

**OFFICE OF THE COLLECTOR & DISTRICT MAGISTRATE,
BALANGIR (TOUZI SECTION)**

Notification No. 394 / Tz

Dt. 19.07.2025

It is brought to the Notice of the general public that, the draft District Survey Report (DSR) with respect to Specified Minor Mineral under different tahasils of Balangir district has been prepared as per guidelines of Ministry of Environment, Forest and Climate Change, Government of India and State Environment Impact Assessment Authority (SEIAA), Odisha, Bhubaneswar. In this regards objections are being invited from the public if any within 30 days from the date of publication of this notice. The objections must reach at the Office of the Collector, Balangir within the stipulated period. Receipt of objections after the time period is over shall not be considered.

The copy of NOTICE is being up-loaded in the public domain i.e. district portal www.balangir.nic.in and displayed on the Notice Board of Mining Office, Tahasil Offices, Block Offices, Sub-Collector Offices and Office of the Collector, Balangir etc. for its wide publication.

By orders of the District Collector
& District Magistrate, Balangir


Additional District Magistrate,
Balangir

ଜିଲ୍ଲାପାଳଙ୍କ କାର୍ଯ୍ୟାଳୟ, ବଲାଙ୍ଗିର

(ତତ୍ତ୍ୱ ବିଭାଗ)

ପତ୍ର ସଂଖ୍ୟା 394 /

ତା. 19.07.2025

ସର୍ବସାଧାରଣ ବିଜ୍ଞପ୍ତି

ଏତଦ୍ୱାରା ସର୍ବସାଧାରଣଙ୍କ ଅବଗତ ନିମନ୍ତେ ଜଣାଇ ଦିଆଯାଉଅଛି କି, ବଲାଙ୍ଗିର ଜିଲ୍ଲାରେ ବିଭିନ୍ନ ଚହସିଲ ଅଧୀନରେ ଥିବା ନିର୍ଦ୍ଦିଷ୍ଟ ଲଘୁ ଖଣିଜ ଉତ୍ତ (ଗ୍ରାନାଇଟ୍ ପଥର) (Decorative Stone, Quartz & Quartzite) ଖଣି, କେନ୍ଦ୍ର ସରକାରଙ୍କ ଜଙ୍ଗଲ ଓ ପରିବେଶ ମନ୍ତ୍ରାଳୟ ଦ୍ୱାରା ପ୍ରଚଳିତ ନିୟମ ଅନୁଯାୟୀ ତଥା ରାଜ୍ୟ ପରିବେଶ ପ୍ରଭାବ ଆକଳନ କର୍ତ୍ତୃପକ୍ଷ (SEIAA)ଙ୍କ ନିର୍ଦ୍ଦେଶକ୍ରମେ ଖଣିଜ ଉତ୍ତଗୁଡ଼ିକୁ ସର୍ବେକ୍ଷଣ କରାଯାଇ ଜିଲ୍ଲା ସର୍ବେକ୍ଷଣ ରିପୋର୍ଟ (District Survey Report)ରେ ସ୍ଥାନିତ କରିବା ନିମନ୍ତେ ପ୍ରକ୍ରିୟା ଆରମ୍ଭ କରାଯାଇଅଛି । ତାର ସାରଣୀ ଏଥିସହିତ ସଂଲଗ୍ନ କରାଗଲା । ଏଥିନିମନ୍ତେ ସରକାରଙ୍କ ନିୟମ ଅନୁଯାୟୀ ଖଣିଜ ଉତ୍ତଗୁଡ଼ିକ ଚୂଡ଼ାନ୍ତ ଜିଲ୍ଲା ସର୍ବେକ୍ଷଣ ରିପୋର୍ଟ (District Survey Report)ରେ ସ୍ଥାନିତ ହେବା ପୂର୍ବରୁ ଜନସାଧାରଣଙ୍କର ଅବଗତ ଓ ଅଭିଯୋଗ ପ୍ରସ୍ତାବ ସୁପାରିଶ ନିମନ୍ତେ ଆହ୍ୱାନ କରାଯାଇ ସର୍ବସାଧାରଣ ବିଜ୍ଞପ୍ତି ତାରିଖ, ୨୨.୦୭.୨୦୨୫ ଠାରୁ ଜିଲ୍ଲା ୱେବ ପୋର୍ଟାଲ (balangir.odisha.gov.in)ରେ ଉପଲବ୍ଧ କରାଯିବ । ପ୍ରକାଶନାଦି, ବିଜ୍ଞପ୍ତି ପ୍ରକାଶନର ୩୦ ଦିନ ପରେ କୌଣସି ଅଭିଯୋଗ ବା ପ୍ରସ୍ତାବ ସୁପାରିଶ ଗ୍ରହଣ କରାଯିବ ନାହିଁ । ଉକ୍ତ ନିର୍ଦ୍ଦିଷ୍ଟ ଲଘୁ ଖଣିଜ ବ୍ରବ୍ୟର ସର୍ବେକ୍ଷଣ ବିବରଣୀ ଜିଲ୍ଲା ୱେବ ପୋର୍ଟାଲ (balangir.odisha.gov.in) ଓ ଖଣି ଉପନିର୍ଦ୍ଦେଶକଙ୍କ କାର୍ଯ୍ୟାଳୟ, ବଲାଙ୍ଗିର, ସମସ୍ତ ବ୍ଲକ କାର୍ଯ୍ୟାଳୟ, ଚହସିଲ କାର୍ଯ୍ୟାଳୟ, ଉପ ଜିଲ୍ଲାପାଳଙ୍କ କାର୍ଯ୍ୟାଳୟ ଏବଂ ଜିଲ୍ଲାପାଳଙ୍କ କାର୍ଯ୍ୟାଳୟରେ ଉପଲବ୍ଧ ଅଟେ ।

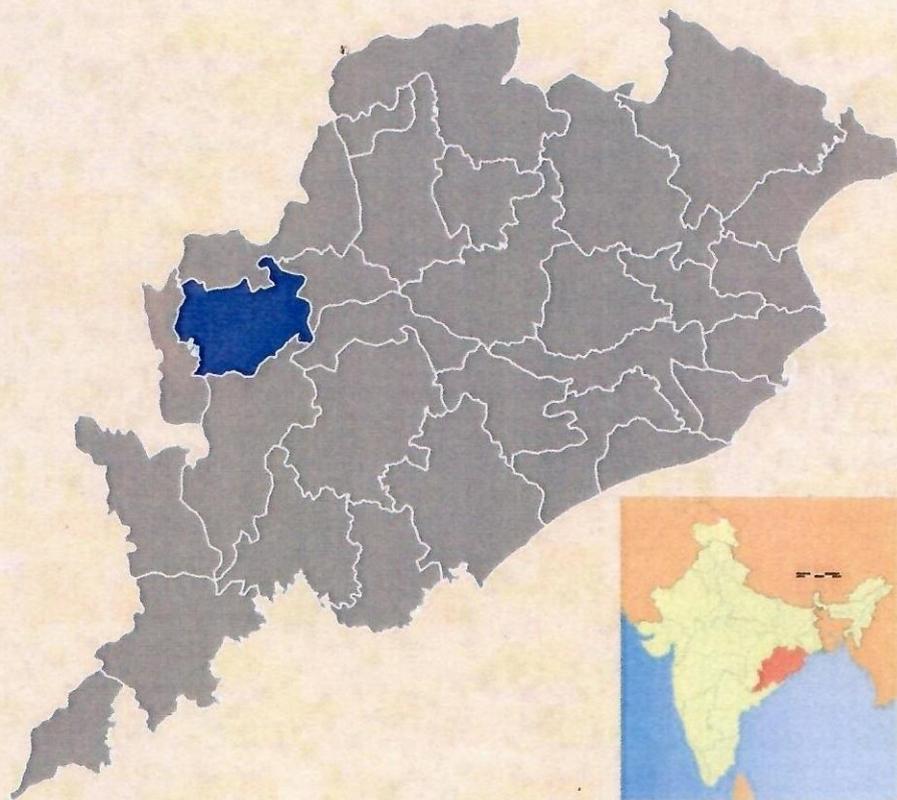
ଜିଲ୍ଲାପାଳଙ୍କ ଆଦେଶାନୁସାରେ,


ଅତିରିକ୍ତ ଜିଲ୍ଲାପାଳ, ବଲାଙ୍ଗିର



**DISTRICT SURVEY REPORT (DSR)
OF
BALANGIR DISTRICT, ODISHA
FOR
SPECIFIED MINOR MINERAL**

(FOR PLANNING & EXPLOITATION OF MINOR MINERAL RESOURCES)



**As per Notification No. S.O. 3611(E) New Delhi
dated 25th July 2018 of
Ministry of Environment, Forest & Climate Change
(MoEF& CC)
COLLECTORATE BALANGIR**

CONTENT

CH. NO.	DESCRIPTION	PAGE NO.
	Preamble	3
1	Introduction	6
	1.1 Location and Geographical Area	6
	1.2 Administrative Units	9
	1.3 Connectivity	10
2	Overview of Mining Activity in the District	13
3	General Profile of the District	14
	3.1 Demography	14
4	Geology of the District	15
	4.1 Physiography & Geomorphology	22
	4.2 Stratigraphy.	24
	4.3 Mineral Resources.	25
	4.4 Soil	26
5	Drainage of Irrigation Pattern	27
	5.1 River System	28
6	Land Utilization Pattern in the District	29
	6.1 Forest and non-forest land.	29
	6.2 Agricultural land.	32
	6.3 Horticultural land.	33
7	Surface Water and Ground Water Scenario of the District	34
	7.1 Hydrogeology.	34
	7.2 Depth to water level.	34
	7.3 Ground Water Quality.	37
	7.4 Ground Water Development.	37
	7.5 Ground water related issues & problems.	38
	7.6 Mass Awareness Campaign on Water Management Training Programme by CGWB	38
	7.7 Area Notified By CGWB/SGWA	39
	7.8 Recommendations	39
8	Rainfall of the District and Climate Condition	39
	8.1 Month Wise rainfall.	40
	8.2 Climate.	40
9	Details of Mining Lease in the District	41
	9.1 List of Mines in operation in the District	41
	9.2 List of Mines not in operation in the District	41
10	Detail of Royalty or Revenue received in last 3 years	42
11	Detail of production of minor mineral in last 3 years	42
12	Mineral Map of the District.	42
13	List of Letter of Intent (LOI) Holders in the District along with its Validity.	43
14	Total Mineral Reserve Available in the District.	43
15	Quality /Grade of Mineral Available in the District.	43
16	Use of Mineral.	44
17	Demand and Supply of the Mineral in the Last Three Years.	45
18	Map of Existing Mining Leases in the District.	45

Specified Minor Mineral Mining**DSR of Balangir District**

19	Details of the Area of where there is a cluster of mining lease viz. Number of mining leases, location (latitude and longitude).	45
20	Details of Eco-Sensitive Area, if Any, in the District	45
21	Impact of Mining on Environment	45
22	Remedial Measures to Mitigate the Impact of Mining on the Environment	47
23	Reclamation of Mined Out Area	47
24	Risk Assessment and Disaster Management Plan	48
25	Details of the Occupational Health Issue in the District	51
26	Plantation and Green Belt Development in Respect of Lease Already Granted in the District	52
27	Conclusion & References	53
	Annexure-A	
	Annexure-A1	

PREAMBLE

Balangir is a city and municipality, the headquarters of Balangir district in the state of Odisha, India. Balangir has a rich cultural heritage. It is also known as the cultural hub of Western Odisha. Balangir municipality is divided into twenty one wards. It is spread over an area of 12,200 acres (4,900 ha). Balangir is a unique District in Odisha lies on the western most part of the State with rich and varied mineral resource.

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 5 ha. Prior to the formation of Odisha Minor Mineral Concession Rule 2004, (OMMCR -2004) the mining operation for minor mineral were carried out in unscientific 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, Morrum, & 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 to make 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 setup, 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 District 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 SEAI. 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, SEIAA, Bhubaneswar issued a Letter on 27th December, 2022 to Collector & District Magistrate, Balangir with a direction " the DSR is to be signed afresh 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, 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.

1.0 INTRODUCTION**Balangir at a Glance:****1.1 Location and Geographical Area:**

The Balangir District is surrounded by Subarnapur district in east, Nuapada District in the west, Balangir District in the south and Bargarh District in the north. The District lies between $20^{\circ}11'40$ to $21^{\circ}05'08$ degree north latitude and $82^{\circ}41'15$ to $83^{\circ}40'22$ East longitude. The District covers an area of 6575 sq.km.

The district of Balangir is flanked in the north-west by the Gandhamardan hills, a name of the Ramayana Fame, and in the north-east by the rock-infested Mahanadi. It is traversed by many hill streams and is interspersed with the evergreen woodlands, the shelter of Bison and Sambar. The main forest area stretches along the western boundary bordering the Nuapada, Balangir district and then turns to the east running parallel to the Gandhamardan range. This forest track is broken by occasional clearings and small settlements, but it mostly consists of thick vegetation in which bamboo of excellent quality grows and Sal, Sahaj, Piasal, Dhaura and Ebony form the principal timber. The crest of the range of Gandhamardan hills is fine plateau, some ten miles long, with an average height of 3000 feet. For most part of this district lies on the north-west bank of river Tel, which form the boundary between his district and the district of Balangir, Sonapur, Boudh and Kandhamal.

The district has many rivers and perennial streams. Almost the entire Bolangir district is drained by nine rivers namely Mahanadi, Tel, Undar, Lanth, Sungadh and Sukhtel (Tributaries of the Tel), Ang, Jira, Saleshing.

Hill System

Mathkhai, The Sacred Hill on the outskirts of Balangir City also a Landmark of the District.

- Gandhamardan (3,296 ft)
- Butel (2,670 ft)
- Chahdli (2,630 ft)
- Thuta (2,056 ft)
- Bender (1,920 ft)
- Patpani
- Chhatardandi
- Matkhai (2,591)

Specified Minor Mineral Mining

DSR of Balangir District

It is best known for Harisankar Temple. The Ordnance Factory is located 45 km South of Balangir. It is the largest city of Western Odisha. The District is divided into 3 Sub-Divisions namely 1) Balangir, 2) Patnagarh and , 3) Titalagarh. It has 1794 villages covering 14 Blocks,

14 Tahasils. Balangir 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 paddy. Because rice is the staple cereal of the local people. Hybrid varieties of seeds are being developed and land reform programs are being planned for the maximum usage of the wastelands, promising to enhance the District's economic stability in the near future. Industries, Agriculture and Tourism are the four major Revenue Sources of Balangir District. The District Industries Centre, Balangir has been functioning since 1978, in order to provide service to the people of Balangir District in all respects of industrial promotion i.e. preparation of project reports, facilitating financial assistance from financing institutions, marketing assistance, allotment of Govt. land and shed, Raw-material recommendation, imparting of Entrepreneurship Development Training to prospective entrepreneurs and providing different technical know-how etc under one roof. There are no of industries are present in the Bolangir District.

1. No. of Small Scale Industries (Working) – 1066
2. No. of Large / Medium Industries – 6

Different Types Of Sophisticated Industries Existing In		
Sl. No.	Type of Industries	No.of units.
1	Aluminium Utensils	08
2	Automatic Bakery Unit	9
3	Automatic Rice	65
4	Auto – Offset	4
5	Ayurvedic	1
6	Cold Storage	1
7	Coolers	15
8	Corn Flakes	2
9	Cotton Ginning	10
10	Detergent Powder	2
11	Digital Colour	3
12	Engineering	20
13	Flax Printing	6
14	Flour Mill	3
15	Fly Ash Bricks	20

16	Gem stone cutting &	2
17	Granite Cutting & Polishing	11
18	Graphite Crucible	1
19	Graphite Beneficiation Plant	12
20	Gudakhu Factory	2
21	Handloom Weaving Factory	8
22	Hot Mix Plant	1
23	Hotel & Lodge	14
24	Leather Foot Wear	4
25	Modern Dal Mill	2
26	Oil Mill	4
27	Packaged Drinking Water	6
28	Pesticides & Insecticides	2
29	Pharmaceutical Tablet Units	1
30	Phenyle	2
31	Pressed Leaf Cup & Plate	12
32	Plastic Glass	2
33	Sophisticated Readymad	5
34	Sortex Rice	12
35	Steel Furniture With Hot	3
36	Stone Crushers	15
37	Tufted Woolen Carpets	3
38	Therm Cool Sheet	2
39	Transformer assembling &	2
40	Tyre Retreading	9
41	Vermicelli	2

Bolangir district is situated in the western side of the state of Odisha, extending from 82⁰41' to 83⁰42' East longitude and 200 9' to 210 05' north latitude. Generally the climate of the district is hot & moist sub-humid. Broadly the district has Red & Yellow, Red & Black, Black, Late-rite, Black Cotton Soil and Brown forest soil 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 Balangir. The District has a rich mineral base of soft stones, limestone, stone chips are available in the District, which are mainly used in industrial units in the District. The huge deposits of granite stones at all the tahasil regions provides tremendous scope for development of few more industries.

