DISTRICT SURVEY REPORT (DSR)

OF

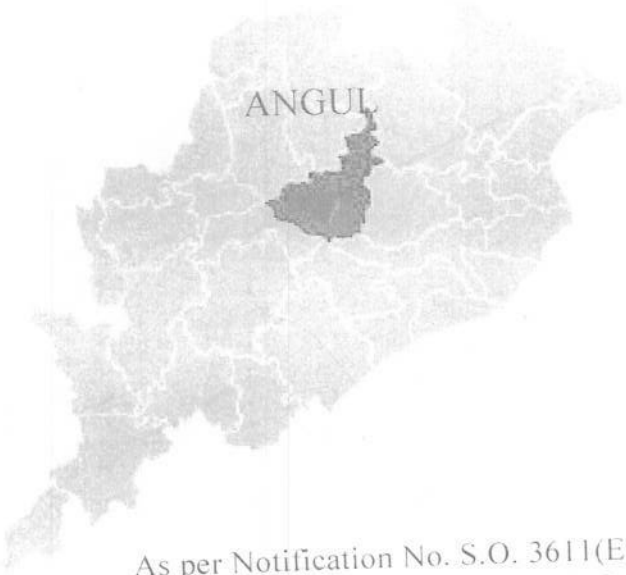
ANGUL DISTRICT, ODISHA

FOR

RIVER SAND

(FOR PLANNING & EXPLOITING OF MINOR MINERAL RESOURCES)

