WEST BENGAL MINERAL DEVELOPMENT & TRADING CORPORATION LTD

(A Govt. of West Bengal Undertaking)

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MDTC/ P-32/180 Date: 24/02/2020

To
The Director (Non-Coal Mining)
IA Division, MoEF & CC, Govt. of India
Vayu-305, Indira Paryavaran Bhawan
Jorbagh Road, Lodhi Road, New Delhi-110003

Sub: Environmental Clearance of Hatgacha-Jethia Black stone Mines over an area of 71.20 ha. of M/s West Bengal Mineral Development & Trading Corporation Ltd. in Hatgacha & Jethia villages, P.S. Mohammad Bazar, Dist. Birbhum of West Bengal-regd.

Ref: (i) File No. J-11015/379/2015-IA.II (M)
(ii) Proposal No. IA/WB/MIN/62270/2015
(iii) Minutes of the 11th meeting of the Expert Appraisal Committee for Environmental Appraisal of Mining projects (Non-Coal) –held during November 27-28, 2019.

Dear Sir,

With reference to the above subject, we are herewith submitting following documents as sought during the presentation for Environmental clearance of Hatgacha-Jethia Black stone Mines over an area of 71.20 ha. in Hatgacha & Jethia villages, P.S. Mohammad Bazar, Dist. Birbhum of West Bengal.

I. District Survey Report (DSR) of Birbhum Dist. as per the Ministry notification S.O. 3611 (E) dated 25.07.2018. (Annexure-I)
II. Revalidation of grant of Mining lease for Hatgacha- Jethia Black stone Mines which is further extended for a period of six (6) months w.e.f 15.11.2019. (Annexure-II)
III. CER budget as per the provisions of OM No. F. No. 22-65/2017-IA-III dated 01 May 2018. (Annexure-III)

The said presentation for Environmental Clearance was made in the 11th meeting before the esteemed Expert Appraisal Committee for Environmental Appraisal of Mining projects (Non-Coal) and was held during November 27-28, 2019.

Therefore, we request you to allow us to obtain Environmental Clearance for our aforementioned project at your earliest.

Thanking you
Yours truly

24/02/2020

SHYAMA PRASAD HAZRA
Dy. General Manager (Project)
WEST BENGAL MINERAL DEVELOPMENT
& TRADING CORPORATION LIMITED
13, Nellie Sengupta Sarani
Kolkata-700087

(Authorised Signatory)
M/s West Bengal Mineral Development & Trading Corporation Ltd.

Encl: Annexure I, II & III.

ANNEXURE I

ANNEXURE I

GOVERNMENT OF WEST BENGAL
DEPARTMENT OF INDUSTRY, COMMERCE & ENTERPRISES
MINES BRANCH
4, ABANINDRANATH TAGORE SARANI (CAMAC STREET), KOLKATA – 16

No.104-CI/O/MIN/GEN-MIS/34/2016 Dated Kolkata the 18th February, 2020

From : The Assistant Secretary to the
Government of West Bengal

To : The District Magistrate, Birbhum,
P.O.Suri, Dist.Birbhum

Sub : Final acceptance of DSR on Birbhum District.

Madam/Sir,

I am directed to send herewith a copy (soft/hard) of final accepted District Survey Report on Birbhum District for uploading in your website.

SDAS 18.02.2020
Assistant Secretary

No.104/1(4)-CI/O/MIN/GEN-MIS/34/2016 Dated Kolkata the 18th February, 2020

Copy forwarded for information to :

1. The Director, Directorate of Mines & Minerals, WB;
2. The Director, WBMDTC Ltd;
3. Director, Directorate of Land, Record & Survey, 35, Alipore Road, Gopalnagar, Chetla, Kolkata-700027;
4. The Chief Mining Officer, WB;
5. The Mining Officer, Suri Zone,Santineer, Tilpara, P.O. & P.S. Suri, Dist.Birbhum, PIN-731101.

SDAS 18.02.2020
Assistant Secretary

No.104/1(2)-CI/O/MIN/GEN-MIS/34/2016 Dated Kolkata the 18th February, 2020

Copy forwarded for information to:

1. Sr. P.S. to the Secretary, ICE Department;
2. P.A. to Additional Secretary, ICE Department.

SDAS 18.02.2020
Assistant Secretary

GOVERNMENT OF WEST BENGAL
DIRECTORATE OF MINES & MINERALS
4, Camac Street, Kolkata 700 016

No. 87 MD/2C-614/18

Dated ~~13th~~ 17th February,2020

To
The Additional Secretary
Department of Industry, commerce & Enterprises
4, Camac Street, Kolkata 700 016

Sub: Final acceptance of DSR on Birbhum District.

Ref: 391-CI/O/MIN/GEN-MIS/34/2016 Dated 18.07.2019

Madam,

Enclosed herein please find District Survey Report on Birbhum District after incorporating necessary corrections and amendments. This may be accepted for final approval.

One copy of approved DSR may be sent to the District Magistrate, Birbhum with a request for uploading in their website.

This is for your kind perusal and necessary action.

Yours faithfully,

DIRECTOR OF MINES AND MINERALS

Approval of Final District Survey Report of Birbhum District

Provisional District Survey Report was published in the District Website of Birbhum Vide Memo No 610-CI/O/MIN/GEN-MIS/34/2016 Dated 14.11.2019.

After necessary corrections and amendments, the said District survey report in respect of Birbhum District as received from M/S RSP Green Development & Laboratories Pvt. Ltd. has been further examined by the committee formed in this regard.

After detailed scrutiny and evaluation of submitted necessary addendum, the members of the committee are of unanimous opinion that the said District Survey Report on Birbhum District **may be approved as Final District Survey Report** in accordance with S.O. 141(E) Ministry of Environment, Forest and Climate Change dated 15.01.2016 read with S.O. 3611(E) of Ministry of Environment, Forest and Climate Change dated 25.07.2018 for final uploading in the District Website.

Mining Officer	Senior Geologist	Senior Geologist	Director
Hooghly	Bankura	Purulia	Directorate of Mines & Minerals

O/C

FINAL DISTRICT SURVEY REPORT OF BIRBHUM DISTRICT, WEST BENGAL

As per Notification No. S.O. 3611 (E) New Delhi
Dated 25th July 2018 of
Ministry of Environment, Forest & Climate Change (MoEFCC)

Prepared By:
RSP Green Development & Laboratories Pvt. Ltd
Howrah, West Bengal

DECEMBER, 2019

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ACKNOWLEDGEMENT

RSP Green Development & Laboratories Pvt. Ltd. record their sincere thanks and gratefulness to the Government functionaries of West Bengal and prominent citizens of Birbhum district and also the villagers in and around the district Birbhum who have offered their fullest cooperation unhesitatingly but for which the execution of the work would have not become as smooth as it has been.

1. PREFACE

The purpose and structure of District Survey Report has been discretely discussed under Para 7 (iii) (a) and Annexure (x) of the notification issued by Ministry of Environment, Forest and Climate Change, Government of India on 15th January 2016. The District Survey Report (DSR) is to be prepared in every district for each minor mineral. It will guide systematic and scientific utilization of natural resources, so that present and future generation may be benefitted at large. The purpose of District Survey Report (DSR) is identification of areas of aggradations or deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited. The District Survey report (DSR) is comprised of secondary data published and endorsed by various departments and websites about geology of the area, mineral wealth details, details of lease and mining activity in the district and revenue of minerals along with the primary data collected from ground survey. This report also contains details of climatic conditions, topography and terrain, land form, forest, rivers, soil, agriculture, road, transportation, irrigation etc. The DSR would also help to calculate the annual rate of replenishment wherever applicable and allow time for replenishment.

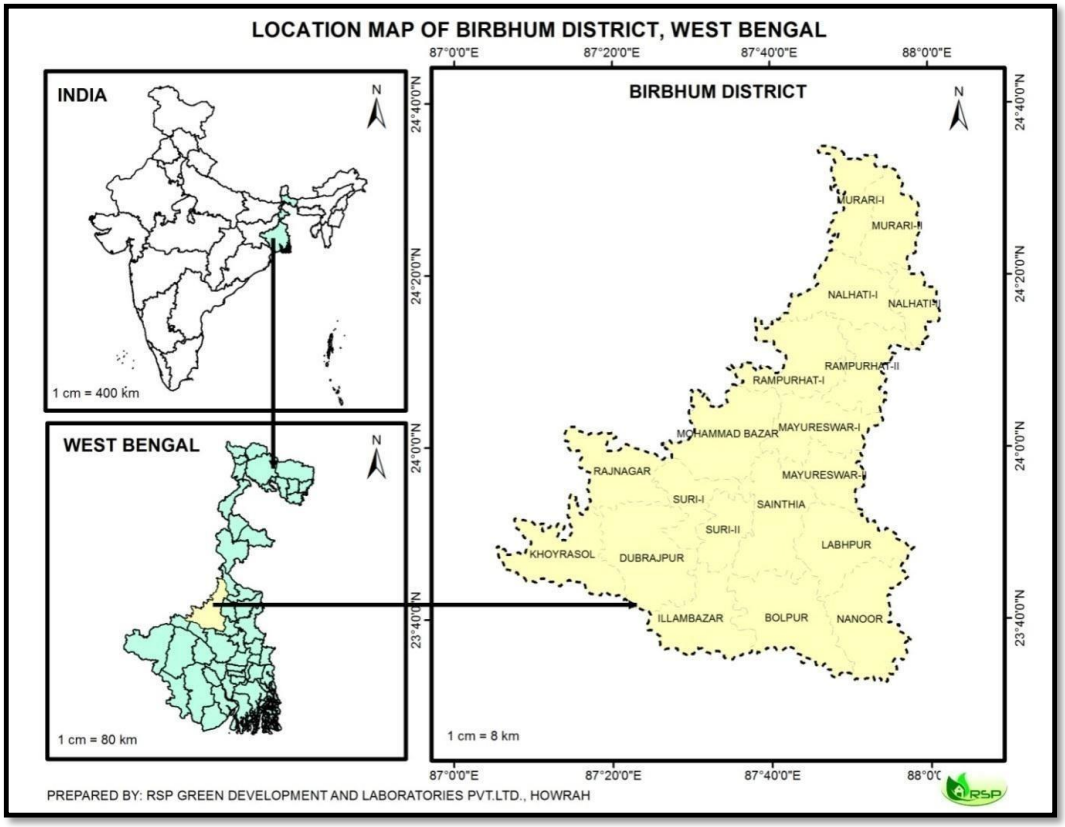
The state of West Bengal has an important position in mineral production of the country. In terms of value, the state accounts for 3.8% of mineral production in India and occupies the seventh position. Various metallic and non-metallic mineral deposits have been located both in the Peninsular and Extra-peninsular parts of the State and some of them viz.coal,chinaclay,fireclay, apatite, dolomite, limestone, silica sand, base metals, wolframite have wide economic importance. Availability of apatite in Birbhum district; coal in Bardhaman, Bankura, Birbhum, Darjeeling, Jalpaiguri and Birbhum districts; china clay in 24-Parganas, Bankura, Birbhum, Bardhaman, Hoogly, Midnapur and Birbhum districts; and fireclay in Bankura, Bardhaman and Birbhum districts is distinct. Other minerals that occur in the State are barytes, copper, gold, kyanite, pyrite and titanium minerals in Birbhum district; dolomite in Jalpaiguri district; felspar in Bankura and Birbhum districts; granite in Bankura and Birbhum districts; lead-zinc in Darjeeling district; limestone in Bankura and Birbhum districts; manganese ore and sillimanite in Midnapur district; quartz/silica sand in Bankura, Hooghly and Birbhum districts; and tungsten & vermiculite in Bankura district (Indian Minerals Year Book 2012 2012,GoI).

Disclaimer: - The data may vary due to flood, heavy rains and other natural calamities. Therefore it is recommended that DEIAA/SEIAA may take into consideration all its relevant aspects / data while scrutinizing and recommending the application for EC to the concerned authority.

2. INTRODUCTION

The entire geological report encompasses the history of river bed, river bank sand deposition and gravel deposits in the form of palaeo-placer or fossilized channels. To prepare the District Survey Report (DSR) of Birbhum district of West Bengal, the concept of GREEN FIELD THEORY (or somewhere the concept of BROWN FIELD THEORY) has been taken into account just to depict the history of overall geology followed by disposition of different types of lithounits. The Birbhum district referred as the 'Land of the Red Soil'. It is well known for its cultural importance. The shape of the district is more or less akin to isosceles triangle encompassing an area of 4545 sq. km. lying within 23°32'30" and 24°35'00"N and 88°01'40"and 87°05'25"E. The base of the triangle is marked by river Ajay separating the boundary of Birbhum with Burdwan district. On the western and north the district is bounded by the Jharkhand state and shares it eastern boundary with district of Murshidabad and Burdwan of West Bengal. Birbhum district falls under lower gangetic plain region as per Agro-Climatic classification with the majority of soils being red laterite with low alluvium and/or clay content.

Map. No. 1 LOCATION MAP OF THE DISTRICT



3. GENERAL PROFILE

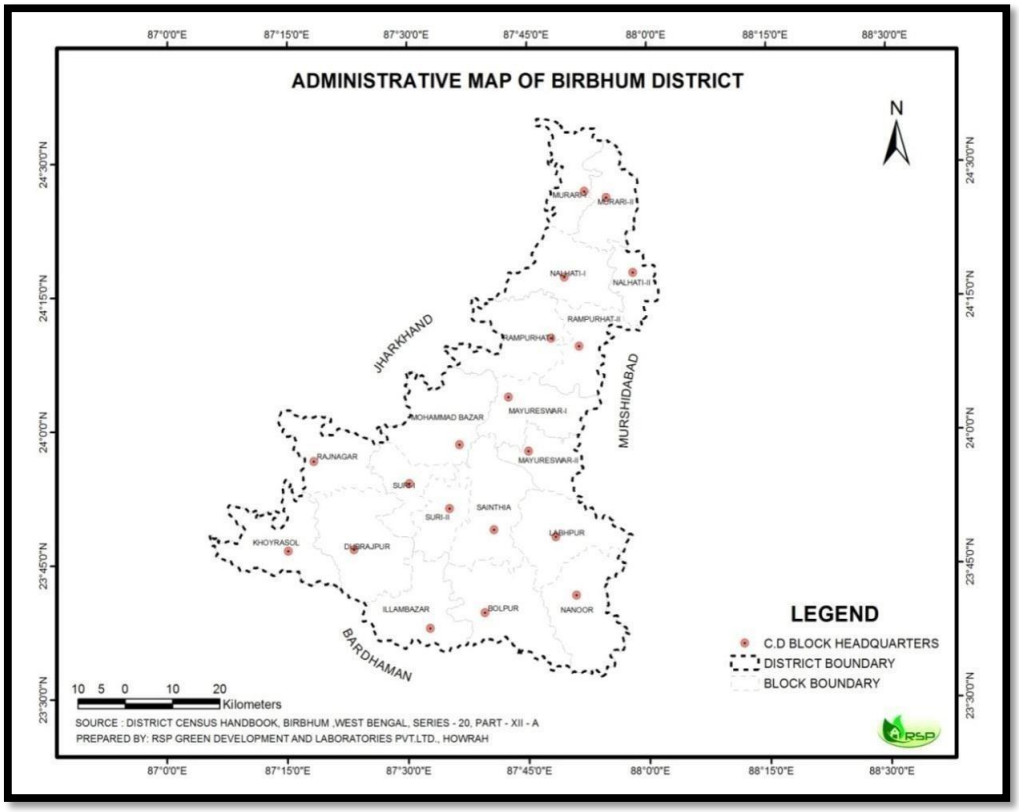
a) General information

Birbhum district is an administrative unit in the Indian state of West Bengal. It is the northernmost district of Burdwan division—one of the five administrative divisions of West Bengal. The district headquarters is in Suri. Other important cities are Rampurhat and Bolpur Jamtara, Dumka and Pakur districts of the state of Jharkhand lie at the western border of this district; the border in other directions is covered by the districts of Bardhaman and Murshidabad of West Bengal.

Situated between 23°32'30" and 24°35'0" N and 87°5'25" and 88°1'40" E, and about 4,545 square kilometre in area, this district is triangular. River Ajay forms the southern base and the apex of the triangle points north. The river forms the boundary between the districts of Birbhum and Bardhaman. The state of Jharkhand is at the northern and the western border of Birbhum and Murshidabad is at the east.

Formal results of DGPS survey of Birbhum have been attached as **Annexure VI.**

Map. No. 2 ADMINISTRATIVE MAP OF THE DISTRICT



b) Climate Condition

- **Altitude:** 180 feet
- **Summer Temperature:** Max: 40°C
- **Winter Temperature:** Min: 10°C

▪ **Summer**

The district of Birbhum experiences dry and hot summer with temperatures often rising above normal. During summers, the mercury rises well above 40°C(104°F).As for the direction of the wind, it always blows from the south-east. The climatic conditions in the western and eastern side of the district are different. While the western side is dry and extreme, it is relatively milder on the eastern side. The summers in Birbhum usually start from middle of March and last till the middle of June.

▪ **Monsoon**

The arrival of the month of June marks the onset of monsoon in Birbhum.The district boasts of a high average rainfall. However, it is observed that the western region of the Birbhum district receives higher rainfall as compared to the eastern region. The difference between the annual average rain fall in Rajnagar (1,405millimeters) and Nanoor (1,212millimeters)is an example of this. Monsoon in Birbhum lasts till the middle of the month of October.

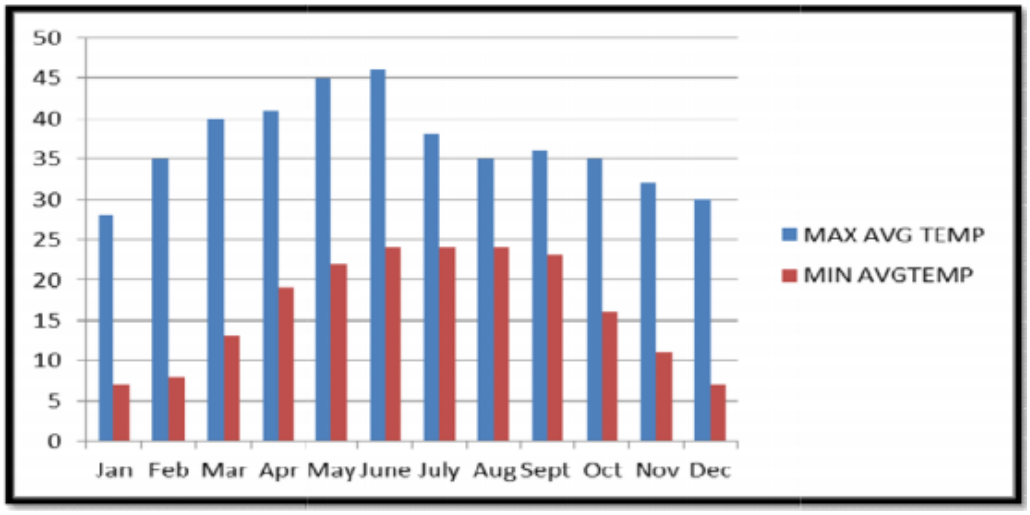
▪ **Winter**

Winters in Birbhum are pleasant and enjoyable, with mercury dropping to about 10°C (50°F). While the day time is pleasingly cool, with the fall of evening temperature lowers further, making the nights chilly and cold. During winters, wind usually blows from the north-west direction. The winter starts from December and last till the month of February. Due to such favourable conditions, winters is deemed as the best time to visit this historic and significant district in West Bengal.

Table 1: Maximum and Minimum Temperature by month in the district of Birbhum (Centre Suri, Year-2012)

Month	Maximum Temp (ºC)	Minimum Temp (ºC)
January	28	7
February	35	8
March	40	13
April	41	19
May	45	22
June	46	24
July	38	24
August	35	24
September	36	23
October	35	16
November	32	11
December	30	7

Chart. No. 1 Graphical Representation of Average Minimum & Maximum Temperature of Birbhum

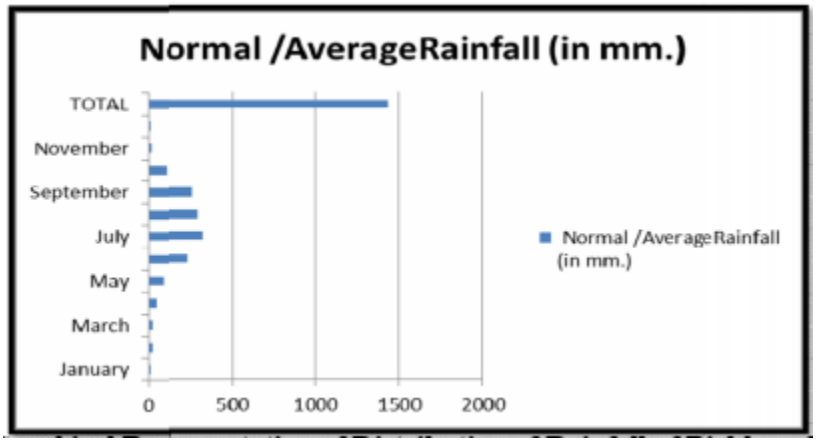


c) Rainfall (month wise) and Humidity

Table 2: Average monthly rainfall of Birbhum district

Month	Normal /Average Rainfall (in mm)	Actual Rainfall (in mm) (2015)
January	9.7	5.60
February	23.2	9.30
March	23.3	30.4
April	40.7	91.20
May	88.7	69.8
June	234.2	304.0
July	324.5	695.56
August	295.7	289.2
September	258.2	113.2
October	105.4	37.4
November	17.5	4.26
December	9.4	3.5
TOTAL	**1430.50**	**1653.42**

Chart. No. 2 Graphical Representation of Distribution of Rainfall of Birbhum District

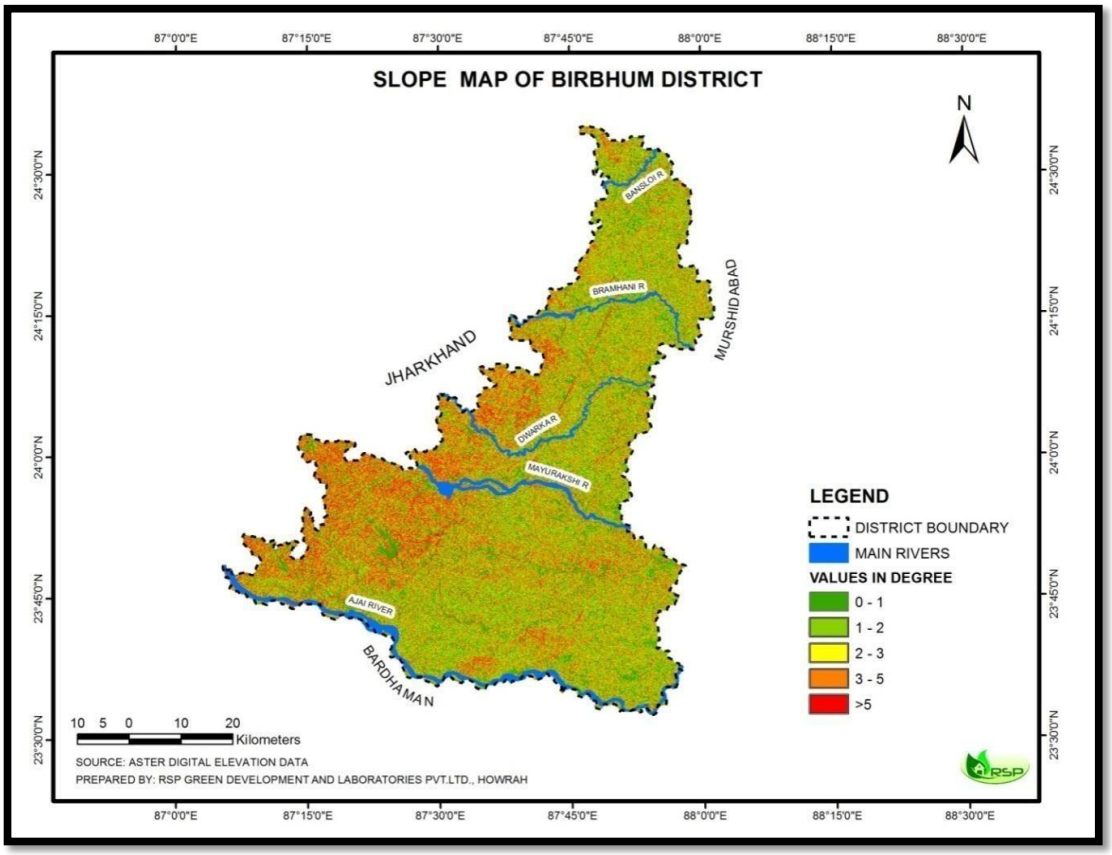


d) Topography and Terrain

Birbhum is a part of the Rarh region; high land to the West is located on the hard nonporous crystalline rocks, while the rest is made up of the Gondwana sediments, the laterites and the alluvium. The general trend of the district is from north-west to south-east. At the western boundary the high ridges capped by laterites and are separated by valleys. But at the south- eastern part these ridges disappear gradually and valleys become shallow and gradually mixed with the alluvium of Indo- Gangetic plains.

At the Rampurhat subdivision, hills are the extensions of the low Rajmahal hills of basaltic formation. The south of the Labhpur and Bolpur, the land is totally flat. The general gradient is from north-west to south-east. The rolling upland topography between Mayurakshi and the Ajay is known for its splendour and picturesque variety. Mayurakshi shows a non-perennial channel flow whereas the Koiya (combined streams of Bakreswar and Kopai) is perennial. Kopai river shows meandering in a semi-circular arc.

Map. No. 3 SLOPE MAP OF THE DISTRICT



e) Water Course and Hydrology

Birbhum district mainly comprises of i) alternating layers of sand, silt and clay ii) Rajmahal trap basalt, hard clays with caliche nodules iii) enclaves of granite gneiss. These lithological units directly control the hydrological part of this undulating area. Presence of hard clays and Rajmahal trap basalt hinders the flow of ground water system due to lack of vesicular structures. So in this region low to heavy duty tube wells are feasible. The yield prospect is 7.2-250 cum/hr. Permeable layers of shale, sandstone increase the downward percolation and flow of groundwater. So that dug wells and bore wells are feasible in this area. Archaean granite gneiss occurs at the western region; water bearing fractures are encountered within 60m below ground level that paves the way of advent of water easily during pumping.

The Archaeo-Proterozoic rocks are the main source of fluorine causing the fluoride contamination of groundwater mainly in Nalhati Block-I and Block-II. So the human habitation of these localities suffers fluorosis disease due to intake of fluoridated ground water. The permissible limit of F content in GW is 1.5 ppm as per WHO. But water of Nalhati blocks exceeds the limit.Sporadic occurrence of high fluoride (>1.5mg / L) in ground water has been reported from the blocks of Khoyrasol, Sainthia, Suri-II,Mayureswar-I, Nalhati-I, Rampurhat-I of Birbhum District. Fluoride content more than 1.5mg/ L has been noted in the following depth ranges in different types of hydrogeological formations consisting of different types of litho units:

- In highly fractured, jointed and fissured granite, basalt & alluvium with in a depth range of 50- 80m.
- In Gondwana formation with in 30m depth range.

f) Ground water development

Ground water potentialities and its position largely depends on the geological structures, composition of strata, infiltration circumstances, water retention capacity, presence and alignment of aquifer and aquiclude (impermeable hard layer) layer. The average potentiality of layers of this district are located at the depth of i) 12.19-24.38 m ii) 30.48-42.67 m iii) 54.86-67.06 m.

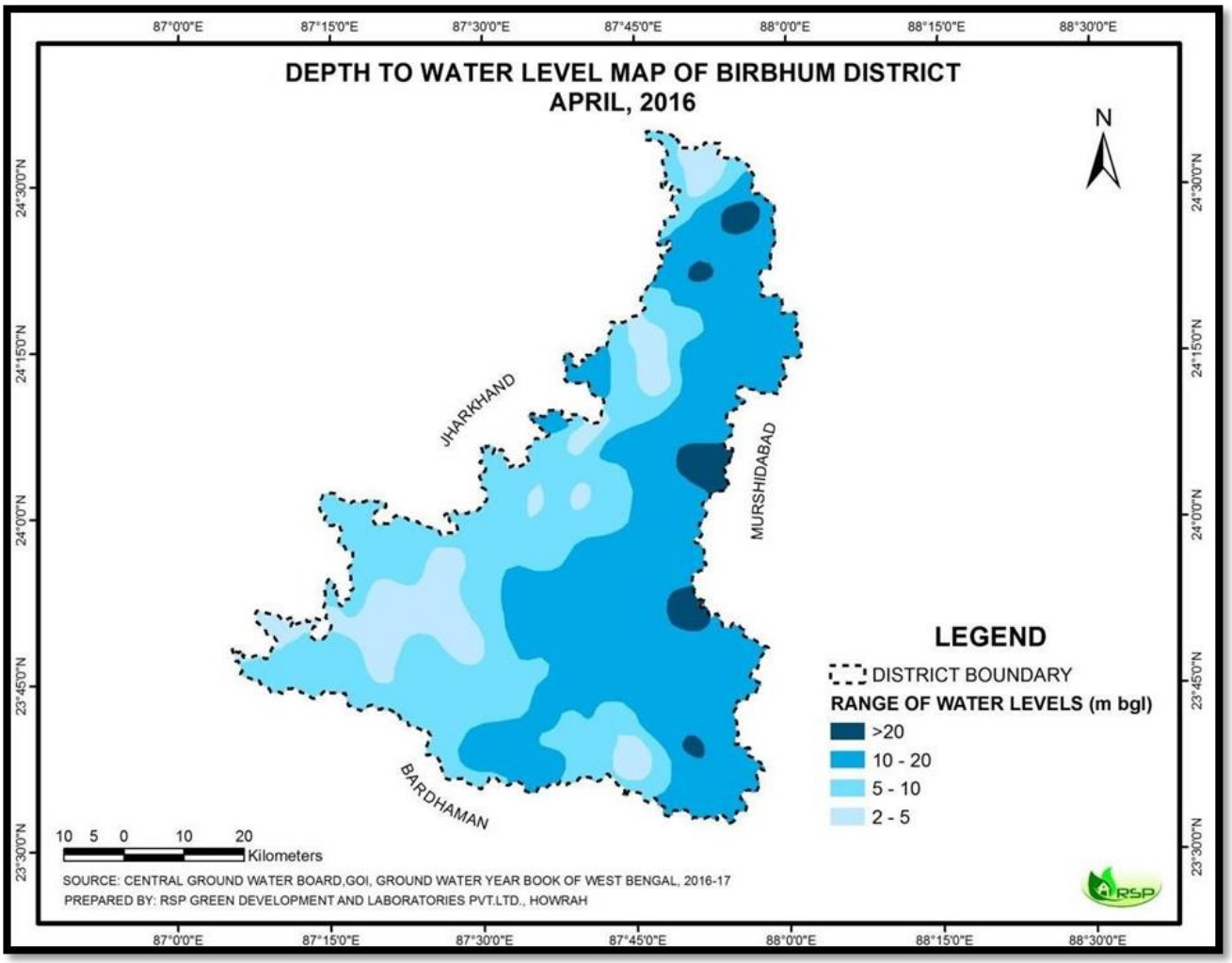
The lithological conditions are not same in all parts. Hatia and Dwarka have only two potential layers, first layer is composed of coarse sand and the second layer is used for drinking water purpose. Only Chauhatta-II is composed of six potential layers and grade of sand becomes going to be decreased with the changing of layers from the surface. Here fifth and sixth layers are used for drinking water purpose. Rests of the Panchayets are composed of 3 layers and the 2nd and 3rd layers are used for drinking water purpose. In all Panchayets the first layers remain unused for drinking water because coarse sand helps to filter the surface water which reaches to the second layer.

In Labpur block the potentiometric map (*i.e.,* the map shows the equal potential lines of same hydraulic head

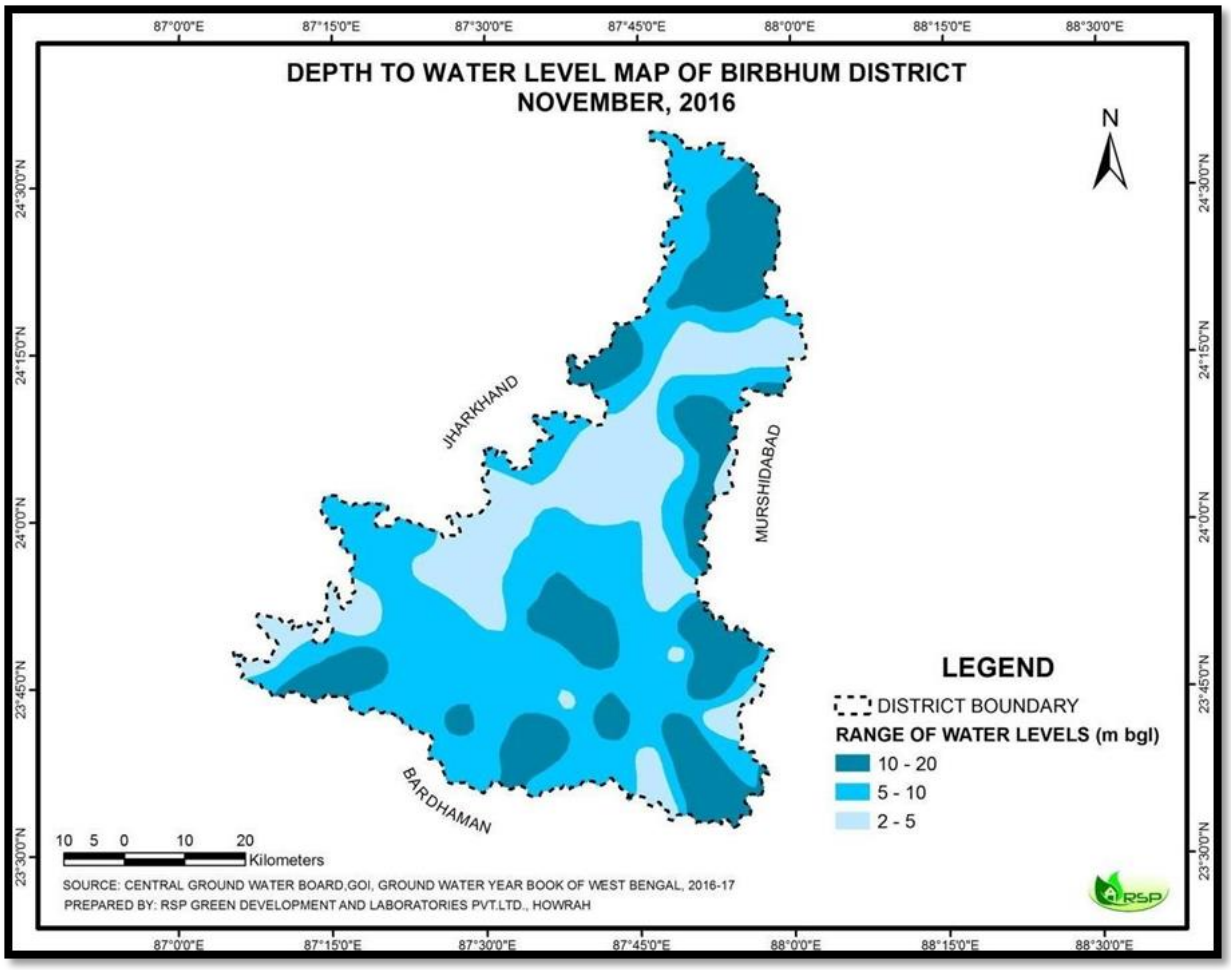
difference) provides clues about the rate of groundwater flow.

Both pre-monsoon and post-monsoon season equipotential pattern have the tendency to flow ground water same as the surface water flow. It also proves that flow pattern of ground water is towards the flood plain wetlands *e.g.,* it flows towards the eastern part of the block i.e. towards Langolhata beel, Patharghata beel , Panchpara beel. The another fact also reveals from the equipotential lines that at the low equipotential gradient, ground water flow is not confined, which means ground water aquifer is unconfined in this block. Monsoonal rainfall causes large scale ground water recharge which result into presence of GWL at very lower depth. Huge draft of ground water for agricultural purposes and lithological characteristics are responsible for these high observed depths of GWL.

Map. No. 4 WATER LEVEL DEPTH MAP OF BIRBHUM DISTRICT (PRE-MONSOON)



Map. No. 5 WATER LEVEL DEPTH MAP OF BIRBHUM DISTRICT (POST-MONSOON)



g) Drainage system (general)

The rivers of the western part of the district resembles dendritic pattern and become fenced by well-marked undulations. Actually the western portion of the district is an extension of Chhotanagpur plateau and the eastern part merges with alluvium. Thus from west-east drainage slope becomes decreased.

h) Demography

The official Census 2011 detail of Birbhum, has been released by Directorate of Census Operations in West Bengal. In 2011, Birbhum had population of 3,502,404 of which male and female were1,790,920 and 1,711,484 respectively. In 2001census, Birbhum had a population of 3,015,422 of which males were 1,546,633 and remaining 1,468,789 were females. There was change of 16.15% in the population compared to population as per 2001. In the previous census of India 2001, Birbhum District recorded increase of 17.99% to its population compared to 1991.

Table 3: Demographic pattern of the district (Source: Census 2011, 2001)

Description	2011	2001
Population	35.02 Lakhs	30.15 Lakhs
Actual Population	3,502,404	3,015,422
Male	1,790,920	1,546,633
Female	1,711,484	1,468,789
Population Growth	16.15%	17.99%
Area insq. km.	4,545	4,545
Density/km	771	663
Proportion to West Bengal Population	3.84%	3.76%
Sex ratio(per 1000)	956	950
Child SexRatio(0-6 Years)	959	964
AverageLiteracy	70.68	61.48
MaleLiteracy	76.92	70.89
Female literacy	64.14	51.55
Total Child Population(0-6Years)	448,485	488,193
Male Population(0-6Years)	228,909	248,599
Female Population(0-6Years)	219,576	239,594
Literates	2,158,447	1,553,852
Male Literates	1,201,481	920,153
Female Literates	956,966	633,699
Child Proportion(0-6 Age)	12.81%	16.19%
Boys Proportion(0-6 Age)	12.78%	16.07%
Girls Proportion(0-6 Age)	12.83%	16.31%

Chart. No. 3 Graphical Representation of Male & Female Population of Birbhum

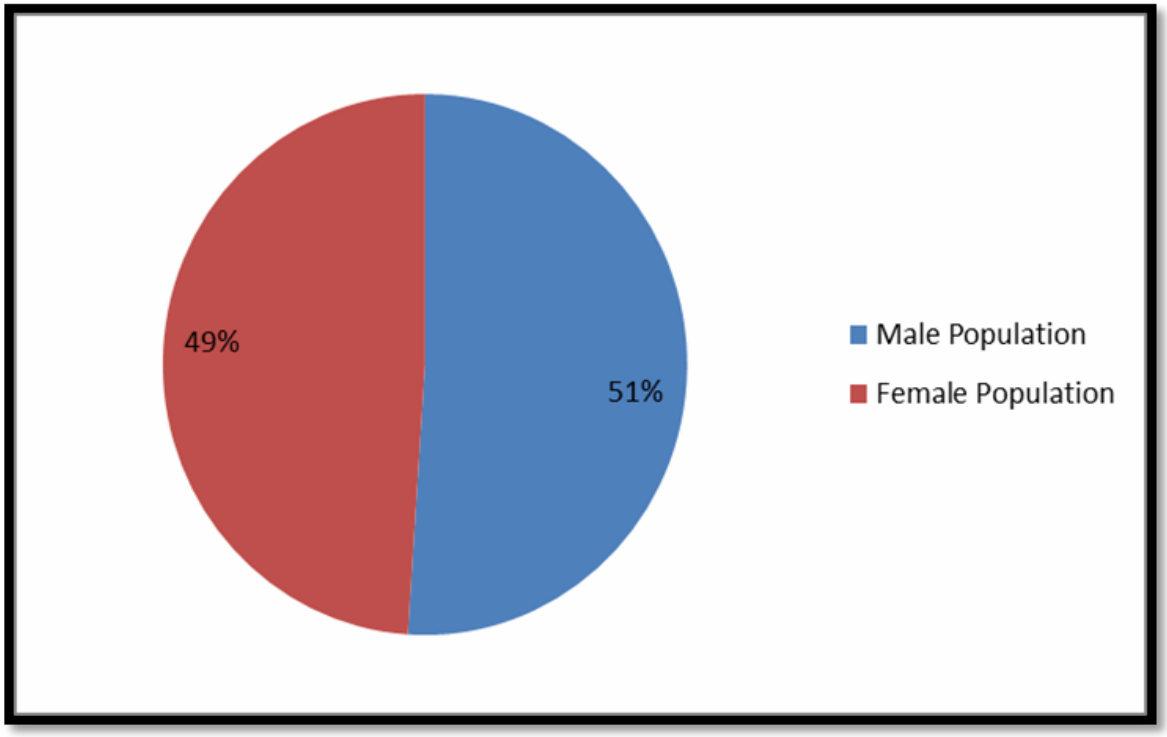


Chart. No. 4 Graphical Representation of distribution of male & female literates of the district of Birbhum

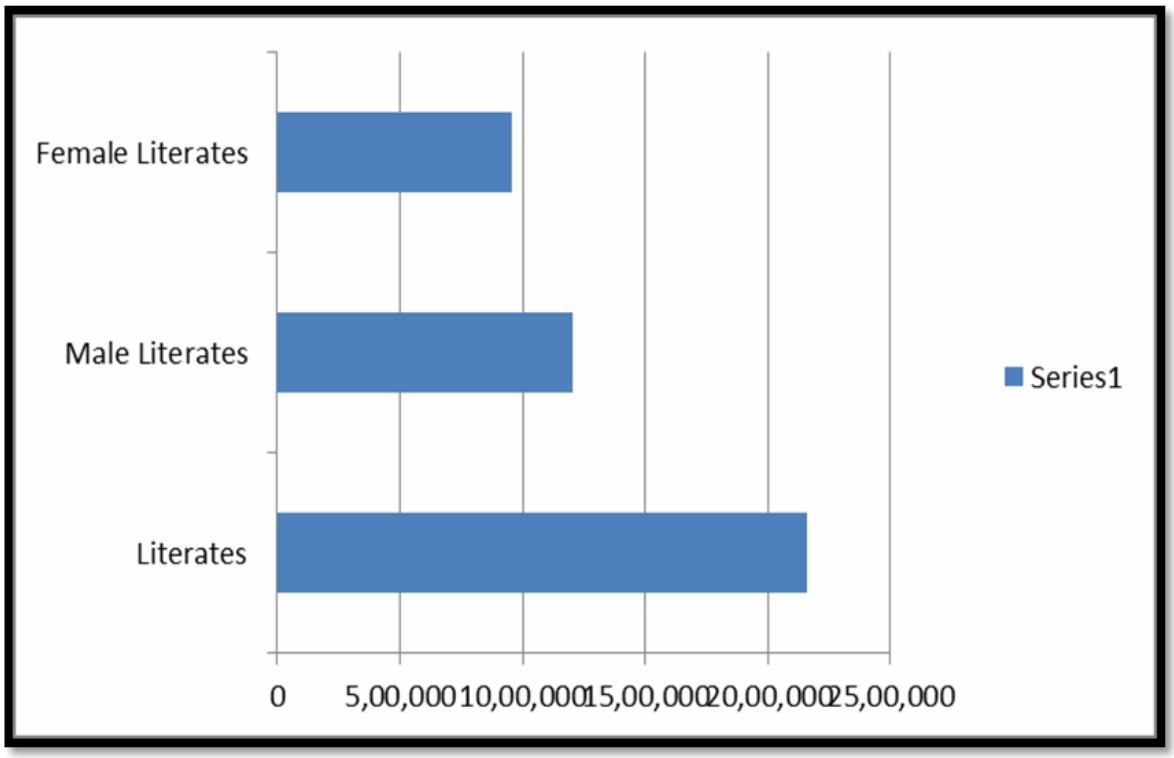


Table 4: Human Resource Development Index of Birbhum District

Blocks	Urbanization Index	Workers Index	Literacy Index	Female Literacy Index	Women Self-Help Group Index	School Index	Human Resource Development Index (HRDI)	Remarks
Nalhati –I	9.981	35.159	52.666	44.250	62.040	0.399	34.083	Moderate
Nalhati-II	0	33.327	50.184	42.707	38.806	0.291	27.553	Low
Murarai-I	0	32.733	37.032	29.805	65.067	0.325	27.494	Low
Murarai-II	0	32.395	37.244	30.277	81.910	0.274	30.350	Moderate
Mayureswar-I	0	38.431	55.247	46.035	48.442	0.453	31.435	Moderate
Mayureswar-II	0	38.128	53.162	43.972	53.022	0.463	31.458	Moderate
Rampurhat -I	31.793	44.330	51.711	42.807	61.686	0.567	30.816	Moderate
Rampurhat-II	0	35.005	52.943	44.321	61.686	0.413	29.441	Low
Mohammad Bazar	0	37.605	45.395	36.363	68.296	0.466	31.354	Moderate
Sainthia	27.075	38.409	55.002	46.408	68.734	0.627	39.376	High
Dubrajpur	20.597	39.806	47.064	37.052	42.179	0.544	31.207	Moderate
Rajnagar	0	45.799	49.006	38.464	59.459	0.793	32.254	Moderate
Suri-I	64.064	42.818	52.655	43.593	76.379	0.518	46.671	High
Suri-II	0	49.408	53.314	44.768	43.899	0.539	31.988	Moderate
Khoyrasole	0	35.109	51.453	40.678	56.815	0.532	30.765	Moderate
Bolpur-Sriniketan	36.883	43.729	51.203	42.947	72.222	0.478	41.244	High
Labhpur	0	35.395	52.590	44.618	57.447	0.493	31.757	Moderate
Nanoor	0	36.882	51.885	44.694	80.335	0.478	35.712	High
Illambazar	0	36.526	52.243	43.766	55.319	0.523	31.396	Moderate

[Source: Roy& Mondal, 2014]

i) Cropping Pattern

The soil of the Nalhati Plain has lateritic soils mixed with Recent alluvium. Brahmani- Mayurakshi Basin has red sandy and red loamy soils of the older alluvium. The soils are loose and friable. In Suri-Bolpur Plain the soil varies from red sandy, red loamy and older alluvium in the south-western to brown and recent alluvium in the central and south-eastern part of the region. The soil of Bakreswar Upland is generally lateritic mixed with alluvium. The various types of soil as observed in the district and their suitability for growing different crops are described below.

