DISTRICT SURVEY REPORT (DSR)

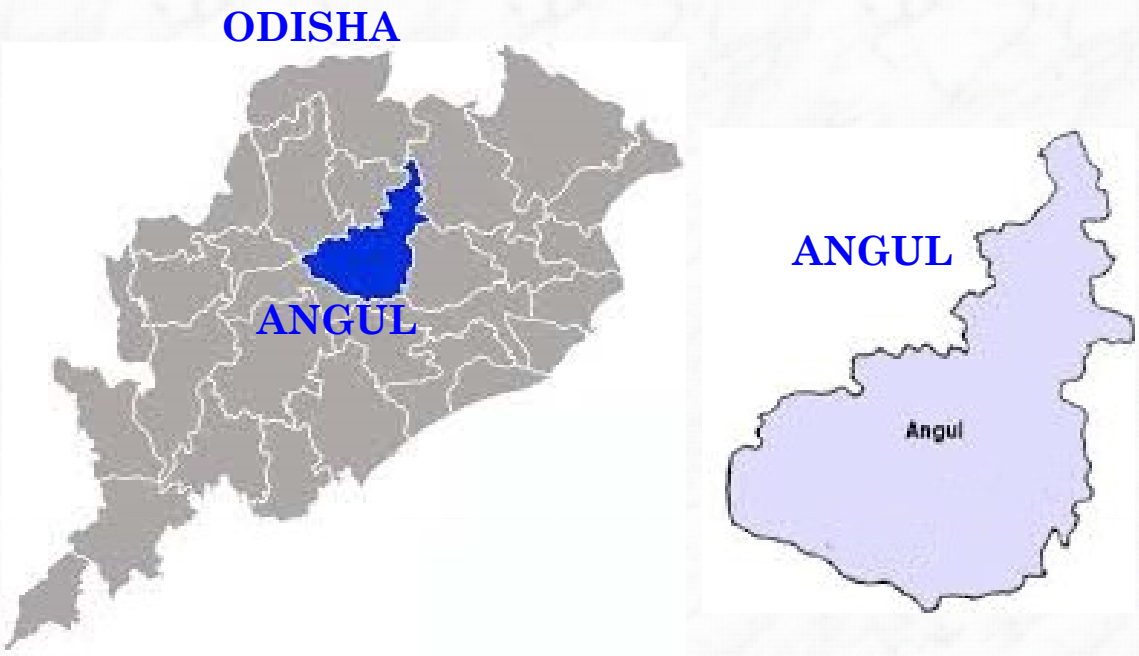
OF

ANGUL DISTRICT, ODISHA

FOR

ROAD METAL / BUILDING STONE / BLACK STONE

(FOR PLANNING & EXPLOITING OF MINOR MINERAL RESOURCES)



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

COLLECTORATE, ANGUL

CONTENTS

LIST OF ANNEXURES

LIST OF PLATES

LIST OF FIGURES

LIST OF TABLES

PREAMBLE

Odisha is renowned for its rich mineral resources, with a diverse array of both major and minor minerals found throughout the state. Angul district, located in the central part of Odisha, is widely recognized for its substantial contribution to the state's mineral and industrial landscape. Rich in natural resources, the district possesses a diverse range of minerals that play an essential role in Odisha's economic development. Its geological formations are marked by extensive deposits of coal and other key minerals, making Angul one of the state's major resource hubs. With its strategic location and abundant mineral wealth, Angul continues to be one of the essential core for mining, energy production, and related industrial activities in Odisha.

In compliance to the notification issued by the Ministry of Environment and Forest and Climate Change Notification no. S.O.3611 (E) New Delhi dated 25-07-2018; the preparation of district survey report of road metal/building stone mining has been prepared in accordance with Clause II of Appendix X of the notification. Every effort has been made to cover road metal/building stone mining locations, future potential areas and overview of road metal mining activities in the district with all its relevant features pertaining to geology and mineral wealth. This report will act as a compendium of available mineral resources, geological set up, environmental and ecological set up of the district and is based on data of various departments like Revenue, Water Resources, Forest, Geology and Mining in the district as well as statistical data uploaded by various state Government departments. The main purpose of preparation of District Survey Report is to identify the mineral resources and developing the mining activities along with other relevant data of the district.

The District Survey Report (DSR) for stone in Angul district provides a concise, scientific assessment of the region's stone and building-material resources. Angul's diverse geological formations, including hard rock terrains and hill ranges, contribute to the occurrence of various stone deposits across the district. The report promotes sustainable stone mining by identifying potential quarry sites, evaluating environmental sensitivities, and ensuring compliance with regulatory guidelines. Overall, the DSR serves as an essential tool for guiding responsible extraction, management, and long-term conservation of stone resources within Angul district.

1. INTRODUCTION:

The district of Angul situated at the heart of Odisha was a part of Undivided Dhenkanal district till early March 1993, but for the administrative convenience, Dhenkanal District was divided into two parts i.e. Dhenkanal and Angul vide State Government Notification No. DRC-44/93/14218/R. dated 27 March 1993. Angul District came into existence as a separate district on April 1, 1993. The district is surrounded by Cuttack &Dhenkanal on the east, Sambalpur & Deogarh on the west, Sundargarh & Keonjhar on the north and Phulbani on the south. Covering an area of 6232 sq.km, Angul District is located at Latitude 20˚31' to 21˚41' North to 84˚16' to 85˚23'East Longitude. The altitude of this place is 564 to 1187 mt. The district is abundant with natural resources. Angul, The district headquarters is about 150 km (93 mi) from the state capital Bhubaneswar.

The name "Angul" is believed to be derived from the Odia word "Anugul", which has a few possible interpretations.

"Anu" means "inside" and "gul" means "cavity" or "hollow". Some believe it's derived from "Antar-garh", meaning "inner fort". The exact origin of the name "Angul" is unclear, but it's thought to be linked to the region's geographical features or historical significance.

To ensure better administrative control, Angul district has been divided into four sub divisions: Angul, Athmallick, Pallahara, Talcher, encompassing a total of 8 Tahasil/blocks. This initiative reflects a commitment to decentralization and empowers local leaders to address the unique challenges faced by their areas.

Table-1
Blocks/Tahasils of Angul District

NAME OF DISTRICT	NAME OF THE SUB-DIVISION	NAME OF THE BLOCK	NAME OF THE TAHASIL	NO. OF R.I. CIRCLE	NO. OF VILLAGE
Angul	Angul	Angul	Angul	9	230
		Banarpal	Banarpal	5	156
		Chhendipada	Chhendipada	7	184
	Athamallik	Athamallik	Athamallik	10	351
		Kishorenagar	Kishorenagar	8	251
	Talcher	Talcher	Talcher	4	205
		Kaniha	Kaniha	5	234
	Pallahara	Pallahara	Pallahara	7	319
TOTAL	**4**	**8**	**8**	**55**	**1930**

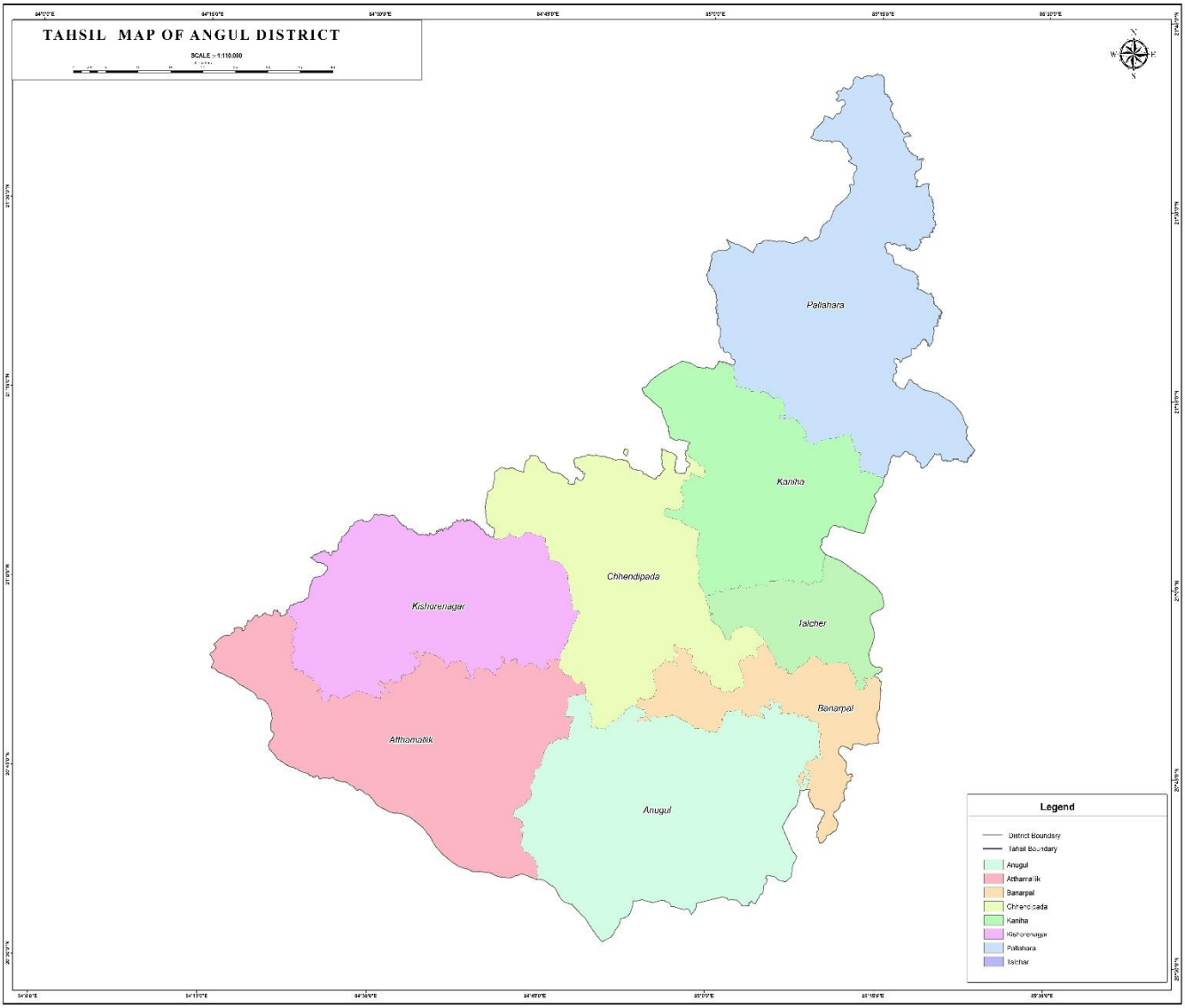


Fig1: Tahasil Map of Angul District

Angul district has a well-developed transport and communication network that supports both local and regional connectivity. Road transport is the primary mode, with highways and regular bus services linking Angul to nearby towns and major cities across Odisha. The district is also served by an important railway network, providing direct connections to key industrial and urban centres. In addition, modern communication systems—including mobile networks, internet services, and postal facilities—ensure efficient communication across the district.

Table-2:
Road/Communication Details

Communication	Units
Railway route length	102.165 Km
No of Rly stations and PH	13
Forest road	449.53 Km
National Highway	264.04 Km
State Highway	177.38 Km
Major district roads	30.90 Km
Other dist roads	1117.44 Km
Village roads	2425.23 Km
Inter village roads	2032.16 Km
Intra village roads	2359.83 Km

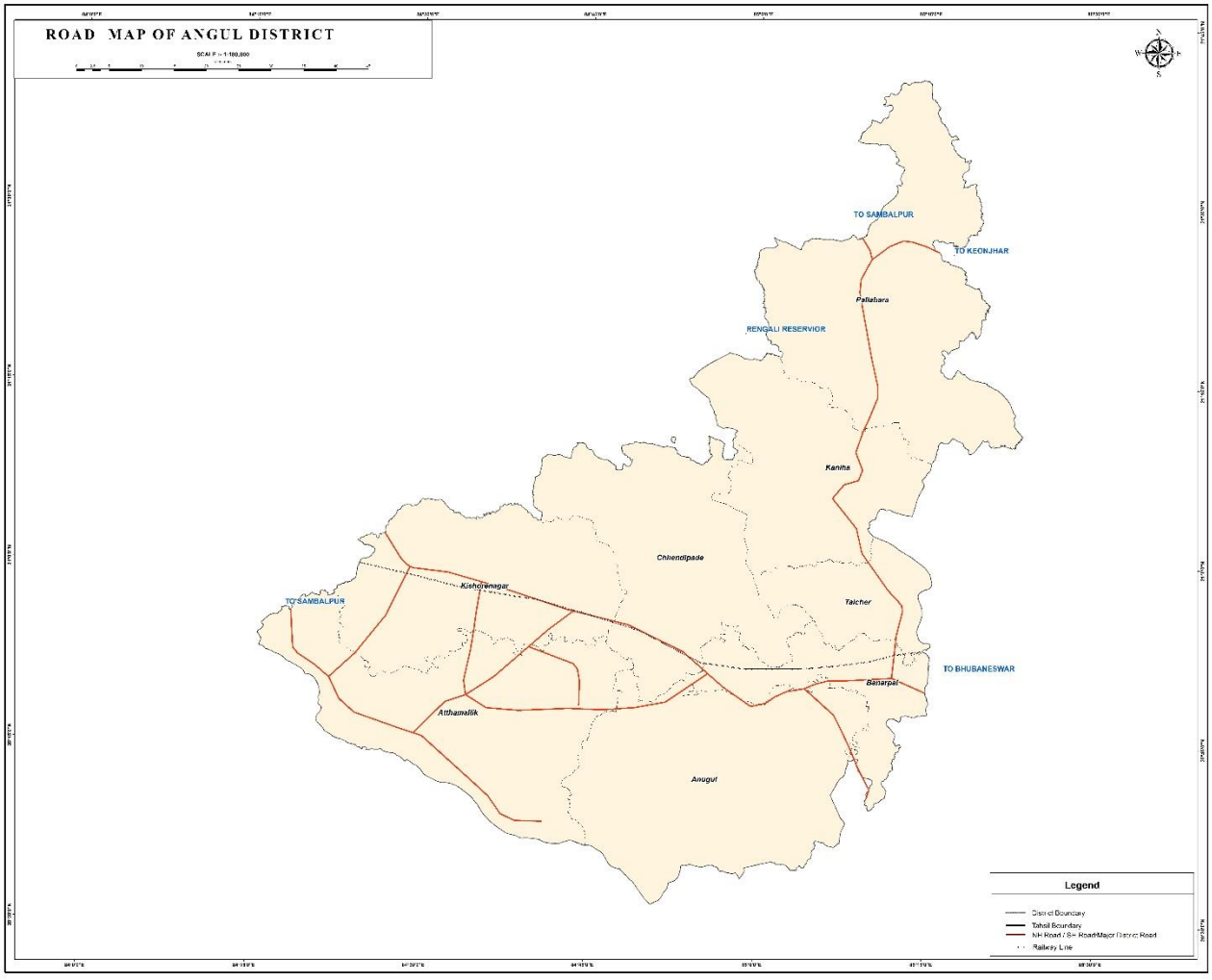


Fig2: Road Map of Angul District

Angul district in Odisha, India, has a tropical climate with three main seasons: summer, monsoon, and winter.During Summer Season it is Hot and humid, monsoons receive significant rainfalland wintersare relatively cool and dry.

The climate of Angul district is suitable for agriculture, with the region being predominantly agrarian. However, the district is also prone to extreme weather events like heatwaves and cyclones.

Angul district's economy is driven by a mix of industries, agriculture, and natural resources. Angul is home to several major industries, including – National Aluminium Company Limited (NALCO): One of India's largest aluminum producers. Mahanadi Coalfields Limited (MCL): A major coal producer in India. National Thermal Power Corporation (NTPC): A leading power generation company. Jindal Steel and Power Limited (JSPL) (JITPL): A prominent steel and power producer. Agriculture: Agriculture is a significant contributor to the district's economy, with crops like paddy, wheat, and pulses being major produce. Coal mining: Angul district has significant coal reserves, with the Talcher and Brahmani Valley coalfields being among the largest in India. Power generation: The district has several power plants, including thermal and hydroelectric power plants. Small-scale industries: The district also has a thriving network of small-scale and ancillary industries, providing employment and growth opportunities. Handicrafts and cottage industries: The district is known for its handicrafts, including Pattachitra paintings, stone carvings, and Dhokra metal crafts.

2. OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT:

Angul district is one of India's major coal-mining regions, dominated by the Talcher Coalfield, which produces nearly 100 MMT of coal annually through mostly open-cast mines operated by Mahanadi Coalfields Ltd. Besides coal, the district has minor deposits of chromite, graphite, manganese, mica, quartz and laterite, though these play a smaller role. The availability of coal has driven significant industrial growth, including steel, aluminium, and thermal power plants. Mining has also created environmental pressures involving forest diversion, land degradation, and water contamination, leading to the establishment of District Mineral Foundation (DMF) mechanisms to support affected communities. Angul continues to expand mining operations, with new coal blocks and minor mineral sources being developed, making mining a central economic activity but also a key environmental and social concern for the district.

Apart from this, Angul district is enriched with many valuable economic minerals like kyanite, graphite, fireclay, china clay, precious and semi-1precious stones, dimension and decorative stones etc.

Coal:

Angul district occupies a significant position in the mineral map of India because of its vast resources of coal in the Talcher coal field. A total reserve of 50,406 million tonnes of coal of all categories has been estimated in the district in Talcher coalfield. The Karaharbari and Barakar formations belonging to Damuda series are coals bearing. Coal produced in this area is mostly used for power generation purpose.

Fireclay:

Fireclay occurs sporadically within a stretch of 15 sq. km area in and around Badaganduri, Kansamunda and Telisinga villages of Kaniha Block, Angul district. In Talcher Lower Gondwana basin, the fireclay beds usually overly the coal seams. Fireclay also occurs in Handapa area around Kakarpani, Ichhapur villages. The total fireclay resource of the district has been estimated at 1.22 million tonnes. This fireclay contains Lower Gondwana plant fossils like Glossopteris and Gangompteris.

Kyanite:

Kyanite occurrences are reported around Magarmuhan and Bankoli villages of Pallahara sub-division. In Magarmuhan, Kyanite occurs in association with quartzite-kyanite-schist and quartz-

chlorite-kyanite schist extending over a length 1.5 km with an average width of 5 m. A reserve of 6000 tonnes of Kyanite has been inferred upto a depth of 1.5 m with Al_2O_3 content varying from 19.02% to 53.81% and silica content varying from 32.84% to 54.07%.

Graphite:

Incidence of graphite are recorded in the khondalite suite of rocks within a 25 km long and 10 km wide belt extending in NW-SE direction between Dondatopa and Patharkupa of Athmallik sub-division. The graphite occurs as flakes and disseminations. The important locations are Kamalpur, Dandatopa, Bhuasuninali, Adeswar, Girida, Akharkata, Sanrohila, Lanchi, Govindapur, Polamahal, Siariamalia, Cherkhandi, Karadagadia, Dhauragoth, Brahmanidei and Padmapokhari. Graphite occurrence near Dandatopa is high grade and pocket type where the F.C. content varies between 54% to 77%. In the remaining areas, graphite occurs as disseminations and flakes in khondalites with F.C. content ranging from 5% to 15%. Besides the above, occurrences of graphite are reported around Badakantakul, Kanja and Talisara in Angul sub-division.

China clay:

China clay occurs is Panduripathar area of Athmallik sub-division. It extends over a strike length of 250 m with an average width of 150 m.

Precious and Semi-Precious Stones:

Garnet (pink, violet, red and honey yellow varieties), red corundum, moonstone, blue Kyanite etc. have been reported in Nuagaon, Parhang, Burubura, Kulad, Karanpal area of the district.

Manganese Ore:

Floats of Pyrolusite and psillomelane are strewn over the ground near Teleipathar, Pathartaila and Akharkata village.

Decorative and Dimension stone:

Granite, granite-gneiss, porphyritic granite gneiss and charnockites exposed between Boinda and Athmallik along the roadside are suitable for decorative and dimension stone. 4800 cu. m of decorative and dimension stone has been estimated in Govinda Panasahi and Durgapur Panasahi.

Other than the above-mentioned minerals, minor minerals such as river sand, laterite slabs, building stone/black stone/road metals, morrum, brick earth etc. are also available in the district.

In the district of Angul, there are ten working mines and two non-working coal mines. Besides, one sand and one quartz mines are also operating in this district. Detailed of the working/non-working mines are given below.

Table-3
List of Working Mines

Sl. No.	Name of working mines	Mineral	Area (in sq. km)
1	Talcher Colliery	Coal	11.4
2	Nandira Colliery	Coal	3.70
3	Jagannath Colliery	Coal	5.12
4	Bharatpur OCP	Coal	17.67
5	Anata OCP	Coal	5.35
6	Lingaraj	Coal	12.48
7	Balaram OCP	Coal	11.17
8	Hingula OCP	Coal	10.64
9	Kaniha OCP	Coal	0.24
10	Bhubaneswari	Coal	6.88
11	Mandapal Sand mine for stowing	Sand	0.18

Name of the non-working Mines:

1. Deulabera Colliery — Coal
2. Handidhua Colliery — Coal
3. Kakudi&Kishoripal Sand Mines — Sand
4. Bilinga/Bikser Sand Mines — Sand
5. Kandapal Sand Mines — Sand
6. Telisinga F.C. Mines — Fireclay

Further, Angul District is self-sufficient in its minor mineral resources. The district boasts a total of 30 stone sources including 15 currently in operation, 4 non-operational and 11 new sources. The abundant availability of these resources supports local infrastructure development and contributes to the district's economic sustainability.

3. GENERAL PROFILE OF THE DISTRICT:

a. Administrative set up:

Angul district, located in the central part of Odisha, functions under the administrative control of the Angul District Collector and is organized into multiple administrative units to ensure effective governance and service delivery. The district is divided into several tahasils and blocks, along with a network of gram panchayats and municipalities that facilitate local administration. Various line departments operate under the supervision of the district administration to implement development programmes, maintain law and order, and deliver essential public services across both urban and rural areas.

Table-4

Administrative Set up of Angul District

Sl No	Item	Unit	Magnitude
1	Location		
	Longitude	Degree	84˚16' to 85˚23'East
	Latitude	Degree	20˚ 31' to 21˚41' North
2	Geographical area	Sq.Km.	6375
3	Sub-division	Numbers	4
4	Tahasils	Numbers	8
5	C D Blocks	Numbers	8
6	Municipalities	Numbers	2
7	NACs	Numbers	1
8	Police Stations	Numbers	23
9	Gram Panchayats	Numbers	225
10	Villages	Numbers	1871
	Inhabited	Numbers	1654
	Uninhabited	Numbers	217
11	Assembly constituencies	Numbers	5

b. Area and Population:

The district has an area of 6375 sq. km and 12.74lakhs of population as per 2011 census. The district accounts for 4.09 percent of thestate'sterritory and shares 3.03 percent of the state's population. The population densityof the district is 200 per sq. km as against 270 person per sq. km. ofthe state. It has 1871 villages (including 217 un-inhabited villages) covering 8 blocks, 8 Tahasils and 4 Subdivisions. As

per 2011 census the schedule caste population is239552 (18.8.%) and schedule tribe population is 179603 (14.1.%). The literacy rate of the district constitutes 77.53 against 72.9 of the state.

Table-5
Population status of Angul District

Odisha, Angul District				
No. of households:295,922				
Sl. No.	**Indicators**	**Persons**	**Males**	**Females**
1	Population	12,73,821	6,55,718	6,18,103
2	Child Population	1,52,403	80,666	71,737
3	Scheduled Castes	2,39,552	1,21,459	1,18,093
4	Scheduled Tribes	1,79,603	89,980	89,623
5	Literate	8,69,456	4,94,425	3,75,031
6	Illiterate	4,04,365	1,61,293	2,43,072
7	Workers	2,47,707	1,72,018	75,689
8	Non-Workers	3,31,798	1,24,672	2,07,126

c. Climate:

The climate condition of the district is generally hot and high humidity during April to May and cold during November to December the monsoon generally breaks during the month of July, Average annual rainfall of the district was 1147.52 mm during last four years, which is less than the normal rainfall 1312mm.

d. Economy:

Agriculture occupies a vital place in the economy of Angul District, as it provides direct and indirect employment to around 70 % of its total work force, as per the 2001 census. The total cultivable area of this District is 2, 16,403 hectares, covering 32.7 % of its total geographical area. The major crops of the Kharif season are paddy, maize, ragi, oilseeds, pulses, small millets and vegetables etc. Paddy, wheat, maize, field pea, sunflower, garlic, ginger, potato, onion, tobacco, sugarcane and coriander etc. are the major Rabi crops.

The last decade has witnessed a tremendous improvement in the industrial scenario of Angul District. Many public sector undertakings have setup up plants and offices here, like National Aluminium Company Limited (NALCO), Mahanadi Coal Fields Limited (MCL), National Thermal Power Corporation (NTPC) and Talcher Thermal Power Station (TTPS). One of the major coalfields is the TalcherCoalField, which contains huge reserves of power grade non-coking coal. Engineering Units,

Rice Mills, Hotels, Fly Ash Brick units, Stone Crushers, Service Units, Bleaching units, Bread and Bakery units, Tyre Retreading units, Flour Mills and Spices Grinding units etc. are some of the small-scale industries functioning here.

Dhokra casting works, Terracotta works, Wood carvings, Art textiles and Soft toys etc are some examples of the crafts that have been generating revenues for this District. The District Industries Center functioning in the district promotes its various industrial activities.

e. Industry:

Angul district is a significant industrial hub in Odisha. It is known for its large-scale industries, including coal, bauxite, and steel and is home to the National Aluminium Company Limited (NALCO), Mahanadi Coal Fields Limited (MCL), National Thermal Power Corporation (NTPC) and Talcher Thermal Power Station (TTPS).

The Micro, small and Medium Enterprises (MSMEs) play a crucial role in the local economy. The district is home to significant industries, including the National Aluminium Company, which is a major contributor to the company. The District Industry Centre (DIC) in Angul provides essential support services for entrepreneurs, helping them set up MSMEs and access various government schemes and subsidies. During the year 2021-22, 1485 nos of Micro Small and Medium Enterprises have been established with total capital investment of about Rs 7846.69 lakhs with 3055nos of Employment generated in Angul district.

Apart from this, a good number of Thermal power plants and sponge plants have been established within the district including NTPC and various private companies due to abundant availability of thermal grade coal. Besides various kinds of handicraft works like dhocra casting, bell metals, textile products have been developed by the skilled workers and artisans of the district.

Table-6
Brief MSME Profile of Angul, 2021-22

No. of MSME units set up	Investment (Rs. In lakhs)	Employment Generated
1485	7846.69	3055

f. Agriculture:

Agriculture continues to be an important livelihood source for a significant portion of the population in Angul district. The district possesses a mix of alluvial, lateritic, and red soils, supported by moderate rainfall and expanding irrigation coverage from major and minor irrigation projects, making it suitable for a variety of agricultural activities. Paddy remains the principal crop cultivated predominantly during the kharif season, followed by pulses, oilseeds, vegetables, and maize. In recent years, farmers have also diversified into horticulture and cash crops owing to improved market access and support services. During the year 2024-25 the net area sown was 141884 hectares against 200575 hectares of the state. The production of was as below:

Table-7
Agricultural Scenario for year 2024-25

Name	Production in MT
Paddy	326679
Wheat	0
Maize	6322
Mung	3635
Biri	3701
Kulthi	5985
Til	1606
Groundnut	7648
Mustard	2695
Potatoes	NA
Jute	NA
Sugarcane	5202

g. Fertilizer consumption:

The major fertilizers used include urea, DAP (Di-Ammonium Phosphate), MOP (Muriate of Potash), and complex fertilizers, applied mainly for paddy, pulses, oilseeds, and vegetable cultivation. The average fertilizer consumption in the district is moderate, reflecting balanced use of nutrients based on soil fertility and crop requirements. The total fertilizers used in the district during 2024-25 was about 34.29 Kg per Ha.

Table-8
The total fertilizers used in the district in year 2024-25

Type of fertiliser	Nitrogenous	Phosphatic	Pottasic	Total	Consumption (Kg per Ha)
Quantity in MT	3687.05	1965.29	294.9	5947.24	34.29

h. Power:

Consumption of electricity in Angul district during the year 2021-22 is reported, and villages so far electrified as on 31.03.2020 is 1654 revenue villages which constitutes 100% of the total inhabited revenue villages of the district.

i. Transport & Communication:

Angul district has a well-connected transportation and communication network that supports the movement of people, goods, and mineral resources. The district is linked by major national and state highways, along with an efficient rail system centred around Angul and Talcher, which facilitates both passenger travel and mineral transport. While Angul has no commercial airport, it is adequately served through the airport at Bhubaneswar. The district also has reliable mobile, internet, and postal communication services. Overall, this infrastructure plays a key role in supporting industrial development and ensuring smooth, regulated mineral transportation within the district.

Table-9
Roads and Railways Overview (in km)

Communication	Units
Railway route length	102.165 Km
No of Rly stations and PH	13
Forest road	449.53 Km
National Highway	264.04 Km
State Highway	177.38 Km
Major district roads	30.90 Km
Other dist roads	1117.44 Km
Village roads	2425.23 Km
Inter village roads	2032.16 Km
Intra village roads	2359.83 Km

j. Health:

The health sector in Angul district operates through a multi-tiered system of healthcare facilities supported by government institutions, private providers, and voluntary organizations. Services are delivered through the District Headquarters Hospital, CHCs, PHCs, and Health & Wellness Centers, complemented by private hospitals and clinics. Together, these institutions work to improve accessibility, affordability, and the overall quality of healthcare across the district.

Table-10
Category-wise Distribution of Health Institutions and Bed facilities

Category	Units
Medical college/DHq Hospitals	1 No.
Sub divisional hospitals including mobile	3 Nos.
Bed facilities	990 Nos.
Homoeopathic dispensaries	19 Nos.
Ayurvedic dispensaries	16 Nos.
CHC	9 Nos.
PHC	33 Nos.
Health Subcenter	166 Nos.
Mobile Health Unit	1 No. of MHU & 16 Nos. of MHT

k. Tourist places:

There are 13 nos. of tourist center such as Angul, Banarpal, Bhimkand, Binikei, Bulajhar, Deulajhari, Tikarapada, Talchar, Handapapatrapada, Hingulapitha, khuladi, Rengali and Derjanga as identified by Department of Tourism and culture, Odisha. During 2023 the numbers of Domestic tourists were 435224and foreign tourists were 1228who visited the tourists' sports of the district.

Table-11
List of Tourists Places

Year	Domestic Tourists	Foreign Tourists
2020	206757	119
2021	229257	59
2022	335699	874
2023	435224	1228

l. Forest areas:

The forests in Angul district, spread across both reserved and protected categories, play a vital role in maintaining ecological balance, biodiversity conservation, carbon sequestration, and supporting soil and water conservation efforts. They also provide essential livelihoods for local communities through non-timber forest products, eco-tourism, and minor forest produce collection. As per the latest available official records from the district administration, the forest area constitutes approximately 35.78% of the district's total geographical area (1041.22 sq km out of 2909.54 sq km), underscoring Angul's significant environmental importance within Odisha despite its industrial prominence.

Table-12
Forest Area Statistics – Angul District

Category of forest	Area in ha
Reserve Forest	51357.137
Proposed Reserve Forest	21845.631
Unclassified Forest	54.2
Demarcated Protected Forest (DRF)	488.068
Village Forest	694.0
Other forest under Revenue Dept.	29682.7
Total	**104121.736**

m. Education:

Angul District features a robust network of educational institutions, from primary and upper primary schools to high schools, higher secondary schools, degree colleges (e.g., Government Autonomous College, Angul; Talcher Autonomous College), and technical institutions (polytechnics, ITIs, and engineering colleges).

The Government of Odisha, along with private partners, is actively enhancing access, infrastructure, and quality through initiatives like SamagraShiksha, 5T reforms, smart classrooms, and skill development programs, with special focus on rural and tribal areas to reduce dropout rates and improve learning outcomes.

Table-13
Category-wise Number of Educational Institutions along with students enrolled– Angul District

Educational Institution	**Details**	**Number**
Primary school	No. of Schools	746
	No. of Enrolment	96064
	No. of Teacher	3499
	Pupil Teacher Ratio	27.45
Upper Primary School	No. of Schools	669
	No. of Enrolment	62646
	No. of Teacher	3751
	Pupil Teacher Ratio	16.70
Secondary School	No. of Schools	291
	No. of Enrolment	37786
	No. of Teacher	2297
	Pupil Teacher Ratio	16.45
Higher Secondary	No. of Schools	57
	No. of Enrolment	23247
	No. of Teacher	549
	Pupil Teacher Ratio	42.34

n. Culture & Heritage:

Angul district is very much rich in its fairs and festivals. Laxmi Puja is celebrated in the city of Angul. The celebration starts from Kumar Purnima and continues for long 11 days. Ganesh Puja of Talcher is one of the most famous festivals celebrated in the district. Amb Nua (fresh mango eating), Raja, Gammha Purnima, and Push Punei are functions celebrated by the people with much enthusiasm. Further to highlight, the Hingula Jatra of Talcher and Viswakarma Puja of Angul are of immense importance. The number of fairs and festivals observed in the district showcase its varied culture vividly.