ODISHA



ANGUL

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

COLLECTORATE, ANGUL

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PLATE NO-1

INDEX MAP

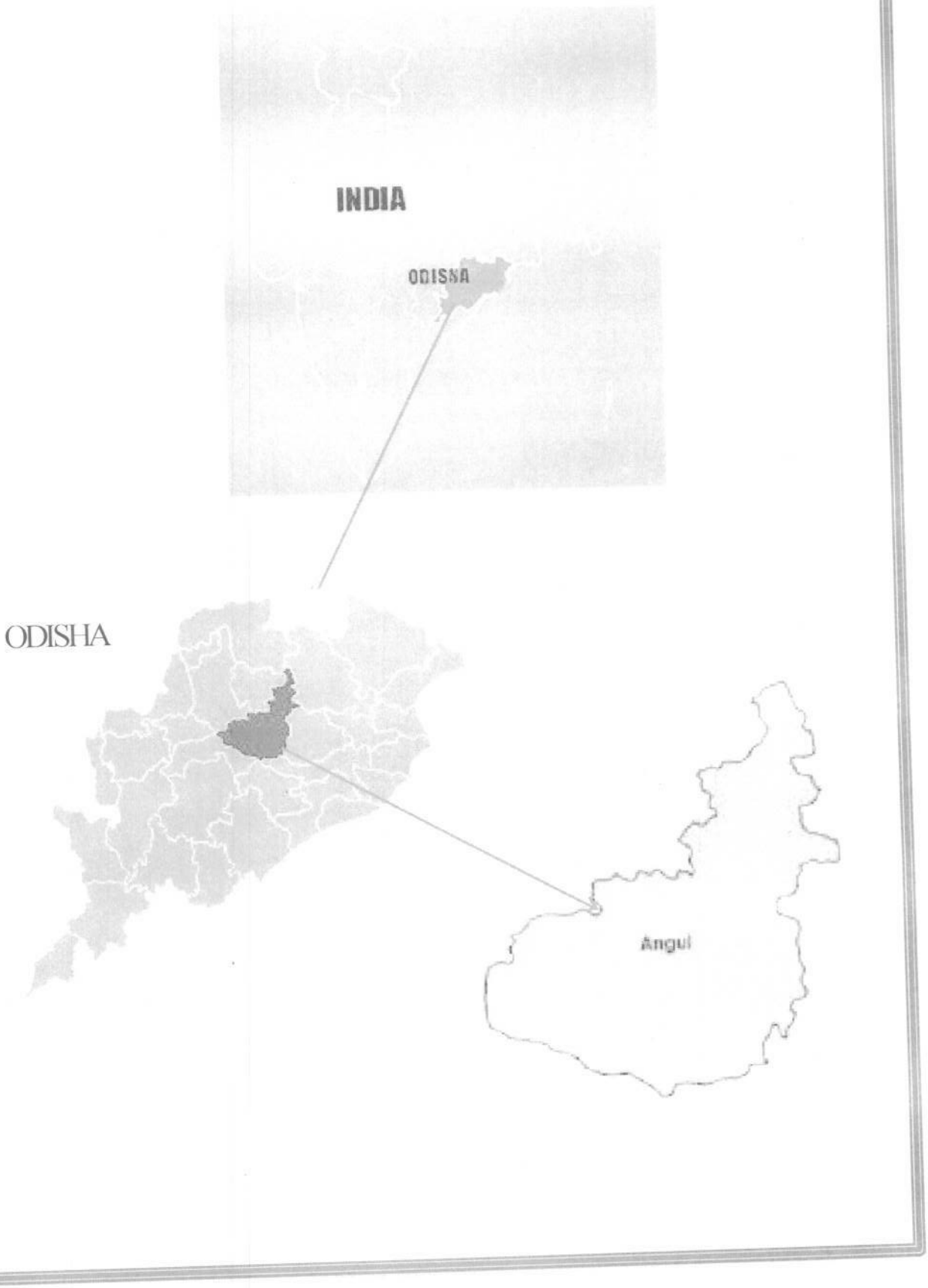


PLATE NO-2

MAP SHOWING THE TAHASILS OF ANGUL DISTRICT

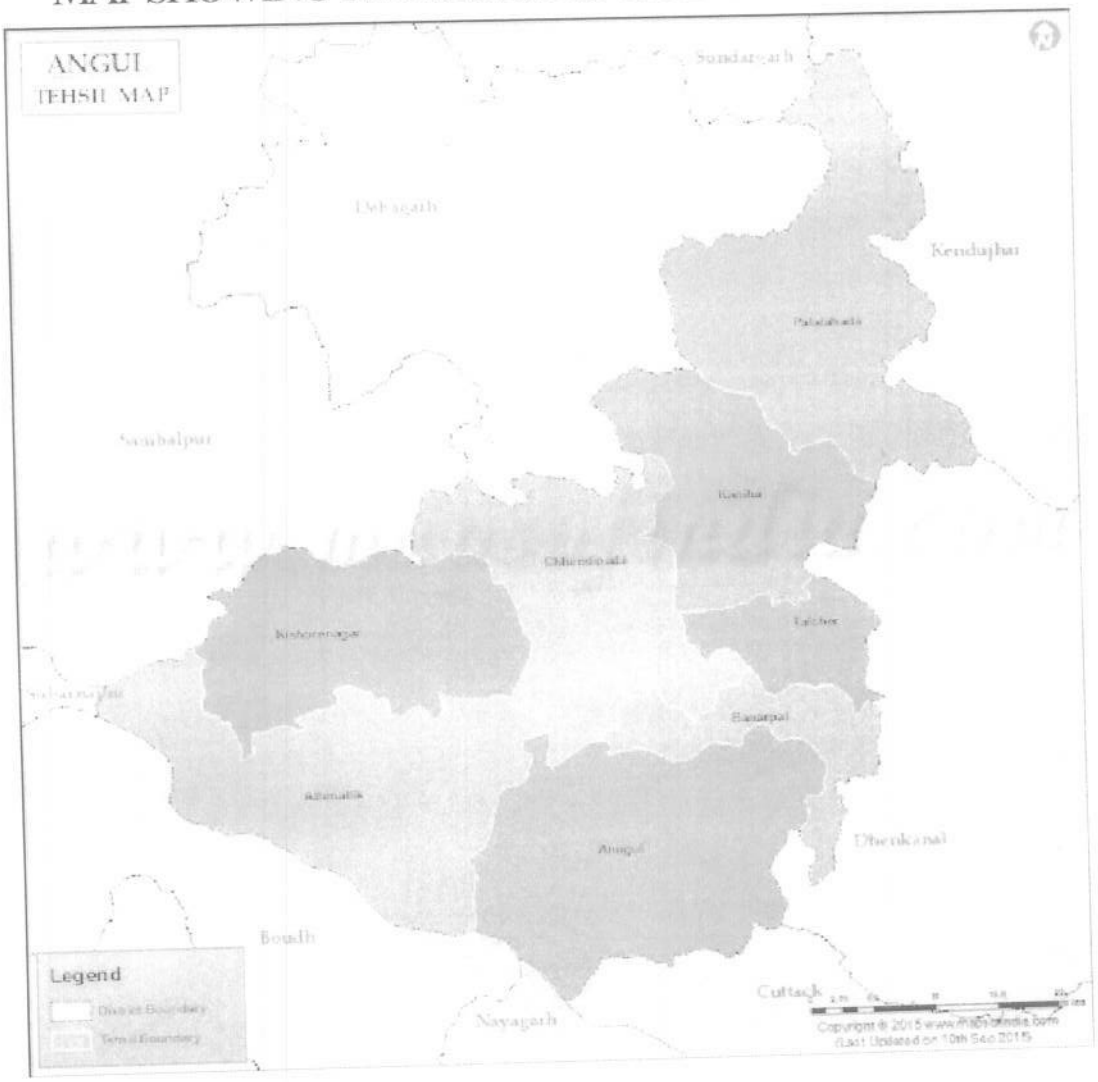
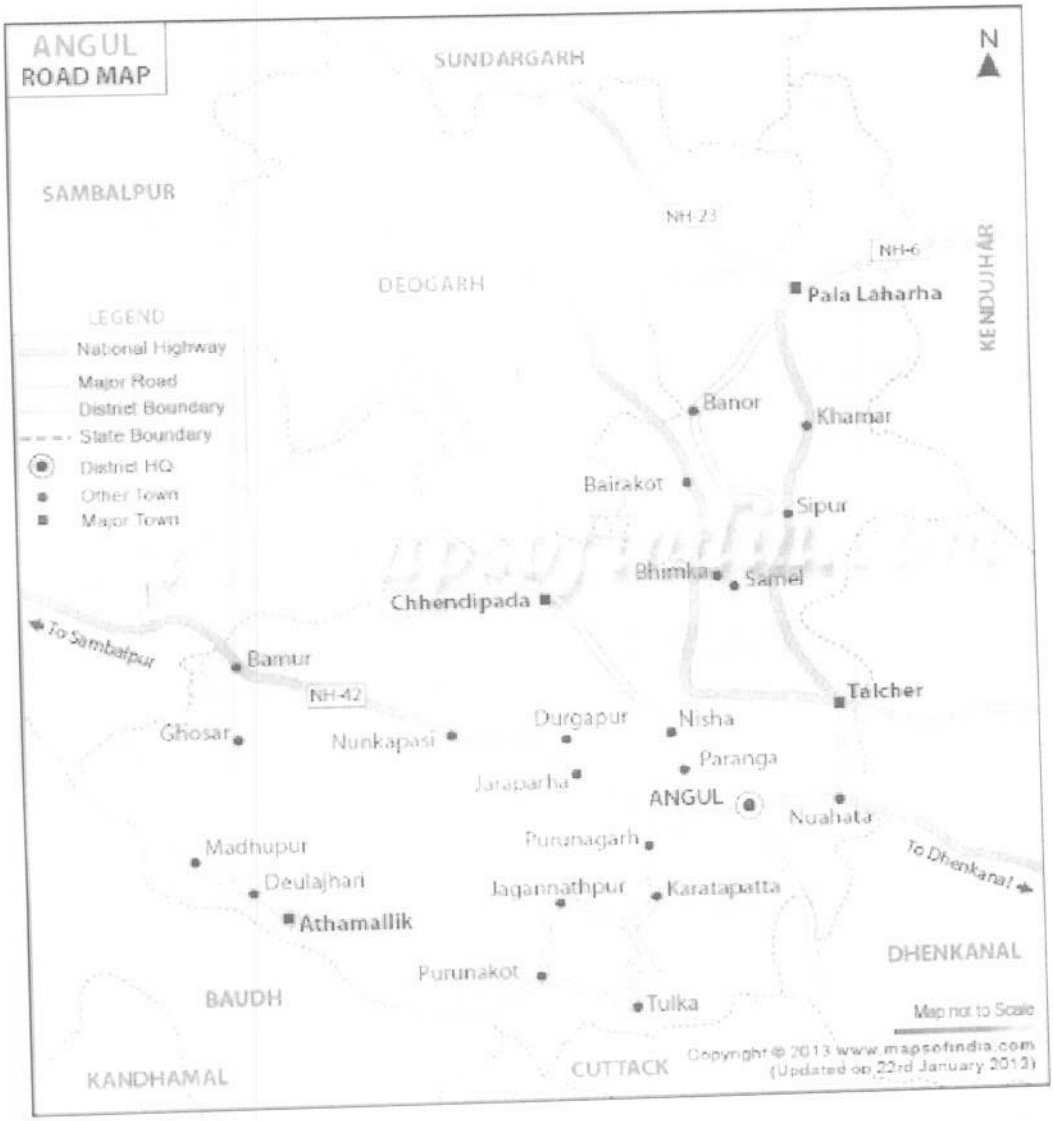


