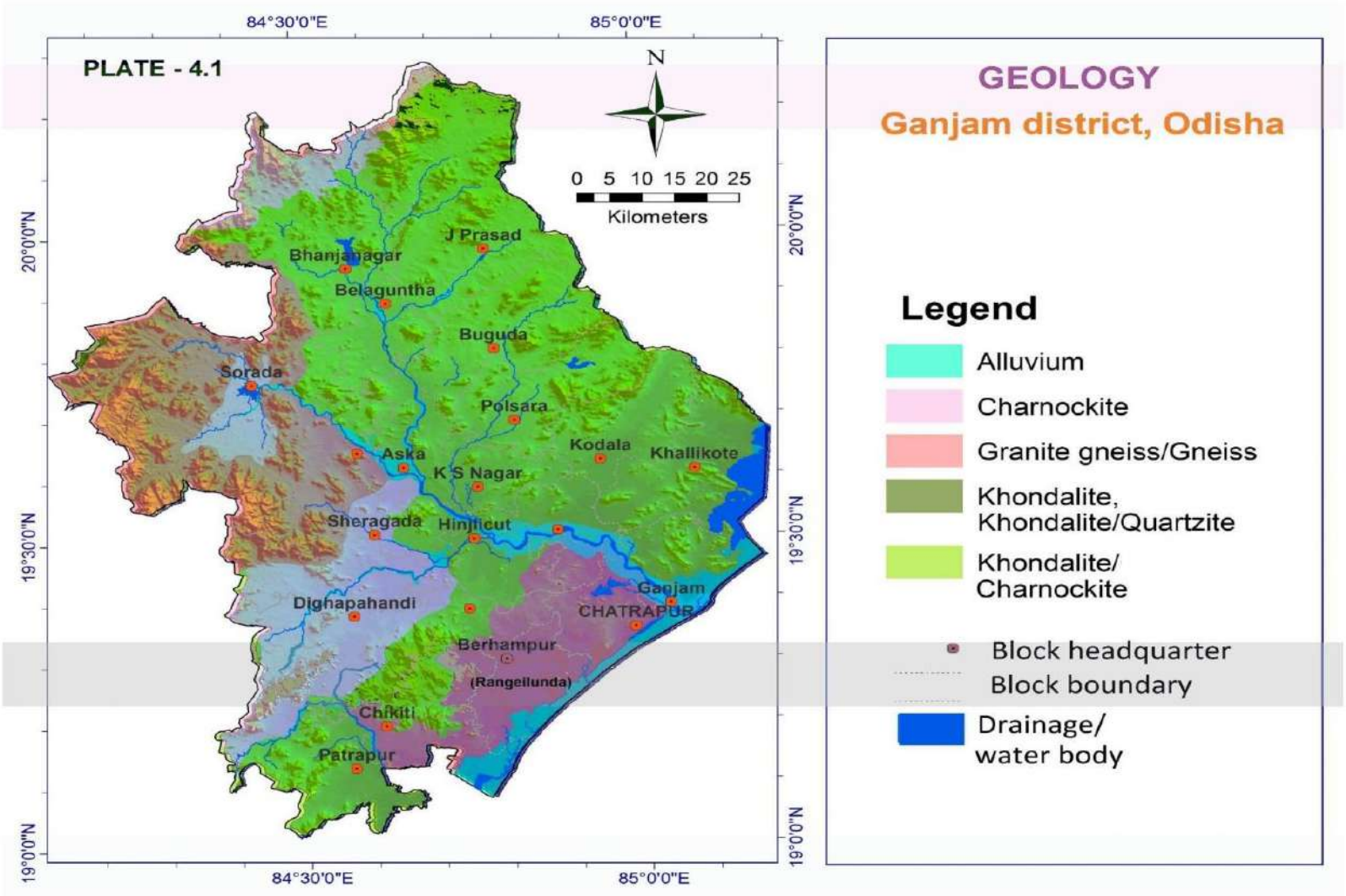


PLATE - 4.1
84°30'0"E
85°0'0"E
20°0'0"N
19°30'0"N
19°0'0"N
N
0 5 10 15 20 25
Kilometers
J Prasad
Bhanjanagar
Belaguntha
Buguda
Sorada
Polsara
Kodala
Khallikote
Aska
K S Nagar
Sheragada
Hinjlicut
Ganjam
CHATRAPUR
Dighapahandi
Berhampur
(Rangeilunda)
Chikiti
Patrapur
GEOLOGY
Ganjam district, Odisha
Legend
Alluvium
Charnockite
Granite gneiss/Gneiss
Khondalite, Khondalite/Quartzite
Khondalite/ Charnockite
Block headquarter
Block boundary
Drainage/ water body

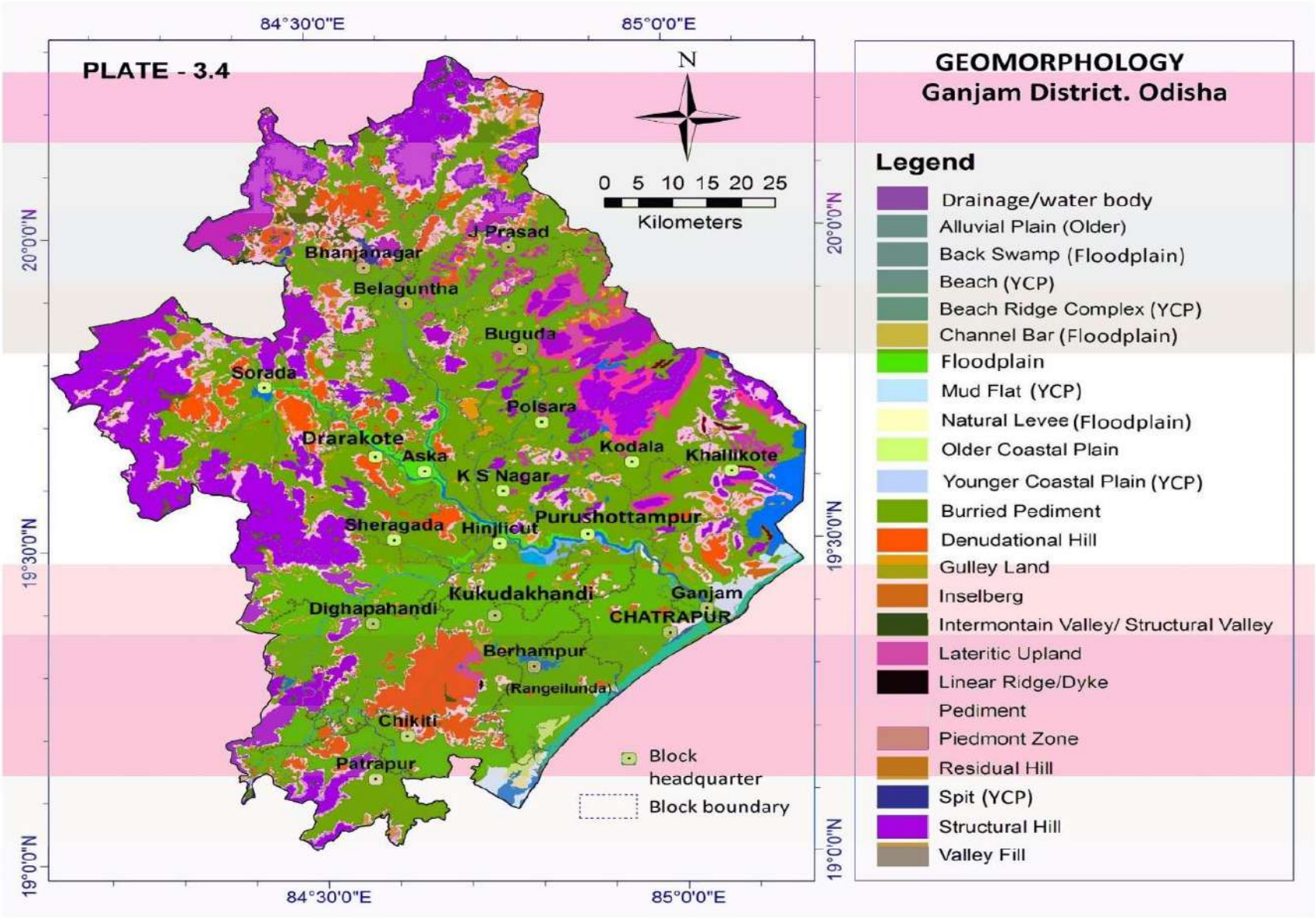


PLATE - 3.4
84°30'0"E
85°0'0"E
20°0'0"N
19°30'0"N
19°0'0"N
N
0 5 10 15 20 25
Kilometers
J Prasad
Bhanjanagar
Belaguntha
Buguda
Sorada
Polsara
Drarakote
Aska
K S Nagar
Kodala
Khallikote
Sheragada
Hinjlicut
Purushottampur
Kukudakhandi
Ganjam
CHATRAPUR
Dighapahandi
Berhampur
(Rangeilunda)
Chikiti
Patrapur
Block headquarter
Block boundary
GEOMORPHOLOGY
Ganjam District. Odisha
Legend
Drainage/water body
Alluvial Plain (Older)
Back Swamp (Floodplain)
Beach (YCP)
Beach Ridge Complex (YCP)
Channel Bar (Floodplain)
Floodplain
Mud Flat (YCP)
Natural Levee (Floodplain)
Older Coastal Plain
Younger Coastal Plain (YCP)
Burried Pediment
Denudational Hill
Gulley Land
Inselberg
Intermontain Valley/ Structural Valley
Lateritic Upland
Linear Ridge/Dyke
Pediment
Piedmont Zone
Residual Hill
Spit (YCP)
Structural Hill
Valley Fill