4. GEOLOGY OF THE DISTRICT:

The district can be broadly divided into five sectors such as central, northern, southern, eastern and north-central sectors. The Eastern Ghat Super-group of rocks occurs in the southern sector, whereas the rocks of Gondwana Supergroup, Gorumahasani and Lower Bonai Groups occur in the central, north-central and northernmost sectors respectively. The Quaternary sediments overlie the above groups of rocks and occur in the south, central and eastern parts of the district. The rocks of Eastern Ghat Supergroup, Gorumahasani Group and Lower Bonai Group are overlain by laterites (both in-situ and transported). The Eastern Ghat Super-group of rocks mainly comprises quartz - feldspar -garnet - sillimanite - graphite schist /gneiss, garnetiferous quartzite, charnockite, pyroxene granulite, leptynite and augen gneiss. The meta-sedimentaries of Gorumahasani Group constitute quartzite, gritty quartzite, and quartz - mica schist. Fuchsite quartzite, quartz - chlorite schist, hornblende schist, and metabasics. The Lower Bonai Group constitutes biotite gneiss, biotite-hornblende granite gneiss and granodiorite. Meta-sedimentaries of Lower Bonai Group consist of ferruginous shale, cherty shale, phyllite, sandstone and conglomerate. The Gondwana Supergroup consists of sandstone, shale, conglomerate and fire clay. The Quaternary sediments mainly consist of sandy clay with calacareous concretions, coarse to fine sand, silt and clay.

The geological succession in the district is as follows:

STRATIGRAPHY:

AGE	GROUP/SUPER GROUP	FORMATION	LITHOLOGY
Holocene	Quaternaries	Brahmani / Mahanadi formation	Alluvium
Upper Pleistocene to Holocene		Kaimundi formation	Gray sandy clay with calcareous concretions
Pleistocene	Tertiaries		Laterite / Latosol (in situ)
Permian to Triassic		Mahadeva Formation	Sandstone. shale
Permian	Gondwana Supergroup	Barakar, Barren Measures. Raniganj&Damuda Formations (Unclassified)	Conglomerate. sandstone, shale, coal

Carboniferous (?) to Permian		Talchir Formation	Sandstone. shale, tillite
Archaean to Palaeoproterozoic		Lower Bonai Group	Gabbro Metavolcanics Granite, biotite gneiss, biotite - hornblende granite gneiss, granodiorite
Archaean	Eastern Ghat Supergroup	Gorumahisani Group	Ferruginous shale, cherty shale with ash IBT and tuts, mangarfilerous shale/ phyllite Gritty sandstone, orthoquartzite, conglomerate Metabasics Quartzite, sericite schist, quartz schist, quartz -mica schist, mica schist, micaceous quartzite Actinolite quartzite, tremolite - actinolite schist
		Granitoids	Augen gneiss, garnetiferous gneiss, biotite gneiss, migmatisedkhondalite Leptynite
		Charnockite Group	Acid and intermediate charnockite
			Basic charnockite, pyroxene granulite
		Khondalite Group	Quartz-feldspar-garnet- sillimanite graphite schist/ gneiss Coarse crystalline quartzite, quartz-sillimanite schist. garnetiferous quartzite

Angul district is enriched with many valuable economic minerals like coal, Kyanite, graphite, fireclay, china clay, precious and semi-precious stones, dimension and decorative stones etc.

Coal:

Angul district occupies a significant position in the mineral map of India because of its vast resources of coal in the Talcher coal field. A total reserve of 50,406 million tonnes of coal of all categories has been estimated in the district in Talcher coalfield. The Karaharbari and Barakar formations belonging to Damuda series are coals bearing. Coal produced in this area is mostly used for power generation purpose.

Fireclay:

Fireclay occurs sporadically within a stretch of 15 sq. km area in and around Badaganduri, Kansamunda and Telisinga villages of Kaniha Block, Angul district. In Talcher Lower Gondwana basin, the fireclay beds usually overly the coal seams. Fireclay also occurs in Handapa area around Kakarpani, Ichhapur villages. The total fireclay resource of the district has been estimated at 1.22 million tonnes. This fireclay contains Lower Gondwana plant fossils like Glossopteris and Gangompteris.

Kyanite:

Kyanite occurrences are reported around Magarmuhan and Bankoli villages of Pallahara sub-division. In Magarmuhan, Kyanite occurs in association with quartzite-kyanite-schist and quartz-chlorite-kyanite schist extending over a length 1.5 km with an average width of 5 m. A reserve of 6000 tonnes of Kyanite has been inferred upto a depth of 1.5 m with Al_2O_3 content varying from 19.02% to 53.81% and silica content varying from 32.84% to 54.07%.

Graphite:

Incidence of graphite are recorded in the khondalite suite of rocks within a 25 km long and 10 km wide belt extending in NW-SE direction between Dondatopa and Patharkupa of Athmallik sub-division. The graphite occurs as flakes and disseminations. The important locations are Kamalpur, Dandatopa, Bhuasuninali, Adeswar, Girida, Akharkata, Sanrohila, Lanchi, Govindapur, Polamahal, Siariamalia, Cherkhandi, Karadagadia, Dhauragoth, Brahmanidei and Padmapokhari. Graphite occurrence near Dandatopa is high grade and pocket type where the F.C. content varies between 54% to 77%. In the remaining areas, graphite occurs as disseminations and flakes in khondalites with F.C. content ranging from 5% to 15%. Besides the above, occurrences of graphite are reported around Badakantakul, Kanja and Talisara in Angul sub-division.

China clay:

China clay occurs is Panduripathar area of Athmallik sub-division. It extends over a strike length of 250 m with an average width of 150 m.

Precious and Semi-Precious Stones:

Garnet (pink, violet, red and honey yellow varieties), red corundum, moonstone, blue Kyanite etc. have been reported in Nuagaon, Parhang, Burubura, Kulad, Karanpal area of the district.

Manganese Ore:

Floats of Pyrolusite and psillomelane are strewn over the ground near Teleipathar, Pathartaila and Akharkata village.

Decorative and Dimension stone:

Granite, granite-gneiss, porphyritic granite gneiss and charnockites exposed between Boinda and Athmallik along the roadside are suitable for decorative and dimension stone. 4800 cu.m of decorative and dimension stone has been estimated in Govinda Panasahi and Durgapur Panasahi.

Other than the above-mentioned minerals, minor minerals such as river sand, laterite slabs, building stone/black stone/road metals, morrum, brick earth etc. are also available in the district.

5. DRAINAGE AND IRRIGATION PATTERN:

Drainage and irrigation patterns describe how water naturally flows across a landscape and how it is managed for human use. Drainage patterns reflect the arrangement of rivers and streams shaped by the terrain, geology, and climate of an area. Irrigation patterns, on the other hand, show how water from these natural systems is captured, stored, and distributed to support agriculture and other needs. Together, they provide insight into both the natural hydrology of a region and the human interventions used to optimize water resources. The drainage of the district is mainly controlled by rivers like Mahanadi, Brahamani, Tikira and their tributaries. Major part of the district is irrigated through canal irrigation from Rengali dam on river Brahmani.

i. Drainage pattern:

Brahmani and Mahanadi are the two major rivers of the district. Both these rivers have numerous perennial and non-perennial tributaries. Most part of the district lies within the Brahmani basin while the Mahanadi basin spreads over Athmallik subdivision and southern part of Angul sub-division. The Brahmani River which is the second longest river in Orissa flows through Talcher subdivision. The major portion of the district is drained by Brahmani River and its tributaries. The Brahmani flows in a general SE direction, broadly parallel to the general strike trends of the prevalent rock formations, but locally guided by major joints and faults. The major tributaries of Brahmani are Tikra Jhor, Singhara Jhor, Samakoi, Nandira Jhor, Gambhira, Nigra, Bade Jhor etc. These major streams show a general right-angle pattern while joining with the river Brahmani. The Mahanadi flows along the south-west boundary of the district, parallel to the strike of Khondalites and is guided by a major shear zone. The major tributaries of this river are Karandi Jhor, Ghosar Jhor, Sindol Jhor, Chanagorhi and Malia Jhor etc., all flow from the northern side of the river originating in Athmallik and Angul subdivisions. The river Mahanadi though flows in a general SE direction, but occasionally flows due south or east at places.

The Angul district has a mainly dendritic drainage pattern, with some parallel drainage in the hills. Rivers are used for irrigation through bunds and medium dams. The Darjanga Reservoir, about 3 km east of Angul town, is the area's main surface water source.

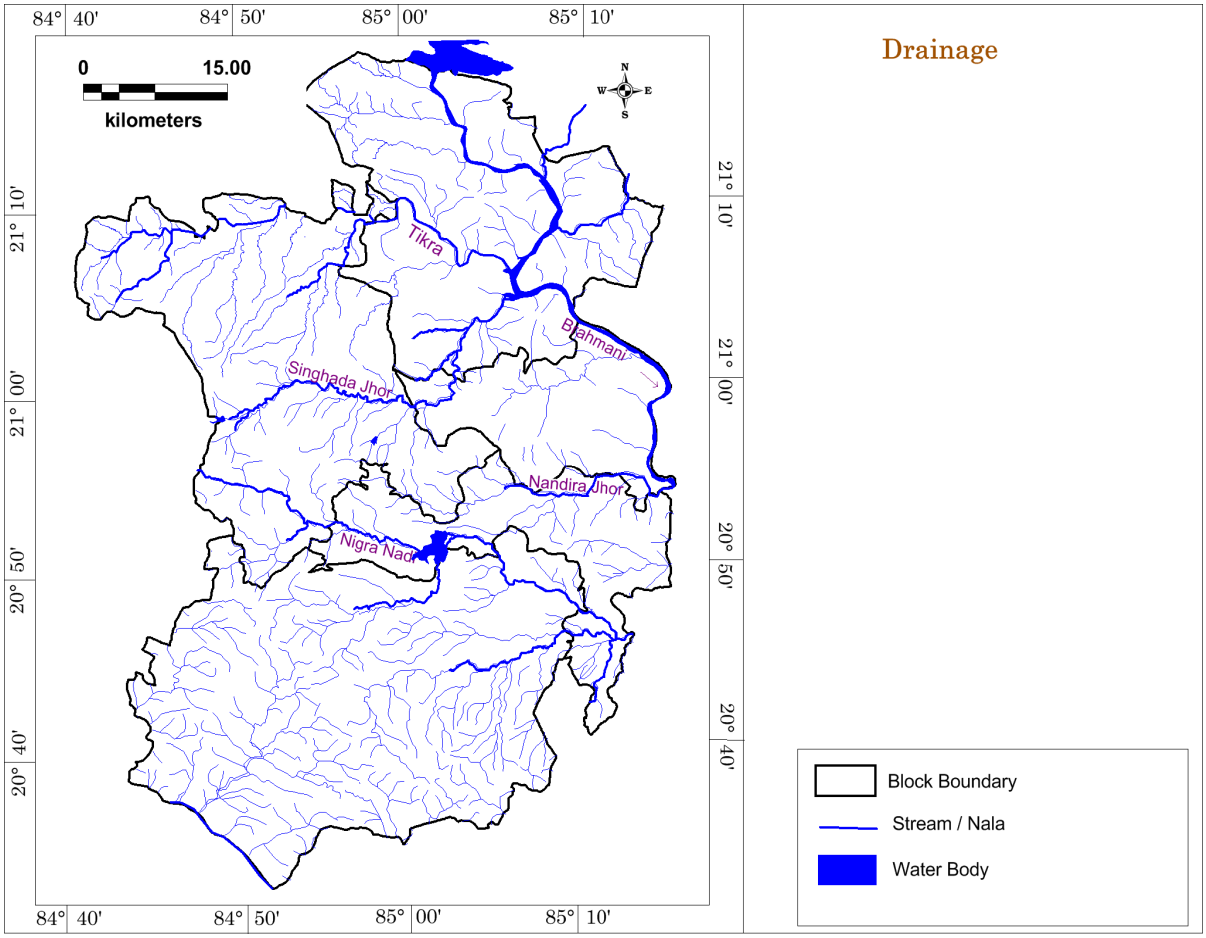


Fig 3: Drainage Pattern of Angul District

ii. Irrigation Pattern:

Irrigation in Angul district is largely dependent on the monsoon, with surface water from reservoirs and medium irrigation projects, along with groundwater, providing supplementary support. Crop production is highest during the kharif season. In irrigated areas, cereals cover about 40,856 ha, while in rainfed areas they cover 63,326.8 ha. Coarse cereals occupy 3,880.71 ha during the kharif season. Fibers crops are absent in kharif but cover 1,240 ha during the rabi season. Rabi production is dominated by oilseeds (8,492.2 ha) followed by pulses (4,208.3 ha). Summer cropping is generally absent.

The district has a total cropped area of 171,673 ha, of which 83,890 ha are rainfed and 87,783 ha are irrigated. Horticultural and plantation crops—such as vegetables, condiments, sugarcane, and other plantation crops—are mostly found in rainfed areas, covering 26,635 ha.

Angul district is supported by two medium irrigation projects. The Derjung Medium Irrigation Project, built on the Ningara and Matalia rivers in Angul block, has a catchment area of 399 sq km and a CCA of

7,392 ha. The Aunli Medium Irrigation Project, constructed on the AunliRiver in Chhendipada block, has a 150 sq km catchment area with a CCA of 1,746 ha in kharif and 300 ha in rabi.

Additionally, the district receives significant irrigation support from the Rengali Dam on the Brahmani River, which provides regulated water supply for agriculture in parts of Angul, enhancing irrigation reliability during both kharif and rabi seasons.

6. LAND UTILISATION PATTERN:

The land-use pattern of Angul district reflects a balanced distribution among agriculture, forestry, and other uses. A substantial portion of the district is covered by forests, while agriculture continues to dominate in the non-forest areas. Additional categories include land under non-agricultural use, fallow land, and cultivable waste. Together, these patterns underscore the district's reliance on natural resources for both ecological stability and economic livelihood. The Land utilization pattern of Angul district is as follows:

Table-14

Land utilization pattern of Angul district

Sl No	Landuse	Area in Ha
1	Forest Area	272000
2	Misc. trees & Grooves	23000
3	Permanent Pasture	36000
4	Culturable Waste	19000
5	Land put to Non Agri Use	28000
6	Barren &Unculturable Land	17000
7	Current Fallow	19000
8	Other Fallow	17000
9	Net Area Sown	197000
10	Mining	10000
Geographical Area		**638000**

a. Forest Profile of the District

Angul district in central Odisha has extensive forest cover of about 2720km², comprising mainly Moist and Dry Deciduous Forests, Sal forests, and mixed bamboo-rich areas. The forests provide valuable timber (sal, teak, bamboo), NTFPs such as kendu leaves, mahua, siali fibre, honey, and several medicinal plants. These forests support rich wildlife, protect watersheds, and contribute significantly to local livelihoods.

b. Agriculture profile of the district:

Agriculture remains a primary livelihood in Angul district, with farmers adopting diverse practices including intensive paddy cultivation, mixed cropping, crop rotation, pulses-oilseeds intercropping, and horticulture for improved yields.

Angul falls under the Mid Central Table Land agro-climatic zone and comprises eight blocks: Angul, Banarpal, Chhendipada, Athamallik, Kishorenagar, Pallahara, Talcher, and Kaniha. Parts of the district, particularly in riverine and canal-irrigated areas along the BrahmaniRiver, benefit from medium/major irrigation projects, while upland and tribal-dominated blocks (Pallahara, Chhendipada, Athamallik) remain largely rainfed.

Table-15
Details of cultivated area tahasil wise

SL.NO.	TAHASIL	CULTIVATED AREA (IN HA)
1	Angul	18353
2	Banrapal	12954
3	Banrapal	25559
4	Athamallik	26277
5	Kishorenagar	22129
6	Talcher	3363
7	Kaniha	15461
8	Pallahara	17788
TOTAL		**141884**

The district has fairly developed agriculture in irrigated pockets, supporting double-cropping and contributing to food security, while rain fed areas focus on drought-resistant crops.

Four major types of soils are found in the district: Red lateritic soils (predominant in uplands, suitable for pulses like arhar, oilseeds, and horticulture); red and yellow soils (suitable for rice-pulse sequences); sandy soils (ideal for groundnut and pulses); and alluvial soils along river basins (highly fertile for paddy, vegetables, and spices).

