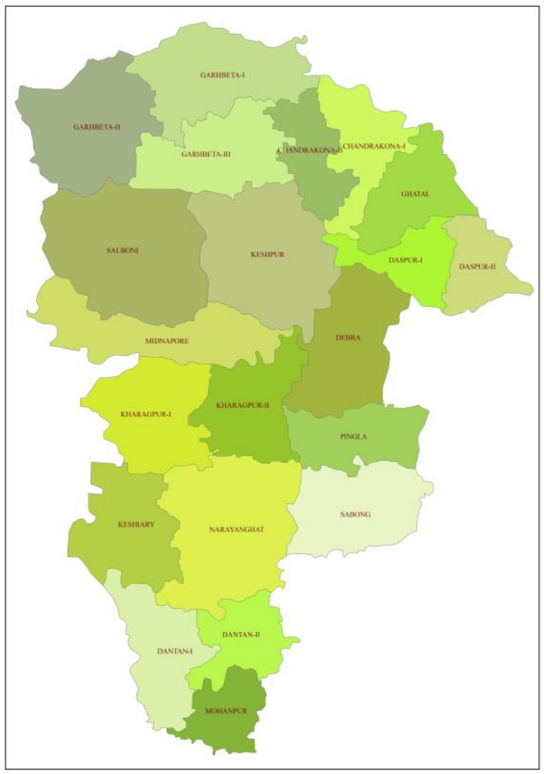
DISTRICT SURVEY REPORT OF PASCHIM MEDINIPUR DISTRICT

(For mining of minor minerals)
As per Notification No.S.O.141 (E) New Delhi Dated 15th of January 2016, S.O.3611 (E) New Delhi Dated 25th of July 2018 and Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) January 2020, Issued by Ministry of Environment, Forest and Climate Change (MoEF&CC)



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PREPARED BY
Department of Industry, Commerce & Enterprises, Government of West Bengal

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No. 1333 MD

Kolkata, 6th January, 2022.

TO WHOM IT MAY CONCERN

This is to certify that DSRs of concerned districts of West Bengal have been duly validated by respective district authorities and their suggestions/inputs, if any, have been duly incorporated in the DSRs. The DSRs have been finally scrutinised and accepted by the scrutiny committee of DMM, WB and the same have been forwarded to the Dept. of Industry, Commerce and Enterprises along with respective scrutiny reports for onward transmission to SEAC for necessary action.

6.1

Director of Mines and Minerals
Govt. of West Bengal

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Abbreviations

% DEP – Departures

° C – Degree Centigrade

BGL – Below Ground Level

CD - Community Development

Cft- Cubic Feet

CGWB - Central Ground water Board

CRIS - Customized Rainfall Information System

Cum - Cubic meter

DGMS - Directorate General of Mines Safety

DGPS - Differential Global Positioning system.

DL&LRO - District Land & Land Reform officer

DSR - District Survey Report

EC – Environmental Clearance

EIA- Environment Impact Assessment

EMGSM - Enforcement and Monitoring Guideline for Sand Mining

ENVIS - Environmental Information System

ft – Feet

GIS - Geographical Information System

GMEC - Global Management and Engineering Consultant

GSI - Geological Survey of India

Ha – Hectare

hr - Hour

IMD – Indian Meteorological Department

ISRO - The Indian Space Research Organization

KM - Kilometer

LISS - Linear Imaging Self-Scanning Sensor

LOI - Letter of Intent

LULC - Land Use Land Cover

m^2 - Square meter

MBT - Main Boundary Thrust

MCT - Main Central Thrust

MFT - Main Frontal Thrust

Mcum – Million Cubic Meters

MMDR - Mines & Minerals (Development and Regulation) Act

MMR - Metalliferous Mines Regulation

MOEF & CC - Ministry of Environment, forest & Climate Change

Mph- miles per hour

M-Sand - Mineral Sand

MSME - Micro, Small & Medium Enterprises

Mt - Metric Ton

MT – Million Tons

NGT - National Green Tribunal

NH – National Highway

NIC - National Informatics Centre

OC - Officer In Charge

OGL - Original Ground level

PSU - Public Sector Unit

R/F – Rain Fall

SSMG - Sustainable Sand Mining Guidelines

WBMDTCL- West Bengal Mineral Development and Trading Corporation Limited

The WBMMCR 2016 – The West Bengal Minor Mineral Concession Rules, 2016

Definitions

Riverbed: A riverbed is the area between two banks of river where sediment deposited. During the normal flow period, river water is contained in and flows along the riverbed. However, during a flood, the river overflows the riverbed and flows onto the floodplain.

Sandbars: The sandbar is the ridge of sand or coarse sediment that is built over a period of time.

Pre monsoon Sandbars: Sandbars which are identified from satellite imagery of pre monsoon period.

Post monsoon Sandbars: Sandbars which are identified from satellite imagery of post monsoon period.

Restricted Area: Sandbars or part of sandbars which are falling within restricted area. As per the Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) 2020 the restricted zone for mining is a distance from the bank is ¼th of river width and not be less than 7.5 meters. Also, there is a no mining zone up to a distance of 1 kilometre (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side. No mining zone has been marked for an area up to a width of 100 meters from the active edge of embankments.

Potential Zone: Sandbars which are falling within the central $3/4^{th}$ part of the riverbed and which are not falling within the restricted area.

Potential Block: Each individual sand bars of potential zone is Potential Block.

River bed occurrence: River bed occurrence means sand, stone, boulder, pebbles, gravel accumulated in the river bed by natural phenomenon.

Replenishment: Quantum of sand deposited in a mined out void during monsoon period.

Aggradations: Aggradation (or alluviation) is the term used in geology for the increase in land elevation, typically in a river system, due to the deposition of sediment. Aggradation occurs in areas in which the supply of sediment is greater than the amount of material that the system is able to transport.

Act: It means the Mines and Minerals (Development and Regulation) Act, 1957(67 of 1957), as subsequently amended.

Mineral: It means minor minerals as defined in clause (e) of section 3 of the Act.

Sand: A natural resource, is a minor mineral as defined under S 3(e) of the Mines and Minerals (Development and Regulation) Act, 1957 (" MMDR Act").

Lease: It means a mining lease granted under West Bengal Minor Mineral Concession Rules, 2016.

Mining: Excavation of mineral by manual method or using machineries.

EXECUTIVE SUMMARY

Paschim Medinipur district is located in the south-western part of the state and bounded by Jhargram district in the West and by the Mayurbhanj and Balasore District of Orissa in the south. To its eastern side is the Purba Medinipore, while the district Bankura lies to its North.

Geomorphologically the district is characterized by hard rock uplands, lateritic covered area, flat alluvial and deltaic plains. Extremely rugged topography is seen in the western part of the district and rolling topography is experienced in the lateritic covered area. These rolling plains gradually merge into flat alluvial and deltaic plains to the East and the South-East of the District.

The maximum area of the district falls under the Seismic Zone III and rest of the part fall under Zone II, indicating the district under safe earthquake–prone zone.

The drainage system of the district is mainly controlled by rivers like Shilabati, Kangsabati and Subarnarekha River along with their network of tributaries. The rivers of district Paschim Medinipur, owing to the typical physiographical condition of the district, emerge from the Chhotanagpur Plateau to the West, flows East or South-East ward direction according to the slope of the land and meets Bay of Bengal to the South East or tributaries of Hugli (Hooghly) to the East.

The district is generating considerable revenue from mining of minor minerals such as riverbed sand deposits. Revenue generated in the district of Paschim Medinipur from Minor minerals during the period of April 2017 to January 2020 is Rs. 34.45 crores.

Potential minor mineral blocks of sand have been identified based on satellite imagery study along with ground truthing and are listed in this District Survey Report. Restriction zones are defined as per the EMGSM guidelines 2020. In Paschim Medinipur district, total 20.79 Mcum potential river bed deposits estimated.

The most part of the district consists of laterite and alluvium comprises eastern half of the district. The lateritic zones in the eastern part of Paschim Medinipur are forming one of the important minor mineral potential zones of the district. Presences of claystone are also holding minor mineral potential zones.

1 Preface

The need for District Survey Report (DSR) have been necessitated by Ministry of Environment, Forest and Climate Change (MoEF&CC) vide there Notification No. 125 (Extraordinary, Part II Section 3, Sub-section ii), S.O. 141 (E), dated 15th January 2016. The notification was addressed to bring certain amendments with respect to the EIA notification 2006 and in order to have a better control over the legislation. District level committee's have been introduced in the system. As a part of this notification, preparation of District Survey Reports has been introduced. Subsequently, MOEF& CC has published Notification No. 3611 (E), dt. 25thJuly, 2018 regarding inclusion of the "Minerals Other than Sand" and format for preparation of the DSR has been specified. Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) January 2020, Issued by MoEF& CC is prepared in consideration of various orders/directions issued by Hon'ble NGT in matters pertaining to illegal sand mining and also based on the reports submitted by expert committees and investigation teams. This DSR has been prepared in conformity with the S O 141 (E), S O 3611 (E) and other sand mining guidelines published by MOEF& CC time to time as well as the requirement specified in West Bengal Minor Mineral Concession Rule, 2016.

The purpose of DSR is to identify the mineral potential areas where mining can be allowed; and also to distinguish areas where mining will not be allowed due to proximity to infrastructural structures and installations, areas of erosion, areas of environmental sensitivities etc. The DSR would also help to estimate the annual rate of replenishment wherever applicable.

Preparation of this DSR involved both primary and secondary data generation. The primary data generation involved the site inspection, survey, ground truthing etc. while secondary data has been acquired through various authenticated sources and satellite imagery studies. The secondary data related to district profile, local geology, mineralization and other activities are available in rather a piecemeal fashion.

The district survey report of Paschim Medinipur district also describes the general geographical profile of the district, distribution of natural resources, livelihood, climatic condition, inventory of minor minerals and revenue generation.

2 Introduction

The District Survey Report of Paschim Medinipur District has been prepared as per the guide line of Ministry of Environment, Forests and Climate Change (MoEF& CC), Government of India vide Notification S.O.-1533(E) dated 14th Sept, 2006 and subsequent MoEF& CC Notification S.O. 141(E) dated 15th Jan, 2016. This report shall guide systematic and scientific utilization of natural resources, so that present and future generation may be benefitted at large. Further, MoEF& CC published a notification S.O. 3611(E) Dated 25th July, 2018 and recommended the format for District Survey Report.

The main objective of 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 and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area. The DSR would also help to calculate the annual rate of replenishment wherever applicable and allow time for replenishment. Besides the sand mining, the DSR also include the potential development scope of in-situ minor minerals.

The objectives of the District Survey Report are as follows:

1. To identify and quantify minor mineral resources for its optimal utilization.
2. To regulate sand and gravel mining, identification of site specific end-use consumers and reduction in demand and supply gaps.
3. To facilitate use information technology (IT) for surveillance of the sand mining at each step.
4. To enable environmental clearance for cluster of sand and gravel mines.
5. To restrict illegal mining.
6. To reduce occurrences of flood in the area.
7. To maintain the aquatic habitats.
8. To protect ground water in the area by limiting extraction of material in riverbeds to an elevation above the base flow.
9. To maintain data records viz. details of mineral resource, potential area, lease, approved mining plan, co-ordinates of lease hold areas, and revenue generation.
10. To design a scientific mining plan and estimate ultimate pit limit.
11. To frame a comprehensive guideline for mining of sand and other minor minerals.