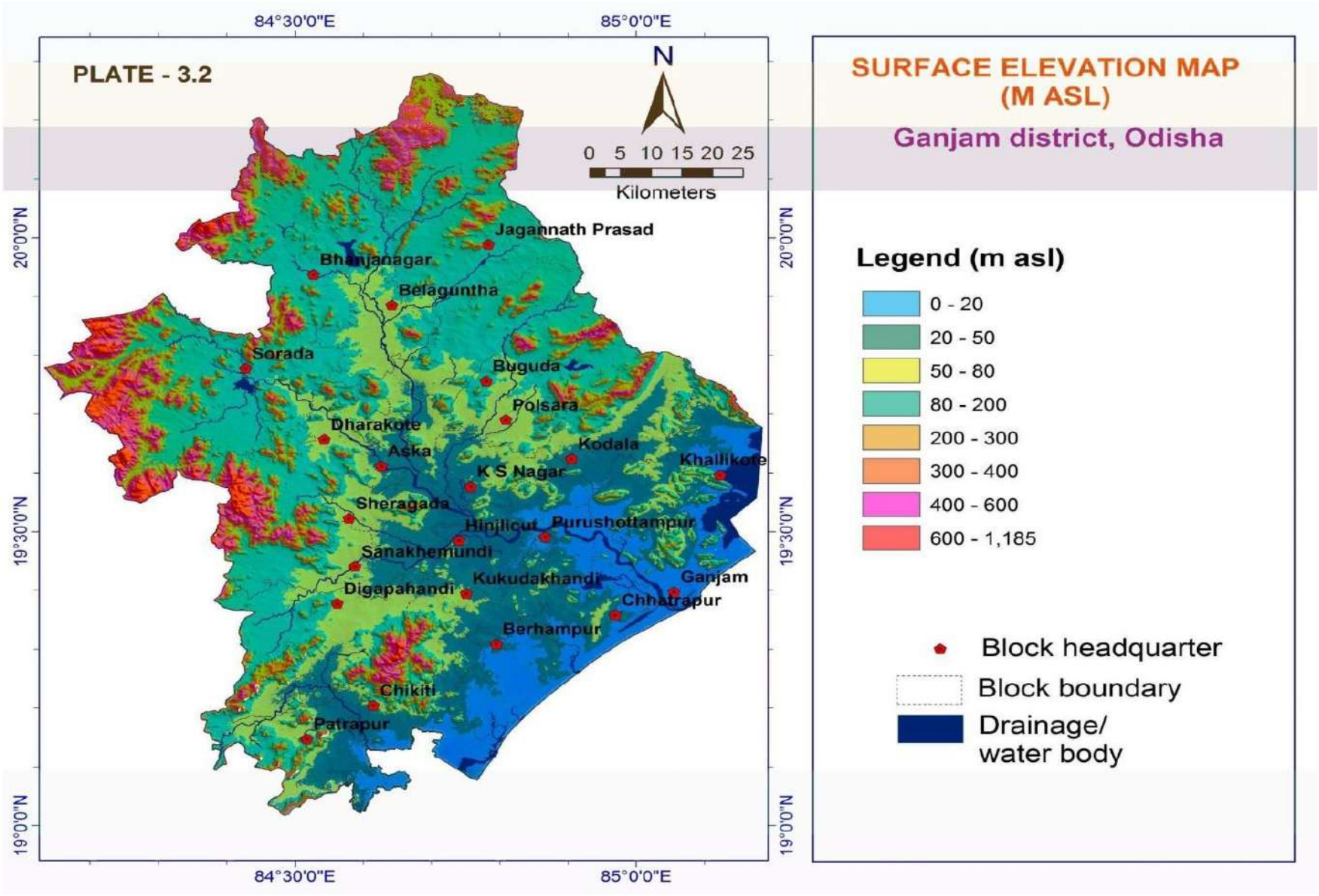


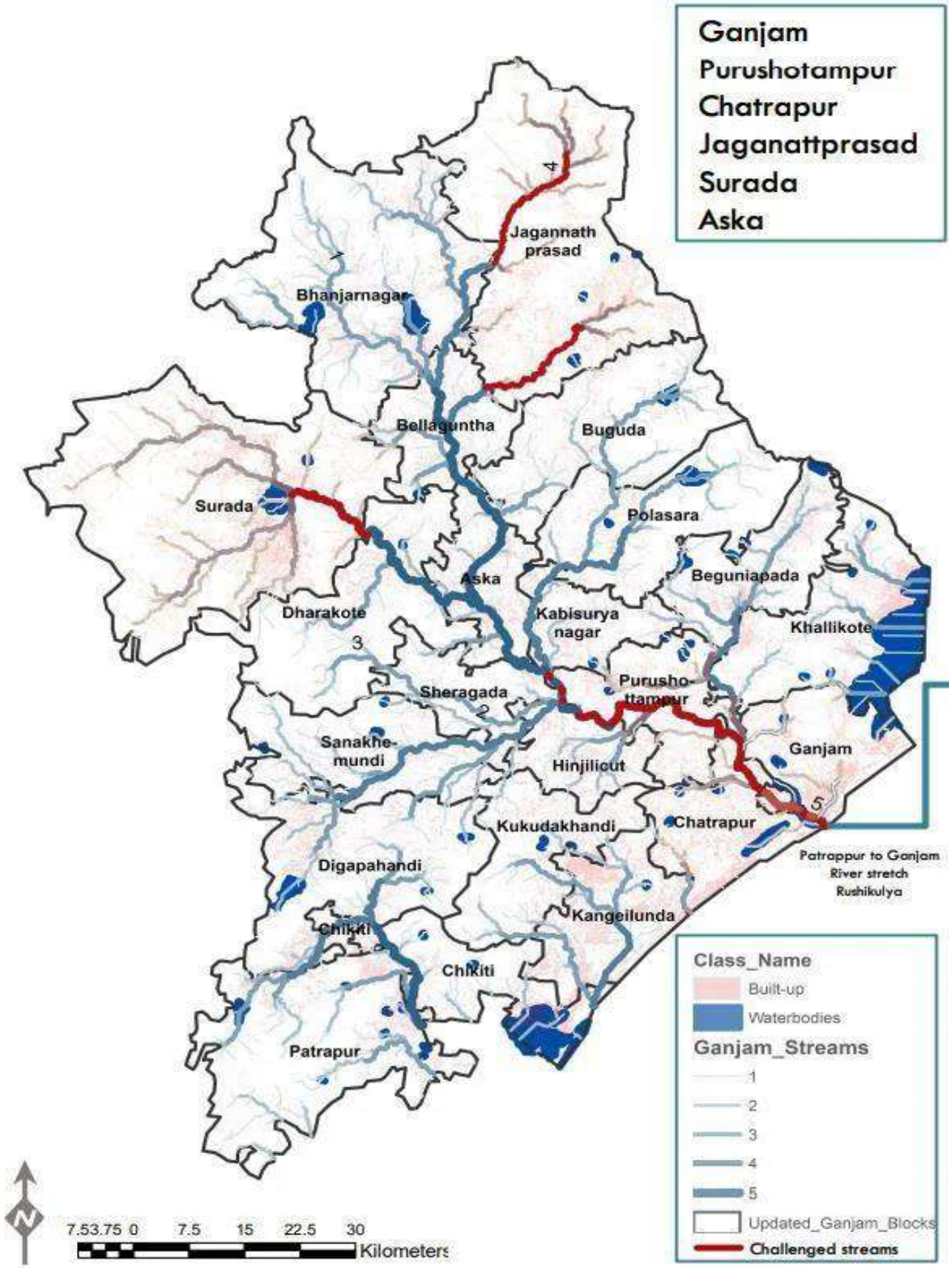
PLATE - 3.2
84°30'0"E
85°0'0"E
20°0'0"N
19°30'0"N
19°0'0"N
N
0 5 10 15 20 25
Kilometers
Jagannath Prasad
Bhanjanagar
Belaguntha
Sorada
Buguda
Polsara
Dharakote
Aska
Kodala
Khallikote
K S Nagar
Sheragada
Hinjlicut
Purushottampur
Sanakhemundi
Kukudakhandi
Ganjam
Digapahandi
Chhatrapur
Berhampur
Chikiti
Patrapur
SURFACE ELEVATION MAP
(M ASL)
Ganjam district, Odisha
Legend (m asl)
0 - 20
20 - 50
50 - 80
80 - 200
200 - 300
300 - 400
400 - 600
600 - 1,185
Block headquarter
Block boundary
Drainage/
water body

05. DRAINAGE AND IRRIGATION PATTERN.

The drainage of the District is mainly controlled by Rivers 7 streams like, Rushikulya, Ghodahada, Bahuda, Dhanei, Badanadi, Baghua, Sananadi, Badanadi, Loharakhandi, kokoloba, Nandini, Jorou & Padma etc. the details of river system is narrated below. These rivers and streams are originated from different hillrocks and finally fall into the bay of Bengal.

DRAINAGE SYSTEM WITH DESCRIPTION OF MAIN RIVERS

Sl No.	Name of the River	Place of Origin	Altitude of Origin	Total Length in the District(In Km)	Area Drained (Sq.Km)	% Areas Drained in the District	Process of Deposition of Sediments
1	Ghodahada	Ramagiri hills, Gajapati	103.85 mtr	60.55	138.00	100%	Moderate
2	Bahuda	Ramagiri hills, Gajapati	72.01 mtr	73.00	456.87	100%	Moderate
3	Dhanei	Dhanei Dam, Ganjam	84.58 mtr	39.00	106.00	100%	Moderate
4	Badanadi	Chakapad, Kandhamai	30.00 mtr	129.81	15.58	100%	Moderate
5	Rushikulya	Daringbadi, kandhamai	1000mtr	165.00	41.25	100%	Moderate
6	Baghua	Banchapur, Kurala, Nayagada	199.0mtr	45.05	4.5	100%	Moderate
7	Sananadi	Kupati, Ganjam	191. 0 mtr	12.80	1.792	100%	Moderate
8	Bodanadi	Alasu, Ganjam	130.0 mtr	30.40	1.824	100%	Moderate
9	Kokolaba	Rudhapadar, Ganjam	171.0 mtr	27.50	3.575	100%	Moderate
10	Loharakhandi	Andharakoti, Kalinga, Kandhamal	443.0mtr	35.25	1.762	100%	Moderate
11	Nandini	Jali surada, Ganjam	124.0 mtr	21.30	0.639	100%	Moderate
12	Jorou	Govindpur Ganjam	273.0 mtr	08.40	0.504	100%	Moderate
13	Padma	Harabhangi Gajapati	364.81 mtr	45.00	13.50	100%	Moderate


Ganjam
Purushotampur
Chatrapur
Jagannattprasad
Surada
Aska
Jagannath prasad
Bhanjarnagar
Bellaguntha
Buguda
Surada
Polasara
Aska
Beguniapada
Dharakote
Kabisurya nagar
Khallikote
Sheragada
Purusho-ttampur
Sanakhe-mundi
Hinjilicut
Ganjam
Kukudakhandi
Chatrapur
Digapahandi
Kangeilunda
Chikiti
Chikiti
Patrapur
Patrappur to Ganjam River stretch Rushikulya
Class_Name
Built-up
Waterbodies
Ganjam_Streams
1
2
3
4
5
Updated_Ganjam_Blocks
Challenged streams
N
7.53.75 0 7.5 15 22.5 30
Kilometers

