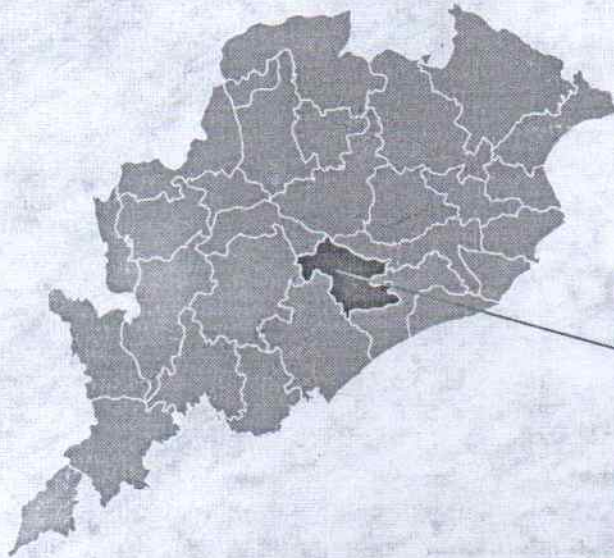




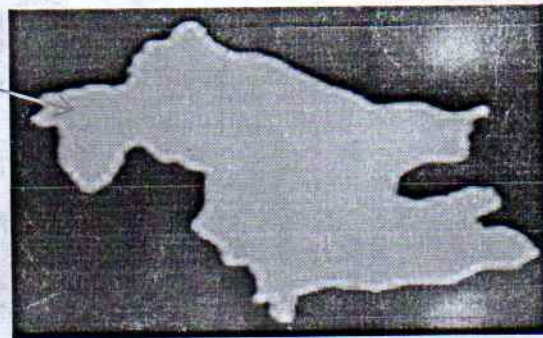
**DISTRICT SURVEY REPORT (DSR)
OF
NAYAGARH DISTRICT, ODISHA
FOR
QUARTZITE**

**(FOR PLANNING & EXPLOITING OF MINOR
MINERAL RESOURCES)**

ODISHA



NAYAGARH



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

COLLECTORATE, NAYAGARH

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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 decorative stone mining has been prepared in accordance with Clause II of Appendix X of the notification. Every effort has been made to cover decorative stone mining locations, future potential areas and overview of decorative stone 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.

1. INTRODUCTION

The Nayagarh district is located towards the west of Puri district surrounded by Cuttack district in the North, Phulbani district in the West, Ganjam district in the South and Khurda district in the East. It lies between 19°54' to 20°32' North latitude and between 84° 29' to 85° 27' East longitude. It has an average elevation of 178 meters (583 feet). This town has Rukhi mountain to the South and Balaram mountain in North. These mountains mitigated the effects of the 1999 Odisha Cyclone on Nayagarh. This district is situated in the hilly ranges in the West and its North Eastern part has formed a small well cultivated fertile valleys intersected by small streams. It's in the higher altitude than the sea level and above flood level. The River Mahanadi flows in the Eastern boundary.

From the history of Nayagarh district it reveals that the district was founded by Suryamani of Baghela dynasty who had come to Puri on a pilgrimage from "Rewa" of Madhya Pradesh. He had built his fort here and adopted Tiger Head as a state symbol. Ninth king of this dynasty "Bagel Singh" (1480-1510) shifted his capital to the district. As per his name this place was known as "Baghua Nayagarh". He was a Vaishnavite and is known to have made small

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singh*

Collector & Dist. Magistrate
NAYAGARH

Divisional Forester
Mahanadi Wildlife Division
Nayagarh

Asst. Conservator of Forest
Nayagarh Division

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Date
Sub-Collector

Sub-Collector
Nayagarh

icons of Shree Vighraha Chaturdha Murty and installed the deities in a mudaltar on the foot hill of Balarama for the first time in the history of Nayagarh district.

During the rule of 12th King of Nayagarh District, Raghunath Singh (1565–1595) had already captured Odisha and the king Mukunda Dev (1565) was defeated in Gohritikira and died. Taking advantage of the flaccid political situation, Raghunath Singh attacked Ranapur and captured Odgaon, Sarankul and Baunsiapara area from Ranapur estate and took control of the Nayagarh–Dasapalla border area from the King of Boudh and Sunamuhin area of Odgaon from the King of Ghumusar. He also captured a portion from Banpur.

Just before his death, the King Ragunath Singh divided his estate between his three sons. Harihar Singh got Nayagarh and Jadunath Singh got four Khandagrams (large area of land) which was known as Khandapara later. It was his heirs from here on that ruled Nayagarh until it was captured by the Britishers.

2. OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT.

As per Schedule-IV of OMMC Rules'2016, the Mining Officer, Cuttack is the competent authority of Specified Minor Minerals of the district. In Nayagarh district, there is existence of Decorative Stone from the Specified Minor Minerals. There are 2 nos. of Decorative Stone Mining Leases (ML) and one no. of Prospecting License (PL) of Decorative Stone. Out of the said 2 nos. of Mining Leases, one Mining Lease is in village Dimiritadi under Dasapalla Tahasil of Nayagarh district which has been executed in favour of Maa Chandeswari Granites over an area of 5.504 hecets. for a period of 30 years i.e. from 29.01.2018 to 28.01.2048 which has started its operation since January'2019 .