The District Survey Report (DSR) comprises secondary data on geology, mineral resources, climate, topography, land form, forest, rivers, soil, agriculture, road, transportation, irrigation etc of the district collected from various published and un-published literatures and reports as well as various websites. Data on lease and mining activities in the district, revenue etc. have been collected from the DL&LRO office of the district and from West Bengal Mineral Development Corporation Limited.

2.1 Statutory Framework

Ministry of Environment, Forest and Climate Change (MoEF& CC) has published several notifications time to time to formulate and implement the District Survey Report (DSR) for every district. Statutory Framework and its legal aspect with respect to DSR is tabulated in Table 2.1.

Table 2.1: Statutory Framework and guidelines on DSR with time scale

Year	Particulars
1994	The Ministry of Environment, Forest & Climate Change (MoEF&CC) published Environmental Impact Assessment Notification 1994 which is only applicable for the Major Minerals more than 5 ha.
2006	In order to cover the minor minerals also into the purview of EIA, the MoEF&CC has issued EIA Notification SO 1533 (E), dated 14th September 2006, made mandatory to obtain environmental clearance for both Major & Minor Mineral more than 5 Ha.
2012	Further, Hon'ble Supreme Court wide order dated the 27th February, 2012 in I.A. No.12- 13 of 2011 in Special Leave Petition (C) No.19628-19629 of 2009, in the matter of Deepak Kumar etc. Vs. State of Haryana and Others etc., ordered that "leases of minor minerals including their renewal for an area of less than five hectares be granted by the States/Union Territories only after getting environmental clearance from MoEF"; and Hon'ble National Green Tribunal, order dated the 13th January, 2015 in the matter regarding sand mining has directed for making a policy on environmental clearance for mining leases in cluster for minor Minerals.
2016	The MoEF&CC in compliance of above Hon'ble Supreme Court's and NGT'S order has prepared "Sustainable Sand Mining Guidelines (SSMG), 2016" in consultation with State governments, detailing the provisions on environmental clearance (EC) for cluster, creation of District Environment Impact Assessment Authority, preparation of District survey report and proper monitoring of minor mineral. There by issued Notification dated 15.01.2016 for making certain amendments in the EIA Notification, 2006, and made mandatory to obtain EC for all minor minerals. Provisions have been made for the preparation of District survey report (DSR) for River bed mining and other minor minerals.
2016	West Bengal Minor Minerals Concession Rules, 2016 amended the Mines and Minerals (Development and Regulation) Act, 1957 (Act 67 of 1957), to make the rules regulating the grant of mining licenses, prospecting license-cum-mining leases and mining leases in respect of minor minerals by auction process. The rule also incorporates EIA

	2016 also includes SSMG 2016 for minor mineral mining.
2018	MoEF& CC published a notification S.O. 3611(E) Dated 25th July, 2018 and recommended the format for District Survey Report .The notification stated about the objective of DSR i.e."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 and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area".
2020	Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) 2020 has been published modifying Sustainable sand Mining Guidelines, 2016 by MoEF& CC for effective enforcement of regulatory provisions and their monitoring. The EMGSM 2020 directed the states to carry out river audits, put detailed survey reports of all mining areas online and in the public domain, conduct replenishment studies of river beds, constantly monitor mining with drones, aerial surveys, ground surveys and set up dedicated task forces at district levels. The guidelines also push for online sales and purchase of sand and other riverbed materials to make the process transparent. They propose night surveillance of mining activity through night-vision drones.

Important statutory Guidelines for sand or gravel mining:

- **The West Bengal Minor Minerals Concession Rules (WBMMCR), 2016**

1) (a) No person shall undertake mining operation in any area prohibited by the 'State Government in the public interest by notification in the *Official Gazette*.
Provided that nothing in the sub-rule shall affect any mining operation undertaken in any area in accordance with the terms and conditions of a mining lease or mineral concession already granted.
(b) No person shall transport or store or cause to be transported or stored any mineral otherwise than in accordance with the provisions of these rules and the West Bengal Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2002.

(2) No minor mineral coming out in course of digging of wells or excavation of tanks shall be disposed of by the person digging or excavating without informing the District Authority as well as the Executive Officer of the *Panchayat Samiti* or the Executive Officer of the Municipality concerned, as the case may be, about such occurrence.
Provided that disposal of such minor mineral may be allowed on pre-payment of prices of such minor mineral at the prevailing market rate as determined on the basis of the rates published by the Public Works Department / concerned department of the State Government for the concerned area from time to time.

(3) No mining of river bed occurrences shall be allowed within 300 meters, upstream and downstream, measured from the centre line of any bridge, regulator or similar hydraulic structure and from the end point of bank protection works.

(4) No river bed mining shall be allowed beneath 3 meters of the river bed or ground water Ievel, whichever is less.

(5) No mining operation in case of river bed occurrence shall be done within a distance of three (3) kilometers of a barrage axis or dam on a river unless otherwise permitted by the concerned Executive Engineer or Revenue Officer or authorized officer and such distance shall be reckoned across an imaginary line parallel to the 'barrage, or dam axis, as the case maybe.

(6) No extraction of river bed occurrence shall 'be allowed beyond the central one third of the river bed, or keeping a distance of 100 meter from the existing bank line whichever is less, unless otherwise permitted by the concerned Executive Engineer or Revenue Officer.

(7) No extraction of minerals other than river bed occurrence shall be allowed within fifty (50) meters from any road, public structure, embankment, railway line, bridge canal, road and other public works or buildings.

(8) No mining lease shall be granted without proof of existence of mineral contents in the area for which the application for a mining lease has been made in accordance with such parameters as may be prescribed by the Government from time to time.

N.B- The aforesaid application for mining lease shall succeed the competitive bidding for mining lease for a specified mineral(s).

- **Sustainable Sand Mining Management Guidelines (SSMMG), 2016 by MoEF& CC.**

  The sustainable sand Mining Management Guidelines 2016 has been prepared after extensive consultation with the States and Stakeholders over a period of one year. The main objective of the Guideline is to ensure sustainable sand mining and environment friendly management practices in order to restore and maintain the ecology of river and other sand sources.

a) Parts of the river reach that experience deposition or aggradation shall be identified first. The Lease holder/ Environmental Clearance holder may be allowed to extract the sand and gravel deposit in these locations to manage aggradation problem.

b) The distance between sites for sand and gravel mining shall depend on the replenishment rate of the river. Sediment rating curve for the potential sites shall be developed and checked against the extracted volumes of sand and gravel.

c) Sand and gravel may be extracted across the entire active channel during the dry season.

d) Abandoned stream channels on terrace and inactive flood plains be preferred rather than active channels and their deltas and flood plains. Stream should not be diverted to form inactive channel.

e) Layers of sand and gravel which could be removed from the river bed shall depend on the width of the river and replenishment rate of the river.

f) Sand and gravel shall not be allowed to be extracted where erosion may occur, such as at the concave bank.

g) Segments of braided river system should be used preferably falling within the lateral migration area of the river regime that enhances the feasibility of sediment replenishment.

h) Sand and gravel shall not be extracted within 200 to 500 meter from any crucial hydraulic structure such as pumping station, water intakes, and bridges. The exact distance should be ascertained by the local authorities based on local situation. The cross-section survey should cover a minimum distance of 1.0 km upstream and 1.0 km downstream of the potential reach for extraction. The sediment sampling should include the bed material and bed material load before, during and after extraction period. Develop a sediment rating curve at the upstream end of the potential reach using the surveyed cross- section. Using the historical or gauged flow rating curve, determine the suitable period of high flow that can replenish the extracted volume. Calculate the extraction volume based on the sediment rating curve and high flow period after determining the allowable mining depth.

h) Sand and gravel could be extracted from the downstream of the sand bar at river bends. Retaining the upstream one to two thirds of the bar and riparian vegetation is accepted as a method to promote channel stability.

Flood discharge capacity of the river could be maintained in areas where there are significant flood hazard to existing structures or infrastructure. Sand and gravel mining may be allowed to maintain the natural flow capacity based on surveyed cross- section history.

i) Alternatively, off-channel or floodplain extraction is recommended to allow rivers to replenish the quantity taken out during mining.

j) The Piedmont Zone (Bhabhar area) particularly in the Himalayan foothills, where riverbed material is mined, this sandy-gravelly track constitutes excellent conduits and holds the greater potential for ground water recharge. Mining in such areas should be preferred in locations selected away from the channel bank stretches.

k) Mining depth should be restricted to 3 meter and distance from the bank should be 3 meter or 10 percent of the river width whichever less.

The borrow area should preferably be located on the river side of the proposed embankment, because they get silted up in course of time. For low embankment less than 6 m in height, borrow area should not be selected within 25 m from the toe/heel of the embankment. In case of higher embankment the distance should not be less than 50 m. In order to obviate development of flow parallel to embankment, cross bars of width eight times the depth of borrow pits spaced 50 to 60 meters centre-to-centre should be left in the borrow pits.

l) Demarcation of mining area with pillars and geo-referencing should be done prior to start of mining.

- **Enforcement & Monitoring Guidelines for sand Mining, 2020 (MoEF& CC)**

The Ministry of Environment Forest & Climate Change formulated the Sustainable Sand Management Guidelines 2016 which focuses on the Management of Sand Mining in the Country. But in the recent past, it has been observed that apart from management and systematic mining practices there is an urgent need to have a guideline for effective enforcement of regulatory provision and their monitoring. Section 23 C of MMDR, Act 1957 empowered the State Government to make rules for preventing illegal mining, transportation and storage of minerals. But in the recent past, it has been observed that there was large number of illegal mining cases in the Country and in some cases, many of the officers lost their lives while executing their duties for curbing illegal mining incidence. The illegal and uncontrolled illegal mining leads to loss of revenue to the State and degradation of the environment.

