



DISTRICT SURVEY REPORT (DSR) OF BARGARH DISTRICT, ODISHA ON MORRUM MINING

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



**DISTRICT ADMINISTRATION
BARGARH, ODISHA**

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18/6/2020

Sub-Collector
BARGARH

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18/6/2020

Addl. Dist. Magistrate

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18/6/2020

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0. PREFACE

The Erstwhile Ministry of Environment and Forests(MoEF), (The Government of India, made Environmental Clearance (EC) for mining of minerals mandatory through its Notification of 27th January, 1994 under the provisions of Environment Protection Act, 1986. Keeping in view the experience gained in environmental clearance process over a period of one decade, the Ministry came out with Environmental Impact Notification, SO 1533 (E), dated 14th September 2006. The Ministry of Environment, Forests & Climate Change (MoEF&CC), Government of India had amended the said vide notification S.O. 141(E) Dated 15th January, 2016. Now again Ministry of Environment, Forests & Climate Change (MoEF&CC), Government of India amended the notification S.O. 141(E) Dated 15th January, 2016 vide S.O. 3611(E) Dated 25th July, 2018. It has been made mandatory to obtain environmental clearance for different kinds of development projects as listed in Appendix-X of the Notification.

Further, in pursuance to the order of Hon'ble Supreme Court dated the 27th February, 2012 in I.A. No.12- 13 of 2011 in Special Leave Petition (C) No.19628-19629 of 2009, in the matter of Deepak Kumar etc. Vs. State of Haryana and Others etc., prior environmental clearance has now become mandatory for mining of minor minerals irrespective of the area of mining lease; And also in view of the Hon'ble National Green Tribunal, order dated the 13th January, 2015 in the matter regarding sand mining has directed for making a policy on environmental clearance for mining leases in cluster for minor Minerals, The Ministry of Environment, Forest and Climate Change in consultation with State governments has prepared Guidelines on Sustainable Sand Mining detailing the provisions on environmental clearance for cluster, creation of District Environment Impact Assessment Authority(DEIAA) and proper monitoring of minor mineral mining using information technology and information


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technology enabled services to track the mined out material from source to destination.

The DEIAA and DEAC will scrutinize and recommend the prior environmental clearance of mining of minor minerals on the basis of District Survey Report. This will be a model and guiding document which is a compendium of available mineral resources, geographical set up, environmental and ecological set up of the district and replenishment of minerals and is based on data of various departments, published reports, journals and websites.

The District Survey Report (DSR) shall form the basis for application for environment clearance, preparation of reports and appraisal of projects. The Report will be updated every five years.

Accordingly, a survey has been carried out by the **District Level Environment Impact Assessment Authority (DEIAA), Bargarh** with the assistance of Geology and Mining Department and involvement all other related Departments like Revenue Department, Irrigation Department, Forest Department, etc. in the district as per the MoEF, New Delhi, notification S.O. 141(E) dated 15th January 2016 to prepare the District survey Report (DSR) of Bargarh District (For Morrum) in the year 2019. District Survey Report of **Morum** mining has been prepared in accordance with *Clause-II of Appendix X* of the said notification.

OBJECTIVES

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

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

District Survey Report (Stone) Bargarh, Odisha 2 | Page


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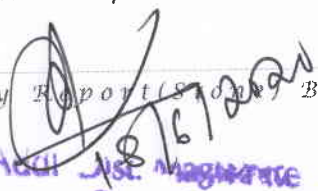

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01. INTRODUCTION.

Bargarh is a district on the Western border of Orissa. Prior to 1992, it was a subdivision of Sambalpur district. Bargarh District formed on the 1st April 1993 being divided from Sambalpur District. It is one of the illustrious District of Odisha. Bargarh has been named after the headquarters town Bargarh situated on the left bank of the Jirariver. The town is on the National Highway No.6 and located at 59 km to the west of Sambalpur district. It is also served by the D.B.K railway running from Jharsuguda to Titlagarh. The railway station is about 3 kms off the town. A meter gauge railway line connects Bargarh with the lime stone quarry at Dunguri. The main Hirakud canal passes through the town and is known as the Bargarh canal. Bargarh District lies on the western most corner of Odisha between 20 degree 43' to 21 degree 41' north latitude and 82 degree 39' to 83 degree 58' east longitude. The District is surrounded by Chhatisgarh state on the north, Sambalpur District on the east, Balangir and Subarnapur on the south and Nuapada District on the west. The original name of the place was Baghar Kota as known from the inscription of the 11th century AD. It was called Bargarh probably from the time of Balaram Dev the first Chouhan Raja of Sambalpur who made it his head quarters for some time and constructed a big fort for it's protection. Narayan Singh the last Chouhan Raja granted this place in Mauzi (free hold) to two Brahmin brothers Krushna Das and Narayan Das, sons of Baluki Das who was killed in action by the Gond rebels led by Bandhy Ray and Mahapatra Ray. The grant is popularly known as Sira-kata(head-cutting) grant. To know the history of the newly formed Bargarh district one cannot ignore the history of undivided Sambalpur district, because Bargarh was one of the subdivisions of old Sambalpur district. This district lies at the close proximity of Sambalpur subdivision separated by the Mahanadi river. The Chouhans, were the most powerful and ruled over a cluster of 18 states in western Orissa and eastern part of Madhya Pradesh. The Chauhan states which crumbled by the British Imperialism, lapsed to the East India Company in 1849 when the last Raja Narayan Singh died without any issue. The Principal Assistant of the British Agent


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for the south east frontier having his headquarters at Ranchi took over the rein of administration of these states. Prior to 1905, Sambalpur and Bargarh sub-divisions were part of present Chhatisgarh state (erstwhile Central province). In 1936, separate province of Orissa was formed. In the year 1948, the ex-state areas of Bamra and Rairakhol were added to the district of Sambalpur. In the year 1969 a new sub-division, Padmapur was created constituting the areas of Bijepur, Gaisilet, Jagadalpur, Melchhamunda, Padmapur, Paikamal and Sohela Police Stations of old Bargarh sub-division. Keeping the smooth administration and effective implementation of developmental programmes in view, 13 districts of Orissa were divided into 30 districts in the years 1992, 1993 and 1994. By this process, the erstwhile Sambalpur district was divided into four districts namely Sambalpur, Jharsuguda, Bargarh and Debagarh. Bargarh district was carved out taking the areas of two sub-divisions, namely, Bargarh and Padmapur from the erstwhile district of Sambalpur as per the Government of Orissa Notification No.14218/R. dated 27.03.1993. The area of Sambalpur district was 17516.00 sq.km as per the 1991 Census and that of Bargarh was 5831.57 sq.km. As such, Bargarh district holds 33.29 percent of the total area of undivided Sambalpur district.

2. OVERVIEW OF MINING ACTIVITY IN THE DISTRICT.

There is a good potential of ordinary Stone/Road Metal & Sand in the district, also there is noticeable quantity of Graphite, Dolomite & Lime stone deposit found within the district, a few decorative stone & quartzite deposits also reported within the district.


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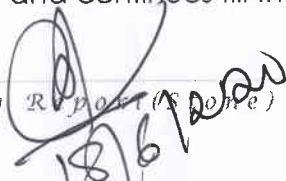

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03. GENERAL PROFILE OF THE DISTRICT.