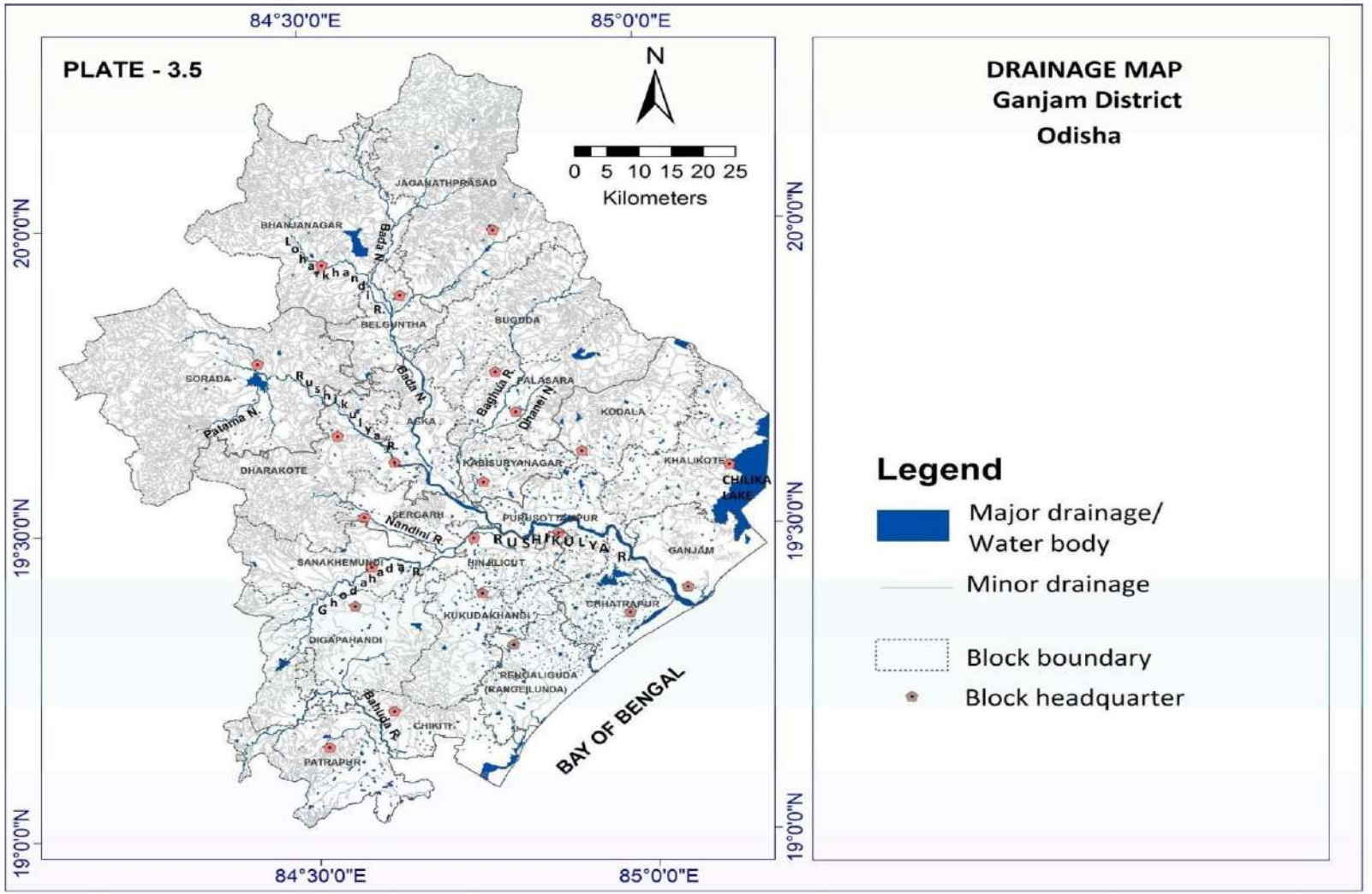


PLATE - 3.5
DRAINAGE MAP
Ganjam District
Odisha
N
0 5 10 15 20 25
Kilometers
84°30'0"E
85°0'0"E
20°0'0"N
19°30'0"N
19°0'0"N
JAGANATHPRASAD
BHANJANAGAR
Badagada N.
Lohakhandi R.
BELGUNTHA
SUGUDA
SORADA
Rushikulya R.
Bada N.
Baghua R.
PALASARA
Dhanei N.
KODALA
Palma N.
ASKA
KABISURYANAGAR
KHALIKOTE
DHARAKOTE
CHILIKA LAKE
SERGARH
Nandini R.
PURUSOTTAMPUR
RUSHIKULYA R.
GANJAM
SANAKHEMUNDI
Ghodahada R.
HINJILICUT
KUKUDAKHANDI
CHHATRAPUR
DIGAPAHANDI
RENGALIGUDA (RANGELUNDA)
Bahuda R.
CHIKITI
PATRAPUR
BAY OF BENGAL
Legend
Major drainage/ Water body
Minor drainage
Block boundary
Block headquarter

06. LAND UTILISATION PATTERN IN THE DISTRICT: FOREST, AGRICULTURAL, HORTICULTURAL, MINING ETC.

Agriculture is the main stay of majority of the populace and thus holds the key to socio-economic development of the district. Growth of agricultural sector is important not only for ensuing food security and reduction of poverty in rural areas but also sustaining growth of rest of economy. Growth of two nonfarm sectors viz. secondary and tertiary sectors can be sustained only when the agricultural sector continues to grow and provide adequate demand for goods and services along with market for the farm produce. Share of Agricultural sector (Agriculture. Animal resources, Forestry and Fishery) in the district i.e. gross domestic product (GDP) has been declining over the years. Still this sector continues to be vital for the district's economy as 80% population of the district draws its sustenance fully or partially from Agriculture sector.

Broadly, physiography of the district can be divided into two distinct parts i.e (a) coastal plains in the east (b) hill and table land in the west. While the former is fertile and close to irrigation sources, the latter is rocky and lacks Irrigation facilities. The plains lie between the Eastern Ghats and the Bay of Bengal but are narrow because of the absence of big rivers. Since the hills are close to sea, the rivers flowing from hills are not very long and are subject to sudden floods. A large area of the district is covered with irregular deposits of laterites at various altitudes. The coastal tracks contain deposits of alluvium and recent alluvium of clay and fine sand. Towards the centre and South it is hilly with beautiful well watered valley. The south eastern portion is fertile. The extreme north east is occupied by a portion of the famous Chilika lake.

The district is covered under two Agro Climatic zones i.e.. (a) East and South Eastern coastal plain zone and (b) North Eastern Ghats zone. The climate of the district coming under the ambit of east and south eastern coastal plain zone is sub tropical, hot and humid where as the climate of the blocks covered by North Eastern Ghats Zone is hot, moist and sub-humid.

Based on variation in topography, soil type, rainfall, irrigation availability and cropping pattern, each Agro Climatic zone has been further divided into several agro ecological situations or farming situations.

The district is coming under two Agro-Climatic zone, namely East and South eastern coastal plain zone and North eastern ghat zone. There are five agro ecological situation exists under East and south eastern Coastal plain zone I.e. Coastal alluvial command, Coastal alluvial non command, Coastal alluvial saline. Rainfed laterite and Rainfed, red and Laterite. Parts of Kabisurya Nagar, Sanakiemundi. Digapahandi, Polasara and whole area of Chikiti, Rangeilunda, Chatrapur, Patrapur Ganjam, Khallikote, Kukudakhnadi, Hinjilicut, Patrapur, and Kodala are coming under East and south eastern coastal plain zone. Similarly, three agro ecological situations exists under North eastern ghat zone. I.e. Medium rainfall block irrigated. Low rainfall alliuvial irrigated and Moderate rain laterite soil irrigated. Parts of Kabisurya Nagar. Sanakhemundi, Digapahandi. Polasara block and whole area of Bellagunatha. Aska, Sheragada. Dharakote. J.N. Prasad, Buguda and Sorada are coming under this Agro climatic zone.

The District has alluvial soil in the eastern part, red- laterite soil in the west and black cotton soll at the centre. Majority of areas of the district are hilly and undulated with, perennial stream, steep slope.

Similarly, the land use pattern for mining cutivity in the district may be district into two category.

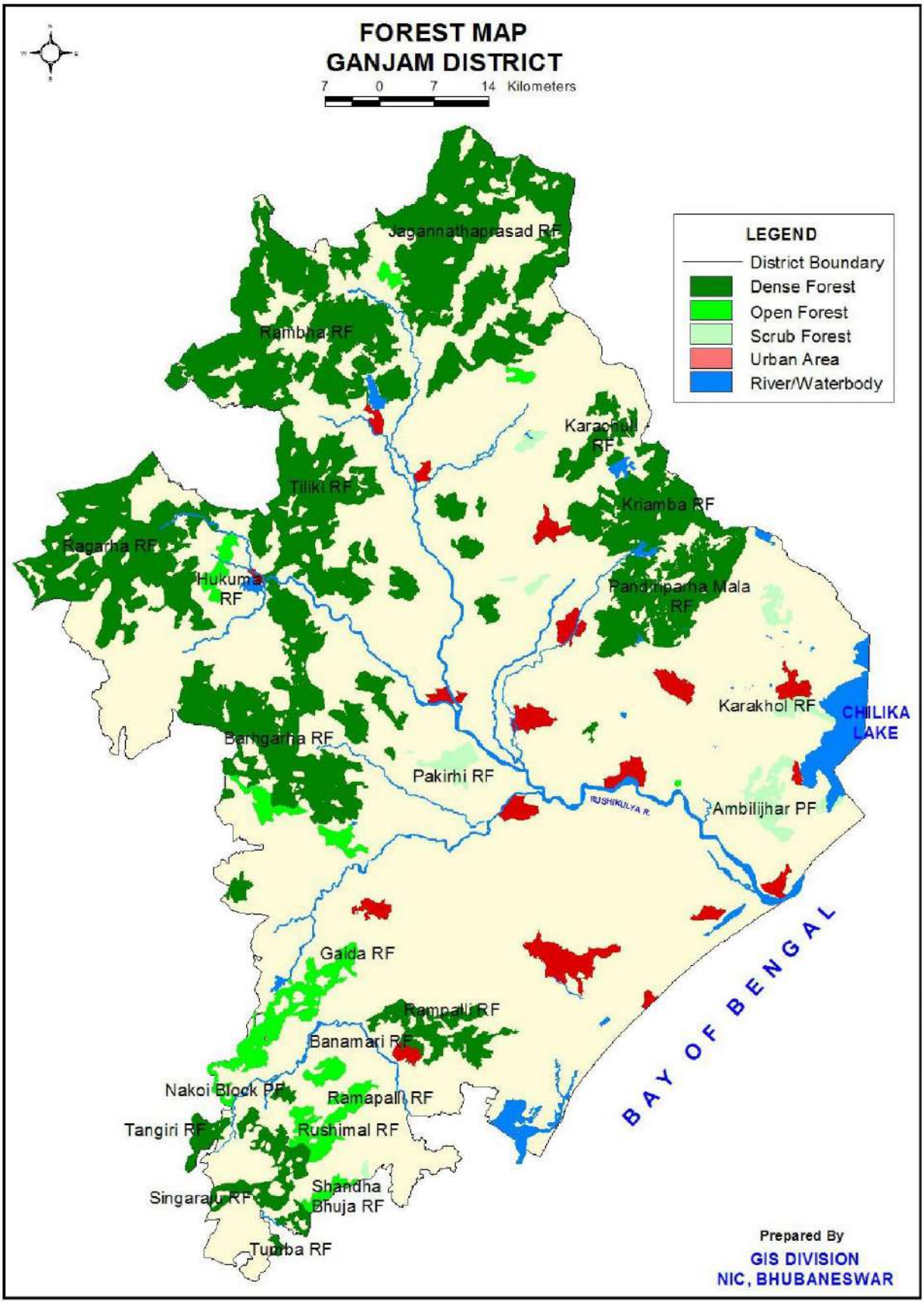
(i) Land use for mining activity for atomine mineral exploration (Major Mineraljarea of 2464.054 Ha.

(ii) Land used for decoration stone (specifled minor mineral) over an area of 469.295 Ha. which includes the mining lease area for working, non working lease and over the area on which Lol has been issued.

(iii) Land used for minor mineral over an area of 2396.2 Ha. which includes all minor mineral sairat sources, out of which some of the sources have been leased out to the lessees on long term lease and some of these could not be settled due to non participation of interested bidders in the auction process.

The land utilisation pattern of the district is given in the table below.