PLATE NO-3

MAP SHOWING THE MAJOR ROADS OF ANGUL DISTRICT



PREFACE

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

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 20^0 31' to $21^0$41' North to $84^0$16' to $85^0$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 kilometres (93 mi) from the state capital Bhubaneswar.

2. OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT.

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 beause of its vast resources of coal in the Talcher coalfield. 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 coal 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.

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	14.19
6	Lingaraj ocp	Coal	14.93
7	Balaram OCP	Coal	11.17
8	Hingula OCP	Coal	18.95
9	Kaniha OCP	Coal	18.80
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. Chhendipada Colliery — Coal

4. Kakudi & Kishoripal Sand Mines — Sand
5. Bilinga/Bikser Sand Mines — Sand

3. LIST OF LEASES WITH LOCATION, AREA AND PERIOD OF VALIDITY

Enclosed as Annexure I

4. DETAILS OF ROYALTY COLLECTED (Rs)

Sl.No	Name Of Tahasil	2015-16	2016-17	2017-18	2018-19
1	Atthamalik	224979	762239	924352	924672
2	Kishorenagar	415297	119821	0	0
3	Pallahara	0	29554	200806	180642
4	Talcher	10966344	7834495	4833791	4709150
5	Banarpal	0	0	0	0
6	Chhendipada	0	0	0	0
7	Kaniha	3983746	4307167	4270363	4177484
TOTAL		**15590366**	**13053276**	**10229312**	**9991948**

5. DETAILS OF PRODUCTION OF SAND

Sl.No	Name Of Tahasil	2015-16	2016-17	2017-18	2018-19
1	Atthamalik	9158	9160	9163	9167
2	Kishorenagar	3945	4620	5295	5970
3	Pallahara	1200	1350	1500	1650
4	Talcher	113161.5	127967.5	90006	86427.5
5	Banarpal	0	0	0	0
6	Chhendipada	0	0	0	0
7	Kaniha	65418	65588	66887	64067
TOTAL		**192882.5**	**208685.5**	**172851**	**167281.5**

6. PROCESS OF DEPOSIT OF SEDIMENTS IN THE RIVERS

The drainage of the district is mainly controlled by rivers like Mahanadi, Brahamani, Tikira and their tributaries. During rainy season the river water carries sand which is formed due to disintegration of rock bodies along with other suspensions. After recession of the water flow the sand gets deposited in the locations where there is less energy.

7. GENERAL PROFILE

a. Administrative set up:

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. kms and 12.74 lakhs of population as per 2011 census. The district accounts for 4.09 percent of the states territory and shares 3.03 percent of the state's population. The density population of the district is 200 per sq. km as against 270 person per sq. km. of the 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 is 239552 (18.8.%) and schedule tribe population is 179603 (14.1.%). The literacy percentage of the district constitutes 77.53 against 72.9 of the state.

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 1401.9 m.m.

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 Talcher coalfield, 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:

The locational advantage and abundant stock of manpower and raw materials have played an important role in the industrial development of the district. The important PSUS of the district are the NALCO, the MCL. Besides, during the year 2014-15,1011 nos of Micro Small and Medium Enterprises have been Established with total capital investment of about Rs 68386.94 lakhs with 7447 nos 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.

No. of MSME units set up	Investment (In Rs. crores)	Employment Generated				Employment of women
		SC	ST	General	Total	
2325	20936.67	2337	704	4175	7216	405

f. Agriculture:

During the year 2017-18 the net area sown was 197 thousand hectares against 5356 thousand hectares of the state. The production of was as below:

Name	Paddy	Wheat	Maize	Mung	Biri	Kulthi	TilL	Groundnut	Mustard	Potatoes	Jute	Sugarcane
Production in 000 MT	188.63	0.09	14.86	15.95	17.36	4.35	14.84	20.72	1.72	0.00	18.00	4.55

During 2017-18, the total fertilizers used in the district was about

Type of fertiliser	Nitrogenous	Phosphatic	Pottasic	Total	Consumption per Ha
Quantity in MT	4354	2025	853	7232	25.45

g. Power:

Consumption of electricity in Angul district during the year 2013-14 covers 1167.05 million units and villages so far electrified as on 31.03.2014 is 1618 revenue villages which constitutes 97.8% to the total inhabited revenue villages of the district.

h. Transport & Communication:

Railway route length (14-15) km	105.51
No of Rly stations and PH(14-15)	12
Forest road (17-18) km	449.54
National Highway (16-17) km	235.93
State Highway (17-18) km	186.13
Major district road (17-18) km	64.42
Other dist road (17-18) km	739.03
Rural road(17-18) km	1391.83
Inter village road (16-17) km	2093.93
Intra village road (16-17) km	2298.06

i. Health:

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

Sub divisional hospitals including mobile	4 No
Beds facilities	392 No
Homoeopathic dispensaries	16 No
Ayurvedic dispensaries	19 No

j. Tourist places:

There are 13 nos. of tourist center such as Angul, Banarpal, Bhimkand, Binikei, Bulajhar, Deulajhari, Tikarapada, Talchar, Handapa patrapada, Hingulapitha, khuladi, Rengali and Derjanga as identified by Department of Tourism and culture, Odisha. During 2015 the number of Domestic tourists were 758273 and foreign tourists were 241 who visited the tourists sports of the district.

k. Forest areas:

Category of forest	Area in sq km
Reserve Forest	1760.76
Unclassified Forest	1.15
Demarcated Protected Forest (DRF)	273.21
Undemarcated Protected Forest	11.99
Other forest under Revenue Dept	669.71
Total	2716.82

l. Education:

Primary School (2017-18)	No. of Schools	1004
	Enrolment (No)	111635
	Pupil Teacher Ratio	21.41
Upper Primary School 2017-18	No. of Schools	680
	Enrolment (No)	63888
	Pupil Teacher Ratio	19.82
Gerneral College 2017-18	Junior	43
	Degree	23
Secondary School	No. of Schools	282
	Enrolment (No)	36666
	Pupil Teacher Ratio	25.71
Literacy Rate, 2011	Male	86.0
	Female	68.6
	Total	77.5

m. 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. The number of fairs and festivals observed in the district showcase its varied culture vividly.

8. LAND UTILISATION PATTERN

Sl No	Landuse	Area in '000Ha
1	Forest Area	272
2	Misc. trees & Grooves	23
3	Permanent Pasture	36
4	Culturable Waste	19
5	Land put to Non Agril Use	28
6	Barren & Unculturable Land	17
7	Current Fallow	19
8	Other Fallow	17
9	Net Area Sown	197
10	Mining	10
	Geographical	638

9. PHYSIOGRAPHY

Physiographically the district can be divided into three regions :

(i) Northern Mountainous Region

(ii) Central Undulating Plain

(iii) Southern & South-western Mountainous Region.

Northern Mountainous Region: This region contains WNW – ESE trending hills immediately north of the Talcher coalfield and NW-SE trending hills towards the boundary of Keonjhar district which locally changes to E-W direction and form the Malayagiri hill, in the south of Pallahara. Malayagiri hill contains one of the loftiest peaks (1,187 m.a.m.s.l in Odisha. The hills and ridges are separated by broad valleys and low hilly areas. The heights above sea level of this region vary from about 76 meters on the bank of Brahmani river to 1,187 meters on Malayagiri peak. The high hills of this region are composed of Quartzites while the lesser hills are made of

Quartz-Mica schists, Granites and other rocks. The broad valleys are mostly underlain by gneissic rocks.

Central Undulating Plain: The Central part of the district is characterized by undulating plain. This region is covered by Talcher subdivision and northern parts of Angul and Athmalik subdivisions. The Brahmani valley portion of this region exposes mainly Granites and its variants and Gneisses with occasional hillocks of Khondalites, while the remaining part from west of Murhi and north of Angul up to the western end of the district is characterized by considerably flat country underlain by sedimentary rocks of Gondwana Group having large deposits of coal (Talcher Coalfield). The general slope of the area is from WNW-ESE.

Southern and South Western Mountainous Region: The Southern and South Western parts comprise of hill ranges trending WNW-ESE and is covered by the sub-divisions of Athmalik and Angul. The elevations vary from 60 to 971 meters above sea level. Banamadali peak in Angul Sub-division is 790 meter in height. In Athamallik Subdivision the main peaks are Panchadhara and Hingamandal hills. The southern & south western 11 hilly regions form the watershed between Brahmani and Mahanadi rivers.

10. RAINFALL

The district is generally hot with high humidity during April and May and cold during December and January. The monsoon generally breaks during the month of July and continues till end of October. The temperature goes as high as up to 45^0C in the summer and up to 7^0-8^0 C during peak winter.

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

Year/ Month	April	May	June	July	August	Sept	Oct	Nov	Dec	Jan	Feb	March	Total
15-16	37.04	39.93	218.86	343.29	224.64	142.20	16.38	0.23	31.85	0.63	24.98	42.59	1122.62
16-17	1.93	44.25	126.63	267.16	389.86	143.23	98.26	4.90	NIL	8.43	NIL	22.44	1107.09
17-18	1.23	35.76	201.05	213.38	213.05	143.69	109.87	16.90	NIL	NIL	NIL	0.10	935.03
18-19	74.34	80.10	123.42	333.20	299.31	295.03	114.29	2.70	50.95	0.40	27.00	24.60	1425.34
Avg.	28.63	50.01	167.49	289.25	281.72	181.04	84.70	6.18	20.70	2.36	13.00	22.43	1147.52

11. GEOLOGY AND MINERAL WEALTH

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 metasedimentaries of Gorumahasani Group constitute quartzite, gritty quartzite, 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. Metasedimentaries 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
		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
Archaean		Granitoids	Actinolite quartzite, tremolite - actinolite schist Augen gneiss, garnetiferous gneiss, biotite gneiss, migmatised khondalite Leptynite
	Eastern Ghat Supergroup	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

a. Detail of river/stream/other sand source- Sand mining in the district is confined to rivers like Mahanadi, Brahamani, Tikira and their tributaries.

b. Availability of sand or gravel or aggregate resources- sand- 54,57,650 cum (Please refer Annexure II), Gravel- Nil, Aggregate- Nil. This is the maximum volume of sand which can be quarried out from the sources of the district and has been calculated as 60% of the quantity derived by multiplying the area of the source with 3m thickness as the exact resource of sand is not possible to calculate due flowing water of last monsoon.

c. Detail of existing mining leases of sand and aggregates- For sand pl refer Annexure I. Aggregate- Nil

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

Detail of the potential of river sand of the district is submitted as Annexure II.

DFO (T)
Angul

Sub- Collector
Angul

Collector. Angul.