Bolangir district with its fascinating natural beauty, rich tribal cultural heritage has a potential reserve of graphite, bauxite, Galena, & manganese.

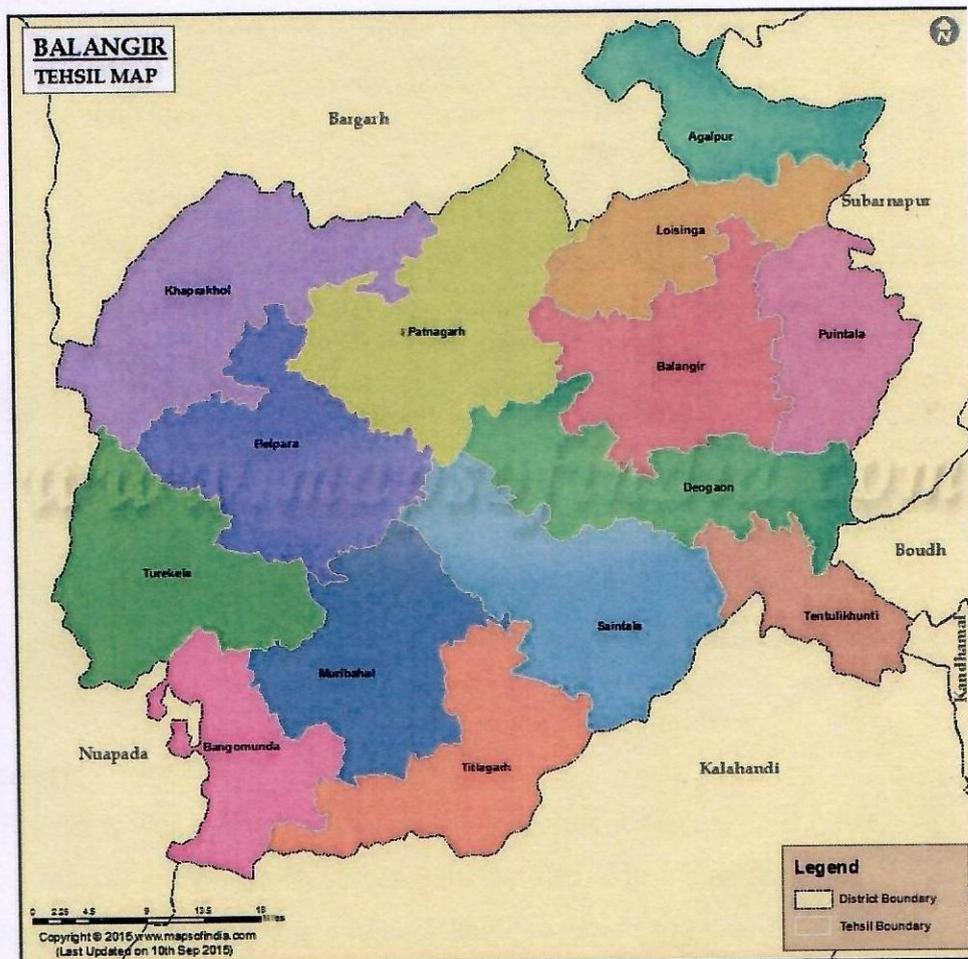


1.2 Administrative Units:-

Balangir is the Administrative Headquarter Balangir District. It is located at a distance of 319 km from Bhubaneswar, state capital of Odisha. In accordance to the area, the District is the 3rd largest western Odisha Districts of Odisha. It has 1794 villages covering 14 Blocks, 14 Tahasils and 3 sub divisions. The district is divided into 3 Sub-Divisions namely 1) Balangir, 2) Patnagarh and, 3) Titalagarh.

The population of the District is 1379647 according to the 2011 Census. The District accounts for 4.22% of the State's territory and about 3.93% of State's population. The

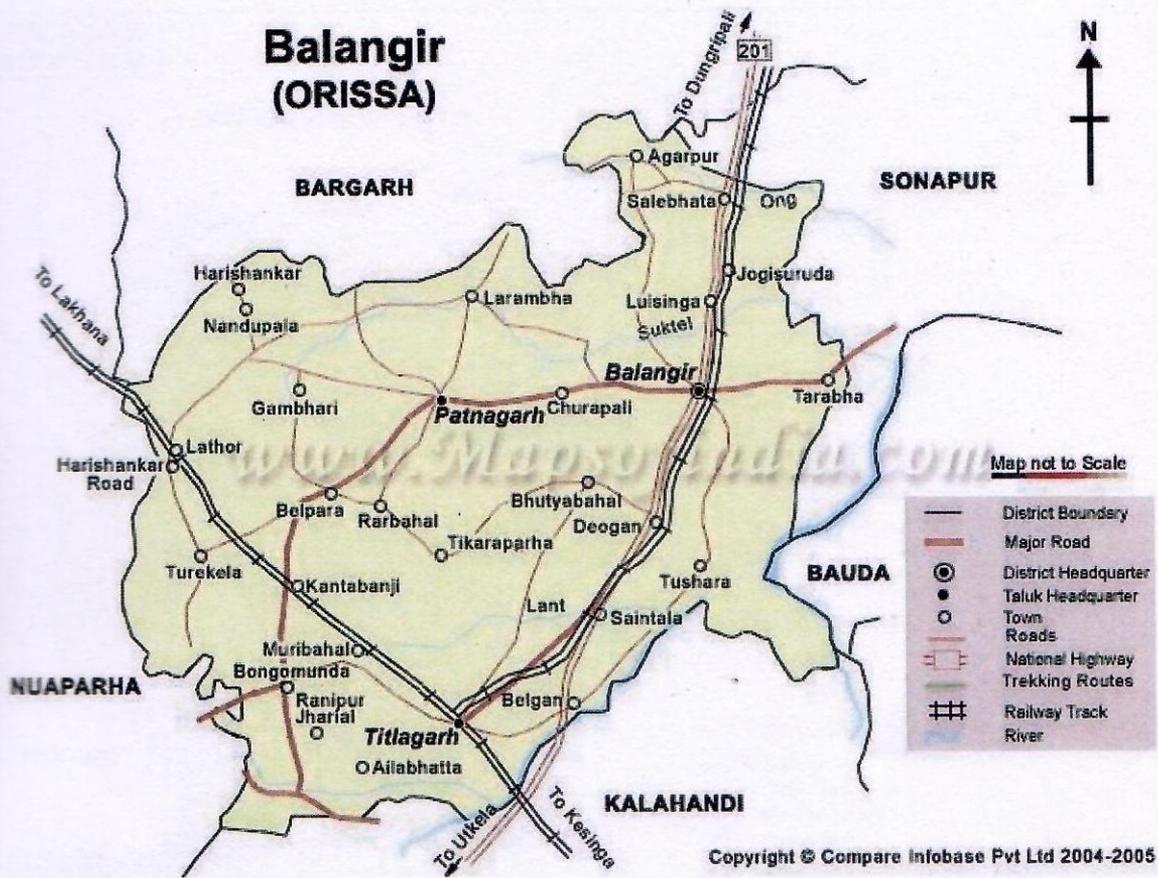
density of population of the District is 251 per square km as against 270 per square km of the state. As per 2011 census, the population of Scheduled Caste is (17.88%), and Scheduled Tribe is (21.05%). The literacy percentage of the District covers 64.70 against 72.90 of the state.



1.3 Connectivity facilities:-

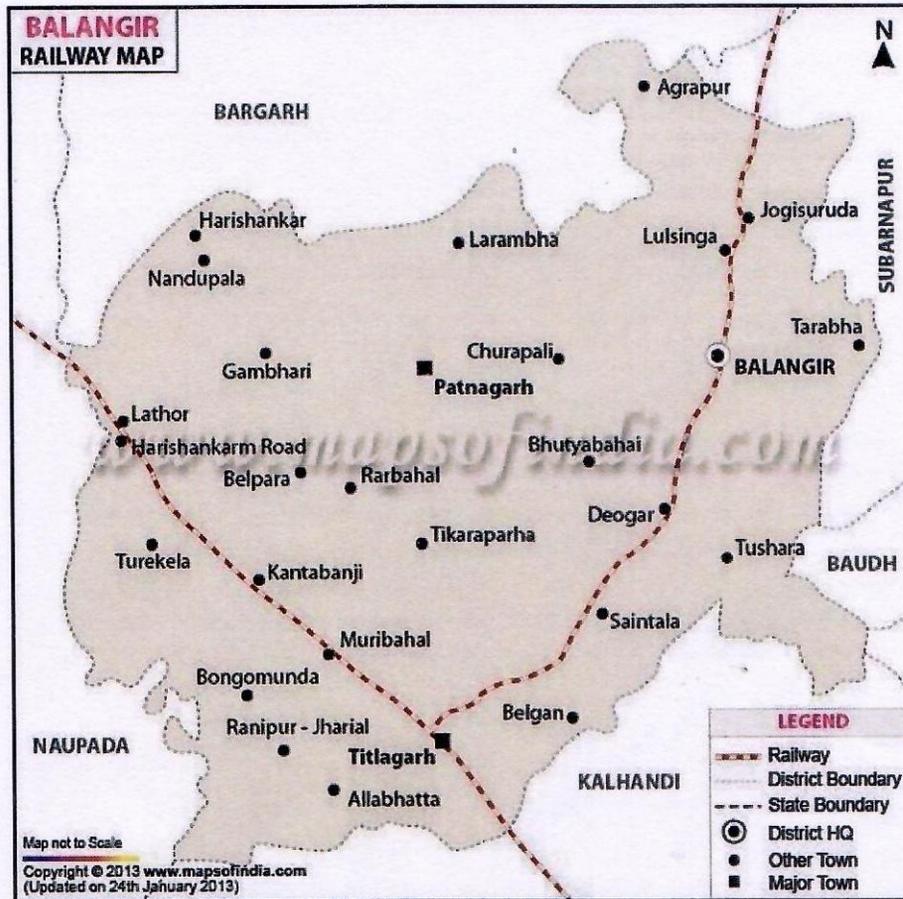
Road Network

The District is well served by a network of good roads. The chief road emanating from Balangir town is NH-201 passes through the District. Balangir Town is about 79 Kms from Bargarh, 119 Kms from Nuapada, 237 Kms from Kalahandi, 98 Kms from Boudh, and 49 Kms from Subarnapur. It is also connected with other cities such as Nabarangpur, Koraput, Ganjam, Khordha, Nayagarh, and Boudh via Odisha State Road Transport Corporation and some private travel services.



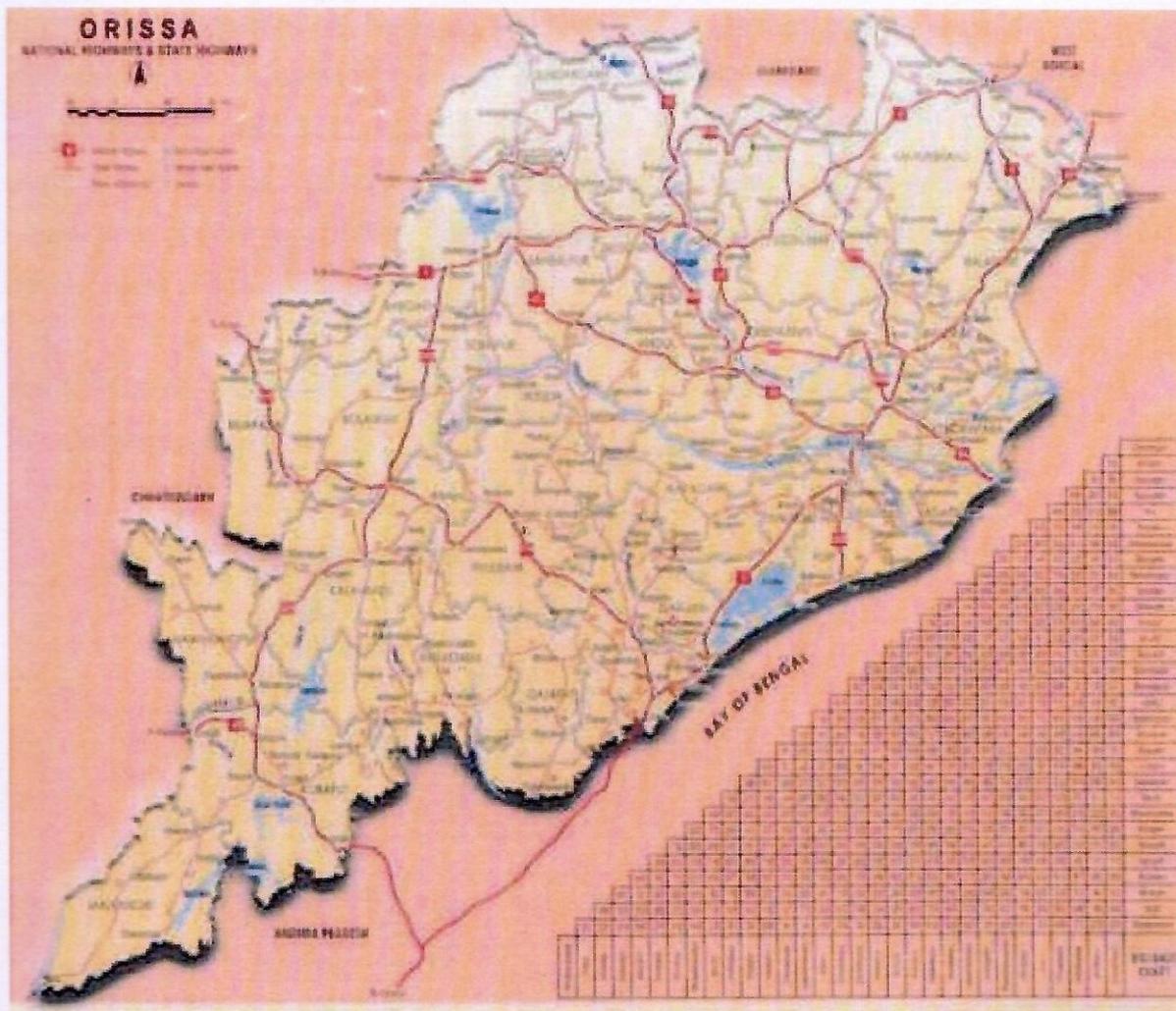
Rail Network

Balangir District is well connected by Rail link to different places, Balangir railway station is a railway station which serves Balangir district in Indian state of Odisha. The Jharsuguda–Vizianagaram line is a railway line in western India. It connects Jharsuguda, on the Howrah-Nagpur-Mumbai line, and Titlagarh, which in turn is connected with Vizianagaram, on the Howrah-Chennai main line, and Raipur, There are several branch lines, like the one connecting Rayagada with Koraput on the Kothavalasa-Kirandul line. The Khurda Road–Bolangir line is a rail line between Khurda Road Junction and Balangir which is under construction. The distance to Raipur is approximately 283 km, while the distance to Bhubaneswar is about 317 km; the city of Balangir is well connected to many places in India like Nayagarh, Phulbani, Baragarh, and Jharsuguda, Rourkela with Bhubaneswar sambalpur.



Air Network

The Jharsuguda Airport at Jharsuguda is the nearest airport to the city while Swami Vivekananda Airport at Raipur, Chhattisgarh is 234 km away. Biju Patnaik International Airport in the state capital, Bhubaneswar is 327 km away by road and 397 km by rail.