Bargarh district is situated on the western part of Orissa. It is linked with the state headquarters, Bhubaneswar which is 370 Kms by road and rail. In conformity with the uniform pattern of district administration, the Collector and the District Magistrate for the district is treated as the pivot of the set up with vast and varied power. As the district Magistrate, he is the highest authority in the district for maintenance of law and order. Although the officials of other departments in the district are under the immediate charge of their respective Heads of departments, the district Collector exercises general supervision over them. The district has been divided into two subdivisions, namely, Bargarh and Padmapur and each sub-division is in charge of a Sub-Collector who looks after the general administration, maintenance of law and order and implementation of developmental programmes. For revenue administration, the district has been divided into 12 tahasils, namely – Paikamal, Padmapur, Sohela, Barapali, Bheden, Bargarh, Bhatli, Attabira, Gaisilet, Bijepur, Ambhabona & Jharbandh and each tahasil is kept in the charge of a Tahsildar. For the maintenance of law and order, the district has been divided into fifteen Police Stations, namely:- Paikamal, Jharbandha, Padmapur, Burden, Gaisilet, Melchhamunda, Sohela, Bijepur, Barapali, Bheden, Bargarh, BargarhSadar, Bhatli, Ambabhona and Attabira. There are 12 CD Blocks in the Bargarh District viz. Ambabhona, Attabira, Bargarh, Barpali, Bhatli, Bheden, Bijepur, Gaisilet, Jharbandh, Padampur, Paikmal and Sohella. Bargarh Municipality is the one Municipality in the District and 3 N.A.Cs are Barpali, Padampur and Attabira. There are total 248 Gram Panchayats and 1208 Revenue villages in the District. The Bargarh District experiences extreme type of climate with hot and dry summer followed by humid monsoon and chilling winter. The temperature varies between 10 degree Celsius to 46 degree Celsius. The winter season lasts between November to February. The hot season follows thereafter and continues till the second week of June. The south-


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west monsoon season is from mid June to the end of September. The average annual rainfall in the District is 1527 mm. Agriculture acts as the backbone of the economy of the Bargarh District. Most of the indigenous inhabitants in Bargarh District mainly practice crop cultivation. Because of the presence of natural drainage facilities, the District plain supports the growth of large agricultural products and is free from insects and pests. As we go through the educational scenario of the District, Bargarh District has got many educational institutes like Pharmacy College Barpali, Vikash Junior College, Sri Sri Nrusinghanath Ayurvedic College Paikmal, Panchayat College Bargarh, Larambha College, Bargarh Law college, Anchal College Padampur, Attabira College, Padmashree Krutartha Acharya College of Engineering Bargarh.

Bargarh district celebrates many festivals round the year. Common festivals like Nuakhai, Dhanuyatra, Maha Shivratri of Kedarnath, Nrusingha Chaturdarshi, Sitalasasthi, Viswakarma Puja, Bali yatra of Khuntapali, Baisakh Mela of Nrusinghanath, Falguna Mela of Bhatli. Many prominent personalities born in this district like Parbati Giri, Padmashree Krutartha Acharya, Padmashree Kunjabihari Meher, Surendra Meher, Manabodh Rana.


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04. GEOLOGY OF THE DISTRICT.

Geology:

Major portion of the district's landmass is underlain by Archaeans. The remaining area is compromised up of rocks belonging to proterozoics and Gondwanas.

Archaeans

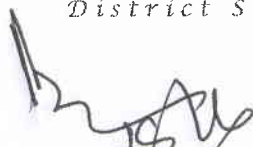
The Archaeans consist of principally of Khondalite suite of rocks & unclassified granite and granite gneisses. The Khondalite group from a significant plateau topography at Gandhamardan associated with rich deposits of bauxite. The rocks also carry economic deposits of Graphite (Sargipalli). A variety of Granite gneisses which are potential source of base metals and gemstones respectively.

Proterozoic (Vindhya)

Proterozoic meta sedimentary rocks are exposed along the area bordering Chhattisgarh. They form the eastern margin of Chhattisgarh basin. The rock types include grit, quartzite, shale, sandstone and slate. These contain important beds of limestone. This has also been targeted for locating primary source for diamond due to long & intermittent history of alluvial diamond recovery.

Gondwana

The lower Gondwana formations rest uncomfortably over pre-cambrian basement along the Ong River alignment. The rock types include shale, sandstone, gritty and conglomeratic sandstone with occasional grey shales. Coal seam belonging to Karharbari/ Basal barakar formations are encountered which also carry fireclay.


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Stratigraphy

Quaternary { Soil/ alluvium
Laterite

Gondwana Super Group.....Talchir Formation-(conglomerate, felspathic sandstone and clay)

(Carboniferous to Permian)

Middle to Upper Proterozoics..Chhattisgarh Super Group { Raipur Gr. (shale, purple Quartzite)
Chandarpur Gr. (quartzite, sandstone, shale, phyllite, conglomerate)

Proterozoics..... (Qtz. Vein, dolerite, granophyres, pyroxenite, anthrosite, granite, gneiss, augen gneiss, migmatite).

Archaean..... Eastern ghat Super group.....Khondalite Gr. (calc silicate/ calcgranulite/quartzite/sillimanite quartzite, qtz-gt. Silimanite schist, amphibolites, metavolcanics)

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05. DRAINAGE AND IRRIGATION PATTERN.

The general drainage pattern in the district is dendritic to sub-parallel. The Danta, Ong, Jonk, Jira river are main river in the district along with its tributaries. Hirakud Dam catchment area covers a part in north-east of Bargarh district.

SI no	Name of the River	place of origin	Altitude at Origin (m)	Total Length in District (km)	area Drained (sq.km)	% area drained in the district
1	Danta river	Banjipali village, Bhatli block	184.00	54.00	-	100.00
2	Jeera River	Ramgiri hills of eastern ghat ,Gajapati district	-	83.50	-	70.00
3	Ong River	Beherapani village	457.00	59.00	5128.00	100.00
4	Jonk River	Khariar hills ,Kalahandi District	762.00	-	3484.00	
5	Girsul nala	Relendapali village, bhatli block	195.00	22.50	-	95.00
6	Jhaun Jore	Guthipali village, Attabira Block	162.00	35.85	-	100.00
7	Kuliary jore	Jaipur village, Bhatli Block	242.00	20.75	-	100.00
8	Dev mohini Nala	Badmal village , Rajbarasambhar Block	200.00	8.00	-	100.00
9	Kumri Nala	Fraserpur village Rajbarasambhar Block	260.00	32.00	-	100.00