Another Mining Lease is in village Bhatagada under Dasapalla Tahasil of Nayagarh district which has been executed in favour of Maa Chandeswari Granites over an area of 15.766 hecets. for a period of 30 years i.e. from

13.11.2018 to 12.11.2048 in which mining operation has not been commenced till date.

There is also a Prospecting license in this district which is located at Kudabadi village over an area of 38.077 hecets granted in favour of SGS Mines & Industries Pvt. Ltd. for a period of 2 years i.e. from 14.02.2019 to 13.02.2021. The said Prospecting License is in active condition.

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

3. GENERAL PROFILE

a. Administrative set up:

Sl No	Item	Unit	Magnitude
1	Location		
	Longitude	Degree	84°29' to 85°27' East
	Latitude	Degree	19° 54' to 20°32' North
2	Geographical area	Sq.Km.	3890
3	Sub-division	Numbers	1
4	Tahasils	Numbers	8
5	C D Blocks	Numbers	8
6	Municipalities	Numbers	-
7	NACs	Numbers	5
8	Police Stations	Numbers	14
9	Gram Panchayats	Numbers	194
10	Villages	Numbers	1692
	Inhabited	Numbers	1541
	Uninhabited	Numbers	151
11	Assembly constituencies	Numbers	4

b. Area and Population:

The district has an area 3890 Sq. Km and 9.63 lakh of population as per 2011 Census. The district accounts for 2.50 percent of the State's territory and

shares 2.29 percent of the State population. The density of population in this district is 248 person Per Sq. Km as against 270 person Per Sq. km of the State. As per 2011 Census the Schedule Caste population was 136399 (14.20 %) and Schedule Tribe population was 58691 (6.10 %). The literacy percentage of the district covers 80.42 against 72.90 of the State. The decennial growth rate as per 2001-2011 was 11.40% as against 14.00% 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 5249.64 mm during last four years, which is much higher than the normal rainfall 1354.3 mm.

d. Agriculture:

During the year 2017-18 the net area sown was 119 thousand hectares against 5356 thousand hectares of the state. The production of was as below:

Name	Pad dy	Whe at	Maiz e	Mun g	Biri	Kulth i	Till	Grou ndnu t	Musta rd	Potato es	Jute	Suga rcan e
Producti on in 000 MT	189.56	0.19	12.85	24.50	6.89	2.87	0.64	1.70	0.71	2.40	0.00	106.04

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	5684	2307	1184	9175	44.48

e. Transport & Communication:

Railway route length (14-15) km	-
No of Rly stations and PH(14-15)	-
Forest road (17-18) km	370.11

National Highway (16-17) km	98.93
State Highway (17-18) km	92.62
Major district road (17-18) km	40.33
Other dist road (17-18) km	555.74
Rural road(17-18) km	648.71
Inter village road (16-17) km	2596.92
Intra village road (16-17) km	1784.83

f. Health:

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

Sub divisional hospitals including mobile	0 No
Beds facilities	650 No
Homoeopathic dispensaries	15 No
Ayurvedic dispensaries	20 No

g. Tourist places:

There are 8 nos. of tourist centres such as Nilamadhava (Kantilo), Baramul, Tarabalo, Raghunath Jew (Odagaon), Ladubaba (Sarankul), Nayagarh, Jamupatna, Maa Maninaga Devi (Ranapur), Deer Park (Near Kuanria Dam, Dasapalla), Kuturi, Udayapur, Gokulananda Ashram, Sidhamula Panchupalli pragana and Jogi-jogiani. During 2015 the numbers of Domestic tourists were 1371035 who visited the tourist spots of the district.

h. Forest areas:

Category of forest	Area in sq km
Reserve Forest	1301.99
Unclassified Forest	0.25
Demarcated Protected Forest (DRF)	188.03
Undemarcated Protected Forest	135.58
Other forest under	455.12

Revenue Dept	
Total	2080.97

i. Education:

Primary School (2017-18)	No. of Schools	762
	Enrolment (No)	71025
	Pupil Teacher Ratio	16.44
Upper Primary School 2017-18	No. of Schools	477
	Enrolment (No)	43867
	Pupil Teacher Ratio	16.87
General College 2017-18	Junior	41
	Degree	26
Secondary School	No. of Schools	245
	Enrolment (No)	30345
	Pupil Teacher Ratio	23.41
Literacy Rate, 2011	Male	88.2
	Female	72.0
	Total	80.4

j. Culture & Heritage:

The culture of Nayagarh is a composite culture of heterogeneous faiths, with the presence of a good number of Semitic and Islamic followers. The aboriginal 'Savaras' and Kandhas are the indigenous people of Nayagarh District. The Aryans came later. The Brahmins are mostly the outsiders, invited by the Khatriya rulers to be engaged as priests in the temples and for other holy rites. The archeological remains with their inscriptions, temples, churches, mosques, forts, folk dances, art, sculptures, handicrafts and festivals of this district displays its rich cultural heritage. In 2003, seven copper plates dating back to early 9th and 10th Century A.D were discovered while excavating an old well in the village Dhanchengada in Bhapur Block of Khandapara Assembly Constituency and they have inscriptions on them. The Somanth Temple complex at Govindpur near Nayagarh has also stone inscriptions.