In Bengali language, the brownish clay is called Entel. It is wholly unsuitable for rabi cultivation and needs manuring to produce rice. Entel is the clay soil, can retain moisture and is capable of producing 'Aman' rice and winter crops like gram, wheat, *etc.* The alluvial deposition is known as 'Palimati'. Such soils are very rich and generally are used for growing wheat, potato, vegetables, *etc*. With adequate irrigation such soils can produce 'Rabi' crops in abundance.

'Bindi' is friable, loose sandy soil with very little water holding capacity. It can grow rice and is quite capable of growing rabi crops with irrigation. 'Doansh' is friable loose blackish soil. It is very rich in fertility and can grow almost all crops. 'Bele' is friable loose whitish soil, poor in fertility, ordinarily unsuitable for rabi cultivation, but can grow rice and to some extent some vegetables. 'Kankar' is friable loose reddish soil and considered as a very poor type of soil. However, it can grow crop like mahua, bajra, maize, *etc.* and with irrigation facilities can grow some rabi crops. 'Bastu' is rich blackish soil with low water holding capacity which with proper manuring and irrigation can grows fine rice, wheat, tobacco, sugarcane, *etc.* In the Brahmani- Mayurakshi Basin aman paddy is the principal crop. With the help of irrigation rabi crops are also grown. In Suri-Bolpur Plain, along with paddy, wheat, peas, sugarcane and tobacco are grown. The soil of the Bakreswar Upland is not fertile but the crops are grown in irrigation schemes of the Mayurakshi canal project and Hingla project.

The economic condition of Birbhum district is dominated by agriculture. The land of Birbhum is divided into 13 classes, viz. (1) Do, (2) Suna, (3) Sali, (4) Ola orolan, (5) Jedanga or Danga, (6) Pat- jamior Mulberryland, (7) Jangalbhumi, (8) Panerbaraj, (9) Ghas,(10) Sarbera,(11) Bastu,12) Salghor and (13) Patit. Out of these 13 classes of land, mainly the first three classes of land are most fit for rice cultivation. Do land has a rich soil, on which aus or aman rice is generally grown, besides gram, masuri, peas, wheat, linseed, khesari, til, sugarcane and occasionally cotton. Suna lands differ from do lands in having a smaller amount of moisture and in being unsuitable for the cultivation of sugarcane. Other crops that grow on do lands also grow onsuna lands, but the quantity of produce is smaller and the cost of cultivation greater. Sali land consists of moist muddy land which will bear three crops in the

year, viz., a crop of aman rice, a crop of khesari, and a crop of kashta til.There is double to triple cropping system of Paddy cultivation in the district. The area under Paddy in 2010-11 is 249.0 thousand hectares of land. **[Source: District Census Handbook, Birbhum, 2011].**

Rice, pulses, wheat, sugarcane, oilseeds, potato, sugarcane are the major crops cultivated in the district. Among Khar if crops,4.8 hectares of land is under rainfed rice cultivation only. Among Rabi crops, which are cultivated by means of irrigation only, rice cultivation covers 315 hectares, pulses cultivation covers 17.8 hectares, wheat cultivation covers 32.1 hectares, oilseeds cultivation covers 36.3 hectares and potato cultivation covers 17.8hectares.

[Source:http://www.crida.in/CP-2012/ statewiseplans / West%20Bengal%20(Pdf)/BCK VV , %20 Kalyani / WestBengal%203-Birbhum- 31.12.2011.pdf]

Table 5: District profile at a glance on agricultural point of view

Particulars	Area in hectares
Geographical Area	454500
Area under non-Agricultural Use	91771
Barren & uncultivable land	382
Permanent Pasture & other Grazing land	395
Cultivable Waste Land	3528
Fallow land other than current fallow	3360
Current fallow	143578
Forest Area	15853
Land under misc. Tree Groves not included in Net Area	1571
Net Cropped Area	320610
Gross Cropped Area	548724
Cropping Intensity	171.15
No. of operational Holding(2010-11)	450313
High land(Notionally Estimated)	75295
Medium land (Notionally Estimated)	174719
Low land (Notionally Estimated)	70596
Drought–prone Area(Notionally estimated)	75295
Flood-prone Area(Notionally Estimated)	21000

Table 6: Cropping intensity of Birbhum district

Year	Cropping Intensity (%)
2008-09	165.1
2009-10	154.94
2010-11	123.94
2011-2012	161.88
2012-2013	163.16
2013-2014	165.43
2014-2015	169.25
2015-2016	171.15

Table 7: Soil characteristics of Birbhum District

Soil Reaction Classes	% Area	Area in Ha
Strongly acidic (pH < 4.5)	2.2	7053
Moderately acidic (pH 4.5--5.5)	48.4	155175
Slightly acidic (pH 5.5--6.5)	36.3	116382
Neutral (pH 6.5--7.5)	9.6	30779
Slightly alkaline (pH 7.5--8.5)	0.9	2885
Miscellaneous	2.6	8336
TOTAL	**100**	**320610**

Table 8: Important variety cultivated under different crops

CROP VARIETY	
Aman Paddy	MTU-7029,SS-I, MTU-1001,MTU-1010,IR-42,Pratiksha,GB-1,Sahabagidhan Summer Paddy MTU-1010,IET-4786,GB-1,IR-64,IR-36
Wheat	HD2967,CBW-38,UP-262,PBW-343
Mustard & Rai	B-9,JD-6,PT-303,B-54,Pitambari
Potato	Kufri Jyoti, Kufri Pokraj, Kufri Chandramukhi Lentil Asha, Ranjan, Subrata, Subhendu, Moitree
Gram	Anuradha, Bidisha,Mahamaya-I &II Sesamum(Til) Rama,Sabitri,Tilotamma
Moong	Samrat,Sonali,Panna,PusaBisal,k-851
Kalai	Kalindi,Sarada,Sulata,Goutam

[Source: h ttp://www.birbhum.gov.in/DDAgri/ddadmin.htm]

j) Landform and Seismicity

At the western part of the Birbhum dist. hillocks are present. That part is elevated region, basically the foothill of Chhotanagpur Plateau that gradually merges with the fertile laterite sand alluvium flat farmland in the east. Birbhum is categorized under seismically active zone- III. (Least Active)

k) Flora

Total forest area in Birbhum district has been estimated nearly 15926.58 hectares which covers only 3.5 per cent of the total district area. There are mainly three types of forest areas in the district namely (i)Reserved Forest (ii)Protected Forest and (iii)Unclassified Forest area. Most of the Reserved Forests and Protected Forests are located along the undulated high lands of the western part of the district while rest of the area is characterized by Unclassified Forests of open mixed jungles and scrubs. The important forests of the district are Masra Reserved Forest in Rampurhat-IC.D. Block, the Kalai Pahari Protected Forest, Maubelia Reserved Forest , Chandpur Protected Forest in Mohammad Bazar C.D. Block, Bansbuni Protected Forest in Rajnagar C.D. Block and Chaupahari Protected Forest in Illambazar C.D. Block. All these forest areas are dominated by *Sal (Shorea robusta)* trees while the Unclassified Forests belong to Northern Tropical Dry deciduous type. The major trees found in these forests are *Teak (Tectona grandis), Pipal (Ficus Religiosa), Siris (Albizzia lebbeck), Mahua (Bassia latifolia), Neem (Azadirachta indica), Babul (Acacia arabica), Bamboo (Bambusha tulda) etc.* These are the main source of non-timber forest products to the people of the district.Besides these tree types, certain medicinal plants including *Neem (Azadirachta indica), Kumbhi (Careya arborea Roxb), Najani (Croton bonplandianum), Bat (Ficus benghalensis Linn), Gurmar (Gymnea sylvestre), Arjun(Terminalia cuneala Roth) and Akanda (Calotropis gigantea) etc.* are also found in plenty in the district (Source: District Census Handbook, Birbhum, 2011).

The vegetation of Birbhum District as a whole belongs to the tropical dry deciduous type with a few representatives of the evergreens occurring here and there. Trees, like Sal *(Shorearobusta),* Mahua *(Bassia lati/olia)* and Palas grow to the western part. Thorny shrubs, palm and mango trees are present throughout. Botanically, the district can broadly be divided into two zones. The first zone comprises the undulated highlands along the western part of the district. Although the soil erosion is acute in this lateritic area, several relict patches of Chhotanagpur plateau forest are still to be found around Rajnagar, Mahammad Bazar, Hetempur and Suri. The vegetation of this region shows semi-arid nature and is similar to eastern Bihar including species of scrubby thickets like *Acacia bridelia*, *Buchanania, Calotropis, Capparis cassia, feronia, jatropha, phyllanthus, streeblus, Tephrosia, wendlandia, Zizy plus etc*. Grooves of trees are rather scarce in the south western parts ofthe district. The second zone consists of the flat alluvial plain in the south and east of the district. The vegetation of this tract is characteristic of the alluvial rice plain of Gangetic West Bengal. Species of *Ageratum alysicarpus, Apongeton, Cayratia commelina etc*. flourish well in

this part of the district The common plants seen around die dwellings in village and towns are clumps of babla (*Acacia nilotica*), bel (*Aegle marmelos*), ata (*Annona squamosa*), kanthal (*Artocarpur heterophyllus*), neem (*Azadirachta indica*), bansh (*Bambusae arundinacea*), bot (*Ficus benghalensis*), pakur or aswatha (*Ficus religiosa*), am (*Mangifera indica*), sajina (*Moringa oleifera*), amra (*Spondias pinnata*), jam (*Syzygiumcumini*), tentul (*Tamarindusindica*), aijun(*Terminaliaarjuna*)and other arborescentspecies.Marginsoftanks, bunds of paddy fields and marshes are inhabited by a mixed community of aquatic and amphibious species: kachuri pana (*Eichhomia crassipes*), jhanjhi (*Hydrilla verticillata*), kalmi (*Ipomoeaaquatica*), susni(*Marsileaminuta*), paniphal(*Trapanatens*)*etc.* Wetland plantspecies include floating hydrophytes, namely, water hyacinth,water lettuce and duck weeds; suspended hydrophytes, Tikejhanji *(Ceratophyllum)* and anchoredhydrophytes such as Patashaola *(Vallisneria* sp.), Padma *(Nelumbo nucifera),* Paniphal *(Trapa* sp.),Panchuli *(Nymphoides* sp.), Shapla *(Nymphaea* sp.), Hydrilla, Ottellia, Najas *etc.* Most of these hydrophytes were abundant in Datindighi, about 4 km. west of Dubrajpur, which is said to have beenexcavated by Kbagaditya Raja (O'Malley, 1910). Similar aquatic or palustrine genera are available in wetlands of Ballavpur and Rampurhat along with sedge *(Cyperus* sp.) and emergent amphibious hydrophytes *(Marsilea, Aponogeton, En hydra, Potamegeton, Paspalsum, Aeschynomene, etc.* especially in the Nagalhata beel. However, man-made ponds of domestic use were turned intogreen colour during summer due to algal blooms caused by *Microcystis* sp. and Tilpara barrage was dominated by filamentous algae *(Spirogyra)* (Nandi *et. al.,* 2001).

Apart from the principal types of food and cash crops - rice, wheat, maize, potato, sugarcane, jute,pulses, oilseeds and vegetables – the Birbhum district also produces several other important economicplants.The district is particularly rich in medicinal plants.Some common ones, which are used as natural drugs and form articles of trade are Vasaka (*Adhatoda vasica*), Kalmegh (*Andrographis paniculata*), Satamul (*Asparagus racemosus*), Anantamul (*Hemideomus indicus*), Siuls (*Nyotanthes arbor-iristis*), Tentul (*Tamarindus indica*), Arjun (*Terminalia arjuna*), Behera (*Terminalia belerica*), Haritaki (*Terminalia chebula*) *etc.* The majority of these drugs come from the forests. The trees of Babla (*Acacia nilotica*), Palas (*Butea monosperma*), Bot (*Ficus benghalensis*), Aswatha (*Ficus religiosa*), Kusum (*Schleichera oleosa*) and Kul (*Zizyphus mauritiana*) are raised for tiny lac insects to leave resinous incrustation on their soft branches. The Tunt (*Moru alba*) is commonly cultivated in Bhadrapur, Boswa Bishnupur, Ganutia and their neighbouring areas to feed silk-worms. Several species of sisal (*Agave* sp.) are grown' on large scale near Rajnagar. The forest are usually distributed in scattered patches, in between the stretches of barren waste lands or fallow fields along the western fringe of the district They are located in Nalhati, Rampurhat, Mahammad bazar, Suri, Rajnagar, Khayrasole, Dubrajpur, Illambazar and Bolpur Police stations. The forest may be classified as lateritic forests, which include, sal forest. With the introduction of permanent settlement, forest was gradually cut to bring land under cultivation. The practice of keeping land fallow and

unscientificlandmanagementledtosevereerosion.Thebiggestareaofforestthathasbeenleftis Chaupahari jungle having an area of about 14 sq.km, under the Illambazar police station. Other notable spots are Baidyanathpur, Kachujore, Asansol, Rajnagarjungles and their adjoining formations. The district is divided into five forest Ranges, as follows: Bolpur, Suri, Rajnagar, Mahammad Bazar and Rampurhat. Some minor forest products like bidi leaves, sal leaves, mahua flowers, pial fruits, grasses and fodder provide means of livelihood to the people in die forest areas.

[Source:https://shodhganga.inflibnet.ac.in/bitstream/10603/164886/11/11_chapter%203.pdf]

Table 9: Diversity of plants in Birbhum

Scientific Name	Common Name	Frequency of occurrence
Abutilon indicum	Petari	Common
Acacia nilotica	Babla	Abundant
Acacia auriculiformis	Akashmoni	Frequent
Acalypha indica	Muktojhuri	Common
Achyranthes aspera	Apang	Abundant
Acorus calamus	Boch	Rare
Aegle marmelos	Bel	Common
Aerva lanata	Chaya	Common
Ageratum conyzoides	Uchunti	Common
Albizzia lebbeck	Sirish	Common
Allium cepa	Piyag	Abundant
Alocasia indica	Mancachu	Common
Aloe barbadensis	Ghritakumari	Rare
Alstonia scholaris	Chattim	Common
Alternanthera sessilis	Sanchi sag	Common
Amaranthus spinosus	Kanta notey	Abundant
Amaranthus viridis	Notey Sag	Abundant
Amorphophallus paeoniifolius	Ol	Common
Andrographis paniculata	Kalmegh	Frequent
Anisomeles indica	Gopali phul	Common
Antigonon leptopus	Anantalata	Common
Arachis hypogea	Badam	Frequent
Argemone maxicana	Sialkanta	Abundant
Aristolochia indica	Iswarmul	Rare
Artocarpus heterophyllus	Kathal	Common
Azadirachta indica	Neem	Common
Bacopa monnieri	Brahmi	Frequent
Basella alba	Pui sak	Abundant
Bauhinia acuminata	Swet Kanchan	Common
Boerhaavia diffusa	Punarnava	Abundant
Bombax ceiba	Shimul	Abundant
Borassus flabellifer	Taal	Common
Bougainvillea spectabilis	Bagan bilash	Abundant
Butea monosperma	Palash	Common
Caesalpinia pulcherrima	Palash	Common
Calotropis gigantea	Akanda	Frequent
Canna indica	Sarbajaya	Abundant
*Cannabis sativa*L	Gaja	Common
Cardiospermum helicacabum	Latapatkari	Rare
Carica papaya	Peypey	Frequent
Cassia fistula	Amaltas	Common

Scientific Name	Common Name	Frequency of occurrence
Cassia occidentalis	Kalkasunda	Common
Cassia siamea	Kassod gach	Common
Catharanthus roseus	Nayantara	Common
Centella asiatica	Thankuni	Common
Cestrum diurnum	unknown	Common
Chenopodium album	Beto sak	Common
Chrysopogon aciculatus	Chorkanta	Common
Cinnamomum tamala	Tejpata	Common
Citrus maxima	Batabilebu	Frequent
Cleome viscosa	Hurhure	Common
Clerodendrum inerme	Bon mehendi	Common
Clerodendrum viscosum	Ghetu	Common
Clitoria ternatea	Aparajita	Abundant
Coccinia grandis	Telakucho	Common
Cocos nucifera	Narkel	Common
Colocasia esculenta	Kachu	Abundant
Commelina benghalensis	Kansira	Abundant
Coriandrum sativum	Dhone pata	Abundant
Crotalaria pallida	Atasi	Common
Crozophorarottleri	Khudi okra	Common
Croton bonplandianum	Bon tulsi	Common
Cucurbita maxima	Kumro	Abundant
Curcuma longa	Halud	Common
Cuscuta reflexa	Swarnolata	Frequent
Cymbopogon citratus	unknown	Frequent
Cynodon dactylon	Durba	Frequent
Cyperus rotandus	Mutha ghass	Abundant
Dalbergia sissoo	Sishu	Common
Datura metal	Dhutura	Common
Dentella repens	Gulmohor	Common
Desmodium triflorum	Salpani ful	Common
Dillenia indicaL	Gime sak Chalta	Common
Duranta repens	unknown	Common
Eclipta alba	Kesuth	Frequent
Eichhornia crassipes	Kachuripana	Common
Emblica officinalis	Amlaki	Common
Eragrostis tenella	Shada fulka	Common
Eucalyptus globulus	Eucalyptus	Frequent
Euphorbia hirta	Borokorni	Abundant
Euphorbia pulcherrima	Lalpata	Frequent
Evolvulus alsinoides	Sankha puspi	Common
Ficus benghalensis	Bot	Frequent
Ficus hispida	Dumur	Rare
Ficus religiosa	Assatha	Common
Gossypium barbadense	Karpas	Common
Heliotropium indicum	Hatisur	Common
Holarrhena antidysenterica	Joba	Frequent
Hibiscus rosa-sinensis	Kurchi	Common
Hygrophylla schulli	Kulekhara	Abundant
Impatiens balsamina	Dopati	Frequent
Ipomoea carnea	Dhol kalmi	Common
Ipomoea aquatica	Kalmi Sak	Common

Scientific Name	Common Name	Frequency of occurrence
Jatropha gossypifolia	Varenda	Common
Justicia adhatoda	Basak	Common
Kyllinga nemoralis	unknown	Common
Lablab perpureus	Sim	Common
Lagerstroemia speciosa	Jarul	Common
Lantana camara	Chotra	Common
Lawsonia inermis	Mehendi	Abundant
Leucas aspera	Shet drone	Abundant
Lindenbergia indica	Basanti ful	Frequent
Litchi chinensis	Lichu	Common
Luffa acutangula	Jhinga	Abundant
Malachra capitata	Bon dharos	Common
Mangifera indica	Aam	Common
Mazus pumilus	unknown	Frequent
Mikania micrantha	Tarulata	Common
Momordica charantia	Ucche	Common
Mimosa pudica	Lajjabati	Common
Mirabilis jalapa	Sandhya malati	Common
Moringa oleifera	Sajina	Rare
Morus indica	Tut	Common
Murraya koenigii	Curry pata	Abundant
Neolamarckia cadamba	Kadam	Frequent
Nerium indicum	Karobi	Frequent
Nicotiana plumbaginifolia	Bon Tamak	Frequent
Nyctanthes arbor-tristis	Seuli	Common
Nymphea nouchali	Saluk	Abundant
Ocimum sanctum	Tulsi	Common
Oldenlandia corymbosa	Khet papra	Common
Opuntia dillenii	Fanimanasha	Common
Oxalis corniculata	Amrul	Common
Paederia scandens	Gandal	Rare
Parthenium hysterophorus	Bish gach	Abundant
Pedilanthus tithymaloides	Rangchita	Common
Peltophorum pterocarpum	Radhachura	Abundant
Peperomia pellucida	Luchipata	Common
Phoenix sylvestris	Khejur	Common
Phyla nodiflora	Bhul okra	Common
Physalis minima	Tepari	Common
Polygonum hydropiper	Pani marich	Common
Portulaca oleracea	Nunia sag	Common
Psidium guajava	Peyara	Common
Quisqualis indica	Madhabilata	Common
Ranunculus scleratus	Bon dhone	Common
Rauvolfia tetraphylla	unknown	Common
Ricinus communis	Rerhi	Frequent
Rorippa indica	Bon sarisha	Frequent
Ruelia tuberosa	Chatpati	Common
Rumex dentatus	Pahari palang	Common
Rungia pectinata	Pindi	Abundant
Saccharum spontaneum	Kaash	Common
Scirpus articulatus	Chechka	Frequent
Scoparia dulsis	jangli-dhone	Abundant

Scientific Name	Common Name	Frequency of occurrence
Shorea robusta	Shal	Common
Sida cordifolia	Berala	Common
Sida cordata	Berala	Common
Solanum nigrum	Kakmachi	Common
Solanum torvum	Bon begun	Common
Spondias pinnata	Amra	Common
Streblus asper	Sheora	Abundant
Syzygium cumini	Kalo jam	Common
Tabernemontana divaricata	Tagar	Frequent
Tamarindus indica	Tetul	Common
Tectona grandis	Segun	Common
Tephrosia perpurea	Ban neel	Common
Terminalia arjuna	Arjun	Rare
Terminalia bellirica	Bohera	Common
Thevetia peruviana	Kolke	Frequent
Tinospora cordifolia	Gulancha	Frequent
Trichosanthes anguina	Chichinga	Common
Trichosanthes dioica	Potol	Frequent
Tridex procumbens	Tridaksha	Common
Vernonia cinerea	Sial lata	Common
Vitex negundo	Nisinda	Abundant
Ziziphus mauritiana	Kul	Common

I) Fauna

The carnivores of the district consist of leopard, bear, wolf, wild pigs and other smaller species. Leopards are not numerous, but are found in some jungles. Bears are very rare, but sometimes they migrate from the neighboring hills in the Santhal Parganas (now in Jharkhand). Wild pigs are found in isolated tracts, especially along river banks and in jungles traversed by watercourses. Besides the above, the long tail apes called *hanuman*, otter, hare, fox and jackal are common. The game birds of the district chiefly consist of patridge, green pigeon and various water-fowls. The grey patridge is plentiful, and green pigeons may usually be seen on the highest branches of *pipal* trees when they are bearing fruit. Among the water-fowls the comb and *Brahmani* ducks are found in abundance. Geese are cold weather visitors, coming in large flocks to feed on the rice crops. Snipes are found in great numbers in the swampy places and in the beds of rivers, and are most common in the east of the district. Different variety of fishes like *rui,katla* and sometimes *hilsa are found in* the major rivers of the district. Tanks, which are numerous in the district, are stocked with *rui, katla, mrigel, magur, koi* and other small fishes (**Source: District Census Handbook, Birbhum,2011).**

Wildpigsand wolves may be found in small tracts jungle of Chinpai, Bandarsol and Charicha. Wild elephants from nearby Santhal Paraganas (now Jharkhand) migrate into the district in search of food and sometime in attraction of Mahua flower. Apart from these long tailed apes, called Hanuman are commonly found. They often damage growing crops in the villages. The birds commonly found in the district include partridges, green

pigeons, and various waterfouls. But their number has dwindled considerably due to reckless hunting. Few migratory birds are also found near Bolpur. Common birds of deltaic Bengal are mixed up in this district with birds of wooded hill, doyel, indian robin, drongo, hawk cuckoo, koel, sun bird, Indian roller (nilkantha), parrot and babblers are found in abundance. (BENGAL DISTRICT GAZETTEERS - BIRBHUM by L.S.S.O'Malley).The species which are habitually found, dependent or associated with wetlands as defined by Nandi *et. al.,* (1993, 1999, 2001) are reported herein leaving aside terrestrial components and/or 'Occasional visitors'.

VERTEBRATES

Mammals

Two species of wetland dependent mammals, viz., Bandicota indica from Ballavpur wetland, Datindighi and Goldighi and Lutra perspicillata from Langalhata beel were encountered in Birbhum district. However, several species belonging to Chiroptera, Carnivora and Rodentia were observed as terrestrial and arboreal components. The Indian Blackbuck, Antilopecervicapra and Spotted Deer, Axis axis are important dryland components of Ballavpur wetlandcomplex.

Avifauna

A total of 36 avian species belonging 10 families comprising of water birds, marsh birds and kingfishers have been observed .Of these, 25 species were resident and 11 species were migratory birds. The migratory ducks were observed in the Ballavpur wetlands and Tilpara barrage. These two wetlands as well as Nagalhata beel exhibit greater avian diversity in this district. However, Ballavpur wetland, Datindighi and Goldighi were found to be inhabited by some resident anatid birds, *viz., Nenapus coromandelianus* throughout the year. The jheels at Ballavpur sanctuary attract a large number of migratory birds. So far, a total of 65 species of birds were recorded from this area of which 27 species are wetland dependent or associated including 9 species of winter migrants (Haldar *et al.,* 1999), but their population has recently been reduced to a few thousands indicating unsafe refuge to wintering waterfowl. This may be due to gradual disappearance of the fencing structure and the changed situations in the protection status of the wetlands. The occurrence of Comb duck, Brahmini duck and geese in large flocks was reported earlier in Birbhum district .

Herpetofauna

Eleven species of herpetofauna, six reptiles and five amphibians belonging to seven families were encountered from wetlands of Birbhum district. Of these, two species of snakes viz., Enhydis enhydris and Xenochrophis piscator and four amphibian species, viz., Rana cyanophlyctis, R. limnocharis and R. tigerina and Bufomelanostictus were common in occurrence. Chakraborty and Chakraborty (1987) reported hunting of yellow monitor, Varanus flavescens by some tribals of Birbhum district.

Fish fauna

Forty five species of fishes belonging to 19 families have been recorded from different wetlands of Birbhum district .Of these, 41 species were encountered in Nagalhata beel, a flood plain wetland, followed by another, viz., Gnorsha beel (36 species). These two wetlands exhibit greater fish faunal diversity due to over flooding of the adjoining rivers which has resulted in occasional availability of hilsa fish, Hilsa ilisha in these two beels. A wide variety of cyprinids, as well as Jeol fish', viz., Anabas testudineus, Clarias batrachusand HeteropneustesJossilis (Bloch) are extensively grown in ponds, bundhs and dinghiesin this district. About seven species of major, minor and exotic carps are mostly cultivated in manmade wetlands yielding 200-500 kg/ha/annum under traditional and semi-intensive practices, (Misra, 1987). Weed fishes belonging to the genera Esomus, Puntius, Colisa, Chanda, Badis, *etc.,* are available in considerable numbers at the periphery of the wetlands.

INVERTEBRATES

Macro-invertebrates Macro-crustaceans

Four species of prawns and three species of crabs have been identified from freshwater wetlands of Birbhum district .A species of prawn, *Macrobranchium Lamarrei* was common in occurrence in all the wetlands, while a species of crab, *Varonalitterata* was reported from flood plain wetlands of Gnorsha beel and Nagalhata beel.

Insects

A total of over 53 species of entomofauna comprising of hemipterans (25 species), coleopterans (22 species), ephemeropterans (I species), odonate larvae (3 species) and dipteran larvae (2 species) have been recorded from different wetlands of Birbhum district. Amonghemipterans, water bug *(Diplonychus* sp.) and water scorpions *(Ranatra* sp.) were quite common and among coleopterans *Canthydrus laetibilis* was widely distributed. A single species of Ephimeropteran, *viz., Ephemera annandalei* was recorded from Tilpara barrage. However, besides larval odonates, five species adult odonates, *viz., Ceriagrioncoromandelianum*belonging to the family Coenagrionidae and *Crocothemis servilia servilia*, *Diplacodestrivialis*, *Rhyothemis variegata* and *Orthetrum Sabina* of the family Libellulidae were collected from Datindighi and Ballavpurwetlands.

Molluscs

Four species, *viz., Bellamya bengalensis*, *Pila globosa*, *Indoplanorbis exustus* and *Gyraulus labiatus* were common in occurrence, while species like *Brotiacostula* and *Corbicula striatella* were encountered in Tilpara barrage only. The highest molluscan diversity was also observed in Tilpara barrage. *Gyraulus labialus* is omnipresent in wetlands of Birbhum district with conspicuous absence of *Gyraulus convexiusculus.*Similar observation was recorded earlier by Mitra and Dey(1992).

Zooplankton

Fifty three species of zooplankton belonging to Copepoda (6 species), Ostracoda (5 species), Cladocera (35 species), Conchostraca (1 species) and Rotifera (6 species) have been recorded from various wetlands of Birbhum district. Of these, Cladocerans exhibited greatest diversity representing 35 species belonging to five families. Among Cladocerans, *Ceriodaphnia comuata* occurs in all the wetlands sampled for zooplankton, while *Daphnia similis* occurredonly in the flood plain wetland of Gnorsha beel. However, in general, littoral species such as Chydorids were dominantover limnetic species since most of these wetlands are used for pisciculture. The scarcity in representation of limnetic Cladocerans belonging to the families Daphnidae, Moinidae and Bosminidae is suspected due to the predation pressure by insects and fishes as suggested by Venkataramanand Das (1993) and Venkataraman *et al.,* (2000).Copepods appear to be the next dominant group in which predaceous cyclops predominate amongst zooplankton population in a number of wetlands surveyed. The wetlands of Birbhum district are utilized in various ways, *viz.,* reservoir of water, recreation, waterfowl habitat, religious purposes, *etc.* Ballavpur wetland and para barrage have high value as waterfowl habitat and Goldighihas high recreational as well as reservoir of water value for domestic purposes. On the other hand, Datindighi is an important religious site for the local people. Ghosh *et. al.,* (1992) reported archaeological domestic mammalian remains from a pond of chalcolithic Kotasur village of this district (Nandi *et. al.,* 2001).

4. PHYSIOGRAPHY OF THE DISTRICT

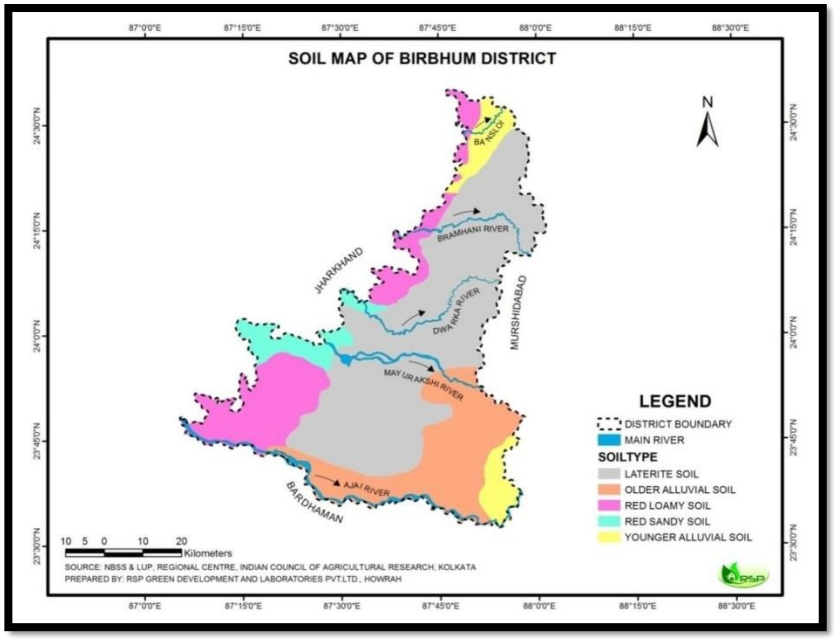
- **General Landform**

The western hilly upland of the district, a part of eastern part of Chhotanagpur plateau is approximately bounded by 100 metre contour in the east with a slope of >2°.Parts of Murarai-I, Nalhati-I, Rampurhat-I, Khoyrasol, Rajnagar and Suri – I are characterized by the existence of cap rocks and hilly upland. This is also known as plateaurim. The land gradually descends eastward with slope of 1-2 º from the plateau rim. This rolling topography is the transitional zone in between hilly upland in the west and the depositional plain in the east. The depositional plain consists of alluvial tract formed by sand, sandy loam and silty loam. Slope of this area is below1º for most of the places.

- **Soil**

The soil type of the area is predominantly old alluvium and red lateritic exposed with granite veins at places. The old alluvium is found along with the layer of clay, gravel, sand, with medium in organic matter, phosphate and medium or high level potash. The water holding capacity is very poor. The pH ranges from 4 to 6.5 i.e. acidic in nature. The whole Rampurhat Block-II and portions of Rampurhat Block-I are covered by lateritic soil, characterized by low pH and low fertility status. The basaltic trap area is associated with red sandy soil in the concave surface and gully areas. Rest of the area is covered by old alluvium. On the basis of textural classification, NATMO has classified the soil into three categories. The lateritic tract is termed as clay loam soil, while cap rocks are denoted by sandy loam and the flood prone tract is classified in to clay soil, the only fertile tract of this area.

Map. No. 6 SOIL MAP OF BIRBHUM DISTRICT



Rock Pattern

The area is covered with Archaean granite-gneisses, Gondwana system, Rajmahal basalt, laterite and old and young alluvium (Oldest to Youngest). Archaean gneiss is mainly found in Suri, Dubrajpur block, has big blocks of granite and gneiss, the Gondwanas of Carboniferous-Permian age cover a small area along Ajay river in the western part, the basalt of early Cretaceous age occur in western part of Rampurhat and Nalhati blocks, the laterite of Cenozoic age occurs largely in western and southwestern parts, particularly in Bolpur, Dubrajpur, Suri, Rampurhat, Rajnagar *etc.*

Different Geomorphological Units

Geomorphology of the region is the expression of surface or subsurface lithostratigraphy. Birbhum district lies at the foothill of western peninsular region *i.e.,* Chhotanagpur Gneissic Complex (CGC) marked by the undulatory uplands.

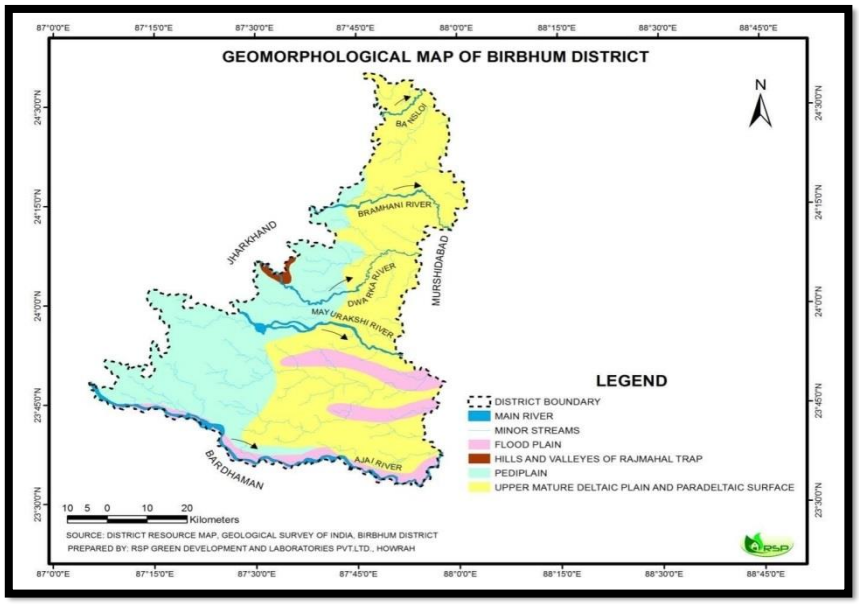
i. Peninsular Region

On the western margin, this part is bounded by a plateau region; extension of the Chhotanagpur Gneissic Complex (CGC) is characterized by similar Granite-Gneisses. High plain metamorphic rocks like Gneiss, Schist and varieties of Phyllites are dominant. Hillocks scattered on the high plain evidenced ancient volcanism in the terrain represents Rajmahal basalts. The uplands are characterized by the undulating landform which is subjected to extensive soil erosion.

ii. Alluvium Region

The river in the area has developed through alleviation. The river gradient has decreased from west to east. This part is mostly inter bedded layers of sand and clay.

Map. No. 7 GEOMORPHOLOGICAL MAP OF BIRBHUM DISTRICT



5. LAND USE PATTERN OF THE DISTRICT

INTRODUCTION

- **Land cover** is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground, water, etc. Land cover data documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water.
- **Land use** shows how people use the landscape – whether for development, conservation, or mixed uses. Land use refers to the purpose the land serves, for example, recreation, wildlife habitat, or agriculture. Land use applications involve both baseline mapping and subsequent monitoring, since timely information is required to know what current quantity of land is in what type of use and to identify the land use changes from year to year.
- **Deciduous forest:** Woody vegetation with a percent cover >60% and height exceeding 2 m. consists of broadleaf tree communities with an annual cycle of leaf-on and leaf-off periods, dominated by trees that lose their leaves each year.
- **Cropland:** Temporarily cropped area followed by harvest and a bare soil period (*e.g.,* single and multiple cropping systems). Different types of cropland based on seasons (*e.g.,* kharif, rabi, zaid). Cropland includes areas used for the production of adapted crops for harvest.
- **Built up land:** a developed area, *i.e.,* any land on which buildings and/or non-building structures are present, normally as part of a larger developed environment such as: developed landlot, rural area, urban area. Land covered by buildings and other man-made structures
- **Mixed forest:** Vegetation formation composed principally of trees, including shrub and bush under storey, where neither broad-leaved nor coniferous species predominate.
- **Shrub land:** Land with woody vegetation less than 2 m in height and with greater than 10% shrub canopy cover. The shrub foliage can be either evergreen or deciduous. Shrubland, scrubland, scrub, brush, or bush is a plant community characterised by vegetation dominated by shrubs, often also including grasses, herbs, and geophytes. Shrubland may either occur naturally or be the result of human activity.
- **Fallow land:** Fallow Land is farmland that has no crops on it, usually for a year, to recover its fertility to grow crops. Land taken up for cultivation temporarily allowed to remain uncultivated for one or more seasons.
- **Waste land:** Sparsely vegetated land with signs of erosion and land deformation that could be attributed to lack of appropriate water and soil management, or natural causes. These are land identified as currently underutilized and could be reclaimed to productive uses with reasonable effort. Degraded forest (<10% tree cover) with signs of erosion is classified under wasteland.

- An **empty area** of land, especially in or near a city, which is not used to grow crops or built on, or used in any way and/or a place, time or situation containing nothing positive or productive, or completely without a particular quality or activity.
- **Water body:** Areas with surface water, either impounded in the form of ponds, lakes, reservoirs or flowing as streams, rivers, etc. Can be either fresh or salt-water bodies.
- **Plantations:** A plantation is the large-scale estate meant for farming that specializes in cash crops. The crops that are grown include cotton, coffee, tea, cocoa, sugarcane, sisal, oilseeds, oil palms, rubber trees, fruits, commercial horticulture plantations, orchards and tree cash crops.
- **Wetland:** A wetland is a distinct ecosystem that is inundated by water, either permanently or seasonally. The primary factor that distinguishes wetlands from other land forms or water bodies is the characteristic vegetation of aquatic plants, adapted to the unique hydric soil. Land with permanent mixture of water and herbaceous or woody vegetation. The vegetation can be present either in salt, brackish, or freshwater/ The LULC pattern and map of district Birbhum have been depicted below:

Map. No. 8 LAND USE & LAND COVER MAP OF THE DISTRICT

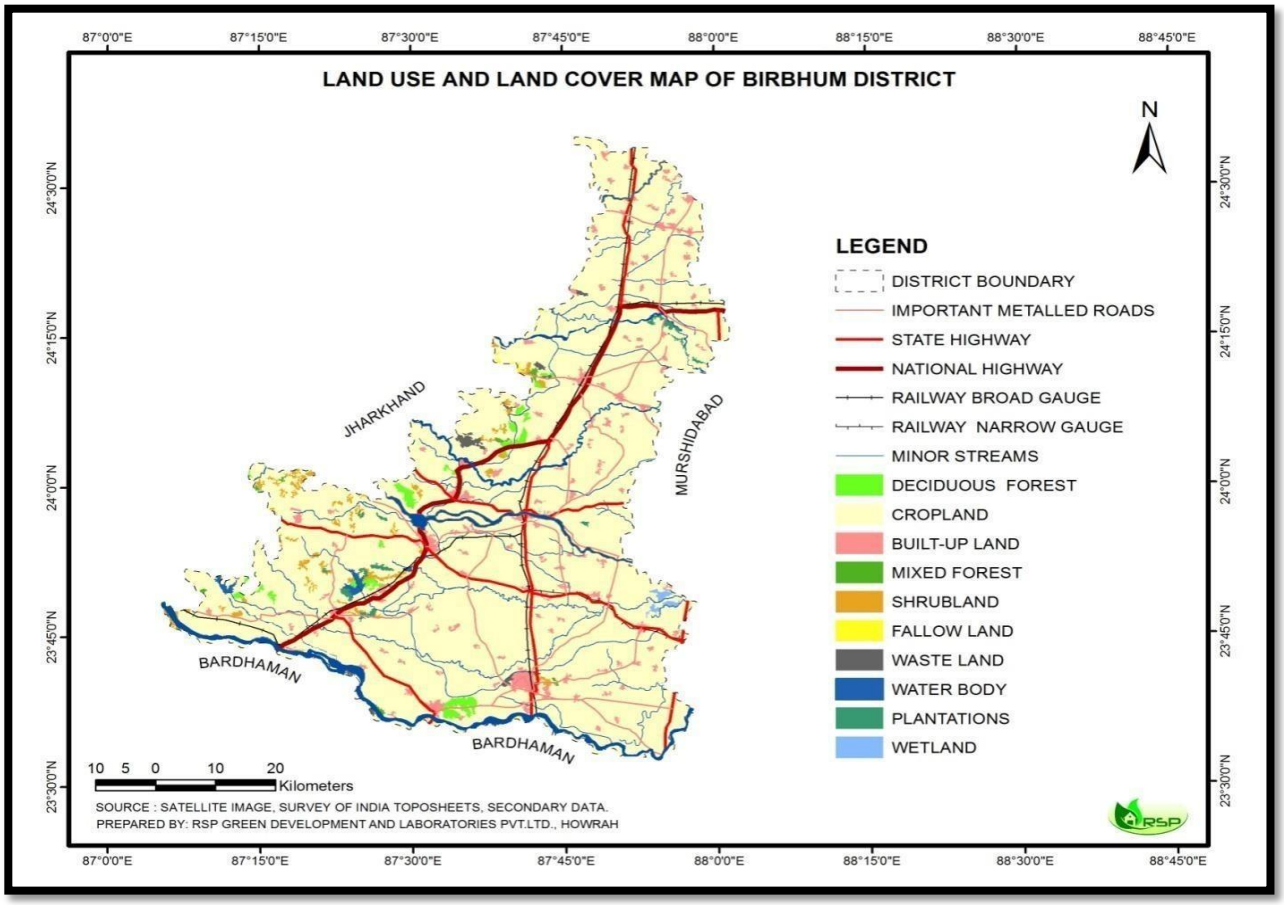
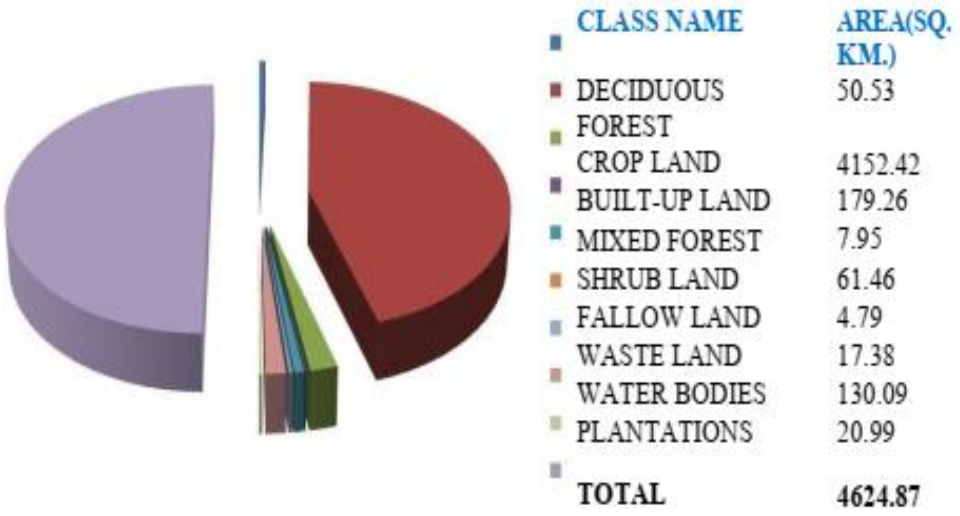


Chart. No. 5 Graphical Representation of Land Use pattern of Birbhum district (in sq.km)

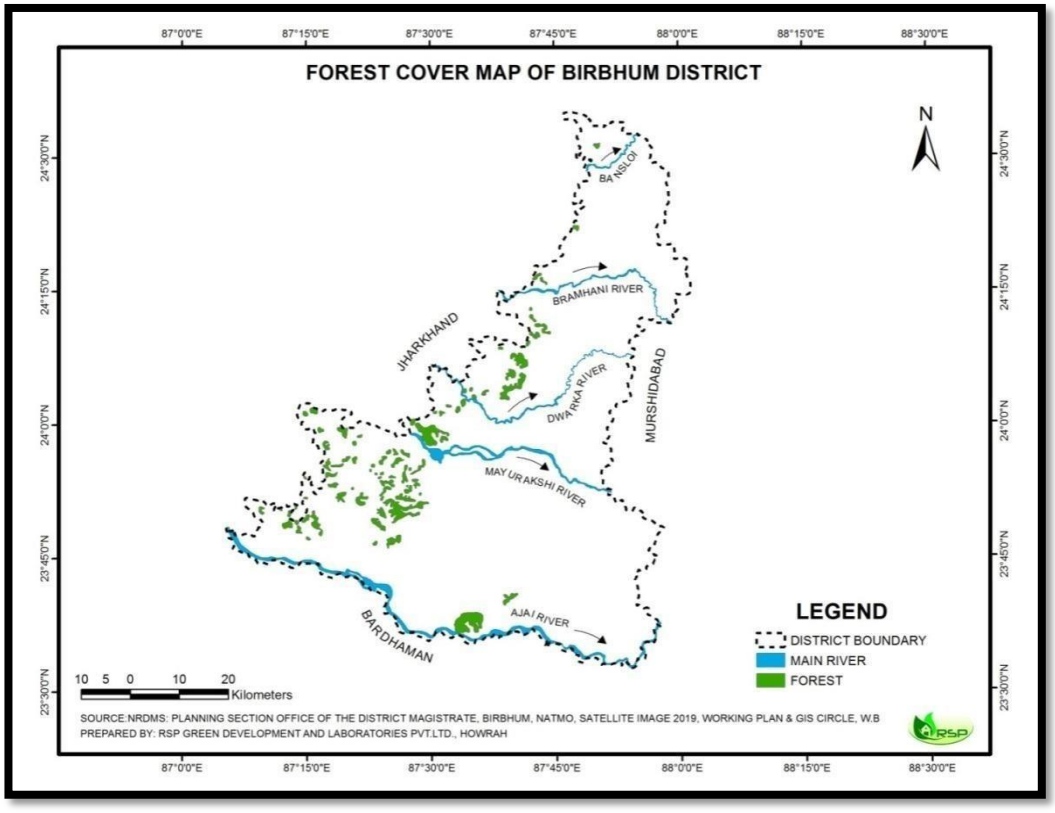


CLASS NAME	AREA(SQ. KM.)
DECIDUOUS FOREST	50.53
CROP LAND	4152.42
BUILT-UP LAND	179.26
MIXED FOREST	7.95
SHRUB LAND	61.46
FALLOW LAND	4.79
WASTE LAND	17.38
WATER BODIES	130.09
PLANTATIONS	20.99
TOTAL	**4624.87**

a) Forest

Birbhum has 15,926.58 hectares of land covered by forest in 2011. Out of the total forest area, 2,848.79 hectares of land is under Reserved Forest, 6,242.30 hectares is under Protected Forest and 6835.49 hectares of land is under Unclassified State Forest. From the forest produce the Government collected revenue of Rs.1,49,03,330 /-in 2010-11.