2. OVERVIEW OF MINING ACTIVITY IN THE DISTRICT:

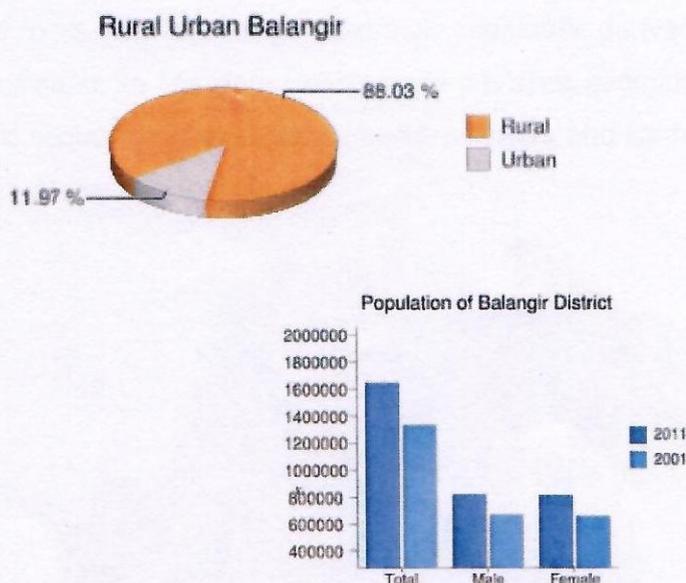
A great variety of ores and minerals occur in this district. Of these, the important ones are graphite, Galena(Lead ore), Manganese ore and Bauxite. Balangir District is a transition land features of both coastal plain and hilly region. Most of the mineralized area coming under Eco-Sensitive Zone, mining activity only confined out of safety zone of Eco-Sensitive Zone. The mining activity in the District is only restricted to minor minerals i.e. of sand, stone, granite and brick clays. Altogether there are leases of stone,

granite and sand which has been granted to the District is regulated as per minerals concession rules of Odisha, there is no lease of major mineral in the District. At present Leases of stone, sand and bricks making units are operational in the District. Stone chips, granite stones, ordinary sand constitute the principal mining activity of all the tahasil area of Balangir District. which have been provides tremendous scope for development of few more Industries based on this resources.

3.0 GENERAL PROFILE OF THE DISTRICT:

3.1 Demography:

Census - 2011	
Geographical Area	3806 Sq. Km.
Total population	1,648,997
Male Population	830,097
Female Population	818,900
Male Literacy	545,672
Female Literacy	381,588
SC Male	148,356
SC Female	146,421
ST Male	1,72,489
ST Female	1,74,675
Illiterate Male	2,84,425
Illiterate Female	437312



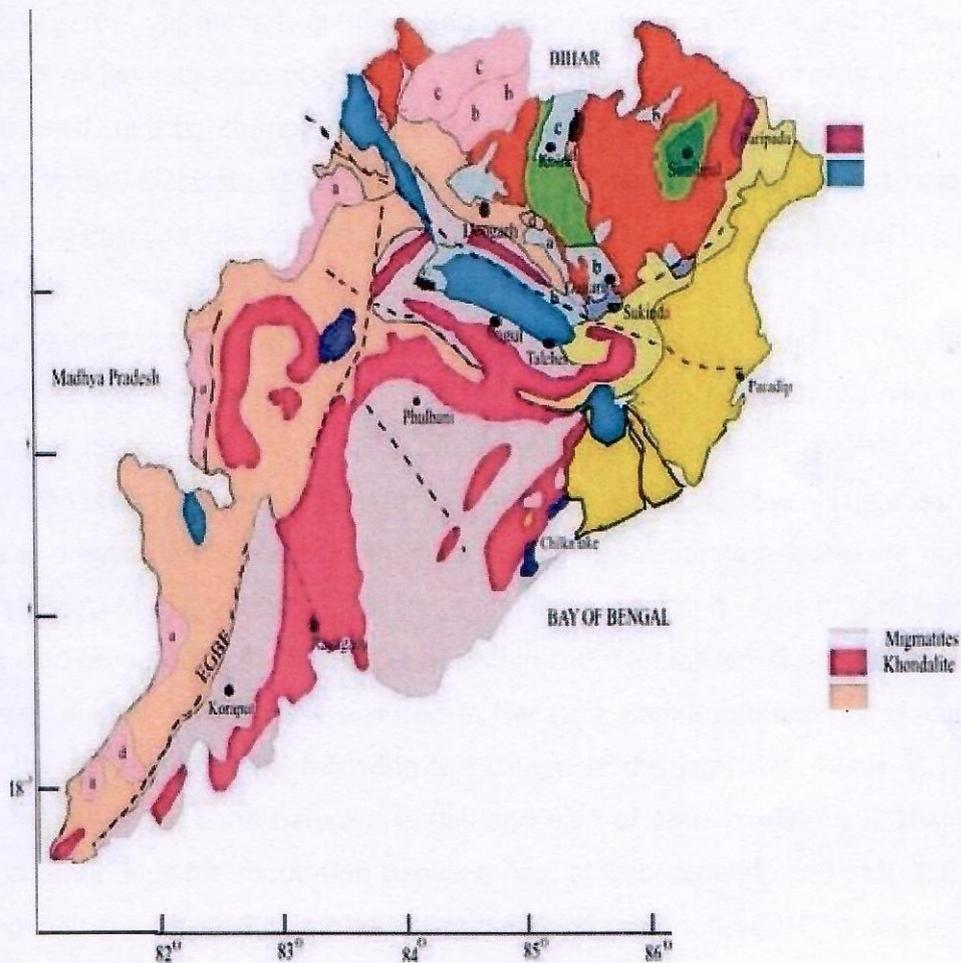
4.0 GEOLOGY OF THE DISTRICT:

Balangir district constitutes a portion of the peninsular reunion. It has largely remained a table-land, a mass of great rigidity and has not been affected by inner movements of the earth through some portions of the peninsular India has been affected by structural disturbance of vertical nature.

The Archean formations of the eastern Ghat region, represented mainly by the rocks of the Khondalite series, extend up to the western limit of the district. The next younger series of rocks, in this area consisting of garnetiferous gneisses are thought to be the products of hybridism between the calc silicate rocks and aplitic solutions. The concluding phases of the Archean in the Mahanadi tracts have been marked by a large scale intrusion of very coarse grained, often porphyritic granite with the accompanying pegmatite facies. Large scale feldspathisation of the older rocks, particularly the granulitic rocks and the leptynitic gneisses resulted in a variety of injection gneisses.

The next younger formations in this area consists of certain fresh water sediments perhaps of lower Gondwana (Talchir stage) age and are exposed as isolated sandstone patches in the Tel Valley. The youngest geological formations of the area are laterite and alluvium, the former occurring extensively as surface capping on the plains as well as on the 3,000 foot high Gandhamardan Plateau.

The areas represent parts of the Eastern Ghat Super Group comprising strongly metamorphosed rocks viz. Khondalites (and their migmatitic derivatives), calc granulites and garnetiferous quartzite associated with granite gneisses, pegmatites and quartz veins. The stratigraphic sequence established by earlier workers and confirmed by the present authors for these areas is as follows:-



Khondalite formations:

Khondalites, *sensu stricto*, are as vary scars in the areas as a result of extensive migmatitisation. Portions of these rocks, which are much less migmatitised with leuco-somes 10% or less, form in general, high conical hills that support thick vegetation and stand out prominently in an otherwise undulating rolling country.

Such hills are generally made up of gneissic khondalite. The Kalinili hill west of Sanbanki as well as the hill further north and the hill east of Sapmund are made up of this type of rock. The schistose variety, on the other hand, is exposed in the nalas and foothills close to those hills. The rock is greyish to reddish brown in colour, medium grained, foliated and consists of quartz, garnet, sillimanite, graphite and a little feldspars. The reddish brown colour is the result of limonitisation of garnet. Under the microscope, it consists of xenomorphic and strained, quartz, stumpy needles of sillimanite with transverse cracks, limonitised garnet showing diablastic structure and biotite altering from garnet mostly along cracks and peripheries. Graphite occurs as greyish black flakes. Both perthite and K-feldspar are present.

The garnetiferous quartzite forms small hillocks east and NE of Bariali, east of Dholmandal and west of mahulpati. The rock stands out prominently as hills and ranges because of its resistant nature. The quartzite is a granular rock, greyish in colour and dotted with conspicuous reddish garnet. In some cases, e.g. on the hill near Bariali, a little biotite is present in the rock. Sometimes occasional sillimanite needles are noticed. It is generally devoid of graphite except for a few flakes as noted in the east of Dholmandel .

The calc-granulite forms linear bands within the migmatized khondalite terrain and is intricately folded. This rock is exposed in the west Bariali and extends discontinuously along the strike further NE following the course of the Lant river (Plate-II.). The total strike length of the band between Bariali and east of 1561 hill is about 10km. Another band is continuous for about 4km between east of Debriamunda and east 1561 hill. The other bands are exposed near Kharli, Debriamunda, and north of Harishankar Road (foot hills of 1561). The width of the bands varies from 3m to 10m. Bands of 1m or less width are exposed in Thongajhar nala east of Jamki and Sanbanki. Differential weathering has given the rock a serrated appearance. Megascopically, the rock is medium grained and pale in colour. Under the microscope, it shows granulitic texture and is found to contain diopside, quartz, calcite, scapolite and sphene. Garnet is rarely present.

Pyroxene granulite:

Pyroxene granulite occurs as isolated small outcrop on either side of the forest road connecting Harishankar Road Rly. Station with Ghagruli, about 6km away. This is the only

outcrop of pyroxene granulite where it forms small humps standing out from the surrounding soil cover area. Its contact with the other litho-units is concealed.

The rock is medium grained, dark in colour and very compact. It shows granulitic texture under the microscope and consists of hypersthene, diopside, plagioclase (andesine to labradorite), garnet and quartz with some opaque. Incipient alteration of garnet to biotite at the margin is noticed.

Migmatites:

Migmatite is a hybrid rock containing an admixture of palaeosomes and leucosomes (neosomes) in various proportions. Strictly speaking, all the litho-units of the areas examined are migmatized to some extent or the other. But the khondalitic rocks being most prominent of the metasedimentaries, the migmatites formed after Khondalites are by far more conspicuous and prominently developed. The migmatite bodies are concordant to the regional trend of the rock units and are confined to the low lying soil covered tracts where these are exposed mainly in nala cuttings. Outcrops of migmatites are in Thongajhar nala east of Sanbanki and Jamki, Pandrapatranala, Palsakaninala and the nalas east of Gargarbahal, Lant river sections, south and north of Telenpali (Plate I). In all these outcrops the rocks considered to be migmatites have leucosomes varying from 10% and above. The ratio of palaeosomes, leucosome varies from more than 80:20 to as low as 20:80. The known graphite deposits fall within the migmatite zones.

The various migmatitic structures noted are stromatic, schollen and schollen types (Mehner, 1968). Of these, the stromatic in which veins of neosome alternate with palaeosomes is the most common. The schollen structure is noted in Pandrapatra and Palsakaninala where small sillimanite lumps are included within the leucosome. Development of biotite and garnet at the contact of leucosomes and palaeosomes is common.

Megascopically, the migmatites have a general gneissic appearance as a result of alternation of the paleosomes and neosomes. Under the microscope, the schistose structure is prominent. A mineral assemblage of K-feldspar, microperthite, quartz and garnet with minor amounts of biotite, sillimanite and opaques are seen. The feldspars are later developed and enclose sillimanite needles and biotite flakes partially or fully. Garnet alters to biotite at the margin. Graphite normally occupies the inter-granular space.

Granite gneisses:

Granite gneisses occupy a major part of the areas examined. Two distinct types of granite gneisses are discernible non-porphyroblastic (garnetiferous) and porphyroblastic, of which the latter is predominant.

The non-porphyroblastic granite gneiss is exposed on a small ridge south-west of Dhusamunda and has a few isolated outcrops further west. Small concordant tongues of this rock within the migmatites are exposed in Pendrapatra, Thongajhor and Palsakaninalas. Relicts of the rock within porphyroblastic granite gneiss are observed on the hill in Patpani R.F area indicating an older age of the former.

The rock is leucocratic, medium grained and shows well developed gneissosity. It contains Kfeldspar, perthite, quartz garnet and biotite. The quartz grains in the rock are stretched (flattened) at some places.

The porphyroblastic granite forms a continuous ridge in Patpani and Chandil R.F. areas apart from the small ters, Whalebacks and ruwares in the planes between Bardakle on the south of Jalpankel on the north (Plate I).It has intruded into all other units described above along their foliation planes.

The rock is leucocratic and consists of large porphyroblasts of feldspar (long axis varying from 2cm to 15cm, showing a crude gneissosity), quartz, garnet and biotite. At the contact with the older rocks, segregated zones of garnet and biotite are noticed. Sometimes growth of feldspar is impeded by garnets suggesting a later origin of porphyroblasts. This may be due to alkali metasomatism at a deeper tectonic level after the development of garnet.Under the microscope, it shows porphyroblastic texture and consists of plagioclase (oligocaseandesine),perthite, quartz, garnet, biotite with apatite as accessory. The rock is granodioritic in composition.

Pegmatite and quartz veins:

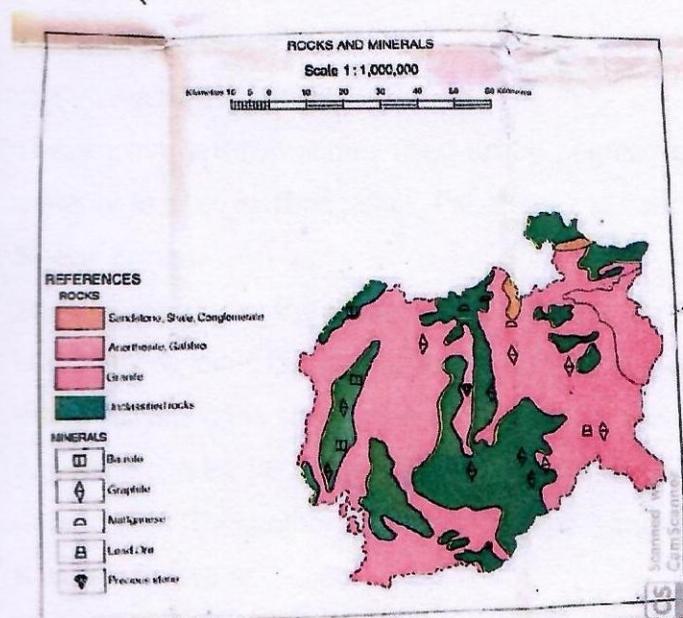
Depending upon the mineral assemblages, three types of pegmatites are identified. These have the fo1lowing

compositions:

- i) Quartz-feldspar-biotite-garnet with or without clots of graphite
- ii) Quartz-feldspar-garnet -biotite -muscovite-tourmaline.
- iii) Quartz-feldspar-with or without garnet and graphite

The pegmatite bodies are frequent within the migmatite zone and run parallel to the host rock foliation with sharp contact as seen east, west and north of Jamki.

The third type has a gradational contact with the host rock and is exposed mainly in graphite quarries near Chormunda and Sapmand and to the south of Sanbanki, The second type has mainly E-W to NW-SE trends. This type of pegmatite is reported to be clandestinely excavated for precious stores (mainly aquamarine and topaz). The width of pegmatite bodies vary from less than a meter to more than 3m. One such excavation was noted in the nala NNW of Karuanajhor. Two quartz veins are noted about 2.5km south-east of Lathor and 1.5km SW of Gargarbahal. These are highly fractured and sheared. The quartz is milky white in colour.



Structure:

Foliation: The Khondalite and the associated rocks display well developed foliation as a result of preferred orientation of sillimanite needles graphite flakes and other platy minerals. Alternation of quartz-feldspathic bands with garnet rich bands is also quite prominent. The regional trend of foliation varies from NNE-SSW to NE-SW with steep easterly dips 35° to 70° (Plate I). In the Bakbahal R.F. area the strike is confined between N-S and NNE-SSW directions with local variation to NW-SSE (Plate I). The dip is sometimes

as low as 10° in this part. The porphyroblastic granite displays a crude gneissosity with a linear arrangement of feldspar porphyroblasts.

Folds:

The general parallelism of foliation indicates isoclinal to overturned nature of the regional fold pattern. Such folds on minor scale are well preserved in calc-granulites. The tight folds preserved in this rock have axial plane parallel or sub-parallel to the foliation with fold axes plunging 15° to 30° towards NNE. Later warping with plunge at 35° to 45° towards east, among along NW-SE and E-W axes is observed in calc-granulites. This explains the swing in strike locally from NNW-SSE to NNESSW in Bakbahal R.F. area.