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

Forest

SL.No.	Legal status of the Forest Blocks	Forest land use as per the concern authority is as follows Abstract of areas statement of Bargarh Forest Division												Total	
		Name of the Range													
		Bargarh Range		Bhaili Range		Ghess Range		Padampur Range		Nisinghanath Range		Paikmal Range			
No. of the forest Block	Area in ha.	No. of the forest Block	Area in ha.	No. of the forest Block	Area in ha.	No. of the forest Block	Area in ha.	No. of the forest Block	Area in ha.	No. of the forest Block	Area in ha.	No. of the forest Block	Area in ha.		
01	2 Reserve Forests (RF)	3 7	4 1064.92	5 3	6 15712.14	7 4	8 2749.39	9 10	10 1535.59	11 1	12 46.84	13 5	14 625.67	15 30	16 21734.55
02	Protected Forests (PF)	0	0.00	0	0.00	1	20.24	0	0.00	0	0.00	0	0.00	1	20.24
03	Proposed Reserve Forests (PRF)	0	0.00	0	0.00	9	11014.76	36	14207.41	10	10259.39	29	10140.58	84	45622.14
04	Un-Demarcated Protected Forests(UDPF)	0	0.00	0	0.00	4	24.38	4	113.47	0	0.00	0	0.00	8	137.85
05	Demarcated Protected Forests(DPF)	1	19.43	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	19.43
06	VFI Social Forestry Plantation Notified by F.D)	79	404.734	72	479.032	43	300.76	50	264.892	9	49.676	13	86.632	266	1585.726
		87	1489.084	75	16191.172	61	14109.53	100	16121.362	20	10355.906	47	10852.882	390	69119.936

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Agriculture:

LAND UTILISATION PATTERN IN THE DISTRICT: AGRICULTURE

General land information of Bargarh District as follows:

Sl. No.			High	Medium	Low	
1	Geographical area					583200
2	Cultivable area	Ha.				363624
3	Forest area	Ha.				71937
4	Misc. Trees & Grooves	Ha.				4557
5	Permanent Pasture	Ha.				19638
6	Culturable Waste	Ha.				14879
7	Land put to non agriculture Use	Ha.				23711
8	Net shown area	Ha.	173731	97685	77331	348747
9	Gross Crop area	Ha.				478984
10	Cropping intensity	Ha.				737
11	Irrigated area	Ha.				184053
12		Ha.				120929
13	Cultivated area	Ha.	173731	97685	77331	348747
14	Paddy area	Ha.	80172	95078	77331	252581
15	Non paddy area	Ha.	93559	2607	0	96166
16	DAO Circle					4
17	AAO Circle					24
18	AO/VAW circle					233

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Horticulture:

Physical and Financial Progress made under MIDH(NHM)/NMMI/STATE PLAN/NMOP/MGNREGA/RKVY FOR THE YEAR 2018-19

NAME OF THE DISTRICT : BARGARH

Sl. No.	Item	Unit	BARGARH						PADAMPUR						TOTAL DISTRICT	
			Physical		Financial		Physical		Financial		Physical		Financial		Physical	Financial
			Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement				
1. NHM (MIDH)																
Establishment of new Gardens (Area Expansion)																
1 Plantation																
a	Banana TC - Without Integration	ha	10	14.83	3.07	4.56	7	2.15	0	17	14.83	5.22				
b	Papaya - Without Integration	ha	3		0.68		3	0.68	0.680	6	3.00	1.36				
c	High Density -Mango-Without Integration	ha	2	2	0.2	0.200	1	0.1	0.1	3	3.00	0.3				
d	Mango (10m.x10m) normal spacing	ha	43	43	3.29	3.29	79	6.04	6.04	122	122.00	9.33				
2 Vegetables (For maximum area of 2 ha per beneficiary)																
	Hybrid @Rs.50000/ha (40% of the cost in general)	ha	50	63.40	10	12.680	50	10		100		20				
3 Flowers (For a maximum of 2 ha per beneficiary)																
a	Loose flowers	ha	5	0.1	0.80	0.016	5	0.80		0	0.00	0				
b	S&M Category	ha	5	1.2	0.50	0.12	5	0.50		10	0.10	1.6				
4 Training of Farmers																
a	Within the State @ Rs.1000/day/farmer including transport	Nos.	100	100	1	1.000	100	1	1.000	200	200	2				
b	Outside the State @ 5000/farmer	Nos.	20	20	1	1.000	18	0.9	0.900	38		1.9				
5 Exposure Visit of Farmer																
a	Outside the State @ 5000/farmer	Nos.	10	10	0.5	0.500	10	0.5	0.500	20		1				
b	Outside India @ Rs.4.0 lakh / participant	Nos.														

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SCHEME WISE PHYSICAL & FINANCIAL TARGET AND ACHIEVEMENT OF HORTICULTURAL ACTIVITIES OF BARGARH DISTRICT 2018-19														
Sl No	Item	BARGARH				PADAMPUR				DISTRICT TOTAL				REMARKS (% OF ACHIEVEMENT)
		Physical		Financial	Physical		Financial	Physical		Financial	Physical		Financial	
		Target	Achievement	Achievement	Target	Achievement	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	
A	MIDH(NHM)													
i	Banana TC - Without Integration	20.00	12.1060	3.7213	3	3	0.92214	23.00	15.11	4.6434				66
ii	Papaya - Without Integration	0	0	0	5	5	1.12	5.00	5.00	1.1200				100
iii	Mango (10m.x10m) normal spacing	60	55.20	4.2228	50	53	4.01625	110.00	108.20	8.2391				98
iv	Pomogranet - Without Integration	5	5.00	0.72	5	4.5	0.648	10.00	9.50	1.3680				95
B	Special intervention for Top (Promotion of hybrid tomato cultivation) & hybrid Vegetablecultivation	100	106.90	21.06	100	100	20.00	200.00	206.90	41.0600				103
C	Plastic Mulching Max-2 ha/Benif (sqm)	30	27	4.32	20		0	50.00	27.00	4.3200				54
D	Shednet House limited to 4000 sqm	0.10	0.02	0.36				0.10	0.02	0.3600				20
E	Horticulture Mechanisation									0.0000				
i	Tractor (Upto 20 PTO HP)	4	4	0	2	2	1.465	6.00	6.00	1.4650				100
F	High Tech Horticulture	3	0	0				3.00	0.00	0.0000				
	Poly House	4000 sqmt	under erection							0.0000				
G	Cold Storage	1	under progress							0.0000				
H	Training of Farmers									0.0000				

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	Within the State @ Rs.1000/day/farmer including transport	100	100	1	225	225	2.25	325.00	325.00	3.2500	100
	Outside the State @ 5000/farmer	40	40	2	30	30	1.5	70.00	70.00	3.5000	100
I	Exposure Visit of Farmer									0.0000	
	Outside the State @ 5000/farmer	40	40	2	30	30	1.5	70.00	70.00	3.5000	100
J	INTEGRATED POST HARVEST MANAGEMENT									0.0000	
	Functional Pack House/On farm collection & Storage unit (9M x 6m)	8	4	8	16	14	28	24.00	18.00	36.0000	75
	Onino storage structure	10	2	1.75	30	28	24.5	40.00	30.00	26.2500	75
K	District Level @Q 2 days event	1	1	2				1.00	1.00	2.0000	100
	Other Activities (Vermibed Bed, Vermicompost, Zero energy cool chamber)									0.0000	
L	MIDH(NHM) Total			51.1541			85.92139			137.0755	
M	NM00P									0.0000	
	Plantation	350	349.71	34.557	350	370	38.71	700.00	719.71	73.2670	103
N	RKVY							0.00	0.00	0.0000	
	AHO Buildings/Farmdevelopment.	5	4	49	3	2	29.87	8.00	6.00	78.8700	75
	Potato	6	6.267	0.6267	5	4.8	0.48	11.00	11.07	1.1067	101
O	STATE PLAN SCHEMES									0.0000	
	Input subsidy on seed fertiliser, bio-fertiliser, insecticides, bio-pesticides etc									0.0000	
i	Sale of Planting Material	10100	10100	1.04100	6110	6110	0.33	16210.0	16210.0	1.3710	100
	Devt of Potato & Veg.							0	0	0.0000	
i	Subsidised sale of Onion Seeds(in Qtl)	5	3.76	2.256	2.5	2.5	1.5	7.50	6.26	3.7560	83
P	Micro Irrigation									0.0000	

i	Drip	250	400	265.5				250.00	400.00	265.5000	160
ii	Portable Sprinkler	400	900	89.90				400.00	900.00	89.9000	225
Q	MGNREGS									0.0000	
i	Mango and Maint.Mango Plantation.	85	76.80	18.38	350	373.5	91.87	435.00	450.30	110.2500	104
	Total			512.4148			248.68139			761.0962	97