a) Parts of the river reach that experience deposition or aggradation shall be identified. The Leaseholder/ Environmental Clearance holder may be allowed to extract the sand and gravel deposit in these locations to manage aggradation problem.
b) The distance between sites for sand and gravel mining shall depend on the replenishment rate of the river. Sediment rating curve for the potential sites shall be developed and checked against the extracted volumes of sand and gravel.
c) Sand and gravel may be extracted across the entire active channel during the dry season.
d) Abandoned stream channels on the terrace and inactive floodplains be preferred rather than active channels and their deltas and flood plains. The stream should not be diverted to form the inactive channel.
e) Layers of sand and gravel which could be removed from the river bed shall depend on the width of the river and replenishment rate of the river.
f) Sand and gravel shall not be allowed to be extracted where erosion may occur, such as at the concave bank.
g) Segments of the braided river system should be used preferably falling within the lateral migration area of the river regime that enhances the feasibility of sediment replenishment.
h) Sand and gravel shall not be extracted up to a distance of 1 kilometre (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side.
i) The sediment sampling should include the bed material and bed material load before, during and after the extraction period. Develop a sediment rating curve at the upstream end of the potential reach using the surveyed cross-section. Using the historical or gauged flow rating curve, determine the suitable period of high flow that can replenish the extracted volume. Calculate the extraction volume based on the sediment rating curve and high flow period after determining the allowable mining depth.
j) Sand and gravel could be extracted from the downstream of the sand bar at river bends. Retaining the upstream one to two-thirds of the bar and riparian vegetation is accepted as a method to promote channel stability.
k) The flood discharge capacity of the river could be maintained in areas where there is a significant flood hazard to existing structures or infrastructure. Sand and gravel mining may be allowed to maintain the natural flow capacity based on surveyed cross-section history. Alternatively, off-channel or floodplain extraction is recommended to allow rivers to replenish the quantity taken out during mining.
l) The Piedmont Zone (Bhabhar area) particularly in the Himalayan foothills, where riverbed material is mined, this sandy-gravelly track constitutes excellent conduits and holds the greater potential for groundwater recharge. Mining in such areas should be preferred in locations selected away from the channel bank stretches.

m) Mining depth should be restricted to 3 meters and distance from the bank should be ¼th or river width and should not be less than 7.5 meters.

n) The borrow area should preferably be located on the riverside of the proposed embankment because they get silted in the course of time. For low embankment, less than 6 m in height, borrow area should not be selected within 25 m from the toe/heel of the embankment. In the case of the higher embankment, the distance should not be less than 50 m. In order to obviate the development of flow parallels to the embankment, crossbars of width eight times the depth of borrow pits spaced 50 to 60 meter center-to-center should be left in the borrow pits.

o) Demarcation of mining area with pillars and geo-referencing should be done prior to the start of mining.

p) A buffer distance /un-mined block of 50 meters after every block of 1000 meters over which mining is undertaken or at such distance as may be the directed/prescribed by the regulatory authority shall be maintained.

q) A buffer distance /unmined block of 50 meters after every block of 1000 meters over which mining is undertaken or at such distance as may be the directed/prescribed by the regulatory authority shall be maintained.

r) River bed sand mining shall be restricted within the central 3/4th width of the river/rivulet or 7.5 meters (inward) from river banks but up to 10% of the width of the river, as the case may be and decided by regulatory authority while granting environmental clearance in consultation with irrigation department. Regulating authority while regulating the zone of river bed mining shall ensure that the objective to minimize the effects of riverbank erosion and consequential channel migration are achieved to the extent possible. In general, the area for removal of minerals shall not exceed 60% of the mine lease area, and any deviation or relaxation in this regard shall be adequately supported by the scientific report.

s) Mining Plan for the mining leases(non-government) on agricultural fields/Patta land shall only be approved if there is a possibility of replenishment of the mineral or when there is no riverbed mining possibility within 5 KM of the Patta land/Khatedari land. For government projects mining could be allowed on Patta land/Khatedari land but the mining should only be done by the Government agency and material should not be used for sale in the open market.

The minerals reserve for riverbed area is calculated on the basis of maximum depth of 3 meters and margins, width and other dimensions as mentioned in para (s) above. The area multiplied by depth gives the volume and volume multiplied with bulk density gives the quantity in Metric Ton. In case of riverbed, mineable material per hectare area available for actual mining shall not exceed the maximum quantity of 60,000 MT per annum.

Demand and Utilisation of Sand

Sand is a multi-purpose topographical material. It is known as one of the three fundamental ingredients in concrete. The composition of sand is diverse. Mostly sand is made of silica which is a common element. It can also come from another source of minerals like quartz, limestone, or gypsum.

From beds to flood plains to coastlines- we can find the sand at almost everywhere. The robustness of sand has played a significant role in everyday life. We use sand practically every other day.

Sand extraction from river beds and brick earth mining for making raw bricks are the main mining activities in the district. With a spurt in construction of real estate sectors and various govt. sponsored projects, the demand for both sand and bricks has increased manifold. The extraction of sand is carried out either manually or through semi- mechanized system. The depth of mining for both river bed sand and brick earth is restricted due to statutory provision in the regulations pertaining to conservation and development of minor minerals.

River sand mining is a common practice as habitation concentrates along the rivers and the mining locations are preferred near the markets or along the transportation route, for reducing the transportation cost.

In the real world, there are a lot of situations where we can find uses of sand. Followings are the common sand uses.

1. While bunging metal, we can mix sand with clay binder for frameworks used in the foundries.
2. Sand can be used for cleaning up oil leak or any spill by dredging sand on that spill. The material will form clumps by soaking up, and we can quickly clean the mess.
3. Sand can be used as a road base which is a protective layer underneath all roads
4. Industrial sand is used to make glass, as foundry sand and as abrasive sand.
5. One creative usage of sand is serving as a candle holder. We can try putting some sand before pouring tea light or any candle in a glass. It holds the candle still and refrain the candle from rolling by giving it an excellent decoration.
6. Adds texture and aesthetic appeal to space.
7. Sand is mostly pure to handle, promptly available and economically wise.
8. We use sand in aquariums, fabricating artificial fringing reefs, and in human-made beaches
9. Sandy soils are ideal for growing crops, fruits and vegetables like watermelon, peaches, peanuts, etc.
10. Sand can light a path by filling mason jars with sand and tea light which is another inexpensive way to make a walkway glow.
11. Sand helps to improve resistance (and thus traffic safety) in icy or snowy conditions.
12. We need sand in the beaches where tides, storms or any form of preconceived changes to the shoreline crumble the first sand.
13. Sand containing silica is used for making glass in the automobile and food industry- even household products for the kitchen.
14. Sand is a strong strand which is used for plaster, mortar, concrete, and asphalt.
15. The usual bricks formulated of clay only are way weaker and lesser in weight than blocks made of clay mixed with sand.

2.2 Methodology of DSR Preparation

The steps followed during the preparation of District Survey Report are given in Figure 2.1. The individual steps are discussed in following paragraphs.

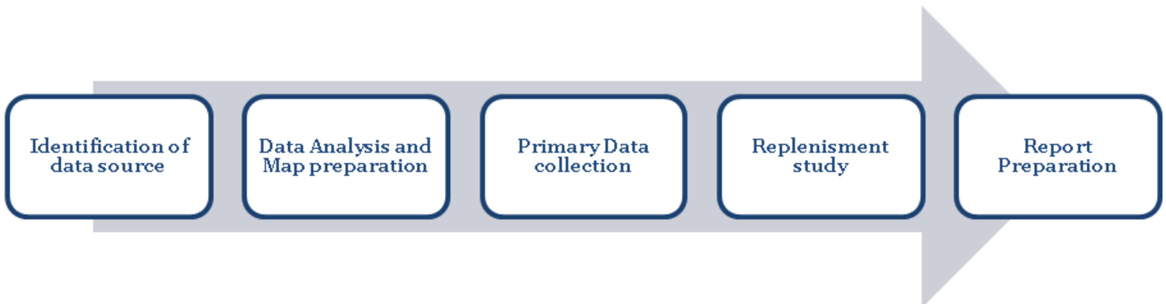


Figure 2.2.1: Steps followed in preparation of DSR

Data source Identification: District Survey Report has been prepared based on the Primary data base and secondary data base collected and collated from different sources. This is very critical to identify authentic data sources before compiling the data set. The secondary data sources which are used in this DSR are mostly taken from public domain and or from the published report in reputed journal. Information related to district profile has been taken from District Census report, 2011 and District Statistical Handbook published by the Govt. of West Bengal. Potential mineral resources of the district have been described based on the published report of Geological Survey of India (GSI) or any other govt. agencies like MECL etc. List of Mining lease, name of lease holder, lease/Block area, resource in already allotted mining lease, revenue from minor mineral sector etc. have been collected from the concern DL&LRO offices of the district. Satellite images have been used for map preparation related to physiography and land use/land cover of the district.

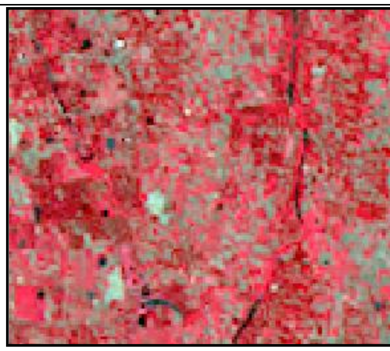
Data Analysis and Map preparation: Dataset which are captured during the report preparation, are gone through detail analysis work. District Survey Report involves the analytical implication of the captured dataset to prepare relevant maps.

Methodology adopted for preparation of relevant maps is explained below.

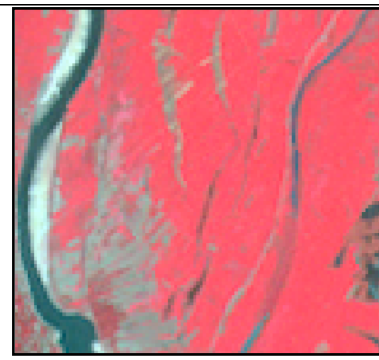
<u>Land Use and Land Cover Map:</u> Land Use and Land Cover classification is a complex process and requires consideration of many factors. The major steps of image classification may include determination of a suitable classification system via Visual Image Interpretation, selection of training samples, Satellite image (FCC-False Color Composite) pre-processing, selection of suitable classification approaches, post classification processing, and accuracy assessment.

Here LISS-III satellite Imagery has been taken for Supervised Classification as supervised classification can be much more accurate than unsupervised classification, but depends heavily on the training sites, the skill of the individual processing the image, and the spectral distinctness of the classes in broader scale.

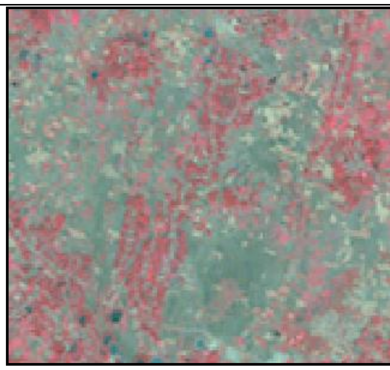
According to the Visual Image Interpretation (Tone, Pattern, Texture, Shape, Color etc.) training set of the pixel has been taken. Pictorial descriptions of Land Use classification are explained in Figure 2.2.



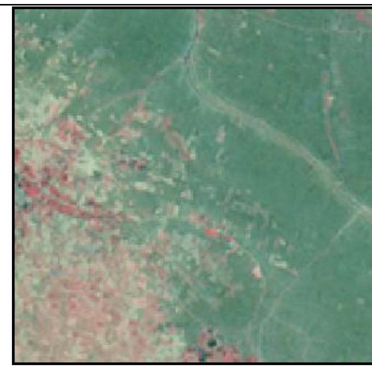
Agricultural Land - Based on their Geometrical shape, Red and Pink color tone, Agricultural Land has been identified.