Sl. No.	Information Particular	Ganjam District (Area In Ha.)
1	Geographical Area(Ha)	821000
2	Forest Area(Ha)	315000
3	Permanent Pasture(Ha)	20000
4	Misc. Trees And Grooves(Ha)	22000
5	Culturable Waste(Ha)	11000
6	Land Put To Non-Agril. Use(Ha)	21000
7	Barren And Uncultivable Waste(Ha)	20000
8	Current Fallow(Ha)	25000
9	Other fallow(Ha)	6000
10	Net Area Sown(Ha)	381000
11	Cultivated Area(Ha)	406000
a	High	190000
b	Medium	113000
c	Low	103000
12	Paddy Area(Ha)	223500
a	High Land	19400
b	Medium Land	101275
c	Low Land	102825
13	Mining(Ha)	5329.549


FOREST MAP
GANJAM DISTRICT
7 0 7 14 Kilometers
LEGEND
District Boundary
Dense Forest
Open Forest
Scrub Forest
Urban Area
River/Waterbody
Jagannathaprasad RF
Rambha RF
Karachuli RF
Tiliki RF
Kriamba RF
Hagarha RF
Hukuma RF
Pandripama Mala RF
Karakhol RF
CHILIKA LAKE
Barhgarha RF
Pakirhi RF
RUSHIKULYA R.
Ambilijhar PF
BAY OF BENGAL
Gaida RF
Rampalli RF
Banamari RF
Nakoi Block PF
Ramapalli RF
Tangiri RF
Rushimal RF
Singaraju RF
Shandha Bhuja RF
Tumba RF
Prepared By
GIS DIVISION
NIC, BHUBANESWAR

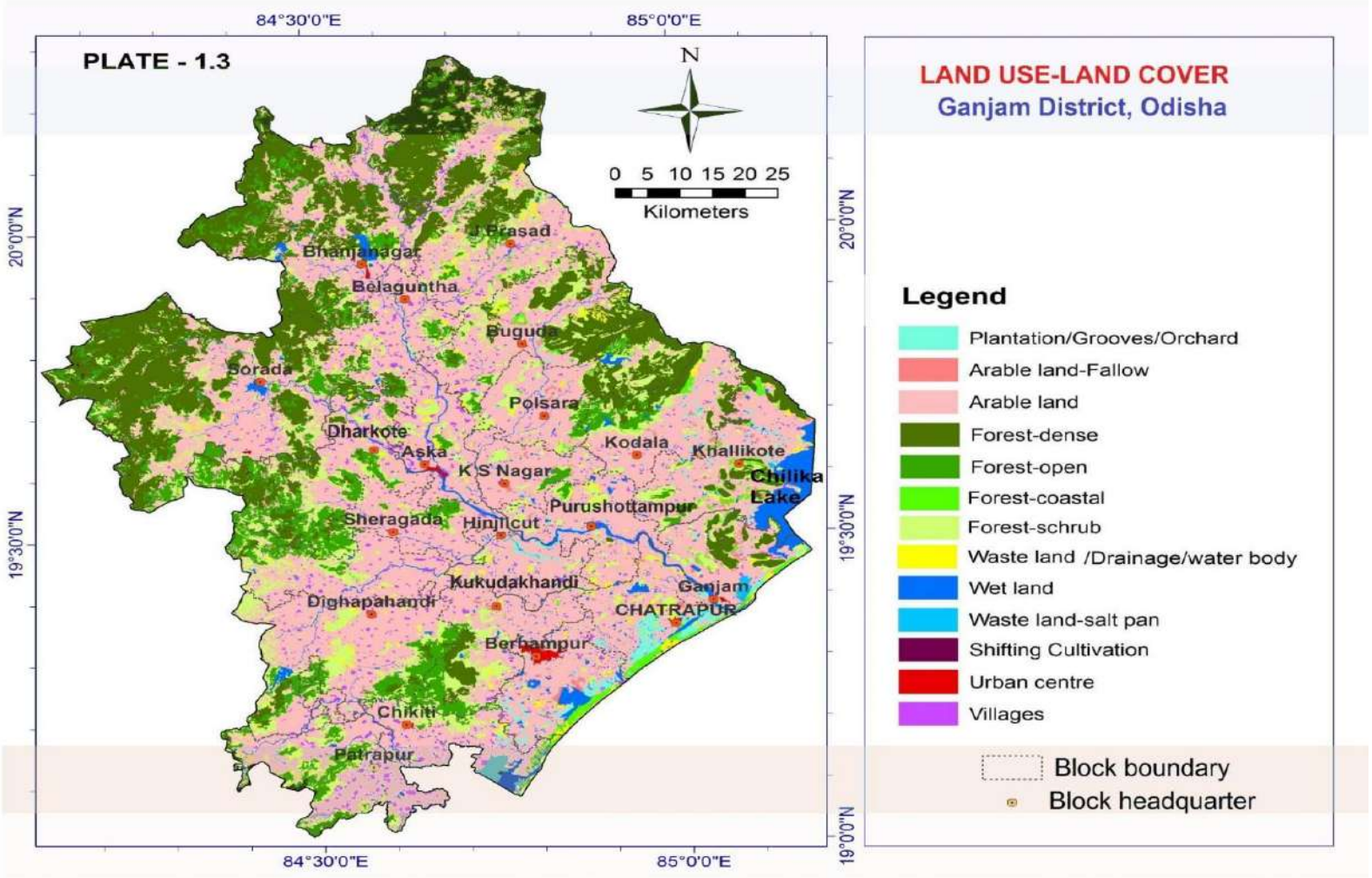


PLATE - 1.3
84°30'0"E
85°0'0"E
20°0'0"N
19°30'0"N
19°0'0"N
N
0 5 10 15 20 25
Kilometers
J Prasad
Bhanjanagar
Belaguntha
Buguda
Sorada
Polsara
Dharkote
Aska
K S Nagar
Kodala
Khallikote
Chilika Lake
Purushottampur
Sheragada
Hinjilicut
Kukudakhandi
Ganjam
Dighapahandi
CHATRAPUR
Berhampur
Chikiti
Patrapur
LAND USE-LAND COVER
Ganjam District, Odisha
Legend
Plantation/Grooves/Orchard
Arable land-Fallow
Arable land
Forest-dense
Forest-open
Forest-coastal
Forest-schrub
Waste land /Drainage/water body
Wet land
Waste land-salt pan
Shifting Cultivation
Urban centre
Villages
Block boundary
Block headquarter

07. SURFACE WATER AND GROUND WATER SCENARIO OF THE DISTRICT.

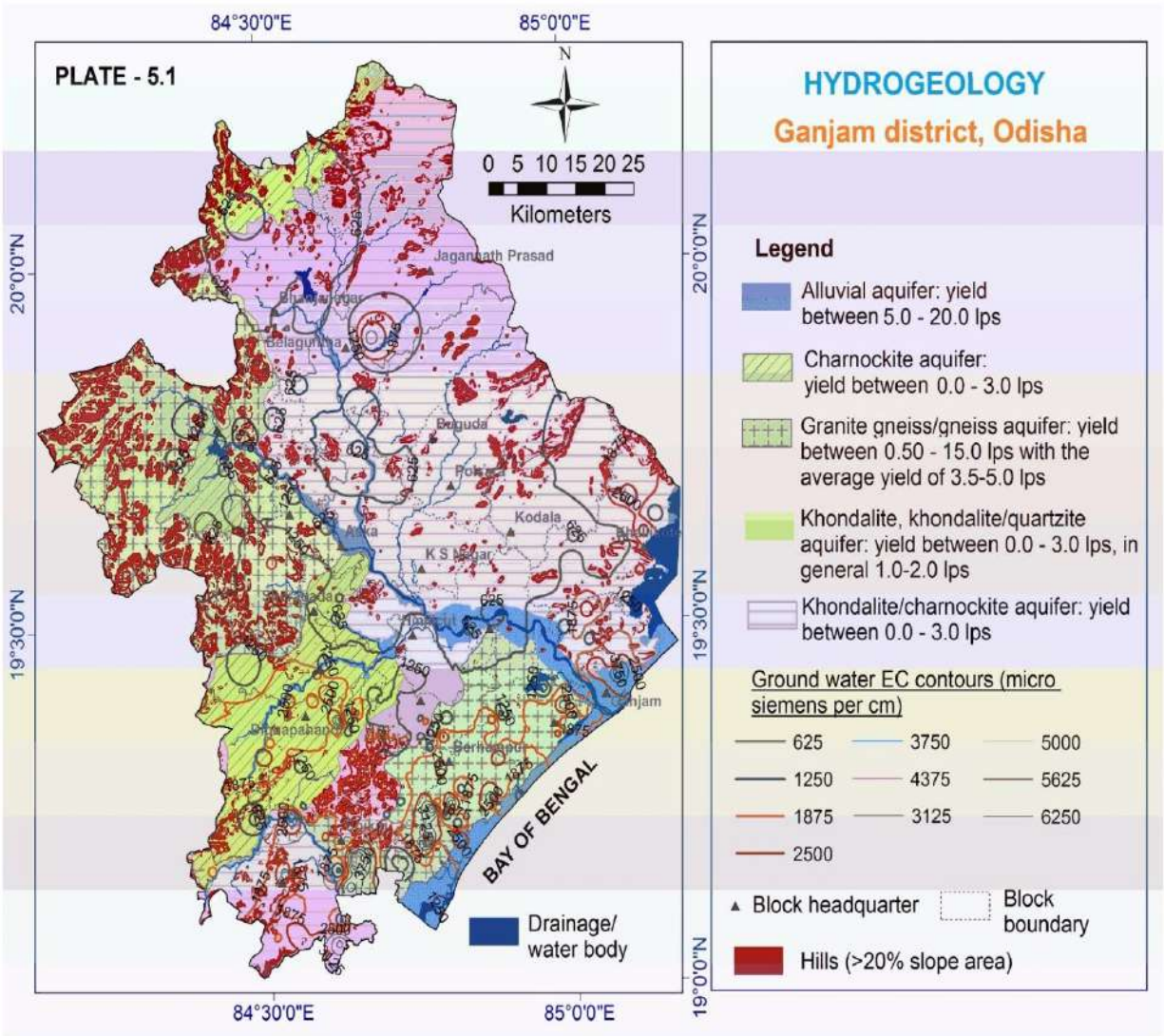
The drainage systems i.e., rivers of the District gets filled with water during the monsoon and gradually it decreases from the month of January to June of each year. In the summer season all rivers become almost dry excepting narrow flow of water within the basin. The water bearing and transmitting properties of various geological formations play the key roles in the occurrence and movement of groundwater. In the district of Ganjam, the crystalline rocks such as chamockites, khondalites, granites. granite gneisses etc. occupy a major part. In these rocks, the secondary porosities such as athered zone, fractures zones, joints etc control the groundwater occurrence and movement. Besides, the semi-consolidated rocks like laterite occur as cap rocks over the parent crystalline rocks in the district. Laterites hold water in the pore and open spaces originated due to dissolution and leaching of weak minerals. The Quaternary unconsolidated alluvial formations are restricted to the narrow river valleys and the river mouths near their confluence with sea. The sand/silt forming the granular zones In the alluvium form aquifers that yield water to wells. The general depths to groundwater level scenario in the district are described in the following paragraphs.

During pre-monsoon period (Month of May), the depths to water levels in major parts of the district vary between 4-6 meter below ground level (mbgl). Limited patches adjacent to the coast and in some of the canal command areas those remain within 2-4 mbgl. In the south western hilly parts and other highland the water level vary between 6-8 mbgl. At minor patches close to the hills, the depths to water levels even go beyond 8 mbgl and may reach up to 15 mbgl.

During the post monsoon period (Month of November), the shallower depths to water levels (2-6 mbgl) cover still more area of the district. A major part of the district falls in the water level depth range of 4-6 mbgl. In similar trend to the pre monsoon period, the areas close to the coast and those in the canal command areas, the water levels remain still shallower within 0-2 mbgl. The water levels of more than 6 mbgl remain restricted to minor patches in the hilly and highlands.