SCHEME WISE PHYSICAL AND FINANCIAL TARGET AND ACHIEVEMENT OF HORTICULTURAL ACTIVITIES OF BARGARH DISTRICT 2019-20 (TILL DATE)

Sl.No	Item	Unit	BARGARH						PADAMPUR										
			TAR		ACH		TAR		ACH		TAR		ACH						
			Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.					
1	Establishment of New Garden																		
I	Cost Intensive Crops (For a maximum area of 4 ha per beneficiary)																		
II	Mango without integration @ Rs.25,500/ ha - maximum of Rs.0.30 lakh /ha (50% of cost) for meeting the expenditure on planting materials, and cost of material for INM/IPM, in 3 installments (60 : 20 : 20) - (10 x 10)	ha	70	5.355	60			100	7.65	100				170	13.005	160			
III	Banana TC - Without integration @ Rs 1.25 / ha - maximum of Rs.0.50 lakh /ha (40% of cost) for meeting the expenditure on planting materials, and cost of material for INM/IPM, in 2 installments (75:25)	ha	20	6.148	under progress			10	3.07	under progress				30	9.2178	under progress			under progress
IV	Papaya - Without integration @ Rs 60,000/ ha - maximum of Rs.0.30 lakh /ha (40% of cost)	ha	5	1.130	5.00			2	0.45	2				7	1.58	7			
V	Pomegranate - Without integration @ Rs.48,000/ ha - maximum of Rs.0.30 lakh /ha (50% of cost) for meeting the expenditure on planting materials, and cost of material for INM/IPM, in 3 installments (60 : 20 : 20) - (5 x 5)	ha	5	0.720	5.000			10	1.440					15	2.16	5			

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VI	High Density Mango without integration @ Rs.41,000/ ha - maximum of Rs.16,400/ha (40% of cost)	ha	10	0.980	3,000					10	0.98	3
2	Vegetables (For maximum area of 2 ha per beneficiary)											
3	i) Hybrid @Rs.50000/ha (40% of the cost in general)	ha	100	20,000	under progress	75	15.00	under progress	175	35		under progress
	Flowers (For a maximum of 2 ha per beneficiary)											
	Loose flowers											
I	S&M Category	ha	5	0.800	under progress	2	0.32	under progress	7	1.12		under progress
II	Other Category	ha	5	0.500	under progress	4	0.40	under progress	9	0.9		under progress
4	Promotion of Integrated Nutrient Management (INM)/ Integrated Pest Management (IPM)											
i)	Promotion of INM/IPM@Rs.4000/ha, Max-4ha/Beneficiary	ha	50	0.600	under progress	50	0.60	under progress	100	1.2		under progress
5	Organic Farming											
I	Vermi Compost Units/ Organic Input Production Unit											
	Permanment Structure 30'x8'x2.5' @Rs.100000/Unit	Nos.	2.00	1.000	under progress	2.00	1.00	under progress	4	2		under progress
6	Human Resource Development (HRD)											
I	Training of Farmers											
a	Within the State @ Rs.1000/day/farmer including trasport	Nos.	150	1.500	under progress	100	1.00	under progress	250	2.5		under progress
b	Outside the State @ 5000/farmer	Nos.	50	2.500	under progress	50	2.50	under progress	100	5		under progress
II	Exposure Visit of Farmer											
a	Outside the State @ 5000/farmer	Nos.	50	2.500	under progress	50	2.50	under progress	100	5		under progress
7	INTEGRATED POST HARVEST MANAGEMENT											
c.1	Functional Pack House/On farm collection & Storage unit (9M x 6m)	Nos.	3	6.000	under progress	2	4	under progress	5	10		under progress
c.4	Evaporative/Low energy cool chamber (8 MT) @ 5.0 lakh /unit	Nos.	2	5.000	under progress			under progress	2	5		under progress
c.5	Preservation Unit (low cost) - New Units	Nos.	10	10,000	under progress	5	5.00	under progress	15	15		under progress
c6	Low cost Onion Storage Structure (25 MT)	Nos.	35	30,625	under progress	35	30.63	under progress	70	61,255		under progress
c.7	Pusa Zero energy Cool Chamber (100)	Nos.	30	0.600	under progress	25	0.50	under progress	55	1.1		under progress

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E	Special Interventions	Ha	300	0.480	under progress	200	0.32	under progress	0	0	under progress
	Supply of Plastic Crates to Vegetable/ Fruit Growers								500	0.8	under progress
F	Mission Management								0	0	
a	District Level @Q 2 days event	Nos.	1	2.000	under progress				1	2	under progress
b	Exhibition & work shop for each MP both Lok Sabha & Rajya Sabha	Nos.	1	2.000	under progress				1	2	under progress
2	STATE PLAN SCHEMES										
a	Sale of Planting Material	nos.	3100		3100	525		525	3625		3625
5	NFSM-OP										
a	Oil Palm	ha.	130		12.42	200		49.07	330	0.00	61.49

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Mining:

Incidence of major mineral resources is not quite encouraging in the district. Besides, the district is rich in minor minerals like river sand, road metals, morrum, laterite stone etc. The total area considered for mining activity for all minerals shall be the mining area within the district.


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

(Please refer Plate-III).

The general drainage pattern in the district is dendritic to sub-parallel. The Danta, Ong, Jonk, Jira river are main river in the district along with its tributaries. Hirakud Dam catchment area covers a part in north-east of Bargarh district.

SI no	Name of the River	place of origin	Altitude at Origin (m)	Total Length in District (km)	area Drained (sq.km)	% area drained in the district
1	Danta river	Banjipali village, Bhatli block	184.00	54.00	-	100.00
2	Jeera River	Ramgiri hills of eastern ghat, Gajapati district	-	83.50	-	70.00
3	Ong River	Beherapani village	457.00	59.00	5128.00	100.00
4	Jonk River	Khariar hills, Kalahandi District	762.00	-	3484.00	
5	Girsul nala	Relendapali village, bhatli block	195.00	22.50	-	95.00
6	Jhaun Jore	Guthipali village, Attabira Block	162.00	35.85	-	100.00
7	Kuliary jore	Jaipur village, Bhatli Block	242.00	20.75	-	100.00
8	Dev mohini Nala	Badmal village, Rajbarasambhar Block	200.00	8.00	-	100.00
9	Kumri Nala	Fraserpur village, Rajbarasambhar Block	260.00	32.00	-	100.00

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HYDROGEOLOGICAL CONDITION

Geological setting, climate and topography plays a vital role in occurrence and movement of groundwater. The Bargarh district is underlain by diverse rock types, which range in age from Precambrian to Quarternary. The Precambrians occupy nearly 80% of the total geographical area of the state. The Tertiary and the Quaternary formations are restricted mainly to the narrow Gondwana tracts.