Map. No. 9 FOREST COVER MAP OF THE DISTRICT



b) Agriculture and Irrigation

Paddy is the principal agricultural crops produced in the district. Apart from it many other different crops are grown in the district such as wheat, potato, sugarcane ,pulses, oilseeds, tomato, cabbage, cauliflower, brinjal, cucurbits, onions etc. Fruits such as Mango, banana, guava etc are also found to grown in the district.

Table 10: Season wise irrigation potential in hectares

Source	Area in hectare
Canal	182.362
Tank	31.416
D.T.W & MD.T.W	46.959
S.T.W	16.592
RLI	5.630
Open Dug Well	0.62
Other sources	2.605
Total	**286.184**

c) Horticulture

Table 11: The major fruits and vegetables grown in the district

Horticulture fruit crops	Area (Hectare)	Horticulture vegetable crops	Area (Hectare)
Mango	**0.9**	**Brinjal**	**9.9**
Banana	**0.7**	**Cucurbits**	**9.3**
Guava	**0.9**	**Ladies Finger**	**3.9**
Citrus	**0.5**	**Cabbage**	**2.6**
Paoaya	**0.5**	**Cauliflower**	**2.2**
		Tomato	**1.9**

d) Mining

For performing mining operations there mainly basalt quarries present at Nalhati, Rampurhat and Barapahari blocks. The Basalt deposit is well exposed on the surface. In view of this, the deposit will be worked by opencast mining method to achieve the required amount of production.Clay mining plays also a crucial role accelerating the development of mining activity (Dubrajpur & Md. Bazar) which may meet the market demand augmenting clay production. Riverbed sands are also mined in these districts as minor minerals which are responsible for huge economic growth of this region. Successful management of sand, clay and stone mining involving exploration, exploitation, conservation and protection of the resource in the district will be of immense help to its economic growth and sustenance of the quality of environment. Deocha - Pachami- Dewanganj- Harinsingha, Birbhum coalfield, District Birbhum, West Bengal of an area of 12.3 sq.km having Lat: 24^0 01' 45"- 24^0 05' 30" (approx) Long : 87^0 34' 15"- 870 37' 39" (approx), Toposheet No- 72P/12.

6. GEOLOGY OF THE DISTRICT

o REGIONAL GEOLOGY

The Regional Geology is represented by vast spread of basalt of Rajmahal volcanics. These volcanic rocks are believed to be of Middle Jurassic to Lower Cretaceous age. The Rajmahal volcanic rocks include thick sequence of basalt and intertrappean sediments. These basaltic flow rests either on the Dubrajpur Formation of Upper Triassic (Upper Gondwana age) or the Lower Gondwana Sediments. The maximum thickness of the Rajmahal volcanic suite is of the order 330m.However,it shows a decrease in thickness towards the south near the eastern periphery of the Raniganj Coalfield where it attains a thickness of about 100m. The intertrappean horizon varies in thickness from 1m to 26m and even greater thickness has been recorded. More than 15 intertrappean beds occur within the sequence of 300m of Rajmahal traps. The surface and sub- surface data indicate that the intertrappean horizons are of lensoid nature and pinch out laterally within a short distance. The generalized stratigraphic succession of the area, established by Geological Survey of India (GSI) is given below.

Map. No. 10 GEOLOGICAL MAP OF THE DISTRICT

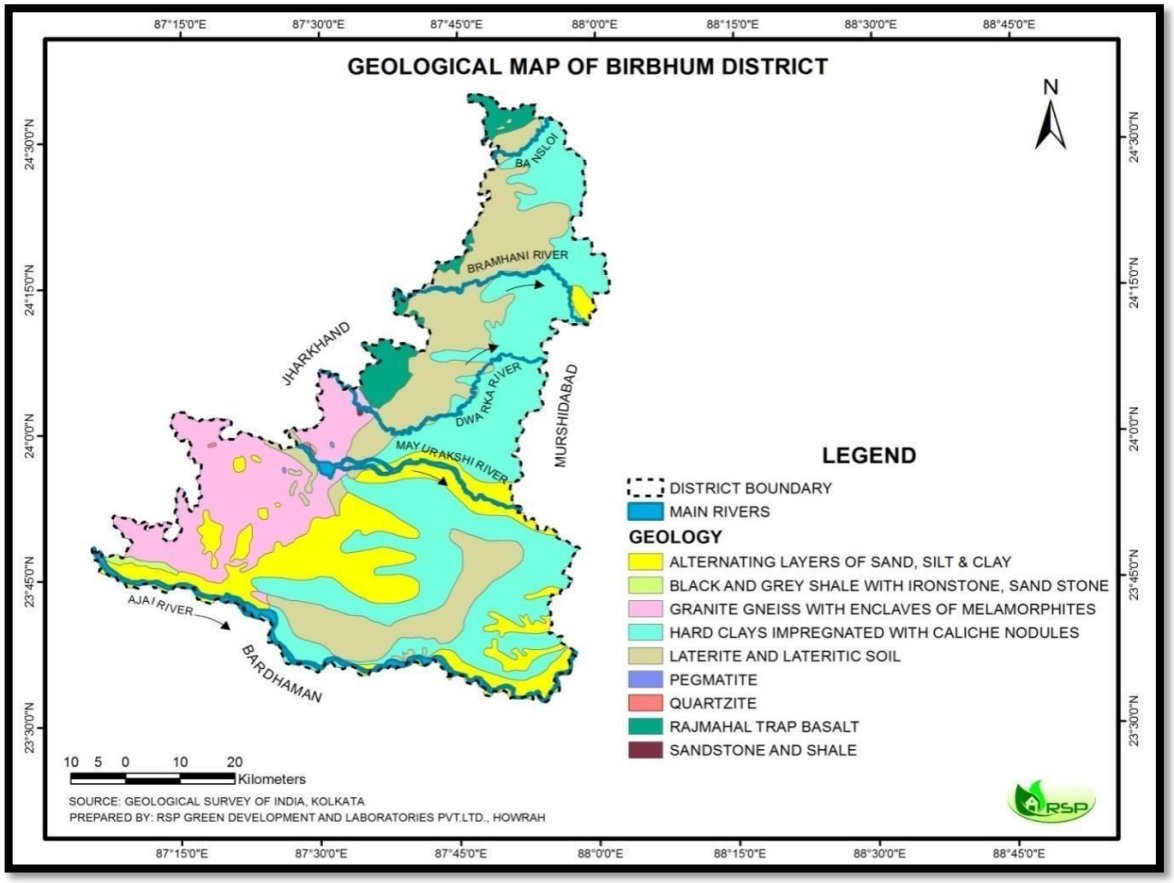


Table 12: Generalized Stratigraphic Sequence of Birbhum District

AGE	FORMATION	LITHOLOGY
Recent Quaternary/ Tertiary	Alluvium Undifferentiated Surficial deposits	Loose soil, silt & clay Laterites, lateritic soil, lateritic gravel with petrified wood & china clay.
	Unconformity	
Middle Jurassic to lower Cretaceous	Rajmahal Traps and Intertrappeans	Flows of basalt and intertrappeans Sediments (Sand stone, Shale *etc*.)
	Unconformity	
Lower Jurassic (Upper Triassic)	Dubrajpur	Conglomerates, coarse to medium grained sand stone, grey siltstone, mottled shale & thin coal bands.
	Unconformity	
Lower Permian Upper carboniferous to lower Permian (Permocarboniferous)	Barakar Talchir	Coarse to medium grained sandstone, carbonaceous sandstone with grey shale, fire clay, carbonaceous shale and coal seam. Greenish sandstone, siltstone, tillite, olive green shale
	Unconformity	
Precambrian	Metamorphics	Granites and granitoids, gneiss, pegmatite, quartz veins and metabasic dykes

o LOCAL GEOLOGY

The areas in toposheets 72P/12, 73M/9 and 73M/5 form the western part of this district, where geologic sections are exposed. The remaining part in toposheets 73 M/6 and 73 M/10 mostly consists of alluvium with scattered hummocks and minor exposures of laterite/ lateritic gravel. The geological formations met with in these areas are as given in next page:

Recent	Alluvium
Tertiary	Laterites and lateritic gravels with fossil wood. Clay beds Ferruginous and feldspathic sandstones and clay beds
Middle Jurassic	Traps (Rajmahal)
Lower Jurassic (Upper Gondwana)	Flaggy shales, clays and compact sandstones (Dubrajpur Beds)
Lower Gondwana	Coal beds(Barakar & Talchir Formation)
Unconformity	
Archaean	Granitegneisses, biotite-schists, calc-granulites with Quartz and pegmatite veins.

The Archaeans comprising granite gneisses, biotite-schists and calc-granulites occur on the western and southern parts of the area. Pegmatites and quartz veins are also noticed traversing the above rock types. Coal bands of Lower Gondwana age (Belonging to Barakar & Talchir Formation) are reported from Khoyrasol, Deocha & Pachami.

The Dubrajpur Beds comprising sandstone (gritty and ferruginous) and shaly clay beds are exposed as elongated patches in the south-eastern part overlying the Archaeans with an unconformity/fault. The well preserved fossil plant impressions in shaly clay beds indicate an upper Gondwana age to these Dubrajpur Beds.

The Rajmahal Traps consisting mainly medium to fine grained basalts, often vesicular and amygdaloidal, occur on, the northern and western parts.

The Tertiary age consists of mainly sandstones (also loose and friable sand and grit) and clay beds. The latter, occurring as thick beds, the minimum recorded being 30 m. (Rao, 1966), form the economic deposits in this district. The Tertiaries mainly overlie the Rajmahal Traps; but to the west and south of Makhdumnagar, these overlie the Archaean basement (Rao, *op.cit.*).Laterite, mostly vesicular type, occurs as a cap rock over the basalts and Tertiaries. Platy laterite is also recorded at a few places. Lateritic gravel has a widespread occurrence and is of detrital nature. Loose fragments of silicified fossil wood are met with in this horizon and also in the Tertiary clay beds.

7. MINERAL WEALTH

- **OVERVIEW OF MINERAL RESOURCES**

It is really an enigma, why the plateau regions are the store house or repository of mineral resources. Being a part of Chhotanagpur, mineral resource quarrying in Birbhum district has a historical past. Mining gained sky-scrapper popularity after the recovery of famine of 1176 (of Bengali calendar). Processing of sponge iron from good quality laterite in Narayanpur was the popular practice before company rule. During company rule 'Summer Healthy and Co.', the pioneer of coal mining in Raniganj Coal Field (RCF) started iron ore processing in Narayanpur in 1978 and coal mining in Panchokot (Panchokot was then located in Birbhum) in the same year.

China Clay mining in Mohammad Bazar and also in Rampurhat Block-I and basalt quarryingin Baramosia is mining phenomena after independence. Basalt quarrying of Rampurhat Block-I, has started around the beginning of 1960s. Nalhati Block-I contains basalt quarry. The trap basaltic rock of Rajmahal hill has an extension towards Bhagirathi basin, and is found at the surface level in Pakur. Rajmahal Traps consisting mainly medium to fine grained basaltshaving vesicular and amygdaloidal structure in the northern and western part basically with intertrappean sediments. In the eastern part of the district, recent alluvium mainly composed of sand and clay occur as patches.

- **DETAILS OF RESOURCES**

Clay

Clays have widespread occurrences in Birbhum district so far investigated. Different types of clay have been observed according to the modes of their occurrence. The following types are recognised:

i) Kaolinitic clay associated with weathered granite gneisses, pegmatites and blackstone.

ii) Semi-plastic light grey clay within the upper Gondwana sedimentaries.

iii) Plastic white clays within the Tertiary sequence

iv) Lithomergic clay associated with laterite. The clays are bedded in nature and interbanded with sand and sandy clay. There are a number of clay horizons within the sequence, their thicknesses varying from 2 m. to 20 m. (as seen in the quarries).

1. **Chaknurai sector**: This sector is delineated to the east (Dhatelpara, Baghajor) and south of Chaknurai (bounded by Baragachia and Baramasia), 8 km. west of Rampurhat. Clay is exposed in nallah beds, mound scarps, road cuttings, and well section and in the abandoned/ existing quarries. In the exposure the clay is bedded and jointed.

2. **Makhdumnagar Sector**: Clay beds are reported from Salak, Makhdumnagar and Shaikherdeh areas in this

sector. The clay in this sector is plastic and varies in colour from yellow to cream at the top, followed by creamy white and white with brown, yellow and violet stains, forming bands at places. The clay is bedded and hard when dry and fine grained.

3. **Dewanganj-Katpaheri Sector**: Yellow and white clay is known to occur near Chanda and grey fireclay at Harin-singha near Katpahari.

4. **Mohammad Bazar Sector**: Occurrences of white clay have been reported since long from the area comprising Mohammad Bazar, Khariaand Kumarpur. Several workers of G.S.I. earlier prospected, aided by drilling, for white clay (deposits in this sector and also in the adjoining areas. (Rao, *et. al.,*) estimated a reserve of 20.44 million tonnes of clay. This sector, however, has the largest deposit of white china-clay in Birbhum district.

Morrum

Morrum of Birbhum district has been formed from N-S trending lateritic hard crust on the Rajmahal Trap Basalts, Archean granite-gneiss, Lower Gondwana sediments, Palaeogene gravels and older deltaic alluvium under different tectono-climatic condition of north-western marginal part of Bengal Basin. Low level secondary laterites of Bengal comprising of heterogeneous Fe-Al rich gravelly materials are basically the products from high level primary laterites of plateau region. Morrum is the manifestation of the phenomenon of weathering of laterites or lateritic beds which are formed from the leaching of sedimentary rocks (sandstones, clays, limestones); metamorphic rocks (schists, gneiss and migmatites); igneous rocks (granite, basalt, gabbro and peridodite) and mineralised proto-ores (*i.e.,* protore).

Basically, Laterite is a soil & rock type rich in Fe and Al and commonly considered to have formed in hot and wet tropical climate condition. Nearly all laterites are of red in colour because of high Fe content.

Morrums are generally impervious, friable ferruginous concretions. In Birbhum, morrums are generally of Kankar & lateritic loamy nature.

The main rivers of Birbhum district-Ajay and Mayurakshi are the chief carriers of ferruginous coarse sediments that form a upland lateritic terrain.

In a morrum quarry of Baramasia near Rampurhat-I (24°12’12" N, 87°40’29" E) three distinct domains of laterites are found to seen.

A well-developed & well preserved laterite profile of about 10-11 m thick (primary laterites) is exposed at Naihati-I (24°17’47" N, 82°49’28" E) of Naihati hillock. This acts as an avenue for supply of morrum.

Morrum is also recorded at Pansiuri (23°46’39" N & 87°16’47" E).

Based on field observations in Boro Pahari (24°12'03" N,87°41'33" E) of Rampurhat zones of morrum have been identified.

In a quarry of China Clay (Kaolin) at Bhatina of Birbhum district (24°10'02" N, 87°42'18" E) presence of morrum has been recorded.

The badland topography (*i.e.,* Khoai Landscape) of Kopai-Ajay interfluves region of Bolpur has developed over morrum.

Morrums are used for making roads & civil construction purposes. It is used in plinth filling, back filling in trenches; footing pits *etc.*

In view of the increasing demand of morrum in the state, exploitation of it should be of national interest & it should be prioritized at national level.

Coal

Birbhum has the resource of coking coal with total reserves of 6586.01 million tonnes.

Khoyrasole , Deocha & Pachami are the potential coal bearing horizons in Birbhum Province.

i) At Djara area, Birbhum is covered with Tertiary sediments. The maximum thickness of Tertiary sedimentaries is 323.40m; Rajmahal Formation is 317.40m, Barakar Formationis233.41 m and Talchir Formation is 61.37 m

ii) Gazipur west sector also covered by Tertiary sediments. The maximum thickness of Tertiary sedimentariesis275.60m;RajmahalFormationis383.30mandBarakarFormationis183.19m, respectively.(Source: Indian Minerals Yearbook 2015 (Part- I)/ ibm.nic.in)

Deocha - Pachami- Dewanganj- Harinsingha, Birbhum coalfield, District Birbhum, West Bengal of an area of 12.3 sq.km having Lat: 24^0 01' 45"- 24^0 05' 30" (approx) Long : 87^0 34' 15"- 870 37' 39" (approx), Toposheet No- 72P/12.

SEAM /ZONE	THICKNESS OF COAL SEAM ZONES [i.e., CUMULATIVE THICKNESS OF COAL SEAMS & PARTINGS (M)]	DEPTH RANGE	REMARKS
IV	8.98-30.77 (4.1-20.9)	135-355	Seams occur in a number of sections. Coal seams are concealed by a thick cover of Trap, Laterite and Dubrajpur formation
Parting	100-122		
III	17.32- 42.66 (6.7- 40.4)	280-500	
Parting	30-122		
II	40.69-58.88 (15.2-53.6)	350-580	
Parting	87-200		
I	41.61-79.89 (5.2-63.4)	510-850	

Note: Figures in bracket indicate cumulative thickness of coal sections.

Dewanganj –Harinsinha

Seam Zone	Zone Thickness (m)	Depth Range (m)	Remarks
III	101 – 138	12 – 96	There are 5 – 22 sections in seam zone. The total thickness of coal sections varies from 5.30 – 38.63 m
Parting	47 – 63		
II	25 – 74	204 – 284	There are 6 to 16 sections in seam zone. The total thickness of coal sections varies from 8.62 to 31.04 m.
Parting	122 – 144		
I	10 – 17	45 – 386	There are 2 to 4 sections in seam zone. The total thickness of coal sections varies from 6.69 – 9.65 m.

- **RESERVES**

Deocha – Pachami: An indicated reserve of 2025.62 m.t. has been reported here and adjoining eastern sector of Birbhum coalfields.

Seam	Gr A	Gr B	Gr C	Gr D	Gr E	Gr F	Gr G	Total
IV					23.62	123.51	49.78	196.91
III			135.63	157.06	240.62	265.53	91.08	889.92
II			310.80		147.29			458.09
I			161.44	212.97	94.20		12.09	480.70
Total			**607.87**	**370.03**	**505.73**	**389.04**	**152.95**	**2025.62**

The depth wise breakup of the reserves is cited below:

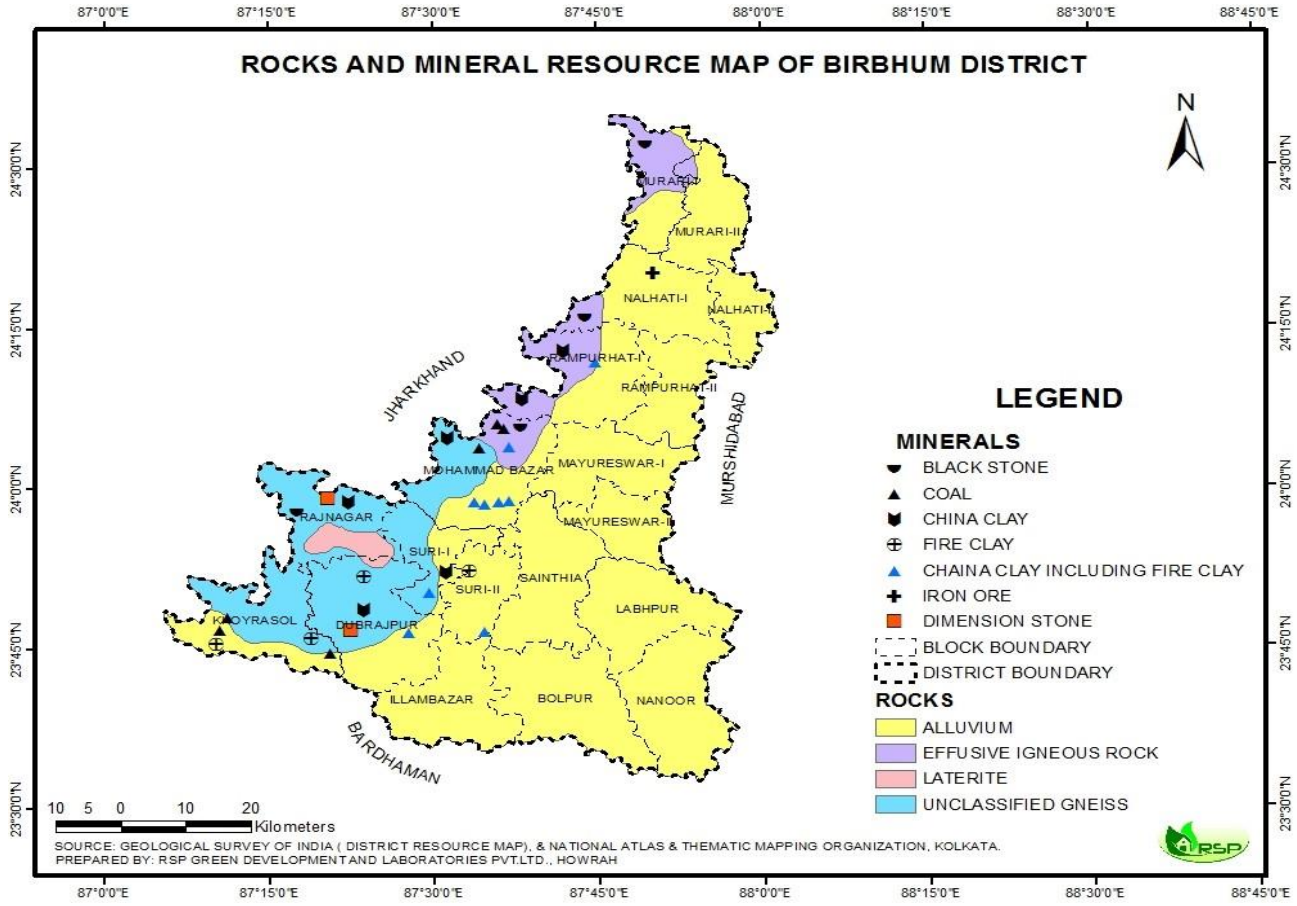
Depth Range (m)	Reserves (Mt)
0 - 300	152.20
300 – 600	1078.39
600 – 1200	795.03
Total	**2025.62**

Dewanganj Harinsinha : out of 38.693 mt. of net reserves, proved reserve of 28.093 and indicated reserve of 10.600 mt. has been reported. Horizon wise reserved of coal seams is as follows:

Horizon (Seam Zone)	Proved Reserve	Indicated	Net Total (in Million tonnes)
III	12.014	1.797	13.811
Local	1.513	0.825	2.338
II	11.128	6.333	17.461
I	3.438	1.645	5.083
Total	**28.093**	**10.600**	**38.693**

Proved reserves of Dewanganj-Harinsinha blocks have been estimated taking 200 m area of influence from the drilled boreholes [Source: Birbhum District Coalfield, & West Bengal Coal Wing, GSI, (1992).]

Map. No. 11 ROCKS & MINERAL RESOURCE OF THE DISTRICT



8. SAND AND OTHER RIVERBED MINERALS

(i) Drainage system

Most of the rivers and rivulets arise out from Chhotanagpur hills, entering into the western portion then passing through the eastern portion of the district with slightly southerly inclination. There are two major rivers Ajay and Mayurakshi by which the district is drained mainly and other rivers are Hingla, Bansloi, Kopai, Bakraswar, Siddheswari, Brahmani, Dwarka passing through the different blocks of the district. The river Ajay divides the district Burdwan and Birbhum. Overall drainage pattern of district is dendritic and parallel but west part is controlled by structurally. So, it may be of Trellis type to some extent. The upland ridges, hillocks, high erosion rate, badland topography have resulted the formation of numerous lower order streams which run through deep cutting of lateritic tract. Hence, stream frequency, drainage density is remarkably high of this geo-province.

Brief descriptions of rivers in this district are:

- **AJAY RIVER**

The Ajay River originates on a small hill, southwest of Deoghar in Jharkhand. After entering Katwa Sub-division of East Bardhaman District joins Bhagirathi River. Total length of Ajay is 288 km and catchment area is 6000 sq.km. The important tributaries are Partho and Jayanti in Jharkhand.

- **MAYURAKSHI RIVER**

Also called Mor River, is a major river in Jharkhand and West Bengal. Its source from Trikut hill, from Deoghar in Jharkahnd state. Then it flows through Birbhum and Murshidabad of West Bengal before flowing into Hoogly River. The river is about 250 km.

- **BANSLOI RIVER**

The Bansloi River originates on Bans Hill in Sahebganj District of Jharkhand through pakur district of Jharkhand. The combined catchment area of the Pagla-Bansloi river system is 2200 sq.km.

- **KOPAI RIVER**

Kopai river is the tributary of the Mayurakshi River. It flows past such towns as Santiniketon, Bolpur, Kankalitala, Kirnahar and Labhpur in Birbhum district.The area around the river quite often has purple soil, which forms ravines on the river bank with weathering and popular as khoai.

- **BAKRESHWAR RIVER**

The Bakreshwar River is a tributary of the Mayurakshi River. It originates in Santhal Parganas division of Jharkhand. It meets kopai at Birbhum district.

- **BRAHMANI RIVER**

The Brahmani originates in the Santhal Parganas in Jharkhand and then flows through Birbhum district, bisecting Rampurhat subdivision. It is a hill stream with beds full of pebbles and yellow clay.

- **DWARAKA RIVER**

The Dwaraka originates in Santhal Parganas in Jharkhand, flows through Deucha, and then through Mayureswar and Rampurhat police station areas of Birbhum district. Total length of Dwarka river is 156.5 km

Map. No. 12 DRAINAGE NETWORK MAP OF THE DISTRICT

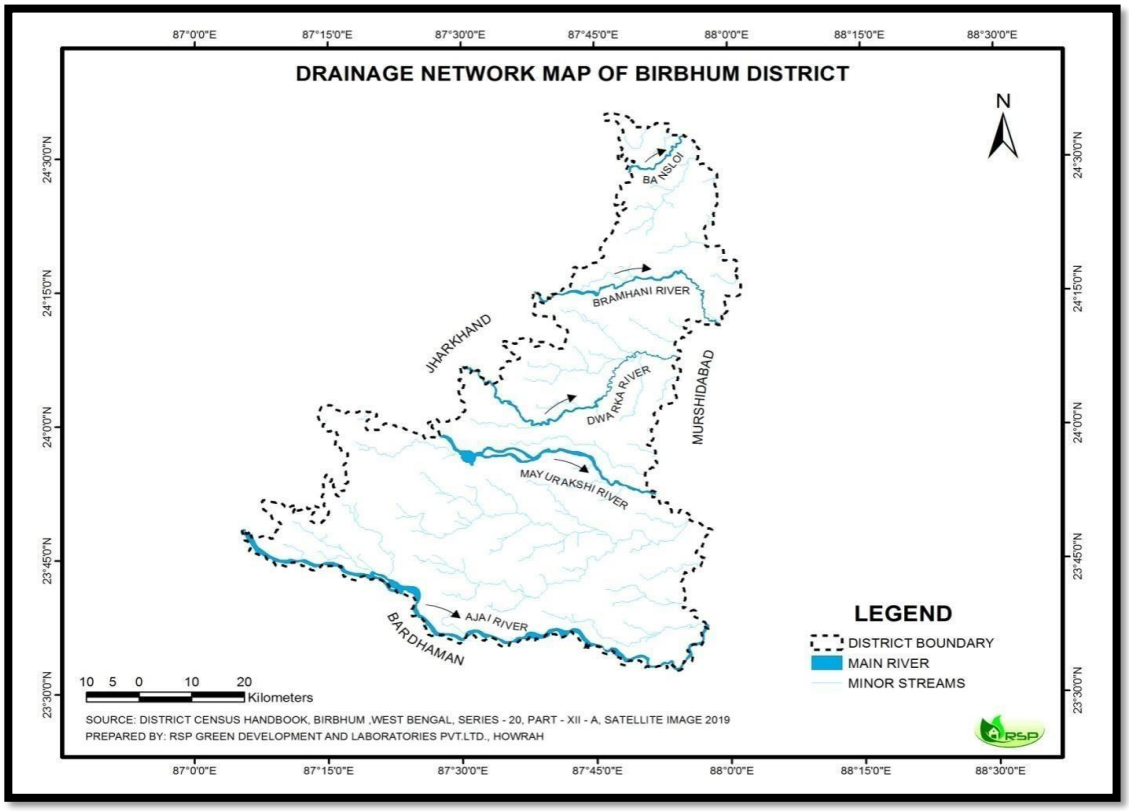


Table 13: Drainage system with description of Main River

Sl. No.	Name of the River	Area drained (sq.km.)	% area drainedin the district	Name of the Blocks
1	Mayurakshi	246.27	5.45%	Kalyanpur, Illambazar, Bhedia, Sonarkunda, Haridaspur
2	Ajay	587.35	12.92%	Jayrampur, Dubrajpur, Deucha, Palan, Bajitpur, Dumra
3	Bansloi	444.24	9.77%	Suri, Kunuri, Narasinghpur, Ranpur, Malian, Barulia,Dhanyagram

Sl. No.	Name of the River	Area drained (sq.km.)	% area drainedin the district	Name of the Blocks
4	Brahmani	162.25	3.56%	Narayanpur, Swadhinpur, Nalhati, Belebari, Sonarkunda,Haridaspur
5	Dwarka	168.39	3.70%	Sumanpur, Bhimpur,Ramnagar,

Table 14: Salient features of important rivers and streams

SL.NO	Name of River / Strem	Total length in the district (km)	Place of Origin	Altitude of Origin (m)
1	Mayurakshi	48	Trikut Hill, Jharkhand	262.13
2	Ajai	91	South-west of Deoghar in Jharkhand	300.00
3	Bansloi	8.32	Near Bans Hill(Jari),Sahebganj district of Jharkhand	214.18
4	Dwarka	27	Santhal Parganas, Jharkhand	155.75
5	Brahmani	28	Santhal Parganas, Jharkhand	231.65

(ii) Annual deposition of river bed minerals

Evaluation based on following parameters:

a) Geomorphological studies

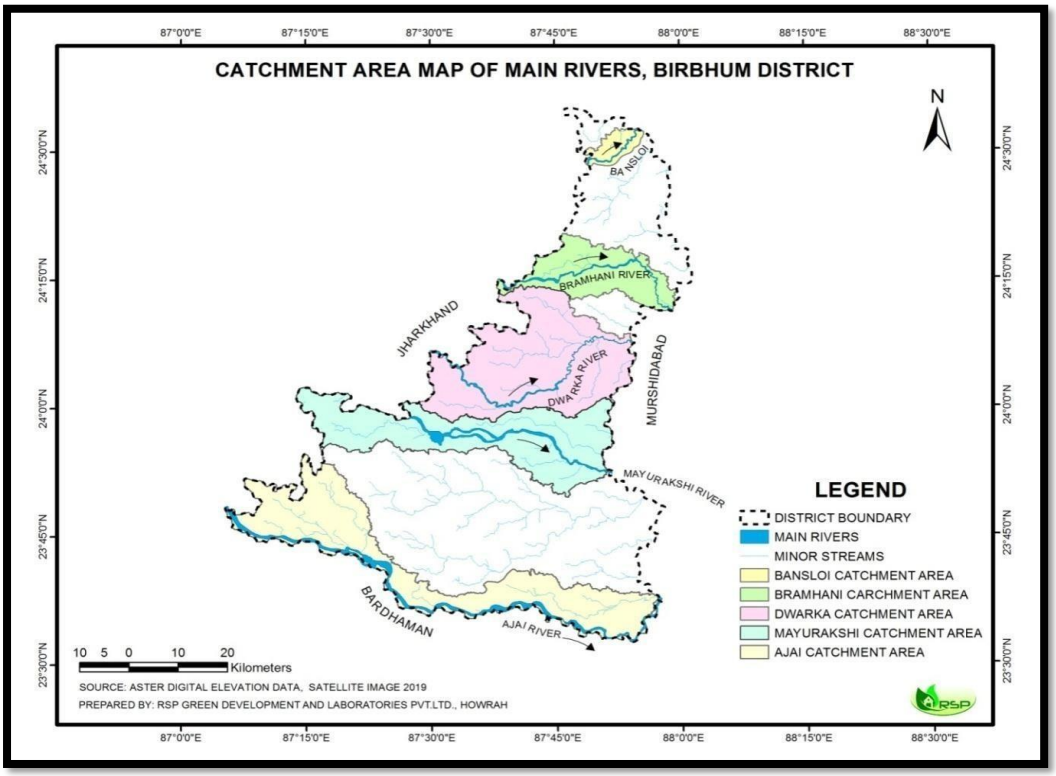
I. Place of origin

- **Ajay River:** South west of Deoghar in Jharkhand
- **Mayurakshi River**: Trikut hill, Jharkhand
- **Bakreshwar River:** Santhal Parganas, Jharkhand
- **Brahmani River**: Santhal Parganas, Jharkhand
- **Dwarka River**: Santhal Parganas, Jharkhand

II. Catchment area

- Catchment area of **Mayurakshi River** : 246.27 km^2 (in Birbhum District)
- Catchment area of **Ajay River**: 587.35 km^2 (in Birbhum District)
- Catchment area of **Brahmani River**: 162.25 km^2(in Birbhum District)
- Catchment area of **Dwarka River**: 168.39 km^2(in Birbhum District)

Map. No. 13 CATCHMENT AREA MAP OF MAIN RIVERS OF THE DISTRICT

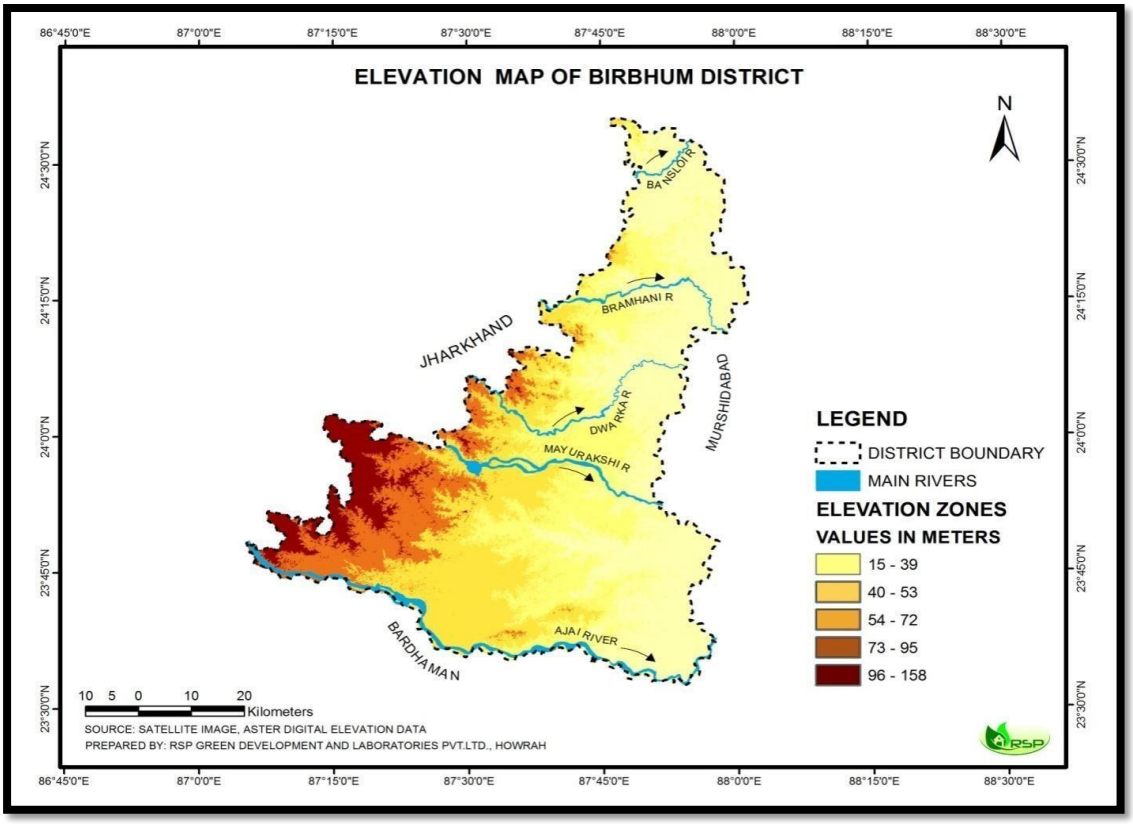


(iii) General profile of river/stream

If rivers are always straight i.e. if rivers follow straight course, the meaning of slope becomes valueless, but if the river is curvy and follows a sinusoidal pattern(as is usually the case, at least to some extent) then we have to measure the horizontal distance along the sinuous projection of the course of the river on a horizontal plane. The slope can be measured in feet per mile or some metric units like meters per kilometre. Recalling some trigonometry, we might recognise as the tangent of a slope angle although measuring the slope of a river is not an easy matter. The slope of the rivers of Ajay & Mayurakshi of Birbhum district, in this case, has been measured following the method of Digital Elevation Model (DEM).

To reach the targeted approach, here contour lines are digitized from topographic map using a scale of 1:8000; from this map few contours are also digitized in flat areas. Spot heights are also digitized. From this height data, contour interpolation is completed in Arc-GIS approach. This slope map is exported to ERDAS for further processing. The slope map is classified to 0-15 degree or more than 15 degree.

Map. No. 14 ELEVATION MAP OF THE DISTRICT



(iv) Annual deposition factor

Detailed Sedimentation Study

Not all channels form sediment and not all rivers transport sediment. Some have been carved into bedrock, usually in headwater reaches of streams located high in the mountains. Sediment transport knowledge is important in river restoration, ecosystem protection, navigation, watershed studies and reservoir management. Bed load represents the lower portion of sediment load in natural rivers. Fluvial sediment load materials are transported by rivers. Geological erosion and soil erosion are the two basic terms usually used to describe the erosion processes. A third term used in this DSR is water course erosion which is predominately stream bank or channel erosion and in some cases is a part of both the geological and soil erosion processes. Geological erosion is the erosion that has scarred the earth's surface creating mountains, chasms, flood plains, deserts, and deltas under natural or relatively undisturbed conditions. Different types of Landscapes & geomorphological sculptures are also the outcome of geological erosional activities.

Geological Erosion is caused by volcanic eruptions, earthquakes, landslides, mudflows (*i.e.,* Lahar) and gulling and has to a varying degree been influenced by man's activities and may require partial control by man.

Soil Erosion is more closely associated with agricultural land because by definition soil is the unconsolidated mineral or

organic material that will support plant growth. Soil particles located on the surface of agricultural lands, forest lands, or grazing lands are detached by rainfall or eroded away by surface runoff. This may take place in the form of sheet erosion with at in sheet of water flowing down a gentle upland slope. Rill erosion is another form with runoff occurring in well-defined yet small incisions in the land surface. Gully erosion is the dissection of the soil surface with a deep cut in the land channel formed below an uncut reach thus creating a sudden break in surface slope.

Water Course Erosion is the erosion of a stream channel's bank and bed caused by flowing water. A river channel or water course transports or carries sediment that originates from surface runoff in the upland reaches by the erosion processes previously described of geological or soil Erosion. The water course's ability to transport its sediment load is dependent on channel velocity or energy. If the upland sediment inflow to the river channel or water course is low then there is unspent energy which will pick up or erode the bank and bed of the channel. A meander pattern may develop with erosive forces active on the bank and bed of the channel on the outside or concave bends in the water course meander. These streams have channel forms that often are dominated by the nature of the rock (of varying hardness and resistance to mechanical weathering and of varying frequencies of joints, spacing and pattern) in which the channel has been cut. Such channels often include pools that trap sediment so that long reaches of channel may carry essentially no sediment at all. Such channels, known as *non-alluvial channels,* have been taken into account for convenience of study of sedimentation. But here we will focus on alluvial *channels,* the class of river channel forming the vast majority of rivers on the earth‘s surface. Alluvial channels are *self-formed channels* in sediments that the river typically has at one time or another transported downstream in the flow.

The movement of detrital particles by air, water, ice or gravity is defined as sediment transport. Grains (may be sand particles transported by air & water (fluid transport) move as **bed load** (by rolling and sliding and by saltation) or in suspension, when grains are kept up by turbulence. The different sizes/density population of moving grains promote sorting of the materials and mechanical abrasion during transport removes corners and edges, so the grains become more rounded. The lower density and viscosity of air means that air transports a smaller range of grains sizes than does water, and generally only the fineness dust move in suspension. As a result, Aeolian deposits are usually much better sorted than water-laid sediments. The process of deposition of sand on riverbed is vital part of sedimentation. For proper documentation of the processes, we should cater light on the following aspects.

The amount and size of sediment moving through a river channel are determined by three fundamental controls: *competence, capacity* and *sediment supply*.

The sediment load of a river is transported in various ways although these distinctions are to some extent arbitrary and not always very practical in the sense that not all of the components can be separated in practice:

1. Dissolved load
2. Suspended load

3. Intermittent suspension (saltation)load

4. Wash load

5. Bed load

Dissolved Load: Dissolved load is the material that has gone into solution and is part of the fluid moving through the channel. Since it is dissolved, it does not depend on forces in the flow to keep it in the water column. The amount of material in solution depends on supply of a solute and the saturation point for the fluid. For example, in limestone areas, calcium carbonate may be at saturation level in river water and the dissolved load may be close to the total sediment load of the river. In contrast, rivers draining insoluble rocks, such as in granitic terrains, may be well below saturation levels for most elements and dissolved load may be relatively small.

Suspended load: Sediments carried as solids as the stream flows are suspended load. The size of particles that can be carried is determined by the stream's velocity. Faster streams can carry larger particles. Streams that carry larger particles have greater **competence**. Streams with a steep **gradient** (slope) have a faster velocity and greater competence.

Saltation Load: A type of sediment transport in air or water in which particles are moved forward in short, abrupt leaps. This process is intermediate between suspension and traction.