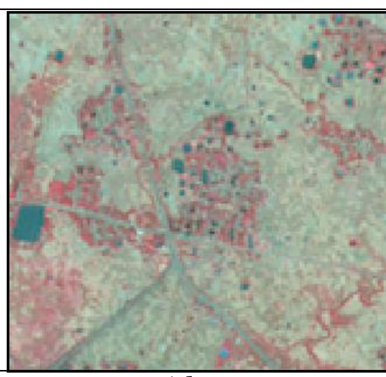
Vegetation Covered Area - Area with continuous Red color tone, Vegetation Covered Area has been classified.



Agricultural Fallow Land - Based on their Geometrical shape, Yellowish green color tone, Agricultural Fallow Land has been identified.



Badland Topography- Area with Non geometrical shape and Yellowish green color tone has been identified as Bad Land Topography.



Settlement – Area with some geometrical shape in a Linear Pattern including Light Cyan Color has been recognized as Settlement Area.

Water Bodies – Area with Blue color has been classified as Water Bodies.

Figure 2.2.2: Pictorial description of Land Use Classification methods

Geomorphological Map: The major step of preparing Geomorphological Map is identifying features like – Alluvial Fan, Alluvial Plain, Hilly Region etc. from Satellite Imagery

(FCC-False Colour Composite) via Visual Image Interpretation and then digitisation has been taken into the consideration to prepare map including all the Geomorphological features according to their location. Pictorial descriptions of Geomorphological unit's classification are explained in Figure 2.3.

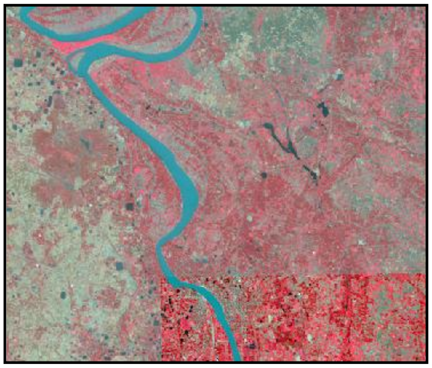
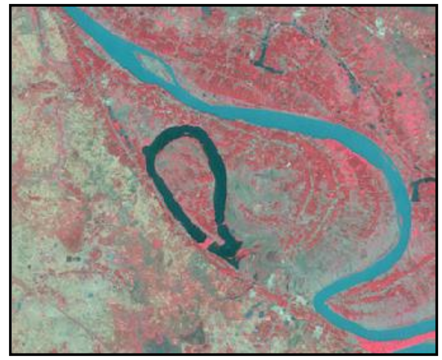
	
Flood plain-Floodplainis a generally flat area of land next to a river or stream. It stretches from the banks of the river to the outer edges of the valley. For Paschim Medinipur District, Whole region has been classified as Flood Plain Area.	**OX-BOW Lake-** An ox-bow lake starts out as a curve, or meander, in a river. This "U" shaped body of water identified as Ox-Box Lake from Satellite Imagery.

Figure 2.2.3: Pictorial description of Geomorphological Units Classification methods

Physiographical Map: The major step of preparing Physiographical Map is generating contour at a specific interval to show the elevation of the area using Cartosat DEM.

Block Map/Transportation Map/Drainage Map:

- Raw Data collected from **National Informatics Centre (NIC Website) during Sept 2020.**
- Data has been geo-referenced using GIS software.
- Digitization of block boundary, district boundary, state boundary, international boundary, and district headquarter, sub–district headquarter, places, road, railway, river, nala etc.
- Road name, River name, Railway name has been filled in attribute table of the Layers
- Final layout has been prepared by giving scale, legend, north arrow, etc.

Earthquake Map:

- Raw data collected from **Ministry of Earth Science.**
- Data has been geo-referenced using GIS software.
- Digitization of Earthquake zone and superimposed it over Block Boundary.
- Zone name has been filled in attribute table of the Layers
- Final layout has been prepared by giving scale, legend, north arrow, etc.

Soil Map:

- Raw data collected from **National Bureau of Soil Survey and Land Use Planning during Sept 2020.**
- Data has been geo-referenced using GIS software.
- Digitization of Soil classification zone and superimposed it over District Boundary.
- Soil classification has been filled in attribute table of the Layers.
- Final layout has been prepared by giving scale, legend, north arrow, etc.

Wildlife Sanctuary and National Park location Map:

- Raw data obtained from **ENVIS Centre on Wildlife & Protected Areas during August 2020.**
- Data has been geo-referenced using GIS software.
- Digitization of Wildlife Sanctuary and National Park and superimposed it over Block Boundary.
- Wildlife Sanctuary & National Park name has been filled in attribute table of the Layers

Final layout has been prepared by giving scale, legend, north arrow, etc.

Primary Data Collection: To prepare DSR, primary data has been collected and field work has also been carried out for the district. Field study involves assessment of the mineral resources of the district by means of pitting / trenching in specific interval. This provides clear picture of mineral matters characterization and their distribution over the area.

Replenishment study: One of the principal causes of environmental impacts river bed mining is the removal of more sediment than the system can replenish. Therefore, there is a need for replenishment study for riverbed sand in order to nullify the adverse impacts arising due to excess sand extraction. The annual rate of replenishment carried out on every river of the district to have proper assessment of the potential sand reserve.

Four times physical survey has been carried out by GPS/DGPS/ Total Station to define the topography, contours and offsets of the riverbed. The surveys clearly depict the important attributes of the stretch of the river and its nearby important civil and other feature of importance. This information will provide the eligible spatial area for mining.

Report Preparation: The district survey report portrays general profile, geomorphology, land use pattern and geology of the district. The report then describes the availability and distribution of riverbed sands and other minor minerals in the district. Apart from delineation the potential mining blocks, the report also includes inventorization of the minerals, recent trends of production of minor minerals and revenue generation there from. Annual replenishment of the riverbed sand has been estimated using field observation, satellite imagery and empirical formula. The road network connecting arterial road to potential mining blocks has been identified. Potential environmental impacts of mining of these minerals, their mitigation measures along with risk assessment and disaster management plan have also been discussed. Finally the reclamation strategy for already mined out areas is also chalked out.

3 General Profile of the district

a) General Information

Paschim Medinipur (also known as Midnapore West), located in the south-western part of West Bengal, was created with the partition of the erstwhile Midnapore district, then the largest district of India, on 1 January 2002. On 4 April 2017, the Jhargram subdivision was converted into a district. Paschim Medinipur district ranks second in terms of geographical area amongst the districts of the state, next to South 24-Parganas. The district covers an area of 9368 sq.km (https://Paschim Medinipur.gov.in/).

It is bounded by Jhargram district in the West and by the Mayurbhanj and Balasore District of Orissa in the south. To its eastern side is the Purba Medinipore, while the district Bankura lies to its North. The district's Head quarter is at Medinipore (Figure 3.1).

The district comprises three subdivisions: Kharagpur, Medinipur Sadar and Ghatal. Kharagpur subdivision consists of Kharagpur municipality and ten community development blocks: Dantan–I, Dantan–II, Pingla, Kharagpur–I, Kharagpur–II, Sabang, Mohanpur, Narayangarh, Keshiari and Debra. Medinipur Sadar subdivision consists of Midnapore municipality and six community development blocks: Medinipur Sadar, Garhbeta–I, Garhbeta–II, Garhbeta–III, Keshpur and Shalboni. Ghatal subdivision consists of five municipalities (Ramjibanpur, Chandrakona, Khirpai, Kharar and Ghatal) and five community development blocks: Chandrakona–I, Chandrakona–II, Daspur–I, Daspur–II and Ghatal (https://en.wikipedia.org/wiki/Paschim_Medinipur_district) (Figure 3.2).

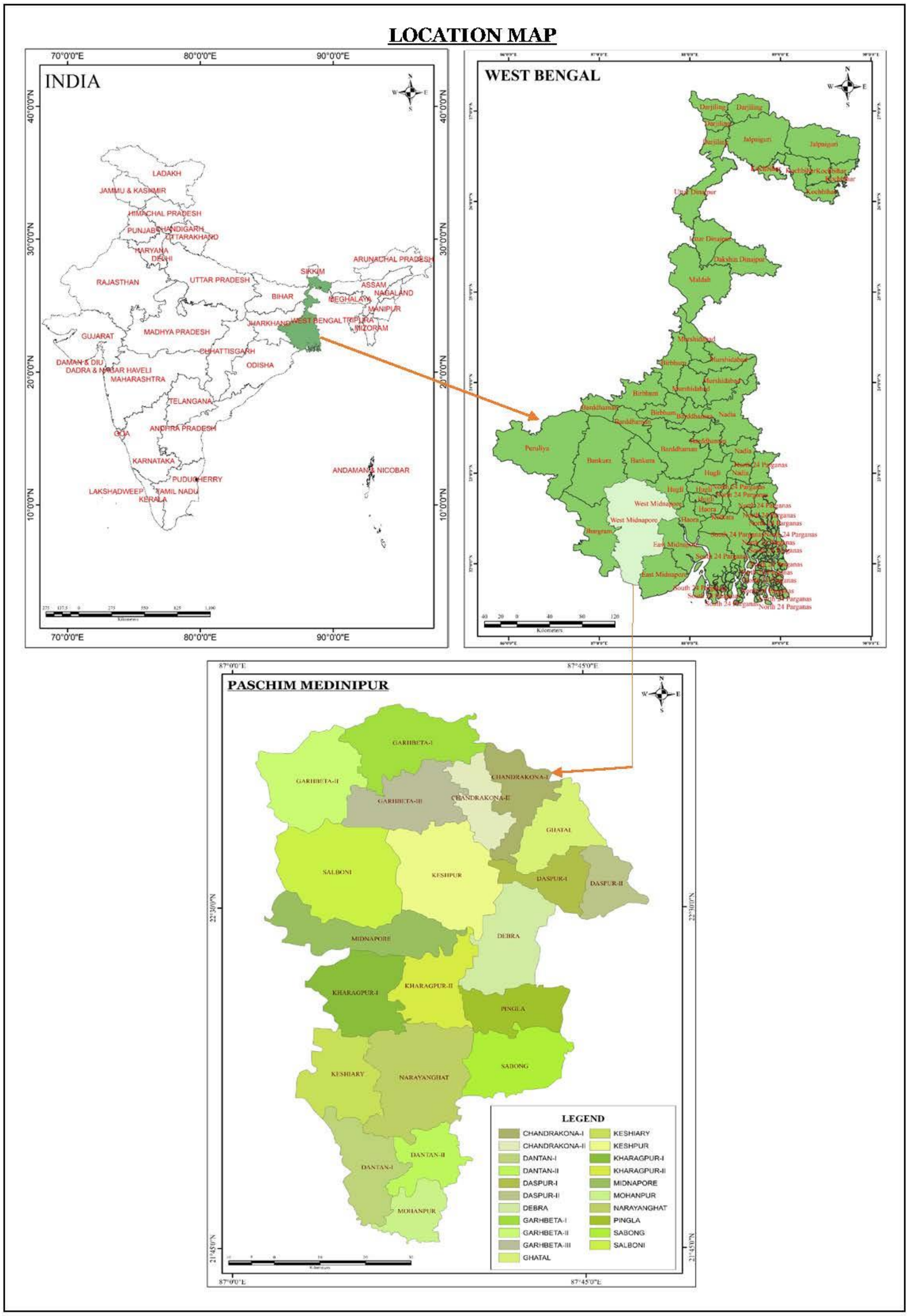


Figure 3.1: Location Map of Paschim Medinipur
(Source: National Informatics Centre and ESRI Base Map)