Depth of water level (mbgl)/ Period	April	August	November	January
Minimum	00.20	00.30	00.08	00.21
maximum	08.58	06.07	07.20	08.41

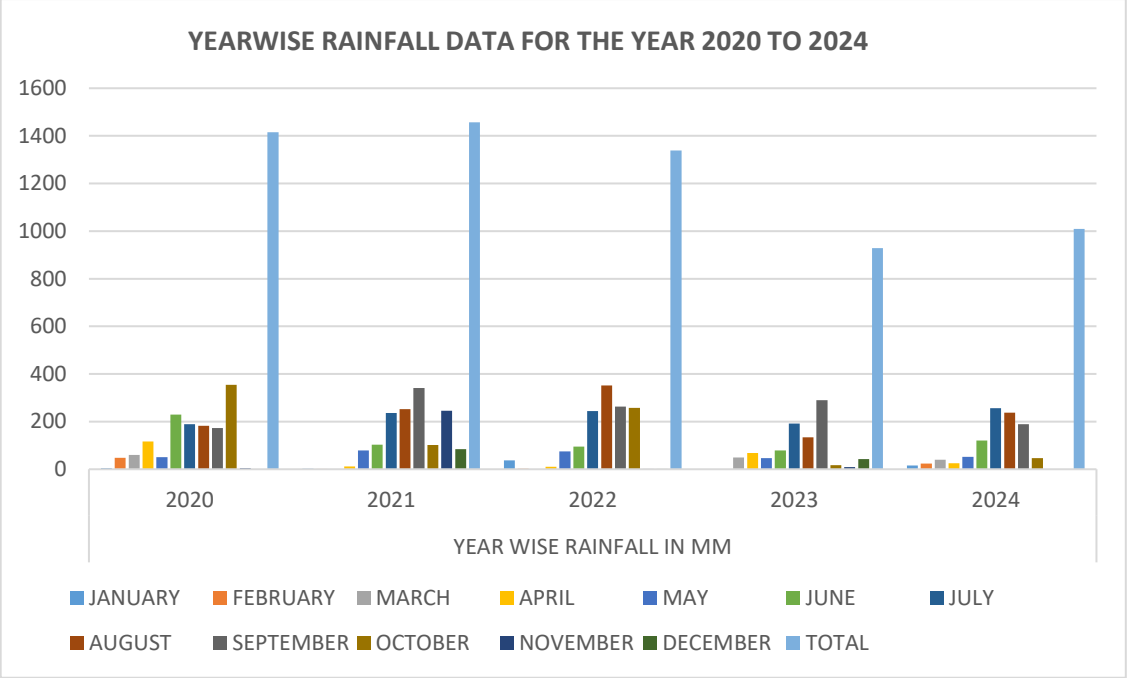
In view of this current scenario of climate change, water sector is going to be seriously affected. Both the surface and ground water systems are shrinking as resources. It happens due to increase in run off component of the hydrologic cycle. It has late to scarcity of fresh potable water and water for irrigation at many places. Depth of water levels in aquifers has gone deeper owing to increase in demand for Irrigation. In the scenario, there is a necessity to think over the proper use of flood waters.



08. RAINFALL OF THE DISTRICT AND CLIMATIC CONDITION.

Records of rainfall in the district are made available for 22 Numbers of rain- gauge stations. The average annual rainfall in the district figures at 1295.6 mm. The rainfall generally increases from the coast towards the interior hilly areas of the district. Gopalpur on the coast receives only 1148.6mm. of average rainfall in a year. The south-west monsoon commences in the district by about the second week of June and withdraws early in October. About 80 per cent of the annual rainfall is received during the south-west monsoon season. There is heavy rainfall in the July-August. The variation in the rainfall from year to year is not much. During the first half of this century the highest annual rainfall in the district (amounting to 147 per cent of the normal) occurred in 1919. The lowest annual rainfall was 68 per cent of the normal occurred in 1935. Taking into account the district as a whole there were only three years in which the rainfall was less than 80 % of the normal. Two consecutive years with the rainfall less than 80 5 of the normal occurred at a few stations once in a period of fifty years. On an average there are 65 rainy days a years in the district. A month wise and year wise data of rainfall for last five years is given below.

YEARWISE RAINFALL DATA FOR THE YEAR 2020 TO 2024					
MONTH	**YEAR WISE RAINFALL IN MM**				
	2020	**2021**	**2022**	**2023**	**2024**
JANUARY	4.47	2.21	36.96	0	15.99
FEBRUARY	47.86	0.18	2.97	0	23.86
MARCH	60.48	0.46	0	49.24	39.42
APRIL	116.77	11.35	9.95	68.31	25.62
MAY	51.1	78.45	75.48	46.79	52.54
JUNE	229.49	102.85	95.21	79.52	120.88
JULY	189.36	236.02	244.89	191.33	256.67
AUGUST	182.64	252.61	352.11	134.54	238.2
SEPTEMBER	172.94	340.8	262.79	290.48	189.47
OCTOBER	355.2	102.52	257.49	16.64	46.49
NOVEMBER	5.55	245.15	0.62	9	
DECEMBER	0	84.55	0.04	43.09	
TOTAL	1415.86	1457.15	1338.51	928.94	1009.14


YEARWISE RAINFALL DATA FOR THE YEAR 2020 TO 2024
1600
1400
1200
1000
800
600
400
200
0
2020
2021
2022
2023
2024
YEAR WISE RAINFALL IN MM
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
TOTAL

09. DETAILS OF THE MINING LEASES IN THE DISTRICT AS PER THE FOLLOWING FORMAT.

SL.NO	NAME OF THE MINERAL	NAME OF THE LESSEE	ADDRESS & CONTACT NO. OF LESSEE	MINING LEASE GRANT ORDER NO. & DATE	AREA OF MININ G LEASE (IN HC)	PERIOD OF MINING LEASE (INITIAL)		DATE OF COMME NCEME NT OF MINING OPERAI ON	STATUS (WORKING NON WORKING/TE MP. WORKING FOR DESPATCH ETC.)	OBTAINED ENVIRONVENTAL CLEARENCE (Y/N) IF Y LETTER NO. WITH DATE OF GRANT OF E.C	LOCATION OF THE MINING LEASE LAND SCHEDULE AND (LATITUDE & LONGITUTE)
						FROM	TO				
1	2	3	4	5	6	7	8	11	12	14	15
NAME OF THE TAHASIL:- SANAKHEMUNDI											
NEW SOURCES											
A1	KESHPUR				0.809				NON-WORKING		MOUZA-KESHPUR, KHATA NO.83 ,PLOT NO.916 ,919 & 570 , AREA-2 ACER,KISSAM- PADAR
A2	GUDIAPATANA				0.307				NON-WORKING		MOUZA- GUDIAPATANA, KHATA NO.257 ,PLOT NO.1150 & 1153 , AREA-0.760 ACER,KISSAM- PADAR ,LAT-19.511 ,LONG-84.565
A3	AMLAGUDA				0.941				NON-WORKING		MOUZA-AMLAGUDA,KHATA NO.67 ,PLOT NO.744 & 747, AREA-2.327 ACER,KISSAM- ,LAT-19.386 LONG-84.521
A4	MAHIGUDA				0.92				NON-WORKING		MOUZA-MAHIGUDA,KHATA NO.149 ,PLOT NO.726,729,735,806,807,808,805,KHATA NO.227/293 ,PLOT NO.804, AREA- 2.2980 ACR KISSAM-PADAR ,LAT-19.446 LONG-84.667
NAME OF THE TAHASIL:- SHERAGADA											
B1	KHASPA BRICK EARTH				0.493				NON-WORKING		MOUZA-KHASPA,KHATA NO.75, 290/6 ,PLOT NO.1412, 1413, 1411, KISSAM- BILO JOLOSECHITA DOFOSOLI
B2	MAHIRAKANA BRICK EARTH				0.789				NON-WORKING		MOUZA-MAHIRAKANA ,KHATA NO-146,11, 174/73,133,47 ,PLOT NO-1052,1054, 1055, 1056, 1057, 1058, 1115, 1116, 1122, 1124 KISSAM-BILO ANASECHITA-II ,LAT-19.465 LONG-84.711
B3	KURULA BRICK EARTH				0.488				NON-WORKING		MOUZA- KURULA ,KHATA NO. 538 ,PLOT NO-3548,3549,3550 KISSAM- PADAR
B4	KURULA BRICK EARTH				1.142				NON-WORKING		MOUZA- KURULA ,KHATA NO. 443 ,PLOT NO-516 KISSAM-PADAR
B5	KURULA BRICK EARTH				0.9				NON-WORKING		MOUZA- KURULA ,KHATA NO.139, 689/90, 403, 281, 330 ,PLOT NO- 3473, 3475, 3486, 3483, 3484, 3485, 3479, 3472, 3476, 3474, 3470, 3471, 3477, 3478 KISSAM- PADAR

NEW SOURCES											
B6	KURULA BRICK EARTH QUARRY				0.644				NON-WORKING		MOUZA-KURULA,KHATA NO.640 , PLOT NO.3640 ,3641 ,3642 , 3643 , 3644 , 3645 , 3646 , 3647 ,3651 & 3652 , AREA-1.592 ACER,KISSAM-PADAR ,LAT-19.27,25.56 LONG-84.42,26.88
B7	SERAGADA				0.8				NON-WORKING		MOUZA-SERAGADA,KHATA NO-736, PLOT NO-4963,4964,4965,4966,4980,4981,4982, AREA-1.978AC, KISSAM-BILO DOFOSOLI ,LAT-19.502 LONG-84.623
B8	KURULA BRICK EARTH QUARRY				1.197				NON-WORKING		MOUZA-KURULA,KHATA NO-139, PLOT NO-3473,3475,3486,3483,3484,3485,,KHATA NO-669/90, PLOT NO-3479,KHATA NO-403, PLOT NO-3472,3476,,KHATA NO-669/785, PLOT NO-3480,3481,3482,KHATA NO-330, PLOT NO-3470,3471,3477,3478,KHATA NO-669/86, PLOT NO-3479/3876,,KHATA NO-281, PLOT NO-3474, AREA-2.9591AC,KISSAM-PADAR
B9	KURULA BRICK EARTH QUARRY				0.517				NON-WORKING		MOUZA-KURULA,KHATA NO-457, PLOT NO-3511,KHATA NO-208, PLOT NO-3510,3512,3517,3518,3519,3520, AREA-1.280AC,KISSAM-PADAR
B10	ALARIGADA				0.955				NON-WORKING		MOUZA-ALARIGADA,KHATA NO-37, PLOT NO-2898,KHATA NO-998/121, PLOT NO-2943,KHATA NO-998/114, PLOT NO-2946,KHATA NO-998/28, PLOT NO-2947,KHATA NO-998/35, PLOT NO-2944,2945 AREA-2.360AC,KISSAM-PADAR,LAT-19.43 LONG-84.698
B11	ALARIGADA				0.479				NON-WORKING		MOUZA-ALARIGADA,KHATA NO-998/344, PLOT NO-121/6311,121,121/6310, KHATA NO-998/345, PLOT NO-218, KHATA NO-998/346, PLOT NO-217,89,216, KHATA NO-998/347, PLOT NO-140,141, KHATA NO-998/352, PLOT NO-88,194,198,199,215, KHATA NO-998/353, PLOT NO-196,197,151,152,153,154,157,214,KISSAM-GHARABARI
B12	MAHIRAKANA BRICK EARTH				0.9125				NON-WORKING		MOUZA-MAHIRKANA,KHATA NO-115, PLOT NO.-1097,1109,1112,117, KHATA NO-174/120, PLOT NO.-1110,1106,1107,KHATA NO-174/122, PLOT NO.-1082,1116,KHATA NO-174/121, PLOT NO.-1088,1096,KHATA NO-147, PLOT NO.-1073,1069,1068 KISSAM-PADAR ,LAT-19.464 LONG-84.711
NAME OF THE TAHASIL:- KUKUDAKHANDI											
NEW SOURCES											
C1	KANKIA				0.724				NON-WORKING		MOUZA-KANKIA,KHATA NO.450/88 PLOT NO.672 ,AREA-1.790 ACER,KISSAM-PADAR ,LAT- 19.239 LONG-84.706
C2	GURUNTHI				2.929				NON-WORKING		MOUZA-GURUNTHI,KHATA NO.1189/4856, PLOT NO.7096/9928 ,7058 ,7059 ,7060 ,7061 ,7062 ,7063 ,7064 ,7065 ,7066 ,7067 ,7070 ,7051 ,7052 ,7053 ,7054 ,7055 ,7056 ,7057 ,7071 & 7072 , AREA-7.240 ACER,KISSAM-PADAR ,LAT- 19.359 LONG-84.845
NAME OF THE TAHASIL:- DIGAPAHANDI											
NEW SOURCES											
D1	DHANARASI				0.802				NON-WORKING		MOUZA-DHANARASI,KHATA NO.192/1 , PLOT NO.19 , 15 , 18 ,24 ,21/1804 & 21 ,,KHATA NO.179, PLOT NO.16 ,20 ,22 & 23 , AREA-1.982 ACER,KISSAM-BILO ANAJOLOSECHITO EK ,LAT-19.232 LONG-84.52