Wash load: Although w*ash load* is part of the suspended-sediment load it is useful here to make a distinction. Unlike most suspended-sediment load, wash load does not rely on the force of mechanical turbulence generated by flowing water to keep it in suspension. It is so fine (in the clay range) that it is kept in suspension by thermal molecular agitation (sometimes known as *Brownian motion*). Because these clays are always in suspension, wash load is that component of the particulate or clastic load that is-washed through the river system. Unlike coarser suspended-sediment, wash load tends to be uniformly distributed throughout the water column. That is, unlike the coarser load, it does not vary with height above the bed.

The term sand is use to denote an aggregate of mineral or rock grains greater than 1/16mm and less than 2mm in diameter.

Sands follow traction and inertiasuspensi on approximately in accordance with the so-called Sixth-Power Law, which corroborates a complete transfer of kinetic energy transmitted from water to a particle and prohibits allowance for the subsidiary effect of viscous drag. But the size-velocity relationship in this range is defined by the popular Stokes Law. Here smaller particles remain in suspension chiefly by the kinetic effects of disperse system i.e. colloid.

Bed load: Particles that are too large to be carried as suspended load are bumped and pushed along the stream bed as bed load. Bed load sediments do not move continuously. Streams with high velocities and steep gradients do a great deal of down cutting into the streambed, which is primarily accomplished by movement of particles that make up the bed load.

Drainage system is the pattern formed by streams, rivers and lakes in a drainage basin. In a drainage system, streams or rivers always connect together to form networks. Many factors such as **topography, soil type, bedrock type, climate and vegetation cover influence input**, **output and transport of sediment and water in a drainage basin** (Charlton, 2008). So the river bed sand depositions are the manifestation of rate of current of water flow. Another two factors–lower flow regime and upper flow regime are also the vital factors which play a pivotal role for deposition of sands in particular pockets. These factors also influence the nature of the pattern of water bodies (Twidale, 2004).

Methodology: The catchment area of river has been analyzed with the help of Arc-GIS approach. The mined affected area of the river will be measured through Arc-GIS approach and ground based survey by GPS approach gives fruitful results. The stretch of the mined area of river is divided in various segments depending on stretch of the rivers. The width (meters) and GPS information at each segment is collected to quantify the total mined area of river. The geo-morphological patters in terms of stream orders were also observed using ArcGIS methodology. Besides, the mined affected area of the river is divided in to various segments to analyze grain size distribution in river bed. The role of hydraulic gradient of most of the rivers has been scrutinized in detail to explain the causes of riverbed sand deposits. Although, the role of drainage density is of paramount importance in riverbed sand deposition.

Bed material: The mixture of sediment that composes stream bed is called bed materials .Bed material is stationary, but particle size is important to sediment transport because as energy level of a stream increases, some bed-material particles are mobilized and become part of the bed load or suspended load. In this report, composition of bed material is defined by particle-size distribution.

Suspended Sediment Material: Usually small particles, suspended by turbulence of the flow or existing as colloids, and transported at about the same downstream velocity as the flowing water. Suspended sediment is distributed at all depths in flowing water. In this report, suspended sediment is expressed as concentration in milligrams per litre.

Suspended-sediment load: In this report, annual suspended-sediment load is expressed in tones .Suspended-sediment discharge: A computed value of the quantity (weight)of suspended sediment per unit time also referred to as suspended-sediment transport rate.

Total sediment load: The sum of bed load and suspended sediment load, together called total sediment load. In this report, total sediment load is expressed in tones. Total sediment discharge: The sum of bed load discharge and suspended-sediment discharge.

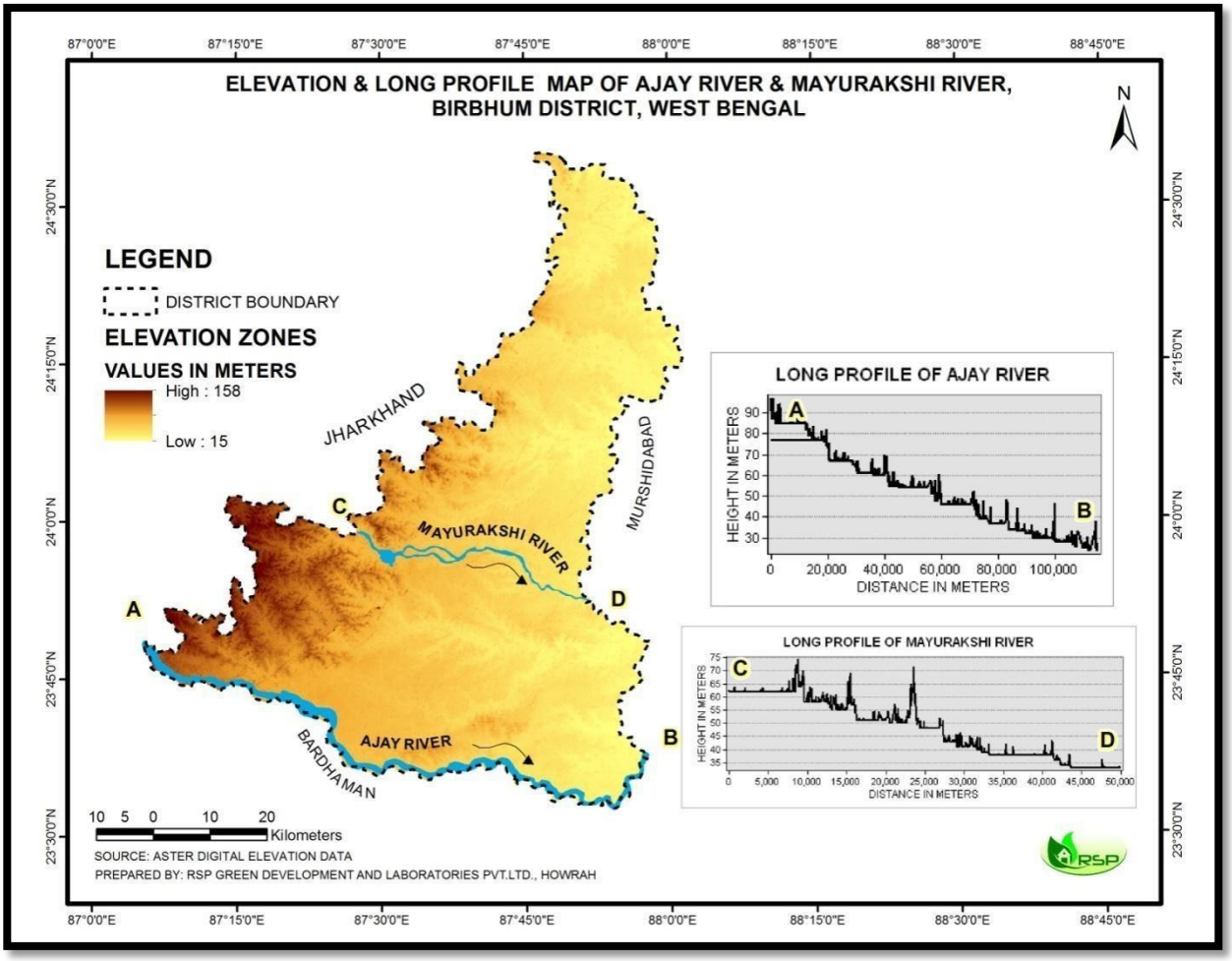
When a graph is plotted with the river bed elevation on the vertical axis and the upstream distance on the horizontal axis, a smooth curve may pass through the points. The result is called the Longitudinal Profile or Long profile of the river. The longitudinal profiles of most rivers are *concave upward*. The reason is not difficult to understand. In the downstream direction, one tributary after another joins the river, each adding discharge. As the river grows larger, the ratio of cross-

sectional area to wetted perimeter increases. Because the slope of the river depends, in large part, on the relative magnitude of the down slope driving force of gravity, which is affected by the whole volume of the river, and the up slope resisting force of friction, which is affected by the area of the riverbed, the slope decreases downstream.

A longitudinal profile should extend through a reach extending from upstream of the project area to downstream of the project area. Profile points should be surveyed in the thalweg and be detailed enough to illustrate the channel morphology (riffle-pool sequences).

The base level of a river is the elevation of the water surface of the water body, along the river course, into which the river flows. Let us think about what happens to the river as its base level changes. The concept to keep mind is that the river has some equilibrium longitudinal profile, in the sense that if conditions of precipitation, sediment supply, and base level remain constant the longitudinal profile stays the same. If a different set of conditions is imposed upon the river, the river adjusts its longitudinal profile accordingly toward a new equilibrium.

Map. No. 15 ELEVATION & LONGITUDINAL PROFILE MAP OF AJAY RIVER & MAYURAKSHI RIVER



If base level rises, some of the sediment that's carried along by the river toward the river mouth is deposited along the

way to raise the river bed, thereby establishing a new equilibrium longitudinal profile. If base level falls, the river erodes its bed to adjust toward a new, lower equilibrium profile. There's more to be said, however, about what happens as the river erodes its bed as a consequence of a fall in base level. The erosion does not happen uniformly everywhere. All at the same time, but by upstream propagation of a point where the channel slope changes, from steeper downstream of the point to less steep point survives, for a long time, as a pair of terraces above the new, lower river channel Because the differ upstream of the point. The point of change in slope is called a ***knickpoint***. The position of a knick point is marked by a waterfall or rapids. Knick points migrate slowly up stream, thereby extending the new, lower longitudinal profile as the river eats its way upstream. If a floodplain has developed in the river valley, the old floodplain downstream of the knickpoint between old and new equilibrium profiles decreases upstream, other things being equal (the elevations of the highlands in the headwaters of the river are very conservative), the height of this knickpoint decreases as it migrates upstream. Often, if base level drops abruptly a number of times during some long period of time, more than one knickpoint is present along the river course, each slowly making its way upstream.

Sediment Transport Rate: The rate at which sediment is moved past a cross section of the flow is called either the ***sediment transport rate*** or the ***sediment discharge***. It's related to the sediment load, but it's different, just because different fractions of the sediment load are transported at different rates. It can be measured in mass per unit time, or in weight per unit time, or in volume per unit time.

Sediment Discharge formulae: To derive a sediment discharge formula, you try to think about the physics of sediment transport in a way that allows you to develop the form of some rational equation for transport rates, which contains within it one or more adjustable parameters‖ whose values are assigned by analysis of selected data sets already at hand. Our common sense tells us that the stronger the flow the greater the sediment transport rate. And an important first-order fact of observation is that the sediment transport rate is a very steeply increasing function of the flow strength. Think about the simplest way to embody these important facts in a formula for the sediment transport rate per unit width of flow, usually written qs. Perhaps the simplest approach to quantifying qs is to write an expression like $q_s = A\tau^n$ where A is a coefficient and n is an exponent much larger than one.

The Sediment Yield: To introduce just one more thing about sediment in rivers, we should make a distinction between the sediment discharge and what's called the sediment yield of a river. The sediment yield is the sediment discharge divided by the total drainage area of the river upstream of the cross section at which the sediment discharge is measured or estimated. The sediment yield measures the rate, per unit area, at which sediment is removed from the watershed. It is important in studies of the long-term evolution of landscapes drained by rivers.

(v) Replenishment

Replenishment defines rejuvenation of riverbed sand deposition phenomena. The word replenishment is the fulcrum of riverbed sedimentation under different depositional environmental conditions especially in syn-monsoon *i.e.,* during rainy

seasons.

Local monitoring for replenishment at specific mining sites, monitoring of the entire reach through the estuary will provide information on the cumulative response of the system to sand and gravel extraction. For example, it is important for downstream bars and the estuary to receive sufficient sand and gravel to maintain estuarine structure and function. Because the elevation of the bed of the channel is variable from year to year, a reach-based approach to monitoring will provide a larger context for site-specific changes.

The rate of gross or absolute silt production (erosion) in the watershed and the ability of the, stream system to transport the eroded material in a river have the direct relation with the quantity of sediment delivered into a river. The rate of gross erosion is dependent upon many physical factors like climatic conditions, nature of soil, slope of the area, topography and the land use. Hydro-physical conditions of the watershed govern the capability of transporting the eroded material. It has been observed that the average rate of sediment production decreases as the size of drainage area increase and the larger watershed the lesser is the variation between the rates. The larger water shed presents more opportunity for deposition of silt during its traverse from the point of production. The water shed with maximum land use class of forest generate very low rate of production unless the forest are degraded or open forest. The cultivated watersheds with unscientific farming produce very high rate of silt production. The total amount of eroded material, which reaches a particular hydraulic control point, is termed as sediment yield.

For sustainability of river sand mining, it is necessary that the mine pits formed as a result of sand excavation are refilled with sand by natural process of replenishment in a reasonable period of time so that the area is again available for mining. The rate of excavation should be decided in accordance with the rate of replenishment which is the rate at which sand/gravel is deposited on the river flood plain by the river during monsoon season. However, determination of site-specific rate of replenishment is quite difficult as it is dependent on several factors such as geology and topography of the catchment area of the river, breadth of the flood plain, rainfall in that particular year(which is quite variable and not very much predictable much in advance),etc. Dandy-Bolton formula is generally used to calculate the sediment yield. However, this formula can give only a quick rough approximation of mean sediment yield at regional basis (for the whole catchment area of the river) and it can, at best, be used only for preliminary watershed planning and its use to predict sediment yield for a specific location would be unwise because of the wide variability caused by local factors, not considered in the formula. But it is to be kept in mind that to prepare the mining plans of the mines, the factor of annual replenishment is to be taken into consideration while calculating the mineral reserves. It has also been observed that during flooding, all the pits replenish with sand. Hence, mined out areas in the pre monsoon season will be completely replenished with sand during monsoon. Therefore, it has been assumed that the pits will be replenished after each monsoon. **The replenishment data collections are going on and will be furnished within six (6) months.**

(vi) Total potential of minor mineral in the riverbed

The total potential of minor mineral (sand) in the riverbed is 1231276.66 cum.

b) Geological Studies

I. Lithology of Catchment Area

- **Ajay River:** lithological units are alternating layers of sand, silt and clay with hard clays impregnated with caliche nodules.
- **Mayurakshi River:** Granite gneiss, with enclaves of metamorphites, laterite and lateritic soils, alternating layers of sand, silt and clay.
- **Brahmani River:** Laterite and lateritic soils, hard clays impregnated with caliche nodules.

II. Tectonics and structural behaviour of rocks

Chhotanagpur Gneissic Complex marks the metamorphic basement rocks which comprise of pink granite, granite gneiss and epidote granite impregnated with veins of quartz and pegmatite which are exposed in the south-west and north-west part of the districts. Foliation of this areas dip towards north-east moderately; trend of the foliation is generally NW-SE. Early Cretaceous Rajmahal Trap Formation consisting of grey, hard and compact intertrappean basalt having a network of siliceous veins with pockets of zeolites in the northern parts are found to seen.

Here geology provides crucial information about the underlying hidden set up. Weathered and fractured hard rock terrains with higher elevations and steeper topography are the special features of this province. As Birbhum is the part of Chhotanagpur plateau, it tectonically lies within the cradle of orogeny i.e. more or less within the tectonically active zone. Structural features like faults (neotectonic fault and subsurface fault), geomorphic lineament, breaks in slope, geomorphic lineament-ridges parallel and columnar joints within basaltic rocks are also prominent in the western part of the district.

c) Climatic factors

I. Intensity of rainfall

The intensity of rainfall due to depressions sometimes becomes very great and may cause enhanced soil erosion in the district. During winter, western disturbances generally cause light rainfall .This does not cause any major soil erosion problem. During hot weather season of March to May, rainfall is caused by the Norwesters or Kalbaisakhis. Kalbaishakhis generally bring sudden rainfall with great intensities. Besides, the season in which it occurs is characterized by the presence of bare soil mostly devoid of vegetation. Therefore, it causes considerable amount of soil erosion.

II. Climate Zone

Birbhum district enjoys the tropical monsoon type of climate characterized by hot wet summer and cool dry winter. There is a relatively short wet period preceded by a period of comparatively dry spells of long duration.

III. Temperature variation

The year may be divided into four seasons. The cool weather commences in the later part of November and lasts until the middle of February. During these months the prevailing winds are from the north and north east .This is followed by the hot and dry season which extends up to May. The weather becomes increasingly hot during the day, though the night remains fairly cool. The daily range of temperature is often tempered by Norwesters which generally appears in the evening. The south west monsoon season sets in about the middle of June and continues up to the end of September .October and the first half of November constitute the post monsoon season.

Table 15: Annual Deposition of Sand

Sl. No.	River /stream	Portion of the river/stream recommended for mineral concession	Length of area recommended for mineral concession(km)	Avg. width of area recommended for mineral Concession (m)	Area recommended for mineral concession (sq.m)	Mineable mineral potential (in metric ton) 60% of total mineral potential
1.	Ajai	Only commercially viable zones are recommended here for mineral concession to get economic vintage.	122.39	65.2	7979828	Geological reserves and mineable reserves have been calculated considering 3m depth as per guidelines. **Geological reserve =16881911.243 tonnes. Mineable reserve =10129146.74 tonnes.**
2.	Brahmani		47.39	319	8909320	
3.	Dwarka		69.46	266	18476360	
4.	Mayurakshi		50.99	526	26820740	
5.	Bansloi		17.72	175	3101000	
Total for the district			**307.95**	**1938.00**	**596807100**	

****Sp.gr of sand =>2.67gm/cc ;depth of mining =>3m; conversion factor : 1cum=0.0035314667 tonn**

i) Riverbed mineral potential

Table 16: Riverbed mineral potential

River bed is devoid of other minerals other than sand.

Boulder (in cum)	Pebbles/gravels (cum)	Sand/ white sand (cum)	Total mineable mineral potential (cum)
Not Available	Not Available	2458761.00	1231276.66
			Source: Field survey

ii) Riverbed mineral potential zone (Sand)

- **Reference: ANNEXURE - I**

LIST OF POTENTIAL SAND BLOCK (TOTAL: 48 No.s)

(In-situ Minerals (Blackstone, China clay & Fire clay)

(Source: Field survey)

- **Reference: ANNEXURE – II**

LIST OF IN-SITU MINERALS IN RESERVE AREA

(Source: Field survey)

- **Reference: ANNEXURE – II (a)**

LIST OF IN-SITU MINERALS PROPOSD IN RESERVE AREA (UNDER GAZATTE NOTIFICATION, 2020)

(Source: Field survey)

- **Reference: ANNEXURE – III**

LIST OF LESSEE OF IN-SITU MINERALS (OTHER THAN SAND)

(Source: Field survey)

9. OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT

a. GENERAL OVERVIEW

To prepare the DSR of Birbhum district of West Bengal, geological studies along with structural studies in the quest from knowing more and more pertaining to tectonic set up of this regime, suitability for riverbed sand mining and time of deposition of different types of minor minerals are also important. The common hydrological regime plays a pivotal role for deposition of sand and other minor minerals and it is defined by the tropical monsoon climate with alternating dry and wet seasons. Birbhum, in this regard, gives a best fit result. The spatiality of rain is controlled by the orientation of the axis of monsoon trough. River bed sand mining or sand mining adjacent to a river or stream has a direct impact on the physical characteristics of the stream such as channel geometry, bed elevation, substratum composition and stability, in-stream roughness of the bed, pro velocity, discharge capacity, sediment transport capacity, turbidity, temperature etc. Alteration or modification of the said attributes may cause hazardous impact on ecological equilibrium of riverine regime.

b. EXISTING MINING LEASES OF THE DISTRICT WITH LOCATION, AREA, PERIOD FOR EACH MINOR MINERAL

- **Reference: ANNEXURE – IV**

LIST OF EXISTING MINING LEASES (STONE QUARRY)

(Source: DLLRO SURI, BIRBHUM)

c. DETAILS OF PRODUCTION OF SAND AND OTHER MINOR MINERALS DURING LAST 3 YEARS

The data regarding production against revenue will be furnished within six (6) months.

- **Reference: ANNEXURE – V**

LIST OF EXISTING SAND BLOCK

(Source: DLLRO SURI, BIRBHUM)

10. DETAILS OF REVENUE GENERATED FROM MINERAL SECTOR DURING LAST THREE YEARS

Table 17(a): Details of revenue generated from mineral sector (Sand)

Year	Royalty/ deed rent (Rs.)	Cess (Rs.)	Surface rent (Rs.)	Total revenue (Rs.)
2017	22655738.00	2511570.00	0.00	25167308.00
2018	106005738.00	85238800.00	0.00	114529538.00
2019	86293371.00	10393200.00	0.00	96686571.00
			TOTAL	**236383417.00**

Table 17(b): Details of revenue generated from mineral sector (Stones)

Year	Royalty/ deed rent (Rs.)	Cess (Rs.)	Surface rent (Rs.)	Total revenue (Rs.)
2017	450792.00	72000.00	0.00	522792.00
2018	14037024.00	3940144.00	0.00	17977168.00
2019	12247918.00	1852800.00	0.00	14100718.00
			TOTAL	**32600678.00**

Table 17(c): Details of revenue generated from mineral sector (China clay & Fire clay)

Year	Royalty/ deed rent (Rs.)	Cess (Rs.)	Surface rent (Rs.)	Total revenue (Rs.)
2017	7507087.00	112400.00	0.00	7619487.00
2018	5704733.00	483010.00	0.00	6187743.00
2019	4929367.00	0.00	0.00	4929367.00
			TOTAL	**18736597.00**

(The data have been received from the Office of the Addl. District Magistrate, Birbhum, Govt. of West Bengal)

11. TRANSPORT (RAILWAYS, ROAD)

Emphasize on local transport infrastructure from mineral transport point of view Birbhum district is well connected with other cities and towns of West Bengal and neighborhood states by road and rail transport.

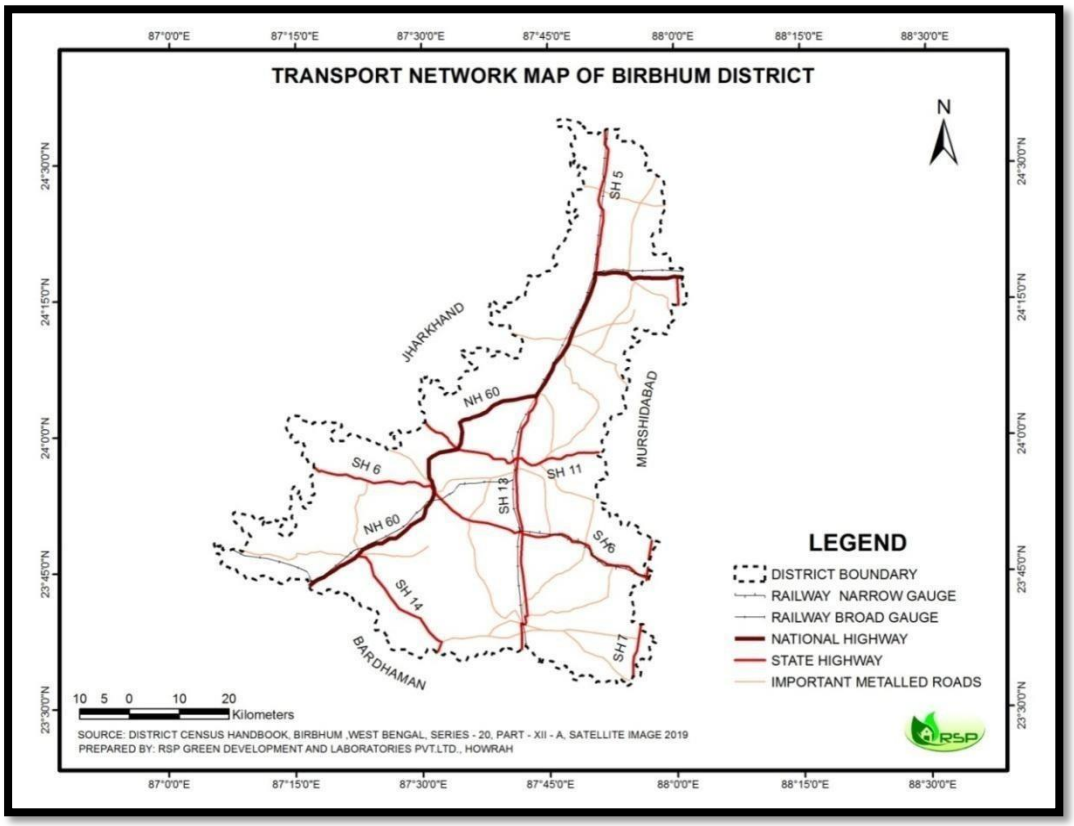
❖ RAIL

Suri is model Railway station. There are few trains to go Howrah (via Andal-Durgapur-Bandel), like Hool express, Mayurakshi Fast Passenger, Siuri-Howrah (via Sainthia) *etc*.

❖ ROAD

Suri is 220km from State capital Kolkata (Calcutta), 90km from Durgapur,34km from Bolpur, Santiniketan, 55 km from Andal and 19 km from Sainthia on the Andal-Sainthia Branch Line of Eastern Railway. It is on Panagarh–Morgram Highway (known as N.H 60).Suri connects to Ahmadpur station via Purandarpur, and KondaipurVillage.Transport system mainly depends on Govt. Bus Service & Private Bus service. The town is well connected to major towns like - Kolkata, Durgapur, Asansol, Sainthia, Medinipur, Digha, Burdwan, English Bazar, Jalpaiguri, Siliguri, Katwa, etc. through roadway.

Map. No. 16 TRANSPORT NETWORK MAP OF THE DISTRICT



13. CONCLUDING REMARKS & SUGGESTED RECOMMENDATIONS

It is pertinent to say in the context of preparation of DSR of Birbhum district that it is a laudable attempt and it will give the **"facilities galore"** to West Bengal Government, from point of view of mineral deposits (both minor & major minerals). This district survey report indicates prima facie availability of requisite area from within the ML blocks to prove adequate reserves of black stones, fireclay, china clay, and riverbed sand deposits. For complete feasibility of the said projects if following points are taken into grip, a crystal clear picture about the reserve and grade of the deposits can be obtained.

- Application of the concept of mineral (Minor & Major) paragenesis in regional and local context.
- Increasing utilization of remotely sensed data such as multi sensor airborne survey, LAND SAT imageries *etc*.
- Review, intensification and projectisation of exploration in already intense field blocks.
- Necessity of extensive exploration and thoroughness of search for stones, minor minerals, and new vistas of riverbed sand deposits in view of geological diversity.
- Testing of unconventional targets based on minor and major mineral paragenesis and its localization applying BROWN FIELD / GREEN FIELD concepts. More aggressive surface sampling, geochemical survey, soil analysis and assays of other minerals followed by grid pattern and chemical assay of bore hole samples at short depth of interval by technical experts to the field of minor and major minerals.(although these come under G:2 & G:3 stages; but these are beyond your scope.)

It is the prime time for the technocrats associated with mineral development to take up the challenge and present propagation of misconceptions in the ALIBI of environmental degradation.

But successful management of stones and riverbed sand deposits involving exploitation, conservation and protection of the resources from the company will be pivotal to its economic growth and sustenance of the quality of the environment.

NB:

Data concerning production against revenue and replenishment details of post-monsoon (2019) and pre-monsoon (2020) will be provided within six (6) months.

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ANNEXURE-I: LIST OF POTENTITAL SAND BLOCKS (TOTAL: 48 NOs)

Details of New sand Block in different blocks under Birbhum District																		
Sl. No.	Sand Block Name	Name of River	Name of Block	Mouza	J.L. No.	River Plot No.	Area (In acre)	Latitude (North)				Longitude (East)			Geological Reserve(in Cum/ Year)including boulder,bajri,sand,silt)	Permissible/ Mineable Reserve(in Cum/ Year)including boulder,bajri,sand,silt)	Nearest Railway Station	Nearest SH/ NH	Nearest PF /RF	Area within prohibited zones as per rule 3 of WBMMC Rules, 2016
								P-NO	D	M	S	D	M	S						
1	NP-003-NEW	DARWAKA	Md.Bazar	NISCHINTAPUR	37	2454 (P)	4.19	A	24	3	37.61	87	33	46	50868.00	24966.00	Gadadharpur, about-16.60Km.	NH-60, 3.98Km.	Ramnabagan WS about 51.00 km.	Possible (as per guideline)
								B	24	3	38.09	87	33	43.67						
								C	24	3	43.57	87	33	50.21						
								D	24	3	44.56	87	33	47.67						
2	NP-001-NEW	DARWAKA	Md.Bazar	NISCHINTAPUR	37	2734 (P)	2.75	A	24	3	20.67	87	33	46.59	33384.00	16605.00	Gadadharpur, about-13.95Km.	NH-60, 3.86Km.	Ramnabagan WS about 51.80 km.	Possible (as per guideline)
								B	24	3	20.02	87	33	44.88						
								C	24	3	26.44	87	33	42.4						
								D	24	3	26.71	87	33	44.37						
3	NP-002-NEW	DARWAKA	Md.Bazar	NISCHINTAPUR	37	2454 (P)	4.10	A	24	3	27.49	87	33	44.24	49776.00	10826.66	Gadadharpur, about-16.83Km.	NH-60, 3.86Km.	Ramnabagan WS about 51.90 km.	Possible (as per guideline)
								B	24	3	27.29	87	33	42.42						
								C	24	3	36.59	87	33	45.41						
								D	24	3	36.87	87	33	43.19						
4	NP-004-NEW	DARWAKA	Md.Bazar	NISCHINTAPUR	37	2454 (P)	2.54	A	24	3	44.62	87	33	50.68	30837.00	15300.00	Gadadharpur, about-16.70Km.	NH-60, 4.01Km.	Ramnabagan WS about 51.00 km.	Possible (as per guideline)
								B	24	3	45.34	87	33	48.44						
								C	24	3	50.05	87	33	51.46						
								D	24	3	49.64	87	33	53.36						
5	NP-005-NEW	DARWAKA	Md.Bazar	NISCHINTAPUR	37	2454 (P)	3.61	A	24	3	53.62	87	33	54.68	43827.00	21888.00	Gadadharpur, about-14.10Km.	NH-60, 4.10Km.	Ramnabagan WS about 51.00 km.	Possible (as per guideline)
								B	24	3	53.67	87	33	52.48						
								C	24	4	1.28	87	33	53.06						
								D	24	4	0.33	87	33	50.92						
6	MP-001-NEW	DARWAKA	Md.Bazar	MALLIKPUR	30	352(P)	1.10	A	24	0	17.78	87	38	57.93	13353.00	6480.00	Gadadharpur, about-4.48Km.	SH-60, 3.84Km.	Ramnabagan WS about 48.22 km.	Possible (as per guideline)
								B	24	0	17.82	87	38	56.73						
								C	24	0	13.01	87	38	56.94						
								D	24	0	13.4	87	38	56.12						
7	MD.BAZAR/KANIARA/001/2018	MAYURAKSHI	Md.Bazar	KANIARA	119	1(P)	12.00	A	23	57	34.39	87	33	8.94	145686.00	72660.00	Kunuri,about-7.23Km.	NH-60, 1.81Km.	Ramnabagan WS about 42.42 km.	Possible (as per guideline)
								B	24	57	31.5	87	33	15.91						
								C	24	57	23.89	87	33	18.35						
								D	24	57	28.95	87	33	7.58						
8	MD.BAZAR/CHATORMA/001/2018	MAYURAKSHI	Md.Bazar	CHATORMA	134	206(P)	6.10	A	23	57	20.21	87	33	27.87	74055.00	36630.00	Kunuri,about-6.95Km.	NH-60, 3.12Km.	Ramnabagan WS about 42.40 km.	Possible (as per guideline)
								B	24	57	20.02	87	33	31.34						
								C	24	57	16.15	87	33	40.48						
								D	24	57	14.32	87	33	39.14						
9	MD.BAZAR/NADIGHASBERA/001/2018	MAYURAKSHI	Md.Bazar	NADIGHASBERA	141	1(P)	4.73	A	23	57	37.45	87	35	44.98	57423.00	28350.00	Kunuri,about-4.97Km.	SH-11, 1.87Km.	Ballavpur WS about 30.66 km.	Possible (as per guideline)
								B	24	57	35.86	87	35	56.16						
								C	24	57	33.89	87	35	55.74						
								D	24	57	35.4	87	35	44.88						
10	MD.BAZAR/NADIGHASBERA/002/2018	MAYURAKSHI	Md.Bazar	NADIGHASBERA	141	1(P)	5.35	A	23	57	33.76	87	35	58.9	64950.00	32077.50	Kunuri,about-4.61Km.	SH-11, 1.79Km.	Ballavpur WS about 30.33 km.	Possible (as per guideline)
								B	24	57	28.76	87	36	14.08						
								C	24	57	27.18	87	36	13.45						
								D	24	57	32.51	87	35	58.49						

11	BP-001-NEW	DARWAKA	Md.Bazar	BATASPUR	31	544(P)	3.19	A	24	0	42.98	87	37	40.34	38727.00	19125.00	Gadadharpur, about-6.25Km.	NH-60, 4.95Km.	Ramnabagan WS about 48.52 km.	Possible (as per guideline)
								B	24	0	41.08	87	37	40.03						
								C	24	0	40.02	87	37	49.13						
								D	24	0	38.55	87	37	47.92						
12	BP-002-NEW	DARWAKA	Md.Bazar	BATASPUR	31	544(P)	4.89	A	24	0	39.55	87	37	50.13	59367.00	29355.00	Gadadharpur, about-6.05Km.	SH-11, 4.53Km.	Ramnabagan WS about 48.52 km.	Possible (as per guideline)
								B	24	0	37.89	87	37	48.83						
								C	24	0	35.44	87	37	56.36						
								D	24	0	33.21	87	37	53.27						
13	BP-003-NEW	DARWAKA	Md.Bazar	BATASPUR	31	544(P) & 651(P)	6.86	A	24	0	34.42	87	37	56.89	83283.00	41250.00	Gadadharpur, about-6.03Km.	SH-11, 4.24Km.	Ramnabagan WS about 48.50 km.	Possible (as per guideline)
								B	24	0	32.7	87	37	53.74						
								C	24	0	25.72	87	37	56.3						
								D	24	0	26.64	87	37	52.94						
14	BP-004-NEW	DARWAKA	Md.Bazar	BATASPUR	31	772(P) & 651(P)	9.69	A	24	0	15.64	87	37	49.81	117642.00	58800.00	Gadadharpur, about-6.05Km.	SH-11, 3.86Km.	Ramnabagan WS about 48.30 km.	Possible (as per guideline)
								B	24	0	15.53	87	37	47.48						
								C	24	0	11.76	87	37	59.59						
								D	24	0	9.61	87	37	59.61						
15	BP-005-NEW	DARWAKA	Md.Bazar	BATASPUR	31	772(P) & 651(P)	3.66	A	24	0	11.72	87	38	1.04	44433.00	22110.00	Gadadharpur, about-5.81Km.	SH-11, 3.86Km.	Ramnabagan WS about 48.30 km.	Possible (as per guideline)
								B	24	0	9.51	87	38	1.4						
								C	24	0	13.99	87	38	8						
								D	24	0	11.99	87	38	8.99						
16	SURI/SAINTHIA/U-GOBINDAPUR-001/2018	MAYURAKSHI	SAINTHIA	UTTAR GOBINDAPUR	26	1375(P)	1.97	A	23	56	3.13	87	36	43.03	23916.00	11880.00	Kunuri,about-2.02Km.	SH-11, 3.99Km.	Ballavpur WS about 27.71 km.	Possible (as per guideline)
								B	23	56	4.79	87	36	43.42						
								C	23	56	2.32	87	36	48.81						
								D	23	56	0.98	87	36	48.23						
17	SURI/SAINTHIA/U-GOBINDAPUR-002/2018	MAYURAKSHI	SAINTHIA	UTTAR GOBINDAPUR	26	1378(P)	2.36	A	23	56	4.06	87	37	1.09	28650.00	14193.00	Kunuri,about-2.01Km.	SH-11, 3.81Km.	Ballavpur WS about 27.60 km.	Possible (as per guideline)
								B	23	56	1.43	87	37	1.84						
								C	23	55	59.67	87	36	56.24						
								D	23	56	3.13	87	36	58.77						
18	SURI/SAINTHIA/KULTOR-001/2018	MAYURAKSHI	SAINTHIA	KULTOR	25	1118(P)	3.47	A	23	56	4.16	87	37	20.02	42126.00	20910.00	Kunuri,about-2.30Km.	SH-11, 3.71Km.	Ballavpur WS about 27.64 km.	Possible (as per guideline)
								B	23	56	6.53	87	37	18.49						
								C	23	55	9.3	87	37	23.57						
								D	23	56	6.83	87	37	24.93						
19	SURI/SAINTHIA/KULTOR-002/2018	MAYURAKSHI	SAINTHIA	KULTOR	25	1118(P)	6.80	A	23	56	11.78	87	37	52.46	82554.00	41242.50	Mahishadaharl,about-2.27Km.	SH-11, 2.77Km.	Ballavpur WS about 27.66 km.	Possible (as per guideline)
								B	23	56	15.16	87	37	50.6						
								C	23	55	19.27	87	37	57.57						
								D	23	56	15.89	87	37	59.5						
20	RAM-1/MURAROI-1/DIMBA-001/2018	BANSLAI	MURAROI-I	DIMBA	19	434(P)	1.31	A	24	31	17.61	87	53	45.44	15903.00	7770.00	Rajgram,about-4.26Km.	SH-7, 3.70Km.	Ballavpur WS about 95.43 km.	Possible (as per guideline)
								B	24	31	18.48	87	53	44.88						
								C	24	31	19.7	87	53	45.15						
								D	24	31	20.6	87	53	48.93						
								E	24	31	19.97	87	53	49.2						
21	RAM-1/MURAROI-2/KALAHPUR-001/2018	BANSLAI	MURAROI-II	KALAHPUR	56	1158(P)	3.21	A	24	31	35.28	87	54	19.98	38970.00	19140.00	Rajgram,about-3.80Km.	SH-7, 2.81Km.	Ballavpur WS about 94.76 km.	Possible (as per guideline)
								B	24	31	36.97	87	54	18.24						
								C	24	31	38.45	87	54	24.86						
								D	24	31	38.23	87	54	26.28						
								E	24	31	37	87	54	27.27						
22	RAM-1/NALHATI-2/PRASHADPUR-001/2018	BRAHMANI	NALHATI-II	PRASHADPUR	142	181(P)	1.00	A	24	13	0.68	87	57	14.44	12138.00	5850.00	Lohapur,about-9.55Km.	SH-7, 5.49Km.	Ballavpur WS about 64.83 km.	Possible (as per guideline)
								B	24	13	0.07	87	57	14.06						
								C	24	13	2.21	87	57	11.04						
								D	24	13	3.54	87	57	10.11						
								E	24	13	4.06	87	57	10.93						

23	RAM-1/NARAYANPUR-001/2018	BRAHMANI	RAMPURHAT-I	NARAYANPUR	3	1674(P) & 218(P)	1.31	A	24	14	35.35	87	40	20.53	15903.00	7752.00	Pinargaria,about-4.78Km.	NH-114A, 5.31Km.	Ballavpur WS about 61.26 km.	Possible (as per guideline)
								B	24	14	36.46	87	40	19.73						
								C	24	14	36.72	87	40	21.6						
								D	24	14	37.74	87	40	24.94						
								E	24	14	36.19	87	40	24.41						
24	RAM-1/EKPARA-001/2018	BRAHMANI	RAMPURHAT-I	EKPARA	2	1(P)	2.93	A	24	15	6.1	87	38	43.37	35571.00	17670.00	Pinargaria,about-4.43Km.	NH-114A, 4.84Km.	Ballavpur WS about 62.15 km.	Possible (as per guideline)
								B	24	15	8.45	87	38	46.21						
								C	24	15	3.81	87	38	50.09						
								D	24	15	3.02	87	38	49.52						
								E	24	15	4.13	87	38	47.99						
25	RAM-1/EKPARA-002/2018	BRAHMANI	RAMPURHAT-I	EKPARA	2	1(P)	1.54	A	24	15	0.38	87	38	52.75	18696.00	9004.00	Pinargaria,about-4.18Km.	NH-114A, 4.64Km.	Ballavpur WS about 61.84 km.	Possible (as per guideline)
								B	24	15	0.61	87	38	53.82						
								C	24	14	58.43	87	38	55.81						
								D	24	14	53.71	87	38	58.79						
								E	24	14	53.41	87	38	58.32						
26	SURI-1/P SHIMULIA/001/2018	MAYURAKSHI	SURI-1	P-SHIMULIA	18	1348(P)	6.95	A	23	56	45.34	87	34	37.55	84375.00	42180.00	Kunuri,about-4.50Km.	SH-11, 4.22Km.	Ballavpur WS about 29.70 km.	Possible (as per guideline)
								B	23	56	47.93	87	34	50.59						
								C	23	56	45.43	87	34	50.49						
								D	23	56	42.87	87	34	37.86						
27	SURI-1/SHAKTIPUR/002/2018	MAYURAKSHI	SURI-1	SHAKTIPUR	19	1421(P)	6.21	A	23	56	58.01	87	35	13.6	75390.00	37638.00	Kunuri,about-4.10Km.	SH-11, 3.38Km.	Ballavpur WS about 29.67 km.	Possible (as per guideline)
								B	23	56	57.59	87	35	21.7						
								C	23	56	55.23	87	35	26.18						
								D	23	56	53.9	87	35	25.89						
								E	23	56	56.34	87	35	13.34						
28	SURI-1/SHAKTIPUR/001/2018	MAYURAKSHI	SURI-1	SHAKTIPUR	19	1421(P)	6.11	A	23	56	44.2	87	35	44.09	74178.00	36960.00	Kunuri,about-3.30Km.	SH-11, 3.45Km.	Ballavpur WS about 28.95 km.	Possible (as per guideline)
								B	23	56	38.55	87	35	53.84						
								C	23	56	36.27	87	35	52.76						
								D	23	56	41.73	87	35	43.24						
29	SURI-1/JUNIDPUR/001/2018	MAYURAKSHI	SURI-1	JUNIDPUR	20	1863(P) & 1127(P)	7.52	A	23	56	30.87	87	36	6.07	91296.00	45360.00	Kunuri,about-2.61Km.	SH-11, 3.68Km.	Ballavpur WS about 28.33 km.	Possible (as per guideline)
								B	23	56	22.52	87	36	16.26						
								C	23	56	20.62	87	36	14.35						
								D	23	56	28.6	87	36	4.57						
30	NP-003-NEW	DARWAKA	Md.Bazar	NISCHINTAPUR	37	2454 (P)	4.19	A	24	3	37.61	87	33	46	50868.00	24966.00	Gadadharpur, about-16.60Km.	NH-60, 3.98Km.	Ramnabagan WS about 51.00 km.	Possible (as per guideline)
								B	24	3	38.09	87	33	43.67						
								C	24	3	43.57	87	33	50.21						
								D	24	3	44.56	87	33	47.67						
31	Suri /Khrasole/Nabason-001/2018	Ajoy	Khyrasole	Nabason	97	2098 (P) 2258 (P)	7.35	A	23	45	2.23	87	10	1.36	89232.00	44320.50	Hazrathpur, 6.11Km.	N.H. - 60-10.94 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	45	4.07	87	10	1.09						
								C	23	45	5.39	87	10	16.86						
								D	23	45	2.74	87	10	16.57						
32	Suri /Khrasole/Nabason-002/2018	Ajoy	Khyrasole	Nabason	98	2258 (P)	9.40	A	23	45	4.02	87	10	23.45	114120.00	56823.00	Hazrathpur, 5.55Km.	N.H. - 60-10.44 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	45	6.47	87	10	23.17						
								C	23	45	8.55	87	10	37.21						
								D	23	45	5.41	87	10	37.44						
33	Suri /Khrasole/Barrjore - 001/2018	Ajoy	Khyrasole	Barjore	113	3420 (P)	6.77	A	23	44	29.82	87	13	33.42	82191.00	41022.00	Hazrathpur, 3.85Km.	N.H. - 60-5.02 km	Ramnabagan Wildlife Sanctury about at 23.67 km	Possible (as per guideline)
								B	23	44	32.30	87	13	32.94						
								C	23	44	33.55	87	13	40.88						
								D	23	44	33.16	87	13	44.25						
								E	23	44	30.38	87	13	44.36						
34	Suri /Khrasole/Barrjore - 002/2018	Ajoy	Khyrasole	Barjore	113	3400 (P)	7.17	A	23	44	31.68	87	13	56.14	87045.00	43215.00	Mahishadahari, 3.90Km.	N.H. - 60-4.33 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	44	34.22	87	13	55.01						
								C	23	44	36.71	87	13	10.07						
								D	23	44	35.07	87	13	10.35						