Table 3.3.1: Block distribution of Paschim Medinipur District

Sub-Division	Police Station	C.D.Block / M	Panchayat		
			Samity	Gram	Gram Sansad
(1)	(2)	(3)	(4)	(5)	(6)
Sadar Sub-Div.	**6**	**6/1**	**6**	**64**	**880**
	Salboni	Salboni	1	10	134
	Keshpur Anandapur	Keshpur	1	15	230
	Garhbeta & Goaltore	Garhbeta-I	1	12	162
		Garhbeta-II	1	10	110
		Garhbeta-III	1	8	115
	Medinipur	Medinipur	1	9	129
		Medinipur(M)	-	-	-
Kharagpur Sub-Div.	**10**	**10/1**	**10**	**99**	**1451**
	Debra	Debra	1	14	214
	Pingla	Pingla	1	10	142
	Keshiary	Keshiary	1	9	110
	Dantan	Dantan-I	1	9	124
	Belda	Dantan-II	1	7	114
	Narayangarh	Narayangarh	1	16	224
	Mohanpur	Mohanpur	1	5	82
	Sabong	Sabong	1	13	200
	Kharagpur (Local)	Kharagpur-I	1	7	112
		Kharagpur-II	1	9	129
	Kharagpur (Town)	Kharagpur(M)	-	-	-
Ghatal Sub-Div.	**3**	**5/5**	**5**	**48**	**709**
	Chandrakona	Chandrakona-I	1	6	102
		Chandrakona-II	1	6	86
		Chandrakona(M)	-	-	-
		Khirpai(M)	-	-	-
		Ramjibanpur(M)	-	-	-
	Ghatal	Ghatal	1	12	166
		Kharar(M)	-	-	-
		Ghatal(M)	-	-	-
	Daspur	Daspur-I	1	10	161
		Daspur-II	1	14	194

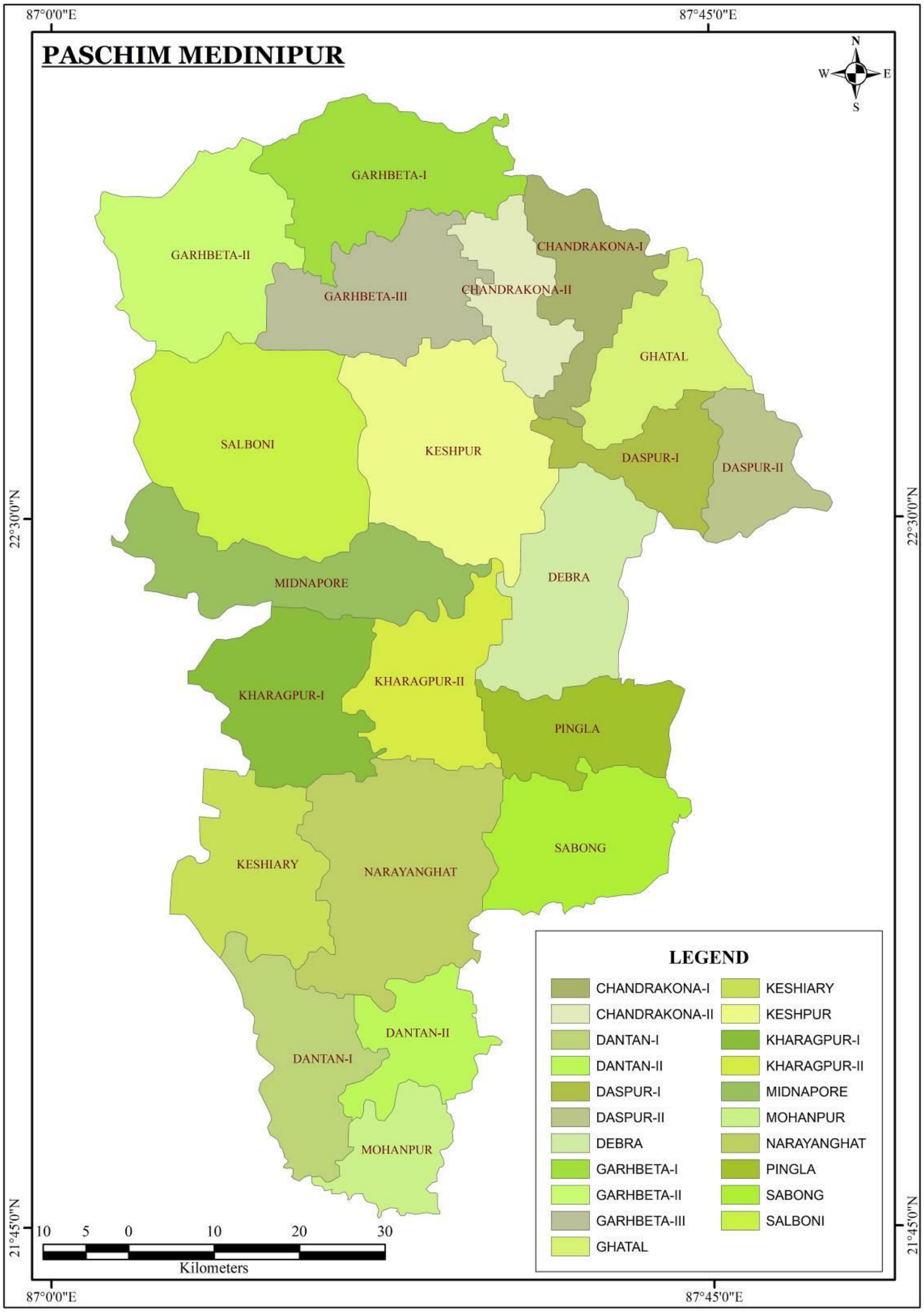


Figure 3.2: Block divisional map of Paschim Medinipur

(Source: National Informatics Centre)

b) Climate Condition

The district experiences a humid sub-tropical type of climate with minimum and maximum temperature varying from 7°C in the winter to 45°C in summer respectively. Humidity in this district is quite high particularly in the monsoon months and shows an upward trend from January onwards. Rainfall fluctuates widely over years and concentrates over a few months of a year under monsoon.

The district of Paschim Medinipur experiences an extreme climate with high range of temperature. The climate of the district is characterized by oppressive heat and high humidity in summer with average daily maximum temperature varies between 25°C and 40°C. Winter is generally dry and cold with average winter temperature around 17° C. The year may be divided into four seasons. The cold season is from about the middle of November to the end of February. The period from March to May is the summer season. The south west monsoon season commences about the beginning of June and lasts till the end of September. October and the first half of November may be termed as post monsoon season. (https://www.imdpune.gov.in/library/public/Climate%20of%20WestBengal.pdf)

c) Rainfall

The average annual rainfall in the district is 1485mm. The variations in the annual rainfall within the district and from year to year are not large. The rainfall during the monsoon season – June to September – constitutes 74 percent of the annual rainfall; July and August are the rainiest months. The district receives a mean annual rainfall varying from 1295 mm to 1637 mm.
(https://hydro.imd.gov.in/hydrometweb/(S(c31xot2fu1lahs45tplr2vuh))/DistrictRaifall.aspx)

The information on annual rainfall for the five years from 2016 to 2020 for the district Paschim Medinipur is given in Table 3.2. Average rainfall of the district explained graphically in Figure 3.3.

Table 3.3.2: Annual rainfall (in milimeter) recorded in Paschim Medinipur District

Month	2016	2017	2018	2019	2020	Average
Jan	6	5	0	0	41.6	10.52
Feb	48	0	3.4	107.2	11.3	33.98
Mar	27.4	43.9	1.6	63.6	62.6	39.82
Apr	12	17.4	99.1	75.7	113.8	63.6
May	133.5	109.2	109.3	113	262.6	145.52
Jun	161.1	205.5	187.7	128	240.3	184.52
Jul	359.2	411.7	259.7	216.9	217.4	292.98
Aug	371.7	311.9	300.9	397.9	368.9	350.26

Sept	192.2	202.7	229.6	361.7	134.3	224.1
Oct	71.6	203.4	72.7	125.5	84	111.44
Nov	8.6	32.1	7.1	40	10.8	19.72
Dec	0	9.3	23.8	7.6	0	8.14
Yearly Total	1391.3	1552.1	1294.9	1637.1	1547.6	1484.6

Source: Website of Indian Meteorological Department, Govt. of India

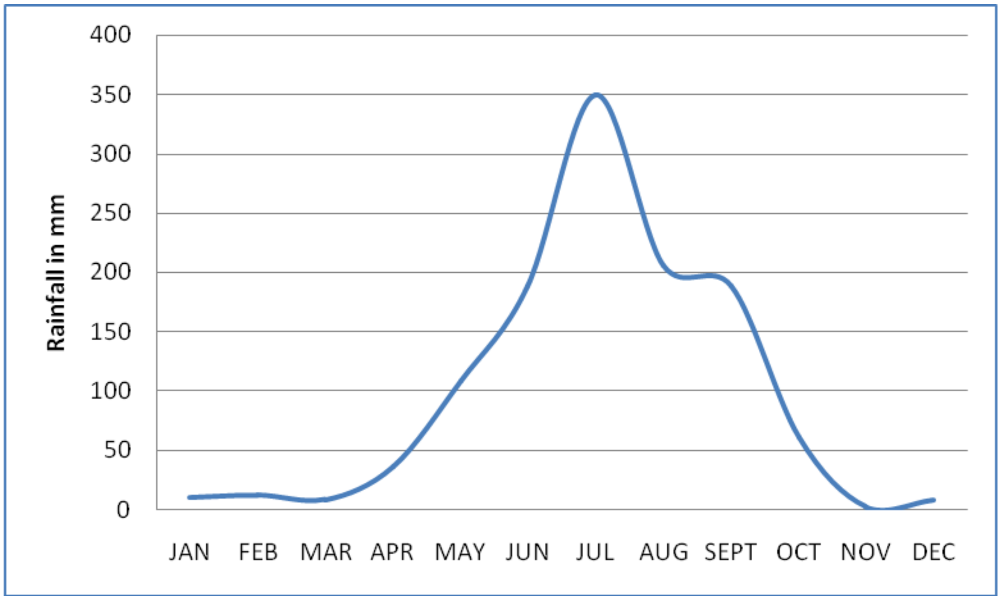


Figure 3.3: Graphical representation of Paschim Medinipur District rainfall

- **Temperature:**

Temperature along with other meteorological conditions of the district is more or less uniform. The cold season commences by about the middle of November when the temperature begins to decrease. January is the coldest month with the mean daily maximum and minimum temperature at 28 ^{o}C and 10^{o}C respectively. By about the end of February the temperature begins to increase and April is found as the hottest month, the mean maximum daily temperature is 39 ^{o}C and the mean minimum daily temperature is 25 ^{o}C. (https://en.climate-data.org/asia/india/west-bengal/Paschim Medinipur-55531)

The average maximum and minimum temperature recorded in Paschim Medinipur is given in Table 3.3.