Table-16
Land use details of District Agricultural Area

Sl No.	District Agriculture Area		Land Use (Fig. in Ha.)
1	Geographical Area		432458
2	Cultivable Area		200575
3	Cultivated Area	High	68111
		Medium	49411
		Low	24362
		Total	141884
4	Paddy Area (Kharif)	High	17770
		Medium	48218
		Low	24232
		Total	90220
5	Cropping Intensity	Year	Cropping Intensity %
		2019-20	141%
		2020-21	140.5 %
		2021-22	137 %
		2022-23	153 %
		2023-24	155%
6	Irrigation Potential	Kharif	50368 Ha.
		Rabi	39651 Ha.
7	Total nos. of GPs	Total number of GP	225 nos.
		Village	1920 nos.
		NAC	2 nos.
		Municipality	I nos.
8	Major Crops	Kharif	Paddy, Maize, Green gram, Red gram, Groundnut
		Rabi	Green gram, Black gram, Groundnut, Mustard, Kulthi

c. Horticulture profile of the district:

The Horticulture Department in Angul district focuses on enhancing the production and productivity of major fruit crops commonly grow in the region, such as mango, guava, citrus, banana and papaya. The department works toward strengthening the horticulture sector by promoting improved cultivation practices, encouraging and adopting of high-yielding varieties, and facilitating efficient use of available resources.

Table-17
Fruit Plantation Data for Angul District

Year		2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	Total
Fruit Plantation (Area in ha/ Nos)	Mango Normal (ha.)	130	120	130	120	200	700
	Cashew (ha.)	70	120	112	155	250	707
	Mango High/ Medium Density (ha.)	155	160	180	110	150	755
	Banana TC (ha.)	10	8	5	48	38	109
	Papaya (Nos)	2000	2500	2200	20000	12080	38780
	Litchi (ha.)	2	0	0	19	17	38
	Pine Apple (ha.)	0	0	0	0	0	0
	Pomegranate (ha.)	0	0	0	0	0	0
	Amla (ha.)	0	0	0	0	0	0
	Mixed Fruit	0	0	0	0	0	0
	Guava (ha.)	5	3	2	52	50	112
	K. Lime (ha.)	12	15	20	16.5	15	78.5
	Black Pepper (Nos)	0	0	0	0	0	0
	Apple (ha.)	0	0	0	0	0	0
	Orange (ha.)	0	0	0	0	0	0
	Tamarind (ha.)	0	0	0	0	0	0
Name Of Scheme		Central and State Plant	Central and State Plant	Central and State Plant	Central and State Plant	Central and State Plant	

In addition to fruit crops, the department is also placing significant emphasis on the development of perennial crops and vegetable cultivation. By supporting farmers with modern techniques, quality planting materials, and appropriate crop management practices, the department aims to ensure year-round production, diversify income sources, and enhance nutritional security in the district.

Table-18
Perennial and Vegetable Cultivation Data of Angul District

Sl No.	Year	Perennial crop cultivation (Lemon Grass)	Vegetables (Area in ha/Unit) 1 unit (Mushroom) = 150 bed		(Area in ha)		Name of scheme
			Hybrid vegetable (Ha.)	Mushroom	Cut flowers	Loose Flower	
1	2019-20	0	130	10	0	5	Central and State Plan
2	2020-21	0	120	10	0	7	Central and State Plan
3	2021-22	0	120	25	0	5	Central and State Plan
4	2022-23	0	520	485	0	23	Central and State Plan
5	2023-24	0	750	925	0	23	Central and State Plan
	Total	**0**	**1640**	**1455**	**0**	**63**	

The department aims to increase crop productivity while also supporting the overall socio-economic development of the farming community by providing technical assistance, training, and access to government schemes. The office is headed by the Deputy Director of Horticulture, who oversees planning, implementation, and monitoring of all horticulture-related activities across the district.

d. Mining activities of the district:

Angul district is richly endowed with significant mineral resources, which play a crucial role in supporting Odisha's industrial growth and contributing substantially to the State Exchequer. The district hosts deposits of coal, fireclay, laterite, and other minor minerals, making it one of the key mining zones in the state.

Angul is largely self-reliant in terms of minor mineral, including road metal (stone), sand, murram, and laterite, which are widely utilized in construction, infrastructure development, and industrial activities across the district.

7. SURFACE WATER AND GROUND WATER SCENARIO:

The drainage systems i.e. rivers of the district get filled with water during the monsoon and the gradually it decreases from the month of January to June each year. In the summer season all rivers become almost dry excepting narrow flow of water within the basin.

The variation of ground water table in the district is as follows:

Table-19
List of Depth of Water level

Depth of water level (mbgl)/ Period	April	August	November	January
Minimum	2.55	0.30	0.60	2.10
Maximum	18.8	9.70	15.30	18.10

Angul district's water scenario is characterized by both surface and groundwater resources. The district has a significant groundwater potential, particularly in the Banarpal block, where the groundwater availability is estimated to be around 94 million cubic meters (MCM). The Ground Water Development department of the Odisha government is actively involved in managing groundwater resources. They have a dedicated team who can be contacted for groundwater-related matters in Angul district. While there isn't specific information on surface water resources in Angul district, the district's water requirements are likely supported by nearby water bodies and rivers. To get more detailed information on surface water resources, it would be best to consult the Water Resources Department of the Odisha Government or local authorities. Overall, Angul district seems to have a favorable groundwater scenario, with opportunities for further development and management.

Surface Water:

In Angul the surface water sources include the Brahmani and Mahanadi rivers and their tributaries, along with canal systems, irrigation canals, reservoirs, and minor irrigation tanks. These sources meet a portion of the district’s drinking and irrigation requirements, although the overall irrigation coverage remains limited, making much of the district rain fed. Seasonal variability in rainfall leads to fluctuations in surface water availably, and the extent of utilization depends largely on river flow conditions and storage in existing tanks and canals. Despite this, surface water continues to serve as an important resource for agriculture, domestic use, and industrial operations in the district.

Ground Water:

Groundwater in Angul occurs within hard crystalline Precambrian formations and semi-consolidated Gondwana formations, where it is stored in the weathered zone and deeper fractured rock aquifers. Groundwater studies indicate that blocks such as Banarpal have a net annual groundwater availability of approx. 93.5MCM, with a gross draft of about 22.5 MCM, resulting in a groundwater development stage around 24% which falls within the safe category. Seasonal water-level fluctuations typically range between 2 to 4 meters, reflecting moderate recharge conditions influenced by monsoon precipitation. Groundwater plays a vital role in meeting domestic, agricultural and industrial water demands, and there remains considerable scope for enhancing availability through artificial recharge structures, rainwater harvesting and scientific groundwater management practices.

The chemical quality of ground water in the district is monitored annually on a routine basis by CGWB through its national Hydrograph Network Stations. Quality of ground water from deeper aquifers was assessed during the Exploration activities like drilling and pumping tests. Apart from these, a number of special studies have been carried out by CGWB in the area on ground water quality and its pollution aspect.

Table-20
The chemical quality of ground water in the district

Parameter	Unit	Shallow (Aquifer-I)			Deep(Aquifer-II)	
		Minimum	Maximum	Avg	Minimum	Maximum
pH	-	7.36	8.69	8.11	7.38	8.44
EC	mS/cm	180	**4007**	921	330	1073
TDS	mg/L	87	1951	449	200	547
TH	mg/L	40	**1355**	**314**	160	**395**
TA	mg/L	50	**660**	193		
Ca	mg/L	6	**340**	61	14	76
Mg	mg/L	0.11	**197**	39	7	74
Na	mg/L	1	370	43	12	120
K	mg/L	0.09	121	5	0.1	31
CO_3	mg/L	0	66	1	0	72
HCO_3	mg/L	61	781	232	189	451
NO3	mg/L	0.6	**105**		<1	9
Cl	mg/L	7	**1127**	134	14	138
SO_4	mg/L	0.21	272	43	<1	53
F	mg/L	0.06	**3.80**	0.56	0.1	**1.85**
Cu	ppm	0	0.03	0.01		

Fe	mg/L	0	**0.75**	0.15		
Mn	ppm	0	0.25	0.05		

Based on the chemical analysis of water samples from different sources, it was observed that, almost all chemical parameters lie within permissible limit for drinking and irrigation purpose except few samples of some isolated pockets. Higher fluoride (F >1.5ppm) has been recorded numerous locations.

8. RAINFALL AND CLIMATIC CONDITION:

The district of Angul experiences a largely sub-humid climate, with a well-defined seasonal cycle that significantly influences its agriculture, water resources and socio-economic landscape. The summers, during April and May, are generally hot with dry to sub-humid condition and the winters, during December and January, are cool and pleasant. The temperature goes as high as up to 45°C in the summer and up to 7°-8° C during peak winter.

The southwest monsoon, active from mid-June to September, delivers most of the district's rainfall, contributing to a long-term annual average of about 1600 mm. The variability in rainfall, particularly during crucial monsoon months, often affects Kharif cultivation and water availability. Understanding these rainfall patterns is essential for effective groundwater management, land-use planning, and promoting sustainable development across the district. The rainfall statistics of the district for last six years is given below in table-21.

Table-21
The rainfall statistics of the district for last five years (in mm)

Year/Month	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
2019-20	241.2	607.6	1208.8	1812.4	2475.2	2166.5	1111.0	0.0	29.2	196.5	611.6	592.6	11052.6
2020-21	879.7	614.8	1884.1	1904.6	4691.8	1038.6	1408.7	0.0	0.0	0.0	5.0	35.2	12462.5
2021-22	44.8	1283.3	1165.4	2019.2	970.8	3273.6	373.1	286.1	318.2	286.2	19.3	0.0	10004.0
2022-23	3.2	524.50	1313.2	2361.1	3218.6	803.9	754.9	0.0	0.0	0.0	0.0	337.50	9316.9
2023-24	306.7	267.40	2221.9	2468.81	2571.1	2130.9	1004.6	77.3	78.5	153.4	100.8	577.5	11958.91
2024-25	12.13	52.12	115.74	322.1	349.55	254.9	78.37	6.81	28.62	0.0	12.18	20.63	1253.15
NORMAL	27.4	63.7	197.6	329.6	336.7	216.8	89.6	18.2	6.6	10.4	12.8	17.3	1326.7

9. DETAILS OF QUARRY LEASES:

Sl No	NAME OF THE MINERAL	NAME OF THE LESSEE	ADDRESS & CONTACT NO OF LESSEE	MINING LEASE GRANT ORDER NO. AND 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 DESPATCH ETC.)	CAPTIVE / NON-CAPTIVE	OBTAINED ENVIRONMENT CLEARANCE (YES/NO), IF YES LETTER NO WITH DATE OF GRANT OF EC	LOCATION OF THE MINING LEASE (LATITIDE, LONGITUDE, VILLAGE, KHATA NO. PLOT NO. AND KISSAM)
1	2	3	4	5	6	7	8	9	10	11	12	13	14
						FROM	TO	FROM - TO					
	TAHASIL-ANGUL												
1	LOKEIPASI STONE QUARRY	NAGEN KUMAR SAHU	S/o Prasanna Kumar Sahu, At: Sasan Bazaar, PS: Bantala, Dist: Angul.	10012202199, 20-04-22	2.938	20-04-2022	19-04-2027	NA	20-04-2022	Working	Non-capt	YES: SIA/OR/MIN/239675/2021, 20-04-2022	LAT-21°00’21.25” LONG-84°32’26.66” KHATA-1 : PLOT-1538(B): KISAM-Mundia

	TAHASIL-BANARPAL												
2	KRUSHNACHANDRAPUR STONE QUARRY NO.1	JCPL	Jagannath Corporation Project Pvt. Ltd., Plot No. 397, Sarangi Bhawan, Lewis Road, Old Town, Bhubaneswar- 751002	208/MM, 30.10.25 (LOI number and date)	2.258	NA	NA	NA	NA	Non-Working	Non-captive	NA	LAT-20°51'52.12" LONG-85°00'14.14" KHATA-62, 64, 65 : PLOT-565, 275, 276, 277, 54, 55 : KISAM-PAHAD
3	KRUSHNACHANDRAPUR STONE QUARRY NO.2	AB CORPORATION	AB CORPORATION, PLOT NO. 2703, MOHARANA SAHI, MISSION ROAD, Old Town, BHUBANESWAR-751002	564/MM, 31.07.2024(LOI number and date)	2.278	NA	NA	NA	NA	Non-Working	Non-captive	NA	LAT-21°17’50.28” LONG-84°57’23.45” KHATA- 62: PLOT-565 : KISAM-PAHAD
4	KRUSHNACHANDRAPUR STONE QUARRY NO.3	JCPL	Jagannath Corporation Project Pvt. Ltd., Plot No. 397, Sarangi Bhawan, Lewis Road, Old Town, Bhubanesw	12204785, 15-09-2022	2.278	15-09-2022	14-09-2027	NA	15-09-2022	WORKING	Non-captive	YES: EC22B001OR156325, 02-06-2022	LAT-21°07’30.5” LONG-85°01’56.7” KHATA-62 : PLOT-558, 565 : KISAM-PAHAD

			ar- 751002										
5	KRUSHNACHANDRAPUR STONE QUARRY NO.4	MAA BUDHI EXPLO`SIVES	NEAR CHILDREN PARK, LITTLE HEART TOOLERS, SIMILIPADA, ANGUL-759122	10012505674, 17-10-2025	2.278	17-10-2025	16-10-2030	NA	17.-10-2025	Working	Non-captive	YES EC25C0108OR5770525N, 14-10-2025	LAT-20°51'59.76" LONG-85°00'21.36" KHATA-62 : PLOT-565 : KISAM-PAHAD
6	KRUSHNACHANDRAPUR STONE QUARRY NO.5	OBJPL	Orissa Biodiesel Jatropha Pvt. Ltd., Plot No 398, Garage Chhak, Sarangi colony, Bhubaneswar- 751002	110012204739, 16-09-2022	2.278	16-09-2022	15-09-2027	NA	16-09-2022	WORKING	Non-captive	YES: EC22B001OR159865, 02-06-2022	LAT-20°52'00.69" LONG-KHATA-62 : PLOT-565 : KISAM-PAHAD
7	KRUSHNACHANDRAPUR STONE QUARRY NO.6	OBJPL	Orissa Biodiesel Jatropha Pvt. Ltd., Plot No 398, Garage Chhak, Sarangi colony, Bhubaneswar- 751002	10012303764, 01-08-23	2.225	01-08-2023	31-07-2028	NA	01-08-2023	WORKING	Non-captive	YES: 59702/185-MINB1/01-2022, 02-06-2022	LAT-20°51'58.21" LONG-KHATA-62 : PLOT-565 : KISAM-PAHAD

8	KRUSHNACHANDRAPUR STONE QUARRY NO.7	JCPL	Jagannath Corporation Project Pvt. Ltd., Plot No. 397, Sarangi Bhawan, Lewis Road, Old Town, Bhubaneswar- 751002	10012205073, 07-10-2022	3.581	10-10-2022	09-10-2027	NA	10-10-2022	WORKING	Non-captive	YES: 59702/190-MINB1/01-2022, 02-06-2022	LAT-20°51'52.12" LONG-85°00'21.20" KHATA-62, 64 : PLOT-565, 275, 278, 279, 280 : KISAM-PAHAD
9	FULAPADA STONE QUARRY	Pratima Garnayak	W/o Sri Satyananda Garnaik, At: Pandapur, Po: Fulapada, Angul - 759022	17-09-2021	2.023	04-11-2022	03-11-2027	NA	04-11-2022	Working	Non-captive	YES: SEIAA-1237/01-2021, 01-07-2021	LAT-20°45'00.00000" LONG-85°08'20.40000" KHATA-619 : PLOT-620 : KISAM-PAHAD
10	FULAPADA STONE QUARRY A	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	3.217	Quarry Operation Not Started		NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-20°45'07.20000" LONG-85°08'20.40000" KHATA-619 : PLOT-620/P : KISAM-PAHAD
11	FULAPADA STONE QUARRY B	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	4.168	Quarry Operation Not Started		NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-20°45'07.20000" LONG-85°08'27.60000" KHATA-619 : PLOT-620/P : KISAM-PAHAD