The right side entrance door of Kaunri Thakurani and the front entrance door (inner side) of Beleswar Mahadev, have two inscriptions which are yet to be deciphered. Another inscription is found on the foot-post of Goddess Sita in

Raghunath Temple at Odagaon that reads "Shakabda Saramangalya Rutusya Odanayak".

Buddhist shrine at Anala Patta, Nilamadhaba Temple at Kantilo, Raghunath and Jagannath Temples throughout the District and other Vaishnavite, Shaiva and Shakta shrines are also the symbols of the art and culture of the District. Also are present many forts and buildings in this District that symbolizes its rich art and cultural heritage. The important folk dances of this District are Ghantakalasa (Similisaahi, Nayagarh), Danda Nrutya (Itamati), Dhena Koila (Similisaahi), Khanjani (Balugaon), Singi Baza (Daspalla), Dhumpa (Khandapara), Ghuduki (Ranapur), Dholamahuri (Lathipada), Paika Akhada (Lathipada, Olasa), Adivasi-Nritya (Banigochha) and Janu-Ghanta. Kantilo is famous for its brass works. It is to mention here that, Millennium Talent Cup, the first of this kind in the world has the distinction of becoming the world's tallest cup and was made by the Kansaries of Kantilo for Odisha Institute of Educational Research, Bhubaneswar. Kantilo is also famous for brass works.

Odagaon is famous for stone sculptures. It may be noted here that all most all the temple architects of Odisha hail from Odagaon. Govind Chandra Sur Deo of Nayagarh was an eminent mural painter. All the mural and wall paintings in the temple of Lord Jagannath at Nayagarh is his works. Khandapara is famous for jute handicrafts and Situlia communities of Gania are eminent sculptors of Terracotta. Ravanapodi at Daspalla, festival of Dakhinakali at Nayagarh, Shivaratri of Ladukeswar at Saranakul, Sriram Navamai at Odagaon, Pana Sanakranti, , Kantilo Mela and Car Festival at Nayagarh, Khandapara, Daspalla and Ranpur are the important festivals celebrated in this District. It needs special mention here that the Chariots of Lord Jagannath, Balabhadra and Subhadra of Ranpur are 2nd in height only next to the Chariots of Puri Car Festival.

4. GEOLOGY

In the district, the oldest rocks are represented by Eastern Ghat Supergroup of Archaean age. The Eastern Ghat Supergroup comprises of khondalites and charnockites (acid, intermediate and basic). Khondalites and charnockites occur as isolated residual hills throughout the district. Khondalite group of rocks comprise garnet-quartz-feldspar-graphite schist, gneiss, granetiferous and sillimanite quartzite and leptynite. Granite gneiss and biotite granite of Archaean age represent major country rock of the district. In the eastern part of the district, residual soil is widespread, while laterite occurs as patches in the southern part. A shear zone trending WNW-ESE, identified by the presence of mylonite and crushed zone stretches for 24 Km. along the southern bank of Mahanadi.

STRATIGRAPHY:

The geological succession in the district is as follows:

Age	Supergroup	Group	Litho
Pleistocene to Recent			Residual Soil
Cainozoic			Laterite
			Granite Gneiss/ Biotite Granite
	Eastern Ghat		Quartz Vein
		Charnockite	Charnockite (Acid & Intermediate)
Archaean			Charnockite (Basic)
		Khondalite	Quartz-Garnet- Sillimanite Gneiss/ Schist
			Leptynite

Minerals:

Graphite: Graphite deposits are located around Sanaperi, Gochhabari(Dungjastaila), Gochhabari(Makastaila) and Sanasilinga, Takara and Narachipara area of the district. The Fixed Carbon in these graphite deposits ranges from 7.83% to 16.4%.

Semiprecious stone: Occurrences of semiprecious stone are reported around Dimiripat, Malaspadar and Sagarbhanga area of the district.

Dimension and Decorative stone: Occurrences of Decorative & Dimension stone around Chaupalli, Mardarajpur, Khunta bandh, Singhpada, Khandapada, Sunamundhi, Kantilo, Laxmiprasad, Bebartapur, Malisahi, Bhandarparbat, Damasahi, Kabti hill and Kailama etc. are note worthy. A total resource of 2.2836 million cubic meter has been estimated in the district. Apart from this, Berhampur blue (Granetiferous granite gneiss) at Bhalumundia with recoverable reserve of 0.9 million cubic meter and multi colour granite (Granetiferous granite gneiss) at Bedangi with recoverable reserve of 0.108 million cubic meter has been reported in the district.

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.

The Mahanadi, Burtanga, Kaunria, Kamai, Budha nadi constitute the major drainage system of the district. The drainage is mainly dendritic, radial & centripetal in nature. Hot springs have been reported at Tarabalo near the village Nilakantha prasad. At Tarabalo, the patches of warm water (mud pool) in an elevated area cover about 1,500 Sq.m through which hot water oozes out. The temperature is about 57 degree centigrade and has a feebly sulphurous odour. The discharge is found to be 0.3 lps.