35	Suri /Khrasole/Barari - 001/2018	Ajoy	Dubrajpur	Barari	156	2268 (P) 2328 (P)	4.28	A	23	42	4.38	87	23	45.08	51960.00	25732.500	Panchara, 10.22Km.	S.H. 14- 4.15 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	42	7.00	87	23	45.20						
								C	23	42	6.38	87	23	53.58						
								D	23	42	4.25	87	23	53.22						
36	Suri /Khrasole/Barari - 002/2018	Ajoy	Dubrajpur	Barari	156	2268 (P)	4.21	A	23	42	4	87	24	2.23	51111.00	25530.00	Panchara, 10.60Km.	S.H. 14- 3.77 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	42	6.31	87	24	2.89						
								C	23	42	4.89	87	24	11.01						
								D	23	42	2.67	87	24	10.02						
37	Suri /Khrasole/Barari - 003/2018	Ajoy	Dubrajpur	Barari	156	2268 (P)	7.52	A	23	41	57.1	87	24	8.85	91296.00	45421.500	Panchara, 10.87Km.	S.H. 14- 3.92 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	42	0.99	87	24	11.11						
								C	23	41	57.66	87	24	20.13						
								D	23	41	55.04	87	24	18.92						
38	Ram -I/Nalhati-1/Tailapara - 001 - 003/2018	Brahmani	Nalhati	Tailapara	80	50 (P)	1.10	A	24	16	35.31	87	53	4.78	13353.00	6474.00	Nalhati, 5.13 Km	S.H. 7 - 2.33 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	24	16	36.18	87	53	4.74						
								C	24	16	36.18	87	53	10.72						
								D	24	16	35.36	87	53	10.59						
39	Suri -II/ 001/2018	Bakraswar	Suri -II	Ushagram	62	1653 (P) 1928 (P)	4.71	A	23	49	52.00	87	34	58.39	57180.00	28275.00	Suri, 8.41Km	N.H. - 60- 8.94 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	49	53.85	87	34	58.30						
								C	23	49	55.99	87	35	8.10						
								D	23	49	53.64	87	35	8.06						
40	Suri -II/ 002/2018	Bakraswar	Suri -II	Ushagram	62	1651 (P) 1928 (P)	3.26	A	23	50	1.41	87	35	16.25	39576.00	19425.00	Suri, 8.55Km	N.H. - 60- 9.49 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	50	0.68	87	35	16.84						
								C	23	50	3.89	87	35	27.93						
								D	23	50	4.65	87	35	28.34						
41	Suri -II/ 003/2018	Bakraswar	Suri -II	Behira	60	1311 (P) 1488 (P)	1.80	A	23	49	6.01	87	36	6.25	21852.00	10500.00	Suri, 10.10Km	N.H. - 60- 10.93 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	49	35.47	87	36	5.11						
								C	23	49	33.93	87	36	9.76						
								D	23	49	32.86	87	36	9.31						
42	Suri -II/ 004/2018	Chandrabhaga	Suri -II	kanspai & Gangte	82 & 66	648 (P) 979 (P)	1.00	A	23	49	53.44	87	33	5.16	12138.00	6037.50	Suri, 6.88Km	N.H. - 60- 6.18 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	49	53.08	87	33	4.89						
								C	23	49	50.68	87	33	10.66						
								D	23	49	50.15	87	33	9.76						
43	Suri -II/ 005/2018	Bakraswar	Suri -II	Gangte	66	1949 (P)	1.00	A	23	49	47.59	87	33	19.3	12138.00	5985.00	Suri, 7.04Km	N.H. - 60- 6.44 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	49	46.63	87	33	18.99						
								C	23	49	48.27	87	33	14.74						
								D	23	49	49.31	87	33	14.91						
44	Suri -II/ 006/2018	Bakraswar	Suri -II	Palsita & Parbotipur	65 & 169	1040 (P) 1452 (P)	2.10	A	23	49	47.2	87	33	21.48	25494.00	12690.00	Suri, 7.26Km	N.H. - 60- 6.55 km	Ramnabagan Wildlife Sanctury about at 28.67 km SSw	Possible (as per guideline)
								B	23	49	46.32	87	33	21.64						
								C	23	49	48.44	87	33	27.49						
								D	23	49	47.69	87	33	27.46						
								E	23	49	45.77	87	33	24.16						
45	Suri -II/ 006/2019	Bakraswar	Suri -II	Palsita & Parbotipur	66 & 169	415 (P) 1040 (P)	2.34	A	23	49	48.27	87	34	34.89	28407.00	18900.00	Suri, 7.31Km	N.H. - 60- 6.87 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	23	49	47.30	87	34	35.06						
								C	23	49	46.55	87	34	44.30						
								D	23	49	45.99	87	34	44.22						
46	Suri/Rajnagar/Madarpuir-001/2018	Sidheswari	Rajnagar	Madarpuir	3	197 (P)	4.14	A	24	0	39.5	87	14	27.27	50259.00	24505.00	Suri, 32.42Km	S.H. 6 - 6.50 km	Ramnabagan Wildlife Sanctury about at 48.53 km SS	Possible (as per guideline)
								B	24	0	40.13	87	14	26.27						
								C	24	0	47.06	87	14	30.57						
								D	24	0	54.10	87	14	37.30						
								E	24	0	53.33	87	14	37.70						
47	Suri/Rajnagar/Joypur-001/2018	Sidheswari	Rajnagar	Joypur	4	522(p)	4.89	A	24	0	57.69	87	14	50.72	59367.00	29670.00	Suri, 31.74Km	S.H. 6 - 6.78 km	Ramnabagan Wildlife Sanctury about at	Possible (as per guideline)
								B	24	0	58.94	87	14	50.32						
								C	24	1	4.24	87	15	4.18						
								D	24	1	2.75	87	15	5.24						
48	Suri/Rajnagar/Hirapur-001/2018	Sidheswari	Rajnagar	Hirapur	7	361(p) & 2(p)	1.32	A	24	2	7.04	87	15	33.58	16023.00	7812.00	Suri, 31.96Km	S.H. 14 - 8.63 km	Ramnabagan Wildlife Sanctury about at 50.46 km	Possible (as per guideline)
								B	24	2	6.79	87	15	33.11						
								C	24	2	11.31	87	15	32.01						
								D	24	2	14.03	87	15	34.91						
								E	24	2	13.65		15	35.21						
								F	24	2	10.61	87	15	32.74						

ANNEXURE-II: LIST OF IN-SITU MINERALS IN RESERVED AREA

Table 18 (a): List of in-situ Mineral in Reserve Area where application done (Hatgacha)

SL. No	Name of minerals	Name of associated minerals, if any	Host rock of mineralisation	Area of mineralized zone	Depth of mineralization	Whether virgin or partially excavated	Nature of land (whether free for mining/ forest/ agriculture)	Mineral reserve (approx.) mentioning grade	Location for potential mineralized zones				Area within prohibited zone as per Rule 3 of WBM MC Rules 2016	Infrastructure available near the Mine ralized zone	Remarks
									Administrative Block	Mouza	Plot no.	Co- ordinates			
01.	**Black Stone**	Opal & chalcedony	Dobrajpur beds compris ing of gritty and ferruginous sand stone & shale	108.53 Acres	Variable (often >80m from surface including intertrappean rocks)	Mostly Virgin	Mining is possible	143.20 Million Tonnes(Tentative) Good quality	Md. Bazar	Hatgacha JL No- 1	146(p),225-231, 288 to 316,1050,1061,1073	Hatgacha Black Stone Mine Latitude: 24° 06' 54.59"N to 24° 07' 16.82"N Longitude: 87° 35' 20.30"E to 87° 35' 52.31"E	Not in prohibited zone	Infrastructure available	GO issued by IC & E Dept Govt. of W.B-No-718 CI/O/MM/41/10/ MINES-DATED-30/11/ 2018,For a Period oftwenty(20) years (Provisionally)

Table 18 (b): List of in-situ Mineral in Reserve Area where application done (Jethia)

Sl. No	Name of minerals	Name of associated minerals, if any	Host rock of mineralisation	Area of mineralized zone	Depth of mineralization	Whether virgin or partially excavated	Nature of land (whether free for mining/ forest/ agriculture)	Mineral reserve (approx.) mentioning grade	Location for potential mineralized zones				Area within prohibited zone as per Rule 3 of WBM MC Rules 2016	Infrastructure available near the mineralized zone	Remarks
									Administrative block	Mouza	Plot no.	Co-ordinates			
02.	**Black Stone**	Opal & chalcedony	Dobrajpur beds comprising of grittyand ferruginous sandstone & shale	178.93 Acres	Variable (often >80m from surface including intertrappean rocks)	Mostly Virgin	Mining is possible	196.66 Million Tonnes(Tentative) Good quality	Md. Bazar	Jethia JL No-4	5, 64(P), 72(P), 73(P), 74(p), 75-92, 92/2972,92/3010,92/3011,92/3012,92/3013,92/3014,92/3015,92/3016,92/3017,93 to 96,97(p),98 to 118,119(p),137(p),138,140(p),141 to 154,158 to 160,230(p),261 to 263,264(p), 264/2971(p),264/3018,264/3019(p),264/3020(p),264/302,	Hatgacha Jethia Black Stone Mine Latitude : 24° 06' 54.55"N to 24° 07' 16.78"N Longitude: 87° 35' 20.00"E to 87° 36' 00.85"E	Not in prohibited zone	Infrastructure available	GO issued by IC & E dept Govt. of W.B- No-695-CI/O/MM/42/10/ MINES-DATED-15/11/2018 For a Period of twenty (20) years (Provisionally)

											1(p),265,266, 267(p),271 to 287 1506,1606 to 1609,1611,16 13 to 1623,1642 to 1652,1653(p), 1654 to 1660				
03.	**Black**	Opal &	Dob	Entire	Variable (often	Mostly	Mining	Reserve not	M d.	Jethia	411, 412, 413,	New	Not	No	
	Stone	chalcedony	rajp ur beds com prisi ng of gritt y and ferru gino us sand ston e & shal e	lease area	>80m from surface including intertrappean rocks)	Virgin	is possible	estimated	Bazar	JL No-4	414, 415, 416, 417, 418, 419, 420, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448(P), 450, 451(P), 452(P), 453, 495, 496, 497, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 524, 526, 530, 531, 532, 533, 534, 535, 536, 1350, 1351, 1352, 1353, 1354, 1360, 1361, 1362, 1363, 2955, 3003(P), 264(P), 268, 269, 454, 455, 456, 457, 458, 459, 460, 461, 472, 473, 488, 1521, 2971(P),	Propose d Mining Lease Latitude : 24° 06' 02"N to 24° 07' 15"N Longitu de: 87° 36' 30"E to 87° 37' 52"E ---------- ------- New Propose d Mining Lease Latitude : 24° 06' 05"N to 24° 07' 10"N Longitu	under prohibit ed zone	infrast ructur e availa ble	

											3019(P), 3020(P),	de: 87° 36' 35"E to 87° 37' 55"E			

Table 18 (c): List of in-situ Mineral in Reserve Area where application done (Chanda)

Sl. No	Name of minerals	Name of associated minerals, if any	Host rock of mineralisation	Area of mineralized zone	Depth of mineralization	Whether virgin or partially excavated	Nature of land (whether free for mining/ forest/ agriculture)	Mineral reserve (approx.) mentioning grade	Location for potential mineralized zones				Area within prohibited zone as per Rule 3 of WBMMC Rules 2016	Infra structure available near the mineralized zone	Remarks
									Administrative block	Mouza	Plot no.	Co-ordinates			
04.	Black Stone	Opal & chalcedony	Dobrajpur beds comprising of gritty and ferruginous sand stone & shale	23.321 Acres	Variable (often >80m from surface including intertrappean rocks)	Mostly Virgin	Mining is possible	23.12 Million Tonnes(Tentative) Good quality	Md. Bazar	Chanda (JL No- 2)	1613,1823,1824,1825,1826,1827,1828,1829,1830,1831,1832.	Latitude: 24° 02' 50.69"N to 24° 04' 50.20"N Longitude : 87° 35' 16.51"E to 87° 37' 08.44"E	Not in prohibited zone	Infrastructure available.	Grant order no- 875-ICE/O/MDTC-MIS/06/2017 DATED - 04/12/2017 For a Period of twenty (20) years (Provisionally)

Table 18 (d): List of in-situ Mineral in Reserve Area where application done (Pachami)

Sl. No	Name of minerals	Name of associated minerals, if any	Host rock of mineralisation	Area of mineralized zone	Depth of mineralization	Whether virgin or partially excavated	Nature of land (whether free for mining/ forest/ agriculture)	Mineral reserve (approx.) mentioning grade	Location for potential mineralized zones				Area within prohibited zone as per Rule 3 of WBMC Rules 2016	Infrastructure available near the mineralized zone	Remarks
									Administrative block	Mouza	Plot no.	Co-ordinates			
05.	**Black Stone**	Opal & chalcedony	Dobrajpur beds comprising of gritty and ferruginous sand stone & shale	Entire lease area	Variable (often >80m from surface including intertrappean rocks)	Partially Excavated	Mining is possible	52.57 Million Tonnes(Tentative)	Md. Bazar	Pachami (JL No - 3)	1-7, 9-50, 51, 52-58, 59, 60, 61,62,63,64, 65, 68, 78, 79, 80, 103-106, 107, 123, 124, 125, 126, 127-151, 152, 153, 156, 157, 160, 161, 193, 194, 195, 210, 211-214, 501-503, 915,	Latitude: 24° 04' 21.52" N to 24° 05' 17.65" N Longitude: 87° 35' 48.63" E to 87° 37' 34.15" E	Not in prohibited zone	No infrastructure availabl e.	Grant Order issued

Table 18 (e): List of in-situ Mineral proposed in the Reserve area under Gazzet notification 2002 NO-420- CI/O/MDTC-MISC/005/02/MM,08.11.2002

Sl. No	Name of miner als	Name of associa ted minera ls, if any	Host rock of miner alisati on	Area of miner alized zone	Depth of mineraliza tion	Whether virgin or partially excavated	Nature of land (whether free for mining/ forest/ agricultu re)	Mineral reserve (approx.) mention ing grade	Location for potential mineralized zones				Area within prohibite d zone as per Rule 3 of WBMM C Rules 2016	Infra struc ture avail able near the mine ralize d zone	Rema rks
									Admi nistr ative block	Mouz a	Plot no.	Co-ordinates			
06.	**Black Stone**	Opal & chalcedo ny	Dobrajp ur beds comprisi ng of gritty and ferrugin ous sand stone & shale	Entire lease area	Variable (often >80m from surface including intertrappea n rocks)	M o st ly V ir gi n	Mining is possible	143.208 Million Tonnes(Tentativ e) Good quality	Md. Baza r	Hatg acha (JL No-1)	All the plots available in the Mouza sheet in the Hatgacha (JL No-1)	Latitude: 24° 04' 40.64"N to 24° 07' 37.12"N Longitud e: 87° 34' 17.78"E to 87° 36' 49.40"E	Not in prohibite d zone	No infrastructur e available.	Grant Order issued
07.	**Black Stone**	Opal & chalcedo ny	Dobrajp ur beds comprisi ng of gritty and	Entire lease area	Variable (often >80m from surface including	Partially Excavted	Mining is possible	13.12 Million Tonnes(Tentativ e)	Md. Bazar	Chan da (JL No-2)	All the plots availablein the Mouza sheet in the	Latitude: 24° 02' 50.69"N to 24° 04'	Not in prohibite d zone	No infrastructur e available.	Grant Order issued
			ferrugin ous sand stone & shale		intertrappe an rocks)			Good quality			Chan da (JLNo-2)	50.20"N Longitud e: 87° 35' 16.51"E to 87° 37' 08.44"E			

08.	**Black Stone**	Opal & chalcedony	Dobrajpur beds comprising of gritty and ferruginous sand stone & shale	Entire lease area	Variable (often >80m from surface including intertrappean rocks)	Partially Excavted	Mining is possible	52.57 Million Tonnes(Tentative) Good quality	Md. Bazar	Pachami (JL No-3)	All the plots availablein theMouza sheetinthe Pachami (JLNo-3)	Latitude: 24° 04' 21.52"N to 24° 05' 17.65"N Longitude: 87° 35' 48.63"E to 87° 37' 34.15"E	Not in prohibited zone	No infrastructure available.	Grant Order issued
09.	**Black Stone**	Opal & chalcedony	Dobrajpur beds comprising of gritty and ferruginous sand stone & shale	Entire lease area	Variable (often >80m from surface including intertrappean rocks)	Mostly Virgin	Mining is possible	196.66 Million Tonne(Tentative) Good quality	Md. Bazar	Jethia (JL No-4)	All the plots availablein theMouza sheetinthe Jethia (JLNo-4)	Latitude: 24° 05' 01.16"N to 24° 06' 53.65"N Longitude: 87° 36' 18.41"E To 87° 38' 18.48"E	Not in prohibited zone	No infrastructure available.	Grant Order issued
10.	**Black Stone**	Opal & chalcedony	Dobrajpur beds comprising of gritty and ferruginous sand stone & shale	Entire lease area	Variable (often >80m from surface including intertrappean rocks)	Virgin	Mining is possible	Not estimated	Md. Bazar	Dholkata (JL No-25)	All the plots availablein theMouza sheetinthe Dholkata (JLNo-25)	Not Measured	Not in prohibited zone	No infrastructure available.	Grant Order issued
11.	**Fire Clay & Chin a Clay**	Late rite	Rajmahal Basalt	72.18 Acres	Variable (20-30m from surface)	Virgin	Free for mining	3.15 Million Tonnes(Tentative) Good quality	Md. Bazar	Mokdom nagar (JL No-3 Tentulberia (JL No-32)	254, 257-259, 266, 271-273, 275-286, 291-293, 334-340, 342-344, 383,384, 387,388, 390-393, 251(p),268, 287,288,379(p). 417	Latitude: 24° 01' 9.851"N to 24°01' 37.776"N Longitude: 87° 37'11.697"E to 87° 37' 40.098"E	Not in prohibited zone	infrastructure available.	Grant Orde no-46-CIO/MAJ- MIN/ 26/1 2/MINES date d- 20.01.20 17 For a Period oftwenty

List of In-situ Mineral proposed in the Reserve area under Gazatte notification 2002 NO-420-CI/O/MDTC-MISC/005/02/MM,08.11.2002

Name of minerals	Name of associated minerals, if any	Host rock of mineralisation	Area of mineralized zone	Depth of mineralization	Whether virgin or partially excavated	Nature of land (whether free for mining/ forest/ agriculture)	Mineral reserve (approx.) mentioning grade	Location for potential mineralized zones				Area within prohibited zone as per Rule 3 of WBMNC Rules 2016	Infrastructure available near the mineralized zone
								Administrative block	Mouza	Plot no.	Co-ordinates		
Black Stone(Metamorphosed besic igneous rock)	(vein quartz	Dobrajpur beds comprising of gritty and ferruginous sand stone & shale	50.755 Acres or 205485 sqm	30 m	Virgin	Mining is possible	Geological reserve = 69391.13 tonnes, Mineable reserve = 36834.678 tonnes * Sp. Gr. of Black Stone = 2.8 g/ cc	Md. Bazar	Hatgacha JL- 1	1761, 1776, 1791, 1792, 1797, 1798/5082, 1798/5185, 1799, 1800, 1800/5181, 1800/5182, 1800/5184, 1800/5195, 1800/5196, 1800/5197, 1800/5198, 1805-1809.	Latitude: 24° 06' 09"N to 24° 06' 28"N Longitude: 87° 36'03"E to 87° 36'38"E.	Mining Lease application in process (Under vide memo no- LTS/267/Department of IC & E,W.B. / 2020)	Available
Black Stone(Metamorphosed besic igneous rock)	vein quartz with anastomasing pattern	Dobrajpur beds comprising of gritty and ferruginous sand stone & shale	28.740 Acres or 116356 Sqm	30 m	Virgin	Mining is possible	Geological reserve = 34762.76 tonnes, Mineable reserve = 20857.656 tonnes * Sp. Gr. of Black Stone = 2.8 g/ cc	Md. Bazar	Hatgacha JL- 1	3808, 3842-3851, 3855, 4042, 4043.	Latitude: 24° 05' 16"N to 24° 04' 58"N Longitude: 87° 35'07"E to 87° 35'24"E	Mining Lease application in process (Under vide memo no- LTS/264/Department of IC & E,W.B. / 2020)	Available
Black Stone (Rajmahal Basalt)	vein quartz with anastomasing pattern	Dobrajpur beds comprising of gritty and ferruginous sand stone & shale	57.760 Acres or 233846 Sqm	30 m	Virgin	Mining is possible	Geological reserve = 74323.742 tonnes, Mineable reserve = 44594.245 tonnes * Sp. Gr. of Black Stone = 3.00 g/ cc	Md. Bazar	Jethia JL-4	2220, 2217/2929(P), 2279/3515(P)	Latitude: 24° 05' 11"N to 24° 05' 37"N Longitude: 87° 37'15"E to 87° 37'47"E	Mining Lease application in process (Under vide memo no- LTS/266/Department of IC & E,W.B. / 2020)	Available

ANNEXURE-III: LIST OF LESSEE OF IN-SITU MINERALS (OTHER THAN SAND)

SL NO.	NAME OF MINERAL	NAME OF LEASES	CO-ORDINATES	MOUZA & P.S.	AREA (in Ha)	GEOLOGICAL RESERVE	MINEABLE RESERVE	REMARKS
1	China clay & Fire clay	Netaipada Ghosh Patelnagar P.S. Md Bazar Dist. Birbhum	Lat: 23º59'6"N Long: 87º35'40" E 73 M/9	Komarpur & Saldaha, P.O. Patelnagar P.S. Md. Baazar, Dist. Birbhum R.S:Suri	46.76	91714 MT	82543 MT	Not Working
2	China clay & Fire clay	M/s Patelnagar Mineral Industries Pvt. Ltd. Patelnagar, P.S. Md. Baazar, Dist. Birbhum	Lat: 23º59'10"N Long: 87º35'50"E 73 M/9	Kharia, P.O. Patelnagar P.S. Md. Baazar Dist. Birbhum R.S.Suri	11.8	390182 MT	351164 MT	Not Working (20Years)
3	China clay & Fire clay	M/s Patelnagar Mineral Industries Pvt. Ltd. Patelnagar, P.S. Md. Baazar, Dist. Birbhum	Lat: 23º59'09"N Long: 87º35'49"E 73 M/9 & 73/5	Kharia, P.O. Patelnagar P.S. Md. Baazar Dist. Birbhum R.S.Suri	52.63	135996 MT	122396 MT	Working (20Years)
4	China clay & Fire clay	M/s Patelnagar Mineral Industries Pvt. Ltd. Patelnagar, P.S. Md. Baazar, Dist. Birbhum	Lat: 23º59'12" to 23°59'N Long: 87º35'38"E to 87°35'54" 73 M/9	Komarpur P.O. Patelnagar P.S. Md. Baazar Dist. Birbhum R.S.Suri	14.8	454709 MT	409238 MT	Working (20Years)
5	China clay & Fire clay	M/s Patelnagar Mineral Industries Pvt. Ltd. Patelnagar, P.S. Md. Baazar, Dist. Birbhum	Lat: 23°59'9"N Long: 87°35'49"E 73 M/9	Kharia, P.O. Patelnagar P.S. Md. BaazarDist. Birbhum R.S.Suri	13.07	502264 MT	452038 MT	Working (20Years)
6	China clay & Fire clay	MinatiGhosh, W/o Late DwijapadaGhoshDubrajpurRoad, P.O & P.S. Suri Dist. Birbhum	Lat: 24°7'N Long: 87°41'E 72 P/12	Masra P.O. Masra P.S. Rampurhat Dist : Birbhum R.S.Rampurhat	9.41	492033 MT	442830 MT	Working (20Years)

SL NO.	NAME OF MINERAL	NAME OF LEASES	CO-ORDINATES	MOUZA & P.S.	AREA (in Ha)	GEOLOGICAL RESERVE	MINEABLE RESERVE	REMARKS
7	China clay	G.D. Mishra, Md. Baazar Irrigation More, P.O & P.S. Md Bazaar, Dist. Birbhum,	Lat: 23°59'30"N Long:87°34'45"E 73 M/9	Komarpur P.O. Patelnagar P.S. Md. Baazar Dist. Birbhum R.S.Suri	4.98	28173 MT	25356 MT	Not Working (20Years)
8	China clay	Sharma Minerals, Prop- Nazir Hossain Mallick Vill & P.O.Bharkata, P.S. Md Bazaar, Dist. Birbhum. Ph. No: 03462260232	Lat: 23°55'59"N Long:87°35'11"E 73 M/9	Kharia, P.O. Patelnagar P.S. Md. Baazar Dist. Birbhum R.S. Suri	7.29	157867 MT	142080 MT	Not Working (20Years)
9	China clay	Sharma Minerals, Prop- N.P. Minerals, Patelnagar, P.S. Md Bazaar, Dist. Birbhum Mob. No: 9830895160	Lat: 23°59'12"N Long:87°35'53"E 73 M/9	Kharia, P.O. Patelnagar P.S. Md. Baazar Dist. Birbhum, R.S. Suri	7.23	601792 MT	541613 MT	Working (20Years)
10	China clay	Birbhum Kaoline & Industries Pvt. Ltd. Prop. Jayanta Kr. Sen Barrackpore, Dist. 24 Paraganas Ph. No.- 033-25422342	Lat: 24°11'16"N Long: 87°43'08"E 72 P/12 and P/16	Mondala & Bhatina P.O. Kalidanga, P.S. Rampurhat Dist. Birbhum R.S. Rampurhat	13.98	307044 MT	276340 MT	Working (20Years)
11	China clay & Fireclay	Rustam Momin Patelnagar, P.S. Md Bazaar, Dist. Birbhum	NA	Masra P.S. Rampurhat Dist. Birbhum R.S. Rampurhat	20.2	NA	NA	Not Working (20Years)
12	China clay & Fire clay	Sarkar Mineral, Prop : BishnuSarkar, Bazarpara P.O & P.S. Suri, Dist. Birbhum Mobile No. 9434007798	Lat: 23°47'26"N Long: 87°28'23"E 73 M/9 & 73/5	Chandispur P.O. Sahapur P.S. Dubrajpur Dist. Birbhum R.S.Dubrajpur	5.85	45571 MT	41014 MT	Working (20Years)

SL NO.	NAME OF MINERAL	NAME OF LEASES	CO-ORDINATES	MOUZA & P.S.	AREA (in Ha)	GEOLOGICAL RESERVE	MINEABLE RESERVE	REMARKS
13	China clay & Fire clay	M. Balia Minerals, Ghosh & Chowdhuri Brothers Bhirendranath Ghosh Vill & P.O. Seharakuri, P.S. Md. Bazar, Dist. Birbhum	Lat.-24°01'68"N Long-87°38'24"E 72 P/12	Mobalia, P.O.Ganpur, P.S.Md. Bazar Dist.Birbhum R.S. Suri	50.11	517078 MT	466290 MT	Working [Court Order No-14535 (w)] of 1986 (20Years)
14	Quartz & Feldspar	Joyanta Bhattacharjee, Vill &P.O. Puratangram, P.S. Md. Bazar Dist. Birbhum	Lat.- 23°59'03"N Long- 87°34'45"E 73 M/1	Dholkumra, P.S.Kankartala, Dist.Birbhum R.S. Panchra	1.94	56269 m^3	48619 m^3	Working (20Years)
15	China clay	Rupak Mazumder Prop. Swapan Kanti Ghosh Vill & P.O. Md. Bazar Dist. Birbhum	Lat.- 23°59'03"N Long- 87°34'45"E 73 M/9	Komarpur, P.O. & P.S. Kankartala, Dist. Birbhum R.S. Suri	22.37	1164916 MT	1048424 MT	Working by order WP No-25924 W of 2009 (50Years)
16	Fire clay	S.S. Enterprise Prop. Bholanath Chatterjee 78,K.N.S Road, Dakshin Para, Barasat, Dist. 24Pgs.	Lat.- 23°10'N Long- 87°45'E 72 P/12	Bhatina, P.O. Barpahari, P.S. Rampurhat, Dist. Birbhum R.S. Rampurhat	4.85	155230 MT	139707 MT	Not Working (20Years)
17	China clay	Burma Mines Vill. Mondala P.O. Ramkrishna P.S. Rampurhat Dist. Birbhum	Lat.- 23°7'N Long- 87°41'E 72 P/12	Mondala, P.S. Rampurhat, Dist. Birbhum R.S. Rampurhat	9.93	NA	NA	Not Working (20Years)
18	Black Stone	West Bengal Minerals Development & Trading Corporation Ltd. 13, Nellie Sengupta Sarani (Lindsay Street), 2nd Floor, Kol- 700087	Lat.- 24°6'16.93"N to 24°6'52.37"N Long- 87°36'13.84"E to 87°37'8.62"E 72 P/12	Hatgacha, Pachami & Chanda, P.S. Md. Bazar Dist. Birbhum, R.S. Suri	200.4 Later 71.20	25497240 MT	23266260 MT	Not Working (20Years)

SL NO.	NAME OF MINERAL	NAME OF LEASES	CO-ORDINATES	MOUZA & P.S.	AREA (in Ha)	GEOLOGICAL RESERVE	MINEABLE RESERVE	REMARKS
19	Black Stone	M/s Bharati Stone Product Prop. Smt. Sabina Begum, Lalkuthipara, P.O. & P.S. Suri, Dist. Birbhum	Lat.- 23°07'N Long- 87°45'E 72 P/12	Tarachua, P.S. Rampurhat, Dist. Birbhum, R.S. Rampurhat	3.925	295348 m^3	265813 m^3	Not Working (20Years)
20	Black Stone	M/s. Jayanti stone Querry, Partner. Kamal Khan, Vill. Talbandh P.O. N-Jagatpur, P.S. Md. Bazar, Dist. Birbhum	Lat.- 23°08'50"N Long- 87°35'40"E 72 P/12	Nischintapur & Dewangunj, P.S. Md. Bazar, Dist. Birbhum, R.S. Suri	2.316	656000 m^3	610000 m^3	Working (5 Years)
21	Black Stone	M/s. Md. Bazar Stone Crusher, Partner. Abdul Hannan, Vill. Patelnagar, P.O. Md. Bazar (T.S.), P.S. Md. Bazar, Dist. Birbhum	Lat.-23°3'/4'50"N Long- 87°35'/37'40"E 72 P/12	Komarpur, P.O. & P.S. Md. Bazar, Dist. Birbhum, R.S. Suri	3.64	483975 MT	456779.25 MT	Working (05 Years)
22	Black Stone	M/s Aryan stone Quarry, Partner. Sk. Tajommel, Vill. & P.O. & P.S. Suri, Dist. Birbhum	Lat.-23°44'N Long- 86°48'E 73 P/13	Tarachua, P.S. Rampurhat, Dist. Birbhum, R.S. Rampurhat	1.46	489375 m^3	455119 m^3	Working (05 Years)
23	Black Stone	M/s. Sree Durga Black Stone Industries, Partner. Atanu Roy, P.O. & P.S. Suri, Dist. Birbhum	Lat.-24°04'50"N Long-87°37'40"E 72 P/12	Nischintapur, P.S. Md. Bazar, Dist. Birbhum, R.S. Mollarpur	2.81	364694 MT	344228.85 MT	Working (05 Years)
24	Black Stone	M/s. Khan Stone Quarry, Prop. Musarof Hossain Khan, P.O. Md.Bazar (T.S.), P.S. Md.Bazar	Lat.- 24°3'/4'50"N,Long- 87°35'/37'40"E,72 P/12	Nischintapur, P.O. Harinsingha P.S. Md. Bazar, Dist. Birbhum,	3.95	516000 m^3	479880 m^3	Working (05 Years)

SL NO.	NAME OF MINERAL	NAME OF LEASES	CO-ORDINATES	MOUZA & P.S.	AREA (in Ha)	GEOLOGICAL RESERVE	MINEABLE RESERVE	REMARKS
		Dist. Birbhum		R.S. Mollarpur				
25	Black Stone	M/s. Kamal Stone Quarry, Prop.Kamal Khan, Vill. Talbandh, P.O. N-Jagatpur, P.S. Md.Bazar, Dist. Birbhum	Lat.- 24°4'17.00"N,Long- 87°36'02.52"E72 P/12	Dewangunj, P.S.Md. Bazar Dist. Birbhum R.S. Mollarpur	4.74	1123200 MT	1044576 MT	Working (05 Years)

ANNEXURE-IV: LIST OF EXISTING MINING LEASES (STONE QUARRY)

LIST OF EXISTING MINING LEASES OF THE DISTRICT WITH LOCATION, AREA. PERIOD FOR EACH MINOR MINERALS (STONE QUARRY)											
S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
1	M/S Jagabandhu Stone	Tapas Kr. Yadav&Ananda Yadav	Bhabanandapur/24, Area - 3.00 (In Acres)	Bhabanandapur	1217, 1218, 1306, 2085	24	Nalhati-I	Not available	Not available	Not available	Stopped
2	Shib Shankar Mondal	Shib Shankar Mondal	Bhabanandapur/24, Area - 3.00 (In Acres)/ 0.50	Bhabanandapur	1120, 1121	24	Nalhati-I	Not available	Not available	Not available	Stopped
3	Mondal Stone Mines	Chittaranjan Mondal	Bhabanandapur/24, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
4	Ma Durga Stone	UjjalKshirohan	Bhola/10, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
5	Partha Ghosh	Partha Ghosh	Bhola/10, Area -3.00 (In Acres)	Bhola	1211, 1222, 1223, 1224, 1251, 1252, 1251/1468, 1239	10	Nalhati-I	Not available	Not available	Not available	Stopped
6	Palohan Baba Stone Works	Jamal Sk. & others	Bhola/10, Area -3.00 (In Acres)/2.25	Bhola	796, 797	10	Nalhati-I	Not available	Not available	Not available	Stopped
7	Bablu Murmu	Bablu Murmu	Bhola/10, Area - 3.00 (In Acres)	Bhola	803, 804, 805	10	Nalhati-I	Not available	Not available	Not available	Stopped
8	Subir Kr. Shaw	Subir Kr. Shaw	Bhola/10, Area -3.00 (In Acres)	Bhola	558, 559	10	Nalhati-I	Not available	Not available	Not available	Stopped
9	Jahangir Alam	Jahangir Alam	Bhola/10, Area - 3.00 (In Acres)	Bhola	544	10	Nalhati-I	Not available	Not available	Not available	Stopped
10	BipulGhosh	BipulGhosh	Bhola/10, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
11	Ansar Sk. & Fazu Sk.	Ansar Sk. & Fazu Sk.	Bhola/10, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
12	John Hansda	John Hansda	Madna/11, Area - 3.00 (In Acres)/0.60	Madna	172(P), 152(P), 156(P),	11	Nalhati-I	Not available	Not available	Not available	Stopped

LIST OF EXISTING MINING LEASES OF THE DISTRICT WITH LOCATION, AREA. PERIOD FOR EACH MINOR MINERALS (STONE QUARRY)											
S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
					131(P), 150(P)						
13	Data Stone Works	DilipTudu&Tajel A…	Madna/11, Area - 3.00 (In Acres)	Madna	600(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
14	Joy Maa Kali Stone Mines	BipulGhosh	Madna/11, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
15	R.K. Stone Mines	Tapas Kr. Ghosh	Madna/11, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
16	SidhuKanhu Stone Works	KhairulAlam& Others	Madna/11, Area -3.00 (In Acres)/0.44	Madna	543, 546, 556, 558, 559, 560	11	Nalhati-I	Not available	Not available	Not available	Stopped
17	Subir Kr. GhoshHazra	Subir Kr. GhoshHazra	Madna/11, Area -3.00 (In Acres)/2.80	Madna	168	11	Nalhati-I	Not available	Not available	Not available	Stopped
18	Hayat Ali & Milan Sk.	Hayat Ali & Milan Sk.	Madna/11, Area -3.00 (In Acres)	Madna	597(P), 599(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
19	M/S Arati Stone Industries	Prabhat Kr. Ghosh	Madna/11, Area - 3.00 (In Acres)/0.75	Madna	1263(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
20	Samir Ghosh	Samir Ghosh	Madna/11, Area -3.00 (In Acres)	Madna	1329, 1330, 1263, 1265 to 1268, 1270, 1271	11	Nalhati-I	Not available	Not available	Not available	Stopped
21	Nalateswan Stone Mines	Swapan Kr. Das	Madna/11, Area - 3.00 (In Acres)	Madna	212, 214, 131(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
22	Sk. Julfikar& others	Sk. Julfikar& others	Madna/11, Area - 3.00 (In Acres)/0.52	Madna	227	11	Nalhati-I	Not available	Not available	Not available	Stopped
23	LalitBhattar	LalitBhattar	Madna/11, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
24	TaraknathGhosh	TaraknathGhosh	Madna/11, Area -3.00 (In Acres)/1.07	Madna	1291, 1302, 1303, 1315/1335, 1315/1338	11	Nalhati-I	Not available	Not available	Not available	Stopped
25	Sreeman Mardi & Maheswar Kshirohari	Sreeman Mardi &MaheswarKshirohari	Madna/11,Area - 3.00 (In Acres)/0.93	Madna	584(P), 586(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped

LIST OF EXISTING MINING LEASES OF THE DISTRICT WITH LOCATION, AREA. PERIOD FOR EACH MINOR MINERALS (STONE QUARRY)											
S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
26	Jiten Murmu& KajalS k.	JitenMurmu&Kajal Sk.	Madna/11,Area - 3.00 (In Acres)/0.63	Madna	577	11	Nalhati-I	Not available	Not available	Not available	Stopped
27	Md. Akhtaruzzaman	Md. Akhtaruzzaman	ladna/11,Area - 3.00 (In Acres)/2.38	Madna	712(P), 706(P), 709(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
28	Ananda Kisku & Sajed Ali	AnandaKisku&Sajed Ali	a/11,Area - 3.00 (In Acres)	Madna	377, 380, 381, 382	11	Nalhati-I	Not available	Not available	Not available	Stopped
29	SanjoyGhosh	SanjoyGhosh	Madna/11, Area -3.00 (In Acres)	Madna	131(P) to 138(P), 101, 103, 104, 91	11	Nalhati-I	Not available	Not available	Not available	Stopped
30	Paul Hembram	Paul Hembram	Madna/11, Area -3.00 (In Acres)	Madna	699(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
31	Johan Hasda	Johan Hasda	Madna/11, Area -3.00 (In Acres)	Madna	11, 720, 723 to 725	11	Nalhati-I	Not available	Not available	Not available	Stopped
32	Tashiruddin Sk. & Adari Saren	Tashiruddin Sk. & AdariSaren	Madna/11, Area -3.00 (In Acres)/1.61	Madna	741(P), 38(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
33	Krishna Industries	Suman Dey Roy	Madna/11, Area - 3.00 (In Acres)/2.93	Madna	595(P), 594(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
34	MasammelHaque	Masammel Haque	Madna/11, Area -3.00 (In Acres)	Madna	1069(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
35	Kalicharan Hembram	Kalicharan Hembram	Madna/11, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
36	Jatan Murmu	JatanMurmu	Madna/11, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
37	M/S Joy JagatBandhu Stone Product	Tapas Kr. Yadav&AnandaYadav	Madna/11, Area -3.00 (In Acres)	Madna	444(P), 458(P), 407(P), 408(P), 409(P), 411(P),	11	Nalhati-I	Not available	Not available	Not available	Stopped
38	SubirGhosh	SubirGhosh	Madna/11, Bhola/10,	Madna	1276(P), 1293(P), 1294(P)	11	Nalhati-I	Not available	Not	Not	Stopped

LIST OF EXISTING MINING LEASES OF THE DISTRICT WITH LOCATION, AREA. PERIOD FOR EACH MINOR MINERALS (STONE QUARRY)											
S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
			Bahadurpur/12 , Area - 3.00 (In Acres)	Bhola	819(P), 1215(P), 1216(P), 1225(P), 1227(P), 1234(P), 1242(P), 1235(P), 1244(P), 1230(P), 1232(P)	10			available	available	
				Bahadurpur	6(P) to 8(P), 10(P), 15(P), 19(P)	12					
39	Nandini Stone Mines	SantanuKshirohan	Madna/11, Bhola/10, Bahadurpur/12 , Area - 3.00 (In Acres)	NA	NA	NA	Nalhati-I	Not available	Not available	Not available	Stopped
40	Pradip Kr Kshirohari	Pradip Kr Kshirohari	Madna/11, Bahadurpur/12 , Area - 3.00 (In Acres)	Modna	1301, 1311, 1314	11	Nalhati-I	Not available	Not available	Not available	Stopped
		.		Bahadurpur	45(P), 59(P), 63(P)	12					
41	Rosen Mardi & Others	Rosen Mardi & Others	Pushore/07, Area -3.00 (In Acres)/1.00	Pushore	227, 228, 229, 194	7	Nalhati-I	Not available	Not available	Not available	Stopped
42	LaxiramSaren& Others	LaxiramSaren& Others	Pushore/07, Area -3.00 (In Acres)/1.05	Pushore	215(P), 251(P), 252(P), 253(P),	7	Nalhati-I	Not available	Not available	Not available	Stopped
43	SovanMurmu	SovanMurmu	Pushore/07, Area -3.00 (In Acres)/1.04	Pushore	215(P), 251(P), 252(P), 253(P),	7	Nalhati-I	Not available	Not available	Not available	Stopped
44	UmeshMurmu	UmeshMurmu	Pushore/07, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
45	M/S Rajgaon Stone Co. Pvt Ltd.	Asgar Ali	B. Gopalpur/01, Area - 3.00 (In Acres)	B.Gopalpur	4259	1	Murarai-I	Not available	Not available	Not available	Stopped
46	M/S Bahason Stone Works Pvt. Ltd. Unit – IV	Asgar Ali	B. Gopalpur/01, Area - 3.00 (In Acres)	B.Gopalpur	3702, 3717, 3720, 3850, 3851, 3854, 3856	1	Murarai-I	Not available	Not available	Not available	Stopped

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47	M/S Bahason Stone Works Pvt. Ltd. Unit – III	Asgar Ali	B. Gopalpur/01, Area - 3.00 (In Acres)	B.Gopalpur	3869, 3870, 3873 to 3875, 3877	1	Murarai-I	Not available	Not available	Not available	Stopped
48	M/S Shivam Stone Crusher Pvt Ltd.	Ranjit Kr. Shahi	B. Gopalpur/01, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
49	M/S Shivam Stone Works	Sanjit Kr. Shahi	B. Gopalpur/01, Area - 3.00 (In Acres)	B.Gopalpur	4058	1	Murarai-I	Not available	Not available	Not available	Stopped
50	M/S Shivam Stone Crusher Pvt Ltd.	Pinaki Kumar Singha	B. Gopalpur/01, Area - 3.00 (In Acres)	B.Gopalpur	4213 to 4215	1	Murarai-I	Not available	Not available	Not available	Stopped
51	M/S West Well Iron & Steel Pvt. Ltd.	Rajesh Kumar	B. Gopalpur/01, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
52	M/S S.B.D Enterprise	Rajesh Kumar Bhawnani	B. Gopalpur/01, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
53	M/S Bahason Stone Works Pvt. Ltd. Unit – II	Asgar Ali	B. Gopalpur/01, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
54	M/S Bahason Stone Works Pvt. Ltd. Unit – I	Asgar Ali	B. Gopalpur/01, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
55	M/S Rishu Enterprise Unit – I	Sirajul Islam Khan	B. Gopalpur/01, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
56	M/S Rishu Enterprise Unit –II	Sirajul Islam Khan	B. Gopalpur/01, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
57	M/S Alauddin Stone Works Unit -I	Samsuddin Sk.	B. Gopalpur/01, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
58..	M/S Idu Sk. &Rafiqul Islam	IduSk&Rafiqul Islam	B. Gopalpur/01, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Closed

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59	MdYead Ali	MdYead Ali	Pushore/07, Area -3.00 (In Acres)/1.02	Pushore	213(P)	7	Nalhati-I	Not available	Not available	Not available	Stopped
60	Md. Safi	Md. Safi	Sultanpur/01, Area -3.00 (In Acres)					Not available	Not available	Not available	Stopped
61	R.F. Stone Product	Rajesh Kr. Bhagat& Others	Khadamara/01 Area - 3.00 (In Acres)	Khadamara	278, 279, 280, 281, 283, 284, 285	1	Rampur hat-I	Not available	Not available	Not available	Stopped
62	M/S Jaherera Stone Mines	JatanMurmu& others	Madna/01, Area -3.00 (In Acres)	Madna	308(P)	11	Nalhati-I	Not available	Not available	Not available	Stopped
63	Joy Maa Kali Stone Works	SankhadharGhosh& Prabh atGhosh	Bhola/10, Bahadurpur/12, Area -3.00 (In Acres)	Bhola Bahadurpur	1,21,21,213	10 12	Nalhati-I	Not available	Not available	Not available	Stopped
64	New Joy Maa Kali Stone Mines.	BipulGhosh	Bahadurpur/12, Area - 3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
65	Saptarshi Stone Quarry	Nanda Dulal Banerjee	Jethia&Chakrapur/04 & 10, Area -7.50 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available e	Stopped
66	M/S Nobel Stone Quarry	hoorHossainMondal & Others	/04, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
67	M/S Black Rock Minning& Minerals Pvt	Swapan Kr. Bose	Jethia /04, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
68	M/S Rock Field Industries	SwapanKantiGhosh	Jethia /04, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
69	M/S Maa Tara Stone Quarry	SwapanKantiGhosh	Jethia /04, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
70	M/S Super Black Stone Mines	MousumiDutta& Others	Tarachua/36, Area - 1.91 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
71	M/s Lakhmani Stone Works	Rajesh Lakhmani& Others	Mondala/16, Area - 3.00 (In Acres)	Madala	265, 281	16	Rampur hat-I	Not available	Not available	Not available	Stopped
72	M/S Kaipataru Stone Industries	BipadTaranMondal	Hatgacha/01, Area -7.50 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped

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73	M/S Brahamabali Stone Product	Bulbul Chatterjee	Hatgacha/01, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
74	M/S Mama Bhagne Stone Crusher (Mines)	Azad Ali	Hatgacha/01, Area -7.50 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
75	Subhakhan Stone Mines	Mihir Kr Mondal& others	Tarachua/36, Area -3.00 (In Acres)	Tarachua	499, 500, 506, 509, 510, 511, 512	36	Rampur hat-I	Not available	Not available	Not available	Stopped
76	M/S Friendship Stone Quarry	SK. Mojaffar Ali & Others .	tgacha/01, Area -3.00 (In Acres)	NA	NA	NA	NA	Not available	Not available	Not available	Stopped
77	Annapurna Stone Quarry	SubrataMondal	Nischintapur/37, Area - 3.00 (In Acres)	Nischintapur	71 to 73	37	Md.Bazar	Not available	Not available	Not available	Stopped
78	BadanMarandi	BadanMarandi	Hatgacha/01, Area -3.00 (In Acres)					Not available	Not available	Not available	Stopped
98	M/S Saha Black stone Quarry (Black Stone)	Santi Kumar Saha	Hatgacha/01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	CLOSED
79	M/S Reliable stone Mines Unit I (Black stone)	Mr FirojAhamed	Hatgacha/ 01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
80	M/S Reliable stone mines Unit II (Black stone)	Mr FirojAhamed	Hatgacha/ 01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
81	M/S Dreamland stone Industries (Black stone)	TulshiRanjanPyne	3 Hatgacha/ 01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED

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82	M/S Progressive Industries (Black stone)	Mr BadarAla	Hatgacha/ 01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
83	M/S Naz stone Quarry (Black stone)	MdManiruddin	Hatgacha/ 01 Area:3.00(Acre)	NA NA	NA NA	NA NA	NA NA	Not available	Not available	Not available	STOPED
84	M/S ESSEN.R.CO (Black stone)	Pijushkantichandachaudhury	Hatgacha/ 01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
85	M/S Cell Minerals &Mines Infrastructure Pvt,Ltd (Black stone)	Director Dilipkumar Paul	Hatgacha/ 01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
86	M/S Saudagarh Mining corporation (Black stone)	SkSalauddin& others	Hatgacha/ 01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
87	M/S Stone product (Black stone)	Imran Khan	Hatgacha/01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
88	M/S Jethia stone Mines (Black stone)	MdJulfikar Ali Sk.& others	Jethia/04 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
89	M/S Pragati Mineral Industries (Black stone)	Nepal Murmu& others	Hatgacha/ 01 Area:3.00(Acre)	NA NA	NA NA	NA NA	NA NA	Not available	Not available	Not available	STOPED
90	M/S Haripur Black stone Mines (Black stone)	Karim Mollah& others	Jethia/04 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
91	M/S Bengal Mining Corporation (Black stone)	MdHaider Ali & others	Jethia/04 Area:3.00(Acre)	Jethia	458	4	Md.Bazar	Not available	Not available	Not available	STOPED

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S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
92	M/S East India Mining & Minerals Pvt. Ltd. (Black stone)	SamimAhamed	Jethia/04 Area:3.00(Acre)	Jethia	448(P)	4	Md.Bazar	Not available	Not available	Not available	STOPED
93	M/S Diamod stone Product (Black stone)	Wagnoor Hossain Mondal	Jethia/04 Area:3.00(Acre)	Jethia	448(P)	4	Md.Bazar	Not available	Not available	Not available	STOPED
94	M/S Rock Field Mining&MinaralsPvt.Ltd. (Black stone)	Kolayan Bose	Hatgacha/ 01 Area:3.00(Acre)	Hatgacha	2971, 2986	1	Md.Bazar	Not available	Not available	Not available	STOPED
95	M/S Galvin Enterprise (Black stone)	SK Halim , Rawtara	Hatgacha/ 01 Area:3.00(Acre)					Not available	Not available	Not available	STOPED
96	M/S Data stone Quarry (Black stone)	JoydevGarain	Hatgacha/ 01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
97	M/S East India stone Quarry (Black stone)	Imran Khan	Hatgacha/ 01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPED
98	M/S Saha Black stone Quarry (Black Stone)	Santi Kumar Saha	Hatgacha/01 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	closed
99	M/S MdYadrasul (Black Stone)	Md. Yadrasul	Hatgacha/01 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
100	M/S Bakreswar stone Quarry (Black Stone)	Imran Khan	Hatgacha/01 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
101	M/S Radhagobinda stone Quarry(Black Stone)	Swapankumar Das	Hatgacha/01 Area:3.00Acre)	NA NA	NA NA	NA NA	NA NA	Not available	Not available	Not Available	Closed
102	M/S Md. Bazar stone Crusher (Black Stone)	Abdul Homan	Jethia/04 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not Available	Closed

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S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
103	M/S Salauddin stone Quarry (Black Stone)	SK. Salauddin	Nishintapur/37 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not Available	Closed
104	M/S Raghunath stone Quarry (Black Stone)	Gurudas Sarkar	Nishintapur/37 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not Available	Closed
105	M/S Pollar stone Quarry (Black Stone)	Swapankanti Das	Nishintapur/37 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
106	M/S SreeDurga Black stone Industries(Black	Atanu Roy	Nishintapur/37 Area:3.00Acre)	Nischintapur	58, 59, 61, 68, 70, 86	37	Md.Bazar	Not available	Not available	Not available	Closed
107	M/S Khan stone Quarry (Black Stone)	Musaraf Hossain Khan	Nishintapur/37 Area:3.00Acre)	Nischintapur	11 to 15	37	Md.Bazar	Not available	Not available	Not available	Closed
108	M/S Birbhum Minerals Industries(Black Stone)	Musaraf Hossain Khan	Nishintapur/37 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
109	M/S Deucha Mineral Industries (Black Stone)	Nirmalkumar Pal	Nishintapur/37 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
110	M/S Dewanganj stone co. (Black Stone)	DilipkumarKhemkha	Dewanganj/36 Area:3.00Acre)	Dewanganj	54 to 59, 61	36	Md.Bazar	Not available	Not available	Not available	Closed
111	M/S Asif Ikbal (Black Stone)	Asif Ikbal	Dewanganj/36 (Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
112	M/S Mallick stone co. (Black Stone)	AlaminHaqueMallick	Dewanganj/36 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
113	M/S Rahi stone Quarry (Black Stone)	ManjurMurshed	Chanda/02 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
114	M/S Bharasha stone Quarry (Black Stone)	Md. GolamKibnaMallick	Chanda/02 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	closed

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115	M/S Dutta stone Quarry (Black Stone)	Sujoy Krishna Dutta	Chanda/02 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
116	M/S Pachami stone Quarry (Black Stone)	Najir Hossain Mallick	Chanda/02 &Pacham/03 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Closed
117	M/S Mollah& Co. (Black Stone)	SamsulAlamMollah	Pacham/03 Area:3.00Acre)	NA	NA	NA	NA	Not available	Not available	Not available	closed
136	Kalidas Chatterjee (Black stone)	Kalidas Chatterjee	Bhabanandapur/24 Area:3.00(Acre)/2.75	Bhabanand apur	3805(P), 1301(P) to 1303(P)	24	Nalhati-I	available	Not available	Not available	Stoped
137	Azizul Islam (Black stone)	Azizul Islam	Bhabanandapur/24 Area:3.00(Acre)/0.51	Bhabanand apur	1295, 1297(P)	24	Nalhati-I	Not available	Not available	Not available	Stoped
138	Mukherjee stone Crusher (Black stone)	Sumanta Mukherjee	Bhabanandapur/24 Area:3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	Stoped
139	Suriya Kr Dafadar (Black stone)	Suriya Kr Dafadar	Bhabanandapur/24 Area:3.00(Acre)/0.94	Bhabanand apur	1116, 1119, 1003	24	Nalhati-I	Not available	Not available	Not available	Stoped
140	Raja Industries (Black stone)	Samrat Chatterjee	Bhabanandapur/24 Area:3.00(Acre)	Bhabanand apur	1290, 1291, 1297	24	Nalhati-I	Not available	Not available	Not available	Stoped
141	Md. AnarulSk (Black stone).	MdAnarul Sk.	Bhabanandapur/24 Area:3.00(Acre)/0.41	Bhabanand apur	1297(P)	24	Nalhati-I	Not available	Not available	Not available	Stoped
142	M/S.MOJU SK (BLACK STONE)	MAJU SK.	MURARAI-I, B.GOPALPUR/01, Area: 3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	CLOSED
143	M/S.BARJAHAN SK (BLACK STONE)	BARJAHAN SK	MURARAI-I, B.GOPALPUR/01, Area;3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	CLOSED
144	M/S.ALAUDDIN STONE WORKS, UNIT-II(BLACK	SAMSUDDIN SK	MURARAI-I, BIRNAGAR/02, Area;3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	CLOSED

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	STONE)										
145	M/S.MEIEJA STONE WORKS (BLACK STONE)	SK. S/O.AINUR SK	MURARAI-I, BIRNAGAR/02, Area;3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	CLOSED
146	M/S.UNITED STONE WORKS COMPAMY (LEASE) (BLACK STONE)	MD.JAHANGIR	MURARAI-I, B.GOPALPUR/01, Area;3.00(Acre)	NA NA	NA NA	NA NA	NA NA	NA NA	Not available	Not available	STOPPED
147	M/S.P.M.STONE QUARRY (BLACK STONE)	OOR AMIN HAQUE MALLICK,	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA NA	NA NA	NA NA	NA NA	NA NA	Not available	Not available	STOPPED
148	M/S.MONDAL BLACK STONE (BLACK STONE)	GOUTAM MONDAL	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available	Not available	STOPPED
149	M/S. PANAULLAH STONE QUARRY (BLACK STONE)	MD.NAZIBUDDIN	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available	Not available	STOPPED
150	M/S.NATIONAL STONE QUARRY (BLACK STONE)	SK.SHAMIN AHAMED,	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available Not available	Not available Not available	STOPPED
151	M/S.TAJ STONE QUARRY (BLACK STONE)	ABDUR RAHAMAN	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available Not available	Not available Not available	STOPPED

LIST OF EXISTING MINING LEASES OF THE DISTRICT WITH LOCATION, AREA. PERIOD FOR EACH MINOR MINERALS (STONE QUARRY)											
S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
152	M/S.SHANTI STONE QUARRY (BLACK STONE)	RASANTA KUMAR MONDAL,	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available Not available	Not available Not available	STOPPED
153	M/S.J.D.STONE QUARRY (BLACK STONE)	SK.JAMALUDDIN	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available Not available	Not available Not available	CLOSED
154	M/S.NANDAKESWARI STONE QUARRY (BLACK STONE)	MD.GOLAM KIBRIA MALLICK	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available	Not available	STOPPED
155	M/S.HABRAPAHARI BLACK STONE QUARRY (BLACK STONE)	NEPAL CHANDRA BAURI,	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available	Not available	STOPPED
156	M/S. NETAJI BLACK STONE CO.OP SOCIETY LTD (BLACK STONE)	MADHUSUDAN KONAR	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available	Not available	STOPPED
157	M/S. EASTERN BLACK STONE UNION (BLACK STONE)	JITENDRA NATH GHOSH	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available	Not available	CLOSED
158	M/S.HATGACHA BLACK STONE QUARRY (BLACK STONE)	SUSOVAN GHOSH & OTHERS	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available	Not available	STOPPED

LIST OF EXISTING MINING LEASES OF THE DISTRICT WITH LOCATION, AREA. PERIOD FOR EACH MINOR MINERALS (STONE QUARRY)											
S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
159	M/S.BLACK DIAMOND STONE ENTERPRISES (BLACK STONE)	AST DAS, HATGACHA	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	NA	Not available	Not available	STOPPED
160	M/S.GHOSH & SAHA STONE DEV. CORPORATION (BLACK STONE)	SARAF HOSSAIN KHAN,	MD.BAZAR, HATGACHA/01 Area;3.00(Acre)	NA	NA	NA	NA	Not available	Not available	Not available	STOPPED
161	M/S.FRIENDSHIP STONE QUARRY (BLACK STONE)	DUL ALI AHAMED & OTHERS,	TARACHUA/36 Area : 3.00 (Acre)/0.82	Tarachua	36, 1800, 1811, 1812	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
162	M/S.MAA KALO PATHAR KHADAN (BLACK STONE)	LIPIKA CHKRABORTY,,	TARACHUA/36 Area : 3.00 (Acre)	Tarachua	508(P), 510(P), 508/4847, 1734(P)	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
163	M/S.MAA KALYANESWARI BLACK STONE PRODUCT (BLACK STONE)	PAN KR. MONDAL & OTHERS,	TARACHUA/36 Area : 3.00(Acre)/2.82	Tarachua	275, 276, 274, 346(P), 348(P)	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
164	M/S.VEDANTA STONE MINES (BLACK STONE)	PRADEEP AGARWAL & THERS, TARACHUA, RAMPURHAT,	TARACHUA/36 Area : 3.00 (Acre)	Tarachua	248(P), 191(P), 193, 195, 50, 21	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
165	M/S.BABA STONE WORKS (BLACK STONE)	BHASKAR MONDAL,	TARACHUA/36 Area : 3.00 (Acre)	Tarachua	1724, 1726 to 1731, 1736, 1737, 514, 515	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
166	M/S.STONE UNIT (BLACK STONE)	ANANDADULAL SAHA,	TARACHUA/36 Area : 3.00 (Acre)					Not available	Not available	Not available	STOPPED
167	M/S.LOKNATH BLACK STONE (BLACK STONE)	HENDU BANERJEE & OTHERS,	TARACHUA/36 Area : 3.00 (Acre)/2.58	Tarachua	3735/4860	36	Rampur hat-I	Not available	Not available	Not available	STOPPED

LIST OF EXISTING MINING LEASES OF THE DISTRICT WITH LOCATION, AREA. PERIOD FOR EACH MINOR MINERALS (STONE QUARRY)											
S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
168	M/S.MONDAL STONE PRODUCT (BLACK STONE)	DHIMONTA MONDAL,	TARACHUA/36 Area : 3.00 (Acre)	Tarachua	488, 489, 452, 453, 454	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
169	M/S.BHOLA BABA STONE MINES (BLACK STONE)	NJIT KR. MONDAL & OTHERS,	TARACHUA/36 Area : 3.00 (Acre)/0.75	Tarachua	1745	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
170	M/S.SALMA BLACK STONE (BLACK STONE)	SK.SHAHNEWAJ & OTHERS,	TARACHUA/36 Area : 3.00 (Acre)/2.00	Tarachua	3963(P)	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
171	M/S.NEW MAA KALYANESWARI STONE UNIT (BLACK STONE)	MILAN CHAKRABORTY & OTHERS,	TARACHUA/36 Area : 3.00(Acre)	Tarachua	1767, 1779, 1780, 1781	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
172	M/S.DADA BHAI STONE PRODUCT (BLACK STONE)	KRISHENDU BHATTACHARJEE,	TARACHUA/36 Area : 3.00 (Acre)	Tarachua	874 to 876, 878, 892, 868, 880, 893, 899(P)	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
173	M/S.SHIB SHAKTI STONE PRODUCT (BLACK STONE)	ARATTOM SAHA & OTHERS,	TARACHUA/36 Area : 3.00 (Acre)/2.96	Tarachua	3895 to 3897, 3900, 3901, 3904	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
174	M/S.JOY MATADI STONE MINES (BLACK STONE)	SHIB PUJAN BHAKAT,	TARACHUA/36 Area : 3.00(Acre)/1.78	Tarachua	3759	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
175	M/S Chawdhury stone co. (BLACK STONE)	NityanandaSaha& others	Tarachua/36 Area : 3.00(Acre)/2.75	Mandala	163, 178(P), 182(P), 184, 192, 193(P), 194, 196(P), 197, 198	16	Rampur hat-I	Not available	Not available	Not available	STOPPED
176	Chakraborty black stone Mines (BLACK STONE)	ShaktipadaChakraborty	TARACHUA/36 Area : 3.00 (Acre)	Tarachua	532/5032	36	Rampur hat-I	Not available	Not available	Not available	STOPPED

LIST OF EXISTING MINING LEASES OF THE DISTRICT WITH LOCATION, AREA. PERIOD FOR EACH MINOR MINERALS (STONE QUARRY)											
S.L. NO.	NAME OF MINERAL CO.	NAME OF THE LESSEE	LOCATION & AREA OF MINING LEASE	MOUZA NAME	PLOT NO	JL NO.	BLOCK	GEOLOGICAL RESERVE	MINABLE RESERVE	PERIOD OF LEASE	STATUS (WORKING/ CLOSED)
177	M/S. (Dankuni) Sekkadda stone Product (BLACK STONE)	KaziAinulHudda& others	TARACHUA/36 Area : 3.00 (Acre)/0.99	Tarachua	3898, 3899	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
178	Sher E nterprise (BLACK STONE)	Ramjan Ali 7 others	TARACHUA/36 Area : 3.00 (Acre)	Tarachua	3595, 3596, 5098	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
179	Sri SriAdya Shakti MahamayaRatanti Kali Black stone unit (BLACK STONE)	UjjalSalui& other	TARACHUA/36 Area : 3.00 (Acre)	Tarachua	1755, 1758 to 1760, 1763, 1765, 1766, 1768, 1770	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
180	United stone Mines (BLACK STONE)	Barun Roy & others	TARACHUA/36 Area : 3.00 (Acre)	Tarachua	3881(P), 3885(P), 3906 to 3909	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
181	M/S.Aryans stone Quarry (BLACK STONE)	Sk .Tojammel& others	TARACHUA/36 Area : 3.00(Acre)	Tarachua	3943 to 3946, 3939(P)	36	Rampur hat-I	Not available	Not available	Not available	STOPPED
182	M.D Matenals Handling services Pvt. Ltd. (BLACK STONE)	Partha DEY	TARACHUA/36 Area : 3.00 (Acre)/2.62	Tarachua	1685 to 1687, 1709, 1710	36	Rampur hat-I	Not available	Not available	Not available	STOPPED

NA: Not available

ANNEXURE-V: LIST OF EXISTING SAND BLOCK

Sl. No	Sand Block No.	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
								Latitude (North)	Longitude (East)		
1	2	Bir/Md.Bazar/Latapakur/002/2016	Mayurakshi	Md.Bazar	Latapakur	1.81	1010 (P)	23°59'1.4"	87°27'44.5"	21,900	14,286
2	3	Bir/Md.Bazar/Latapakur/003/2016	Mayurakshi	Md.Bazar	Latapakur	6.02	1010 (P)	23°58'59.6"	87°27'51.0"	72,900	54,495
3	4	Bir/Md.Bazar/Bamundihi/004/2016	Mayurakshi	Md.Bazar	Bamundihi	6.7	774 (P)	23°58'59.6"	87°28'5.0"	81,300	67,440
4	5	Bir/Md.Bazar/Bamundihi/005/2016	Mayurakshi	Md.Bazar	Bamundihi	6	774 (P)	23°58'58.6"	87°28'10.9"	72,900	57,600
5	6	Bir/Md.Bazar/Tangshuli/006/2016	Mayurakshi	Md.Bazar	Tangshuli	7.11	1924 (P)	23°58'50.4"	87°28'23.3"	86,100	67,500
6	8 (B)	Bir/Md.Bazar/Tangshuli/008/2016	Mayurakshi	Md.Bazar	Tangshuli	7.3	1924(P)	23°58'40.1"	87°28'35.5"	53,100	44,280
7	10 (A)	Bir/Md.Bazar/Nijuri/010A/2018	Mayurakshi	Md.Bazar	Nijuri	5.52	780(P)	(a) 23°58'30.569" (b) 23°58'27.193" (c) 23°58'22.819" (d) 23°58'24.43"	(a) 87°28'47.608" (b) 87°28'44.501" (c) 87°28'50.563" (d) 87°28'52.136"	40,212	31,860
8	10 (B)	Bir/Md.Bazar/Tangshuli/010B/2018	Mayurakshi	Md.Bazar	Tangshuli	3.78	1924(P)	(a) 23°58'38.26" (b) 23°58'36.613" (c) 23°58'31.787" (d) 23°58'34.036"	(a) 87°28'38.499" (b) 87°28'37.099" (c) 87°28'42.382" (d) 87°28'44.038"	27,535	20,520
9	11 (A)	Bir/Md.Bazar/Nijuri/011A/2018	Mayurakshi	Md.Bazar	Nijuri	10.22	780 (P)	(a) 23°58'21.149" (b) 23°58'9.924" (c) 23°58'11.234" (d) 23°58'15.77" (e) 23°58'23.16"	(a) 87°28'49.243" (b) 87°28'52.985" (c) 87°28'56.119" (d) 87°28'56.119" (e) 87°28'51.254"	74,340	62,100

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
10	12 (A)	Bir/Suri-I/Kenduli/12A/2018	Mayurakshi	Suri-I	Kenduli	6.5	1/2050 (P)	(a) 23°59'10.846" (b) 23°59'8.881" (c) 23°59'03.657" (d) 23°59'05.742"	(a) 87°27'5.341" (b) 87°27'4.095" (c) 87°27'16.124" (d) 87°27'17.155"	47,340	35,820
11	13	Bir/Md.Bazar/Nijuri/013/2016	Mayurakshi	Md.Bazar	Nijuri	6.82	780 (P)	$23^0$58'0.2"	$87^0$29'3.1"	82,800	63,600
12	14	Bir/Md.Bazar/Kalidaha-Khairapara/014/2016	Mayurakshi	Md.Bazar	Kalidaha Khairapara	8	793 (P)	$23^0$57'50.6"	$87^0$29'10"	97,200	76,500
13	15	Bir/Md.Bazar/Kalidaha-Khairapara/015/2016	Mayurakshi	Md.Bazar	Kalidaha Khairapara	6.84	793 (P)	$23^0$57'47.2"	$87^0$29'10.5"	83,100	65,346
14	16	Bir/Md.Bazar/Kalidaha-Khairapara/016/2016	Mayurakshi	Md.Bazar	Kalidaha Khairapara	3.13	793 (P)	$23^0$57'45.6"	$87^0$29'6.3"	38,100	26,700
15	17	Bir/Md.Bazar/Kalidaha/017/2016	Mayurakshi	Md.Bazar	Kalidaha	4.2	292 (P)	$23^0$57'45.7"	$87^0$29'15.6"	50,700	37,167
16	18	Bir/Md.Bazar/Kalidaha/018/2016	Mayurakshi	Md.Bazar	Kalidaha	7.77	292 (P)	$23^0$57'43.8"	$87^0$29'12.8"	94,200	71,526
17	19	Bir/Md.Bazar/Kalidaha/019/2016	Mayurakshi	Md.Bazar	Kalidaha	10.91	292 (P)	$23^0$57'40.3"	$87^0$29'14.9"	1,32,600	1,03,200
18	20	Bir/Md.Bazar/Kaniyara/020/2016	Mayurakshi	Md.Bazar	Kaniyara	11.4	001 (P)	$23^0$57'25"	$87^0$33'25.6"	1,38,300	1,20,000
19	21	Bir/Md.Bazar/Doborda/021/2016	Mayurakshi	Md.Bazar	Doborda	9.7	001 (P)	$23^0$57'21.4"	$87^0$33'35.1"	**NA**	1,17,900
20	22	Bir/Md.Bazar/Chatarma/022/2016	Mayurakshi	Md.Bazar	Chatarma	9.91	206 (P)	$23^0$57'13.6"	$87^0$33'50.9"	1,20,300	97,500

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
21	23	Bir/Md.Bazar/Doborda/023/2016	Mayurakshi	Md.Bazar	Doborda	4.03	673 (P)	23°56'45.3"	87°33'33.6"	48,900	33,600
22	24	Bir/Md.Bazar/NadighasBera/024/2016	Mayurakshi	Md.Bazar	Nadighasbera	10.86	001 (P)	23°57'12"	87°34'24.9"	1,31,700	1,08,600
23	25	Bir/Md.Bazar/NadighasBera/025/2016	Mayurakshi	Md.Bazar	Nadighasbera	9.29	001 (P)	23°57'15.6"	87°34'40.6"	1,12,800	86,700
24	26	Bir/Md.Bazar/NadighasBera/026/2016	Mayurakshi	Md.Bazar	Nadighasbera	11.96	001 (P)	23°57'21.1"	87°34'53.1"	1,45,200	1,22,700
25	27	Bir/Md.Bazar/NadighasBera/027/2016	Mayurakshi	Md.Bazar	Nadighasbera	8.28	001 (P)	23°57'27.1"	87°35'3.2"	1,00,500	80,100
26	28	Bir/Md.Bazar/Simuliya/028/2016	Mayurakshi	Md.Bazar	Simuliya	11.83	442 (P), 443 (P)	23°56'45.7"	87°34'41"	1,43,700	1,24,044
27	31	Bir/Sainthia/Ghasbera/031/2016	Mayurakshi	Sainthia	Ghasbera	10.34	203 (P), 207 (P), 206 (P)	23°56'38.2"	87°36'5.8"	1,25,100	99,108
28	32	Bir/Md.Bazar/NadighasBera/032/2016	Mayurakshi	Md.Bazar	Nadighasbera	7.87	004 (P)	23°57'25"	87°36'19.8"	95,400	75,600
29	33	Bir/Sainthia/Baidyapur/033/2016	Mayurakshi	Sainthia	Bidyapur	9.31	74 (P), 75 (P)	23°56'47.3"	87°37'27.6"	1,12,800	85,500
30	34	Bir/Sainthia/Baidyapur/034/2016	Mayurakshi	Sainthia	Bidyapur	6.54	74 (P), 75 (P)	23°56'42.2"	87°37'36.4"	79,200	63,000
31	35	Bir/Sainthia/Kultore/035/2016	Mayurakshi	Sainthia	Kultore	6.17	1141 (P), 1114 (P)	23°56'28.3"	87°38'2.2"	74,700	58,500

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
32	36	Bir/Sainthia/Kultore/036/2016	Mayurakshi	Sainthia	Kultore	8.99	1141 (P), 1114 (P)	23°56'24.3"	87°38'3.8"	1,09,200	90,300
33	37	Bir/Sainthia/Kultore/037/2016	Mayurakshi	Sainthia	Kultore	3.79	1141 (P)	23°56'30.6"	87°38'10.3"	45,900	33,000
34	39	Bir/Sainthia/Raihat/039/2016	Mayurakshi	Sainthia	Raihat	10.46	350 (P), 363 (P)	23°56'35.4"	87°38'20.2"	1,26,900	1,05,600
35	41	Bir/Sainthia/Raihat/041/2016	Mayurakshi	Sainthia	Raihat	11.44	363 (P), 404 (P)	23°56'40.8"	87°38'30.5"	1,38,900	1,17,600
36	42	Bir/Sainthia/Raihat/042/2016	Mayurakshi	Sainthia	Raihat	11.47	363 (P), 403 (P), 350 (P), 348 (P)	23°56'36.5"	87°38'32.5"	**NA**	27,843
37	45	Bir/Sainthia/Raihat/045/2016	Mayurakshi	Sainthia	Raihat	12.04	403 (P), 349 (P)	23°56'54.8"	87°38'51.6"	1,46,100	1,23,900
38	46	Bir/Sainthia/Raihat/046/2016	Mayurakshi	Sainthia	Raihat	11.65	348 (P), 349 (P)	23°56'52.2"	87°38'54.5"	1,41,300	1,17,000
39	48	Bir/Sainthia/Laliapur/048/2016	Mayurakshi	Sainthia	Laliapur	9.29	573 (P), 576 (P)	23°57'18.9"	87°39'41"	1,12,800	94,500
40	49	Bir/Sainthia/Amua/049/2016	Mayurakshi	Sainthia	Amua	9.93	1701 (P)	23°57'18.2"	87°40'36.5"	72,180	32,760
41	53	Bir/Sainthia/Bolsunda/053/2016	Mayurakshi	Sainthia	Bolsunda	9.37	001 (P)	23°56'59"	87°42'22.6"	1,13,700	96,300
42	56	Bir/Sainthia/Bolsunda/056/2016	Mayurakshi	Sainthia	Bolsunda	10.66	1893 (P)	23°57'4.7"	87°42'45.7"	1,29,300	1,11,000

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
43	58	Bir/Sainthia/Bolsunda/058/2016	Mayurakshi	Sainthia	Bolsunda	11.27	1892 (P)	23°57'2.5"	87°43'2.1"	1,36,800	1,17,600
44	59	Bir/Sainthia/Bolsunda/059/2016	Mayurakshi	Sainthia	Bolsunda	8.13	1892 (P)	23°57'1.7"	87°43'9.5"	98,700	82,200
45	60	Bir/Sainthia/Uttar Bamnigram/060/2016	Mayurakshi	Sainthia	Uttar Bamnigram	10.38	2689 (P)	23°56'44.8"	87°43'17"	1,26,000	1,05,600
46	61	Bir/Sainthia/Uttar Bamnigram/061/2016	Mayurakshi	Sainthia	Uttar Bamnigram	7.99	2689 (P)	23°56'44"	87°43'24.6"	58,140	35,280
47	62	Bir/Sainthia/Uttar Bamnigram/062/2016	Mayurakshi	Sainthia	Uttar Bamnigram	11.52	2690 (P)	23°56'44.4"	87°43'32"	83,880	51,120
48	63	Bir/Sainthia/Uttar Bamnigram/063/2016	Mayurakshi	Sainthia	Uttar Bamnigram	9.92	2690 (P), 2688 (P)	23°56'43.9"	87°43'39.6"	1,20,300	29,340
49	64	Bir/Sainthia/Kulna/064/2016	Mayurakshi	Sainthia	Kulna	8.83	1068 (P)	23°55'30.3"	87°44'57.9"	1,07,100	81,600
50	65	Bir/Sainthia/Khorad/065/2016	Mayurakshi	Sainthia	Khorad	6.38	817 (P), 816 (P)	23°54'28.5"	87°45'38.4"	77,400	60,300
51	66 (C)	Bir/Illambazar/Khudrapur/066/2016	Ajay	Illambazar	Khudrapur	6.52	2364(P)	23°36'43.72"	87°27'41.06"	52,800	42,400
52	68 (B)	Bir/Illambazar/Khudrapur/068/2016	Ajay	Illambazar	Khudrapur	7.46	2364(P)	23°36'46.29"	87°28'1.85"	54,360	43,380
53	70	Bir/Illambazar/Khudrapur/070/2016	Ajay	Illambazar	Khudrapur	5.13	2364 (P)	23°36'49.54"	87°28'19.62"	62,100	48,000

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
54	71 (A)	Bir/Illambazar/Etapur/071/16	Ajay	Illambazar	Etapur	2.74	1353(P) 1342(P)	23°36'5.15"	87°34'9.19"	20,700	12,420
55	72	Bir/Illambazar/Etapur/072/2016	Ajay	Illambazar	Etapur	5.42	1353 (P), 1342 (P)	23°36'0.12"	87°34'16.62"	65,700	51,300
56	73 (A)	Bir/Illambazar/Etapur/073/16	Ajay	Illambazar	Etapur	4.93	1353(P) 1342(P)	23°35'55.77"	87°34'23.31"	65,700	51,300
57	74 (A)	Bir/Illambazar/Etapur/074/16	Ajay	Illambazar	Etapur	3.64	1353(P) 1342(P)	23°35'52.6"	87°34'28.94"	27,000	19,800
58	75	Bir/Illambazar/Ushahar/075/2016	Ajay	Illambazar	Ushahar	5.47	949 (P), 950 (P)	23°35'46.32"	87°35'0.47"	**NA**	13,280
59	76	Bir/Illambazar/Ushahar/076/2016	Ajay	Illambazar	Ushahar	6.91	949 (P), 950 (P)	23°35'46.49"	87°35'9.02"	84,000	68,100
60	79 (C)	Bir/Illambazar/Tikarbeta/079/16	Ajay	Illambazar	Tikarbeta	7.33	2406(P)	23°38'24.9"	87°25'28.5"	53,460	44,460
61	80	Bir/Illambazar/Tikarbeta/080/2016	Ajay	Illambazar	Tibarbeta	7.49	2406 (P)	23°38'24.09"	87°25'28.05"	90,900	75,000
62	82	Bir/Illambazar/Tikarbeta/082/2016	Ajay	Illambazar	Tibarbeta	4.03	2340 (P)	23°38'54.6"	87°24'59.5"	48,900	37,038
63	86	Bir/Mayureswar-II/Bara Akulpur/086/2016	Mayurakshi	Mayureswar-II	Bara Akulpur	2.53	1035 (P)	23°57'16.88"	87°41'41.49"	30,600	21,900
64	87	Bir/Mayureswar-II/Bara Akulpur/087/2016	Mayurakshi	Mayureswar-II	Bara Akulpur	5.26	1035 (P)	23°57'11.30"	87°42'5.368"	63,900	49,800

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
65	89 (B)	Bir/Mayureswar-II/Akulpur/089/2016	Mayurakshi	Mayureswar-II	Akulpur	8.9	1811 (P) 1791 (P)	23°57'8.106"	87°42'18.073"	64,980	42,840
66	92	Bir/Mayureswar-II/Hatinagar/092/2016	Mayurakshi	Mayureswar-II	Hatinagar	8.98	624 (P)	23°56'38.82"	87°44'16.685"	1,08,000	91,200
67	117	Bir/Mayureswar-II/Napara/117/2016	Mayurakshi	Mayureswar-II	Napara	4.2	804 (P) 792 (P)	23°53'39.16"	87°46'27.63"	51,000	40,800
68	123	Bir/Mayureswar-II/Malancha/123/2016	Mayurakshi	Mayureswar-II	Malancha	3.58	644 (P)	23°52'31.19"	87°51'6.418"	43,500	28,500
69	124	Bir/Mayureswar-II/Ramnagar/124/2016	Mayurakshi	Mayureswar-II	Ramnagar	2.74	814 (P)	23°52'25.10"	87°51'42.413"	33,300	15,000
70	125	Bir/Suri-I/Raipur/125/2016	Mayurakshi	Suri-I	Raipur	6.55	001 (P) 1202 (P)	23°59'1.40"	87°27'35.5"	79,500	63,300
71	126	Bir/Suri-I/Raipur/126/2016	Mayurakshi	Suri-I	Raipur	9.93	001 (P) 1202 (P)	23°58'57.6"	87°27'45.6"	**NA**	93,900
72	127	Bir/Suri-I/Raipur/127/2016	Mayurakshi	Suri-I	Raipur	9.14	1202 (P)	23°58'56.4"	87°27'52.8"	1,11,000	91,800
73	128	Bir/Suri-I/Khatangadihi/128/2016	Mayurakshi	Suri-I	Khatangadihi	12.13	001 (P)	23°58'18.0"	87°28'44.9"	88,380	76,320
74	129 (A)	Bir/Suri-I/Khatangadihi/129/2016	Mayurakshi	Suri-I	Khatangadihi	11.64	001 (P)	23°58'10.9"	87°28'50.5"	1,01,199	67,466
75	130	Bir/Suri-I/Ajaypur/130/2016	Mayurakshi	Suri-I	Ajaypur	3.98	992/1203(P)	23°56'42.7"	87°33'21.2"	48,300	34,200
76	132 (B)	Bir/Dubrajpur/Debipur/132/2016	Ajay	Dubrajpur	Debipur	8.15	559(P), 561(P), 576(P)	23°42'50.4"	87°21'52.7"	59,940	48,960

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
77	133	Bir/Dubrajpur/Palasdanga/133/2016	Ajay	Dubrajpur	Palashdanga	9.51	2917 (P)	23°42'16.9"	87°22'16.6"	1,15,500	96,000
78	134 (C)	Bir/Dubrajpur/Palashdanga/134/2016	Ajay	Dubrajpur	Palashdanga	11.35	2917 (P)	23°42'10.6"	87°22'25.5"	91,800	79,000
79	135 (C)	Bir/Dubrajpur/Palashdanga/135/2016	Ajay	Dubrajpur	Palashdanga	2.97	2874 (P), 2873 (P), 2904 (P)	23°42'1.8"	87°22'54.1"	53,460	44,640
80	136 (B)	Bir/Dubrajpur/Loba/136/2016	Ajay	Dubrajpur	Loba	6.85	2484 (P), 2475 (P), 2476 (P)	23°42'1.0"	87°23'0.9"	49,860	41,220
81	137 (B)	Bir/Dubrajpur/Loba/137/2016	Ajay	Dubrajpur	Loba	5.78	2484 (P), 2475 (P)	23°42'0.7"	87°23'10.2"	42,120	34,200
82	138 (B)	Bir/Dubrajpur/Loba/138/2016	Ajay	Dubrajpur	Loba	7.86	2484 (P), 2475 (P), 2471 (P)	23°42'1.0"	87°23'16.8"	57,240	48,060
83	139 (A)	Bir/Dubrajpur/Loba/139/2016	Ajay	Dubrajpur	Loba	3.29	2484 (P), 2471 (P)	23°42'2.8"	87°23'22.8"	29,400	17,640
84	142 (C)	Bir/Dubrajpur/Loba/142/2016	Ajay	Dubrajpur	Loba	8.31	2474(P), 2581(P), 2485(P), 2480(P) 2473(P)	23°42'2.4"	87°23'36.1"	60,480	50,400
85	143 (B)	Bir/Dubrajpur/Kota/143/2016	Ajay	Dubrajpur	Kota	8.84	3322 (P)	23°41'44.5"	87°24'33.8"	64,440	54,720
86	144 (A)	Bir/Dubrajpur/Kota/144/2016	Ajay	Dubrajpur	Kota	7.44	3322 (P)	23°41'40.7"	87°24'38.9"	54,180	45,180
87	149 (C)	Bir/Khairasole/Sira/149/2016	Ajay	Khairasole	Sira	8.18	2779 (P)	23°45'03.82"	87°11'40.99"	99,300	49,320

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
88	152 (A)	Bir/Khairasole/Chapla/152/2016	Ajay	Khairasole	Chapla	7.16	790 (P), 387 (P), 384 (P)	23°43'12.25"	87°20'09.03"	52,200	41,400
89	156 (A)	Bir/Khairasole/Ratanpur/156/2016	Ajay	Khairasole	Ratanpur	5.64	564 (P)	23°43'41.21"	87°17'20.01"	41,040	32,940
90	158 (A)	Bir/Khairasole/Nalgara/158/2016	Ajay	Khairasole	Nalgara	7.65	2003 (P)	23°45'02.05"	87°12'17.91"	92,700	74,160
91	159 (A)	Bir/Khairasole/Nalgara/159/2016	Ajay	Khairasole	Nalgara	5.78	2002 (P)	23°45'03.02"	87°12'05.99"	42,120	32,220
92	165	Bir/Bolpur/Purushottampur/165/2016	Ajay	Bolpur	Purushottampur	4.14	2301 (P) 2310 (P)	23°36'19.03"	87°39'1.17"	50,400	37,200
93	171	Bir/Bolpur/Udaipur/171/2016	Ajay	Bolpur	Udaipur	5.3	139 (P)	23°37'12.24"	87°40'19.77"	64,200	45,600
94	172	Bir/Bolpur/Udaipur/172/2016	Ajay	Bolpur	Udaipur	6.7	139 (P)	23°37'11.79"	87°40'34.89"	81,300	61,800
95	175 (B)	Bolpur/Rasulpur/175/2016	Ajay	Bolpur	Rasulpur	2	2008 (P)	23°35'57.07"	87°43'40.82"	18,400	13,000
96	176	Bir/Bolpur/Haripur/176/2016	Ajay	Bolpur	Haripur	2.75	923 (P) 818 (P) 989 (P)	23°35'20.45"	87°44'12.22"	33,300	22,500
97	179	Bir/Bolpur/Mahadebpur/179/2016	Ajay	Bolpur	Mahadebpur	3.05	531 (P)	23°35'5.50"	87°46'46.62"	36,900	25,500
98	180 (B)	Bir/Bolpur/Mahadebpur/180/2016	Ajay	Bolpur	Mahadebpur	3.68	531 (P)	23°35'2.24"	87°46'53.79"	**NA**	21,200
99	184	Bir/Labpur/Beley/184/2016	Mayurakshi	Labpur	Beley	2.06	731 (P)	23°53'21.4"	87°46'48.0"	14,940	6,120

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
100	187 (B)	Bir/Rampurhat-I/Narayanpur/187/2016	Brahmani	Rampurhat-I	Narayanpur	5.22	1675(P)	24°14'54.37"	87°40'38.62"	37,980	20,160
101	192	Bir/Nanoor/Bamunia/192/2016	Ajay	Nanoor	Baminia	5.43	1399 (P)	23°33'54.64"	87°50'31.07"	**NA**	13,181
102	200 (B)	Bir/Nanoor/Sundarpur/200/2016	Ajay	Nanoor	Sundarpur	1.67	001(P)	23°33'2.23"	87°50'49.66"	13,600	7,600
103	201 (A)	Bir/Nanoor/Kurgram/201/2016	Ajay	Nanoor	Kurgram	4.43	1129(P) 1130(P)	23°32'59.52"	87°51'31.60"	32,220	22,320
104	203 (A)	Bir/Nanoor/Husenpur/203/2016	Ajay	Nanoor	Husenpur	5.89	2057(P), 1697(P)	23°34'16.4"	87°55'27.09"	57,000	34,200
105	205	Bir/Nanoor/Hussenpur/205/2016	Ajay	Nanoor	Hussenpur	6.19	1702 (P), 1813 (P), 2062 (P)	23°34'30.59"	87°55'49.03"	75,300	55,890
106	207	Bir/Nanoor/Hussenpur/207/2016	Ajay	Nanoor	Hussenpur	6.76	2053 (P)	23°35'26.96"	87°55'59.85"	82,200	65,760
107	209	Bir/Nanoor/Gangnara/209/2016	Ajay	Nanoor	Gangnara	8.9	729(P), 432(P), 429(P), 428(P), 50(P), 781(P), 787(P), 785(P), 433(P), 430(P), 740(P)	23°36'41.59"	87°57'0.30"	64,800	50,040
108	210	Bir/Nanoor/Gomra/210/2016	Ajay	Nanoor	Gomra	4.56	1697(P), 1766(P), 1767(P) & 1768(P)	23°37'0.42"	87°57'2.17"	55,500	39,600

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
109	212	Bir/Nanoor/Gomga/212/2016	Ajay	Nanoor	Gomra	6.06	872 (P0, 875 (P), 819 (P0, 873 (P), 876 (P), 820 (P), 822 (P), 877 (P0, 874 (P)	23°37'33.49"	87°57'13.72"	36,900	29,520
110	217	Bir/Mayureswar-I/Sekhpur/217/2016	Dwarka	Mayureswar-I	Sekhpur	5.8	5850	24°01'39.73"	87°42'13.84"	38,400	23,040
111	218	Bir/Mayureswar-I/Ratgara/218/2016	Dwarka	Mayureswar-I	Ratgara	4	1207 (P)	24°00'49.53"	87°40'46.627"	48,600	33,600
112	219	Bir/Mayureswar-I/Ratgara/219/2016	Dwarka	Mayureswar-I	Ratgara	2.5	1207 (P)	24°00'36.73"	87°40'24.669"	30,300	16,671
113	220	Bir/Mayureswar-I/Ratgara/220/2016	Dwarka	Mayureswar-I	Ratgara	2.7	1207 (P)	24°00'39.25"	87°40'14.38"	32,700	19,800
114	222	Bir/Mayureswar-I/Bajitpur/222/2016	Mayurakshi	Mayureswar-I	Bajitpur	6.1	721 (P), 722 (P), 725 (P)	24°00'45.49"	87°39'48.541"	74,100	59,400
115	228	Bir/Suri-II/Behira/228/2016	Bakreswar	Suri-II	Behira	1.94	1488 (P)	23°49'39.6"	87°36'28.1"	23,700	9,300
116	232 (C)	Bir/Nalhati-I/Madhabpur/232/2016	Brahmani	Nalhati-I	Madhabpur	3.41	1135 (P)	24°14'45.4"	87°41'19.8"	**NA**	8,278
117	233	Bir/Nalhati-I/Madhabpur/233/2016	Brahmani	Nalhati-I	Madhabpur	8.66	578 (P)	24°15'2.7"	87°41'59.6"	63,000	46,440
118	235	Bir/Murarai-II/Aralbasti/235/2016	Bansloi	Murarai-II	Arlabasti	5.12	001 (P)	24°30.'17.5"	87°53'12.3"	**NA**	42,860