12	FULAPADA STONE QUARRY C	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	4.285	Quarry Operation Not Started	NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-20°45'00.00000" LONG-85°08'24.00000" KHATA-619 : PLOT-620/P : KISAM-PAHAD
13	FULAPADA STONE QUARRY D	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	4.122	Quarry Operation Not Started	NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-20°45'03.60000" LONG-85°08'34.80000"KHATA-619 : PLOT-620/P : KISAM-PAHAD
14	FULAPADA STONE QUARRY E	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	4.556	Quarry Operation Not Started	NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-20°44'56.40000" LONG-85°08'27.60000" KHATA-619 : PLOT-620/P : KISAM-PAHAD
TAHASIL-CHHENDIPADA													
15	DURGAPUR PANASAHI STONE QUARRY	Giridhari Pradhan	At/Po-Chhendipada, PS-Chhendipada, Dist-Angul, PIN-759124	10012406132, 28-11-24	3.812	28-11-2024	27-11-2029	NA	28-11-2024	Working	Non-captive	YES: SIA/OR/MIN/295208/2022, 28-11-2024	LAT-20°51’52.12" LONG-85°00’21.20” KHATA-2 / 2 : PLOT-125 : KISAM-PATHARABANI
	TAHASIL-KANIHA												
16	KHINDO- A STONE QUARRY	AMRIT DAS	S/o-Nilamani Das, At-Kairapari, Po-Kothasahi, PS- Tangi, Dist-Cuttack, Pin- 754022	10052101393, 14-07-21	0.405	14-07-2021	13-07-2026	NA	14-07-2021	Working	Non-Captive	YES: SIA/OR/MIN/226914/21021.17-02-2022	LAT-21°08’27.46” LONG-85°12’52.91” KHATA-276 : PLOT-96/1 : KISAM-PARBAT – II

			(On behalf of Durga Condev Pvt. Ltd)										
17	KHINDO- B STONE QUARRY	Himachala Panda	S/o: Prafulla Chandra Panda, At/Po: Bajrakote, Ps: Rengali Dam Site, Dist: Angul - 759105	10052101392, 14-07-2021	0.405	14-07-2021	13-07-2026	NA	14-07-2021	Working	Non-Captive	YES: SEIAA/OR/MIN/496/08-2020, 17-12-2020	LAT-21°08'27.46" LONG-85°12'52.91" KHATA-276 : PLOT-96/2 : KISAM-PARBAT – II
18	KHINDO- C STONE QUARRY	AMRIT DAS	S/o- Nilamani Das, At- Kairapari, Po- Kothasahi, PS- Tangi, Dist- Cuttack, Pin- 754022 (On behalf of Durga Condev Pvt. Ltd)	10052101391, 14-07-2021	0.405	14-07-2021	13-07-2026	NA	14-07-2021	Working	Non-Captive	YES: SIA/OR/MIN/226935/2021, 20-01-2022	LAT-21°17'50.28" LONG-84°57'23.45" KHATA-276 : PLOT-96/3 : KISAM-PARBAT – II
TAHASIL-ATHAMALLIK													
19	RANIBANDHA STONE QUARRY	Sanjeeb Singh	S/o Mahesh Kumar Singh, At/Po- Badakera, PS-Bantala,, Angul - 759132	10022200486, 07-11-2022	2.833	07-11-2022	06-11-2027	NA	07-11-2022	WORKING	NON-CAPTIVE	YES: EC22B001OR127380, 18-07-2022	LAT-20°48'00.72" LONG-84°39'14.21" KHATA-59 : PLOT-11 : KISAM-PATHARBANI

TAHASIL-KISHORENAGAR												
20	JAMUNALI STONE SQUARRY	JCPL	Jagannath Corporation Project Pvt. Ltd., Plot No. 397, Sarangi Bhawan, Lewis Road, Old Town, Bhubaneswar- 751002	NA207/MM, 30.01.2025 (LOI number and date)	1.864	NA	NA	NA	NA	Non-Working	Non-Captive	NO	LAT-21°07'51.96" LONG-84°56'51.53" KHATA-95, 96 : PLOT-180/1486, 985, 986 : KISAM-PATHARBANI, PARBAT- II
21	SANAROHILA STONE QUARRY	ROHITASWA PRADHAN	S/o Dharmapada Pradhan, At: Ramachandrapur, PO: Bamur, PS: Kishorenagar, Angul-759126	05-04-2021	2.222	05-04-2021	04-04-2026	NA	05-04-2021	Working	Non-Captive	YES: 191/SEIAA, 22-01-2021	LAT-20°55'25.52" LONG-85°14'19.86" KHATA-88 : PLOT-29/969 : KISAM-PARBAT - I
22	SANAROHILA STONE QUARRY - A	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	2.645	Quarry Operation Not Started		NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-20°54'03.60000" LONG-84°25'01.20000" KHATA-88 : PLOT-29/969 : KISAM-Parbata-I

23	SANAROHILA STONE QUARRY - B	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	4.918	Quarry Operation Not Started		NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-20°54'28.80000" LONG-84°25'15.60000" KHATA-88 : PLOT-1/968(p) & 25/967 : KISAM-Parbata-I
TAHASIL-PALLAHARA													
24	KHOLAMUNDA STONE QUARRY	SARAT BEHERA	S/o: Kinu Behera, At: Kunditarapatana, Johala, PS: Balianta, Dist: Khordha, Pin: 752101.	10042200400, 26-09-2022	3.096	21-09-2022	20-09-2027	NA	21-09-2022	Working	Non-captive	YES: SIA/OR/MIN/260505/2022	LAT-21°17'50.28" LONG-84°57'23.45" KHATA-27 : PLOT-328 : KISAM-PARBAT - I
25	MOHANPUR STONE QUARRY	MANAS RANJAN BISOI	S/o Hemant Kumar Bisoi At: Kulad, PS: Nalco Nagar, Dist: Angul.	10042100032, 18-01-21	2.396	18-01-2021	17-01-2026	NA	18-01-2021	Working	Non-captive	YES: 9047/SEIAA, 25-09-20	LAT-20°58'40.42" LONG-84°32'11.14" KHATA-28 : PLOT-17, 28 : KISAM-PATHARBANI
26	RANJANA STONE QUARRY	Bikash Kumar Pradhan	NA	NA	0.7082	NA	NA	NA	NA	Non-Working	Non-captive	NO	LAT-21°23'06.00000" LONG-85°07'26.40000 KHATA-47 : PLOT-240 : KISAM-PARBAT-II
27	RANJANA STONE QUARRY A	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	0.503	Quarry Operation Not Started		NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-21°11'29.07" LONG-85°15'46.19" KHATA-47(AJA) : PLOT-240/P : KISAM-PARBAT-II

28	BANDHAKANI STONE QUARRY	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	4.181	Quarry Operation Not Started	NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-21°19'15.60000" LONG-85°08'20.40000" KHATA-72(AAA) : PLOT-21/P &23/P : KISAM-PARBAT-I
29	SANKAMUR STONE QUARRY A	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	3.531	Quarry Operation Not Started	NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-21°15'57.60000" LONG-85°07'04.80000" KHATA-283 : PLOT-52 : KISAM-GRAMYA JUNGLE
30	SANKAMUR STONE QUARRY B	Bidder not Finalised	Bidder not Finalised	Quarry Operation Not Started	1.631	Quarry Operation Not Started	NA	Quarry Operation Not Started	NEW	Quarry Operation Not Started	NO	LAT-21°15'32.40000" LONG-85°08'20.40000" KHATA-283(Rakhita) : PLOT-2508/P : KISAM-GOCHARA

***NB**: (i) "NA" is mentioned in column 8 for the leases that are not renewed, hence the renewal period is Not Applicable*
(ii) The omitted Columns in the above table are,
Column-15: Method of Mining (Opencast/Underground) – All are Opencast
Column-16: Reasons for Non-Working – Annexure (V) – Remarks

"Due to transfer of all mining files from the Revenue Department to the Steel and Mines Department, there is a lack of file availability, resulting in several data points being unavailable during table compilation."

10. DETAILS OF ROYALTY COLLECTED:

SL NO	TAHASIL	NAME OF THE SOURCE	REVENUE COLLECTION IN LAST THREE YEARS (IN RS)		
			2022-23	2023-24	2024-25
1	ANGUL	LOKEIPASI STONE QUARRY	5,00,000.00	0.00	11,00,001.00
2	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.1	0.00	0.00	0.00
3	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.2	0.00	0.00	0.00
4	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.3	32,86,317.00	16,33,283.00	30,67,142.00
5	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.4	0.00	0.00	0.00
6	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.5	43,99,916.00	21,51,575.00	68,70,229.40
7	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.6	0.00	46,83,167.00	1,28,38,386.00
8	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.7	29,02,304.00	12,63,145.00	75,18,532.00
9	BANARPAL	FULAPADA STONE QUARRY	9,75,810.00	4,87,757.00	9,12,623.00
10	BANARPAL	FULAPADA STONE QUARRY A	0.00	0.00	0.00
11	BANARPAL	FULAPADA STONE QUARRY B	0.00	0.00	0.00
12	BANARPAL	FULAPADA STONE QUARRY C	0.00	0.00	0.00
13	BANARPAL	FULAPADA STONE QUARRY D	0.00	0.00	0.00
14	BANARPAL	FULAPADA STONE QUARRY E	0.00	0.00	0.00
15	CHHENDIPADA	DURGAPUR PANASAHI STONE QUARRY	0.00	0.00	14,99,003.00
16	KANIHA	KHINDO- A STONE QUARRY	18,35,442.00	0.00	17,01,975.00
17	KANIHA	KHINDO- B STONE QUARRY	11,75,328.00	0.00	10,90,060.00
18	KANIHA	KHINDO- C STONE QUARRY	18,24,199.00	0.00	16,91,637.00
19	KANIHA	DERANG-A STONE QUARRY	1,93,804.00	1,11,388.00	3,26,624.00
20	ATHAMALLIK	RANIBANDHA STONE QUARRY	13,69,200.00	0.00	13,05,452.00
21	ATHAMALLIK	GHODABANDHUNI STONE QUARRY	10,00,000.00	6,80,086.00	11,65,036.00
22	ATHAMALLIK	GUNDURI STONE QUARRY	13,64,855.00	12,83,075.00	13,02,995.00
23	KISHORENAGAR	JAMUNALI STONE QUARRY	0.00	0.00	0.00
24	KISHORENAGAR	SANAROHILA STONE QUARRY	0.00	46,83,167.00	8,84,916.00
25	KISHORENAGAR	SANAROHILA STONE QUARRY - A	0.00	0.00	0.00
26	KISHORENAGAR	SANAROHILA STONE QUARRY - B	0.00	0.00	0.00
27	KISHORENAGAR	BRUNDABANPUR STONE QUARRY	3,00,45,516.00	46,33,691.51	1,36,48,436.51
28	PALLAHARA	KHOLAMUNDA STONE QUARRY	85,00,000.00	0.00	53,69,359.00
29	PALLAHARA	MOHANPUR STONE QUARRY	0.00	0.00	0.00
30	PALLAHARA	RANJANA STONE QUARRY	0.00	0.00	0.00
31	PALLAHARA	RANJANA STONE QUARRY A	0.00	0.00	0.00
32	PALLAHARA	BANDHAKANI STONE QUARRY	0.00	0.00	0.00

33	PALLAHARA	SANKAMUR STONE QUARRY A	0.00	0.00	0.00
34	PALLAHARA	SANKAMUR STONE QUARRY B	0.00	0.00	0.00
35	PALLAHARA	BESALIA STONE QUARRY	0.00	0.00	0.00
36	PALLAHARA	RENGALI STONE QUARRY	0.00	31,09,631.00	27,47,087.00

NB:*Values shown as 0.00 indicate that the quarry was non-operational during the period.*

11. DETAILS OF PRODUCTION OF STONE:

SL NO	TAHASIL	NAME OF THE SOURCE	PRODUCTION OF LAST 2 YEARS (IN CUM)	
			2023-24	2024-25
1	ANGUL	LOKEIPASI STONE QUARRY	0.00	0.00
2	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.1	0.00	0.00
3	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.2	0.00	0.00
4	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.3	5978	10077
5	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.4	0.00	0.00
6	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.5	4592	10948
7	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.6	6788	11662
8	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.7	4242	8808
9	BANARPAL	FULAPADA STONE QUARRY	9	2802
10	BANARPAL	FULAPADA STONE QUARRY A	0.00	0.00
11	BANARPAL	FULAPADA STONE QUARRY B	0.00	0.00
12	BANARPAL	FULAPADA STONE QUARRY C	0.00	0.00
13	BANARPAL	FULAPADA STONE QUARRY D	0.00	0.00
14	BANARPAL	FULAPADA STONE QUARRY E	0.00	0.00
15	CHHENDIPADA	DURGAPUR PANASAHI STONE QUARRY	0.00	1669
16	KANIHA	KHINDO- A STONE QUARRY	0.00	5040
17	KANIHA	KHINDO- B STONE QUARRY	0.00	2152
18	KANIHA	KHINDO- C STONE QUARRY	0.00	4886
19	KANIHA	DERANG-A STONE QUARRY	0.00	0.00
20	ATHAMALLIK	RANIBANDHA STONE QUARRY	1420	1008
21	ATHAMALLIK	GHODABANDHUNI STONE QUARRY	453	0.00
22	ATHAMALLIK	GUNDURI STONE QUARRY	3267	4281
23	KISHORENAGAR	JAMUNALI STONE QUARRY	0.00	0.00
24	KISHORENAGAR	SANAROHILA STONE QUARRY	0.00	0.00
25	KISHORENAGAR	SANAROHILA STONE QUARRY - A	0.00	0.00
26	KISHORENAGAR	SANAROHILA STONE QUARRY - B	0.00	0.00
27	KISHORENAGAR	BRUNDABANPUR STONE QUARRY	10368	1882
28	PALLAHARA	KHOLAMUNDA STONE QUARRY	0.00	8290
29	PALLAHARA	MOHANPUR STONE QUARRY	0.00	0.00
30	PALLAHARA	RANJANA STONE QUARRY	0.00	0.00
31	PALLAHARA	RANJANA STONE QUARRY A	0.00	0.00
32	PALLAHARA	BANDHAKANI STONE QUARRY	0.00	0.00
33	PALLAHARA	SANKAMUR STONE QUARRY A	0.00	0.00
34	PALLAHARA	SANKAMUR STONE QUARRY B	0.00	0.00
35	PALLAHARA	BESALIA STONE QUARRY	0.00	0.00
36	PALLAHARA	RENGALI STONE QUARRY	1167	330

NB: *Values shown as 0.00 indicate that the quarry was non-operational during the period.*