6. LANDUSE PATTERN

SI No	Landuse	Area in '000Ha
1	Forest Area	208
2	Misc. trees & Grooves	6
3	Permanent Pasture	4
4	Culturable Waste	5
5	Land put to Non Agril Use	25
6	Barren & Unculturable Land	5
7	Current Fallow	15
8	Other Fallow	1
9	Net Area Sown	119
10	Mining	1
	Geographical Area	389

7. SURFACE WATER & GROUND WATER SCENARIO

This district comes under eastern ghats climate and type of terrain is mostly undulating. As the terrain is undulated most of the rainfall flows as Surface run off to the river or nallas. Hence it is highly essential to promote extension activities relating to water harvesting and water management. Similarly, steps have to be taken for creation of major and medium Irrigation projects to make optimum utilisation of surface water.

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

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

Depth of water level (mbgl)/ Period	April	August	November	January
Minimum	1.08	0.5	0.7	1.0

Maximum	10.4	6.5	7.0	8.5
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8. RAINFALL & CLIMATIC CONDITION

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

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

Year/ Month	April	May	June	July	August	September	October	November	December	January	February	March	Total
2015-16	627.2	343	1248.7	1594.9	2141	2029.1	298.66	43.5	261.76	82.4	129.6	133.2	8932.97
2016-17	76.7	869.5	1158.4	2193.9	1859.8	2004.3	686.56	22.2	0	2	0	476.4	9349.68
2017-18	67.2	246.9	1063.5	2539.5	2038	1465	1453.2	395.71	9.8	0	0	0	9278.79
2018-19	483.3	852.8	809.85	3182.4	1505.4	2102.4	1875.9	0	394.1	37.1	238.3	0	11481.61
Average	156.80	578	535.05	1188.8	943.04	930.11	539.29	115.36	125.73	15.19	45.99	76.2	5249.64

9. DETAILS OF MINING LEASES

Two mining leases and one Prospecting License are active within the district for decorative stone. Details of these three concessions are as below:

Sl No	Name of the Concession	Type of concession (PL/ML/Composite)	Status (Running/Temp closed)	Name of the Concession holder	Village	Tahasil	Co-ordinates of all Boundary Points						Total Area (hect.)	Validity of concession	
							Latitude(N)			Longitude(E)				From	To
							Deg	Min	Sec	Deg	Min	Sec			
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Dimiradi	ML	Running	Maa Chand eswari Grants	Dimiradi	Daspalla	20 to 20	18 to 18	16.20 to 27.10	84 to 84	36 to 36	16.10 to 25.30	5.504	29.01.18	28.01.48
2	Bhatagada	ML	Mining Operation not yet Started	Maa Chand eswari Grants	Bhatagada	Daspalla							15.766	13.11.18	12.11.48
3	Kudubadi	PL	Running	SGS Mines & Industries Pct. Ltd.	Kudubadi	Daspalla	20 to 20	19 to 19	26.60 to 48.30	84 to 84	36 to 37	33.50 to 30.00	38.077	14.02.19	13.02.21

10. DETAILS OF ROYALTY COLLECTED

Sl. No.	Name of Concession Holder/ Village & Tahasil	FY	Collection of Royalty (Rs)	Collection of Other Revenue (Rs)	Production (Ton)
1	Maa Chandeswari Granties, Dimiritadi, Dasapalla	15-16	0	0	0
		16-17	0	0	0
		17-18	0	0	0
		18-19	478479	656114	158
		19-20			250

11. DETAILS OF PRODUCTION

Please refer the above table.

12. MINERAL MAP OF THE DISTRICT

Attached as Plate No 4.

13. LIST OF LOI HOLDERS ALONG WITH VALIDITY

Please refer the above table.

14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT

Total mineral reserve of decorative stone is 76,13,293 cum which may increase after detail investigation.

Details of the potential areas submitted as Annexure III.

15. QUALITY/GRADE OF MINERAL

The decorative stone of the district is hard, compact and of granitic variety and is capable of taking good polish. Normal colour is greyish white to bluish white.

16. USE OF MINERAL

Decorative stone after good polish is used for interior and exterior decoration of walls and floors of buildings and other constructions.

17. DEMAND & SUPPLY OF THE MINERAL

The tentative annual demand is to the tune of 1,00,000 cum of road metal and is mainly supplied mainly from Daspala tahasil of the district and adjoining district of Ganjam .

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

Attached as Plate No 5.

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

Not applicable.

20. DETAILS OF ECO-SENSITIVE AREA

Not applicable.

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

Activities attributed to Mining:-

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

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

Impact on Ambient Air

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

The major air pollutants due to mining activities include:-

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

Dust is the single air pollutant observed in the open cast mines. Diesel operating drilling machines, blasting and movement of machineries/ vehicles produce NOx , SO2 and CO emissions, usually at low levels. Dust can be of significant nuance surrounding land user and potential health risk in some circumstances.

Water Impact

Sometimes the mining operation leads to intersect the water table causing ground water depletion. Due to the interference with surface water sources like river, nallah etc drainage pattern of the area is altered.