Consolidated formations:

The consolidated formations include the hard crystalline and partly metamorphosed compact sedimentary formations belonging to Pre-Cambrian. The rock types are mainly granites, granite gneisses, schistose rocks, khondalites, charnockites, quartzites, calcsilicates, shale, phyllite, sandstone, limestone, marble etc. These rocks are devoid of primary porosity. The ground water occurs in secondary porosity resulting from weathering fracturing and jointing. The hard rock aquifers exhibit considerable variation laterally as also in depth. The weathered mantle is composed of loose regolith with intergranular porosity, which facilitates free circulation of ground water through deeper fractures and forms potential repository of ground water. In general the average thickness of weathered residuum varies from 15 to 20 m. Ground water occurs under phreatic condition. The water bearing fracture zones generally occur within 100m depth but deeper potential fractures have also been encountered in some of the bore holes drilled by the Central Ground Water Board.

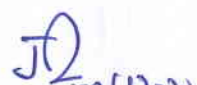
Ground water regime monitoring:

Ground water monitoring is carried out by CGWB through a network of observation wells (dug wells and piezometers) spread all over the district. These wells serve as permanent National Hydrograph Stations (NHS). The existing network provides an optimal spatial distribution of observation stations in the region, through which necessary information on ground water regime is available with a fair degree of accuracy. Through interpolation between data sets at different stations, it is possible to determine the characteristics of elements at any point in the region. Under normal circumstances, the water level of the observation wells are being measured four times in a year during fixed period of time as given below –


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April – 20th to 30th of the month	Represents water level situation in Pre-monsoon period
August – 20th to 30th of the month	Represents peak water level of monsoon period.
November – 1st to 10th of the month	Represents situation of water level in Post-monsoon period.
January – 1st to 10th of the month	Represents water level during irrigation period.

Water samples were collected from each of the network stations only during April (Pre-monsoon) every year, to assess the chemical quality of ground water.

The district wise distribution of NHS wells is furnished below,

April-2016	August-2016	November-2016	January-2017
77	77	77	82

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08. RAINFALL OF THE DISTRICT AND CLIMATIC CONDITION.

Information on Rainfall from the year, 2012 to 2019 in Respect of Bargarh District.

Sl No	Month	District Normal rainfall in mm	2012 Average in mm	2013 Average in mm	2014 Average in mm	2015 Average in mm	2016 Average in mm	2017 Average in mm	2018 Average in mm	2019 Average in mm
1	January	12.5	59.5	5.5	0	0.42	5.50	6.97	0.0	1.5
2	February	19.1	0	17.08	30.75	5.08	12.25	0.0	2.72	13.71
3	March	22.0	0	0.0	23.75	6.88	15.00	11.83	0.18	38.79
4	April	20.0	4.40	29.37	1.42	74.42	4.75	0.0	9.54	21.83
5	May	25.6	1.66	10.50	98.17	6.75	30.04	16.80	66.08	14.5
6	June	205.6	321.83	198.17	94.00	255.67	125.32	260.57	145.53	135.53
7	July	397.2	275.66	396.33	670.67	259.58	218.97	263.00	471.18	412.72
8	August	374.4	487.16	221.58	462.25	274.42	284.32	244.83	397.34	449.07
9	September	222.6	254.44	177.75	294.1	119.46	292.11	115.57	174.23	429.42
10	October	52.8	80.91	186.17	33.4	0.83	56.60	63.26	7.38	64.48
11	November	10.4	9.83	0	0	0.00	0.20	1.12	0.0	
12	December	5.1	0	0	0.08	7.08	0.0	0.00	82.81	
	Total	1367.3	1495.39	1242.45	1708.34	1010.59	1024.97	983.95		

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

In this case only **Morrum** has been considered.

In addition to the existing Stone Sairat Sources there are a number of **Proposed Stone Sairat Sources** in the District as follows;

ATTABIRA TAHASIL								
Sl. No.	Name of the Morrurum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)	Area in Acre (Leasable area of the plot)	Remarks
1	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

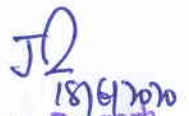
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Sl. No.	Name of the Morrurum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)	Area in Acre (Leasable area of the plot)	Remarks
1	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL


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BARPALI TAHASIL

Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)	Area in Acre (Leasable area of the plot)	Remarks
1	Grindola Morrum Quarry Quarry-1	Grindola	263	282	Gochar	71.16	3.00	New identified source
2	Grindola Morrum Quarry Quarry-2	Grindola	263	306	Gramya Jungle	11.93	0.70	New identified source
3	Baramkela Morrum Quarry Quarry-1	Baramkela	494	1495	Gramya Jungle	18.55	1.00	New identified source
4	Baramkela Morrum Quarry Quarry-2	Baramkela	494	2158	Gramya Jungle	11.07	3.00	New identified source
5	Retamunda Morrum Quarry Quarry	Retamunda	9	257		1.36	1.36	New identified source
6	Amapatra Morrum Quarry Quarry	Amapatra	186	182	Gochar	11.23	11.23	New identified source
7	Katapali Morrum Quarry Quarry	Retamunda	204	1636	Gochar	3.60	3.60	New identified source
8	Banjipali Morrum Quarry Quarry-1	Banjipali	461	3206	Gochar	1.70	1.70	New identified source
				3207	Gochar	0.54	0.54	
				3208	Gochar	0.55	0.55	
9	Tulandi Morrum Quarry quarry	Tulandi	406	2008	Gochar	32.64	3.95	New identified source
10	Patkulunda Morrum Quarry Quarry	Patkulunda	718	1847	Gochar	13.34	1.00	New identified source
11	Bishipali Morrum Quarry Quarry-1	Bishipali	94	1654		1.97	1.97	New identified source

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12	Bishipali Morrum Quarry Quarry-2	Bishipali	236	1639		3.77	2.40	New identified source
13	Bishipali Morrum Quarry Quarry-3	Bishipali	429/128	1653		2.30	2.30	New identified source
14	Kusanpuri Morrum Quarry Quarry-1	Kusanpuri	460	250	Gochar	28.90	3.96	New identified source
15	Kusanpuri Morrum Quarry Quarry-2	Kusanpuri	460	219	Gochar	23.47	3.06	New identified source
16	Julat Morrum Quarry Quarry	Julat	392	1852	Gochar	7.50	2.61	New identified source
17	Raksa Morrum Quarry Quarry	Raksa	167	375		2.65	2.65	New identified source
18	Raksa Morrum Quarry Quarry	Raksa	108	377		1.38	1.38	New identified source
19	Ambamunda Morrum Quarry Quarry-1	Ambamunda	77	22		1.15	1.15	New identified source
20	Ambamunda Morrum Quarry Quarry-2	Ambamunda	77	35/636		2.03	2.03	New identified source
21	Tentelpali Morrum Quarry Quarry-1.	Tentelpali	175	307		2.56	2.56	New identified source
22	Tentelpali Morrum Quarry Quarry-2	Tentelpali	175	116		1.29	1.29	New identified source
23	Pateipali Morrum Quarry Quarry-1	Pateipali	89	145		0.88	0.88	New identified source
24	Pateipali Morrum Quarry Quarry-2	Pateipali	92	163		2.20	2.20	New identified source
25	Pateipali Morrum Quarry Quarry-3	Pateipali	92	159		1.23	1.23	New identified source