NAME OF THE TAHASIL:- CHIKITI											
NEW SOURCES											
E1	KAMPA NUAGAM				0.095				NON-WORKING		MOUZA-KAMPA NUAGAM,KHATA NO.206/39, PLOT NO.2015, 2012, 2008, 2007, 2087, 2017, 2086, 2009/2273 & 2061 , AREA-1.235 ACER,KISSAM-PADAR ,LAT-19.219 LONG-84.563
E2	KAMPA NUAGAM				0.141				NON-WORKING		MOUZA-KAMPA NUAGAM,KHATA NO.206/306, PLOT NO.2089 & 2085 , AREA-0.350 ACER,KISSAM-PADAR ,LAT- 19.219 LONG-84.563
E3	KAMPA NUAGAM				0.35				NON-WORKING		MOUZA-KAMPA NUAGAM,KHATA NO.206/60, PLOT NO.2119, 2110 & 2111 , AREA-0.865 ACER,KISSAM-PADAR ,LAT- 19.219 LONG-84.562
E4	KRUSHNAPUR-2				1.382				NON-WORKING		MOUZA-KRUSHNAPUR-2,KHATA NO.26/1, PLOT NO.61/A , AREA-3.4150 ACER,KISSAM- PADAR ,LAT-19.227 LONG-84.579
NAME OF THE TAHASIL:- KABISURYANAGAR											
NEW SOURCES											
F1	INAM TALIMAPALI				0.627				NON-WORKING		MOUZA-INAM TALIMAPALI,KHATA NO.333/172, PLOT NO.714, 712, 720, 719, 721 & 722 AREA-1.551 HC.,KISSAM- ,LAT-19.571 LONG-84.807
NAME OF THE TAHASIL:- ASKA											
G1	ALIPUR BRICK EARTH				0.718				NON-WORKING		MOUZA-ALIPUR,KHATA NO.29, PLOT NO-1184, 1185, 1234, 1235, 1236, 1237, 1239, 1240. 1241, 1242, 1243, 1244, KISSAM- BILO ANAJOLOSECHITO EK, LAT-19.63 LONG-84.671
G2	NUABABANAPUR BRICK EARTH				1.123				NON-WORKING		MOUZA-NUABABANAPUR,KHATA NO-334/229,334/220,334/302, PLOT NO-38/1475/1684, 270/1574, 36, 36/1708, 270 KISSAM-GHARABARI ,LAT-19.638 LONG-84.682
NAME OF THE TAHASIL:- BHANJANAGAR											
H1	BRAHMANAPADAR BRICK EARTH				1				NON-WORKING		MOUZA-BRAHMANAPADAR, KHATA NO-412/83, PLOT NO-512, 567, 569/5910, KISSAM-BARSADHARA DOFOSOLI DUI ,LAT-20.096 LONG-84.535

NB: In the above table omitted Columns are,
Column- 09 & 10, Period of Mining lease (1st/2nd…renewal)-NA
Column-13, Use (Captive/ Non-Captive) - All Non-Captive
Column-16, Open cast/ Underground- All sources are open cast

10. DETAILS OF ROYALTY OR REVENUE RECEIVED IN LAST THREE YEARS

Revenue collected for Ordinary earth/Brick Earth**.**

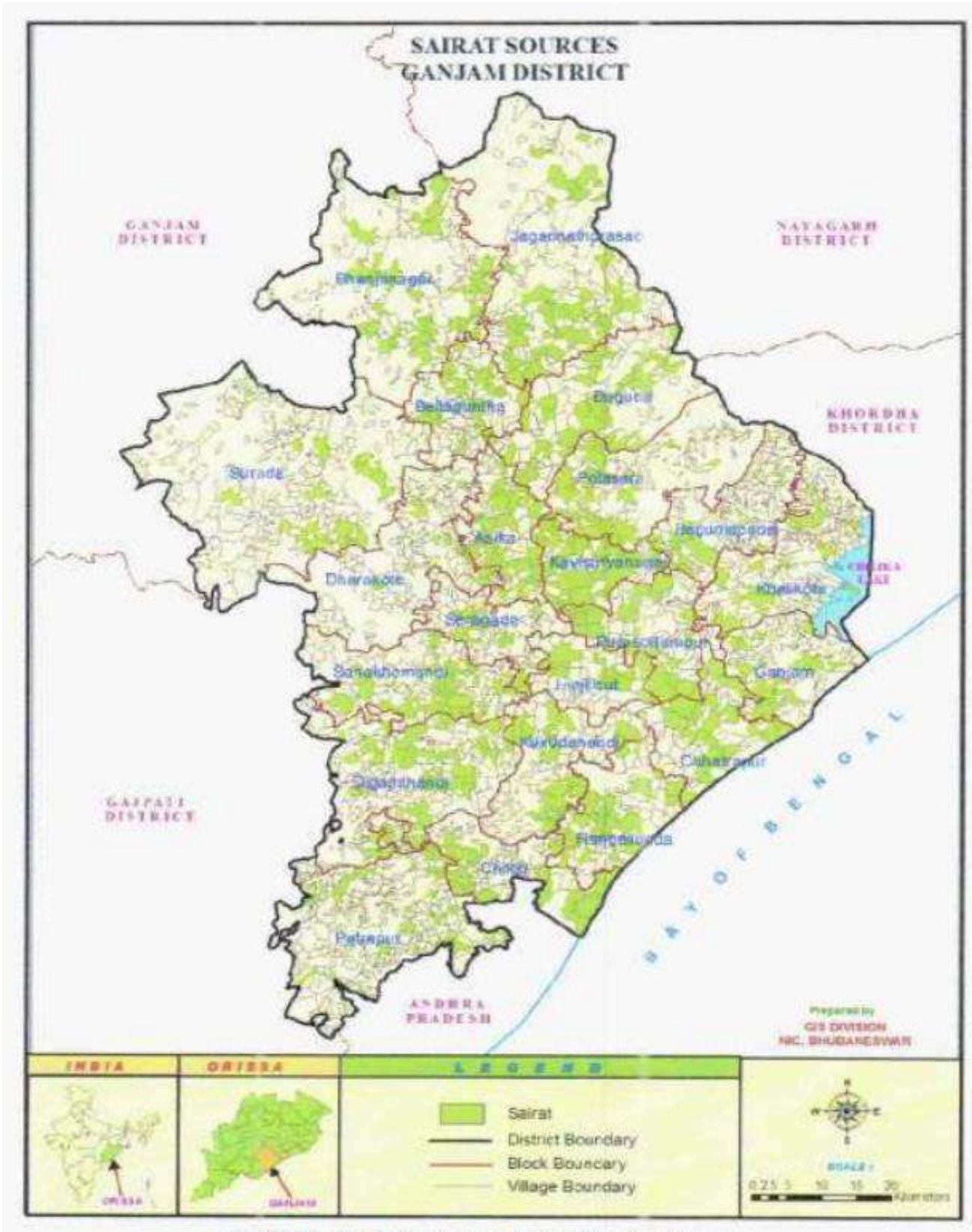
SL. NO.	NAME OF THE TAHASIL	NAME OF SOURCE	REVENUE COLLECTED FOR LAST THREE YEARS (IN RS)LAKH		
			2021-22	2022-23	2023-24
B1	SHERAGADA	KHASPA BRICK EARTH			
B2		MAHIRAKANA BRICK EARTH			
B3		KURULA BRICK EARTH			
B4		KURULA BRICK EARTH			
B5		KURULA BRICK EARTH			
G1	ASKA	ALIPUR BRICK EARTH			
G2		NUABABANAPUR BRICK EARTH			
H1	BHANJANAGAR	BRAHMANAPADAR BRICK EARTH			

11. DETAILS OF PRODUCTION OF MINOR MINERAL IN LAST THREE YEARS.

Production of Ordinary earth/Brick Earth**.**

SL. NO.	NAME OF THE TAHASIL	NAME OF SOURCE	PRODUCTION FOR LAST THREE YEAR (IN CUM)		
			2021-22	2022-23	2023-24
B1	SHERAGADA	KHASPA BRICK EARTH			
B2		MAHIRAKANA BRICK EARTH			
B3		KURULA BRICK EARTH			
B4		KURULA BRICK EARTH			
B5		KURULA BRICK EARTH			
G1	ASKA	ALIPUR BRICK EARTH			
G2		NUABABANAPUR BRICK EARTH			
H1	BHANJANAGAR	BRAHMANAPADAR BRICK EARTH			

12. MINERAL MAP OF THE DISTRICT.



13. LIST OF LETTER OF INTENT (LOI) HOLDERS IN THE DISTRICT ALONG WITH ITS VALIDITY AS PER THE FOLLOWING FORMAT.

NA

14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT.

SL NO.	NAME OF SOURCE WITH LOCATION	LEASE AREA OF NEW SOURCES IN M^2	AVERAGE THICKNESS OF ORDINARY EARTH/BRICK EARTH FOR NEW SOURCES IN M	MINERAL POTENTIAL OF NEW SOURCE AS PER FIELD OBSERVATION(IN M^3)
A1	KESHPUR, MOUZA-KESHPUR, KHATA NO.83 ,PLOT NO.916 ,919 & 570 , AREA-2 ACER,KISSAM- PADAR	8090	1.5	12135
A2	GUDIAPATANA, MOUZA- GUDIAPATANA, KHATA NO.257 ,PLOT NO.1150 & 1153 , AREA-0.760 ACER,KISSAM- PADAR ,LAT-19.511 ,LONG-84.565	3070	2	6140
A3	AMLAGUDA, MOUZA-AMLAGUDA,KHATA NO.67 ,PLOT NO.744 & 747, AREA-2.327 ACER,KISSAM- ,LAT-19.386 LONG-84.521	9410	2	18820
A4	MAHIGUDA,MOUZA-MAHIGUDA,KHATA NO.149 ,PLOT NO.726,729,735,806,807,808,805,KHATA NO.227/293 ,PLOT NO.804, AREA- 2.2980 ACR KISSAM-PADAR ,LAT-19.446 LONG-84.667	9290	2	18580
B1	KHASPA BRICK EARTH, MOUZA-KHASPA,KHATA NO.75, 290/6 ,PLOT NO.1412, 1413, 1411, KISSAM- BILO JOLOSECHITA DOFOSOLI	4930	2	9860
B2	MAHIRAKANA BRICK EARTH MOUZA-MAHIRAKANA ,KHATA NO-146,11, 174/73,133,47 ,PLOT NO-1052,1054, 1055, 1056, 1057, 1058, 1115, 1116, 1122, 1124 KISSAM-BILO ANASECHITA-II ,LAT-19.465 LONG-84.711	7890	2	15780
B3	KURULA BRICK EARTH MOUZA- KURULA ,KHATA NO. 538 ,PLOT NO-3548,3549,3550 KISSAM- PADAR	4880	2	9760
B4	KURULA BRICK EARTH MOUZA- KURULA ,KHATA NO. 443 ,PLOT NO-516 KISSAM-PADAR	11420	2	22840
B5	KURULA BRICK EARTH MOUZA- KURULA ,KHATA NO.139, 689/90, 403, 281, 330 ,PLOT NO- 3473, 3475, 3486, 3483, 3484, 3485, 3479, 3472, 3476, 3474, 3470, 3471, 3477, 3478 KISSAM- PADAR	9000	2	18000