SAND SAIRATS ALREADY LEASED OUT AND EXECUTED IN THE DISTRICT

Sl. No.	Name of Tahasil	River or stream and Name of Village / date of Registration of lease deed	Status	Portion of the River or Stream leased for mineral concession (GPS co-ordinates or Khata& Plot No)(Sketch map to be attached)	Longitude			Latitude			Length of area leased for mineral concession (in km)	Average width of area leased for mineral concession (in km)	Area leased for mineral concession (in sq m)	Mineable mineral potential as per approved mining plan (in cum)	Production proposed in the mining plan (cum)				Y (R) Forms issued by the Tahasildar				Royalty (in Rs lakh) collected as Royalty			
					Degree	Minute	second	Degree	Minute	second					15-16	16-17	17-18	18-19	15-16	16-17	17-18	18-19	15-16	16-17	17-18	18-19
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Athamalick	Khadrapada Sand Quarry Vill:- Khadarapada / Date:- 26.07.2016	Running	Khata No. 33 plotNo.- 410 Area- 13.00	84	28	04.4	20	44	52.4	142.5	107.5	15318.75	15000	30000	30000	30000	30000	0	950	28500	19000	447555	209755	222124	2221224
2	Athamalick	Puleswar Ghat River Sand Quarry Vill:- Puleswar / Date :- 02.07.2016	Running	Khata No. 88 plotNo.- 307/318 Area- 20.00	84	30	59.8	20	42	31.3	130	25	3250	3000	6000	6000	6000	6000	0	200	200	150	6885353	1018538	1208588	1208588
3	Athamalick	Bankapal Sand	Runni	Khata No. 54	84	19	0.	20	51	96	107.5	45	4837.5	25221	50	50	50	50	0	50	65	20	52	35	47	47

		Quarry Vill:- Bankapal Date:- 24.01.2017	ng	plotNo.- 415 Area- 15.35			07			.3					38	40	43	47		0	0	0	8466	62626	08801	12001
4	Athamallick	Ghodamara River Sand Quarry / Date:- 02.07.2016	Running	Khata No. 840 plotNo.- 3359 Area- 17.00	84	32	07.1	20	41	49.0	144	14	2016	2600	5200	5200	5200	5200	0	100	150	100	5852525	9440405	11048809	11048809
5	Kishoren agar	stream Vill- Raniakata	Running	Khata No.52 Plot No. 522 & 1	20	53	13.2	84	26	14.6	0.720	0.0088	74179	6405	945	1120	1295	1470					8961.00	119821.00	--	--
6	Kishoren agar	stream Vill- Sanarohila	Running	Khata No.88 & 31 Plot No. 688/840, 244/834 & 374	20	53	42.7	84	26	18.7	1.03	0.0086	61189	20000	30000	35000	40000	45000					3256636.00	--	--	--
7	Pallahar	River- Samakoi Vill- Kunjam Date of Regn- 05.04.2017	Running	Khata No.187 Plot No. 1902, 1141(Sketch Map attached)	21	12	16.0	85	15	00.1	1.40	0.04	55037	6000	10000	11000	12000	13000	---	---	Yes	Yes	---	---	16525251	18064642
8	Pallahar	River- Samakoi Vill- Raipal, Jambua Date of Regn-	Running	Khata No.113, Plot No. 542/1399, 542(Raipal) , Khata	21	18	13.4	85	16	35.2	0.51	0.13	59246	1500	200	250	300	350	---	Yes	Yes	---	---	---	29554	35555	--

		20.09.2016		No.84 Plot No. 684(Jambua) (Sketch Map attached)																					
9	Talcher	Gopinathpur 19.09.2015	Running	Khata No. 83 Plot No. 100/343	20	56	150	85	14	28.7	0.600	0.300	91054.350	38187.000	94125.500	82955.500	1042121.000	572255.500	32.000	27.000	35.000	19.000	19598667.000	16000000.000	65000000.000	45516168.000
10	Talcher	Dhobapal 23.9.15	Running	Khata No. 22 Plot No. 181/186	85	14	153	20	55	12.8	0.300	0.200	72843.480	71338.000	270000 cum	270000 cum	56779.000	56700.000	90.000	90.000	19.000	19.000	18155554.000	8020000.000	49898977.000	49902626.000
11	Talcher	Nizgarhzami dt.23.09.15	Running	Khata No. 446 Plot No. 3695	85	14	153	20	55	12.8	0.600	0.280	100564.000	70005.000	140001.000	140001.000	140001.000	140001.000	47.000	47.000	47.000	47.000	64124.000	63546.000	84513.000	87417.000
12	Talcher	Sirigida	Running	khata No.142 Plot No.1791	85	13	19.6	20	0	45.9			72845	17813.000	3528.000	3550.000	3561.000	3584.000	12.000	12.000	12.000	12.000	3073.070	3197.990	3423.190	3633.520

																						00	00	00	00
13	Talcher	Santhapada	Running	khata No.480Plot No.4198	85	14	11.15	20	55	07.73	0.550	0.170	72843.480	102851.000	34900.000	35000.000	10904.000	10997.000	116.000	116.000	37.000	37.000	4935728.000	2135474.000	1405888.000	1420775.000
14	Talcher	Haturipal	Running	khata No.39 Plot No.01	85	15	20.10	20	53	24.36	0.450	0.320	107241.800	60000.000	12000.000	12000.000	12000.000	12000.000	40.000	40.000	40.000	40.000	1306664.000	1414443.000	1091448.000	1096652.000
15	Talcher	Dasanali	Running	khata No.46 Plot No.298/1101	85	14	27.47	20	53	42.65	0.360	0.200	72843.480	21500.000	NA	NA	4100.000	4200.000	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
16	Talcher	Santhapada	Running	khata No.480 Plot No.4198(P)	85	14	11.15	20	55	07.73	0.480	0.270	113312.000	18900.000	NA	3600.000	3750.000	3750.000	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
17	Talcher	Kankili	Non-working	khata No.778 Plot No.7446/8031	85	15	18.87	20	58	55.93	-	-	72843.480	5000.000	NA	1000.000	1000.000	1000.000	Nil	Nil	Nil	Nil	Nil	357735.00	Nil	Nil