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26	Mahada Morrum Quarry Quarry-1	Mahada	351	317		5.30	5.30	New identified source
27	Mahada Morrum Quarry Quarry-2	Mahada	351	2		9.80	5.90	New identified source
28	Mahada Morrum Quarry Quarry-3	Mahada	351	14		1.03	1.03	New identified source
29	Kumbhari Morrum Quarry Quarry-1	Kumbhari	326	12825	Aa. Sa.	1.28	1.28	New identified source
30	Kumbhari Morrum Quarry Quarry-2	Kumbhari	733	12826	Aa. Sa.	1.00	1.00	New identified source
31	Kumbhari Morrum Quarry Quarry-3	Kumbhari	98	12789	Aa. Sa.	0.82	0.82	New identified source
32	Bagbadi Morrum Quarry Quarry	Bagbadi	299	790	Gochar	5.38	1.80	New identified source
33	Remta Morrum Quarry Quarry-1	Remta	199	220	Gochar	1.53	1.53	New identified source
34	Remta Morrum Quarry Quarry-2	Remta	642	8		0.63	0.63	New identified source
						5.15	2.00	
35	Barpali Morrum Quarry Quarry-1	Barpali	1421	2823		7.78	3.00	New identified source
36	Barpali Morrum Quarry Quarry-2	Barpali	1412	2347		3.00	3.00	New identified source


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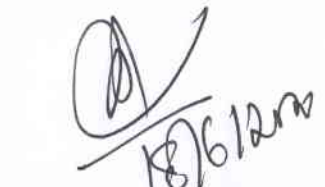

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BHEDEN TAHASIL						
Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)
1	kudopali	akshit	701 (Rakshit)	3831	Gochar	7.62
2	Dalab	Dalab	362 (Rakshit)	194	Gochar	16.88
3	Remunda	Remunda	1128	3597	Gochar	17.85
4	Sialkhandahatha	Sialkhandahatha	841	2655	Gochar	33.74
						Area in Acre (Leasable area of the plot)
						5.00
						5.00
						4.90
						5.00
						New identified source
						New identified source
						New identified source
						New identified source

BHATLI TAHASIL						
Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)
1	Chadeigaon	Chadeigaon	407	2	Patita	2.69
2	Kamgaon	Kamgaon	824	1327	GOchar	11.82
3	Baulsingha	Baulsingha	343	705	Patita	11.56
4	Nuagarh	Nuagarh	373	1815	Patita	2.28
5	Halupali	Halupali	163	1266	Gochar	11.48
6	Hatisar	Hatisar	233	2368	Basti Jogya	5.66
				540	Patita	2.28
				769	Patita	10.53
7	Halanda	Halanda	108	862	GOchar	32.84
						Area in Acre (Leasable area of the plot)
						2.69
						11.82
						11.56
						2.28
						11.48
						5.66
						2.28
						10.53
						32.84
						New identified source
						New identified source
						New identified source
						New identified source
						New identified source
						New identified source
						New identified source


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AMBABHONA TAHASIL

Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)	Area in Acre (Leasable area of the plot)	Remarks
1	Salepali	Salepali	77	657	Gochar	18.80	2.60	New identified Source
2	Naktichhapar Naktichhapar	Naktichhapar	41	266	Gochar	16.58	2.50	New identified Source

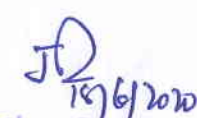
PADAMPUR TAHASIL

Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)	Area in Acre (Leasable area of the plot)	Remarks
1	Sukulipahar	Sukulipahar	77	514	Gochar	6.42	2.00	New identified source
2	Loharpali	Loharpali	109	345	Gochar	3.40	3.40	New identified source
3	Kumunibahali	Kumunibahali	97	246	Gochar	4.05	4.05	New identified source
4	Judhisthirpur	Judhisthirpur	30	246 (p)	Gochar	8.40	7.05	New identified source


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PAIKMAL TAHASIL						
Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)
1	Mandiadhipa	Mandiadhipa	182	1078	Patita	28.07
2	Ranjitpur	Ranjitpur	69	352/534	Aa. Sa.	1.74
SOHELA TAHASIL						
Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)
1	Pastamunda	Pastamunda	125	83	Tikra Chatan	4.48
2	Jamchhapar	Jamchhapar	143	1267	Gochar	18.38
3	Ghess	Ghess	336	235	Jungle	11.09
4	Ghumunipali	Ghumunipali	58	451	Gram jUngle	24.50
5	Bishopali	Bishopali	96	1107	Gram jUngle	11.99
6	Garvana	Garvana	309	56	Gram jUngle	10.32
				79	Gram jUngle	7.28
7	Padhanpali	Padhanpali	72	61/823	Gram jUngle	9.80
				23/822	Gram jUngle	3.30


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BIJEPUR TAHASIL								
Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)	Area in Acre (Leasable area of the plot)	Remarks
1	Ailpur	Ailpur	93	96	Morrum	0.45	0.45	Already existing source (Extinctin proposal submitted)
2	Masnabahal	Masnabahal	41	117	Gochar	5.84	5.84	New identified source

JHARBANDH TAHASIL								
Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)	Area in Acre (Leasable area of the plot)	Remarks
1	Kumir	Kumir	126	253, 255	Gramya Jungle	2.99	2.99	New identified source
2	Rajendrapur	Rajendrapur	164	1112 (p)	Gramya Jungle	26.75	5.00	New identified source

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GAISILAT TAHASIL

Sl. No.	Name of the Morrum Quarry	Mouza	Khata No.	Plot no.	Kisam	Area in acre (Total area of the Plot)	Area in Acre (Leasable area of the plot)	Remarks
1	Bhoipali	Bhoipali	54	475	Patita	2.50	2.50	Already existing source
2	Gaisilat	Gaisilat	169	566	Gochar	18.65	2.00	New identified source
3	Talpali	Talpali	100	1048	Gramya Jungle	12.75	1.60	New identified source
4	Talpali	Talpali	100	1023	Gramya Jungle	8.46	1.50	New identified source

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10. DETAILS OF ROYALTY OR REVENUE RECEIVED IN LAST THREE YEARS
 Revenue collected for **Morrum**.

Sl. No.	Name of Source	Revenue Collected for last three years (in Rs)		
		2016-17	2017-18	2018-19
1	NIL	NIL	NIL	NIL

11. DETAILS OF PRODUCTION OF MINOR MINERAL IN LAST THREE YEARS.
 Production of **Morrum**.

Sl. No.	Name of Source	Production for last three years (in Cum)		
		2016-17	2017-18	2018-19
1	NIL	NIL	NIL	NIL

12. MINERAL MAP OF THE DISTRICT.
 Please refer Plate-IV.

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

No LOI holder for morrum in the Bargarh district. Hence it is not applicable.