Joints:

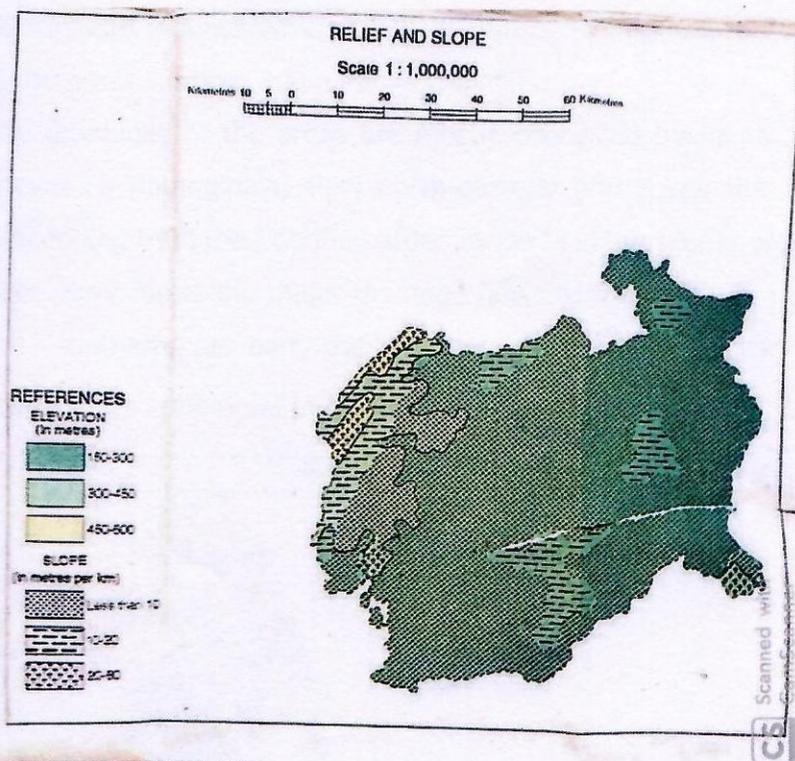
The following three prominent sets of joint sets are noted in the areas examined of which the latter two sets are tension joints:

- a) NE-SW to NNE-SSW, parallel to foliation
- b) NW-SW vertical joint set
- c) E - W vertical joint set

These joints are sometimes filled up by pegmatite veins and other quartzo-feldspathic material as seen in Thongajhor, Palsakani and Pandrapatranalas.

Shear Zones:

Shearing parallel to the foliation is evident at many places. As a result of shearing, close spaced joints had developed along with mylonitisation of the rocks. The quartz reef emplaced along the shear zone SW of Gargarbahal and SE of Lathor is much crushed and has close spaced joints parallel to the regional foliation trend. Shearing in migmatites is noted along Thongajhor, Pandrapatranala, Karusnjhar, village, Lant river and WNW of Kandagadh village.



4.1 Physiography & Geomorphology:

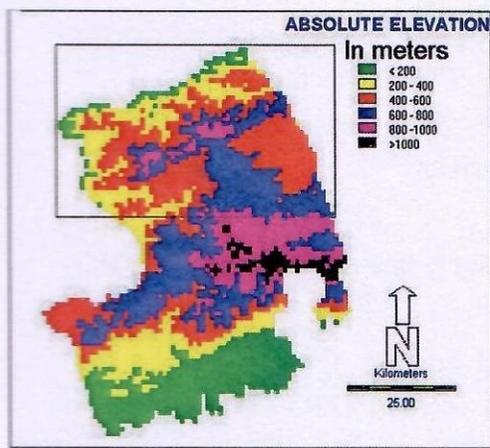
Physiography:

The areas examined in the course of the investigation fall south of the arcuate Gandhamardan range forming a water divide. The different hill ranges in the area have NE-SW to ENE-WSW trends in the northern part which swerves to the general N-S direction in the southern part. The Gandhamardan range is a table land having the highest elevation of about 1000m above the MSL. To the SW lies the Chandil range, known as Patpani range in its southern extension. In between the two (Gandhamardan and Patpani ranges) lies a narrow valley. The Patpani range marks the boundary between the two districts of Kalahandi and Bolangir many prominent peaks of heights ranging from 560m to 715m above the MSL make the range quite conspicuous.

Another prominent hill, the Chattradandi (810m), lies in the south eastern part of the area. The intervening valleys are extensively soil covered and have a few isolated hills. The area around Sapsmund, at the south-eastern foot hills of the Gandhamardan range, has two prominent hills (816m and 518m). Elsewhere in the areas, there are many small

hillocks and mounds which range in altitude from 400m to 600m. The general elevation in the areas is about 300m above the MSL.

The drainages of the areas are mostly controlled by joints .In the northern part (also known as Katanginala) flow north-easterly and joins the Suktel River.Perennial nalas descending from the Gandhamardan range feed this higher order stream. In the South,the Lant river forms the major drainage flows to the NE to join the Tel river further SE. In the southernmost part, the Arjunnala flows and joins the Udanti river.The southern streams are ephemeral in nature.



Geomorphology :

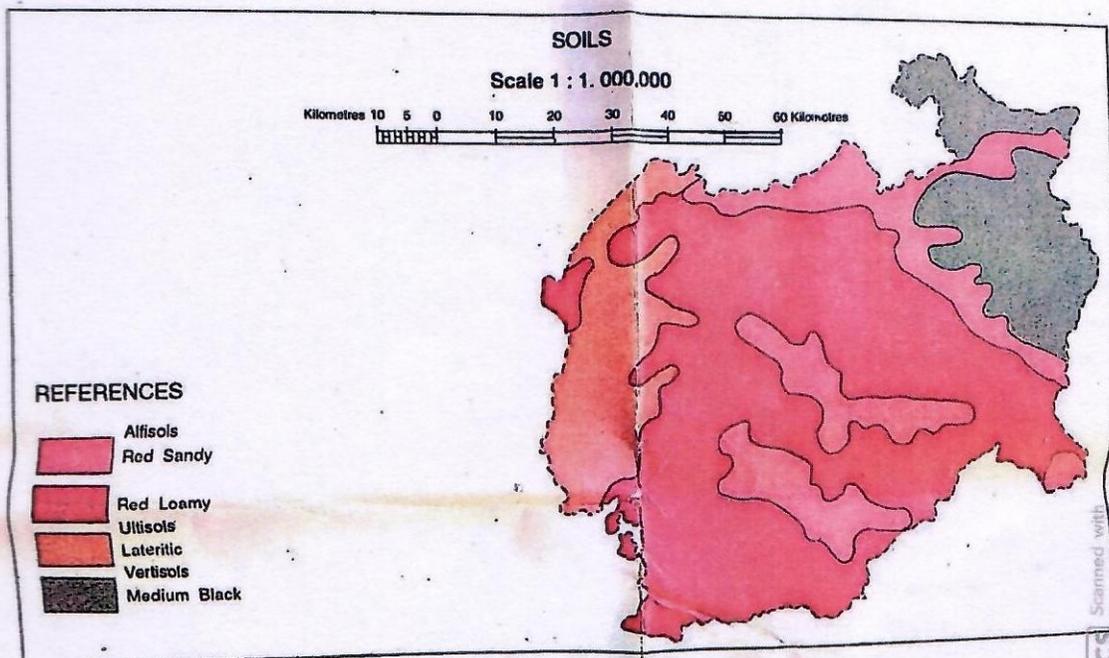
The district can be divided into two broad physiographic units (i) undulating plains (Pediments) dotted with residual hills and (ii) scattered hills and areas with high relief. The undulating plains occupy the central and eastern parts of the district the western, western and south eastern parts of the district average elevation being 200m to 300m above mean sea level with a general slope towards east. The areas with high relief and high hills are situated in the north western, western and south eastern parts of the district (Plate-V).The hill ranges belong to the Eastern Ghats having a general trend of Northeast-Southwest. The highest peak is Gandhamardan situated 983 m above mean sea level.

4.2 Stratigraphy:

Event Stratigraphy of the Eastern Ghat Mobile Belt is as follows;

Age(Ma)	Event
550-650	Exhumation & Stabilisation (Pan-African)
800-850	Emplacement of Anorthosite Massifs, Some Alkaline Rocks Younger Granitoids are Charnokites.
950-1100	Main Eastern Ghat Orogeny(=Grenville)
	Khondalite Group
	Garnet-sillimanite-Graphite Gneiss(Khondalite) with Minor cordierite-Saphrine-Special Gneiss(Mg-Al). Calc-Silicate rocks & rare Marbles. Quartzite(Garnet+Sillimanite)
~1500	Emplacement of Alkaline rocks along with the rift Margin.
Evolution of platform	(Purana) basins like Cuddahpah, Chhatishgarh, Indravati etc.
1600-1800	Evolution of Nellore-Khemmam schist belt in Dharwar Craton
2600-2800	Charnokite & Gneisses of the basement (WCZ)

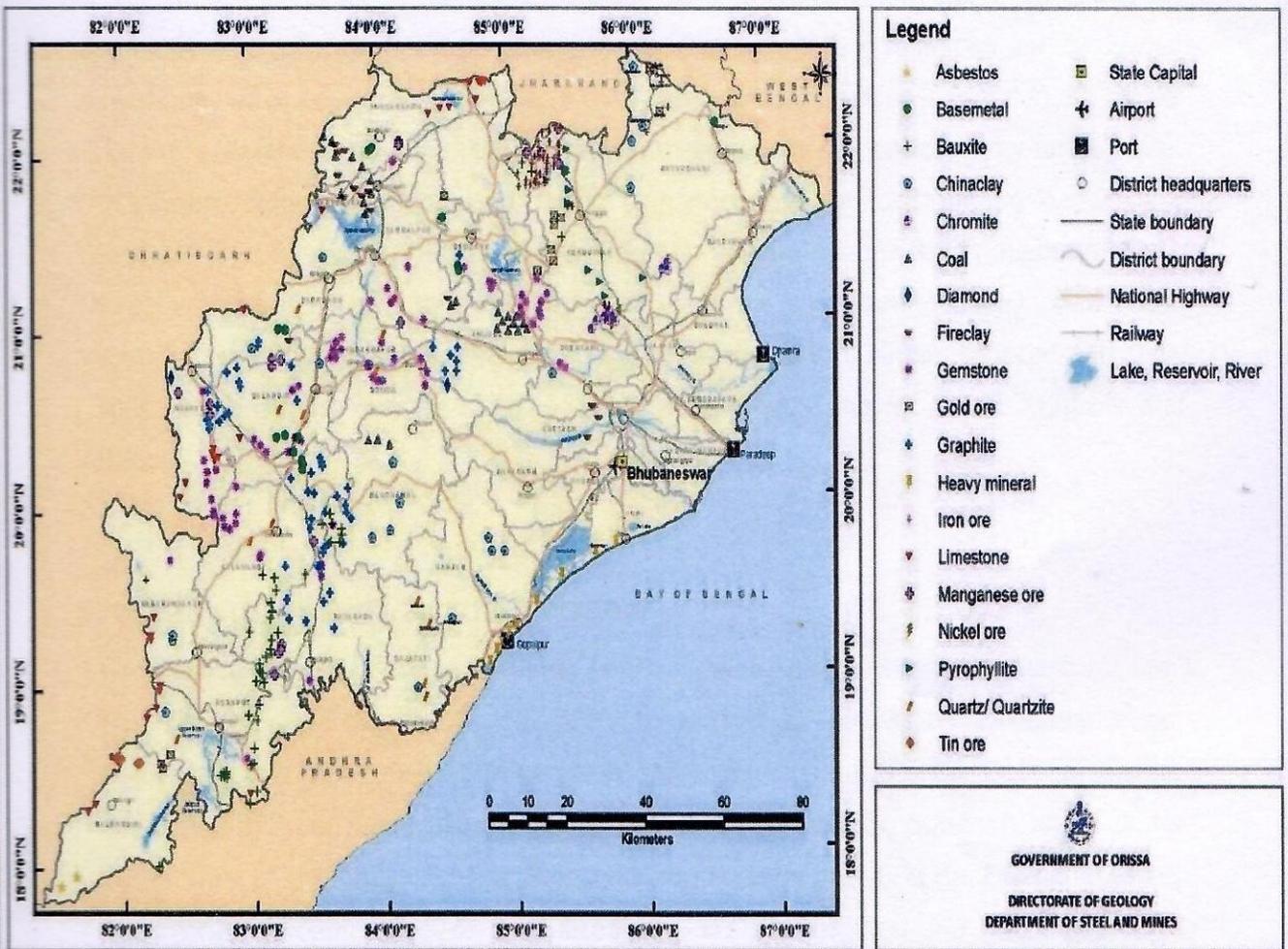
Map



4.3 Mineral Resources:

Minerals like soft stones, limestone, stone chips are available in the District, which are mainly used in industrial units in the District. The huge deposits of granite stones at all the tahasil area provide 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.

MINERAL MAP OF ORISSA



4.4 Soil:

Soil:

The distribution of different soil types in the district depends much on its physiographic and lithologic variations. Based on the physical and chemical characteristics, mode of origin and occurrence **Alfisol** : It includes red sandy soils and red loamy soils. The red loamy and sandy soils are occurring in major parts of the district. The characteristic features of red soils are (1) light texture, porous and friable structure, (2) absence of lime Kankar and free carbonates and (3) soluble salts in a small quantity usually not exceeding 0.05%. These are usually deficient in nitrogen, phosphate, organic matter and paddy and other crops.

Ultisol : These are lateritic soils occurring in northwestern part of the district in Khaprakhol block in a limited area. These are characterized by compact to vesicular mass

in the subsoil horizons composed essentially of a mixture of the hydrated oxides of aluminum and iron. Due to peculiar granular nature, these soils can be cultivated immediately after heavy rains. Vertisols : These are medium black soils found in the blocks of Loisinga, Bolangir and Puintala especially in the areas mostly underlain by anorthosite. The soils are highly argillaceous and contain high amount of iron, calcium and magnesium. These are poor in organic matter, nitrogen and phosphorous but rich in potash and lime. The pH varies from neutral to alkaline and texture varies from loam to clayey loam. These are quite fertile soils and the crops grown are generally cotton, wheat, tobacco and chilly , soils of the district may be classified into three groups namely Alfisols, Ultisols and Vertisols

5. DRAINAGE OF IRRIGATION PATTERN

The District has considerable flat land, which provide suitable site for agricultural use. The hilly areas are mostly under forest with patches of cultivation on scarp areas. The district has many rivers and perennial streams. Almost the entire Bolangir district is drained by nine rivers namely Mahanadi, Tel, Undar, Lanth, Sungadh and Sukhtel (Tributaries of the Tel), Ang, Jira, Saleshing. Major crops grown in the District are rice, Only. 12.21 percent area of agricultural use are net irrigated and major source of irrigations are well and tube wells.

IRRIGATION BY DIFFERENT SOURCES(Areas and Number of Structures)				
	Sources of Irrigation	Number	Area in hectare	Percentage of total irrigated area
	Canals	142	129118	65.31
	Tanks	-	-	-
	Open wells	13547	10.486	53.04
	Bore wells	4159	7.884	3.99
	Lift irrigation schemes	2127	23.890	12.08
	Micro-irrigation	78	0.058	0.029
	Other	-	8.681	4.39
	Total Irrigated Area	-	190.917	96.56
	Pump sets	253	-	-

No. of Tractors	56	-	-
Irrigation	Area in hectares		
Net irrigated area	Net irrigated area 190.9(30.38%)		
Gross irrigated area	Gross irrigated area 197.7(32.95%)		
Rainfed area	402.3(67.04%)		
Source: Agriculture Strategy of Balangir District, Kharif, 2020-21			



5.1 River System

The district has many rivers and perennial streams. Almost the entire Bolangir district is drained by

nine rivers namely Mahanadi, Tel, Undar, Lanth, Sungadh and Sukhtel (Tributaries of the

Tel), Ang, Jira, Saleshing.

Industrial Estate and flows from west to east. Amrutia N. flows from NNW to SSE and carries the waste water load of East Coast Fertilizer at Gadadeulia and water

laden solid wastes (particularly in rainy season) from the dumping site of Krebs & CIE Ltd. at Kalma. These tributaries join Burhabalang river downstream at Sahupada and Bhimda (outside present area) respectively. There is another local stream, which flows from Southwest to Northeast, carrying the waste water of Birla Tyres Ltd. at Chhanpur and the Industries located at Ganeshwarpur Industrial Estate. This stream too ultimately joins the Burhabalang river near Nuabazar, Balangir town.

6.0 LAND UTILIZATION PATTERN IN THE DISTRICT

6.1 Forest and non-forest land

The important forest produce of Balangir are timber, fuelwood and bamboo while others include Tenduleaves, Charcoal, bramgrass, Mahua flowers and seeds etc.

The forest of Balangir district correspond to "Tropical forests" according to Champion's classification. These forests depict generally two main types, viz; moist and dry deciduous, which cover different regions of the tract and indicate the origin of a broad pattern very much in consonance with the configuration and geology of the tract and also to a large extent with its climate and rainfall. The peculiar situation of the tract, the "Tension Zones" between the Northern and Southern Indian form, represented by sal and teak respectively, is again an interesting feature of the tract.

Although, as would be expected, local variations due to edaphic factors is quite common in each of the general formations much of the originality in considerable portions of these forests, has been lost due to continued biotic influence, the most deciding of which has been shifting cultivation, locally known as Podu, practised in this tract since many years. Indulged in moderate proportion this practice has hastened the formation of sal forests which are generally taken as climax types. But when podu is prolonged and over done, the result has been rapid retrogression and appearance of secondary seral types of much poorer forests. This is amply evident by comparison of similar areas inside reserved forest, protected from podu during the past nearly half a century, and those outside reserved forest under active expanding Podu.