18	Talcher	Jadiamba	Non-working	khata No.35 Plot No.01	20	53	39.6	85	14	48.9	-	-	105218.360	52100.000	NA	104000.000	106000.000	105000.000	Nil	Nil	Nil	Nil	Nil	0 5695 581.000	Nil	Nil
19	Talcher	Banabaspu	Non-working	khata No.106 Plot No.61	85	02	220.0	20	59	15.3	-	-	69525.050	12500.000	250000.000	250000.000	250000.000	250000.000	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
20	Talcher	Baghabaspur	Non-working	khata No.53 Plot No.24	85	02	36.7	20	59	39.1	-	-	76285	12390.000	240000.000	245000.000	249000.000	250000.000	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
21	Talcher	Gopalprasad	Non-working	khata No.314Plot No.1440, 1441	85	01	48.3	21	58	27.4	-	-	72319	45591.000	742000.000	817171.000	900000.000	1000000.000	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
22	Kaniha	Tikira Takua dt.11.09.2015 (Takua Sand Quarry)	Running	K. No. 99 Plot No. 2207	21	06	57.37	85	02	51.44	0.250	0.200	87600	71638	21616	22542	22941	21561	36033	37577	38223	35994	21.610886	21.493800	21.874225	20.558422
23	Kaniha	Tikira Khajuria dt.31.08.2015	Running	K. No. 59 Plot No. 1000	21	08	0.15	85	01	36.1	1.140	0.07	60700	95328	21646	21446	22000	21224	36100	35777	36667	35440	7.14	8.24	7.770	7.743

		(Khajuria Sand Quarry)								1					0	2	0	0					780	575	000	400
24	Kaniha	Tikira Derenga dt.31.08. 2015 (Derenga Sand Quarry)	Running	K. No. 59 Plot No. 1000	21	08	0.15	85	01	29.94	0.6	0.1	60700	79788	2000	1988	2000	1988	333	332	333	332	2.78400	3.81940	3.48495	3.42090
25	Kaniha	SingidaRutubhuin Dt.31.08. 2015 (Rutubhuin Sand Quarry)	Running	K. No. 111 Plot No. 1/374	21	02	46.25	85	04	52.339	0.7	0.04	20800	20502	18142	17608	17946	17290	3024	2935	2991	2881	7.147780	8.37260	8.49743	8.22140
26	Kaniha	Brahmani Dangarabeda Dt.31.08. 2015 (Dangarbeda Sand Quarry)	Running	K. No. 106 Plot No. 1184/1	21	04	44.4	85	08	31.38	0.13	0.1	8100	6406	2000	1988	2000	1988	334	331	334	331	1.14700	1.14012	1.14700	1.14012

Annexure-II

POTENTIAL OF SAND SAIRATS IN THE DISTRICT

Sl. No.	Name of Tahasil	Status	River or stream and Name of Village / date of Registration of lease deed	Portion of the River or Stream recommended for mineral concession (GPS co-ordinates or Khata& Plot No)(Sketch map to be attached)	Longitude			Latitude			Length of area recommended for mineral concession (in km)	Average width of area recommended for mineral concession (in km)	Area recommended for mineral concession (in sq m)	Maximum Mineable sand (in cum) (60% of total potential)
					Degree	Minute	Second	Degree	Minute	Second				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Athamallick	Running	Khadrapada Sand Quarry Vill:-Khadarapada / Date:-26.07.2016	Khata No. 33 plotNo.-410 Area- 13.00	84	28	04.4	20	44	52.4	142.5	107.5	52610.2792	94699
2	Athamallick	Running	PulseswarGhat River	Khata No. 88 plotNo.-307/318 Area- 20.00	84	30	59.8	20	42	31.3	130	25	80938.8911	145690

			Sand Quarry Vill:- Pulesswar / Date :- 02.07.2016											
3	Athamallick	Running	Bankapal Sand Quarry Vill:- Bankapal Date:- 24.01.2017	Khata No. 54 plotNo.- 415 Area- 15.35	84	19	0.07	20	51	96.3	107.5	45	62120.5989	111817
4	Athamallick	Running	Ghodamara River Sand Quarry / Date:- 02.07.2016	Khata No. 840 plotNo.- 3359 Area- 17.00	84	32	07.1	20	41	49.0	144	14	68798.0575	123837
5	Athamallik	New	Khadarapada Mahanadi sand Quarry	Khata No. 33 plotNo.- 410 Area- 13.00	84	28	06.29	20	40	50.45	142.5	107.5	52610.2792	94699
6	Athamallik	New	Pulesswar Mahanadi	Khata No. 88 plotNo.- 307/318 Area- 20.00	20	42	34.1	84	30	57.0	130	25	80938.8911	145690

			sand Quarry											
7	Athamallik	New	Bankapal Mahanadi sand Quarry	Khata No. 54 plotNo.- 415 Area- 15.35	84	18	18.45	20	51	21.77	107.5	45	62120.5989	111817
8	Athamallik	New	Kaintragarh Mahanadi sand Quarry	Khata No. 840 plotNo.- 3359 Area- 17.00	84	32	39.22	20	41	54.31	144	14	68798.0575	123837
9	Kishorenagar	Running	stream Vill- Ranikata	Khata No.51 Plot No. 1 Ac 14.05	20	53	13.2	84	26	14.6	0.720	0.0088	56859.571	102347
10	Kishorenagar	Running	stream Vill- Sanarohila	Khata No.88 & 31 Plot No. 688/840, 244/834 & 374 Ac 15.12	20	53	42.7	84	26	18.7	1.03	0.0086	61189.8017	110142
11	Pallahar	Running	River - Samakoi Vill- Kunjam Date	Khata No.187 Plot No. 1902, 1141(Sketch Map attached)	21	12	16.0	85	15	00.1	1.40	0.04	55037	99067

			of Regn - 05.04 .2017											
12	Pallahar	Running	River - Samakoi Vill-Raipal, Jambua Date of Regn - 20.09 .2016	Khata No.113, Plot No. 542/1399, 542(Raipal) , Khata No.84 Plot No. 684(Jambua) (Sketch Map attached)	21	18	13.4	85	16	35.2	0.51	0.13	59246	106643
13	Talcher	Running	Gopinathpur 19.09 .2015	Khata No. 83 Plot No. 100/343	20	56	15.0	85	14	28.7	0.600	0.300	91054.350	163898
14	Talcher	Running	Dhobapal 23.9.15	Khata No. 22 Plot No. 181/186	85	14	15.3	20	55	12.8	0.300	0.200	72843.480	131118
15	Talcher	Running	Nizgarhzami dt.23.09.15	Khata No. 446 Plot No. 3695	85	14	15.3	20	55	12.8	0.600	0.280	100564.000	181015
16	Talcher	Running	Sirigida	khata No.142 Plot No.1791	85	13	19.6	20	0	45.9			20502	36903
17	Talcher	Running	Santhapada	khata No.480Plot No.4198	85	14	11.15	20	55	07.73	0.550	0.170	72843.480	131118