Noise Impact

Noise pollution mainly due to operation of machineries and occasional plying of machineries. These actives will create noise pollution in the surrounding area.

Impact on Land environment

The topography of the area will change certain changes due to mining activity which may cause some alteration to the entire eco system.

Impact on Flora & Fauna

The impact on biodiversity is difficult to quantify because of it's diverse and dynamic characteristics.

Mining activities generally result in the deforestation, land degradation, water, air and noise pollution which directly or indirectly affect the faunal and flora status of the project area.

However, occurrence and magnitude of these impacts are entirely dependent upon the project location, mode of operation and technology involved.

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

Air

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

- Dust generation shall be reduced by using sharp teeth of shovels.
- Wet drilling shall be carried out to contain the dust particles.
- Controlled blasting techniques shall be adopted.
- Water 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 are to be covered with tarpaulin.
- The mine pit water can be utilized for dust suppression in and around mine area.
- Information on wind direction and meteorology are to be considered during planning, so that pollutants, which cannot be fully suppressed by engineering techniques, will be prevented from reaching the nearby agricultural land, if any.
- Comprehensive greenbelt around overburden dumps and periphery of the mining projects/clusters has to be carried out to reduce to fugitive dust transmission from the project area in order to create clean & healthy environment.

Water

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

- The mined out pits shall be converted in to the water reservoir at the end of mine life. This will help in recharging ground water table by acting as a water harvesting structure.
- Periodic analysis of mine pit water and ground water quality in nearby villages are to be undertaken.
- Domestic sewage from site office & urinals/latrines provided within ML/QL areas is to be discharged in septic tank followed by soak pits.

NOISE

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

Biological Environment

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

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

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

1. If, substantial amount of waste is there, the exhausted quarry can be fully or partly backfilled using the stored waste. The backfilled areas are to be brought under plantation of local species.
2. If the generation of waste is much less as in the case of minor mineral mining, the exhausted quarries can be reclaimed by
 - a. Plantation on the broken up surface if the depth of quarry is not much below the surrounding surface level.
 - b. Converted to water reservoir after stabilization of the slopes if the exhausted quarry continues much below the surrounding surface level. It is preferred to cordon the water reservoir either through wire fencing or retaining wall with plantation from the safety point of view.

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

24. RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

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

The disaster management plan (DMP) is supposed to 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 salvage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated through rehearsal/induction conducted by the respective department from time to time .

General responsibilities of employees' during an emergency:

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

Co-ordination with local authorities:

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

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

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 fulfil 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. 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 equipments 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 fire fighting equipments.

Details of occupational health issues in the district since last 5 years.

There is no case of Silicosis found in the district within the last five years.

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

As most of the minor mineral mines/quarries of the district are yet to be exhausted of their mineral content no sort of reclamation measures including plantation has been undertaken excluding gap plantation of local species in the peripheral safety zones of the quarries/ clusters and in some of the haul roads.

27. ANY OTHER INFORMATION

Nil

Aruna Kalyan
Shrinika

Collector & Dist. Magistrate
NAYAGARH

[Signature]
Asst. Conservator of Forest
Nayagarh Division

[Signature]
Divisional Forests Officer
Mahanadi Wildlife Division
Nayagarh.