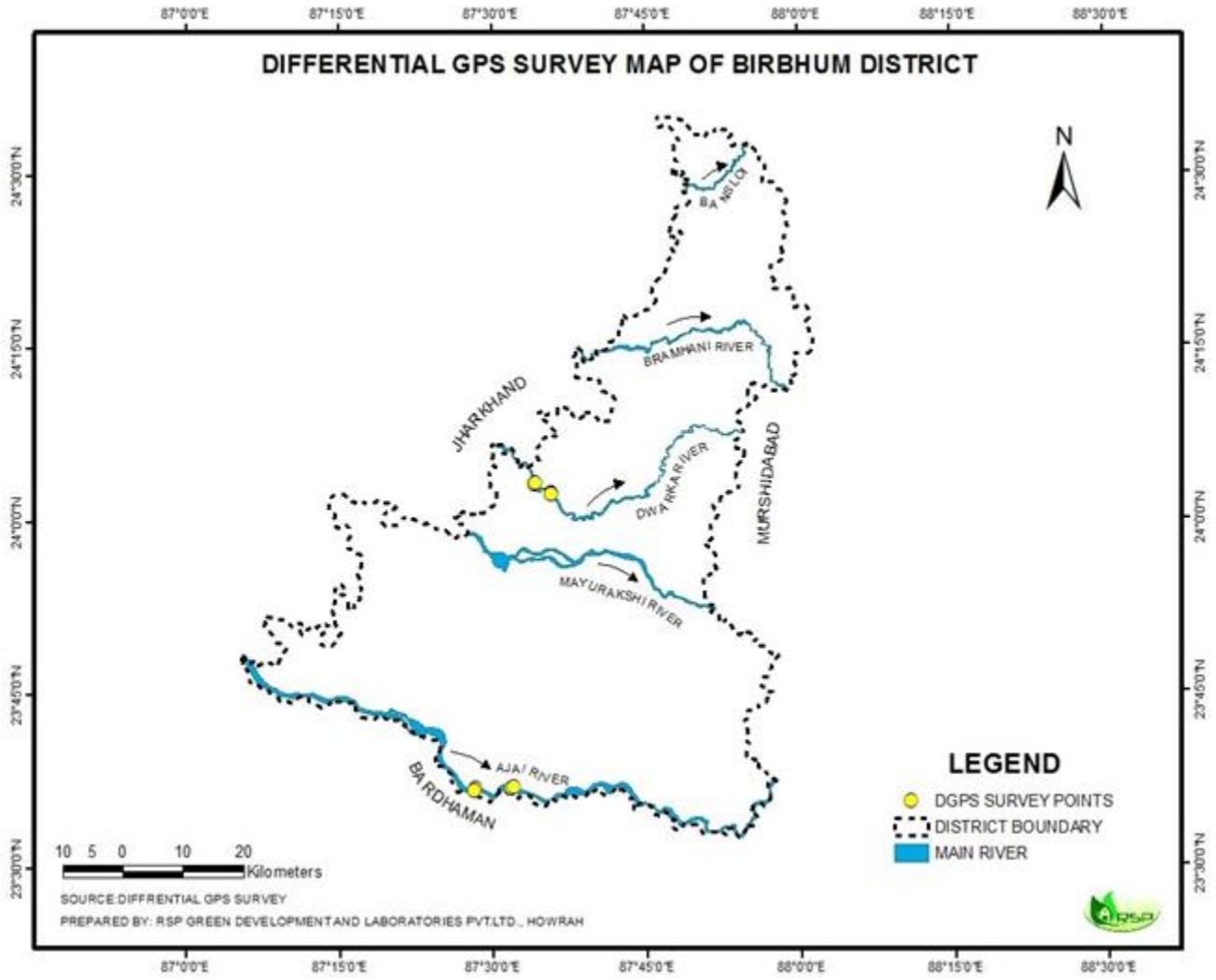
Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
119	240 (B)	Bir/Md.Bazar/Mallickpur/240/2016	Dwarka	Md.Bazar	Mallickpur	1.67	305(P) 306(P)	24°00'20.2"	87°38'39.5"	12,240	7,380
120	244 (B)	Bir/Illambazar/Gangapur/244/2016	Ajay	Illambazar	Gangapur	5.12	1584 (P), 1578 (P), 1577 (P)	23°37'7.342"	87°31'5.776"	37,260	28,800
121	245 (B)	Bir/Illambazar/Khayerbuni/245/2016	Ajay	Illambazar	Khayerbuni	3.77	1274 (P)	23°36'39.969"	87°32'11.633"	27,540	21,060
122	250 (D)	Bir/Suri-I/Bhandirban/250/2016	Mayurakshi	Suri-I	Bhandirban	4.55	279 (P)	23°58'52.045"	87°28'3.938"	33,120	26,100
123	251	Bir/Suri-I/Bhandirban/251/2016	Mayurakshi	Suri-I	Bhandirban	6.95	279 (P), 290 (P)	23°58'48.653"	87°28'9.489"	**NA**	41,580
124	254 (D)	Bir/Suri-I/Bhandirban/254/2016	Mayurakshi	Suri-I	Bhandirban	5.51	279 (P), 254 (P)	23°58'39.247"	87°28'25.885"	40,140	32,040
125	255	Bir/Suri-I/Bhandirban/255/2016	Mayurakshi	Suri-I	Bhandirban	5.64	279 (P), 254 (P)	23°58'36.061"	87°28'29.02"	31,001	27,901
126	256 (C)	Bir/Suri-I/Bhandirban/256/2016	Mayurakshi	Suri-I	Bhandirban	6.52	1513 (P)	23°58'32.566"	87°28'33.183"	**NA**	41,256
127	257 (B)	Bir/Suri-I/Bhandirban/257/2016	Mayurakshi	Suri-I	Bhandirban	7.02	1513 (P)	23°58'29.174"	87°28'35.753"	51,220	41,774
128	258 (B)	Bir/Suri-I/Bhandirban/258/2016	Mayurakshi	Suri-I	Bhandirban	8.06	1513 (P)	23°58'25.319"	87°28'38.323"	58,680	48,420
129	259 (D)	Bir/Suri-I/Dhanyagram/259/2016	Mayurakshi	Suri-I	Dhanyagram	5.98	58 (P)	23°57'23.274"	87°29'27.033"	43,560	35,100
130	260 (B)	Bir/Suri-I/Dhanyagram/260/2016	Mayurakshi	Suri-I	Dhanyagram	5.6	58 (P), 574 (P)	23°57'17.928"	87°29'32.995"	40,860	32,760

Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
131	261 (F)	Bir/Suri-I/Dhanyagram/261/2016	Mayurakshi	Suri-I	Dhanyagram	5.06	574 (P)	23°57'13.303"	87°29'38.546"	36,900	29,160
132	264 (C)	Bir/Mayureswar-I/Bajitpur/264/2016	Dwarka	Mayureswar-I	Bajitpur	3.97	2704 (P)	24°0'23.979"	87°39'20.626"	48,300	9,900
133	265	Bir/Mayureswar-I/Bajitpur/265/2016	Dwarka	Mayureswar-I	Bajitpur	4.31	2704 (P)	24°0'28.369"	87°39'7.95"	31,500	16,560
134	266 (B)	Bir/Mayureswar-I/Bajitpur/266/2016	Dwarka	Mayureswar-I	Bajitpur	4.88	2704 (P)	24°0'25.609"	87°39'1.587"	35,460	20,160
135	267	Bir/Md.Bazar/Nadighasbera/267/2018	Mayurakshi	Md.Bazar	Nadighasbera	11.05	001(P)	23°57'9.114"	87°34'3.844"	1,34,100	75,456
136	268	Bir/Md.Bazar/Nadighasbera/268/2018	Mayurakshi	Md.Bazar	Nadighasbera	10.87	001(P)	23°57'8.703"	87°34'15.563"	1,12,806	75,204
137	269 (B)	Bir/Md.Bazar/Nadighasbera/269/2018	Mayurakshi	Md.Bazar	Nadighasbera	11.45	004(P)	23°57'33.373"	87°35'25.308"	83,340	59,220
138	275	Bir/Md.Bazar/Girajpur/275/2018	Mayurakshi	Md.Bazar	Girajpur	12.21	1321(P) 1322(P)	23°57'22.758"	87°29'32.981"	88,920	68,760
139	278	Bir/Illambazar/DakshinEkdala/278/2018	Ajay	Illambazar	DakshinEkdala	10.67	693 (P), 696 (P), 698 (P), 699 (P)	23°39'39.398"	87°24'39.287"	1,29,600	1,03,680
140	283	Bir/Sainthia/Ikra/283/2018	Bakreshwar	Sainthia	Ikra	1.56	1059 (P), 1085 (P)	23°49'21.292"	87°38'31.628"	11,340	4,860
141	285	Bir/Rajnagar/Rahida/285/2018	Siddheshwari	Rajnagar	Rahida	2.01	84(P)	24°1'24.433"	87°15'29.55"	14,580	9,180

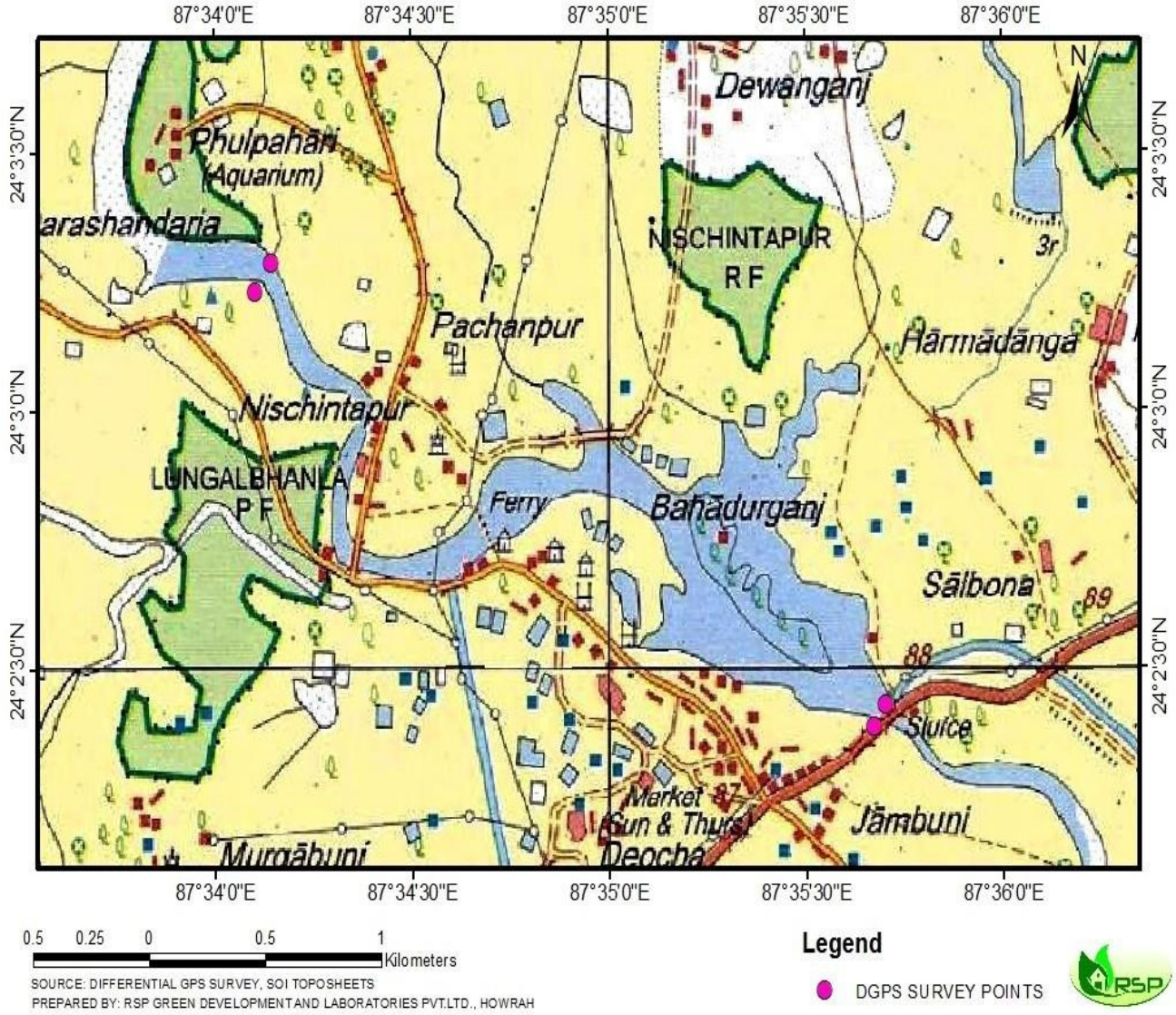
Sl. No	Sand Block	Sand Block Name	Name of River	Name of Block	Mouza	Area (in acre)	Plot No.	Coordinate		Geological Reserve	Minable Reserve
142	287	Bir/Suri-I/Dhanyagram/287/2018	Mayurakshi	Suri-I	Dhanyagram	11.35	1(P)	23°57'28.556"	87°29'16.374"	82,620	70,740
143		Miraj Sk.	Mayurakshi	Labpur	Dwarka	4.654	8001(P), 8002(P), 8003(P), 8004(P), 8005(P), 8012(P), 11348, 11629, 11854 & 11900	23°53'01.32" 23°53'01.72" 23°52'53.44" 23°52'51.60"	87°49'05.12" 87°49'08.78" 87°49'16.42" 87°49'05.33"	1,39,620	1,15,767

MAPS AS ANNEXURE

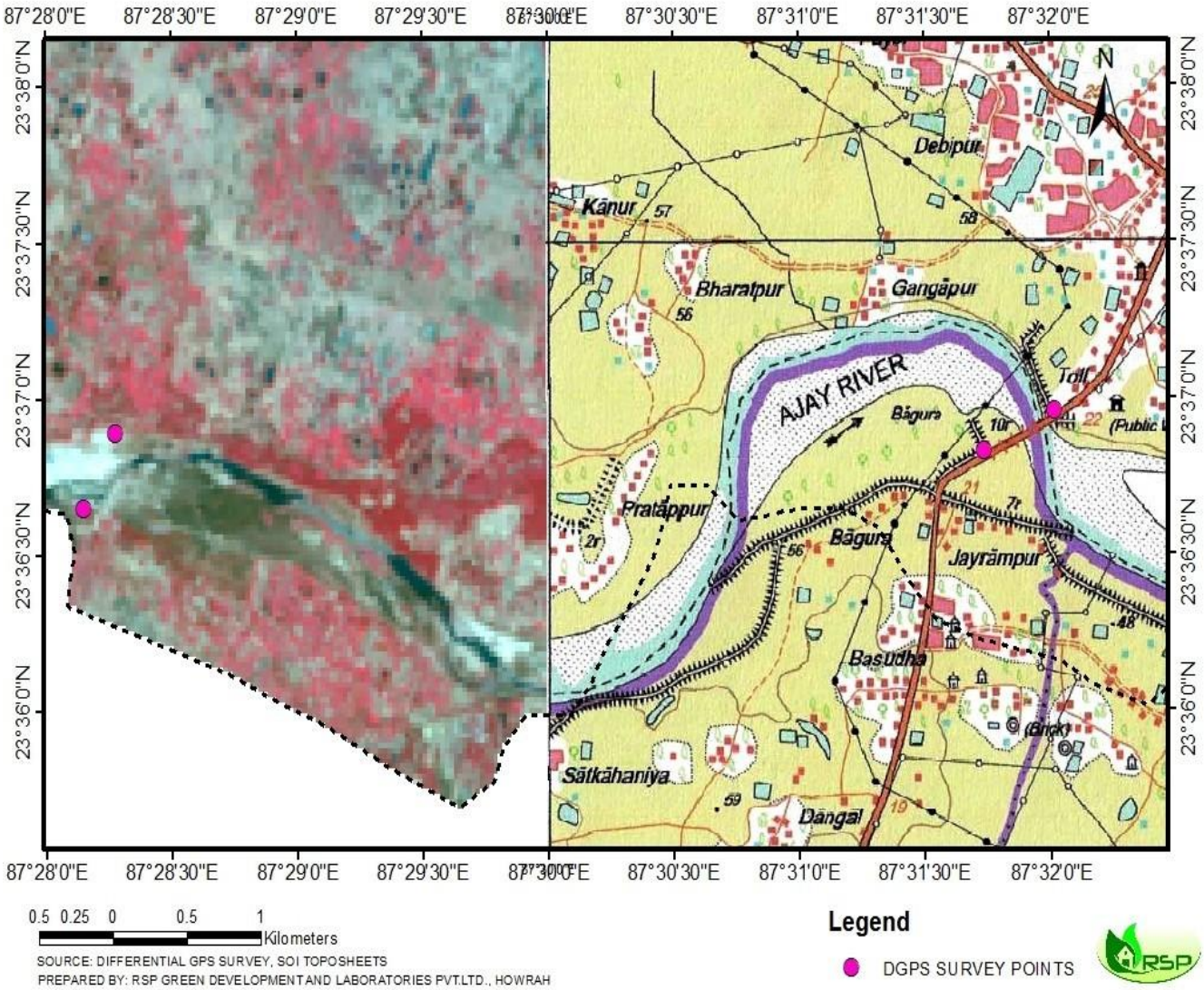
Annexure VI: DGPS Survey



DIFFERENTIAL GPS SURVEY POINTS SUPERIMPOSED ON SOI TOPOSHEETS, BIRBHUM DISTRICT (PART - 1)

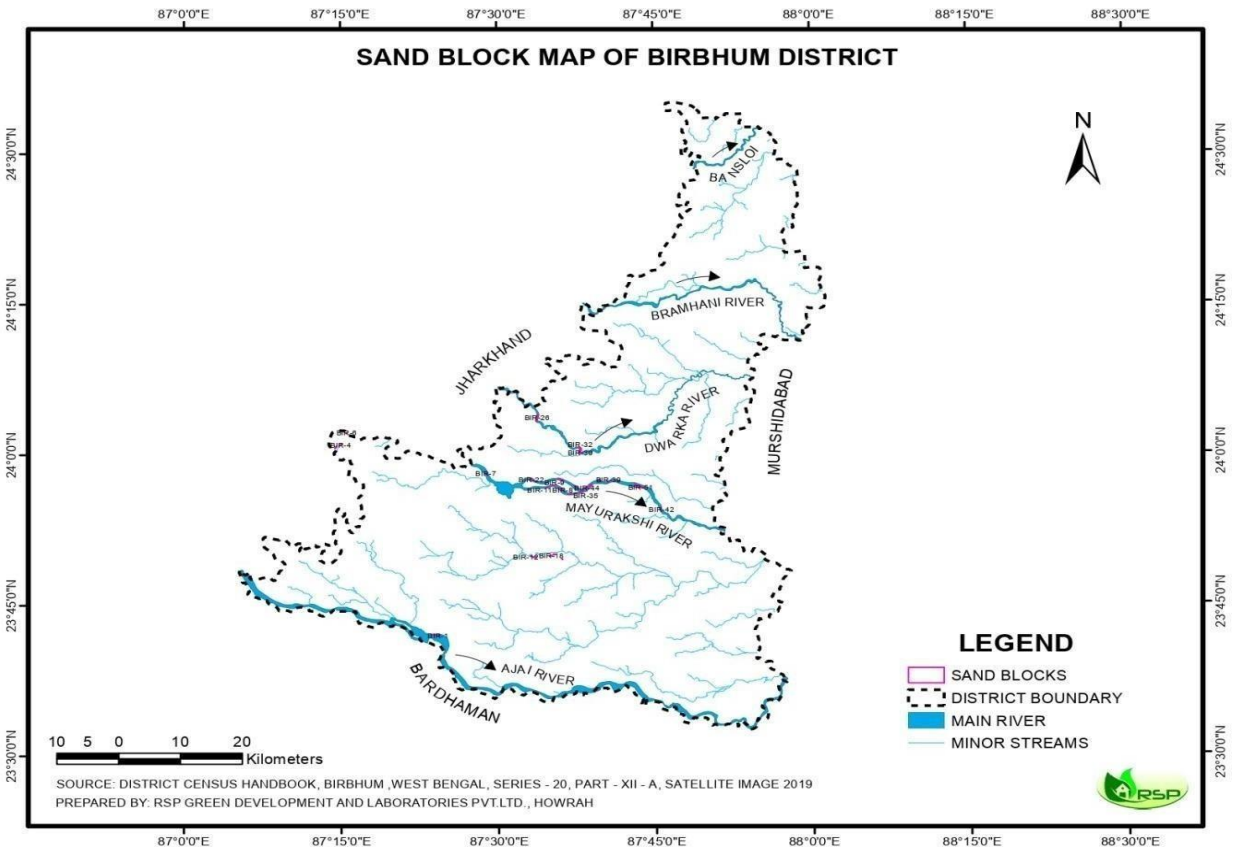


DIFFERENTIAL GPS SURVEY POINTS SUPERIMPOSED ON SOI TOPOSHEETS, BIRBHUM DISTRICT (PART - 2)

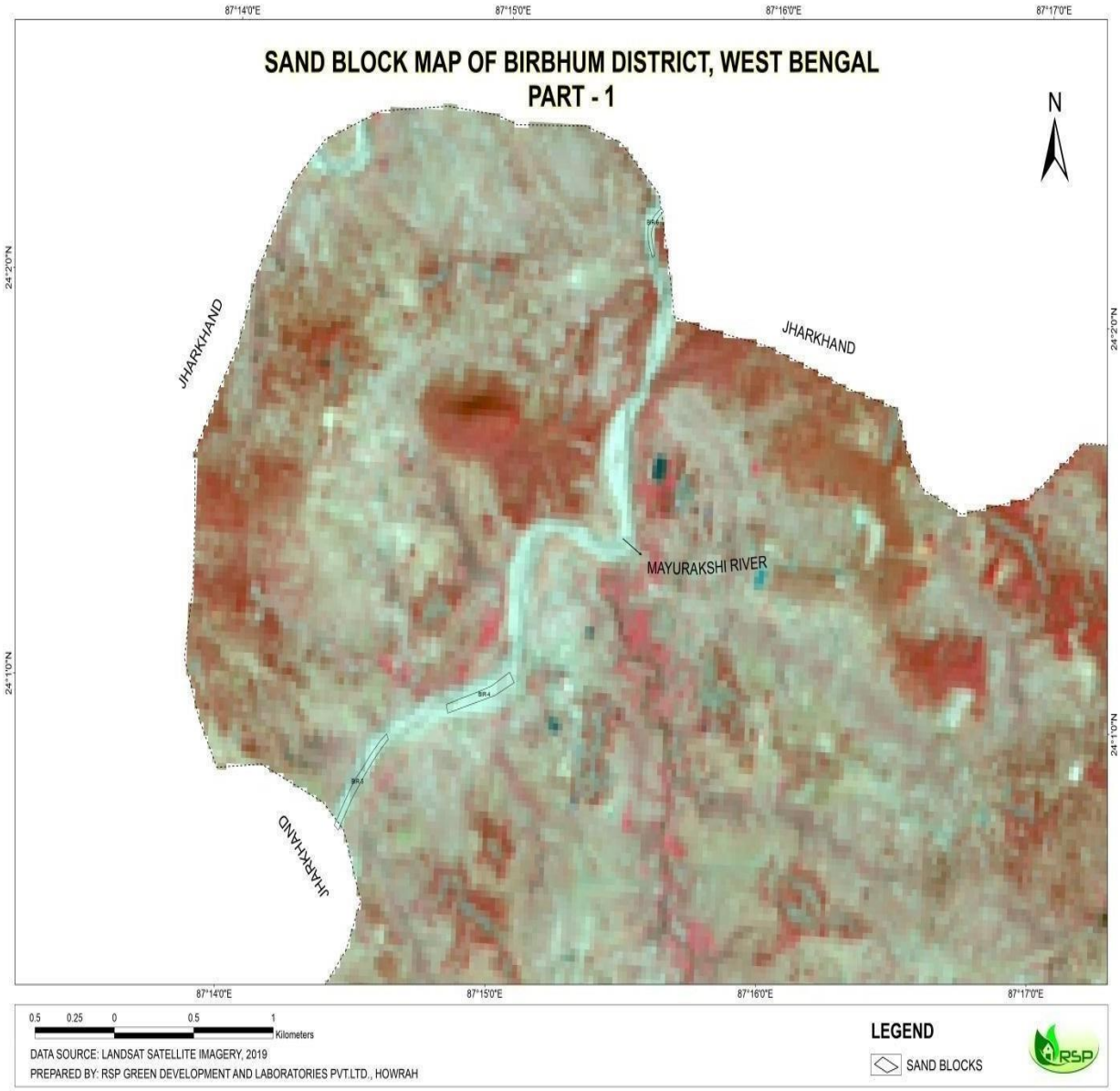


Annexure VII: Existing Sand Block Map of the district

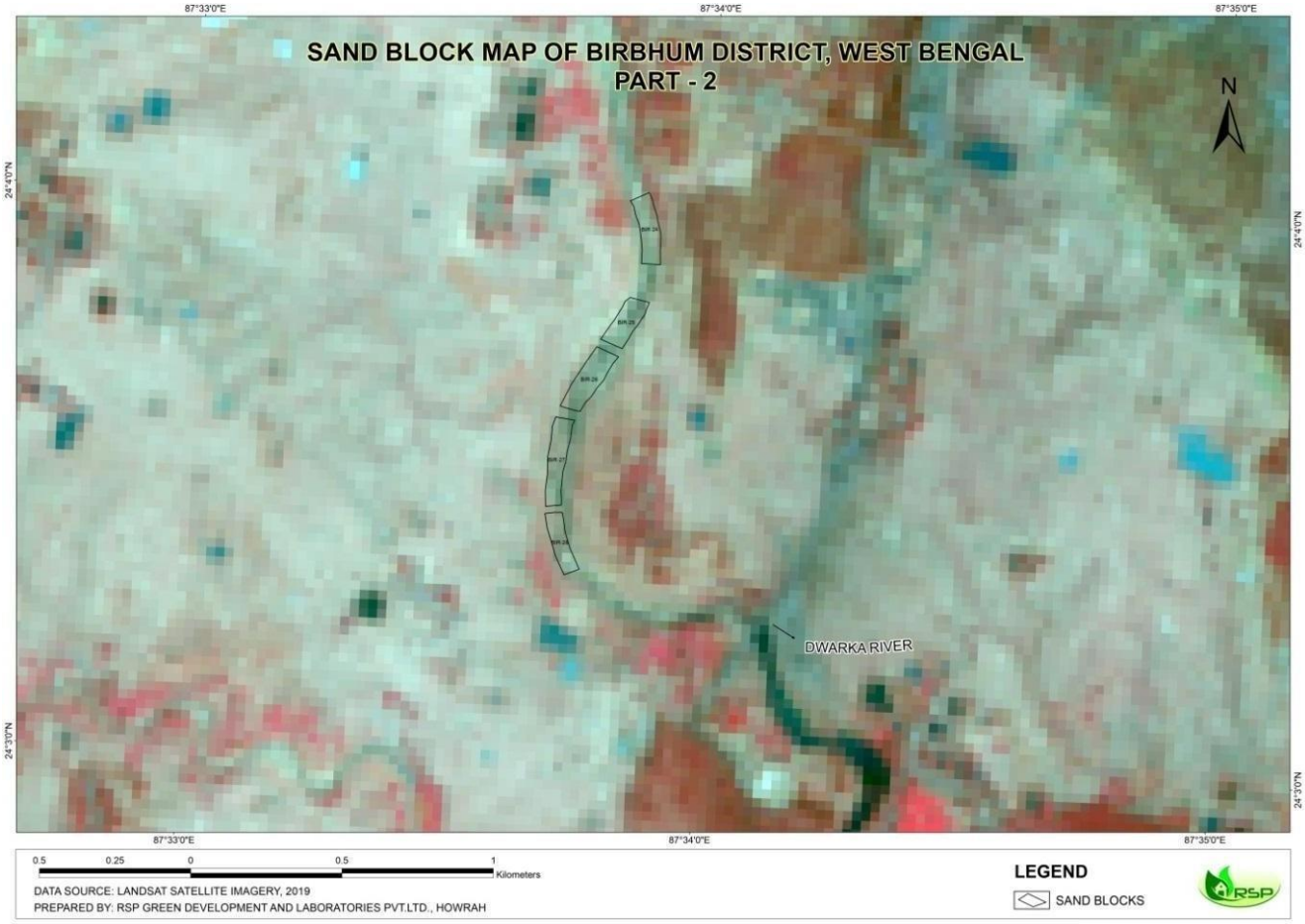
(It's a part of table given for depiction of ANNEXURE – II)



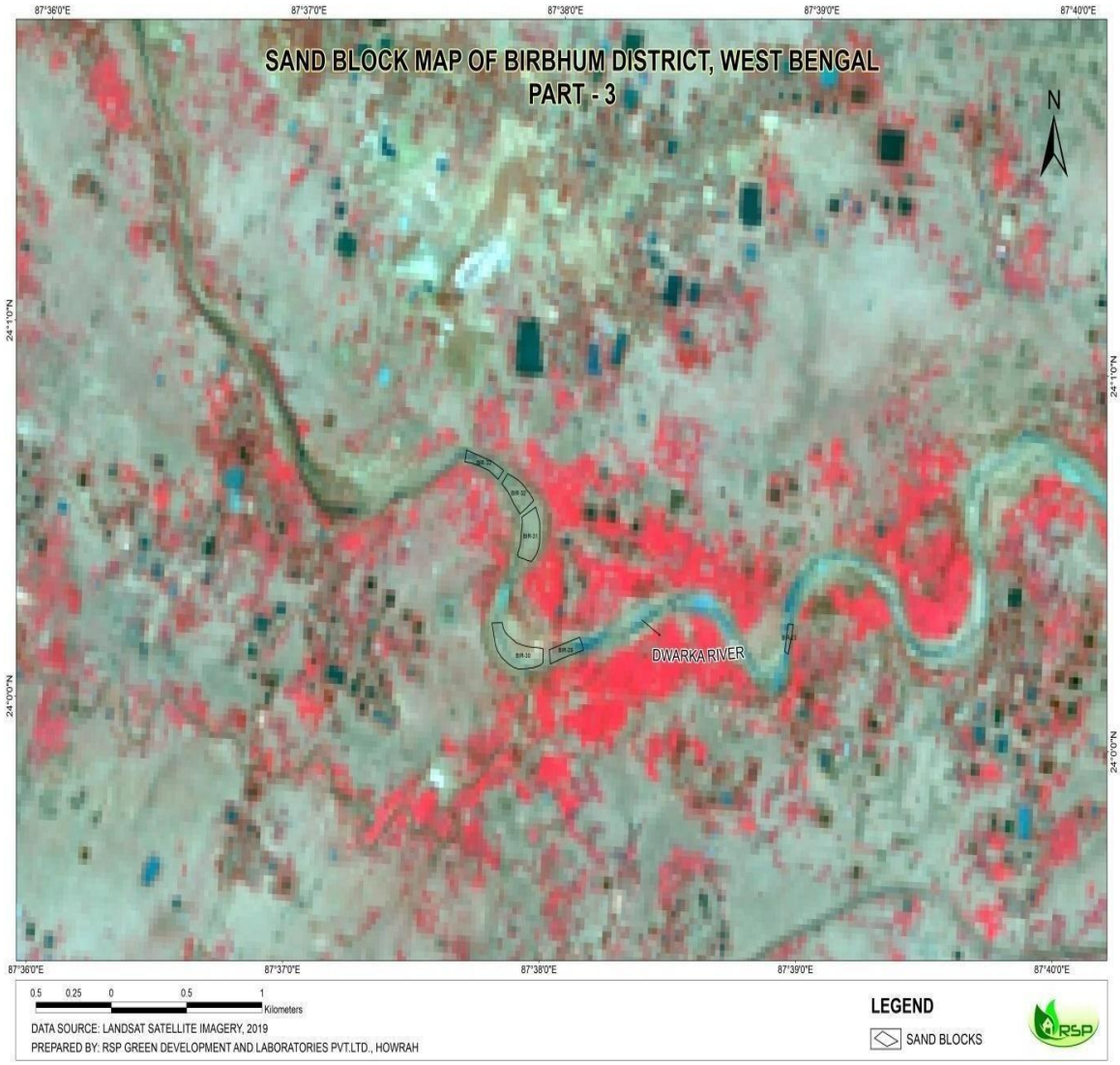
Sand Block map of Birbhum (Part 1)



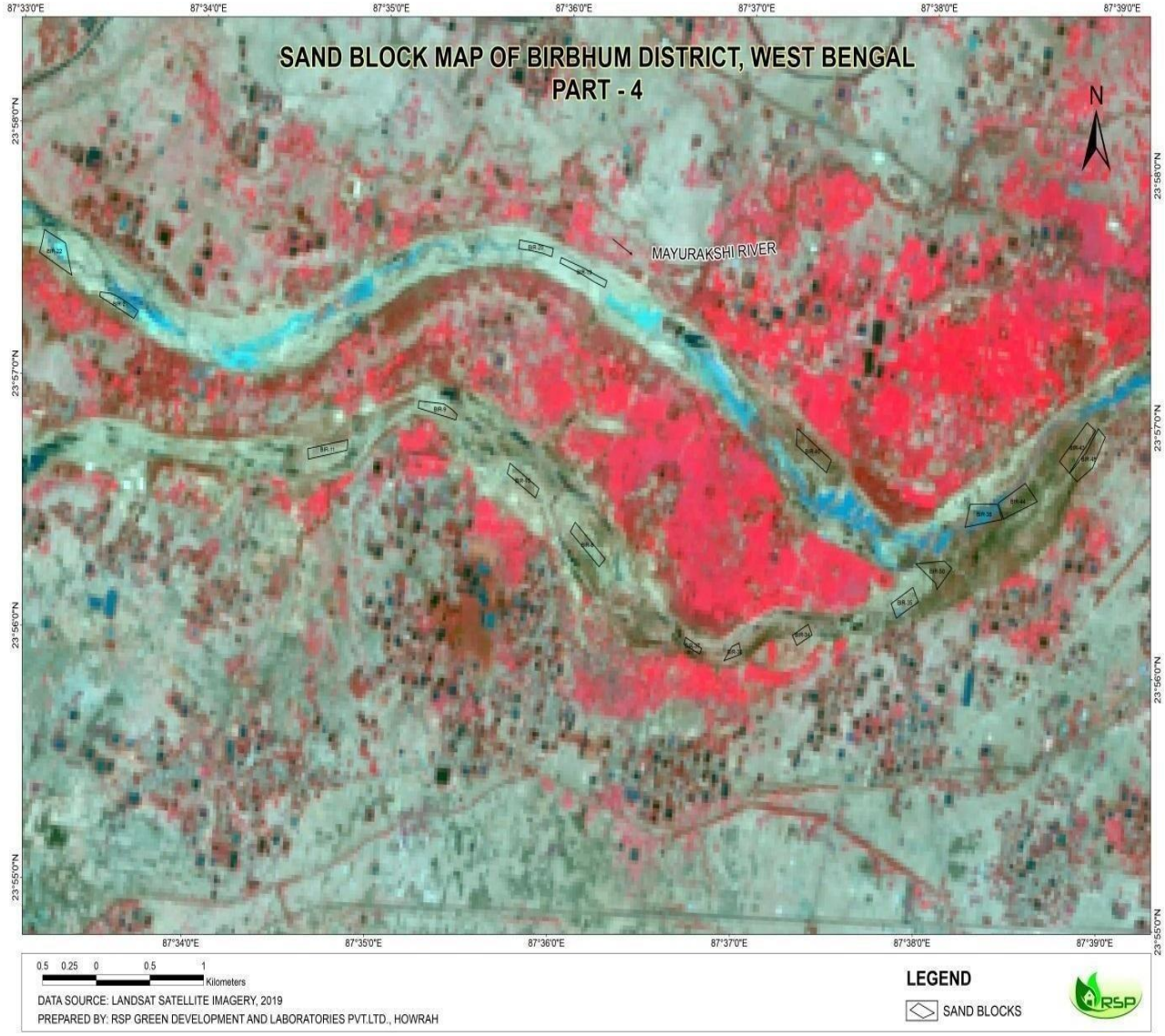
Sand Block map of Birbhum (Part 2)



Sand Block map of Birbhum (Part 3)

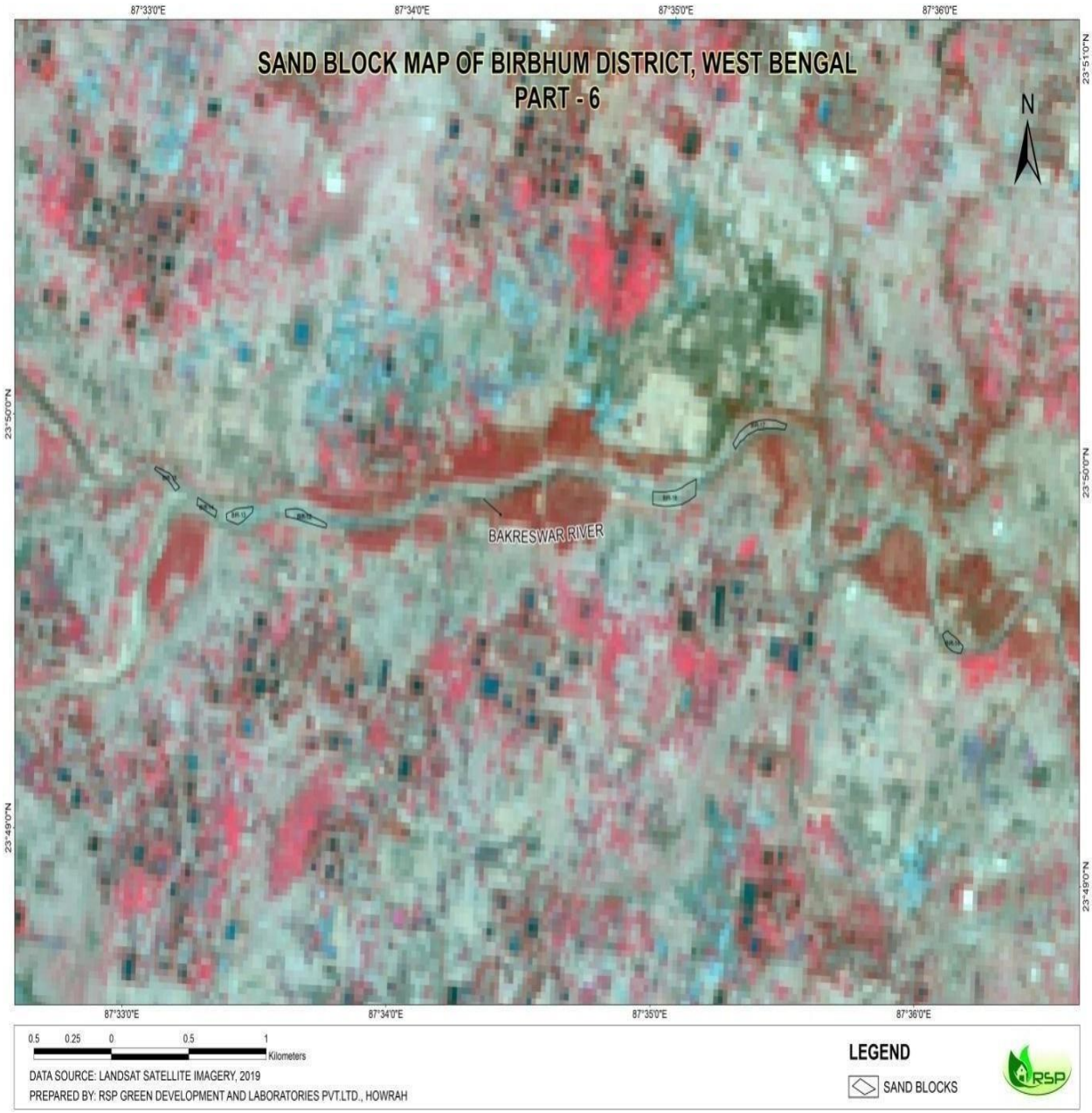


Sand Block map of Birbhum (Part 4)

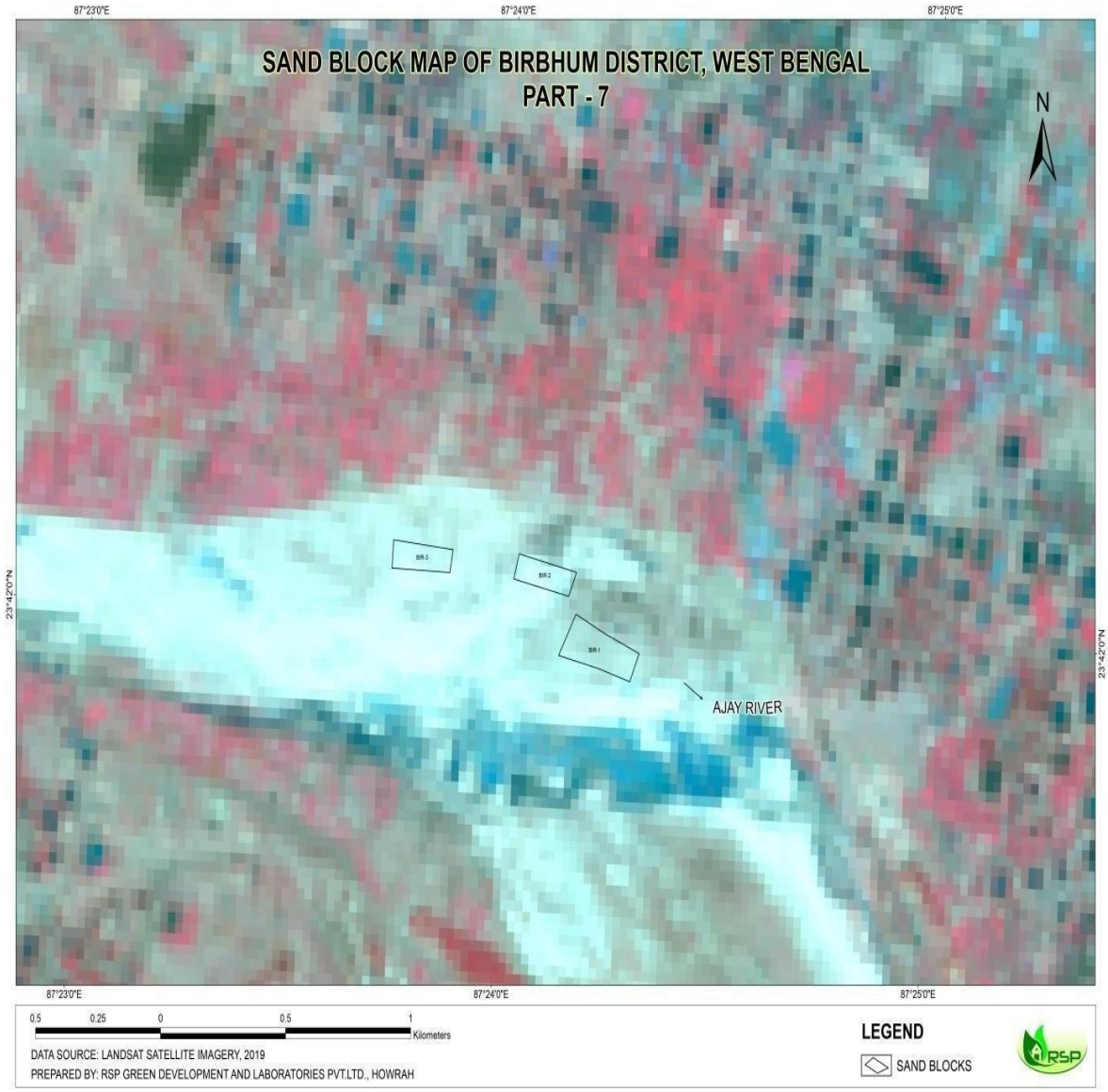


Sand Block map of Birbhum (Part 5)

Sand Block map of Birbhum (Part 6)