12. MINERAL MAP OF THE DISTRICT:

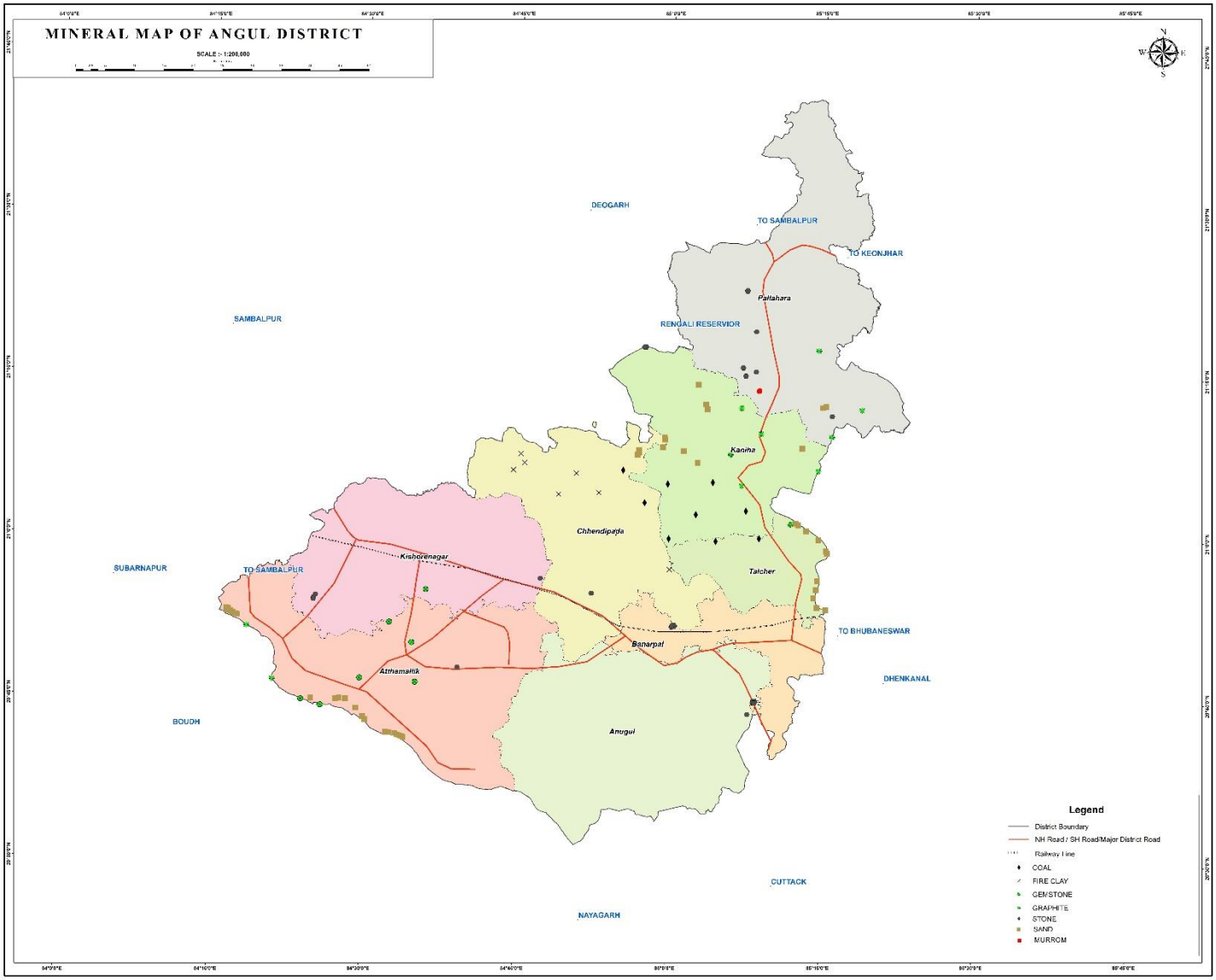


Fig 4: Mineral Map of Angul District

13. LIST OF LOI HOLDERS ALONG WITH VALIDITY:

SL NO.	NAME OF THE MINERAL	NAME OF THE LESSEE	ADDRESS & CONTACT NO. OF INTENT HOLDER	LETTER OF INTENT 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	JAMUNALI STONE SQUARRY	JCPL	Jagannath Corporation Project Pvt. Ltd., Plot No. 397, Sarangi Bhawan, Lewis Road, Old Town, Bhubaneswar - 751002	207/MM, 30.01.2025	1.864	15 days	NON-CAPTIVE	21°07’51.96” 84°56’51.53”
2	KRUSHNACHANDRAPUR STONE QUARRY NO.1	JCPL	Jagannath Corporation Project Pvt. Ltd., Plot No. 397, Sarangi Bhawan, Lewis Road, Old Town, Bhubaneswar - 751002	208/MM, 30.10.25	2.258	15 days	NON-CAPTIVE	20°51'52.12" 85°00'14.14"
3	KRUSHNACHANDRAPUR STONE QUARRY NO.2	AB CORPORATION	AB CORPORATION, PLOT NO. 2703, MOHARANA SAHI, MISSION ROAD, Old Town, BHUBANESWAR- 751002	564/MM, 31.07.2024	2.278	15 days	NON-CAPTIVE	21°17’50.28” 84°57’23.45”

14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT:

Total mineral reserve of stone was access after detail study or grant of potential area, which may increase after detail investigation as per the processes mentioned 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 details need to be verified from revenue record.

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: Annexure- V

15. QUALITY/GRADE OF MINERAL:

Road metal/building stone of the district is very much suitable for various construction purposes after its crushing and screening. The in-situ rocks are fractured making these unsuitable for decorative purpose.The grade of stone refers to its classification based on strength, durability, and appearance.

Table-22
Quality Parameters of Stone

Parameter	**Desirable Value / Characteristics**
Compressive Strength	>100 MPa for structural use; >50 MPa for general construction
Specific Gravity	>2.5
Water Absorption	<0.6% (by weight)
Porosity	Low (less than 5%)
Durability	Resistant to weathering, frost, and chemical action
Hardness	Mohs Scale >6
Workability	Should be workable with minimal wastage
Appearance	Uniform color, texture, free from cracks and weathered patches
Toughness	Adequate to resist impact and wear

Depending upon above parameters, stones are classified into three grades:

- **Grade I:**
    - Characteristics: High strength, low porosity, durable, fine texture, and uniform appearance
    - Use: Bridges, dams, high-rise structures
- **Grade II:**
    - Characteristics: Moderate strength and durability, fair appearance, workable
    - Use: General building works, masonry
- **Grade III:**
    - Characteristics: Lower strength, more porous, variable texture or weathered surface
    - Use: Low-cost construction, rural housing

16. USE OF MINERAL:

Road metal/building stone of the district is used mainly for various construction purposes like roadmaking, concrete making, dams etc. Additionally, these materials are essential for producing dimension Stone is one of the oldest and most durable natural materials used in construction. Depending on its type, quality, and properties, stone serves a wide range of purposes in civil, architectural, and decorative applications.

i. Construction Uses:

- **Foundation Works:** Strong stones like granite and basalt are used for foundations of buildings.
- **Masonry Walls:** Sandstone, limestone, and laterite are used for load-bearing and non-load-bearing walls.
- **Pavement and Road Construction:** Crushed stones (aggregate) are used in base courses and surface layers.
- **Retaining Walls & Embankments:** Hard stones provide strength and resistance against earth pressure.
- **Bridges and Dams:** High-grade stones like granite are used for structural stability.

ii. Industrial Uses:

- **Aggregates in Concrete:** Crushed stones are essential in making concrete and asphalt.
- **Ballast in Railways:** Hard stones like basalt are used under railway tracks for stability.
- **Cement and Lime Manufacturing:** Limestone is the primary raw material
- **Glass and Ceramics:** Some types of stones (like feldspar or quartz) are raw materials.

17. DEMAND & SUPPLY OF THE MINERAL:

Stone is extensively used for road construction, building works, embankments, bridges, and other infrastructure and developmental activities, resulting in a steady and increasing demand within the district. To cater this growing requirement, it is proposed to enhance stone production in a planned and sustainable manner. Such an approach will help address the demand–supply gap, augment district revenue, and generate employment opportunities for local communities.

The district's stone supply is sourced from identified minor mineral quarries, which are regulated to ensure scientific and environmentally sustainable extraction. This section briefly presents the existing demand–supply scenario of stone in Angul and supports systematic planning for its responsible and efficient utilization. The details of which are furnished below in Table-19. The tentative annual demand for stone in the district is primarily fulfilled from various tahasils within the district, supplemented by supplies from adjoining areas as required.

Table-23
Demand and Supply of Minor Mineral Stone for last three years (In Cum.)

Sl No.	Material Type	2021-2022		2022-2023		2023-2024	
		Demand	Supply	Demand	Supply	Demand	Supply
1	Building Stone (Hard Granite)	2,20,000	1,83,100	2,50,000	2,11,060	7,30,000	6,42,245

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

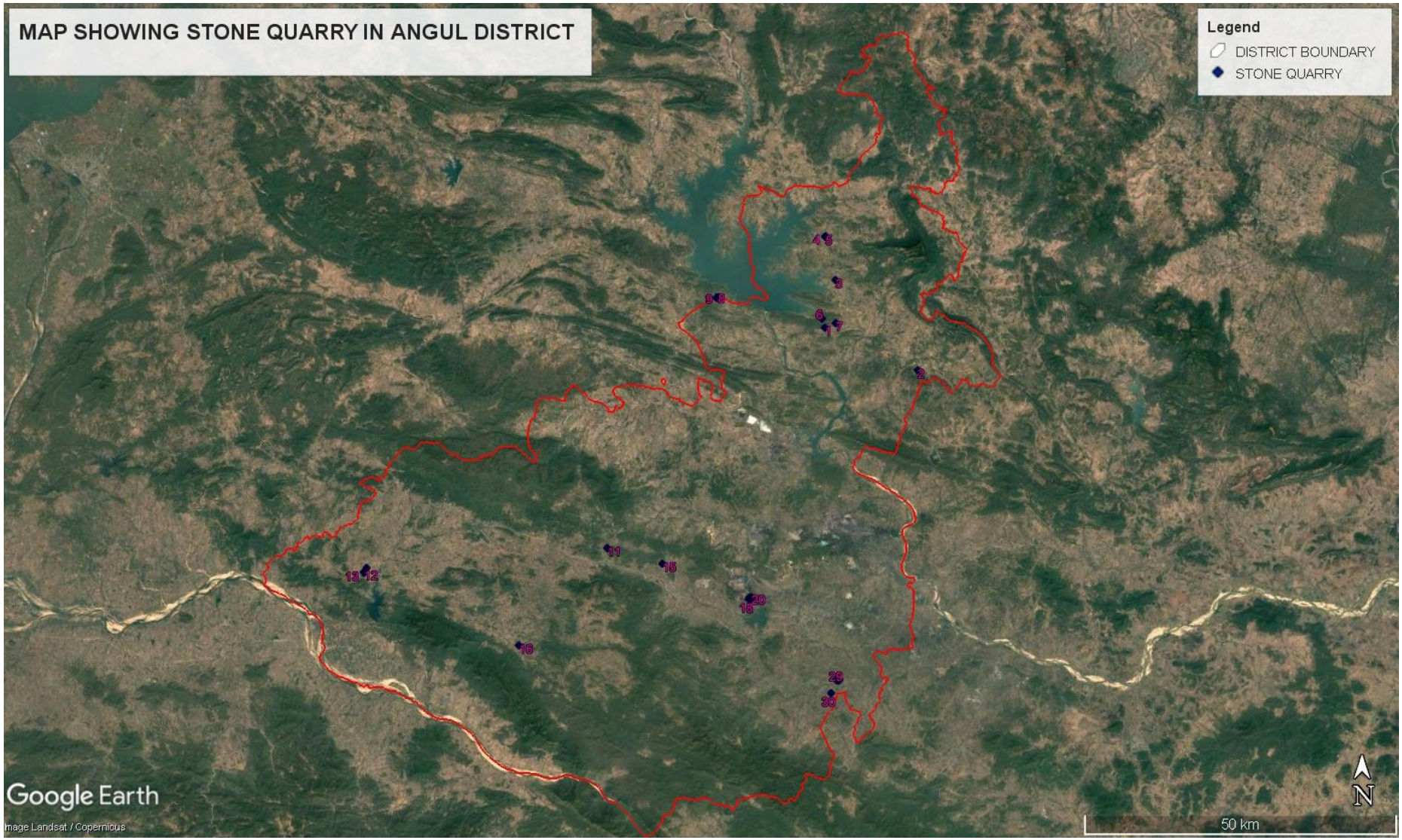


Fig 5: Map Showing Stone Quarry in Angul District

19. DETAILS OF AREAS HAVING CLUSTER OF MINING LEASES:

Six clusters of stone have been designated in Angul District. Details of the cluster are as below:

Table-24
List of Cluster of Mining Leases

CLUSTER NO.	LEASE NO.	QUARRY NAME	AREA (IN HA)	KHATA NO.	PLOT NO.	LOCATION	
						LAT	LONG
1	1	KRUSHNACHANDRAPUR STONE QUARRY NO.1	2.258	62, 64, 65	565, 275, 276, 277, 54, 55	20°51'52.12"	85°00'14.14"
	2	KRUSHNACHANDRAPUR STONE QUARRY NO.2	2.278	62	565	21°17’50.28”	84°57’23.45”
	3	KRUSHNACHANDRAPUR STONE QUARRY NO.3	2.278	62	558, 565	21°07’30.5”	85°01’56.7”
	4	KRUSHNACHANDRAPUR STONE QUARRY NO.4	2.278	62	565	20°51'59.76"	85°00'21.36"
	5	KRUSHNACHANDRAPUR STONE QUARRY NO.5	2.278	62	565	20°52'01.20"	85°00'32.40"
	6	KRUSHNACHANDRAPUR STONE QUARRY NO.6	2.225	62	565	20°52'01.20"	85°00'21.60"
	7	KRUSHNACHANDRAPUR STONE QUARRY NO.7	3.581	62, 64	565, 275, 278, 279, 280	20°51'52.12"	85°00'21.20"
2	1	FULAPADA STONE QUARRY	2.023	619	620	20°44’53.51”	85°08’25.50”
	2	FULAPADA STONE QUARRY A	3.217	619	620/p	20°45'07.20"	85°08'20.40"
	3	FULAPADA STONE QUARRY B	4.168	619	620/p	20°45'07.20"	85°08'27.60"
	4	FULAPADA STONE QUARRY C	4.285	619	620/p	20°45'00.00"	85°08'24.00"
	5	FULAPADA STONE QUARRY D	4.122	619	620/p	20°45'03.60"	85°08'34.80"
	6	FULAPADA STONE QUARRY E	4.556	619	620/p	20°44'56.40"	85°08'27.60"
3	1	KHINDO- A STONE QUARRY	0.405	276	96/1	21°08’27.46”	85°12’52.91”
	2	KHINDO- B STONE QUARRY	0.405	276	96/2	21°11’17.49”	85°06’32.36”
	3	KHINDO- C STONE QUARRY	0.405	276	96/3	21°17’50.28”	84°57’23.45”
4	1	SANAROHILA STONE QUARRY	2.222	88	29/969	20°55’25.52”	85°14’19.86”
	2	SANAROHILA STONE QUARRY - A	2.645	88	29/969	20°54'03.60"	84°25'01.20"

	3	SANAROHILA STONE QUARRY - B	4.918	88	1/968(P) & 25/967(P)	20°54'28.80"	84°25'15.60"
5	1	RANJANA STONE QUARRY	0.708	47	240	21°11’29.07”	85°15’46.19”
	2	RANJANA STONE QUARRY A	0.503	47(AJA)	240/P	21°23'02.40"	85°07'26.40"
6	1	SANKAMUR STONE QUARRY A	3.531	283	52	21°15'57.60"	85°07'04.80"
	2	SANKAMUR STONE QUARRY B	1.631	283 (Rakhita)	2508/P	21°15'32.40"	85°08'20.40"

20. DETAILS OF ECO-SENSITIVE AREA:

Satkosia Tiger Reserve, which partly lies within Angul district, is a key ecologically sensitive area. It encompasses the Satkosia Gorge, formed by the Mahanadi River cutting through the Eastern Ghats, and is recognized as a Ramsar wetland. The reserve supports diverse flora and fauna, including endangered species, and serves as a crucial riverine-forest ecosystem. Its protected status as a tiger reserve and sanctuary makes it one of the most significant eco-sensitive zones near Angul.

Any extraction of minor minerals such as stone in or near Satkosia requires careful adherence to environmental regulations. The area is under consideration for an Eco-Sensitive Zone (ESZ), with buffer regulations to minimize ecological impact. Mining or quarrying activities near the reserve or its buffer zones are either restricted or require special clearances, making it important to plan sourcing from less-sensitive areas within the district.As per environmental protection guidelines, any extractive activities within or intruding into the ESZ would be rejected, ensuring that the ecological integrity of the sanctuary remains undisturbed.

21. IMPACT OF MINING ON THE ENVIRONMENT:

Generally, the impact of mining activities on environment can be categorized as either primary or secondary. Primary Impacts are those, which are caused directly during operation of various existing projects. Secondary impacts are induced by expansion of project area, enhancement in production or addition of ancillary units by the project proponents themselves or dependent secondary and tertiary units. The pollutants are common in all the stone quarries as the process of extraction is similar excepting varying degree of operation. The nature of environment pollution is correspondingly identical vis-à-vis level of production. Accordingly, the preventive measures adopted are more or less same and post mining effects are taken care of with suitable remedies.

- **Impact on Ambient Air Quality:** Mining operation in the district is carried out mostly by opencast semi-mechanized /mechanized methods and rarely by manual methods generating huge volume of dust particles. Such generation is the result of various activities like blasting, excavation and loading by heavy machineries (power shovels, surface miners, haul packs etc.), processing off minerals in crushers, coal handling plants and transportation by large dumpers and trucks. The air quality in the mining areas depends upon the nature and concentration of emissions and meteorological conditions. The major air pollutants due to mining activities include: -
    i. Suspended Particulatematter (dust) of various sizes.
    ii. Gases, such as Sulphur dioxide, oxides of nitrogen, carbonmonoxide etc. emittedfrom heavyminingmachineries.
    iii. Waste andmineral transporting vehicles.

  Transpiration 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. 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. 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.