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14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT.

The Tentative Potential Morrum Resources of the district are as follows:

Sl. No.	Name of the Morrum Quarry	Tentative reserve in Cum
BARPALI TAHASIL		
1	Grindola Morrum Quarry Quarry-1	21853
2	Grindola Morrum Quarry Quarry-2	5099
3	Baramkela Morrum Quarry Quarry-1	7284
4	Baramkela Morrum Quarry Quarry-2	21853
5	Retamunda Morrum Quarry Quarry	29906
6	Amapatra Morrum Quarry Quarry	81804
7	Katapali Morrum Quarry Quarry	26224
8	Banjipali Morrum Quarry Quarry-1	20323
9	Tulandi Morrum Quarry quarry	28773
10	Patkulunda Morrum Quarry Quarry	7284
11	Bishipali Morrum Quarry Quarry-1	14350
12	Bishipali Morrum Quarry Quarry-2	17842
13	Bishipali Morrum Quarry Quarry-3	16754
14	Kusanpuri Morrum Quarry Quarry-1	28846
15	Kusanpuri Morrum Quarry Quarry-2	22290
16	Julat Morrum Quarry Quarry	19012
17	Raksa Morrum Quarry Quarry	19303
18	Raksa Morrum Quarry Quarry	10052
19	Ambamunda Morrum Quarry Quarry-1	8377
20	Ambamunda Morrum Quarry Quarry-2	14787
21	Tentelpali Morrum Quarry Quarry-1.	18648
22	Tentelpali Morrum Quarry Quarry-2	9397
23	Pateipali Morrum Quarry Quarry-1	6410
24	Pateipali Morrum Quarry Quarry-2	16025
25	Pateipali Morrum Quarry Quarry-3	8959
26	Mahada Morrum Quarry Quarry-1	38607
27	Mahada Morrum Quarry Quarry-2	42978
28	Mahada Morrum Quarry Quarry-3	7503
29	Kumbhari Morrum Quarry Quarry-1	9324
30	Kumbhari Morrum Quarry Quarry-2	7284
31	Kumbhari Morrum Quarry Quarry-3	5973
32	Bagbadi Morrum Quarry Quarry	13112
33	Remta Morrum Quarry Quarry-1	11145
34	Remta Morrum Quarry Quarry-2	19158

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35	Barpali Morrum Quarry Quarry-1	21853
36	Barpali Morrum Quarry Quarry-2	21853
BHEDEN TAHASIL		
37	kudopali Morrum Quarry	36422
38	Dalab Morrum Quarry	36422
39	Remunda Morrum Quarry	35028
40	Sialkhandahatha Morrum Quarry	36422
BHATLI TAHASIL		
41	Chadeigaon Morrum Quarry	19595
42	Kamgaon Morrum Quarry	86102
43	Bausingha Morrum Quarry	84208
44	Nuagarh Morrum Quarry	16608
45	Halupali Morrum Quarry	83626
46	Hafisar Morrum Quarry	41230
47	Halanda Morrum Quarry	332535
AMBABHONA TAHASIL		
48	Salepali Morrum Quarry	18939
49	Naktichhapar Naktichhapar Morrum Quarry	18211
PADAMPUR TAHASIL		
50	Sukulipahar Morrum Quarry	14568
51	Loharpali Morrum Quarry	24767
52	Kumunibahali Morrum Quarry	29502
53	Judhithirpur Morrum Quarry	51355
PAIKMAL TAHASIL		
54	Mandiadhipa Morrum Quarry	87414
55	Ranjitpur Morrum Quarry	12675
SOHELA TAHASIL		
56	Pastamunda Morrum Quarry	32634
57	Jamchhapar Morrum Quarry	133889
58	Ghess Morrum Quarry	80785
59	Ghumunipali Morrum Quarry	36420
60	Bishipali Morrum Quarry	43704
61	Garvana Morrum Quarry	36420
62	Padhanpali Morrum Quarry	95426
BIJEPUR TAHASIL		
63	Ailpur Morrum Quarry	3278
64	Masnabahal Morrum Quarry	42541
JHARBANDH TAHASIL		
65	Kumir Morrum Quarry	21780
66	Rajendrapur Morrum Quarry	36420
GAISILAT TAHASIL		
67	Bhoipali Morrum Quarry	18211
68	Gaisilat Morrum Quarry	14568
69	Talpali Morrum Quarry	11655
70	Talpali Morrum Quarry`	7284
	Total	2360889

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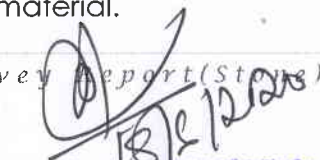
15. QUALITY /GRADE OF MINERAL AVAILABLE IN THE DISTRICT.

Murrum is soils of humid tropical or equatorial zones. It is characterized by a deep weathered layer from which silica has been leached. There is no humus, but an accumulation of aluminium and iron oxides and hydroxides. The reddish colour of these soils is imparted by the iron compounds. They are good material for building huts and paths, as they can be compacted easily to form hard surfaces. They are generally impervious. Murrum or Moram is typically an Indian term. The geological equivalent term is Lateritic soil. Murrum is a soil type rich in iron and aluminium and is commonly considered to have formed in hot and wet tropical areas. Nearly all laterites are of rusty-red coloration, because of high iron oxide content. They develop by intensive and prolonged weathering of the underlying parent rock. Tropical weathering (laterization) is a prolonged process of chemical weathering which produces a wide variety in the thickness, grade, chemistry and ore mineralogy of the resulting soils.

16. USE OF MINERAL.

Murrum is widely used material for the construction of pavement shoulders. Sometimes the available murrum may not satisfy the requirement of CBR and hence need to be modified. The locally available granular material like sand and/ or the crusher dust may be mixed to the soil to obtain the desired characteristics. The paper discusses results of the experimental study in which the quality of local murrum has been improved by adding stone dust. The index properties, compaction characteristics and California Bearing Ratio (CBR) parameters for the murrum blended with varying percentages of the stone dust has been presented and it is shown that the utility of the soil as a road material has been increased greatly by simple mixing of the granular material.


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

The total production about 90% of the supply will be utilized in government works, while rest is consumed by the private purposes. The certainty of the exact demand in the district depends upon various Govt projects & schemes etc, hence quite not possible to quantify the exact demand. Certainly there is an unavoidable gap between the demand and supply of morrum in the district, hence to balance the demand-supply gap large number of morrum quarries have been proposed in certain areas.

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

Please refer Plate-V


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

Quarries existing within 500m radius are considered as cluster of Mining Leases as per the MoEF guide lines. But there is no cluster of Morrum quarries in the Bargarh district.

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

Eco-Sensitive Zones or ecologically fragile areas are notified by the Ministry of Environment, Forest and climate Change, Government of India around protected areas, National Parks and Wildlife sanctuaries. There is one Wildlife sanctuary present in the District i.e. Debrigarh Wild Life Sanctuary.