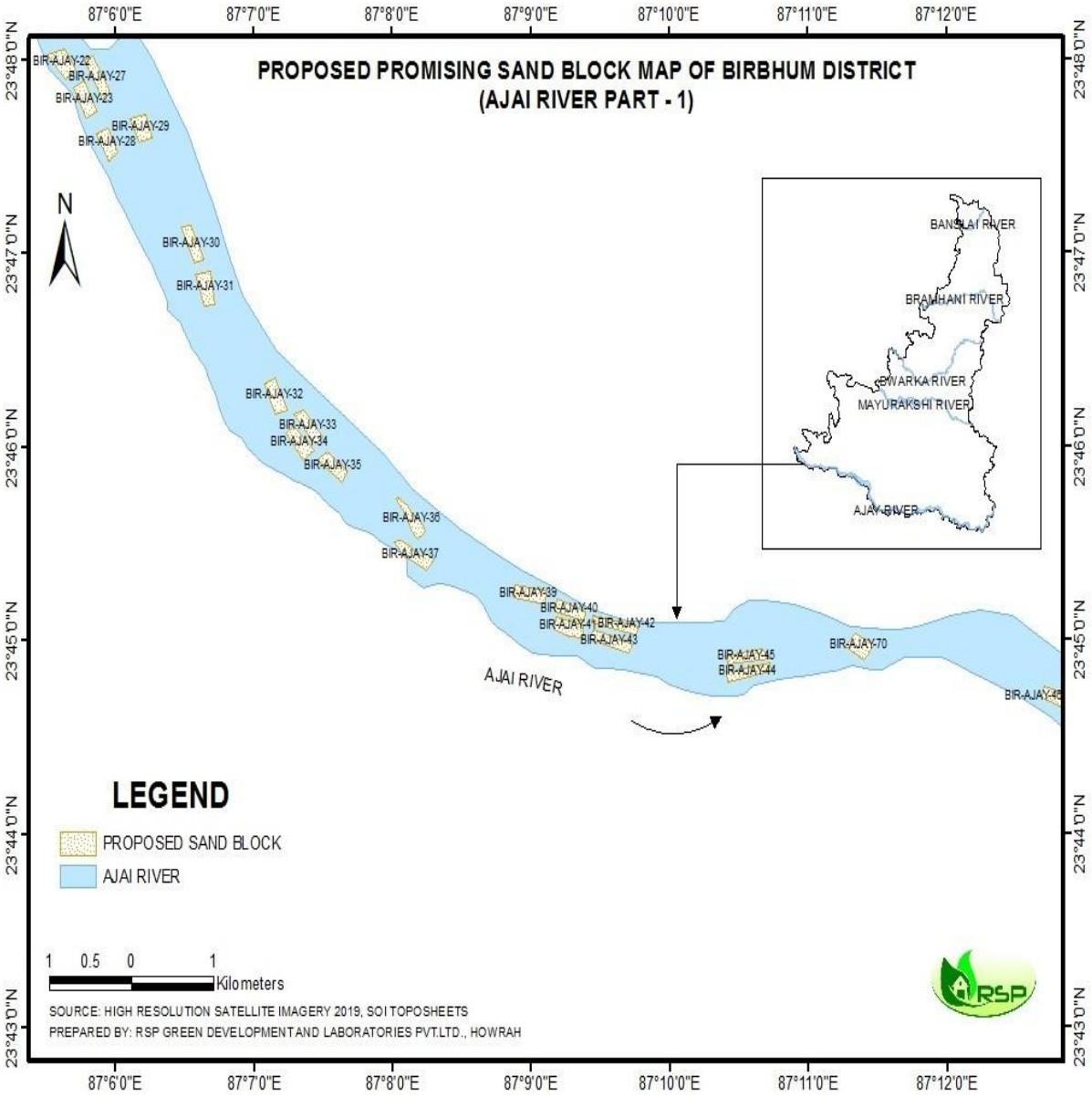


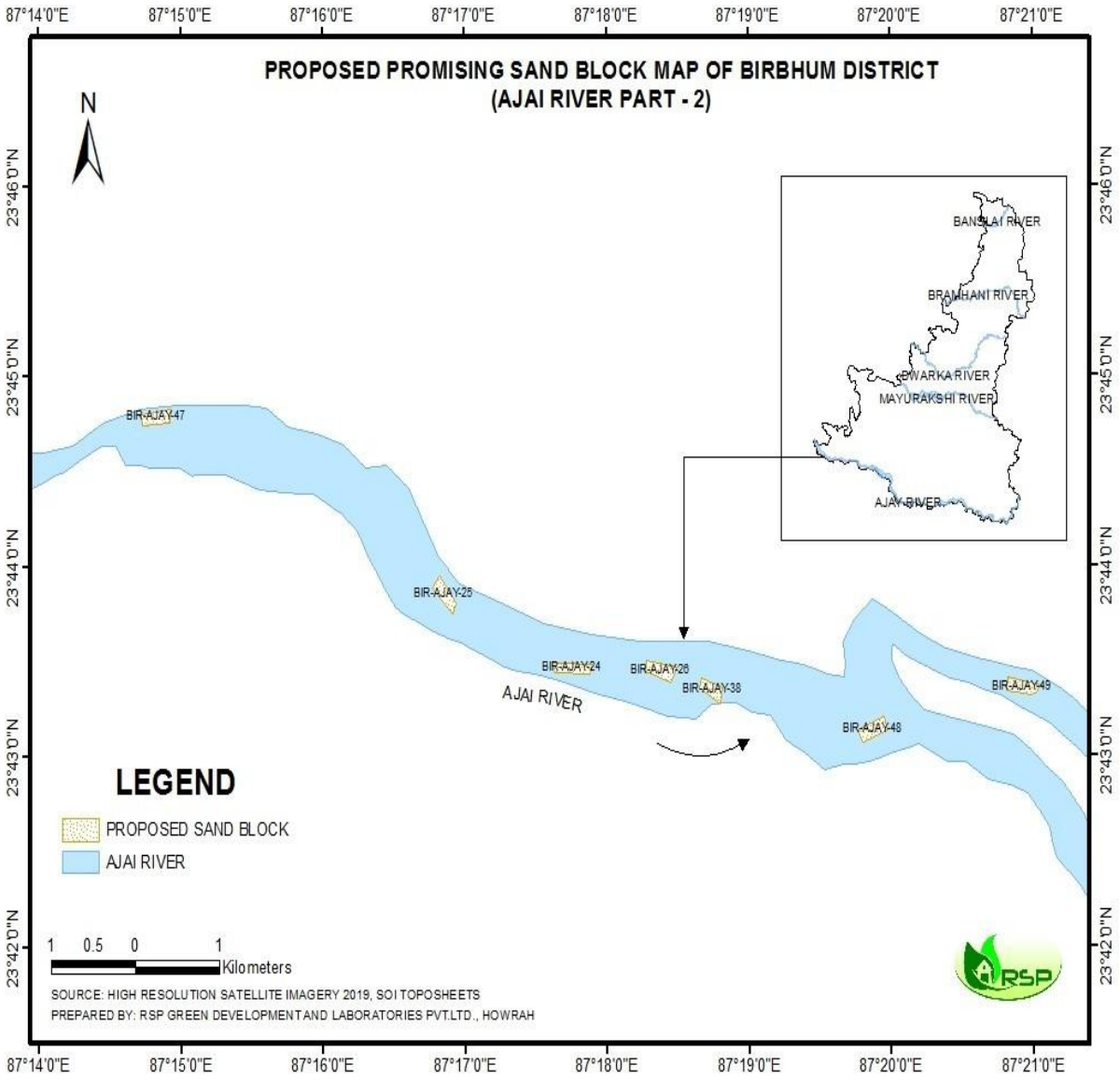
Sand Block map of Birbhum (Part 7)

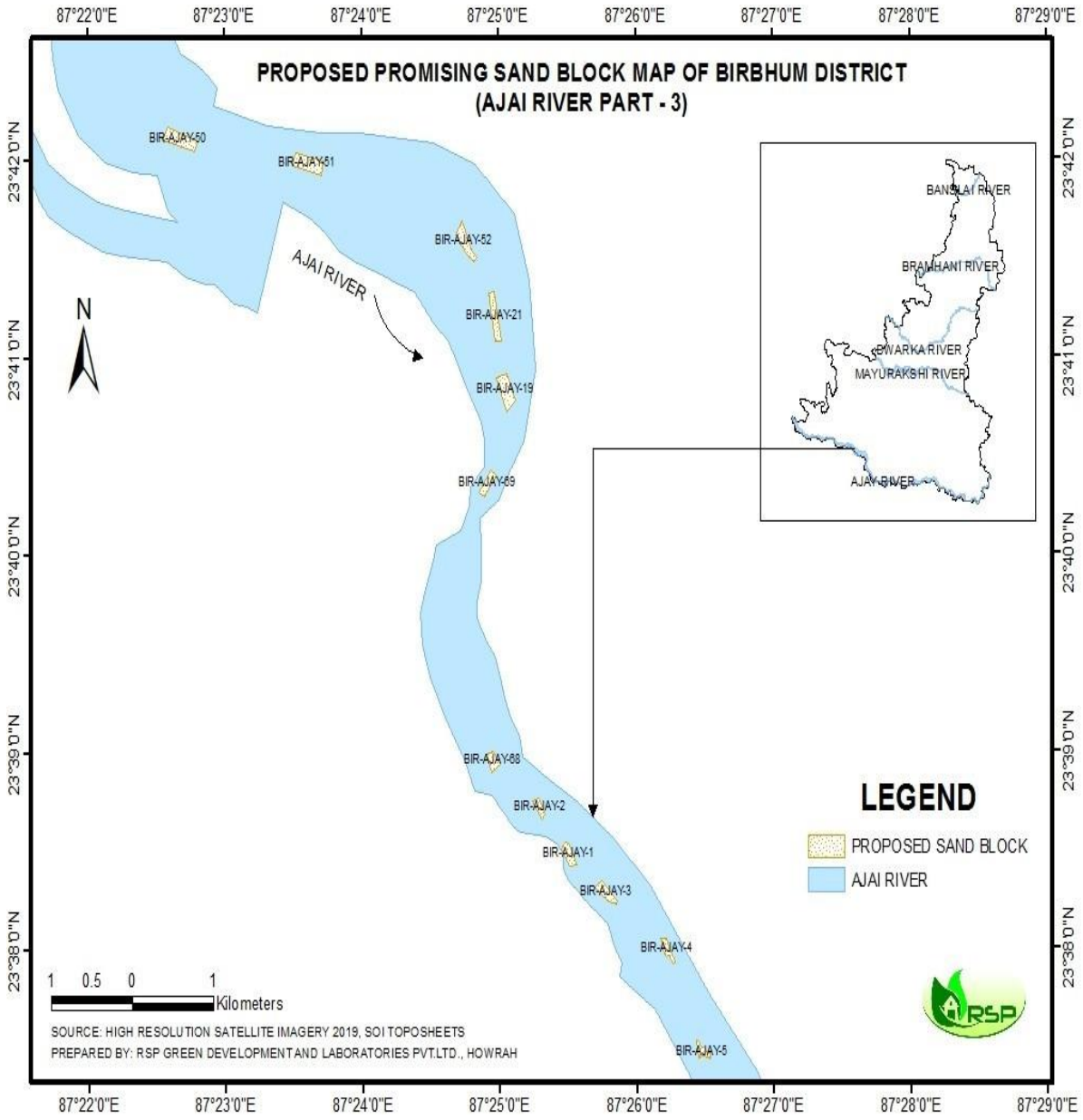


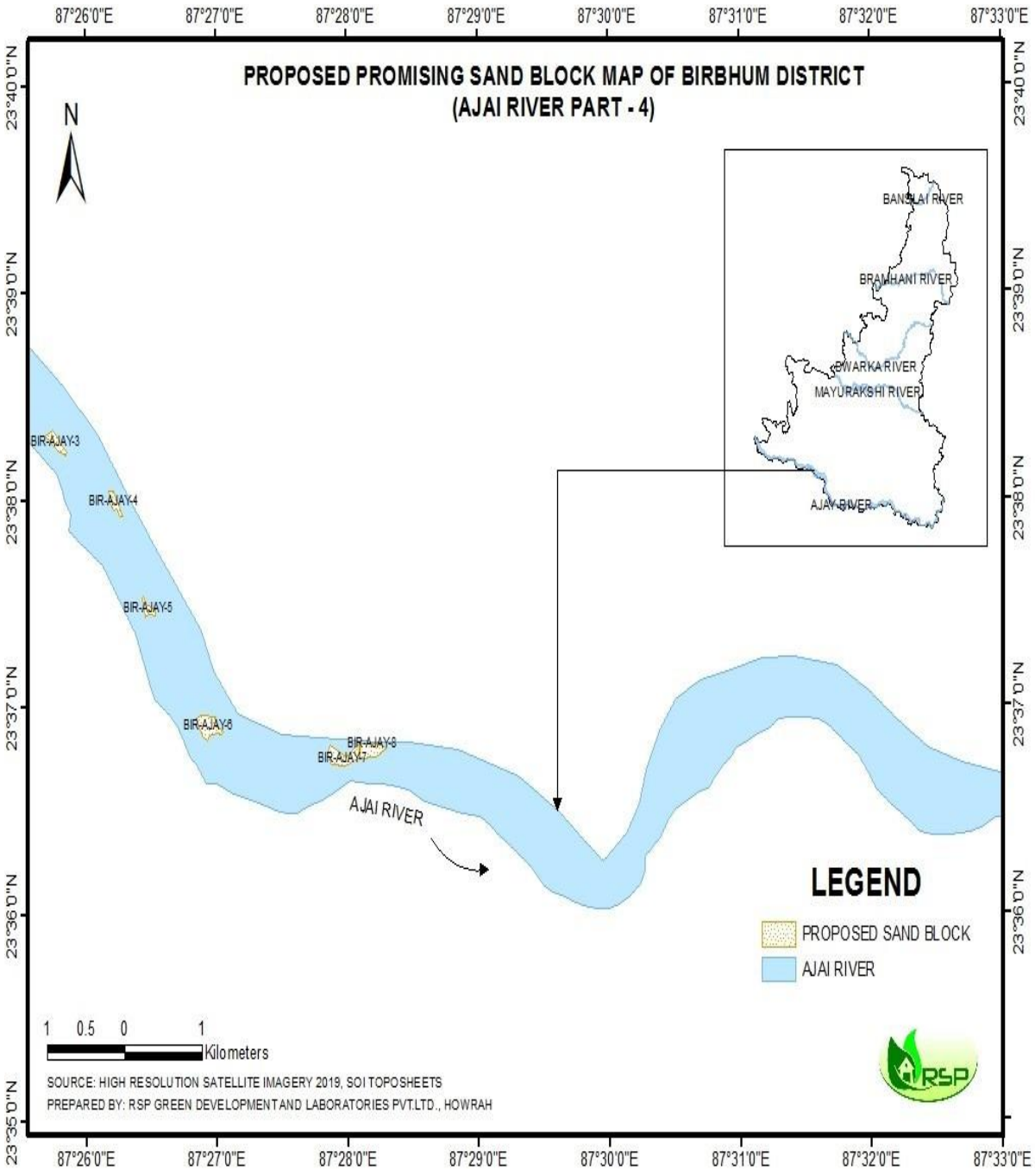
Annexure VIII: Proposed Sand Block Map of Birbhum

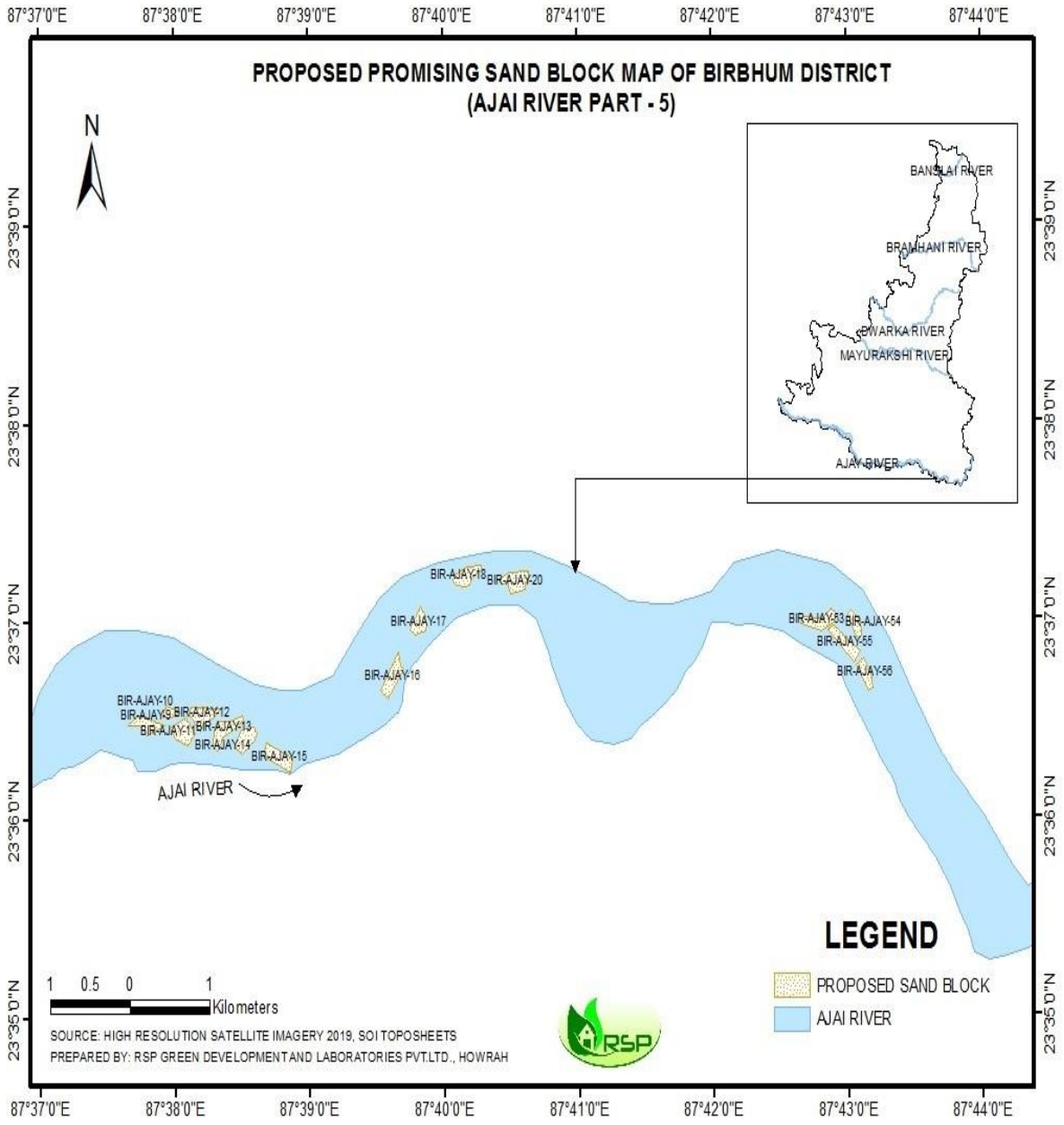
(It's a part of table given for depiction of ANNEXURE – IV)

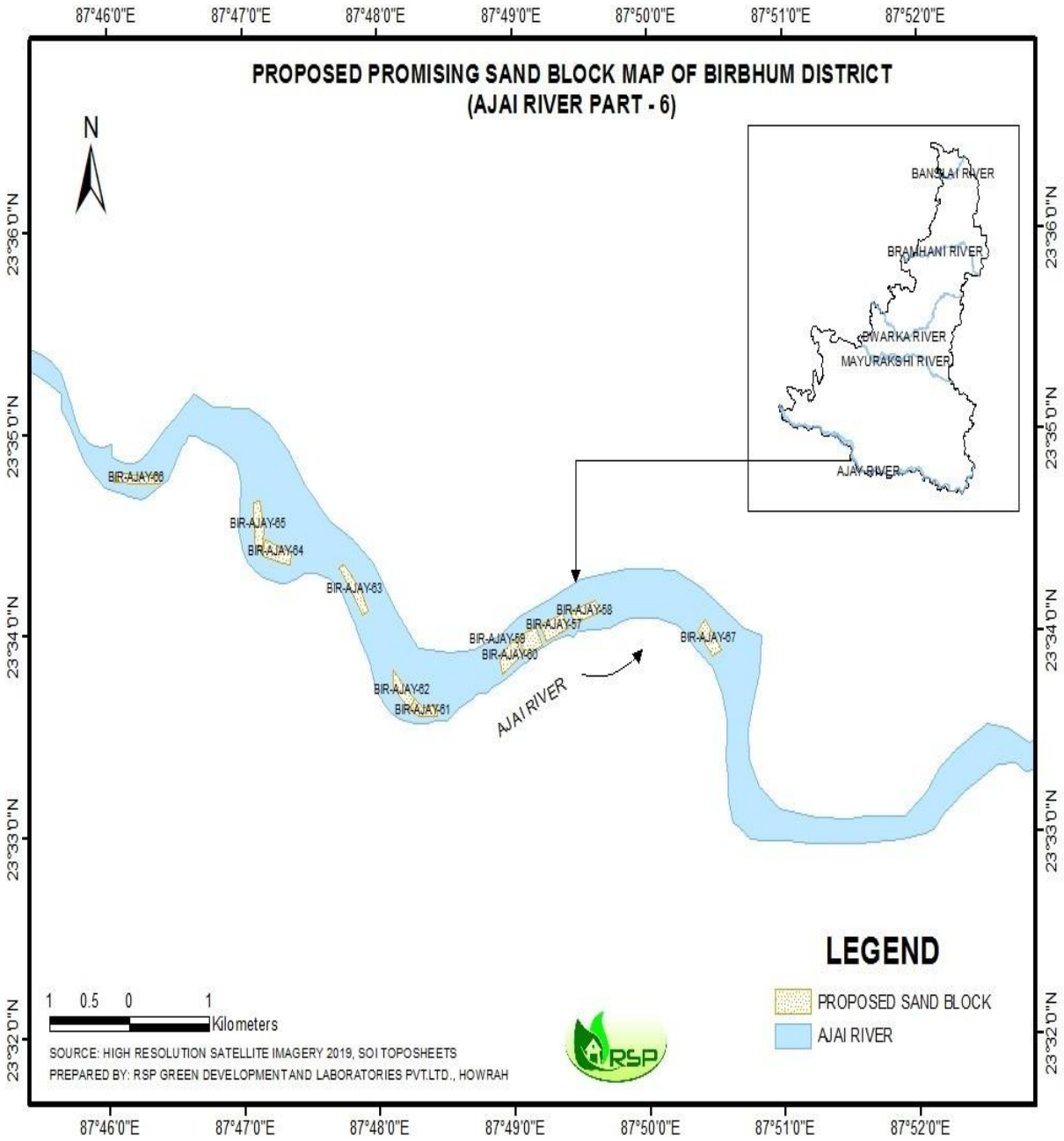


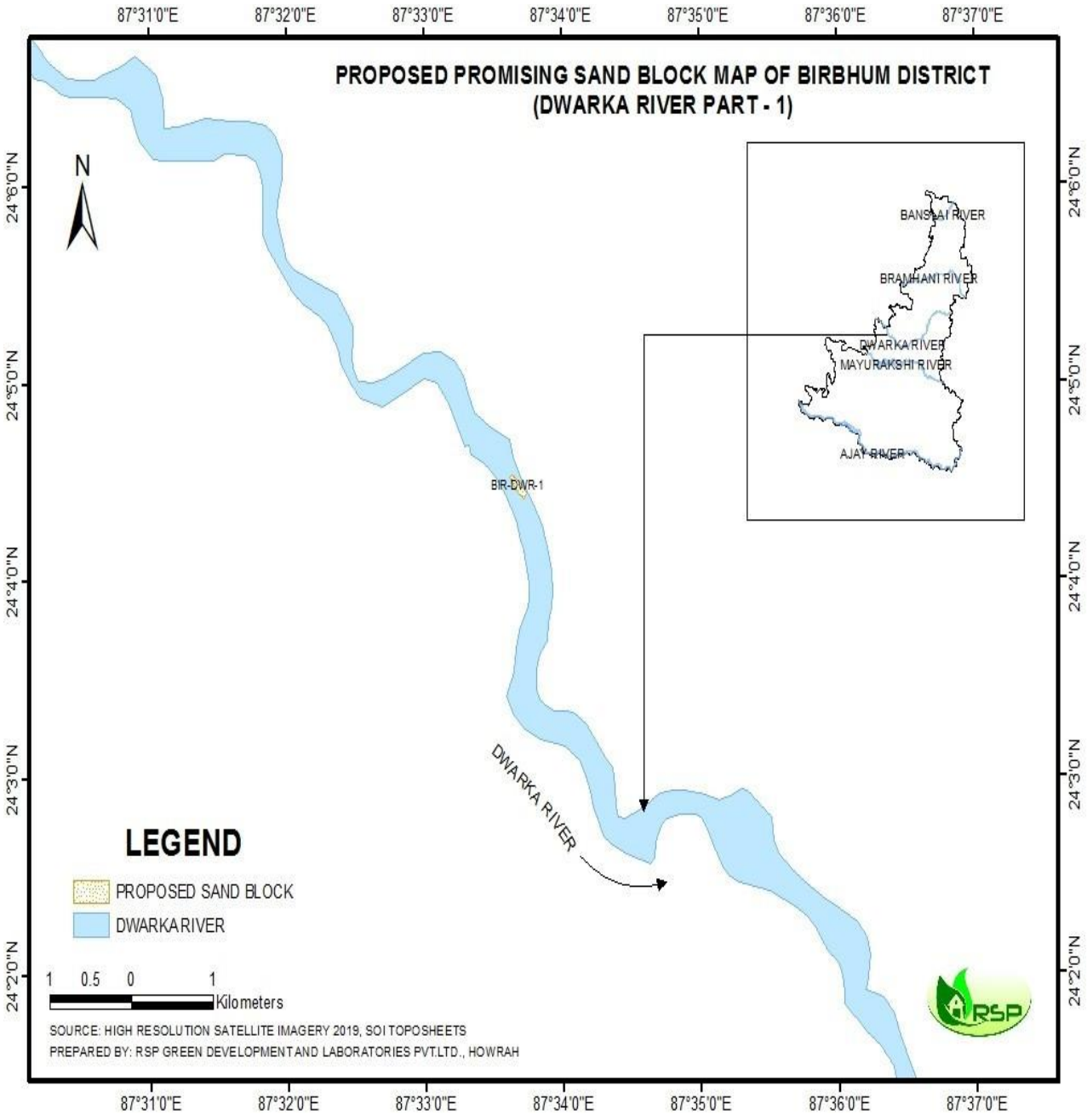

PROPOSED PROMISING SAND BLOCK MAP OF BIRBHUM DISTRICT
(AJAI RIVER PART - 2)
N
87°14'0"E
87°15'0"E
87°16'0"E
87°17'0"E
87°18'0"E
87°19'0"E
87°20'0"E
87°21'0"E
23°46'0"N
23°45'0"N
23°44'0"N
23°43'0"N
23°42'0"N
BANSLAI RIVER
BRAHMANI RIVER
DWARKA RIVER
MAYURAKSHI RIVER
AJAY RIVER
BIR-AJAY-47
BIR-AJAY-25
BIR-AJAY-24
BIR-AJAY-26
BIR-AJAY-38
BIR-AJAY-48
BIR-AJAY-49
AJAI RIVER
LEGEND
PROPOSED SAND BLOCK
AJAI RIVER
1 0.5 0 1
Kilometers
SOURCE: HIGH RESOLUTION SATELLITE IMAGERY 2019, SOI TOPOSHEETS
PREPARED BY: RSP GREEN DEVELOPMENT AND LABORATORIES PVT.LTD., HOWRAH
RSP

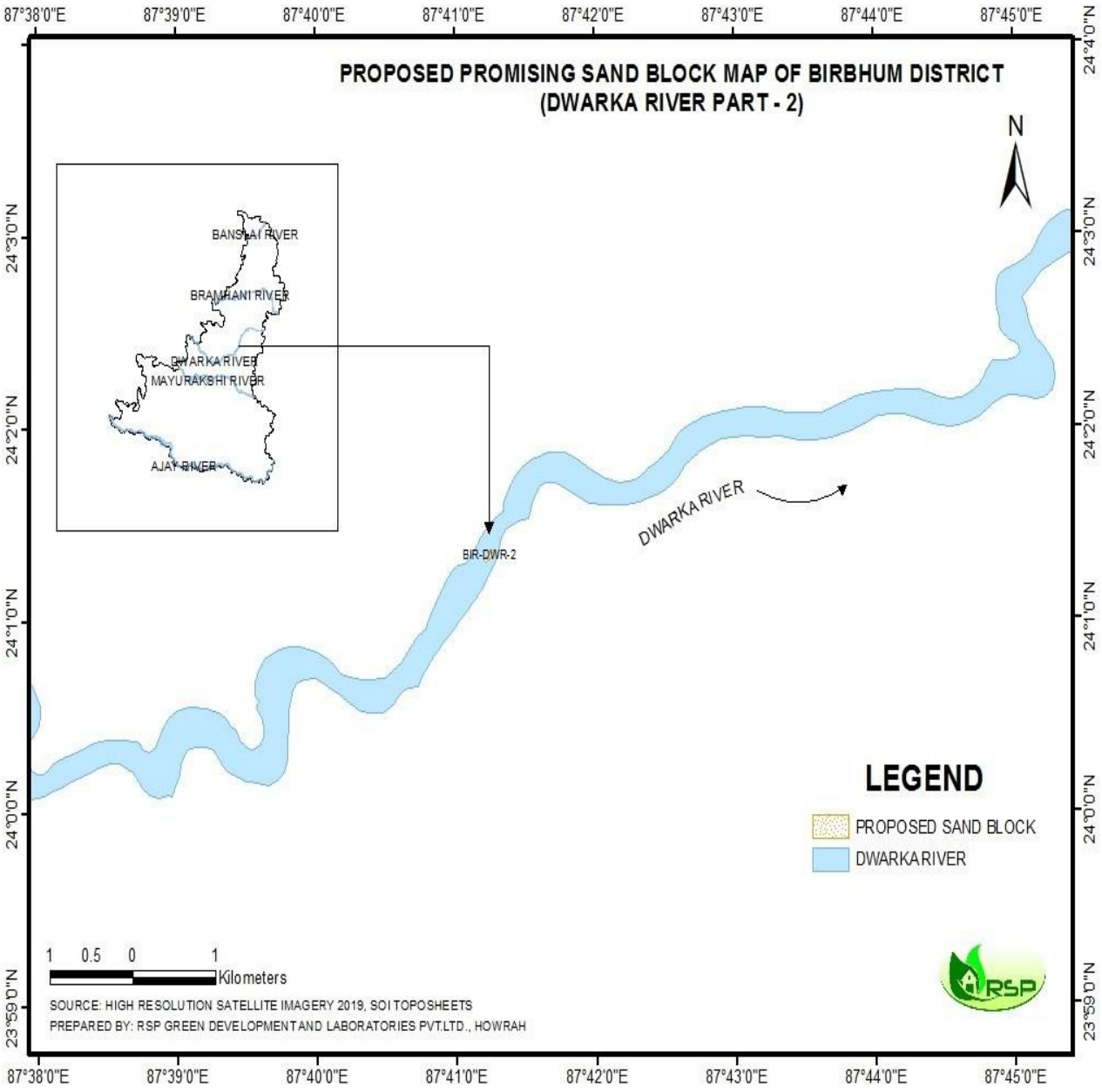

PROPOSED PROMISING SAND BLOCK MAP OF BIRBHUM DISTRICT
(AJAI RIVER PART - 3)
87°22'0"E
87°23'0"E
87°24'0"E
87°25'0"E
87°26'0"E
87°27'0"E
87°28'0"E
87°29'0"E
23°42'0"N
23°41'0"N
23°40'0"N
23°39'0"N
23°38'0"N
BIR-AJAY-50
BIR-AJAY-51
BIR-AJAY-52
BIR-AJAY-21
BIR-AJAY-19
BIR-AJAY-69
BIR-AJAY-68
BIR-AJAY-2
BIR-AJAY-1
BIR-AJAY-3
BIR-AJAY-4
BIR-AJAY-5
AJAI RIVER
N
BANSLAI RIVER
BRAHMANI RIVER
DWARKA RIVER
MAYURAKSHI RIVER
AJAY RIVER
LEGEND
PROPOSED SAND BLOCK
AJAI RIVER
1 0.5 0 1
Kilometers
SOURCE: HIGH RESOLUTION SATELLITE IMAGERY 2019, SOI TOPOSHEETS
PREPARED BY: RSP GREEN DEVELOPMENT AND LABORATORIES PVT.LTD., HOWRAH
RSP

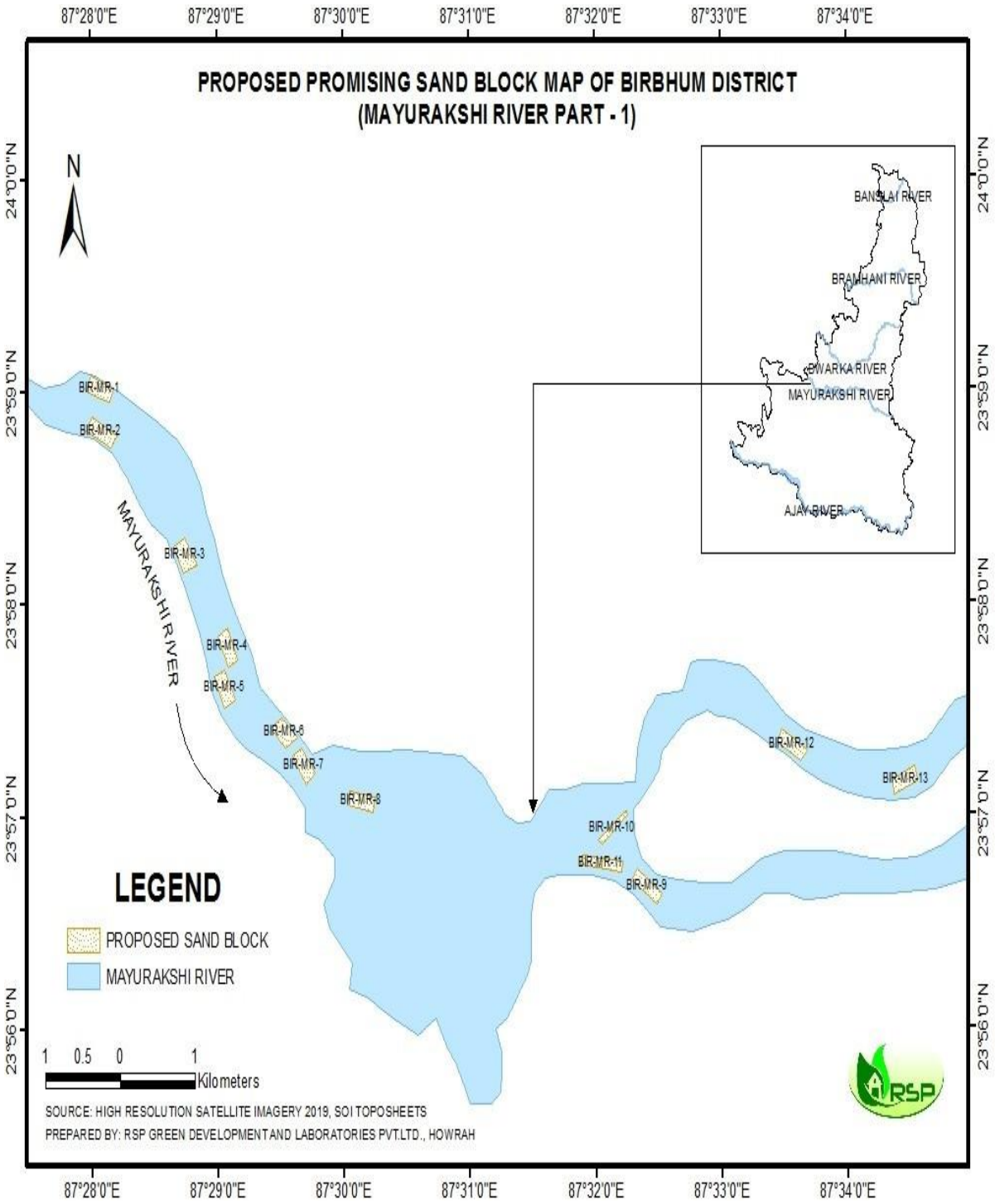

PROPOSED PROMISING SAND BLOCK MAP OF BIRBHUM DISTRICT
(AJAI RIVER PART - 4)
N
87°26'0"E
87°27'0"E
87°28'0"E
87°29'0"E
87°30'0"E
87°31'0"E
87°32'0"E
87°33'0"E
23°40'0"N
23°39'0"N
23°38'0"N
23°37'0"N
23°36'0"N
23°35'0"N
BANSLAI RIVER
BRAHMANI RIVER
KUNUR RIVER
MAYURAKSHI RIVER
AJAY RIVER
BIR-AJAY-3
BIR-AJAY-4
BIR-AJAY-5
BIR-AJAY-6
BIR-AJAY-7
BIR-AJAY-8
AJAI RIVER
LEGEND
PROPOSED SAND BLOCK
AJAI RIVER
1 0.5 0 1
Kilometers
SOURCE: HIGH RESOLUTION SATELLITE IMAGERY 2019, SOI TOPOSHEETS
PREPARED BY: RSP GREEN DEVELOPMENT AND LABORATORIES PVT.LTD., HOWRAH
RSP


PROPOSED PROMISING SAND BLOCK MAP OF BIRBHUM DISTRICT
(AJAI RIVER PART - 5)
N
87°37'0"E
87°38'0"E
87°39'0"E
87°40'0"E
87°41'0"E
87°42'0"E
87°43'0"E
87°44'0"E
23°39'0"N
23°38'0"N
23°37'0"N
23°36'0"N
23°35'0"N
BANSLAI RIVER
BRAHMANI RIVER
BWARKA RIVER
MAYURAKSHI RIVER
AJAY RIVER
BIR-AJAY-10
BIR-AJAY-9
BIR-AJAY-11
BIR-AJAY-12
BIR-AJAY-13
BIR-AJAY-14
BIR-AJAY-15
BIR-AJAY-16
BIR-AJAY-17
BIR-AJAY-18
BIR-AJAY-20
BIR-AJAY-53
BIR-AJAY-54
BIR-AJAY-55
BIR-AJAY-56
AJAI RIVER
LEGEND
PROPOSED SAND BLOCK
AJAI RIVER
1 0.5 0 1
Kilometers
SOURCE: HIGH RESOLUTION SATELLITE IMAGERY 2019, SOI TOPOSHEETS
PREPARED BY: RSP GREEN DEVELOPMENT AND LABORATORIES PVT.LTD., HOWRAH


PROPOSED PROMISING SAND BLOCK MAP OF BIRBHUM DISTRICT
(AJAI RIVER PART - 6)
N
87°46'0"E
87°47'0"E
87°48'0"E
87°49'0"E
87°50'0"E
87°51'0"E
87°52'0"E
23°36'0"N
23°35'0"N
23°34'0"N
23°33'0"N
23°32'0"N
BANSLAI RIVER
BRAHMANI RIVER
DWARKA RIVER
MAYURAKSHI RIVER
AJAY RIVER
BIR-AJAY-66
BIR-AJAY-65
BIR-AJAY-64
BIR-AJAY-63
BIR-AJAY-62
BIR-AJAY-61
BIR-AJAY-60
BIR-AJAY-59
BIR-AJAY-58
BIR-AJAY-57
BIR-AJAY-67
AJAI RIVER
LEGEND
PROPOSED SAND BLOCK
AJAI RIVER
1 0.5 0 1
Kilometers
SOURCE: HIGH RESOLUTION SATELLITE IMAGERY 2019, SOI TOPOSHEETS
PREPARED BY: RSP GREEN DEVELOPMENT AND LABORATORIES PVT.LTD., HOWRAH
RSP


PROPOSED PROMISING SAND BLOCK MAP OF BIRBHUM DISTRICT
(DWARKA RIVER PART - 1)
N
87°31'0"E
87°32'0"E
87°33'0"E
87°34'0"E
87°35'0"E
87°36'0"E
87°37'0"E
24°6'0"N
24°5'0"N
24°4'0"N
24°3'0"N
24°2'0"N
BANSLAI RIVER
BRAHMANI RIVER
DWARKA RIVER
MAYURAKSHI RIVER
AJAY RIVER
BIR-DWR-1
DWARKA RIVER
LEGEND
PROPOSED SAND BLOCK
DWARKA RIVER
1 0.5 0 1
Kilometers
SOURCE: HIGH RESOLUTION SATELLITE IMAGERY 2019, SOI TOPOSHEETS
PREPARED BY: RSP GREEN DEVELOPMENT AND LABORATORIES PVT.LTD., HOWRAH
RSP


PROPOSED PROMISING SAND BLOCK MAP OF BIRBHUM DISTRICT
(DWARKA RIVER PART - 2)
N
BANSHAI RIVER
BRAHMANI RIVER
DWARKA RIVER
MAYURAKSHI RIVER
AJAY RIVER
BIR-DWR-2
DWARKA RIVER
LEGEND
PROPOSED SAND BLOCK
DWARKA RIVER
1 0.5 0 1
Kilometers
SOURCE: HIGH RESOLUTION SATELLITE IMAGERY 2019, SOI TOPOSHEETS
PREPARED BY: RSP GREEN DEVELOPMENT AND LABORATORIES PVT.LTD., HOWRAH
87°38'0"E
87°39'0"E
87°40'0"E
87°41'0"E
87°42'0"E
87°43'0"E
87°44'0"E
87°45'0"E
24°4'0"N
24°3'0"N
24°2'0"N
24°1'0"N
24°0'0"N
23°59'0"N


PROPOSED PROMISING SAND BLOCK MAP OF BIRBHUM DISTRICT
(MAYURAKSHI RIVER PART - 1)
N
87°28'0"E
87°29'0"E
87°30'0"E
87°31'0"E
87°32'0"E
87°33'0"E
87°34'0"E
24°0'0"N
23°59'0"N
23°58'0"N
23°57'0"N
23°56'0"N
BANSLAI RIVER
BRAHMANI RIVER
DWARKA RIVER
MAYURAKSHI RIVER
AJAY RIVER
BIR-MR-1
BIR-MR-2
BIR-MR-3
BIR-MR-4
BIR-MR-5
BIR-MR-6
BIR-MR-7
BIR-MR-8
BIR-MR-9
BIR-MR-10
BIR-MR-11
BIR-MR-12
BIR-MR-13
MAYURAKSHI RIVER
LEGEND
PROPOSED SAND BLOCK
MAYURAKSHI RIVER
1 0.5 0 1
Kilometers
SOURCE: HIGH RESOLUTION SATELLITE IMAGERY 2019, SOI TOPOSHEETS
PREPARED BY: RSP GREEN DEVELOPMENT AND LABORATORIES PVT.LTD., HOWRAH
RSP

ANNEXURE II

Government of West Bengal
Department of Large Industries and Enterprises
Mines Branch
4, Camac Street, Kolkata-700 016

No. 633 -CI/O/MM/42/10/MINES Date 22.11.2019

From : The Assistant Secretary
to the Government of West Bengal.

To : The Managing Director,
West Bengal Mineral Development & Trading Corporation Ltd.,
13, Nellie Sengupta Sarani, 2nd Floor, Kolkata – 700 087

Sub: Revalidation of Grant of mining lease for Blackstone to WBMDTC Ltd. in mouza- Jethia under P.S.Md. Bazar, Dist.Birbhum.

Sir,

I am directed to refer to your application dated 22.10.2019 on the subject mentioned above and to state that your application under reference has been approved and the validity of the G.O. bearing no. -695-CI/O/MM/42/10/MINES Dated 15.11.2018 which was earlier re-validated w.e.f. 15.05.2019 for a period of six(6) months, is further extended for a period of six(6) months w.e.f. 15.11.2019.

This issues with the approval of the Secretary of this Department.

Yours faithfully

Assistant Secretary

ANNEXURE III

Annexure-III

Hatgacha-Jethia Black Stone Mine (Area-71.20 ha.)

M/s West Bengal Mineral Development & Trading Corporation Limited

Corporate Environmental Responsibility (CER) Budget

(As per the provision of OM No. F. No. 22-65/2017-IA-III dated 01 May 2018")

The project cost for Hatgacha-Jethia Black Stone Mine over an area of 71.20 ha. at villages Hatgacha & Jethia, P.S. Mohammad Bazar, Dist. Birbhum is Rs. 14.36 crore. This project being a green field project, the Corporate Environment Responsibility (CER) programme as per the provision of OM No. F. No. 22-65/2017-IA-III dated 01 May 2018" attracts 2% of the project cost, which amount to Rs. 28.72 lakh or about Rs. 29 lakhs (mentioned in the revised EIA & EMP- para 8.5 of Chapter-8).

As per the guideline no. (ii) of the above notification, M/s West Bengal Mineral Development & Trading Corporation Limited (WBMDTC) is committed to spend Rs. 29 lakhs based on public hearing demand:

Budget of Welfare Expenditure based on Public Hearing & Socio-economic needs

Sl. No.	Issues raised by Public & Necessities in Peripheral Areas	1st Year	2nd Year	3rd Year	Total
1.	**Drinking Water Facilities** Construction of Borewell with overhead tank to supply drinking water	Rs 5 lakhs	Rs 2.5 lakhs	0	Rs 7.5 lakhs
2.	**Health Care Facility** Providing ambulance to address the emergency need	Rs 8 lakhs	0	0	Rs 8 lakhs
3.	**Infrastructure Development** Installation of adequate no. of transformers for uninterrupted power supply to the locality; Construction of girls toilet at Jethia & Duarpahari school; Installation of solar lights to provide alternative source of energy to the tribal villages in the locality	0	Rs 7 lakhs	Rs 3.5 lakhs	Rs 10.5 lakhs
4.	**Skill Development** Providing vocational training to 10 villagers	Rs 1 lakh	Rs 1 lakh	Rs 1 lakh	Rs 3 lakh

Total Expenditure towards CER in 3 years is Rs 29 lakhs.

24/02/2020

SHYAMA PRASAD HAZRA
Dy. General Manager (Project)
WEST BENGAL MINERAL DEVELOPMENT
& TRADING CORPORATION LIMITED
13, Nellie Sengupta Sarani
Kolkata-700087

Budget of Village wise Welfare Expenditure based on Public Hearing & Socio-economic needs

Drinking Water Facilities

Sl. No.	Name of Village	Particulars of the Project	Under G.P.	Assessment Amount for 3years
1.	Hatgacha	Construction of Borewell with overhead tank to supply drinking water	Barkata G.P.	Rs 2.5 lakhs
2.	Jethia			Rs 2.5 lakhs
3.	Duarpahari			Rs 2.5 lakhs
Total				**Rs 7.5 lakhs**

Health Care Facilities

Sl. No.	Name of Village	Particulars of the Project	Under G.P.	Assessment Amount for 3years
1.	Hatgacha	Providing ambulance to address the emergency need	Barkata G.P.	Rs 8 lakhs
2.	Jethia			
3.	Duarpahari			
Total				**Rs 8 lakhs**

Infrastructure Development

Sl. No.	Name of Village	Particulars of the Project	Under G.P.	Assessment Amount for 3years
1.	Hatgacha	Installation of adequate no. of transformers for uninterrupted power supply to the locality; Construction of girls toilet at Jethia & Duarpahari school; Installation of solar lights to provide alternative source of energy to the tribal villages in the locality	Barkata G.P.	Rs 3 lakhs
2.	Jethia			Rs 4.5 lakhs
3.	Duarpahari			Rs 3 lakhs
Total				**Rs 10.5 lakhs**

Skill Development

Sl. No.	Name of Village	Particulars of the Project	Under G.P.	Assessment Amount for 3years
1.	Hatgacha	Providing vocational training to 10 villagers & subsidy to start own business	Barkata G.P.	Rs 1 lakh
2.	Jethia			Rs 1 lakh
3.	Duarpahari			Rs 1 lakh
Total				**Rs 3 lakhs**

* * * *

24/02/2020

SHYAMA PRASAD HAZRA
Dy. General Manager (Project)
WEST BENGAL MINERAL DEVELOPMEN
& TRADING CORPORATION LIMITED
13, Nellie Sengupta Sarani
Kolkata-700087