18	Talcher	Running	Haturipal	khata No.39 Plot No.01	85	15	20.10	20	53	24.36	0.450	0.320	107241.800	193035
19	Talcher	Running	Dasanali	khata No.46 Plot No.298/1101	85	14	27.47	20	53	42.65	0.360	0.200	72843.480	131118
20	Talcher	Running	Santhapada	khata No.480 Plot No.4198(P)	85	14	11.15	20	55	07.73	0.480	0.270	113312.000	203962
21	Talcher	Non-working	Kankili	khata No.778 Plot No.7446/8031	85	15	18.87	20	58	55.93	-	-	72843.480	131118
22	Talcher	Non-working	Jadiamba	khata No.35 Plot No.01	20	53	39.6	85	14	48.9	-	-	105218.360	189393
23	Talcher	Non-working	Banabaspu	khata No.106 Plot No.61	85	02	22.0	20	59	15.3	-	-	69525.050	125145
24	Talcher	Non-working	Baghabaspur	khata No.53 Plot No.24	85	02	36.7	20	59	39.1	-	-	91054.350	163898
25	Talcher	Non-working	Gopalprasad	khata No.314Plot No.1440, 1441	85	01	48.3	21	58	27.4	-	-	38040.480	68473
26	Kaniha	Non-working	Demphanala (Santaribida Sandquarr	Khata No. 241, Plot No. 2091	21	02	22.1	85	03	20.1	0.32	0.14	52600	94680

			y)											
27	Kaniha	Non-working	Tikira (TolakabedaSand Quarry)	KHATA No. 111, Plot No. 1,1/3247	21	06	22.82	85	03	53.09	0.060	0.040	50500	90900
28	Kaniha	Non-working	Brahamani (Bajrakote Sand Quarry)	Khata No-519, Plot No- 2402	21	12	25.6	85	13	30.2	0.02	0.3	54600	98280
29	Kaniha	Non-working	Brahamani (Susuba Sand Quarry)	Khat No-240, Plot No-2434/2752	21	13	43.59	85	03	21.67	0.18	0.1	50500	90900
30	Kaniha	Non working	Somakoi (GauniGhasa Sand Quarry)	Khata No-273, Plot No- 3175	21	07	53.104	85	11	10.393	0.140	0.090	8090	14562
31	Kaniha	Non-working	Tikira (Gadasila Sand Quarry)	Khata No-306, Plot No-1 Ac.	21	06	14.4	85	05	23.7	0.6	0.08	54600	98280
32	Kaniha	Running	Tikira Takua	Lower Course 21°06'57.3	21	06	57.	85	02	51.	0.250	0.200	87600	157680

			dt.11.09.2015 (Takua Sand Quarry)	77"N to 21°07'15.352 N 85°02'30.820"E to 85°02'51.440"E K. No. 99 Plot No. 2207			37			44				
33	Kaniha	Running	Tikira Khajuria dt.31.08.2015 (Khajuria Sand Quarry)	Lower Course 21°08'0.15" N to 21°08'17.57" N 85°01'02.35 E to 85°01'36.11" E K. No. 59 Plot No. 1000	21	08	0.15	85	01	36.11	1.140	0.07	60700	109260
34	Kaniha	Running	Tikira Derenga dt.31.08.2015 (Derenga Sand Quarry)	Lower Course 21°08'0.15" N to 21°08'13.95"N 85°01'7.40" E to 85°1'29.94" E K. No. 59 Plot No. 1000	21	08	0.15	85	01	29.94	0.6	0.1	60700	109260
35	Kaniha	Running	SingidaRutbhuin Dt.31.08.2015	Lower Course 21°02'46.251"N to 21°03'00.856" N	21	02	46.25	85	06	52.33	0.7	0.04	20800	37440