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

Mining is the extraction of minerals and other geological materials of economic value from deposits on the Earth. Mining adversely affects the environment by inducing loss of biodiversity, soil erosion, and contamination of surface water, groundwater, and soil. Mining can also trigger the formation of sinkholes. The leakage of chemicals from mining sites can also have detrimental effects on the health of the population living at or around the mining site.

As mentioned above, mining activities can harm the environment in several ways.

Mining of major minerals in the Division is not a common feature, though forests areas are rich in destructive to forests. Mainly stone quarry are going on in the District. Several serious environmental impacts related to quarrying activities on and near the river, such as vibration, land degradation, land subsidence and landslides, water pollution and air pollution, will lead to health related problems and loss of biodiversity.

Impacts on Air

Air quality is adversely affected by mining operations. Unrefined materials are released when mineral deposits are exposed on the surface through mining. Wind erosion and nearby vehicular traffic cause such materials to become airborne. Lead, arsenic, cadmium, and other toxic elements are often present in such particles. These pollutants can damage the health of people living near the mining site. Diseases of the respiratory system and allergies can be triggered by the inhalation of such airborne particles.

Impacts on Water

Mining also causes water pollution which includes metal contamination, increased sediment levels in streams, and acid mine drainage. Pollutants

released from processing plants, tailing ponds, underground mines, waste-disposal areas, active or abandoned surface or haulage roads, etc., act as the top sources of water pollution. Sediments released through soil erosion cause siltation or the smothering of stream beds. It adversely impacts irrigation, swimming, fishing, domestic water supply, and other activities dependent on such water bodies.

High concentrations of toxic chemicals in water bodies pose a survival threat to aquatic flora and fauna and terrestrial species dependent on them for food. The acidic water released from metal mines or coal mines also drains into surface water or seeps below ground to acidify groundwater. The loss of normal pH of water can have disastrous effects on life sustained by such water.

Noise impacts

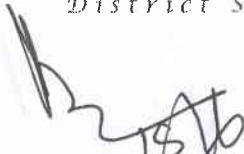
Noise pollution mainly due to operation of machineries , occasional plying of machineries and drilling & blasting. These actives will create noise pollution in the surrounding area that affects the life of the near by habitats.

Impact on Soil

Soil disruptions can contribute to the deterioration of the area's flora and fauna. There is also a huge possibility that many of the surface features that were present before mining activities cannot be replaced after the process has ended. The removal of soil layers and deep underground digging can destabilize the ground which threatens the future of roads and buildings in the area.

Impacts on Flora & Fauna

Often, the worst effects of mining activities are observed after the mining process has ceased. The destruction or drastic modification of the pre-mined landscape can have a catastrophic impact on the biodiversity


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of that area. Mining leads to a massive habitat loss for a diversity of flora and fauna ranging from soil microorganisms to large mammals. Endemic species are most severely affected since even the slightest disruptions in their habitat can result in extinction or put them at high risk of being wiped out. Toxins released through mining can wipe out entire populations of sensitive species.

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

The major potential environmental impacts associated with mining and associated mineral processing operations are related to erosion-prone landscapes, soil and water quality, and air quality. These potential impacts are recognized and addressed in current mining operations as well as in some former mining operations by reclaiming areas of physical disturbance to prevent erosion, stabilizing soils containing metals or chemicals to prevent unwanted metal releases into the environment, preventing and/or treating water contamination, and controlling air emissions.

Mine closure and a number of activities to mitigate the impacts of mining are an integral part of all mine planning and mineral development from the discovery phase through to closure:

Reclamation

Soil treatment

Water treatment

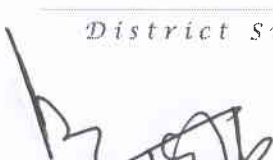
Preventing acid rock drainage


Controlling gas emissions

Air

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

- Dust generation shall be reduced by using sharp teeth of shovels.
- Wet drilling shall be carried out to contain the dust particles.
- Controlled blasting techniques shall be adopted.
- Water sprinkling on haul roads, service roads and overburden dumps will help in reducing considerable dust pollution.
- Proper and regular maintenance of mining equipment's have to be undertaken.
- Transport of materials in trucks are to be covered with tarpaulin.


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- 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 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 check 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.

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- 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.


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

Mine reclamation is the process of restoring land that has been mined to a natural or economically usable state. Although the process of mine reclamation occurs once mining is completed, the planning of mine reclamation activities occurs prior to a mine being permitted or started. Mine reclamation creates useful landscapes that meet a variety of goals ranging from the restoration of productive ecosystems to the creation of industrial and municipal resources. Modern mine reclamation minimizes and mitigates the environmental effects of mining.

In Bargarh district no morrum Quarry has been reported as exhausted of mineral, hence no reclamation approach has been implemented in present date. Mainly two types of reclamation proposal are normally proposed i.e. Firstly Back filling of the exhausted mine by mine generated waste and capping of top soil for forest plantation and growth. Secondly proper fencing of quarried area and can be developed as water reservoir, fishery development or tourist attraction points after the life of the mine.

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24. RISK ASSESSMENT & DISASTER MANAGEMENT PLAN.

Risk assessment is the determination of quantitative or qualitative value of risk related to a concrete situation and a recognized threat. Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

It must be realized that any incident may develop into a major emergency even with the best safety measures and programmes in any industry. Hence, an Emergency procedure will be planned properly and documented to help in reducing time loss, chaos and confusion at the hour of need by assigning person who will engage in meeting emergency smoothly and effectively. Any accident which has potential to develop into a major emergency can threaten large number of person or large area of the industries on the site may affect safety of the public, property and environment. Hence, it is absolutely essential that emergency procedures will be properly planned and documented.

Morum quarry mining is an opencast manual practice in the district, negligible cause disastrous situation as per the approved Plan. Any disastrous situation raised in the mining area must be reported to the concern authorities as soon as possible.

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

As per the data provided by CDMO, Bargarh Tuberculosis patients cases of last 5 years is as follows;

Sl No	Year	TB Cases
01	2015	1058
02	2016	1104
03	2017	1288
04	2018	1041
05	2019	965 (up to Aug-2019)

No case of Silicosis recorded in the district.

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

As the morrum quarry lease within the district are non-forest lands rather revenue lands. As per the guidelines prescribed by OMMCR-2016 a safety zone of 7.5m has been considered for all quarry leases all along the inside of boundary line. Plantation proposal has been usually stated in the approved Mining Plans for all quarry leases. Saplings of local plants has been proposed to be planted in the safety zone area of quarries.

Forest Division could not take up the Plantation works in mining areas due to non-receipt of any fund for the same. But large numbers of plantations have been raised under different schemes in and outside the Reserved Forest and Proposed Reserved Forest.

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27. ANY OTHER INFORMATION.

Bargarh district has a glorious rich cultural past, rich in agriculture. It is at the northern marginal area of Eastern Ghat Province & Bastar province having potential of several valuable minerals like Quartzite, Limestone, gem stones, dimension stones, ordinary stones, sand etc. Systematic & scientific application of technologies in all fields will definitely enhance the livelihood of the common man of the area and the district can contribute a major part in thriving of the state as well as the nation.

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Sub-Collector
BARGARH

[Handwritten signature]
18/6/2020
Conservator of Forest
Bargarh Forest Division
Bargarh

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18/6/2020
Collector, Bargarh