The "Moist sal forests" are found in luxuriant climax patches often showing pure pockets of quality class II and I, sheltered inside reserved forests. The entire region of the tract

lying on the east and stretching from the north-eastern end of the tract to the southern most limit of the southern high lands, had at one time, most certainly been covered in large continuous stretches by moist deciduous forests predominated by sal. Natural Teak forest is interspersed with big chunks of dry deciduous miscellaneous forest in some forest blocks where patches of sal are alone present in the vicinity. Podu had a considerable hand in shaping the forests of this region before the advent of Forestry. With the beginning of forest consciousness in the ex-state regime, many of those forests, generally less disturbed by podu, got reserved. These form now the control to assess the extent of retrogression that has been the result of repeated podu. The usual process is passage through secondary seral type of dry deciduous forests, often gradually changing to pure bamboo brakes, which again is replaced by dry scrub jungle area and finally became waste land and hill slopes of which large areas are seen in the southern high lands.

The transition from the Northern to Southern India form is seen in between the "Moist Sal" in the eastern part of the tract and "Dry Teak" in western boarder. In this zone in some isolated pockets sal and teak are seen growing together. The transition from "Moist Sal" to dry mixed deciduous forests is of both, northern and southern form. In the southern high land also the transition from the northern to southern form is indicated by increasing occurrence of various species more akin to South Indian flora.

The forest of Balangir District is full of variety of medicinal plants, Kendu leaves, Bamboo, Sal, Teak, other timber species and a wide range of carnivorous & herbivorous wild animals.

District-wise Forest Cover Area in Odisha (Area in Km2)

2019 Assessment								
District	Geographical Area Km2	Very Dense Forest	Moderate Dense Forest	Open Forest	Total	Percent of GA	Change	Scrub
Angul	6375	371	1380	1004	2755	43.22	43	84
Bolangir	6575	70	224	837	1131	17.2	151	142
Balangir	3806	23	127	234	380	9.98	30	48
Bargarh	5837	176	371	484	1031	17.66	88	47
Bouda	3098	263	546	480	1289	41.61	27	57
Bhadrak	2505	0	9	66	75	2.99	2	0
Cuttack	3932	53	226	517	796	20.24	11	68

Deogarh	2940	191	667	614	1472	50.07	-3	14
Dhenkanal	4452	174	418	825	1417	31.83	9	82
Gajapati	4325	84	1490	946	2520	58.27	12	262
Ganjam	8206	164	1075	864	2103	25.63	15	655
Jagatsingh pur	1668	0	5	131	136	8.15	6	0
Jajpur	2899	6	72	225	303	10.45	3	so
Jharsugada	2114	3	140	179	322	15.23	9	36
Balangir	7920	362	729	1327	2418	30.53	36	362
Kandhamal	8021	661	2588	2143	5392	67.22	16	380
Kendrapad a	2644	84	88	133	305	11.54	14	2
Keonjhar	8303	289	1404	1519	3212	38.68	4	55
Khorda	2813	21	186	250	457	16.25	0	92
Koraput	8807	94	740	1255	2089	23.72	120	944
Malkangiri	5791	158	709	1475	2342	40.44	20	45
Mayurbhanj	10418	1335	1718	1027	4080	39.16	42	34
Nabarangp ur	5291	168	428	507	1103	20.85	8	47
Nayagarh	3890	189	965	556	1710	43.96	28	173
Nuapada	3852	86	482	705	1273	33.05	33	109
Puri	3479	0	54	160	214	6.15	8	11
Rayagada	7073	422	853	1851	3126	44.2	7	349
Sambalpur	6624	499	1675	1106	3280	49.52	13	40
Balangir	2337	2	187	161	350	14.98	26	29
Sundargarh	9712	1019	1814	1431	4264	43.9	107	89
Grand Total	155707	6967	21730	2300 8	5134 5	32.98	885	430 6

(Source: India state of forest report 2019-Odisha)

The major portion of the District is covered by forest (9.98 % of TGA) and has scattered settlement pattern. The forest is full of variety of medicinal plants, Kendu leaves, Bamboo, Sal, Teak and other timber species. The District has considerable flat land, which provides suitable site for agricultural use. The hilly areas are mostly under forest with patches of cultivation on scarp areas. Major crops grown in the District are rice and pulses. Only 12.50 percent area of agricultural use are net irrigated and major source of irrigations are well and tube wells.

6.2 Agriculture Land:

The primary objective of Agriculture Department is to increase of production as well as productivity of major crops like Paddy, Groundnut, Mustard, Mung, Biri & vegetables which is widely covered in this District in both Kharif & Rabi season. Another key objective is to make all round development of the farming community of the District. The Deputy Director of Agriculture is the Head of office so far as agriculture is concerned & he is the Principal Agriculture Officer of the District. There are 5 District Agriculture Officers & the Block Level Officers are working under him. As it has already been pointed out, that agriculture is the main livelihood of the people in Balangir District, it is therefore designated as the food bowl of Odisha. Rice is the principal crop grown in this District, followed by other cereals, pulses, oilseeds, vegetables, spices and sugarcane. The agricultural statistics for the District is shown in subsequent tables below :in subsequent tables below:

Table: Crop Coverage Area of Balangir District, Odisha

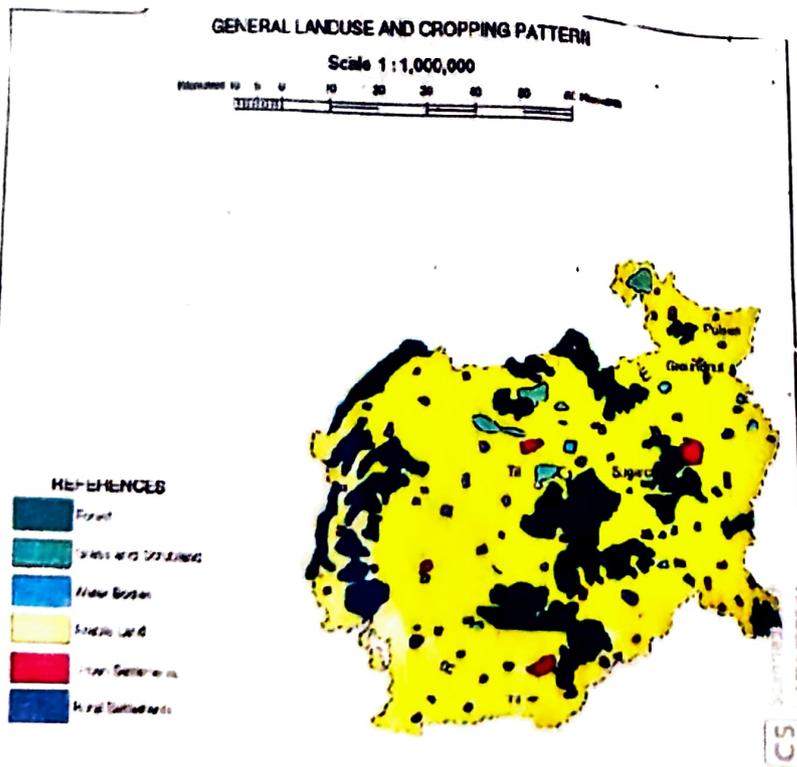
Major field crops cultivated	Area('000ha)							
	Kharif			Rabi			Summ er	Gran d total
	Irrigat ed	Rainfe d	Total	Irrigat ed	Rainfe d	Total		
Paddy	161097	43361	204.458	61.95	-	61.950	39.42	305.828
Green gram	-	6514	6.514	1.353	71.832	73.185	-	79.699
Black gram	800	19741	20.541	0.238	3.972	4.210	-	24.751
Cotton	-	60988	60.988	-	-	-	-	60.988
Arhar	-	20322	20.322	-	-	-	-	20.322

6.3 Horticulture Land:

The primary objective of Horticulture Department is increase of production as well as productivity of major fruits like Mango, Guava, Citrus etc., which is widely covered in this District. Another key objective is the all round development of the farming community of the District. The Deputy Director of Horticulture is the head of office.

Horticulture crops	Total Area (hectares)
Mango	6.985
Guava	1.009
Banana	0.509
Papaya	0.60
Litchi	0.60
Brinjal	7.690
Tomato	6.260
Onion	2.45
Chilli	1.888
Okra	0.749
Ginger	0.150
Turmeric	0.248

Source: SREP, Balangir. Orissa Agric.



7.0 SURFACE WATER AND GROUND WATER SCENARIO OF THE DISTRICT

7.1 Hydrogeology

The hydrogeological framework of the district is mainly controlled by the geological set up, rainfall distribution and the degree of secondary and primary porosities in the geological formations for storage and movement of ground water. Since major parts of the district are underlain by hard rocks of diverse lithological composition and structure, the water bearing properties of the formations also vary to a great extent. The area has undergone several phases of intense tectonic deformations which has been responsible for the development of deep seated intersecting fracture system. Hydrogeological surveys in the district reveals the lithological characteristics and the role of tectonic deformation on the occurrence and distribution of ground water reservoirs and their water bearing and water yielding properties. Lineaments formed due to tensile deformation were picked up from remote sensing studies. The structural elements mainly control the occurrence and movement of groundwater in the typical fractured crystalline basement terrain. The major hydrogeologic units in the district can be subdivided into three broad groups.

- (i) Areas underlain by fractured, fissured and consolidated basement rock formations.
- (ii) Areas underlain by the semi consolidated (Gondwana) formation.
- (iii) Areas underlain by recent unconsolidated alluvial formations. Water bearing properties of the Consolidated formations :

7.2 Depth of water level:

The crystalline rocks like Khondalites, granite gneisses, charnockites, quartzites and anorthosites, which are devoid of primary porosity, occupy about 95% of the area of the district. The weathered residuum and jointed & fractured portion of these consolidated rocks constitute principal water bearing horizons. The thickness of the weathered zone is generally more in the topographic lows and undulating plains than in the high land areas. Ground water occurs under phreatic condition in the weathered zone and in semi-confined to confined condition in deeper fractured zones. The water yielding capacity of fractured rocks largely depends on the extent of fracturing openness and size of fracture and nature of their inter connections. Usually two to four water bearing fractures occur down to a depth of 100m below ground level. Potential fracture zone is encountered even at depth of 178 m at Kanut (Block-Belpara). Granites and Granite Gneisses Including

Bonai granite :These are the most predominant rock types occurring in the undulating plains and topographic lows. Depending upon the topographic set up, the depth of weathering ranges from 5.5m to 17.50m and occasionally extends up to 35.5m depth. The weathered residuum and fracture zones form principal aquifers. In deeper fracture zones ground water occurs under confined to semi-confined conditions. In general the deep bore wells in these rocks can sustain yield of 2 to 25 LPS depending upon topographic setting, proximity to the major lineaments, thickness of weathered residuum and number of saturated and interconnected fractures encountered. The granites and granite gneiss can be developed through open wells and borewells. High yielding wells are recorded in the western parts of the district where the discharge ranges from 10 to 25 LPS. Specific capacity of the dug wells tapping the weathered zone ranges from 6 to 286 LPM/M drawdown.

Khondalites :These rocks generally form steep linear ridges hence don't form potential aquifers. Well foliated nature of these rocks allows deep weathering. In the pediment areas, the thickness of weathering is varying from 5 to 32m. Ground water occurs under water table condition in the weathered zone and circulates through deeper fractures. The yield of bore wells range from 1 to 5 LPS. The specific capacity of the dug wells ranges from 2.3 to 13.3 LPM/M draw down.

Charnockite : These formations are of very much restricted occurrences in the district. Due to paucity of joints and fractures the thickness of weathering in these formations is limited up to 10m. Due to the compact nature and less weathering, ground water prospects in charnockites are not good.

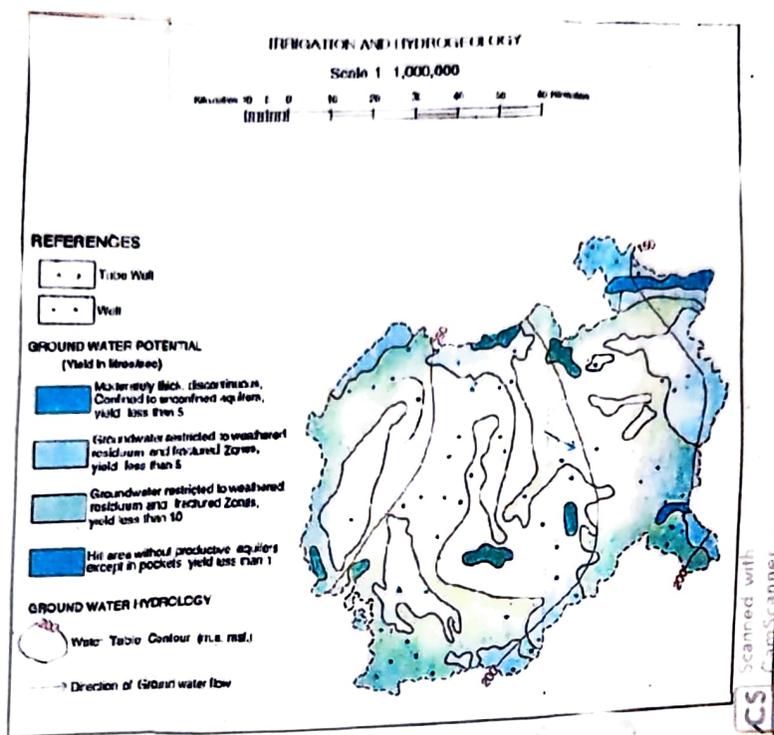
Gabbro –anorthosites : The rheologic property of these rocks resembles with charnockite, Barring few locations dismal weathering and lack of fracturing renders these formation as a bad water yielder. The Sp. Capacity of dug wells in anorthosite vary from 16 to 102 LPM/M drawdown.

Quartzites :This unit also less fractured and weathered hence do not form good aquifers. However fractured quartzites along lineaments yield good amount of water.

Pegmatite and quartz vein : These are coarse grained intrusives and form good aquifers when fractured.

Semiconsolidated Formation :These are represented by rocks of lower Gondwana formations. These formations have faulted contact with the Precambrians. The friable and loosely connected sandstones form the aquifers. Ground water occurs under water table condition in the weathered zone and under semiconfined to confined condition in deeper fractured and friable sand stone beds. The yield of tube

wells in these formation is meager (<1 LPS). Depth of the open wells in this formation ranges from 5 to 12 m bgl. Yield of the open wells is less than 3 LPS. Unconsolidated Formation : Laterites and alluvium of sub-Recent to Recent age constitute the unconsolidated formations. Laterites occur as capping over the older formations and are tapped through dug wells. Recent alluvium occurs as thin discontinuous patches along prominent drainage channels. The thickness of the alluvial deposit varies from 6 to 12m and forms potential shallow aquifers. The specific capacity of the dug wells in alluvium varies from 336 to 466 LPM/M draw down. Aquifer Characteristics of Crystalline: In the hard crystalline rock recharge of ground water from precipitation or seepage from surface water bodies percolate into the weathered (saprolite) zone. In case the underlying basement rocks (both weathered and fresh) are incised by open fractures, the downward movement of the water from the upper regolith zone (comprising the top soil and saprolite horizon) is facilitated. In the saprolite/regolith horizon ground water generally occurs under unconfined conditions whereas in the fractured bedrock aquifers it occurs under semi-confined to confined conditions. At places confined conditions give rise to the formation of auto flowing wells in the basement rocks as seen at Kantabanji (Block-Tureikela), Dokhra (Block-Belpara), Bhoipara (Block-Muribahal). The ground water potentials of various zones i.e. saprolite (tapped by dug wells), weathered basement rock and shallow fractured basement rock horizon (tapped by the hand pumps) and deeper fractured basement rock (tapped by the deep boreholes by CGWB) vary considerably depending upon their lithological and structural characteristics. A total of 34 pumping tests were conducted in dug wells tapping the saprolite horizons of various rock formations. The various aquifer parameters were derived following methods given by Slichter (1906) and Hvorslev (1951). Perusal of all results indicates that granite gneiss forms the most potential aquifer both in shallow and deeper horizons followed by Khondalite, Calc Silicate rocks and anorthosites. Anorthosites and Gondwana sediments are poor water yielders in deeper horizons whereas in the weathered horizon some considerable amount of yield may be obtained from the anorthosites. In unconsolidated alluvium the specific capacity of dug wells varies from 336 to 466-lpm/m drawdown. Although of limited extent the alluvium forms potential shallow aquifers. Depth of water level.