Table 3.3.3: Monthly mean temperature (in °C) distribution of Paschim Medinipur District

Parameters	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Average Temperature (°C)	19.3	22.1	27.3	31.4	32.2	31.2	28.9	28.8	28.7	27	22.7	19.7
Minimum Temperature (°C)	12.5	15.2	20	24.3	26.4	26.4	25.7	25.7	25.3	22.7	16.7	13.1
Maximum	26.2	29	34.6	38.6	38	36	32.1	31.9	32.1	31.4	28.8	26.3

- **Relative Humidity, Wind speed & Wind direction**

Humidity is observed as high throughout the year, but in the summer months, March and April, the relative humidity is comparatively low, begins some 64 to 75 percent in the mornings and 30 to 40 percent in the afternoons. From May the humidity increases. Skies are moderately to heavily cloudy in May. In the south-west monsoon season; the cloudiness increases and skies are mostly heavily clouded or overcast. From October the cloudiness decreases and in the next six months skies are clear or lightly clouded. Winds are generally light or moderate, with a slight increase in force in the summer seasons.

d) Topography & Terrain

The district presents a gradually sloping topography. The highest altitude is 132 m above M.S.L. near Daspur in the east and 18.06 m above M.S.L. near Sansankha in the South East (Figure 3.4).

Geographically, the north and north-west regions of Paschim Medinipur district are a part of Chhota Nagpur Plateau in its eastern end and covered with hard laterite stone. Geographically the district may be divided into three sub-micro regions:

- Plain of Silai: This plain land is found in the northern part of the district bordering Bankura district and is a portion of East Chhotanagpur plateau. Most part of the region comprises recent alluvium and laterite. The Garhbeta-I and Garhbeta-II C.D. Blocks are included in this region.
- Lower Kasai Plain: Lower Kasai plain is located either sides of the Kasai River. Navigability of this river is negligible due to alluvial deposition. Huge depression is formed in the west and north-west area on the Kasai and Kaleghai Rivers confluence and causes flood. This region is also known as 'Mayana Basin'.
- Upland of Medinipur: This region is found in the north-western part of the Paschim Medinipur district and lies close to Odisha and Jharkhand. This upland is 2,029 sq. km. with sloping is from north-west to south-east. This is part of Chhotanagpur Plateau which is formed with laterite. Some hills which are found in the extreme north are 82 meters to 223 meters in height. The Subarnarekha is the controlling river in this upland

region. This river flows from the state of Jharkhand and flows towards south-east and empties at Bay of Bengal in Odisha (Census, 2011).

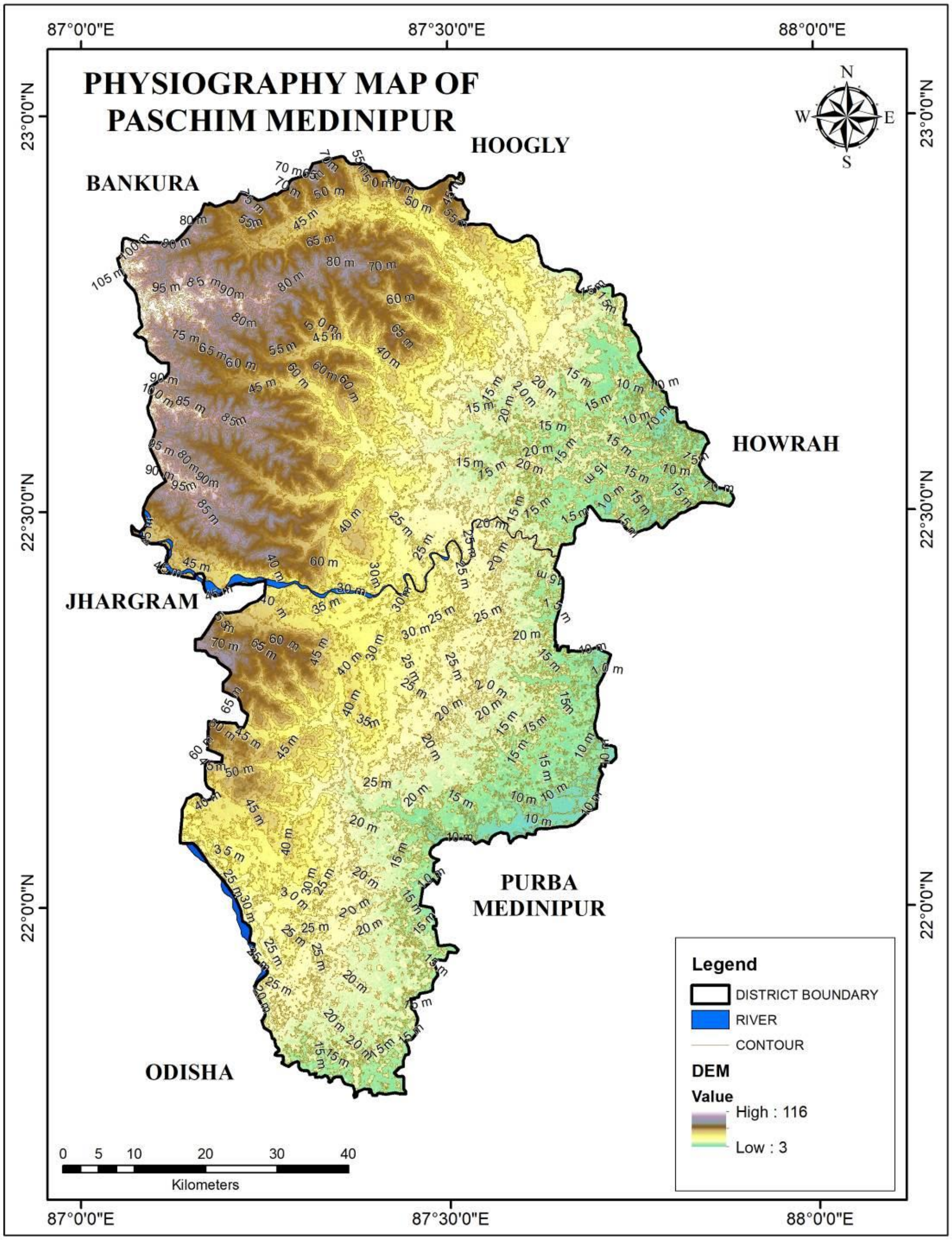


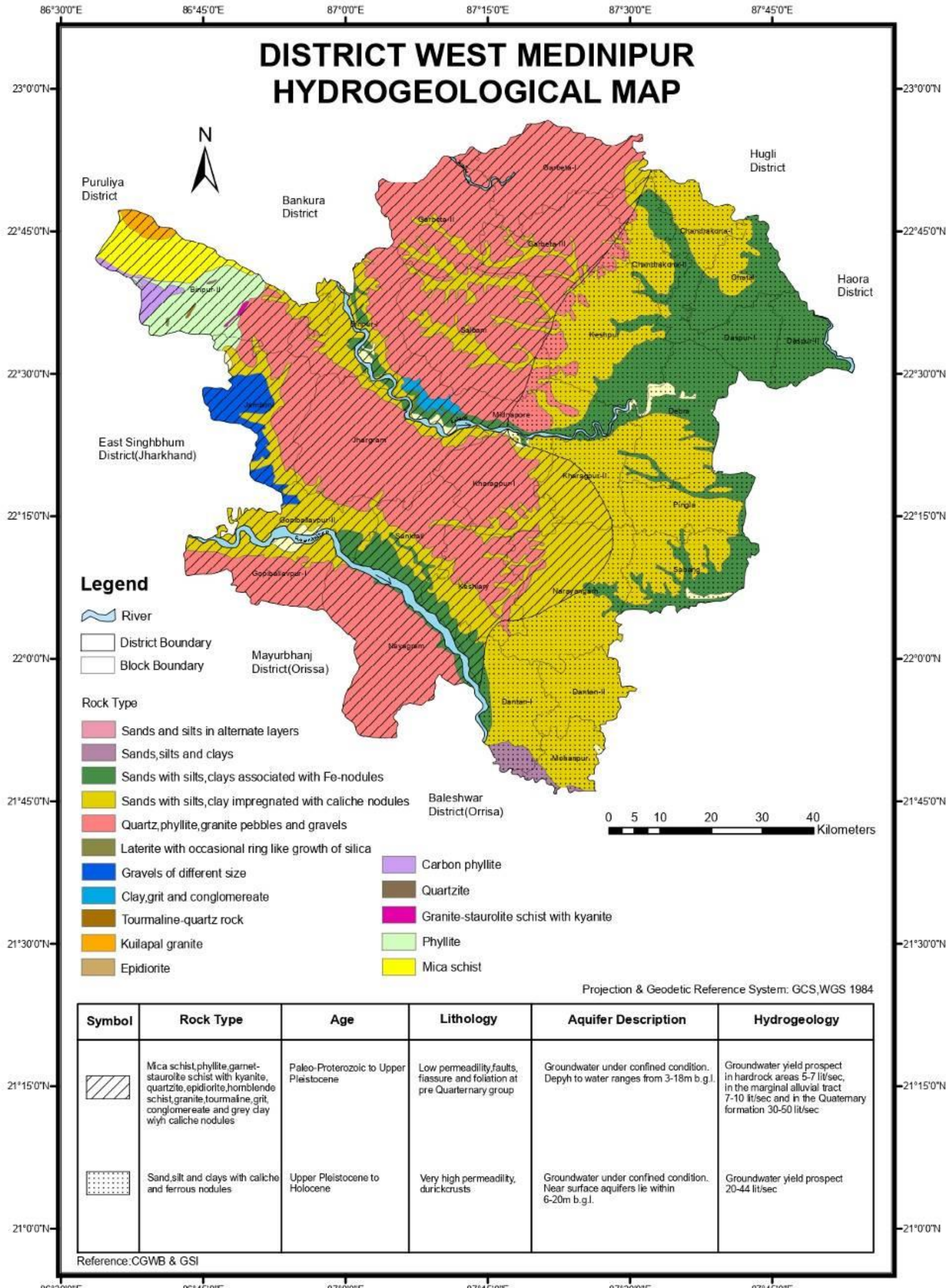
Figure 3.4: Physiographic map of Paschim Medinipur District

(Source: Cartosat-1, Bhuvan India)

e) Water Course & Hydrology

Hydrological condition of the district is guided by topography, geology, and rainfall of the region. Central Ground Water Board (CGWB) has carried out detail hydrogeological investigation of the district. Figure 3.5 represents hydrogeological map showing the hydrogeological scenario of the district.