B6	KURULA BRICK EARTH QUARRY,MOUZA-KURULA,KHATA NO.640 , PLOT NO.3640 ,3641 ,3642 , 3643 , 3644 , 3645 , 3646 , 3647 ,3651 & 3652 , AREA-1.592 ACER,KISSAM-PADAR ,LAT-19.27,25.56 LONG-84.42,26.88	6440	2	12880
B7	SERAGADA, MOUZA-SERAGADA,KHATA NO-736, PLOT NO-4963,4964,4965,4966,4980,4981,4982, AREA-1.978AC, KISSAM-BILO DOFOSOLI ,LAT-19.502 LONG-84.623	8000	2	16000
B8	KURULA BRICK EARTH QUARRY,MOUZA-KURULA,KHATA NO-139, PLOT NO-3473,3475,3486,3483,3484,3485,,KHATA NO-669/90, PLOT NO-3479,KHATA NO-403, PLOT NO-3472,3476,,KHATA NO-669/785, PLOT NO-3480,3481,3482,KHATA NO-330, PLOT NO-3470,3471,3477,3478,KHATA NO-669/86, PLOT NO-3479/3876,,KHATA NO-281, PLOT NO-3474, AREA-2.9591AC,KISSAM-PADAR	11970	2	23940
B15	KURULA BRICK EARTH QUARRY,MOUZA-KURULA,KHATA NO-457, PLOT NO-3511,KHATA NO-208, PLOT NO-3510,3512,3517,3518,3519,3520, AREA-1.280AC,KISSAM-PADAR	5170	2	10340
B17	ALARIGADA,MOUZA-ALARIGADA,KHATA NO-37, PLOT NO-2898,KHATA NO-998/121, PLOT NO-2943,KHATA NO-998/114, PLOT NO-2946,KHATA NO-998/28, PLOT NO-2947,KHATA NO-998/35, PLOT NO-2944,2945 AREA-2.360AC,KISSAM-PADAR,LAT-19.43 LONG-84.698	9550	2	19100
B22	ALARIGADA,MOUZA-ALARIGADA,KHATA NO-998/344, PLOT NO-121/6311,121,121/6310, KHATA NO-998/345, PLOT NO-218, KHATA NO-998/346, PLOT NO-217,89,216, KHATA NO-998/347, PLOT NO-140,141, KHATA NO-998/352, PLOT NO-88,194,198,199,215, KHATA NO-998/353, PLOT NO-196,197,151,152,153,154,157,214,KISSAM-GHARABARI	4790	2	9580
B23	MAHIRAKANA BRICK EARTH, MOUZA-MAHIRKANA,KHATA NO-115, PLOT NO.-1097,1109,1112,117, KHATA NO-174/120, PLOT NO.-1110,1106,1107,KHATA NO-174/122, PLOT NO.-1082,1116,KHATA NO-174/121, PLOT NO.-1088,1096,KHATA NO-147, PLOT NO.-1073,1069,1068 KISSAM-PADAR ,LAT-19.464 LONG-84.711	9125	2	18250
C1	KANKIA,MOUZA-KANKIA,KHATA NO.450/88 PLOT NO.672 ,AREA-1.790 ACER,KISSAM-PADAR ,LAT- 19.239 LONG-84.706	7240	2	14480

C2	GURUNTHI,MOUZA-GURUNTHI,KHATA NO.1189/4856, PLOT NO.7096/9928 ,7058 ,7059 ,7060 ,7061 ,7062 ,7063 ,7064 ,7065 ,7066 ,7067 ,7070 ,7051 ,7052 ,7053 ,7054 ,7055 ,7056 ,7057 ,7071 & 7072 , AREA- 7.240 ACER,KISSAM-PADAR ,LAT- 19.359 LONG-84.845	29290	2	58580
D1	DHANARASI,MOUZA-DHANARASI,KHATA NO.192/1 , PLOT NO.19 , 15 , 18 ,24 ,21/1804 & 21 ,,KHATA NO.179, PLOT NO.16 ,20 ,22 & 23 , AREA-1.982 ACER,KISSAM-BILO ANAJOLOSECHITO EK ,LAT-19.232 LONG-84.52	8020	2	16040
E1	KAMPA NUAGAM,MOUZA-KAMPA NUAGAM,KHATA NO.206/39, PLOT NO.2015, 2012, 2008, 2007, 2087, 2017, 2086, 2009/2273 & 2061 , AREA-1.235 ACER,KISSAM-PADAR ,LAT-19.219 LONG-84.563	950	1	950
E2	KAMPA NUAGAM,MOUZA-KAMPA NUAGAM,KHATA NO.206/306, PLOT NO.2089 & 2085 , AREA-0.350 ACER,KISSAM-PADAR ,LAT- 19.219 LONG-84.563	1410	1	1410
E3	KAMPA NUAGAM,MOUZA-KAMPA NUAGAM,KHATA NO.206/60, PLOT NO.2119, 2110 & 2111 , AREA-0.865 ACER,KISSAM-PADAR ,LAT- 19.219 LONG-84.562	3500	1	3500
E4	KRUSHNAPUR-2,MOUZA-KRUSHNAPUR-2,KHATA NO.26/1, PLOT NO.61/A , AREA-3.4150 ACER,KISSAM- PADAR ,LAT-19.227 LONG-84.579	13820	2	27640
F1	INAM TALIMAPALI,MOUZA-INAM TALIMAPALI,KHATA NO.333/172, PLOT NO.714, 712, 720, 719, 721 & 722 AREA-1.551 HC.,KISSAM- ,LAT-19.571 LONG-84.807	6270	2	12540
G1	ALIPUR BRICK EARTH MOUZA-ALIPUR,KHATA NO.29, PLOT NO-1184, 1185, 1234, 1235, 1236, 1237, 1239, 1240. 1241, 1242, 1243, 1244, KISSAM- BILO ANAJOLOSECHITO EK, LAT-19.63 LONG-84.671	7180	1	7180
G2	NUABABANAPUR BRICK EARTH MOUZA-NUABABANAPUR,KHATA NO-334/229,334/220,334/302, PLOT NO-38/1475/1684, 270/1574, 36, 36/1708, 270 KISSAM-GHARABARI ,LAT-19.638 LONG-84.682	11230	2	22460
H1	BRAHMANAPADAR BRICK EARTH MOUZA-BRAHMANAPADAR, KHATA NO-412/83, PLOT NO-512, 567, 569/5910, KISSAM-BARSADHARA DOFOSOLI DUI ,LAT-20.096 LONG-84.535	10000	1.5	15000

15. QUALITY /GRADE OF MINERAL AVAILABLE IN THE DISTRICT.

The earth is suitable for making of chimney bricks.

16. USE OF MINERAL.

The bricks made up of the earth are used for housing construction purposes.

17. DEMAND AND SUPPLY OF THE MINERAL IN THE LAST THREE YEARS.

The demand for ordinary earth (soil) in Ganjam District, Odisha, is influenced by several factors similar to other areas where construction and agricultural activities are significant. Here are some key aspects that could affect the demand for ordinary earth in Ganjam:

1. Construction Activities:

- **Real Estate Development:** With the expansion of urban areas and infrastructure projects, there is a demand for ordinary earth for construction purposes. This includes its use in leveling land, filling plots, or providing base materials for construction sites.
- **Government Projects:** Development of roads, bridges, and public facilities often requires large quantities of earth for embankment filling, roadbed construction, and soil stabilization.

2. Agriculture:

- **Soil Erosion and Fertilization:** Farmers may require ordinary earth for filling eroded land or improving the soil's quality, especially in regions where the land is sandy or lacks essential nutrients for crops.
- **Land Preparation:** Ordinary earth can also be used in the preparation of land for different types of farming or horticulture, influencing local demand in rural areas.

3. Infrastructure Development:

- **Roads and Highways:** Soil is needed for the creation of embankments and filling for roads and highways, which are common in areas undergoing infrastructure improvements.
- **Water Projects:** Irrigation projects, dams, and embankments may require significant amounts of earth to create levees or raise the height of riverbanks.

4. Quarrying and Local Supply:

- **Local Mining of Earth:** Ordinary earth, typically sourced from quarries or open land, can be extracted and sold locally. The availability of this resource depends on the number of active quarries and their ability to meet the demand for local construction and agricultural needs.

5. Urbanization and Land Development:

- **Urban Growth:** As towns and cities expand, the need for ordinary earth to fill land for housing projects, parks, and other facilities increases**.**
- **Land Reclamation Projects:** In areas experiencing land reclamation or development of industrial zones, ordinary earth is essential for leveling and soil stabilization.

6. Pricing and Supply Chain:

- **Cost of Transportation:** The demand for ordinary earth can also be influenced by its transportation costs. If the area is remote or lacks good transport infrastructure, the cost of ordinary earth could rise, reducing demand or limiting it to nearby areas.
- **Regulatory Factors:** Local regulations around excavation, environmental sustainability, and land use could influence the amount of earth available for commercial use, thereby affecting demand.