7.3 Ground Water Quality

Ground water in the phreatic aquifers in Balangir District slightly alkaline in nature, which is also colourless, odourless. The specific electrical conductance of ground water in phreatic zone at 25°C. The suitability of ground water for drinking purpose has been evaluated on the basis of pH, Total hardness (T.H), Ca, Cl, F and NO₃. The chemical concentration of these constituents is presented.

7.4 Ground Water Development

In the rural areas the entire water supply is dependent on ground water. Ground water development is mainly carried out in the District through dug wells and Hand pumps. In general dug wells are of 2 m diameter and the depth ranges between 8 to 15 m depending on the thickness of the weathered zone, tapping the shallow aquifer in the weathered zone and uppermost slice of the basement. Large number of dug wells used for drinking water is under private ownership for which there is no reliable data.

Specified Minor Mineral Mining

Over the years Mark II/ Mark III hand pumps are being drilled in large numbers for ground water development. These hand pumps have the following two major advantages i) less susceptible to contamination from surface sources and ii) tap fractures between 20-60m depth which have been found to be less affected by seasonal water level fluctuation and thus have lesser chances of failure even during extreme summer. In rural areas of Balangir District the number of hand pumps drilled by PHED is 12311 of which 9342 are under working condition. There are 574 dug wells constructed by government departments that are under regular use. In the urban areas ground water plays a supplementary role in water supply, the major supply being made through dams, reservoirs or weirs across rivers or streams. No authentic data is available on the number of ground water structures catering the urban water supply. As per the latest ground water resource estimation carried out adopting GEC 97 methodology, the overall stage of ground water development in Balangir District has been found to be 41 % indicating enough scope for future development. The ground water resources of Balangir District is given in the table.

7.5 Ground Water Related Issue and Problems

Some of key ground water related issues are

- I. Locating suitable sites for bore wells
- II. Suitable design of dug wells and hand pumps
- III. Taking up artificial recharge projects to augment the resource availability in Balangir District.
- IV. Optimal development of irrigation potential by developing ground water available for future uses.
- V. Creating public awareness for conserving ground water through awareness camps, NGO's and mass media.

7.6 Mass Awareness Campaign (MAP) & Water Management Training Programme (WMTP) by CGWB

NIL

7.7 Area Notified by CGWB/SGWA

None

7.8 RECOMMENDATIONS

As the District suffers from water scarcity, it is recommended to take artificial recharge at suitable locales. On the basis of the hydrogeological criteria such as post monsoon water level below 7 m bgl indicating availability of sufficient space in the unsaturated zone to retain additional water and availability of surplus surface runoff, 250 Sq kms area in Balangir District has been demarcated as suitable for artificial recharge. Through this 41.25 mcm water can be recharged. In the hard rock areas, pin pointing suitable sites for bore wells is always a challenge. Considering the anisotropy in distribution of fractures at deeper level, suitable sites may be selected using remote sensing techniques in association with geophysical and hydro- geological investigations.

For deriving optimal benefit from aquifers in areas under fissured formation, the dug wells should be designed to penetrate the weathered zone as well as top part (1-2 m) of the underlying bed rock, so as to get the full benefit, from the total thickness of the shallow aquifer. For hand pumps and shallow tube wells the casing provided against the weathered zone should be slotted at the bottom so that the well can extract shallow ground water also. In urban areas use of shallow aquifers should be encouraged.

The surface run off in urban areas and its peripheral parts should be harnessed to augment the ground water resource through appropriate recharge techniques. For urban areas roof top rain water harvesting and artificial recharge is most suitable. Location and design of the structures should be guided by findings from hydrogeological and geophysical surveys. Sites for artificial recharge should be taken up at places where sufficient thickness of weathered zone as well as fracture/fracture zones is available. The depth of the recharge well should be governed by the depth of occurrence of the fractures.

8.0 RAINFALL OF THE DISTRICT AND CLIMATE CONDITION

The south-west monsoon is the principal source of rainfall in the district. Average annual rainfall of the district is 1229.47mm. About 80% of the total rainfall is received during the

period from June-September. Droughts are quite common in the district. The rainfall is scanty in the west and westcentral parts of the district i.e. in the Patnagarh subdivision, which increases in east and southern directions. Block-wise average annual rainfall varies from 946.0 mm to 1492.10-mm.

8.1 Month wise rainfall:

The driest month is December, with very less amount of rain. There is on average 16.64 mm of precipitation in February. In August, the precipitation reaches its peak, with an average of 317.54 mm.

Year		2021	2022	2023	Average
Sl. No.	Month	(mm)	(mm)	(mm)	(mm)
1	Jan	18.33	00	00	6.11
2	Feb	49.92	00	00	16.64
3	Mar	6.42	105.29	6.23	39.32
4	Apr	18.33	18.50	162.62	64.48
5	May	224.33	165.98	144.39	178.23
6	Jun	165.05	164.28	268.94	199.42
7	Jul	303.49	317.98	320.48	313.98
8	Aug	334.98	276.51	341.13	317.54
9	Sep	308.00	198.01	346.48	284.16
10	Oct	153.10	251.58	243.31	215.99
11	Nov	46.43	47.20	00	31.21
12	Dec	00	5.08	4.97	3.35
Total		1628.38	1550.41	1838.55	1672.44

The Indian Meteorological Department, Bhubaneswar, vide letter No. BBS/RMC/CS-312, dated 18th January, 2016 has provided the period of Rainy Season viz. Normal dates of Onset and Withdrawal of South West Monsoon over India as state-wise. The duration for the period is 10th June to 15th October.

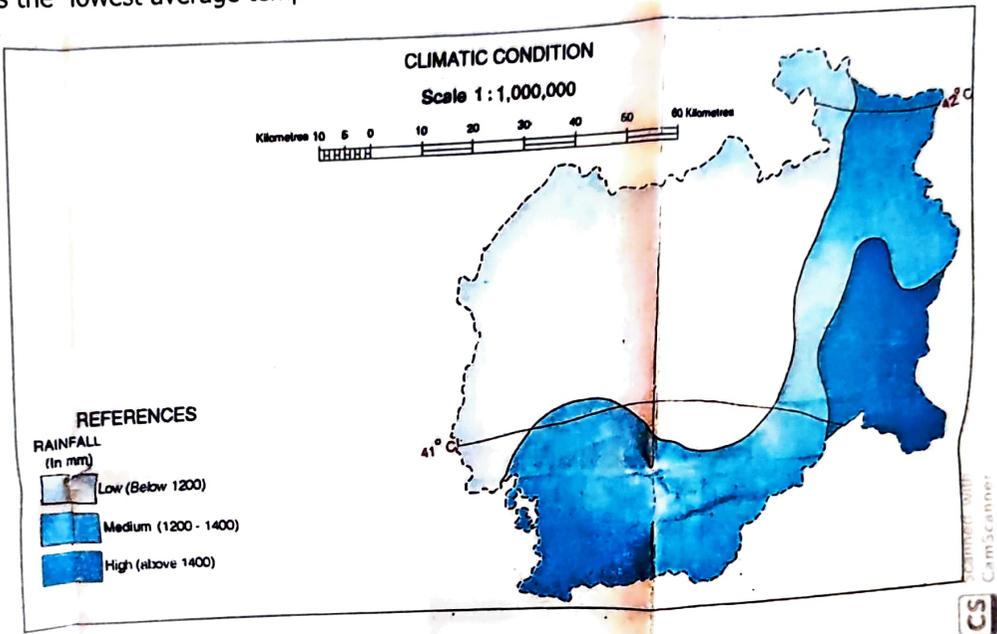
8.2 Climate

The climate of the district is tropical with hot and dry summer and pleasant winter. The summer season extends from March to middle of June followed by the rainy season from June to September. The winter season extends from November till the end of February. Humidity is high during middle of June and it's less in post-monsoon period. The relative humidity in the district varies from 26% to 84% through out the year. The mean monthly

potential evapotranspiration value ranges from 45mm in December to 470 mm in May. Wind is generally light to moderate. During summer and Southwest monsoon months wind velocity increases. The mean annual wind speed is 3.3 Km/hr.

Temperature Graph- Balangir:

May is the warmest month of the year. The temperature in May averages 32.3 °C. January has the lowest average temperature of the year. It is 16.5 °C.



9.0 DETAILS OF MINING LEASE OF SPECIFIED MINOR MINERAL IN THE DISTRICT

9.1 LIST OF MINES OPERATION IN THE DISTRICT

9.2 LIST OF MINES NOT IN OPERATION IN THE DISTRICT

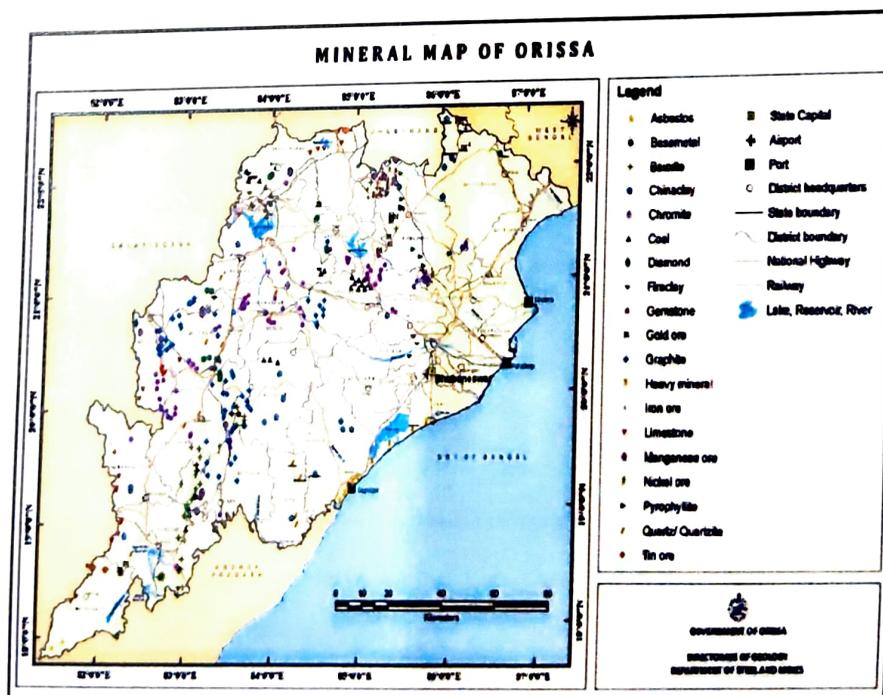
10. DETAIL OF ROYALTY OR REVENUE RECEIVED IN LAST THREE YEARS:

Sl. No.	Name of the Mineral	2021-22	2022-23	2023-24	Total Amount
1	Granite	Nil	5147584	7899570	13047154
2	Quartz & Quartzite	Nil	Nil	Nil	Nil
Grand Total		Nil	5147584	7899570	13047154

11. DETAIL OF PRODUCTION OF SPECIFIED MINOR MINERALS IN LAST THREE YEARS:

Sl. No.	Name of the Mineral	2021-22	2022-23	2023-24	Total Quantity (Cubic meter)
1	Granite	Nil	1506.527	4542.593	6049.12
2	Quartz & Quartzite	Nil	Nil	Nil	Nil
Grand Total		Nil	1506.527	4542.593	6049.12

12. MINERAL MAP OF THE DISTRICT:



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

NIL

14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT

Total mineral reserve of Specified Minor Mineral which may increase after detail investigation as per details below.

- (i) Blocks were identified based on geological studies through field observation.
- (ii) Mineable resource was calculated by considering detail prospecting.
- (iii) Area calculated as per GPS co-ordinates and information obtained from local people.

Land detail

need to be verified from revenue record.

- (iv) Since this is an interim report, as per the present requirement of minerals, more such blocks need to be identified and the data should be updated periodically, after certain intervals to update the data bank of DSR.

Summary of Identified Mineral Potential:

51. No.	Name of the mineral	Name of the lessee	Address and contact No. of the lessee	Letter of Intent Grant	Area of mining lease to be	Validity of Lol	Use (Captive / Non-)	Location of the Mining lease (Latitude & Longitude)
1	2	3	4	5	6	7	9	10
Attached as Annexure-A								

15. QUALITY/GRADE OF MINERAL AVAILABLE IN THE DISTRICT

Rocks and Minerals found in District: -

A great variety of ores and minerals occur in this district. Of these, the important ones are graphite, Galena (Lead ore), Manganese ore and Bauxite. Balangir District is a transition land features of both coastal plain and hilly region. Most of the mineralized area coming under Eco-Sensitive Zone, mining activity only confined out of safety zone of Eco-Sensitive Zone. The mining activity in the District is only restricted to minor minerals i.e. of sand, stone, granite and brick clays. Altogether there are leases of stone, granite and sand which has been granted to the District is regulated as per minerals

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

As such there are huge infrastructural activities such as road, building, railways are coming up by Govt. of India & PSUs under "Make In India" programme.

The Granitic rocks are the main raw minerals for the above activities and considering the last three years' actual production of Balangir with respect to the requirement of the state has a huge gap.

It is proposed to start the stone production from larger block/area to at least double the production of the District which will enhance the revenue of the District and also support the livelihood of the local people.

18. MAP OF EXISTING MINING LEASES IN THE DISTRICT:

Enclosed as Plate-I

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

NIL

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

There is no eco-sensitive area within the district.

21. IMPACTS OF MINING ON ENVIRONMENT:

The most important environmental impact of mining projects are: -

Acid mine drainage and contaminant leaching

Acid mine drainage is considered one of mining most serious threats to water resources. A mine with acid mine drainage has the potential for long-term devastating impacts on rivers, streams and aquatic life. If mine waste is acid generating, the impacts to fish, animals and plants can be severe. Many streams impacted by acid mine drainage have a pH value of 4 or lower – similar to battery acid. Plants, animals, and fish are unlikely to survive in streams such as this.

Transportation sources:

Transportation sources of air pollutants include heavy vehicles used in excavation operations, cars that transport personnel at the mining site, and trucks that transport mining materials.

The level of polluting emissions from these sources depends on the fuel and conditions of the equipment. Even though individual emissions can be relatively small, collectively these

emissions can be of real concern. In addition, mobile sources are a major source of particulate matter, carbon monoxide, and volatile organic compounds that contribute significantly to the formation of ground-level ozone

Stationary sources:

The main gaseous emissions are from combustion of fuels in power generation installations, and drying, roasting, and smelting operations. Many producers of precious metals smelt metal on-site, prior to shipping to off-site refineries. Typically, gold and silver are produced in melting/fluxing furnaces that may produce elevated levels of airborne mercury, arsenic, sulfur dioxide, and other metals

Fugitive emissions:

Common sources of fugitive emissions include: storage and handling of materials; mine processing; fugitive dust, blasting, construction activities, and roadways associated with mining activities; leach pads, and tailing piles and ponds; and waste rock piles. Sources and characteristics of fugitive emissions dust in mining operations vary in each case, as do their impacts. Impacts are difficult to predict and calculate but should be considered since they could be a significant source of hazardous air pollutants.

Noise and vibration:

Noise pollution associated with mining may include noise from vehicle engines, loading and unloading of rock into steel dumpers, chutes, power generation, and other sources. Cumulative impacts of shoveling, ripping, drilling, blasting, transport, crushing, grinding, and stock-piling can significantly affect wildlife and nearby residents.

Vibrations are associated with many types of equipment used in mining operations, but blasting is considered the major source. Vibration has affected the stability of infrastructures, buildings, and homes of people living near large-scale open-pit mining operations. According to a study commissioned by the European Union in 2000: "Shocks and vibrations as a result of blasting in connection with mining can lead to noise, dust and collapse of structures in surrounding inhabited areas. The animal life, on which the local population may depend, might also be disturbed."

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

- Water sprinkling on haul road, loading and unloading points.
- Plantation along the safety zone and dump area.
- Providing dust masks to workers.
- Regular monitoring of ambient air quality.
- Provision of air conditioned cabin of Excavators and Dumpers.
- Regular and proper maintenance of working equipments.
- Periodic medical examination of the workers and organize medical camp in the area.
- Use Milli Second Delay Detonator in blasting operation.
- Provisions of ear plug to the workers.
- Regular training program to the mine workers and operators.

23. 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 opencast mines & hence Land degradation problems is of serious concern.
- An intricate, in-depth and site-specified techniques involving integrated approach Is necessary.

Reclamation has three vital roles:

- i. **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 conformity 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 rare phenomenon.