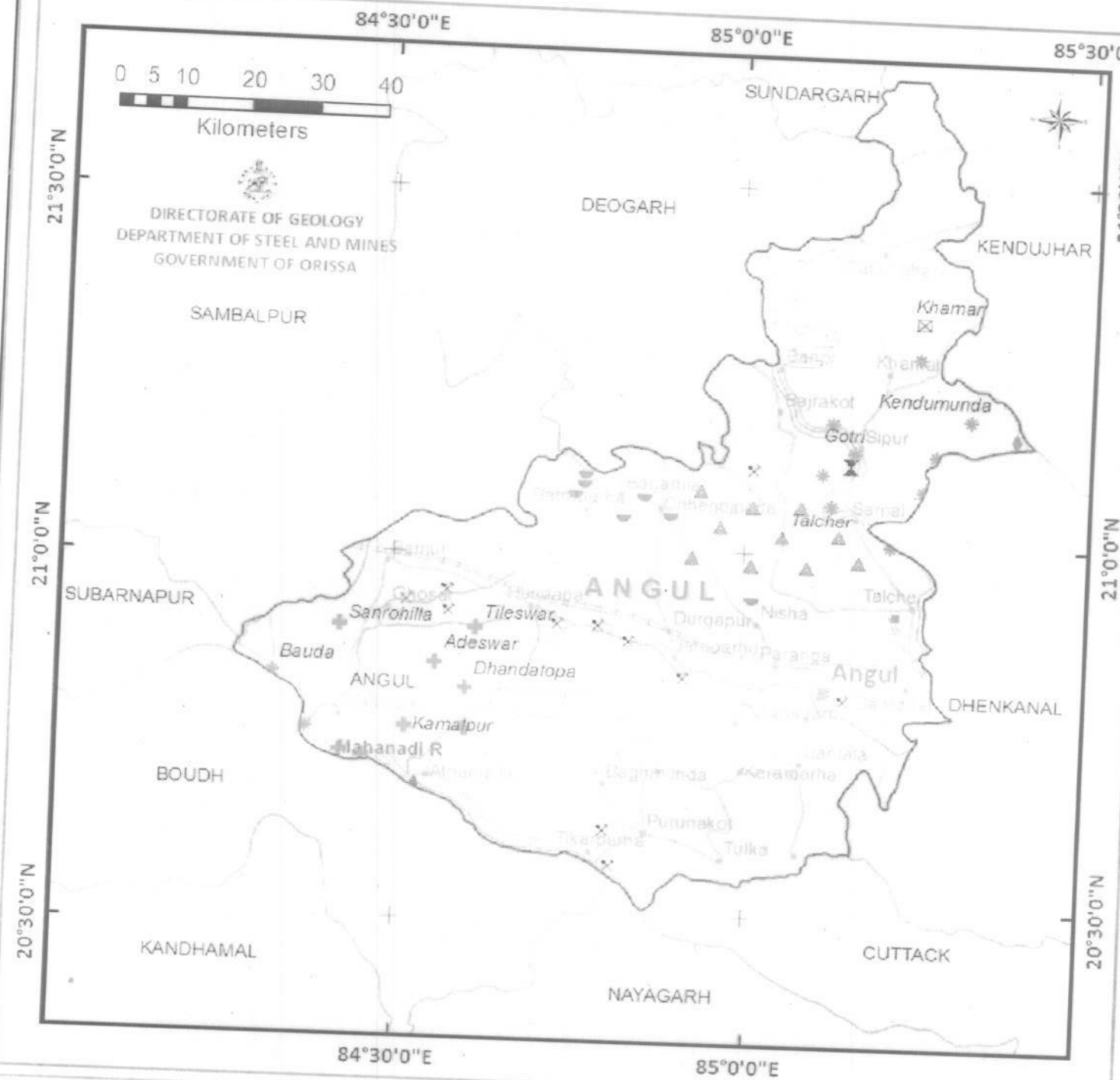
			(Rutubhuin Sand Quarry)	85°04'52.339" E to 85°05'13.882" E K. No. 111 Plot No. 1/374										
36	Kaniha	Running	Brahmani Dangarabeda Dt.31.08.2015 (Dangarbeda Sand Quarry)	Middle Course 21°04'44.404" N to 21°04'47.641" N 85°08'27.836" E to 85°08'31.383" E K. No. 106 Plot No. 1184/1	21	04	44.4	85	08	31.38	0.13	0.1	8100	14580
37	Kaniha	New	Tikira (Patakhman Sand Quarry New) 3.520 Hec	Lower Course 21°09'8.985"N 85°05'1.80"E Khta No 57 Plot No 941/1110 Ac. 8.70	21	05	56.7	85	03	08.5	0.7	0.0765	35208	63374
38	Kaniha	New	Bramhani (Denali Sand Quarry New) 5.263	Middle Course 21°23'5.9 N 85°04'6.33"E Khata no 132 Plot	21	14	05.4	85	02	45.1	0.15	0.36	52630	94734

			Hec	No. 2412 Ac.- 13.00										
39	Chhendipada	New	Tikira (Kampasala Sand Quarry)	Khata No. 323, Plot No-6901,5610 Area – 1.63 Ha, 18.5 Ha	84	56	21.87	21	09	05.62	1	0.08	50000	90000
40	Chhendipada	New	Tikira (Mandua Sand Quarry)	Khata No. 70, Plot No-2201 Area – 5.00 Ha,	21	09	25.9	84	59	24.6	0.700	0.18	50000	90000
41	Chhendipada	New	Ullani (Kankarpal sand quarry)	Khata No. 66, Plot No-1230, 1051 Area – 1.044Ha, 0.930Ha	21	06	44.9	84	56	30.8	1.16	0.048	19740	35532
42	Chhendipada	New	Aunli (Tangiri sand quarry)	-	84	50	09.0	21	08	23.0	0.6	0.12	50000	90000
43	Chhendipada	New	Aunli (Sarpal sand quarry)	-	83	48	41.6	21	08	21.4	0.88	0.63	50000	90000
44	Chhendipada	New	Mamurias ahinala(Mamurias ahi sand	-	84	51	29.5521	08	43.42		2.2	0.015	50000	90000

			quarry)											
45	Chhendipada	New	Chhendipada(Chhendipada sand quarry)	-	84	53	25.21	21	04	44.52	2.2	0.28	50000	90000
46	Chhendipada	New	Singada(Nuapada sand quarry)	-	84	52	23.6	21	08	56.8	2	0.028	50000	90000
47	Chhendipada	New	Singada(Barapada sand quarry)	-	84	54	14.0	20	59	36.2	0.72	0.096	50000	90000
48	Chhendipada	New	Singada(Golagadia sand quarry)	-	84	57	20.3	20	58	45.3	0.4	0.056	10885	19593
49	Chhendipada	New	Makundapur(Makundapur	-	85	02	08.3	20.51	48.5		0.7	0.022	15620	28116

			sand quarry											
50	Chhendipada	New	Singada(Chhotabereni sand quarry)	-	84	56	38.2	21	07	51.1	0.24	0.016	50000	90000
51	Chhendipada	New	Aunli (Raipal sand quarry)	-	84	47	03.4	21	08	05.0	0.68	0.104	50000	90000
52	Chhendipada	New	Aunli (Nuapada sand quarry)	-	84	51	15.7	20	59	31.6	0.32	0.185	50000	90000
53	Chhendipada	LOI issued	Tikira(Mandua sand quarry)	-	84	59	24.6	21	09	25.9	-	-	50000	90000

MINERAL MAP OF ANGUL DISTRICT



Legend

- District Boundary
- Village/ Town
- District headquarter
- Drainage
- National Highway
- Major Road
- Minor Road
- Railway
- Waterbody

Mineral Occurrence

- Coal
- Dimension Stone
- Gemstone
- Gold
- Graphite
- Fireclay

LEASE/POTENTIAL MAP OF MORRUM IN ANGUL DISTRICT