- **Impact on Water Quality:** Sometimes, mining particularly in underground operations lead to interception with the water table causing lowering of ground water table may leads to Groundwater Contamination: Mining activities (Mine tailings and waste rock, Processing plant effluent, Leaks from mines and pipelines, Abandoned mines) compromise aquifer quality. Due to the interference with surface water sources like river, nallah etc. and the entire drainage system downstream of the area is adversely affected. Leaching and Sedimentation leads to mining waste and runoff harms to aquatic habitats. Oil, grease and other lubricants are also carried by surface run off to natural water courses polluting water quality. 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.
- **Impact on Noise Level:** Noise pollution is mainly caused due to Blast vibrations, operation of heavy machineries (drilling, excavation, and haulage), Crushing-processing plant noise and plying of Transport and logistics noise. Noise may impact on quality of Life, human health and wildlife can disrupts their communication, migration, and habitats. 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."

- **Land degradation:** Since winning of minerals involves huge volume of excavation of earth's surface, land degradation cannot be dispensed with. Similarly, dumping of solid waste also creates problem. But lots of remedial measures are in the statute to prevent such degradation.
- **Impact on Flora &Fauna:** Impact on biodiversity is difficult to quantify because of its diverse and dynamic characteristics. Mining activities in forest area also cause deforestation, land degradation, water, air and noise pollution which directly or indirectly affect the fauna and flora status of the project area and its ambience.

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

Air:

Mitigation measures suggested for air pollution controls are to be based on the baseline ambient air quality of the project/cluster area and would include measures such as:

- Dust generation shall be reduced by using sharp teeth of shovels.
- Wet drilling shall be carried out to contain the dust particles.
- Controlled blasting techniques shall be adopted.
- Water spraying on haul roads, service roads and overburden dumps will help in reducing considerable dust pollution.
- Proper and regular maintenance of mining equipment's have to be undertaken.
- Transport of materials in trucks is to be covered with tarpaulin.
- The mine pit water can be utilized for dust suppression in and around mine area.
- Information on wind diction and meteorology are to be considered during planning, so that pollutants, which cannot be fully suppressed by engineering techniques, will be prevented from reaching the nearby agricultural land, if any.
- Comprehensive greenbelt around overburden dumps and periphery of the mining projects/clusters has to be carried out to reduce to fugitive dust transmission from the project area in order to create clean & healthy environment.
- Compaction of terraces, coir mat, geo-textiling along dump slopes followed by plantation.

Water:

- Construction of garland drains and settling tanks to divert surface run –off of the mining area to the natural drainage.
- Construction of checks dams/ gully plugs at strategic places to arrest silt wash off from broken up area.
- Retaining walls with weep hole are to be constructed around the mine boundaries to arrest silt wash off.

- The mined out pits shall be converted in to the water reservoir at the end of mine life. This will help in recharging ground water table by acting as a water harvesting structure.
- Periodic analysis of mine pit water and ground water quality in nearby villages are to be undertaken.
- Domestic sewage from site office & urinals/latrines provided within ML/QL areas is to be discharged in septic tank followed by soak pits.
- Regular Environmental impact assessments.
- Rehabilitation and reclamation are both processes that can be used to restore mined land
- Proper Regulation and enforcement of mines.

Noise:

- Machinery maintenance and upgrade; Periodic maintenance of machineries, equipment shall be ensured to keep the noise generated within acceptable limit also maintaining Blast optimization and scheduling.
- Development of thick green belt around mining/cluster area, haul roads to reduce the noise.
- Provision of earplugs to workers exposed to high noise generating activities like blasting, excavation site etc. Worker and operators at work sites will be provided with earmuffs.
- Conducting periodical medical checkup of all workers for any noise related health problems.
- Proper training to personnel to create awareness about adverse noise related effects.
- Periodic noise monitoring at locations within the mining area and nearby habitations to assess efficacy of adopted control measures.
- During blasting optimum spacing, burden and charging of holes will be made under the supervision of competent qualified mines foreman, mate etc.
- Community engagement and noise management plans to been trained.

Biological Environment:

- Development of green belt/gap filling saplings in the safety barrier left around the quarry area/ cluster area.
- Carrying out thick greenbelt with local flora species predominantly with long canopy laves on the inactive mined out upper benches.

- Development of dense poly culture plantation using local floral species in the mining areas at conceptual stage if the mine is not continued much below the general ground level.
- Adoption of suitable air pollution control measures as suggested above.
- Transport of materials in trucks covered with tarpaulin.

23. RECLAMATION OF MINED OUT AREA:

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

1. If, substantial amount of waste is there, the exhausted quarry can be fully or partly backfilled using the stored waste. The backfilled areas are to be brought under plantation of local species.
2. If the generation of waste is much less as in the case of minor mineral mining, the exhausted quarries can be reclaimed by
    a. Plantation on the broken-up surface if the depth of quarry is not much below the surrounding surface level.
    b. Converted to water reservoir after stabilization of the slopes if the exhausted quarry continues much below the surrounding surface level. It is preferred to cordon the water reservoir either through wire fencing or retaining wall with plantation from the safety point of view.
    c. Fly ash can be used to fill in the voids left by quarrying activities, effectively restoring the landscape to a more usable state. The fly ash, being a good substitute for soil, can be used to create a stable base for further development or landscaping as per the Standard Operating Procedure (SOP) provided by the R & DM Department.

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

24. RISK ASSESSMENT & DISASTER MANAGEMENT PLAN:

The only risk involved relating to mining of building stone excepting natural calamities is slope failure and probable accidents due to high and ill maintained bench walls. This can only be addressed through making of regular benches and undertaking mining in benching pattern.

The disaster management plan (DMP) is supposed be a dynamic, changing, document focusing on continual improvement of emergency response planning and arrangements.

The disaster management plan is to be aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and savage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated through rehearsal/induction conducted by the respective department from time to time.

Quarrying activities, especially those involving blasting, pose significant risks to workers, nearby communities, environment, and infrastructure. A comprehensive risk assessment and disaster management plan as envisaged for sustainable and safe operations in respect of different stone quarries of Angul District is enumerated below.

Potential Hazards in Quarrying and Blasting:

- Blasting Hazards- Fly-rocks, ground vibrations, air blasts, misfires, noise and dust emissions.
- Slope Failure- Collapse of quarry benches and walls due to over-excavation or weak lithology.
- Dust & Air Pollution- Caused by drilling, blasting, crushing, and transport. Affects respiratory health.
- Water Pollution- Run-off from quarry pits contaminating nearby streams or groundwater.
- Accidents- Due to equipment failure, falling rocks etc.
- Fire & Explosion- Improper handling/storage of explosives or diesel, electric equipmentand machineries.
- Biodiversity Disturbance- Disturbance to flora/fauna in the vicinity of forested or eco-sensitive areas.

- Jarring noise from machinery and vehicles.

Consequences of Hazards:

- Human Health: Hearing loss, respiratory diseases, injuries or fatalities.
- Structural Damage: Cracks in nearby infrastructure from vibration or fly-rocks.
- Environmental Degradation: Habitat loss, dust deposition on vegetation, water contamination.
- Legal & Financial Liabilities: Compensation, fines, closure orders from regulatory bodies.
- Community Unrest: Protests or opposition from affected villagers.

Disaster Management Plan (DMP):

A. Preventive Measures

- Controlled blasting techniques with proper burden and spacing.
- Use of NONEL (non-electric) detonators to reduce vibrations.
- Dust suppression via water sprinkling and green belt development.
- Explosive storage as per Explosives Act norms.
- Training of staff in safety protocols and emergency response.

B. Emergency Preparedness

- On-site first aid facilities.
- Installation of sirens and warning signals before blasting.
- Communication plan with local administration and hospitals.
- Evacuation drills and safety signage at key locations.

C. Response Plan

- Immediate cordoning of accident site.
- Rescue operations under trained team leader.
- Communication with police, fire department, and health services.

D. Post-Disaster Management

- Medical treatment and compensation to affected persons.

- Repair of damaged infrastructure or payment of cost of repair in lieu thereof.
- Community engagement to restore trust.

Institutional Setup:

- Engagement of licensed contractor for blasting with deployment of Safety Officer to supervise related operation.
- Disaster Management Team: Comprising site manager, safety officer (direct/contractual), explosive expert, medical assistant.
- Liaison with District Administration for coordinated action.

Recommendations:

- Quarry sites to be at a safe distance from habitations and eco-sensitive zones.
- Regular Environmental and Safety Audits.
- Integration of local communities in monitoring and awareness.
- Use of modern, low-impact mining technology.

General responsibilities of employees' during an emergency:

During an emergency, it becomes more enhanced and pronounced when an emergency warning is raised, the worker in-charge, should adopt safe and emergency shut down and attend to any prescribed duty. If no such responsibility is assigned, the workers should adopt a safe course to assemble at a specified point and wait for instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of DMP.

Co-ordination with local authorities:

The Mine Manger who is responsible for emergency will always keep a vehicle ready at site. In case of any eventuality, the victim will be taken to the nearby hospitals after carrying out the first aid at the site. The Manger should collect and store adequate information of the nearby hospitals, fire station, police station, village panchayat heads, taxi stands, medical shops, district revenue authorities etc. and use them efficiently during the case of emergency.

25. DETAILS OF THE OCCUPATIONAL HEALTH ISSUES IN THE DISTRICT

As per the guidelines of the Mine Rules 1995, occupational health safety has been stipulated by the ILO/WHO. The proponent's will take necessary precautions to fulfill the stipulations. Normal sanitary facilities have to be provided within the lease area. The management will carry out periodic health checkup of workers.

Occupational hazards involved in mines are related to dust pollution, noise pollution, blasting and injuries from moving machineries & equipment and fall from high places.Directorate General Mines Safety(DGMS) has given necessary guidelines for safety against these occupational hazards. The management has to strictly follow these guidelines.

All necessary first aid and medical facilities are to be provided to the workers. The mine shall be well equipped with personal protective equipment (PPE). Further, all the necessary ported equipment such as helmet, safety goggles, earplugs, earmuffs etc. are to be provided to mine workers as per Mines Rules. All operators and mechanics are to be trained to handle firefighting equipments.

Tuberculosis (TB) remains a notifiable communicable disease and the district is covered under the National Tuberculosis Elimination Programme (NTEP), with ongoing efforts to ensure early diagnosis, free treatment, and community-based interventions. TB cases are reported from both rural and urban health institutions, with particular focus on high-risk and vulnerable populations. Despite the availability of diagnostic and treatment facilities, challenges such as patient compliance, remote habitation, and associated co-morbidities like malnutrition and diabetes continue to affect TB control efforts.

Table-25
Status of Tuberculosis (TB) diagnosed in the last five years in Angul district

SL. NO.	NAME OF BLOCK/TAHASIL	YEARS				
		2020	2021	2022	2023	2024
1	Angul	42	80	129	106	111
2	Athamallik	43	56	73	82	81
3	Banarpal	404	437	456	527	500
4	Chhendipada	70	97	144	145	135
5	Kaniha	62	86	90	85	63
6	Pallahara	120	148	198	207	200

7	R. K. Nagar	50	46	78	81	68
8	Talcher	110	215	233	236	214
TOTAL		**901**	**1165**	**1401**	**1469**	**1372**

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

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

Due to stony and rocky nature of the lease areas, plantation activities cannot be effectively undertaken. The hard and uneven terrain, characterized by exposed rock surfaces and lack of soil cover, make it extremely difficult to carry out any meaningful plantation work. The absence of fertile topsoil and limited water availability further restrict the survival and growth of plants in such areas. Consequently, plantation within the mining lease area is not feasible, except in small pockets where some soil cover exists or along safety zones and haul roads where limited plantation is taken up.

As most of the minor mineral mines/quarries of the district are yet to be exhausted of their mineral resources, reclamation measures cannot be undertaken during the subsistence of mining operation.

Considering non-availability of adequate area within the lease barring the safety zone, the scope for plantation is very limited. This constraint is further multiplied due to mining and allied operations involving movement of heavy earth moving machines and transporting vehicles.

However, the mining lessees are insisted for raising plants within safety zones surrounding the lease areas. Apart from these, avenue plantation along haul roads is also carried out.

Table-26
Area for Plantation of Working Lease

SL no	NAME OF THE SOURCE	NAME OF THE LESSEE	AREA OF MINING LEASE (HA)	WORKING/ NON-WORKING	AREA IN PLANTATION (IN HA)	NO OF TREES	REMARKS
1	LOKEIPASI STONE QUARRY	NAGEN KUMAR SAHU	2.938	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY		
2	KRUSHNACHANDRAPUR STONE QUARRY NO.3	JCPL	2.278	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY		
3	KRUSHNACHANDRAPUR STONE QUARRY NO.4	MAA BUDHI EXPLOSIVES	2.278	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY		
4	KRUSHNACHANDRAPUR STONE QUARRY NO.5	OBJPL	2.278	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY		
5	KRUSHNACHANDRAPUR STONE QUARRY NO.6	OBJPL	2.225	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS		

					IMMEDIATELY
6	KRUSHNACHANDRAPUR STONE QUARRY NO.7	JCPL	3.581	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY
7	FULAPADA STONE QUARRY	Pratima Garnayak	2.023	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY
8	DURGAPUR PANASAHI STONE QUARRY	Giridhari Pradhan	3.812	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY
9	KHINDO- A STONE QUARRY	AMRIT DAS	0.405	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY
10	KHINDO- B STONE QUARRY	Himachala Panda	0.405	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY
11	KHINDO- C STONE QUARRY	AMRIT DAS	0.405	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY
12	RANIBANDHA STONE QUARRY	Sanjeeb Singh	2.833	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY
13	SANAROHILA STONE QUARRY	ROHITASWA PRADHAN	2.222	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY
14	KHOLAMUNDA STONE QUARRY	SARAT BEHERA	3.096	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY
15	MOHANPUR STONE QUARRY	MANAS RANJAN BISOI	2.396	WORKING	QUARRY LEASE HOLDER ADVISED TO TAKE UP PLANTATION IN SUITABLE LOCATIONS IMMEDIATELY

27. CONCLUSION:

The District Survey Report for ***Stone (Road Metal/ Building Stone)*** in respect of Angul District prepared in accordance with Appendix-X, Para-7(iii)(a) of S.O. 3611(E) dt. 25.07.2018 of Ministry of Environment, Forest and Climate Change, New Delhi and in compliance with the orders of Hon'ble Supreme Court dt. 10.11.2021 in connection with C.A Nos. 3661-3662 of 2020. This report provides information on the development and planning of the district gathered from various government departments, i.e., Irrigation department, Forest department, Public works department, Revenue department, Water Resource department, ORSAC, and Mining department.

The Angul District Survey Report (DSR) has been meticulously prepared with a comprehensive approach to ensure sustainable utilization of minor mineral resources, particularly ***Stone (Road Metal/Building Stone),*** for the district's ongoing and upcoming developmental activities. With the district witnessing rapid industrial and infrastructural growth, this report aims to balance the demand and supply of minor minerals while safeguarding environmental integrity and promoting socio-economic progress. Emphasis has been laid on systematic planning, transparent monitoring of mineral extraction and transportation, and stringent measures to curb illegal mining practices. The DSR will serve as a vital tool for identifying potential actionable mineral-bearing areas, thereby contributing significantly to the revenue generation of both the district and the state, while ensuring responsible mining practices in alignment with environmental and regulatory frameworks.