[Signature]
Sub-Collector
Nayagarh

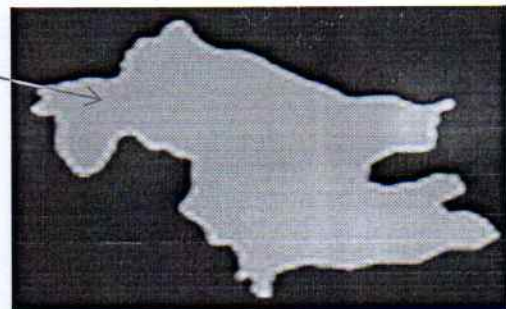
INDEX MAP



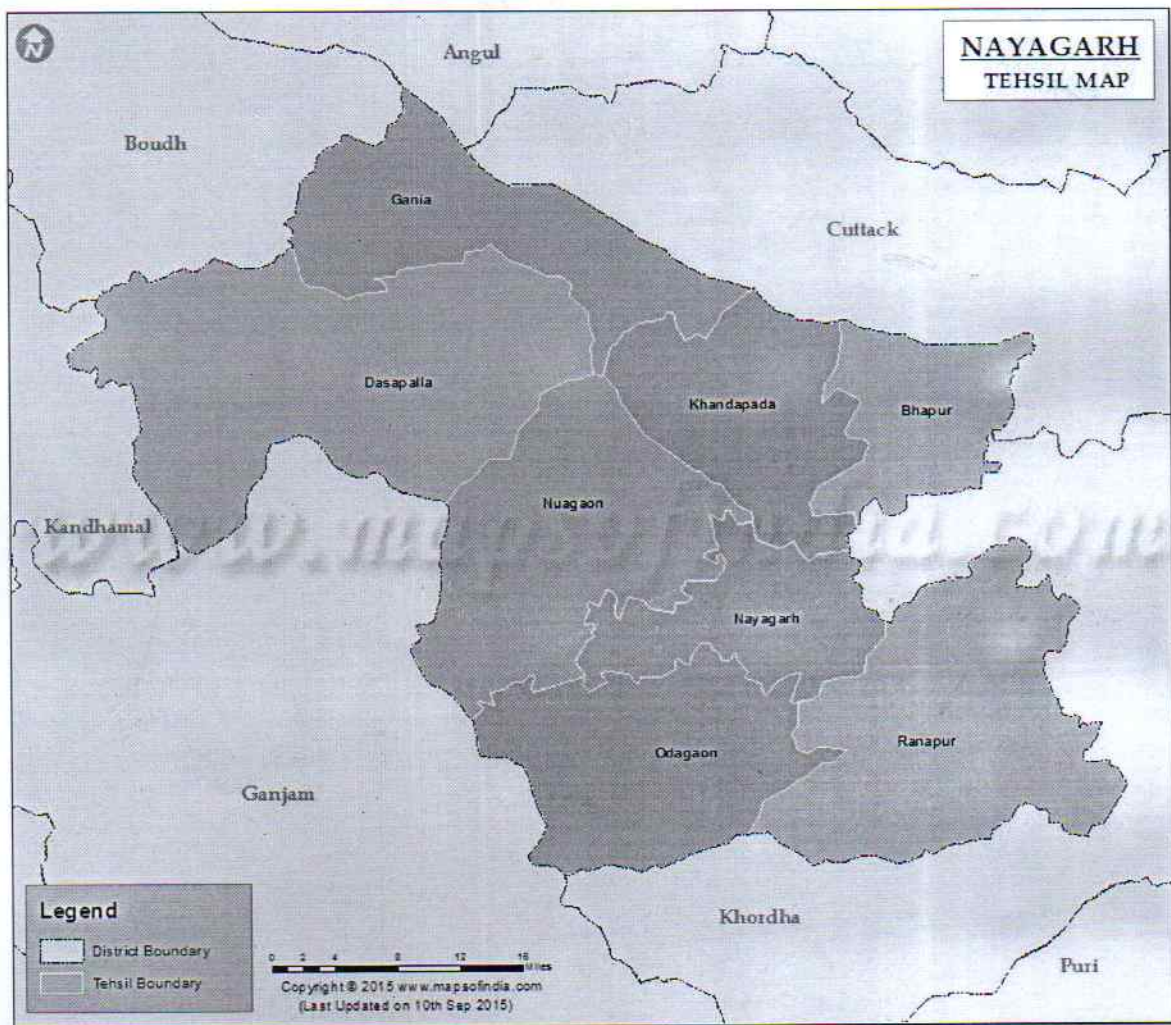
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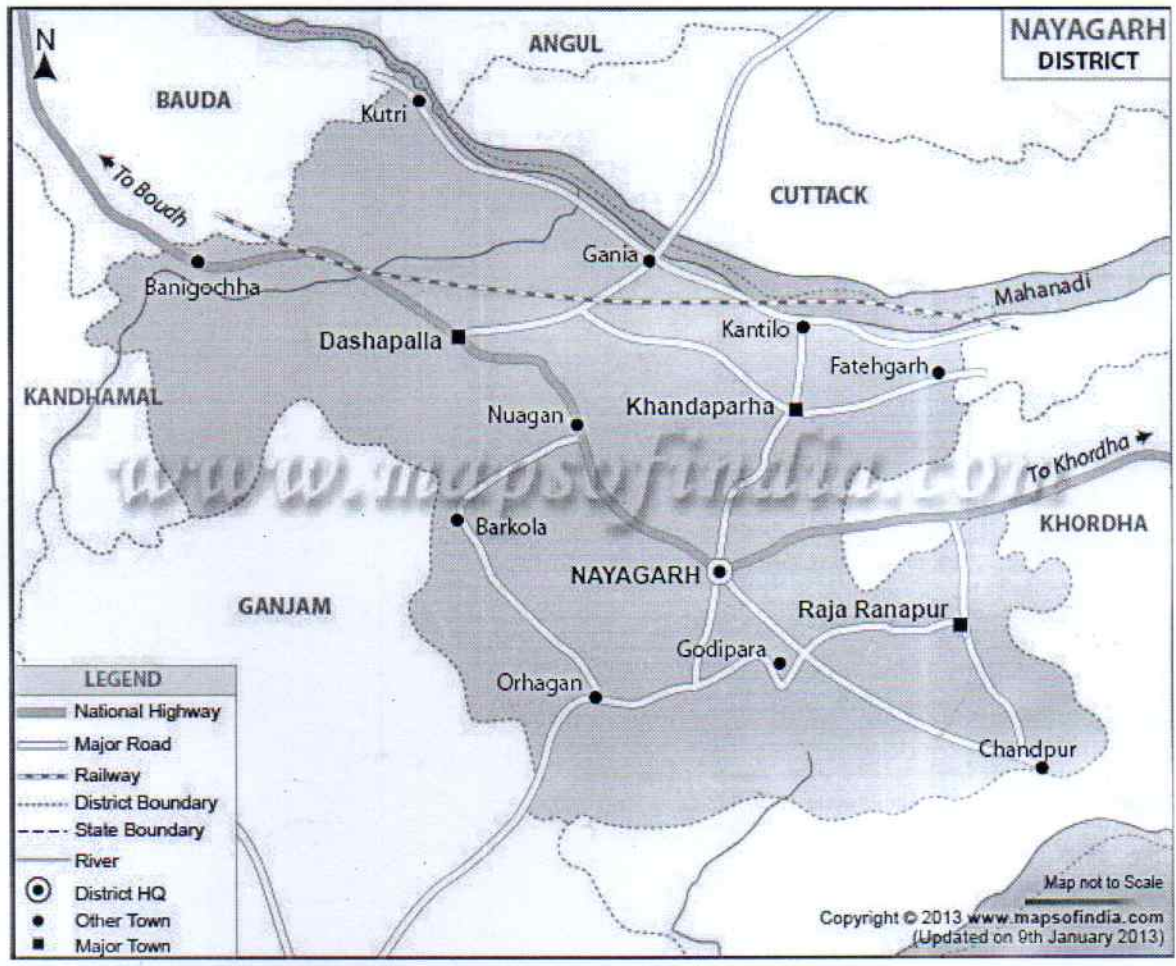
NAYAGARH