As per the CGWB report, the district Paschim Medinipur displays diversified hydrogeological characters that do not have resemblance with the planes. Based on geology and mode of occurrence of groundwater the underline area of the district has been divided into two sectors (i) western sector covered by crystalline rocks of Paleo-Proterozoic age and (ii) Eastern sector covered by Recent Alluvium of Upper Pleistocene to Holocene age. Groundwater occurs in the district both unconfined condition and confined condition. The water table generally declines with the varying gradients from west, north-west to east and south-east directions. In the western part of the district ground water occurs under confined condition. Depth to water ranges from 3-18m b.g.l. In the eastern part, groundwater occurs under confined condition. Near surface aquifers lie within 6-20m b.g.l. (http://wbwridd.gov.in/swid/mapimages/WEST%20MIDNAPORE.pdf).



Symbol	Rock Type	Age	Lithology	Aquifer Description	Hydrogeology
	Mica schist,phyllite,garnet-staurolite schist with kyanite, quartzite,epidiorite,hornblende schist,granite,tourmaline,grit, conglomereate and grey clay wiyh caliche nodules	Paleo-Proterozoic to Upper Pleistocene	Low permeadility,faults, fiassure and foliation at pre Quarternary group	Groundwater under confined condition. Depyh to water ranges from 3-18m b.g.l.	Groundwater yield prospect in hardrock areas 5-7 lit/sec, in the marginal alluvial tract 7-10 lit/sec and in the Quaternary formation 30-50 lit/sec
	Sand,silt and clays with caliche and ferrous nodules	Upper Pleistocene to Holocene	Very high permeadility, durickcrusts	Groundwater under confined condition. Near surface aquifers lie within 6-20m b.g.l.	Groundwater yield prospect 20-44 lit/sec

Figure 3.5: Hydrogeological map of Un-divided Medinipur district

f) Ground Water Development

Central Groundwater Board (CGWB) has carried out hydrogeological investigation in the Paschim Medinipur district. The present report incorporates data published by CGWB. Water level data has been collected from both dug-wells and tube-wells.

The hydrogeological condition of the district can be divided into two broad divisions as

- Fissured/ Fractured Formation
- Porous Formation

Hard crystalline rocks occurs around Birpur –II in the extreme north western part of the district where ground water occurs under water table condition in weathered residuam of the hard rocks and the interconnected fractures, fissures, joints etc. The thickness of the weathered residuam of the hard rocks and the interconnected fractures, fissures, joints etc. The thickness of the weathered zone varying from a very thin to as much as 15-20m. Depth to water level in the zone of weathered and fractured rocks, vary from 2 mbgl to 13 mbgl during pre-monoon period. Ground water in this unit forms limited ground water development scope and is mainly tapped by dug wells, dug cum bore wells and bore wells. However, the deeper fractures are also potential for ground water development and are mainly developed by bore well. Ground Water exploration carried by CGWB in this unit reveals that existence of fractures within depth 85 mbgl with the yield of the well ranges from 5 to 7 lps.

The porous formations are very extensive both laterally and vertically and can be sub divided into two categories:

a) Older Allurium and Upper- Teriastics in the platform Region: The upland region in the north western, northern and south western part of the district is characterized by the occurrence of laterite soils at the top underlain by a thick sequence of clay, silt, sand and grud down to the depth of 250 mbgl. In the shallow phreatic aquifers ground water occurs under table condition in this upland tract whose pre-monsoon depth to water level ranges from 4 mbgl to 10 mbgl during pre-monsoon period. The deeper aquifers occur under confined to semi-confined conditions and the piezometric surface in pre-monsoon period ranges from 5 mbgl to 9 mbgl. Auto flowing tubewells in Narayngarh, Salboni and Garhbeta areas are quite common.

b) Alluvial Plains in the Eastern part: The block areas of Ghatal, Daspur, Keshpur, Debra, Pingla, Subang are mainly covered by recent alluvium deposits. Very significant and promising water bearing formations occur in Daspur- Dobra. Block within the depth range of 130-164 m. Ground water here occurs both in water table and confined conditions.

Figure 3.6 represents water level fluctuation graph. Depth to water level in dug wells measured by CGWB varied from 5.23 m to 10.57 m bgl during pre-monsoon period with an average depth of 8.67 m. During post-monsoon period, water level varies from 5.23 m to 9.57 m bgl with an average of 7.47 m in the year 2011 to 2021.

(https://indiawris.gov.in/wris/#/groundWater%20(CGWB%20website%20for%20Ground%20water%20data)

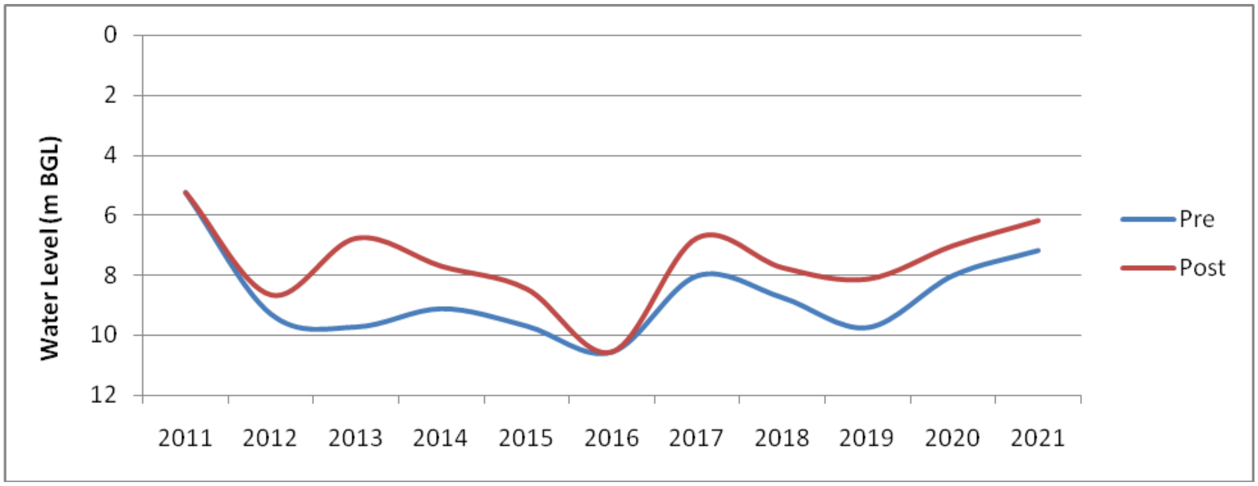
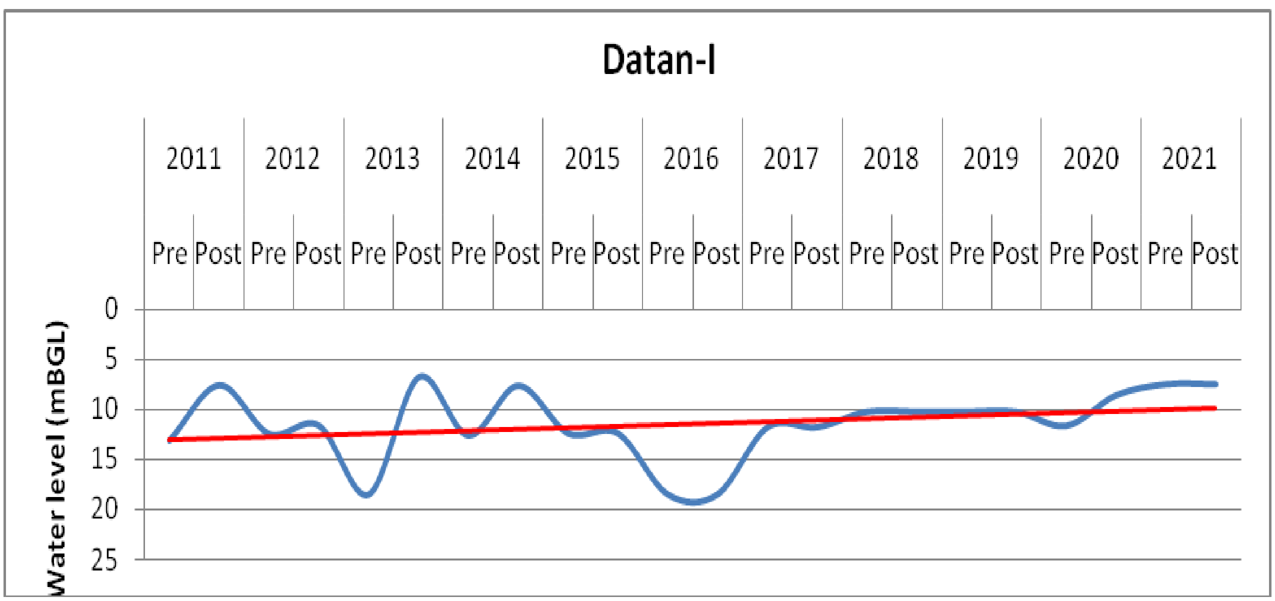
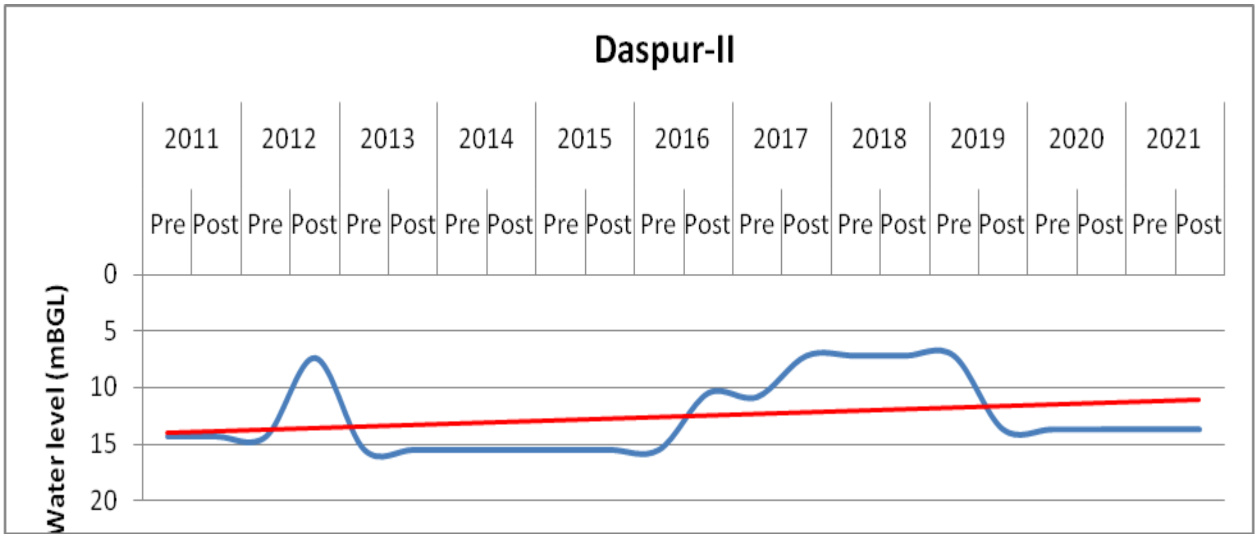
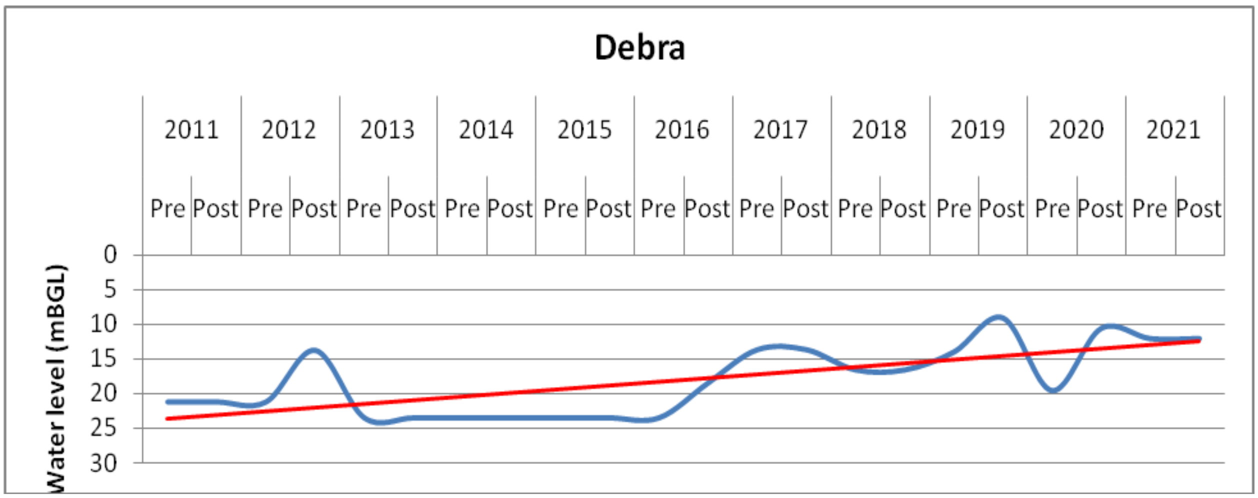