Annexure V

FINAL LIST OF POTENTIAL MINING LEASES (EXISTING & PROPOSED)

Sl No	TAHASIL	LEASE DETAILS			AREA(IN HA)	DISTANCE (IN KM FROM PA/BR/WC)	DISTANCE FROM FOREST AREA (IN KM)	MINING LEASES WITHIN 500 METERS (IF YES CLUSTER AREA)	TOTAL EXCAVATION IN CUM / ANNUM CONSIDERING DIGGING DEPTH MAX AS 6 METERS	MINERAL TO BE MINED (IN CUM)	EXISTING / PROPOSED	REMARKS
		LEASE NAME	KHATA	PLOT								
1	ANGUL	LOKEIPASI STONE QUARRY	1	1538(B)	2.938	5.5 :3.5 : 22	2	NO	62136	310680	WORKING	
2	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.1	62, 64, 65	565, 275, 276, 277, 54, 55	2.258	15.73 :1.2 : 26.5	1.8	YES	17493.8	87469	NON WORKING	STATUTORY CLEARANCE AWAITED
3	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.2	62	565	2.278	15.73 :1.2 : 26.5	1.8	YES	19048.2	95241	NON WORKING	STATUTORY CLEARANCE AWAITED
4	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.3	62	558, 565	2.278	15.73 :1.2 : 26.5	s	YES	20402.2	102011	WORKING	
5	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.4	62	565	2.278	15.73 :1.2 : 26.5	1.8	YES	80463.6	402318	WOKING	
6	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.5	62	565	2.278	15.73 :1.2 : 26.5	1.8	YES	26822.6	134113	WORKING	
7	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.6	62	565	2.225	15.73 :1.2 : 26.5	1.8	YES	30170.2	150851	WORKING	

8	BANARPAL	KRUSHNACHANDRAPUR STONE QUARRY NO.7	62, 64	565, 275, 278, 279, 280	3.581	15.73 :1.2 : 26.5	1.8	YES	29650.8	148254	WORKING	
9	BANARPAL	FULAPADA STONE QUARRY	619	620	2.023	1.27 :1 : 19.1	4	YES	24085.6	120428	WORKING	
10	BANARPAL	FULAPADA STONE QUARRY A	619	620/p	3.217	1.27 :1 : 19.1	4	YES	66000	330000	NEW	
11	BANARPAL	FULAPADA STONE QUARRY B	619	620/p	4.168	1.27 :1 : 19.1	4	YES	84000	420000	NEW	
12	BANARPAL	FULAPADA STONE QUARRY C	619	620/p	4.285	1.27 :1 : 19.1	4	YES	102000	510000	NEW	
13	BANARPAL	FULAPADA STONE QUARRY D	619	620/p	4.122	1.27 :1 : 19.1	4	YES	86000	430000	NEW	
14	BANARPAL	FULAPADA STONE QUARRY E	619	620/p	4.556	1.27 :1 : 19.1	4	YES	96000	480000	NEW	
15	CHHENDIPADA	DURGAPUR PANASAHI STONE QUARRY	2 / 2	125	3.812	2.021 :2.2 : 36	1.036	NO	41966	209830	WORKING	
16	KANIHA	KHINDO- A STONE QUARRY	276	96/1	0.405	4.84 :7.7 : 2.6	0.2	YES	7110	35550	WORKING	
17	KANIHA	KHINDO- B STONE QUARRY	276	96/2	0.405	4.68 :7.8 : 2.6	0.2	YES	5128.2	25641	WORKING	
18	KANIHA	KHINDO- C STONE QUARRY	276	96/3	0.405	4.68 :7.8 : 2.6	0.2	YES	5928.4	29642	WORKING	
19	ATHAMALLIK	RANIBANDHA STONE QUARRY	59	11	2.833	26 :16.5 : 15.5	2	NO	39330	1,96,650	WORKING	
20	KISHORENAGAR	JAMUNALI STONE QUARRY	95, 96	180/1486, 985, 986	1.864	5.02 :1.8 : 38	0.79	NO	26234.2	131171	NON WORKING	STATUTORY CLEARANCE AWAITED
21	KISHORENAGAR	SANAROHILA STONE QUARRY	88	29/969	2.222	3.94 :2.4 : 2.3	3.5	YES	17300	86500	WORKING	
22	KISHORENAGAR	SANAROHILA STONE QUARRY - A	88	29/969	2.645	3.94 :2.4 : 2.3	3.5	YES	43000	215000	NEW	

23	KISHORENAGAR	SANAROHILA STONE QUARRY - B	88	1/968(P) [1.937 Ha] & 25/967(P) [2.981 Ha]	4.918	3.8 :2.4 : 2.3	4.2	YES	65000	325000	NEW	
24	PALLAHARA	KHOLAMUNDA STONE QUARRY	27	328	3.096	27 :6.4 : 1.8	3.5	NO	50503	252514.8	WORKING	
25	PALLAHARA	MOHANPUR STONE QUARRY	28	17, 28	2.396	16.8 :7.6 : 7.8	0.75	NO	13272	66,360	WORKING	
26	PALLAHARA	RANJANA STONE QUARRY	47	240	0.708	2.8 :9.1 : 0.7	1.87	YES	9964.8	49,824.00	NON WORKING	STATUTORY CLEARANCE AWAITED
27	PALLAHARA	RANJANA STONE QUARRY A	47(AJA)	240/P	0.503	2.8 :9.1 : 0.7	1.87	YES	10000	50000	NEW	
28	PALLAHARA	Bandhakani Stone Quarry	72(AAA)	21/P (3.209Ha) & 23/P (0.972Ha)	4.181	9.48 :8.5 : 1.7	3.4	NO	60000	300000	NEW	
29	PALLAHARA	Sankamur Stone Quarry A	283	52	3.531	15.74 :7.9 : 1.7	0.5	YES	50000	250000	NEW	
30	PALLAHARA	Sankamur Stone Quarry B	283 (Rakhita)	2508/P	1.631	15.95 :5.7 : 3.8	2.53	YES	16000	80000	NEW	

NB: *The resource estimation is tentative and the actual resource will be estimated as per the approved mining plan.*

Annexure VI

FINAL LIST OF CLUSTER AND CONTIGUOUS CLUSTER DETAILS

CLUSTER NO.	VILLAGE	AREA (IN HA)	TOTAL EXCAVATION (CUM)	TOTAL MINERAL EXCAVATION (CUM)
1	KRUSHNACHANDRAPUR	2.258	145781.7	87469
	KRUSHNACHANDRAPUR	2.278	158735	95241
	KRUSHNACHANDRAPUR	2.278	170018.3	102011
	KRUSHNACHANDRAPUR	2.278	670530	402318
	KRUSHNACHANDRAPUR	2.278	223521.7	134113
	KRUSHNACHANDRAPUR	2.225	251418.3	150851
	KRUSHNACHANDRAPUR	3.581	247090	148254
2	FULAPADA	2.023	200713.3	120428
	FULAPADA	3.217	550000	330000
	FULAPADA	4.168	700000	420000
	FULAPADA	4.285	850000	510000
	FULAPADA	4.122	716666.7	430000
	FULAPADA	4.556	800000	480000
3	KHINDO	0.405	59250	35550
	KHINDO	0.405	42735	25641
	KHINDO	0.405	49403.33	29642
4	SANAROHILA	2.222	144166.7	86500
	SANAROHILA	2.645	358333.3	215000
	SANAROHILA	4.918	541666.7	325000
5	RANJANA	0.708	83040	49824
	RANJANA	0.503	83333.33	50000
6	SANKHAMUR	3.531	416666.7	250000
	SANKHAMUR	1.631	133333.3	80000

CONTIGUOUS CLUSTERS:

CONTIGUOUS CLUSTER NO.	CLUSTER NO.	NUMBER OF LEASES IN THE CLUSTER	DISTANCE BETWEEN CLUSTERS	VILLAGE	AREA OF CLUSTER (HA)	TOTAL MINERAL EXCAVATION (CUM)
NOT APPLICABLE						

Annexure VII

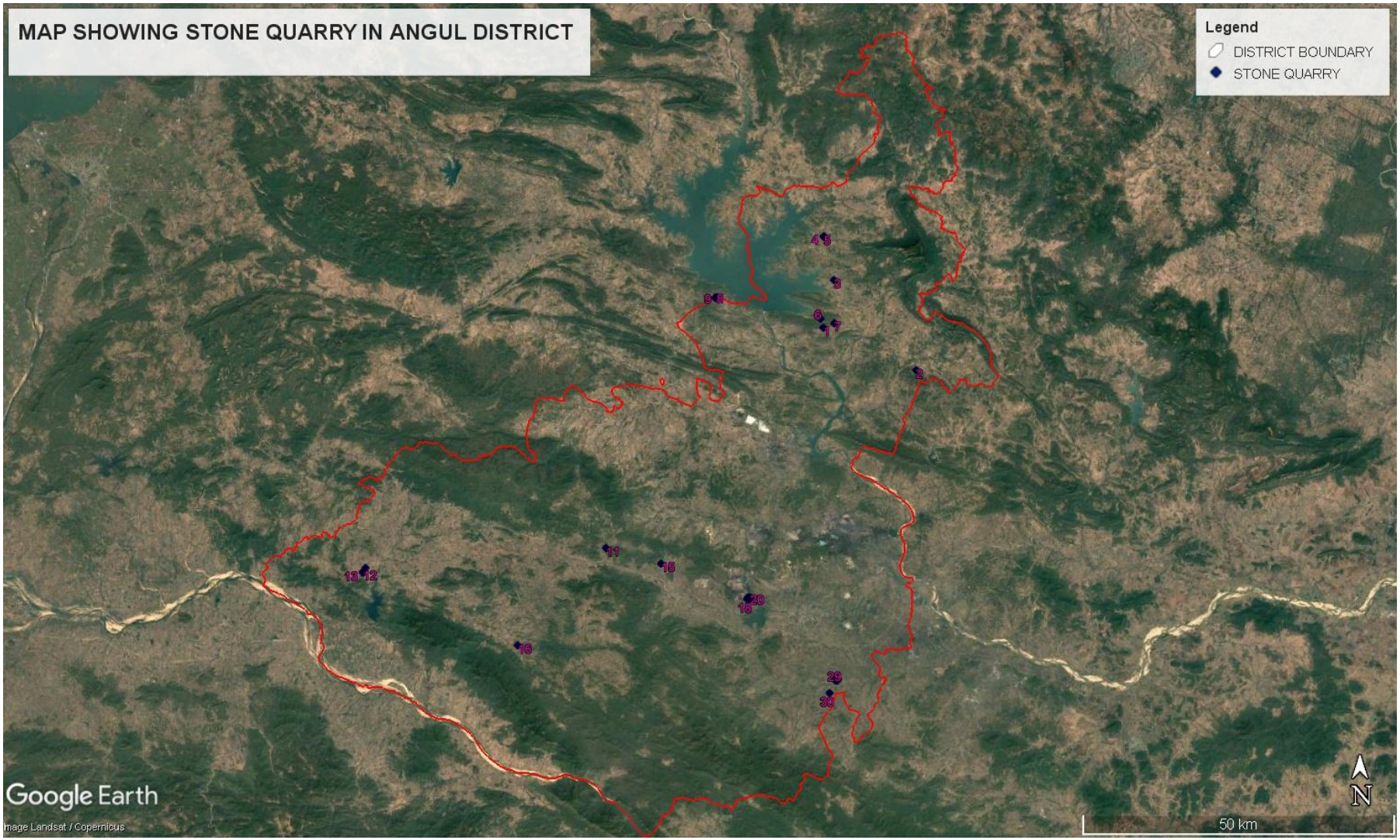
FINAL LIST TRANSPORTATION ROUTES FOR INDIVIDUAL LEASES AND LEASES IN CLUSTER:

LEASE NO	NAME OF SOURCE (STONE)	TRANSPORTATION ROUTE NO.	NUMBER OF TIPPERS / DAY OF LEASE	NUMBER OF TIPPERS / DAY OF ALL LEASE ON ROUTE	LENGTH OF ROUTE IN KM	TYPE OF ROAD (BLACK TOPPED / UNPAVED)	RECOMMENDATION FOR ROAD (BLACK TOPPED / UNPAVED)	THE ROAD WILL BE CONSTRUCTED BY GOVT. / LEASE OWNER	ROUTE MAP & LOCATION
1	LOKEIPASI STONE QUARRY	1	15	15	4	BLACK TOPPED	BLACK TOPPED	GOVT.	LUKEIPASIFUPADA_SH-64
2	KRUSHNACHANDRAPUR STONE QUARRY NO.1	2	6	40	4	BLACK TOPPED	BLACK TOPPED	GOVT.	Krushnachandrapur-PARANG_SH-63
3	KRUSHNACHANDRAPUR STONE QUARRY NO.2	3	6	40	4	BLACK TOPPED	BLACK TOPPED	GOVT.	Krushnachandrapur-PARANG_SH-63
4	KRUSHNACHANDRAPUR STONE QUARRY NO.3	4	7	40	4	BLACK TOPPED	BLACK TOPPED	GOVT.	Krushnachandrapur-PARANG_SH-63
5	KRUSHNACHANDRAPUR STONE QUARRY NO.4	5	16	40	4	BLACK TOPPED	BLACK TOPPED	GOVT.	Krushnachandrapur-PARANG_SH-63
6	KRUSHNACHANDRAPUR STONE QUARRY NO.5	6	9	40	4	BLACK TOPPED	BLACK TOPPED	GOVT.	Krushnachandrapur-PARANG_SH-63
7	KRUSHNACHANDRAPUR STONE QUARRY NO.6	7	9	40	4	BLACK TOPPED	BLACK TOPPED	GOVT.	Krushnachandrapur-PARANG_SH-63
8	KRUSHNACHANDRAPUR STONE	8	10	40	4	BLACK TOPPED	BLACK TOPPED	GOVT.	Krushnachandrapur-PARANG_SH-63

	QUARRY NO.7								
9	FULAPADA STONE QUARRY	9	8	15	2	BLACK TOPPED	BLACK TOPPED	GOVT.	FULPADA_SH-64
10	FULAPADA STONE QUARRY A	10	4	15	2	BLACK TOPPED	BLACK TOPPED	GOVT.	FULPADA_SH-64
11	FULAPADA STONE QUARRY B	11	8	15	2	BLACK TOPPED	BLACK TOPPED	GOVT.	FULPADA_SH-64
12	FULAPADA STONE QUARRY C	12	6	15	2	BLACK TOPPED	BLACK TOPPED	GOVT.	FULPADA_SH-64
13	FULAPADA STONE QUARRY D	13	8	15	2	BLACK TOPPED	BLACK TOPPED	GOVT.	FULPADA_SH-64
14	FULAPADA STONE QUARRY E	14	9	15	2	BLACK TOPPED	BLACK TOPPED	GOVT.	FULPADA_SH-64
15	DURGAPUR PANASAHI STONE QUARRY	15	9	12	4	BLACK TOPPED	BLACK TOPPED	GOVT.	DURGAPUR-JARPADA-NH-55
16	KHINDO- A STONE QUARRY	16	2	6	0.5	BLACK TOPPED	BLACK TOPPED	GOVT.	KHINDO_NH-200
17	KHINDO- B STONE QUARRY	17	2	6	0.5	BLACK TOPPED	BLACK TOPPED	GOVT.	KHINDO_NH-200
18	KHINDO- C STONE QUARRY	18	2	6	0.5	BLACK TOPPED	BLACK TOPPED	GOVT.	KHINDO_NH-200
19	RANIBANDHA STONE QUARRY	19	10	13	3	BLACK TOPPED	BLACK TOPPED	GOVT.	RANIBANDHA-THAKURGARH-SH-62
20	JAMUNALI STONE QUARRY	20	9	12	4	BLACK TOPPED	BLACK TOPPED	GOVT.	JAMUNALI-NH-55
21	SANAROHILA STONE QUARRY	21	6	12	11	BLACK TOPPED	BLACK TOPPED	GOVT.	SANAROHILA-KADALIMUNDA-TUSAR_SH62
22	SANAROHILA STONE	22	12	12	12	BLACK TOPPED	BLACK TOPPED	GOVT.	SANAROHILA-KADALIMUNDA-TUSAR_SH62

	QUARRY - A								
23	SANAROHILA STONE QUARRY - B	23	11	12	12	BLACK TOPPED	BLACK TOPPED	GOVT.	SANAROHILA-KADALIMUNDA-TUSAR_SH62
24	KHOLAMUNDA STONE QUARRY	24	15	12	13	BLACK TOPPED	BLACK TOPPED	GOVT.	Kholamunda-PRIYAMBADAPUR-KUNJAMKantiapas_NH-149
25	MOHANPUR STONE QUARRY	25	4	6	8.5	BLACK TOPPED	BLACK TOPPED	GOVT.	Mohanapur-SANKHMUR-KHAMAR-NH-149
26	RANJANA STONE QUARRY	26	3	6	4	BLACK TOPPED	BLACK TOPPED	GOVT.	RANJANA_SRIRAMPUR_NH-149
27	RANJANA STONE QUARRY A	27	3	6	4	BLACK TOPPED	BLACK TOPPED	GOVT.	RANJANA_SRIRAMPUR_NH-149
28	Bandhakani Stone Quarry	28	12	12	7	BLACK TOPPED	BLACK TOPPED	GOVT.	BANDHAKANI-KARADAPAL-CHAKRADHARAPUR_NH-149
29	Sankamur Stone Quarry A	29	11	11	15	BLACK TOPPED	BLACK TOPPED	GOVT.	SANKHMUR-JHARAKILINDA-Garadamunda-KHAMAR_NH-149
30	Sankamur Stone Quarry B	30	5	5	9	BLACK TOPPED	BLACK TOPPED	GOVT.	SANKHMUR-Mohanapur-SANKHMUR-KHAMAR-NH-149

PLATE-1



SOURCES OF STONE QUARRY LEASES MARKED ON DISTRICT SATTELITE MAP

PLATE-2

TRANSPORTING ROUTE OF STONE QUARRY LEASES MARKED ON DISTRICT SATTELITE MAP