MAP SHOWING THE TAHASILS OF NAYAGARH DISTRICT



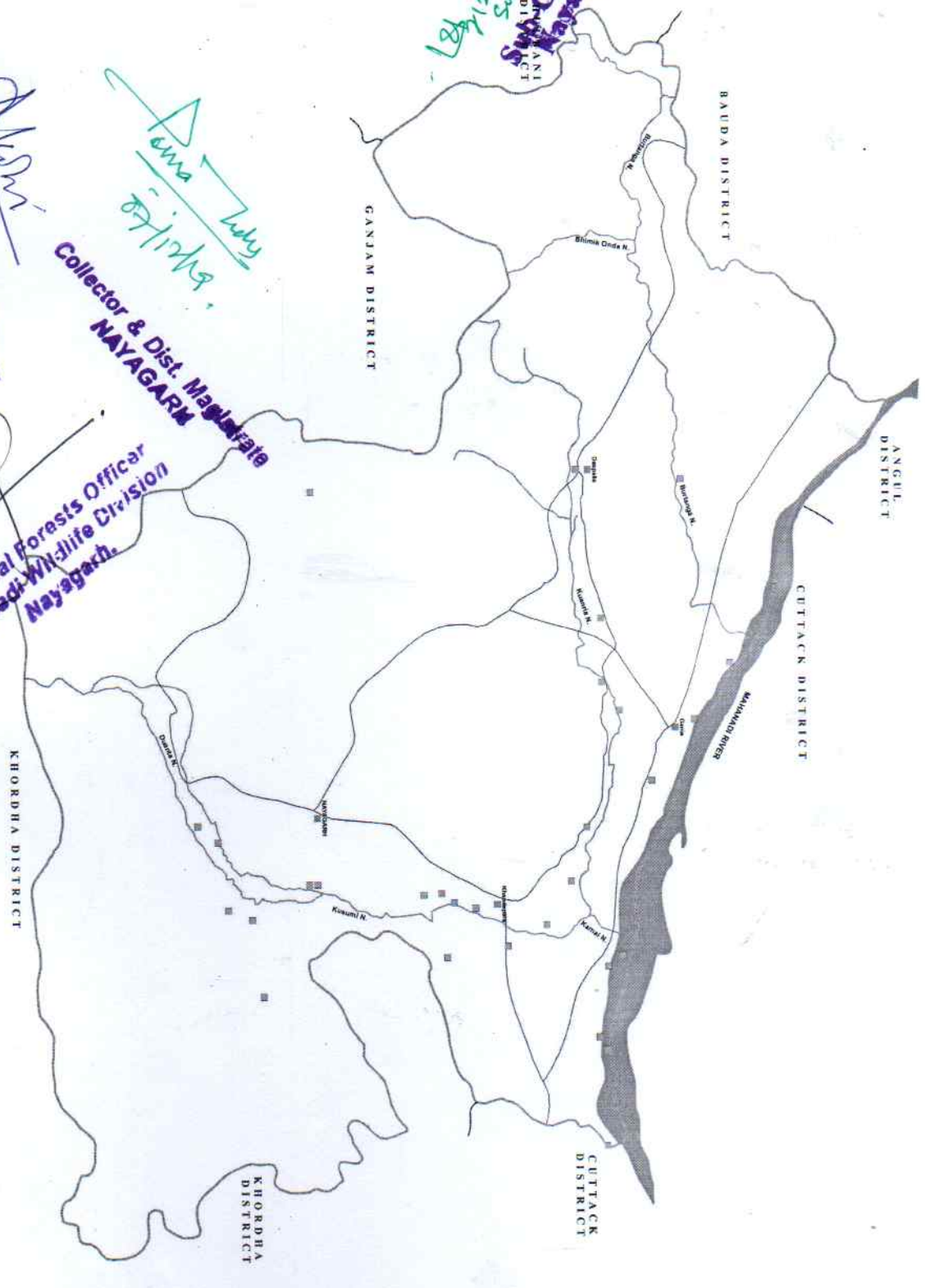
MAP SHOWING THE MAJOR ROADS OF NAYAGARH DISTRICT



LEASE/POTENTIAL MAP OF SAND IN NAYAGARH DISTRICT



PLATE NO.6



Legend

●	Block Headquarters
—	District Boundary
—	NH Road / SH Road/State District Road
—	River/Lake/Waterbody
■	Lease/Potential Area for Sand