- iv. 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 & wildlife Habitat, g. Undeveloped Land, h. Grazing/Pasture Land

Statutory requirement:

As per the Mineral Conservation Development Rule, 2017, the following rules must be bare 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. 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 leads 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 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 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. Seatbelt 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 roadways which affects the operators and can lead to accidents causing injury. They are in acceptable range because of precautions 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 unhygienic 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 any time, 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 rescuer 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. DETAILS OF THE OCCUPATIONAL HEALTH 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 airborne dust at workplace.

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

Total Number of TB cases in Balangir District of last 5 years

.R. O. 2521 dated the 26th June, 1986

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.
- (f) 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 misdiagnosed 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 safe guard, 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 Balangir 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.

Specified Minor Mineral Mining

DSR of Balangir District

Gourahari Dasgoswami

Gourahari Dasgoswami
Geologist
O/o Joint Director Geology
Zonal Survey, Balangir

R. Singh
Regional Officer,
SPCB, Balangir

Regional Officer
State Pollution Control Board
Regional Office, Balangir

[Signature]
Mining Officer, (I/c)
Balangir

Mining Officer (I/c)
Minor Minerals
Balangir

[Signature]
Deputy Director Mines, (I/c)
Deputy Director of Mines
Balangir Circle, Balangir

[Signature]
Sub-Collector, Balangir-Cum
Chairman, Sub-Divisional Committee, Balangir
Sub-Collector
Balangir

[Signature]
Sub-Collector, Titilagarh-cum
Chairman, Sub divisional Committee, Balangir
Sub-Collector
Titilagarh

[Signature]
Sub-Collector, Patnagarh-cum
Chairman, Sub divisional Committee, Balangir
Sub-Collector
Patnagarh

[Signature]
Superintending Engineer, Irrigation Division
Balangir

[Signature]
Divisional Forest Officer, (T)
Asst. Conservator Of Forests
Balangir Forest Division

[Signature]
Collector & District Magistrate, Balangir-cum
Chairman, DEIAA, Balangir

TITILAGARH SUB-DIVISION

Sl No	NAME OF THE MINERAL	NAME OF LESSEE	ADDRESS & CONTACT NO OF LESSEE	MINING LEASE GRANT ORDER NO. & DATE	AREA OF MINING LEASE (Ha)	PERIOD OF MINING LEASE (INITIAL)		PERIOD OF MINING LEASE (1st/2nd...RENEWAL)		DATE OF COMMENCEMENT OF MINING OPERATION	STATUS (WORKING/NOT WORKING/TEMPORARILY STOPPED/WORKING FOR DISPATCH ETC.)	CAPTIVE (NON-CAPTIVE)	OBTAINED ENVIRONMENTAL CLEARANCE (YES/NO), IF YES LETTER NO. & DATE OF GRANT OF EC.	LOCATION OF THE MINING LEASE (LATITUDE & LONGITUDE)	METHOD OF MINING (OPENCAST/UNDERGROUND)
						FROM	TO	FROM	TO						
1	Kuskeela Decorative Stone Mine	Sri Ananda Kumar Sahu	A/Po- Tikarapada, Dist- Balangir, Odisha	RML Under Process	3.237	24.03.2001	23.03.2011	Not Applicable	Not Applicable	24.03.2001	Non-Working	Non-Captive	NA	Latitude-20°12'01" to 20°12'26"N Longitude- 83°02'25" to 83°03'59" E	16
2	Gandhargola Decorative Stone Mine	Medley Minerals India Ltd., Jhendra Leha	Units-1, 7th Floor, Sagar Estate, 2, N.C. Dutta Sarani, Kolkata-700001	ML Under Process	5.779	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Non-Working	Non-Captive	NA	To be Survey by ORSAC	opencast
3	Gandhargola Decorative Stone Mine	Rishabh Mining Private Limited	IDCO Industrial area, Titilagarh, Balangir-767033	RML Under Process	4.047	06.09.1999	05.09.2009	04.09.2019	03.09.2029	06.09.1999	Non-Working	Non-Captive	NA	To be Survey by ORSAC	opencast
4	Gandhargola Decorative Stone Mine	M/s Shree Rama Minerals Private Limited	4, RN Singdeo Marg, Bhubaneswar, Odisha	RML Under Process	34.135	20.03.2002	14.03.2012	Not Applicable	Not Applicable	20.03.2002	Non-Working	Non-Captive	NA	Latitude-20°13'40.00" to 20°14°05.00"N Longitude- 83°02'40.00" to 83°03'14.00" E	opencast
5	Gandhargola Decorative Stone Mine	Orind Overseas Ltd	RN Singhdeo Marg BBSR	RML Under Process	4.614	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Non-Working	Non-Captive	NA	To be Survey by ORSAC	opencast
6	Kurubhata Decorative Stone Mine	M/s Sunnee Granites	402, 4th Floor, Sarada Bhawan, C-2, Nilakanta Nagar, Nayapalli, Bhubaneswar, Odisha-751012	RML Under Process	12.66	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Non-Working	Non-Captive To be Auction	NA	To be Survey by ORSAC	opencast
7	Kurubhata Decorative Stone Mine	M/s Kamadgiri Polygm Pvt. Ltd	Devkunj Pandit ki Kothi, Sanwal Road, Sikanar, Rajasthan, Pin-332001	GO No- 3572 Dt-07.05.2020	17.676	20.07.2000	19.07.2010	23.09.2020	22.09.2050	23.09.2020	Working	Non-Captive	3185/AE/AA 24.06.17	Latitude-20°13'55.2" to 20°13'21.88"N Longitude- 83°01'42.40" to 83°02'04.08" E	opencast
8	Daripali Decorative Stone Mine	Sri Ananda Kumar Sahu	A/Po- Tikarapada, Dist- Balangir, Odisha	GO No- 696 Dt-22.11.2021	0.809	24.05.2006	24.05.2026	Not Applicable	Not Applicable	24.05.2026	Working	Non-Captive	DEBA YES NO-574 Dt-23.11.16	Latitude-20°42'44.32" to 20°42'49.86"N Longitude- 82°55'06.82" to 82°55'10.15" E	opencast
9	Khalapada & Dangarada Decorative Stone	M/s Ambaji Rocks & Minerals	Thikadarpada, Titilagarh, Balangir	GO No- 7095 Dt-30.07.2015	7.77	17.12.2021	16.12.2051	Not Applicable	Not Applicable	17.12.2021	Working	Non-Captive	20913/1943/NCM/01-2018 Dt-21.12.2018	Latitude-20°11'30.20" to 20°11'37.80"N Longitude- 83°04'32.00" to 83°04'55.90" E	opencast
10	Gandhargola Decorative Stone Mine	M/s Rishabh Mining Pvt Ltd	IDCO industrial area, Titilagarh, Balangir-767013	GO No- 6555 Dt-30.06.2023	13.193	16.12.1999	15.12.2009	13.12.2019	01.12.2029	16.12.1999	Non-Working	Non-Captive	EC2380010R117214	Latitude-20°13'53.5" to 20°14'13.7"N Longitude- 83°02'28.4" to 83°02'51.4" E	opencast
11	Kurubhata Decorative Stone Mine	M/s New Laxmi Granites Sri Pawan Kugupta	Plot No.11, Manchewar Industrial Estate, Sector-A, Zone B, Bhubaneswar-751010, Odisha	GO No- 8588 Dt-26.10.2004	10.615	08.08.2001	07.08.2031	Not Applicable	Not Applicable	08.08.2001	Non-Working	Non-Captive	SEAA/26/2013 24.05.2017	Latitude-20°13'12" to 20°13'32"N Longitude- 83°01'35" to 83°01'52"E	opencast
12	Kuskeela Decorative Stone Mine	M/S B.K. Industries	Room No 1/62, Maa Barabhuja Mall, Khandagiri, Bhubaneswar-751030	GO No- 3654 Dt-25.04.2015	3.541	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	LOI Issued	Non-Captive	NA	Latitude-20°11'27.00" to 20°11'34.00"N Longitude 83°07'57.00" to 83°08'02.00" E	opencast
13	Nuapara Quartz	M/s Indian Metals & Ferro-Alloys Ltd	IFWA Building, Bomikhal Bhubaneswar-751010	GO No- 1997 Dt-29.06.1977	90.22	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Non-Working	Non-Captive	NA	To be Survey by ORSAC	opencast
14	Rajamara Quartz	Premara Jatin	A/Po. Bangamunda, Dist- Balangir, Odisha	GO No- 19099 Dt-30.12.1999	4.856	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Non-Working	Non-Captive	NA	To be Survey by ORSAC	opencast

Minor Mining Office
Balangir
Balangir District

Gourabari Dasgupta
O/o Joint Director Geology
Zonal Survey, Balangir

Asst. Collector
Balangir Forest Division
Titilagarh

Superintending Engineer
Balangir Irrigation Division
Balangir

Regional Officer
State Pollution Control Board
Balangir

PATNAGARH SUB-DIVISION

ANNEXURE-A Existing

Sl. No	Name of the Mineral	Name of Lessee	Address & Contact No of Lessee	Mining Lease Grant Order No. & Date	Area of Mining Lease (Ha)	Period of Mining Lease (Initial)		Period of Mining Lease (Renewal)		Date of Commencement of Mining Operation	Status (Working/Non-Working/Temp. Working for Dispatch etc.)	Captive / Non-Captive	Obtained Environmental Clearance (Yes/No), If Yes Letter No with Date of Grant of EC.	Location of the Mining Lease (Latitude & Longitude)	Method of Mining (OpenCast/Underground)
						From	To	From	To						
1	Dangarhala Decorative Stone	M/S R.K. Industries	Room No.1/62, Maa Barabhuja Mall, Khandagiri, Bhubaneswar-751030	GO No- 4322 Dt-13.05.2015	48.185	7	8	9	10	11	12	13	14	15	16
						Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	LOI Issued	Non-Captive	NA	Latitude-20°35'48.5" to 20°35'27.9"N Longitude- 83°05'43.2" to 83°05'15.1" "E"	OpenCast

Gourahari Dasgospwami
Gourahari Dasgospwami
 Geologist
 O/o Joint Director Geology
 Zonal Survey, Balangir

[Signature]
Mining Officer (I/c)
 Minor Minerals
 Balangir

[Signature]
Deputy Director of Mines
 Balangir Circle, Balangir

[Signature]
Regional Officer
 State Pollution Control Board
 Regional Office, Balangir

[Signature]
Superintending Engineer
 Balangir Irrigation Division
 Balangir

[Signature]
Assl Conservator Of Forests
 Balangir Forest Division

[Signature]
Sub - Collector
 Patmagarh

PATNAGARH SUB-DIVISION

ANNEXURE-A Existing

SL NO	NAME OF THE MINERAL	NAME OF LESSEE	ADDRESS & CONTACT NO OF LESSEE	MINING LEASE GRANT ORDER NO. & DATE	AREA OF MINING LEASE (Ha)	PERIOD OF MINING LEASE (INITIAL)		PERIOD OF MINING LEASE (RENEWAL)		DATE OF COMMENCEMENT OF MINING OPERATION	STATUS (WORKING/NON-WORKING/TEMP. WORKING FOR DISPATCH ETC.)	CAPTIVE /NON-CAPTIVE	OBTAINED ENVIRONMENTAL CLEARANCE (YES/NO) IF YES LETTER NO WITH DATE OF GRANT OF EC.	LOCATION OF THE MINING LEASE (LATITUDE & LONGITUDE)	METHOD OF MINING (OPENCAST/UND ERGROUND)
						FROM	TO	FROM	TO						
1	Degeratale Decorative Stone	M/S R. K. Industries	Room No.1/62, Maa Barabhujia Mall, Khandagiri, Bhubaneswar-751030	GO No- 4322 Dt-13.05.2015	48.185	7	8	9	10	11	12	13	14	15	16
						Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	LO Issued	Non-Captive	NA	Latitude-20°35'48.5" to 20°35'27.9" N Longitude- 83°05'43.2" to 83°05'15.1" "E"	OpenCast


Gourahari Dasgoswami
 Geologist
 O/o Joint Director Geology
 Zonal Survey, Balangir


Mining Officer (I/c)
 Minor Minerals
 Bolangir


Deputy Director of Mines
 Balangir Circle, Balangir

Regional Officer
 State Pollution Control Board
 Regional Office, Balangir


Superintending Engineer
 Balangir Irrigation Division
 Balangir


Assl Conservator Of Forests
 Balangir Forest Division


Sub - Collector
 Patnagarh

TITILAGARH SUB-DIVISION

ANNEXURE-A New

Sl. No	Name of the Mineral	Name of Lessee	Address & Contact No of Lessee	Mining Lease Grant Order No. & Date	Area of Mining Lease (Ha)	Period of Mining Lease (Initial)		Period of Mining Lease (Renewal)		Date of Commencement of Mining Operation	Status (Working/Non-Working/Temp. Working for Dispatch etc.)	Captive / Non-Captive	Environmental Clearance (EC) No. If No Letter No With Date of Grant of EC.	Location of the Mining Lease (Latitude & Longitude)	Method of Mining (Open-cast / Underground)
						From	To	From	To						
1	Dolan Decorative Stone	Chunilal Agrawal	At/Po- Kholan, Dist- Balangir, Odisha	GO No- 5194 Dt- 21.06.2016	8.478	Not Applicable	Not Applicable	Not Applicable	Not Applicable	11	NA	Non-Captive	EC Under Process	Latitude-20°12'43.20" to 20°12'55.10"N Longitude- 83°02'42.40" to 83°02'57.80" E	Open-cast
2	Sandhibadi Decorative Stone	Saroj Kumar Meher	At- Sandhibadi, Po- Bangamunda, Dist- Balangir, Odisha	PL-1694 Dt- 17.02.2016	15.766	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	NA	Non-Captive	NA	Latitude-20°16'02.1" to 20°17'05.04"N Longitude- 82°49'29.07" to 82°49'52.80" E	Open-cast
3	Bagdor Decorative Stone	M/s Sonali Granites Pvt. Ltd	At/Po- Bhulia sikuan, Via- Khanar, Dist- Nuapada, Pin- 766107	Under Process	9.150	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	NA	Non-Captive	NA	To be Survey by ORSAC	Open-cast
4	Kalkut Quartz	Natural Resource Mining & Management Services	Chandrasekharpur, Bhubaneswar, Odisha	G.O Under Process	5.249	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	NA	Non-Captive	NA	To be Survey by ORSAC	Open-cast

Sourabhi Dasgupta
Sourabhi Dasgupta
 Geologist
 O/o Joint Director Geology
 Zonal Survey, Balangir

Regional Officer
 Regional Office, Balangir

Regional Officer
 State Pollution Control Board
 Regional Office, Balangir

Mining Officer
 Mining Officer (I/c)
 Minor Minerals
 Bolangir

Deputy Director of Mines
 Balangir Circle, Balangir

Sub-Collector
Titilagarh

Nares
Nares
 18.6.24
 Asst. Conservator Of Forests
 Balangir Forest Division

Superintending Engineer
 Superintending Engineer
 Irrigation Division
 Balangir

BALANGIR SUB-DIVISION

ANNEXURE-A New

SL NO	NAME OF THE MINERAL	NAME OF LESSEE	ADDRESS & CONTACT NO OF LESSEE	MINING LEASE ORDER NO. & DATE	AREA OF MINING LEASE (Ha)	PERIOD OF MINING LEASE (INITIAL)		PERIOD OF MINING LEASE (1st/2nd....RENEWAL)		DATE OF COMMENCEMENT OF MINING OPERATION	STATUS (WORKING/NON-WORKING/TEMP. WORKING FOR DISPATCH ETC.)	CAPTIVE /NON-CAPTIVE	OBTAINED ENVIRONMENTAL CLEARANCE (YES/NO), IF YES LETTER NO WITH DATE OF GRANT OF EC.	LOCATION OF THE MINING LEASE (LATITUDE & LONGITUDE)	METHOD OF MINING (OPENCAST/UND EROGROUND)
						FROM	TO	FROM	TO						
1	Megurbeda Decorative Stone	M/s R. K. Industries	Room No.1/62, Maabarabhuja Mall, Khandagiri, Bhubaneswar-751030	LOI No-701 Dt-24.01.2024	14.852	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	To be working	Non-Captive	NA	Latitude-20°46'01.459" to 20°46'22.252"N Longitude- 83°22'04.247" to 83°22'19.414" "E"	Opencast
2	Kadalimunda Quartz	M/s Indian Metals & Ferro Alloys Ltd.	IMFA Building, Bomkhal Bhubaneswar-751010	GO No-7976 Dt-12.06.1981	5.677	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Non-Working	Non-Captive	NA	To be Survey by ORSAC	Opencast
3	Pandikital Quartz Mine	Anand Kumar Sahu	AJ/PO-tilarpada, Dist- Balangir, Odisha	GO No-2528 Dt-04.03.2005	12.039	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Non-Working	Non-Captive	NA	To be Survey by ORSAC	Opencast