MINING LEASES (ORDINARY EARTH) MARKED ON THE DISTRICT TOPO-MAP OF GANJAM

18. Mining lease marked on the map of the district

SCALE-1:250,000

H1

G1 G2

F1

A2 B7

B1 B2 B4 B5 A4 B3 B10 B11

A1

A3

C2

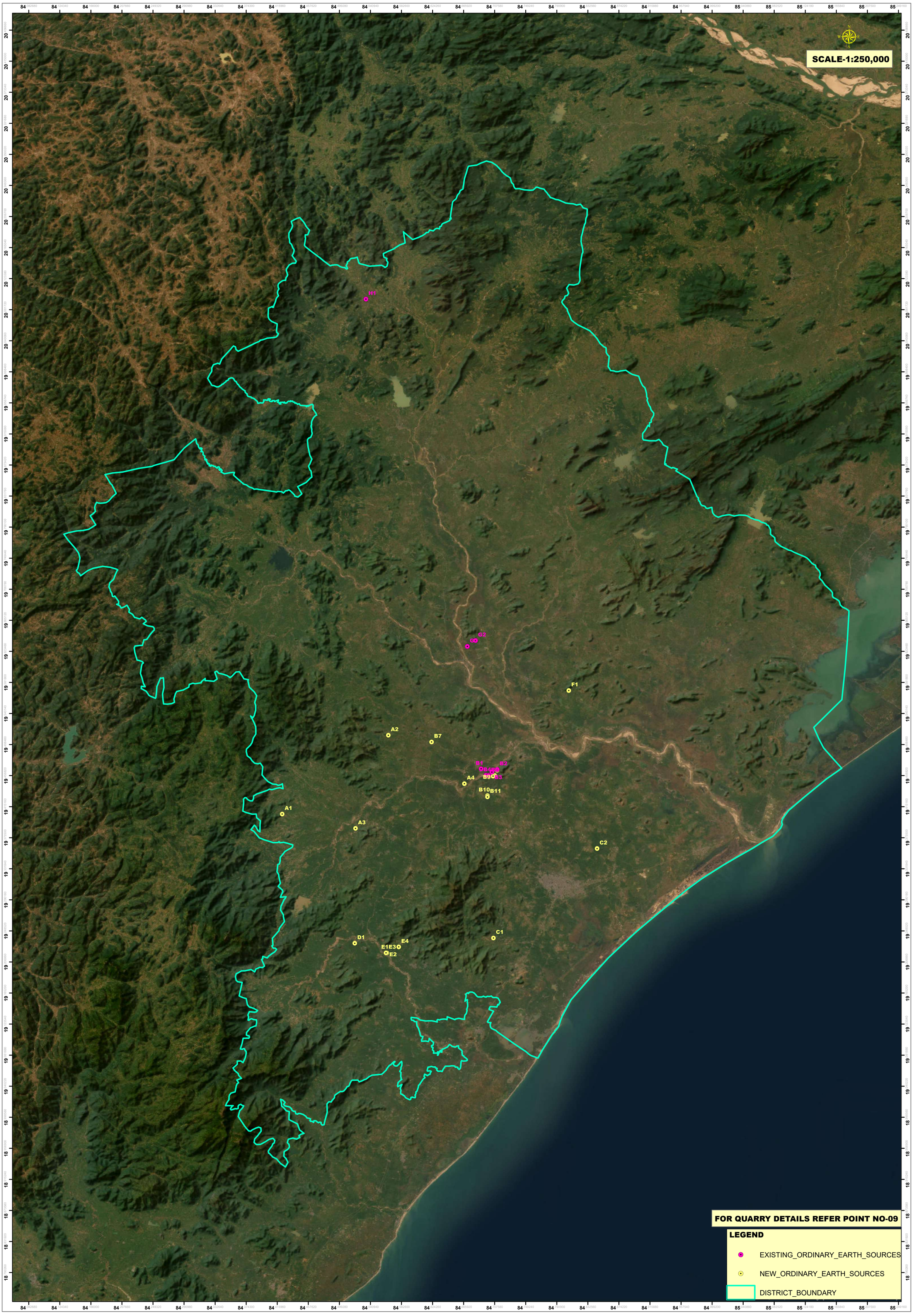
D1 E4 E1 E3 E2 C1

FOR QUARRY DETAILS REFER POINT NO-09

LEGEND

- EXISTING_ORDINARY_EARTH_SOURCES
- NEW_ORDINARY_EARTH_SOURCES
- DISTRICT_BOUNDARY

MINING LEASES (ORDINARY EARTH) MARKED ON THE DISTRICT SATELLITE-MAP OF GANJAM



19. DETAILS OF THE AREA OF WHERE THERE IS A CLUSTER OF MINING LEASES VIZ. NUMBER OF MINING LEASES, LOCATION (LATITUDE AND LONGITUDE).

Quarries existing within 500m radius are considered as cluster of Mining Leases as per the MoEF guide lines.

SL NO.	NAME OF TAHASIL	NAME OF CLUSTER	DETAILS OF QUARRY LEASE AREA	NUMBER OF MINING LEASE
B3	Kurula Brick Earth	KURULA CLUSTER	MOUZA- Kurula ,Khata No. 538 ,Plot No-3548,3549,3550 KISSAM- PADAR	6
B4	Kurula Brick Earth		MOUZA- Kurula ,Khata No. 443 ,Plot No-516 KISSAM- PADAR	
B5	Kurula Brick Earth		MOUZA- Kurula ,Khata No.139, 689/90, 403, 281, 330 ,Plot No- 3473, 3475, 3486, 3483, 3484, 3485, 3479, 3472, 3476, 3474, 3470, 3471, 3477, 3478 KISSAM- PADAR	
B6	Kurula Brick Earth Quarry		MOUZA-Kurula,Khata No.640 , Plot No.3640 ,3641 ,3642 , 3643 , 3644 , 3645 , 3646 , 3647 ,3651 & 3652 , Area-1.592 Acer,KISSAM-PADAR ,LAT-19.27,25.56 LONG-84.42,26.88	
B8	Kurula Brick Earth Quarry		MOUZA-Kurula,Khata No-139, Plot No-3473,3475,3486,3483,3484,3485,,Khata No-669/90, Plot No-3479,Khata No-403, Plot No-3472,3476,,Khata No-669/785, Plot No-3480,3481,3482,Khata No-330, Plot No-3470,3471,3477,3478,Khata No-669/86, Plot No-3479/3876,,Khata No-281, Plot No-3474, Area-2.9591Ac,KISSAM-Padar	
B9	Kurula Brick Earth Quarry		MOUZA-Kurula,Khata No-457, Plot No-3511,Khata No-208, Plot No-3510,3512,3517,3518,3519,3520, Area-1.280Ac,KISSAM-Padar	
E1	Kampa Nuagam	KAMPA NUAGAM CLUSTER	MOUZA-Kampa Nuagam,Khata No.206/39, Plot No.2015, 2012, 2008, 2007, 2087, 2017, 2086, 2009/2273 & 2061 , Area-1.235 Acer,KISSAM-PADAR ,LAT-19.219 LONG-84.563	3
E2	Kampa Nuagam		MOUZA-Kampa Nuagam,Khata No.206/306, Plot No.2089 & 2085 , Area-0.350 Acer,KISSAM-PADAR ,LAT- 19.219 LONG-84.563	
E3	Kampa Nuagam		MOUZA-Kampa Nuagam,Khata No.206/60, Plot No.2119, 2110 & 2111 , Area-0.865 Acer,KISSAM-PADAR ,LAT- 19.219 LONG-84.562	

20. DETAILS OF ECO-SENSITIVE AREA, IF ANY, IN THE DISTRICT.

There is no such Eco-Sensitive Area as notified by the Ministry of Environment. Forest and Climate Change, Govt. of India in respect of Ganjam District.

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

Due to mining activity of the minor mineral such as sand, stone, morrum etc. the immediate environment i.e. the surrounding is affected by dust emission during mining activity, transportation and ore handing. Similarly, during extraction of minor mineral there may be significant noise problem and the surface run off during monsoon affects the down stream water body, soil etc. In case of sand bed mining there may be erosion in the river embankment, non-rejuvenation of the river dyke and there may be change of water course and flood plain area. In case of the deep mining there may be effect on the ground water table. For sound management of Environment w.r.t. Water, Air & Noise. Under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 and Section 21 of Air (Prevention & Control of Pollution) Act. 1981 and regulation of Noise as prescribed in the Noise Pollution (Regulation and Control) Rules, 2000, specific conditions are being imposed to the Sand Mining and Stone Quarries for compliance during operation of the mines/quarries.

Activities attributed to Mining:-

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

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

Impact on Ambient Air

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

The major air pollutants due to mining activities include:-

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

Dust is the single air pollutant observed in the open cast mines. Diesel operating drilling machines, blasting and movement of machineries/ vehicles produce 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.
- Wet drilling shall be carried out to contain the dust particles.
- Controlled blasting techniques shall be adopted.
- Water sprinkling 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 mines area.
- Information on wind diction and meteorology are to be considered during planning, so that pollutants, which cannot be fully suppressed by engineering techniques, will be prevented from reaching the nearby agricultural land, if any.
- Comprehensive greenbelt around overburden dumps and periphery of the mining projects/clusters has to be carried out to reduce to fugitive dust transmission from the project area in order to create clean & healthy environment.

Water

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

Noise

- Periodic maintenance of machineries, equipments shall be ensured to keep the noise generated within acceptable limit.
- Development of thick green belt around mining/cluster area, haul roads to reduce the noise.

- Provision of earplugs to workers exposed to high noise generating activities like blasting, excavation site etc. Worker and operators at work sites will be provided with earmuffs.
- Conducting periodical medical check-up of all workers for any noise related health problems.
- Proper training to personnel to create awareness about adverse noise related effects.
- Periodic noise monitoring at locations within the mining area and nearby habitations to assess efficacy of adopted control measures.
- During blasting optimum spacing, burden and charging of holes will be made under the supervision of competent qualified mines foreman, mate etc.

Biological Environment

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

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

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

1. If, substantial amount of waste is there, the exhausted quarry can be fully or partly backfilled using the stored waste. The backfilled areas are to be brought under plantation of local species.

2. If the generation of waste is much less as in the case of minor mineral mining, the exhausted quarries can be reclaimed by

a. Plantation on the broken-up surface if the depth of quarry is not much below the surrounding surface level.

b. Converted to water reservoir after stabilization of the slopes if the exhausted quarry continues much below the surrounding surface level. It is preferred to cordon the water reservoir either through wire fencing or retaining wall with plantation from the safety point of view.

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

24. RISK ASSESSMENT & DISASTER MANAGEMENT PLAN.

The Ganjam district is very prone to natural calamities le. Cyclone and Flood. The heavy flood of 1990, super cyclone of 1999 and the super Cyclonic storm (Phailin) 2013, Super cyclonic storm (Hudhud) 2014. Super Cyclonic Storm (Titili) 2018, severe super cyclonic storm (Fani) 2019 have devastated Ganjam District. However, in recent years climate change is reflected in the increasingly fluctuating weather cycle with unpredictable cold waves, hot waves, ficods and exceptionally heavy single day downpours, low rainfall long dry spell and early withdrawal of monsoon. The aberrant weather situation was both a challenge and opportunity to the mining exploration as per its nature of extraction and exploitation. The flood occurs due to the sudden rise of the rivers flowing from the hills are not very long and thus their subject to sudden floods. It also rejuvenated the sand mining sairat sources of the district although it causes devastation of the public wealth.

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

Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations. the prevention among workers of departures from health caused by their working conditions, the protection of workers at their employment from risks resulting from factors adverse to health, the adaption of work to men and of each man to his job. In recent years the application of ergonomics has made a significant contribution for reducing industrial accidents and to overall health efficiency of workers.

A. Occupational hazards

The industrial worker today is placed in a highly complicated environment which is getting highly complicated as man is becoming more ingenious. An industrial worker may be exposed to many types of hazards depending upon his occupation.

i) Physical Hazards
ii) Chemical hazards
iii) Biological hazards
iv) Mechanical hazards
v) Psychosocial hazards

B. Occupational Diseases

Occupational diseases are usually defined as diseases arising out of or in the course of employment. For convenience, they may be grouped as under

i) Diseases due to Physical agents:

- Heat:-Heat hyperpyrexia, heat exhaustion, heat syncope, heat cramps, burns and local effects such as prickly heat.
- Cold:- Trench foot, frost bite, chilblains.
- Light:- Occupational cataract, miner's nystagmus.
- Pressure:- caisson disease, air embolism, blast(explosion)
- Noise:- Occupational deafness
- Radiation:- cancer, Leukaemia, Aplastic Anaemia, Pancytopenia
- Mechanical Factor:- injuries, Accidents
- Electricity:- Burns

ii) Diseases due to Chemical egents:-

Gases: - CO_2, CO, HCN, CS_2, NH_3, N_2, H_2S, HCL, SO_2 these causes gas poisoning.

Dusts (Pneumoconiosis):-

A. Inorganic Dusts:-

- Coal Dust:- Anthracosis
- Silica:- Silicosis
- Asbestos:- Asbestosis, Cancer lung.
- Iron- Siderosis

B. Organic (Vegetable) Dust:-

- Cone Fibre: Bagassosis
- Cotton dust: Bussinosis
- Tobacco: Tobacossis(11)
- Hay or grain Dust: Farmer's lung

❖ Metals and their compound:- Toxic hazards from lead, mercury, cadmium, manganese, beryllium , arsenic, chromium etc.

❖ Chemicals:- Acids, alkalies, pesticides

❖ Solvents:- carbon bisulphide, benzene, trichloroethylene, chotoform, etc.

iii. Diseases due to biological agents:- Brucellosis, leptospirosis, anthrax, actionomycosis, hydatidosis, psittacosis, tetanus, ancephallities, fungal infection, etc.

iv. Occupational cancer:- Cancer of skin, lungs, bladder.

v. Occupational dermatosis:- Dermatitis, eczema

vi. Diseases of Psychological organs:- Industrial neurosis, hypertension, peptic ulcer. etc

26. PLANTATION AND GREEN BELT DEVELOPMENT IN RESPECT OF LEASES ALREADY GRANTED IN THE DISTRICT.

Specific conditions are being imposed by the State Pollution Control Board during grant of consent to operate to the Mines to develop adequate Nos of plantation as per the recommendations made in the approved mining plan during the operation period and closure of Mining activities as per the mining plan. 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 (except by IREL Matikhalo) 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