Amma July
Officer
Collector & Dist. Magistrate
NAYAGARH

Amma
Asst. Conservator of Forest
Nayagarh Division

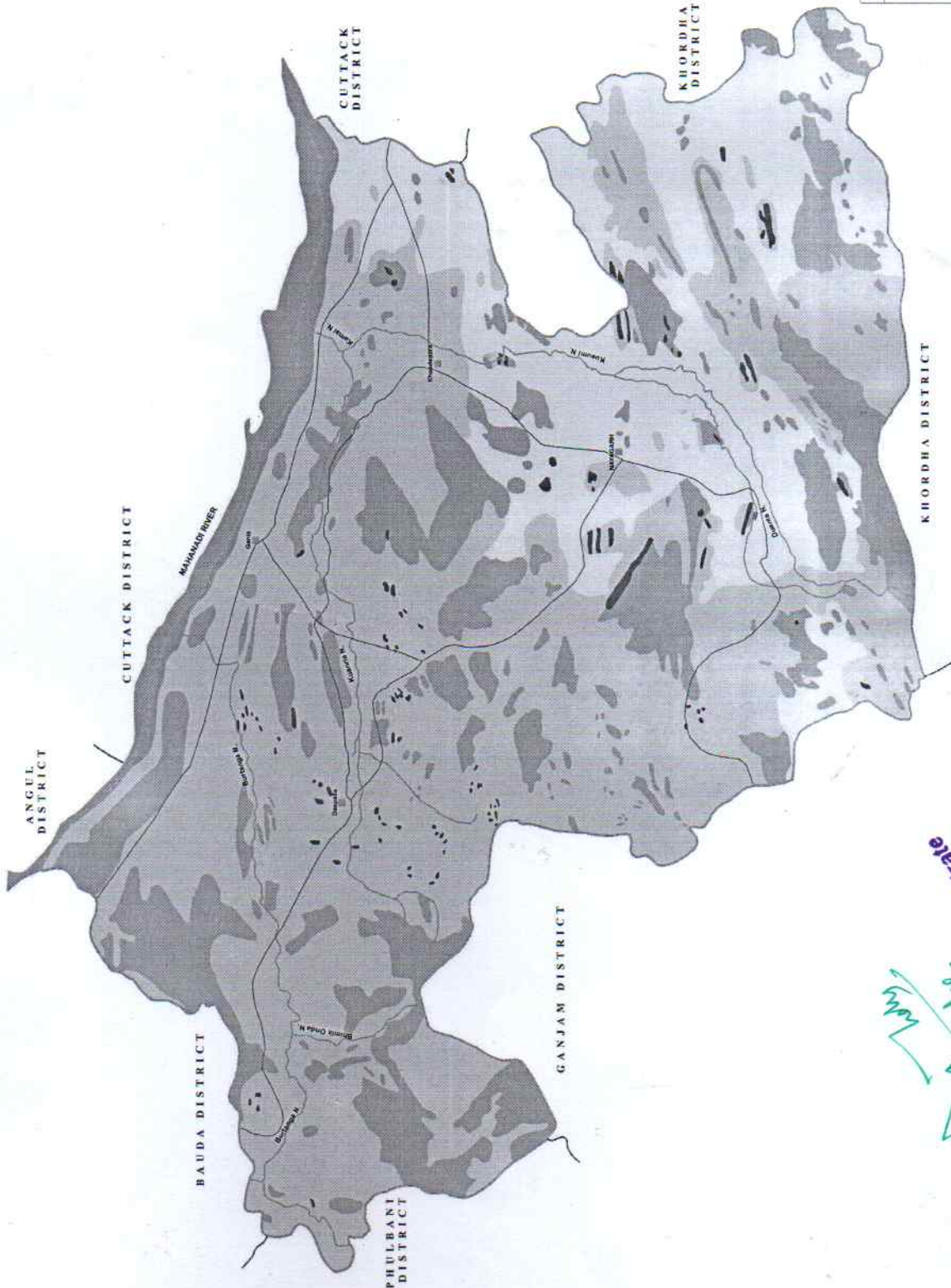
Amma
Divisional Forests Officer
Mahanadi Wildlife Division
Nayagarh.

18/7/2017
Sunil Kumar
Sunil Kumar
Collector
Nayagarh

MINERAL MAP OF NAYAGARH DISTRICT

SCALE 1:50,000

PLATE NO-4



Legend

- Black Headquarter
- District Boundary
- NH Road / SH Road/Major District Road
- Power Lines/Waterbody
- Residual soil
- Laterite
- Grains gneiss/ biotite granite
- Quartz vein
- Charnokite (old & intermediate)
- Charnokite (basic)
- Quartz garnet sillimentite greasy schist
- Lepidolite

Ambar Mohanty
Officer
Collector & Dist. Magistrate
NAYAGARH