Gandhari Dasgouwami
Geologist
Joint Director Geology
Zonal Survey, Balangir

Rajesh

Regional Officer
State Pollution Control Board
Regional Office, Balangir

[Signature]

Mining Officer (I/c)
Minor Minerals
Balangir

[Signature]

Deputy Director of Mines
Balangir Circle, Balangir

[Signature]
Sub-Collector
Balangir

[Signature]
Superintending Engineer
Balangir Irrigation Division
Balangir

[Signature]
Asst. Conservator of Forests
Balangir Forest Division

TITILAGARH SUB-DIVISION

ANNEXURE-A1 Existing

SL NO	NAME OF THE MINERAL	NAME OF LESSEE	ADDRESS & CONTACT NO OF LETTER OF INTENT HOLDER	LETTER OF INTENT GRANT ORDER NO & DATE	AREA OF MINING LEASE TO BE ALLOTTED	VALIDITY OF LOI	USE CAPTIVE /NON-CAPTIVE	LOCATION OF THE MINING LEASE (LATITUDE & LONGITUDE)
1	Decorative Stone Mine	Sri Ananda Kumar Sahu	At/Po- Tikarapada, Dist- Balangir, Odisha	RML Under Process	3.237	NA	Non-Captive	Latitude- 20°12'01" to 20°12'26"N Longitude- 83°03'25" to 83°03'59" "E"
2	Gandhargola Decorative Stone Mine	Medley Minerals India Ltd ,Jitendra Lehia	Unit-1, 7th Floor, Sagar Estate, 2, N.C. Dutta Sarani, Kolkata-700001	ML Under Process	5.779	NA	Non-Captive	To be Survey by ORSAC
3	Gandhargola Decorative Stone Mine	Rishab Mining Private Limited	IDCO Industrial area, Titilagarh, Balangir-767033	RML Under Process	4.047	NA	Non-Captive	Latitude-20°12'22.22" to 20°12'29.13"N Longitude- 83°04'00.93" to 83°04'11.52" "E"
4	Gandhargola Decorative Stone Mine	M/s Shree Rama Minerals Private Limited	4, RN Singdev Marg, Bhubaneswar, Odisha	RML Under Process	34.135	NA	Non-Captive	Latitude-20°13'40.00" to 20°14'05.00"N Longitude- 83°02'40.00" to 83°03'14.00" "E"
5	Gandhargola Decorative Stone Mine	Orind Overseas Ltd	RN Singhdeo Marg BBSR	RML Under Process	4.614	NA	Non-Captive	To be Survey by ORSAC
6	Kurlubhata Decorative Stone Mine	M/s Sunrise Granites	402, 4th Floor, Sarada Bhawan, C-2, Nilakanta Nagar, Nayapalli, Bhubaneswar, Odisha-751012	RML Under Process	12.66	NA	Non-Captive	To be Survey by ORSAC
7	Kurlubhata Decorative Stone Mine	M/s Kamadgiri Polyspin Pvt. Ltd	Devkunji Pandit ki Kothi, Sanwali Road, Sikar, Rajasthan, Pin-332001	GO No- 3572 Dt-07.05.2020	17.676	10 Years	Non-Captive	Latitude-20°13'5.52" to 20°13'21.38"N Longitude- 83°01'42.40" to 83°02'04.08" "E"
8	Darlipali Decorative Stone Mine	Sri Ananda Kumar Sahu	At/Po- Tikarapada, Dist- Balangir, Odisha	GO No- 696 Dt-22.11.2021	0.809	Dt-24.05.2026	Non-Captive	Latitude-20°42'44.32" to 20°42'49.86"N Longitude- 82°55'06.82" to 82°55'10.15" "E"
9	Khaliapada & Dangarpada Decorative Stone	M/s Ambajji Rocks & Minerals	Thikadarpada, Titilagarh, Balangir	GO No- 7095 Dt-30.07.2015	7.77	20 Years	Non-Captive	Latitude-20°11'30.20" to 20°11'37.80"N Longitude- 83°04'32.00" to 83°04'55.90" "E"
10	Gandhargola Decorative Stone Mine	M/s Rishabh Mining Pvt Ltd	IDCO Industrial area, Titilagarh, Balangir-767033	GO No- 6565 Dt-30.06.2023	13.193	Dt-01.12.2029	Non-Captive	Latitude-20°13'53.5" to 20°14'13.7"N Longitude- 83°02'28.4" to 83°02'51.4" "E"

Gourahari Dasgupta
Geologist
O/o Joint Director Geology

Manu Singh
Asst. Conservator of Forests sub. Collector
Balangir Forest Division Titilagarh

Devi Prasad
Superintending Engineer
Balangir Irrigation Division
Balangir

Mining Dir.
Deputy Dir.
Balangir

Reg.
State Poll
Region

11	Kuriuhata Decorative Stone Mine	M/s New Laxmi Granites Sri Pawan Ku gupta	Plot No.11, Mancheswar Industrial Estate, Sector-A, Zone-B, Bhubaneswar-751010, Odisha.	GO No- 8588 Dt-26.10.2004	10.615	Dt-07.08.2031	Non-Captive	Latitude-20°13'12" to 20°13'32" N Longitude- 83°01'35" to 83°01'52" E
12	Kuskela Decorative Stone Mine	M/S R. K. Industries	Room No. 1/62, Maa Barabhujia Mall, Khandagiri, Bhubaneswar-751030	GO No- 3654 Dt-25.04.2015	3.541	NA	Non-Captive	Latitude-20°11'27.00" to 20°11'34.00" N Longitude- 83°07'57.00" to 83°08'02.00" E"
13	Nuapara Quartz	M/s Indian Metals & Ferro Alloys Ltd.	IMFA Building, Bomikhal Bhubaneswar-751010	GO No- 6873 Dt-29.06.1977	90.22	NA	Non-Captive	To be Survey by ORSAC
14	Rajamara Quartz	Premaraj Jain	At/Po- Bangomunda, Dist- Balangir, Odisha	GO No- 19099 Dt-30.12.1980	4.856	NA	Non-Captive	To be Survey by ORSAC
15	Kuskela Decorative Stone Mine	Anand Kumar sahu	At/Po-Tikarpada, Dist- Balangir, Odisha	GO No- 4687 Dt-06.05.2000	27.733	NA	Non-Captive	Latitude-20°12'01.00" to 20°12'26.00" N Longitude- 83°03'25.00" to 83°03'59.00" E"
16	Jhalap Quartz	Premaraj Jain	At/Po- Bangomunda, Dist- Balangir, Odisha	GO No- 19104 Dt-30.12.1980	6.248	NA	Non-Captive	To be Survey by ORSAC
17	Bankiamunda Quartz	M/s Indian Metals & Ferro Alloys Ltd.	IMFA Building, Bomikhal Bhubaneswar-751010	GO No- 10034 Dt-07.09.1981	88.415	NA	Non-Captive	To be Survey by ORSAC
18	Bankiamunda Quartz	M/s Indian Metals & Ferro Alloys Ltd.	IMFA Building, Bomikhal Bhubaneswar-751010	GO No- 7972 Dt-12.06.1981	18.25	NA	Non-Captive	To be Survey by ORSAC
19	Deheli Decorative Stone	Kanakdhara Mining & Metal Ghanshyam Sharma	Main Road, Barbil, Dist- Keonjhar, Odisha	GO No- 4254 Dt-20.10.2000	26.216	NA	Non-Captive	Latitude-20°14'00.00" to 20°14'12.00" N Longitude- 82°53'36.00" to 82°53'56.00" E"
20	Gandhargola Decorative Stone	M/s Rishabh Mining Pvt Ltd	IDCO Industrial area, Titilagarh, Balangir-767033	GO No- 10935 Dt-02.12.1999	6.799	NA	Non-Captive	To be Survey by ORSAC
21	Bankiamunda Quartz	M/s Indian Metals & Ferro Alloys Ltd.	IMFA Building, Bomikhal Bhubaneswar-751010	GO No- 7980 Dt-12.06.1981	139.179	NA	Non-Captive	To be Survey by ORSAC
22	Gandhargola Decorative Stone	Medley Minerals India Lto ,Jitendra Lehia	Unit-1, 7th Floor, Sagar Estate, 2, N.C. Dutta Sarani, Kolkatta-700001	GO No- 1277 Dt-05.02.2003	29.744	NA	Non-Captive	Latitude-20°13'59.00" to 20°14'25.00" N Longitude- 83°01'55.00" to 83°02'34.00" E"
23	Dangarpada Decorative Stone	M/s Penguin Trading & Agencies Ltd.	Maa Paravti Enclave D-Block, 2nd floor, Station road, Post- Barbil, Keonjhar	GO No- 5947 Dt-05.08.2021	16.389	NA	Non-Captive	Latitude-20°21'09.4" to 20°21'30.00" N Longitude- 83°09'08.00" to 83°09'34.00" E"
24	Dangarpada Decorative Stone	M/s Penguin Trading & Agencies Ltd.	Maa Paravti Enclave D-Block, 2nd floor, Station road, Post- Barbil, Keonjhar	GO No- 5943 Dt-05.08.2021	14.921	NA	Non-Captive	Latitude-20°21'17.00" to 20°21'32.10" N Longitude- 83°09'46.20" to 83°10'07.10" E"
25	Dangarpada Decorative Stone	M/s Penguin Trading & Agencies Ltd.	Maa Paravti Enclave D-Block, 2nd floor, Station road, Post- Barbil, Keonjhar	GO No- 5939 Dt-05.08.2021	6.240	NA	Non-Captive	Latitude-20°21'18.7" to 20°21'26.9" N Longitude- 83°09'46.8" to 83°09'34.1" E"

Geologist
 O/o Joint Director Geology
 State Pollution Control Board
 Regional
 Balangir
 Sub-Collector Titilagarh
 Asst. Conservator of Forests
 Balangir Forest Division
 Superintendent Engineer
 Balangir Irrigation Division
 Balangir

Geologist
 O/o Joint Director Geology
 State Pollution Control Board
 Regional
 Balangir
 Sub-Collector Titilagarh
 Asst. Conservator of Forests
 Balangir Forest Division
 Superintendent Engineer
 Balangir Irrigation Division
 Balangir

26	Dangarpada Decorative Stone	M/s Rishabh Mining Pvt Ltd	IDCO Industrial area, Titilagarh, Balangir-767033	GO No- 5816 Dt-08.07.1999	11.027	NA	Non-Captive	To be Survey by ORSAC
----	--------------------------------	----------------------------	--	------------------------------	--------	----	-------------	-----------------------


Subintending Engineer
 Balangir Irrigation Division
 Balangir


Regional Officer
 State Pollution Control Board
 Regional Office, Balangir


Gourahari Dasgowsami
 Geologist
 O/o Joint Director Geology
 Zonal Survey, Balangir


Asst. Conservator Of Forests
 Balangir Forest Division


Sub-Collector
 Titilagarh


Mining Officer (I/c)
 Minor Minerals
 Bolangir


Deputy Director of Mining
 Balangir Circle, Balangir

PATNAGARH SUB-DIVISION

ANNEXURE-A1 Existing

SL NO	NAME OF THE MINERAL	NAME OF LESSEE	ADDRESS & CONTACT NO OF LETTER OF INTENT HOLDER	LETTER OF INTENT GRANT ORDER NO & DATE	AREA OF MINING LEASE TO BE ALLOTTED	VALIDITY OF LOI	USE CAPTIVE /NON-CAPTIVE	LOCATION OF THE MINING LEASE (LATITUDE & LONGITUDE)
1	Dangantala Decorative Stone	M/S R.K. Industries	Room No.1/62, Maa Barabhujja Mall, Khandagiri, Bhubaneswar-751030	GO No- 4322 Dt-13.05.2015	48.185	NA	Non-Captive	Latitude-20°35'48.5" to 20°35'27.9"N Longitude- 83°05'43.2" to 83°05'15.1" "E"

Saurabh Dasgospwami
Geologist
Zonal Survey, Balangir

Regional Officer
State Pollution Control Board
Regional Office, Balangir

Mining Officer (Hc)
Minor Minerals
Balangir

Deputy Director of Mines
Balangir Circle, Balangir

Superintending Engineer
Balangir Irrigation Division
Balangir

Asst. Conservator of Forests
Balangir Forest Division

Sub - Collector
Patmagarh

TITILAGARH SUB-DIVISION

ANNEXURE-A1 New

SL NO	NAME OF THE MINERAL	NAME OF LESSEE	ADDRESS & CONTACT NO OF LETTER OF INTENT HOLDER	LETTER OF INTENT GRANT ORDER NO & DATE	AREA OF MINING LEASE TO BE ALLOTTED	VALIDITY OF LOI	USE CAPTIVE /NON-CAPTIVE	LOCATION OF THE MINING LEASE (LATITUDE & LONGITUDE)
1	2	3	4	5	6	7	8	9
1	Diatan Decorative Stone	Chunilal Agrawal	At/Po- Kholan, Dist- Balangir, Odisha	GO No- 5194 Dt-21.06.2016	8.478	NA	Non-Captive	Latitude-20°12'43.20" to 20°12'55.10"N Longitude- 83°02'42.40" to 83°02'57.30" "E"
2	Sindhivhadi Decorative Stone	Saroj Kumar Meher	At- Sindhivhadi, Po- Bangomunda, Dist- Balangir, Odisha	PL-1694 17.02.2016	15.766	NA	Non-Captive	Latitude-20°16'02.1" to 20°17'05.04"N Longitude- 82°49'29.07" to 82°49'52.80" "E"
3	Bagdor Decorative Stone	M/s Sonali Granites Pvt. Ltd	At/Po- Bhulia sikuan, Via- Khariar, Dist- Nuapada, Pin- 766107	Under Process	9.150	NA	Non-Captive	To be Survey by ORSAC
4	Kalkut Quartz	Natural Resource Mining & Management Services	Chandrasekharpur, Bhubaneswar, Odisha	G.O Under Process	5.249	NA	Non-Captive	To be Survey by ORSAC

Gourahari Dasgupta
Gourahari Dasgupta
 Geologist
 O/o Joint Director Geology
 Zonal Survey, Balangir

R. Singh
 Regional Officer
 State Pollution Control Board
 Regional Office, Balangir

Chen
 Superintending Engineer
 Balangir Irrigation Division
 Balangir

Manas
 18.6.23
 Asst. Conservator Of Forests
 Balangir Forest Division

[Signature]
 Mining Officer (I/c)
 Minor Minerals
 Balangir

[Signature]
 Deputy Director of Mines
 Balangir Circle, Balangir

[Signature]
 Sub-Collector
 Titilagarh

BALANGIR SUB-DIVISION

ANNEXURE-A1 New

SL NO	NAME OF THE MINERAL	NAME OF LESSEE	ADDRESS & CONTACT NO OF LETTER OF INTENT HOLDER	LETTER OF INTENT GRANT ORDER NO & DATE	AREA OF MINING LEASE TO BE ALLOTTED	VALIDITY OF LOI	USE CAPTIVE /NON-CAPTIVE	LOCATION OF THE MINING LEASE (LATTITUDE & LONGITUDE)
1	Magurbeda Decorative Stone	M/s R.K. Industries	Room No.1/62, Maa Barabhuja Mall, Khandagiri, Bhubaneswar-751030	LOI No- 701 Dt-24.01.2024	14.852	NA	Non-Captive	Latitude-20°46'01.459" to 20°46'22.252"N Longitude- 83°22'04.247" to 83°22'19.414" "E"
2	Kadalimunda Quartz	M/s Indian Metals & Ferro Alloys Ltd.	IMFA Building, Bomikhal Bhubaneswar-751010	GO No-7976 Dt-12.06.1981	5.677	NA	Non-Captive	To be Survey by ORSAC
3	Pandkital Quartz Mine	Anand Kumar Sahu	At/Po-Tikarpada, Dist- Balangir, Odisha	GO No-2528 Dt-04.03.2005	12.039	NA	Non-Captive	To be Survey by ORSAC

Sub-Collector
Sub-Collector
Balangir

Gourahari Dasgupta
Gourahari Dasgupta
Geology
Balangir

Regional Officer
Regional Officer
State Pollution Control Board
Regional Office, Balangir

Mining Officer (I/C)
Mining Officer (I/C)
Minor Minerals
Balangir

Deputy Director of Mines
Deputy Director of Mines
Balangir Circle, Balangir

Superintending Engineer
Superintending Engineer
Balangir Irrigation Division
Balangir

Asst. Conservator Of Forests
Asst. Conservator Of Forests
Balangir Forest Division