Figure 3.6: Graphical representation of pre-monsoon and post-monsoon water level data of Kharagpur, Paschim Medinipur

Hydrographs showing variation in water level observed in between 2011 to 2021 in the district is given in Figure 3.7.




Daspur-II
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0
5
10
15
20


Debra
2011
2012
2013
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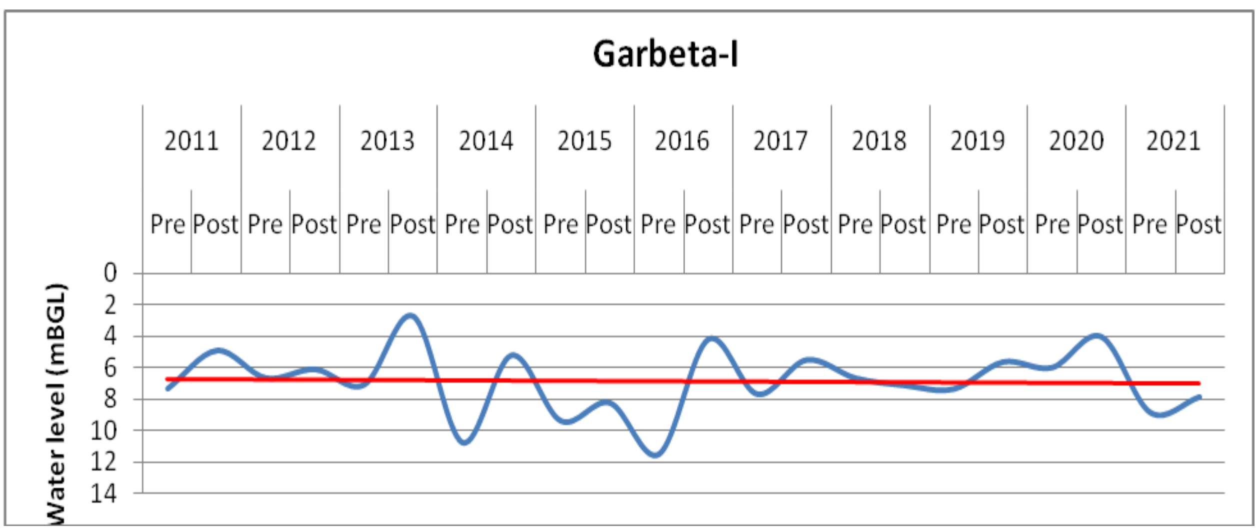
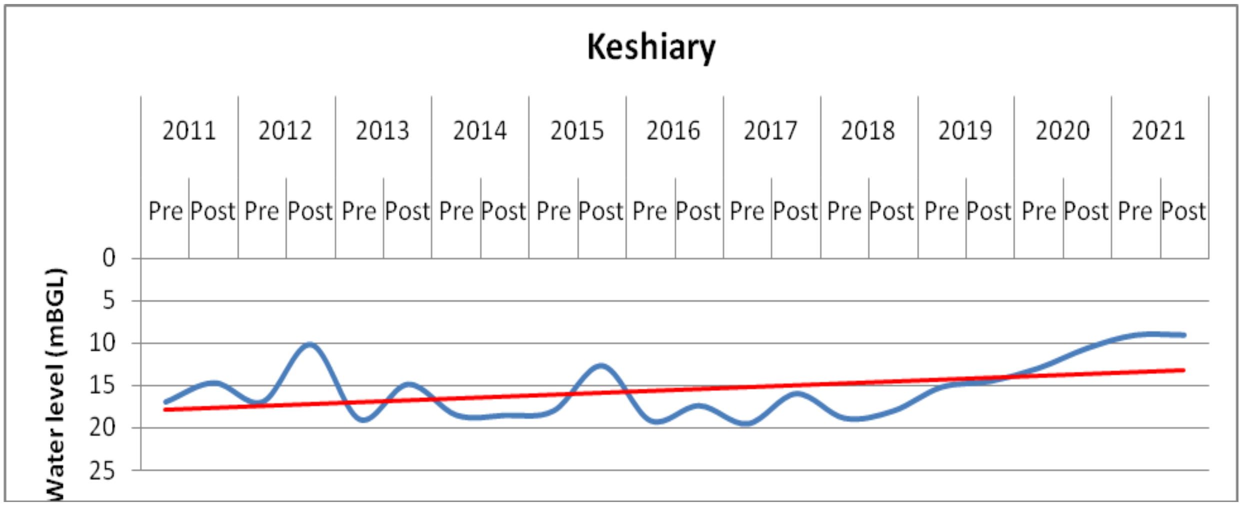
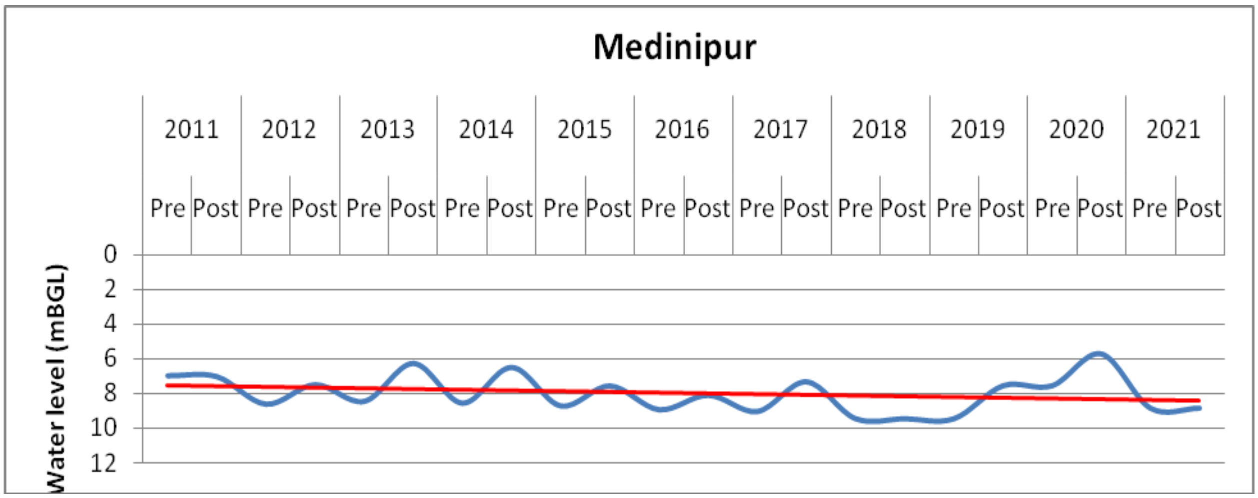
2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0
5
10
15
20
25
30


Garbeta-I
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0
2
4
6
8
10
12
14





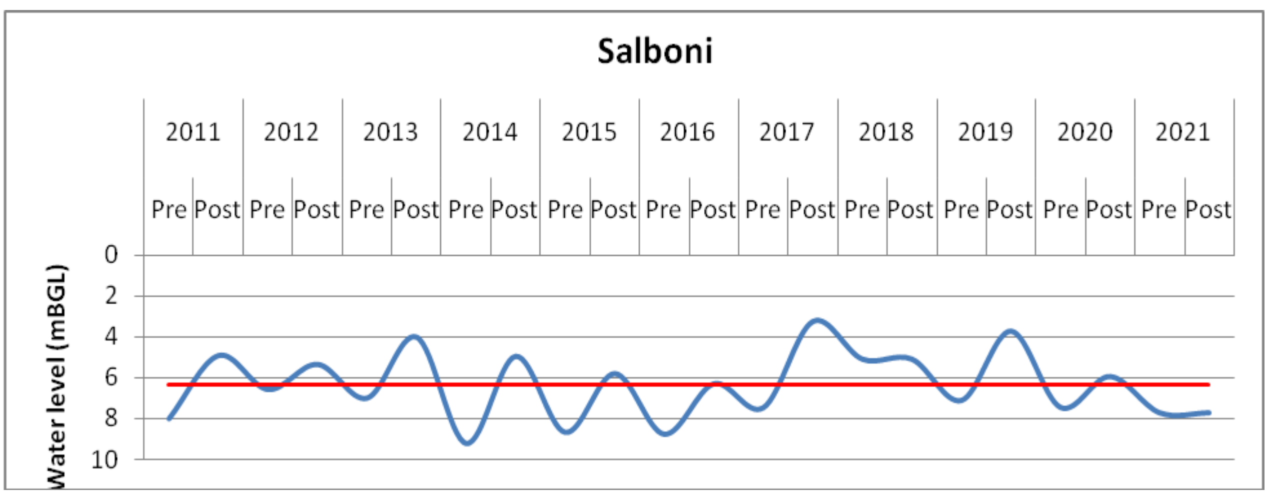


Figure 3.7: Block wise Hydrograph showing variation of water level during 2011 to 2021

g) Drainage System

The rivers of district Paschim Medinipur, owing to the typical physiographical condition of the district, emerge from the Chhotanagpur Plateau to the West, flows East or South-East ward direction according to the slope of the land and meets Bay of Bengal to the South East or tributaries of Hugli (Hooghly) to the East. All the rivers in this region are rain-fed and flows to the fullest during Monsoon.

The river system of district Paschim Medinipur primarily consists of Shilabati, Kangsabati and Subarnarekha and their tributaries.

Drainage map of Paschim Medinipur district is furnished as Figure 3.8 and in Plate 1A.

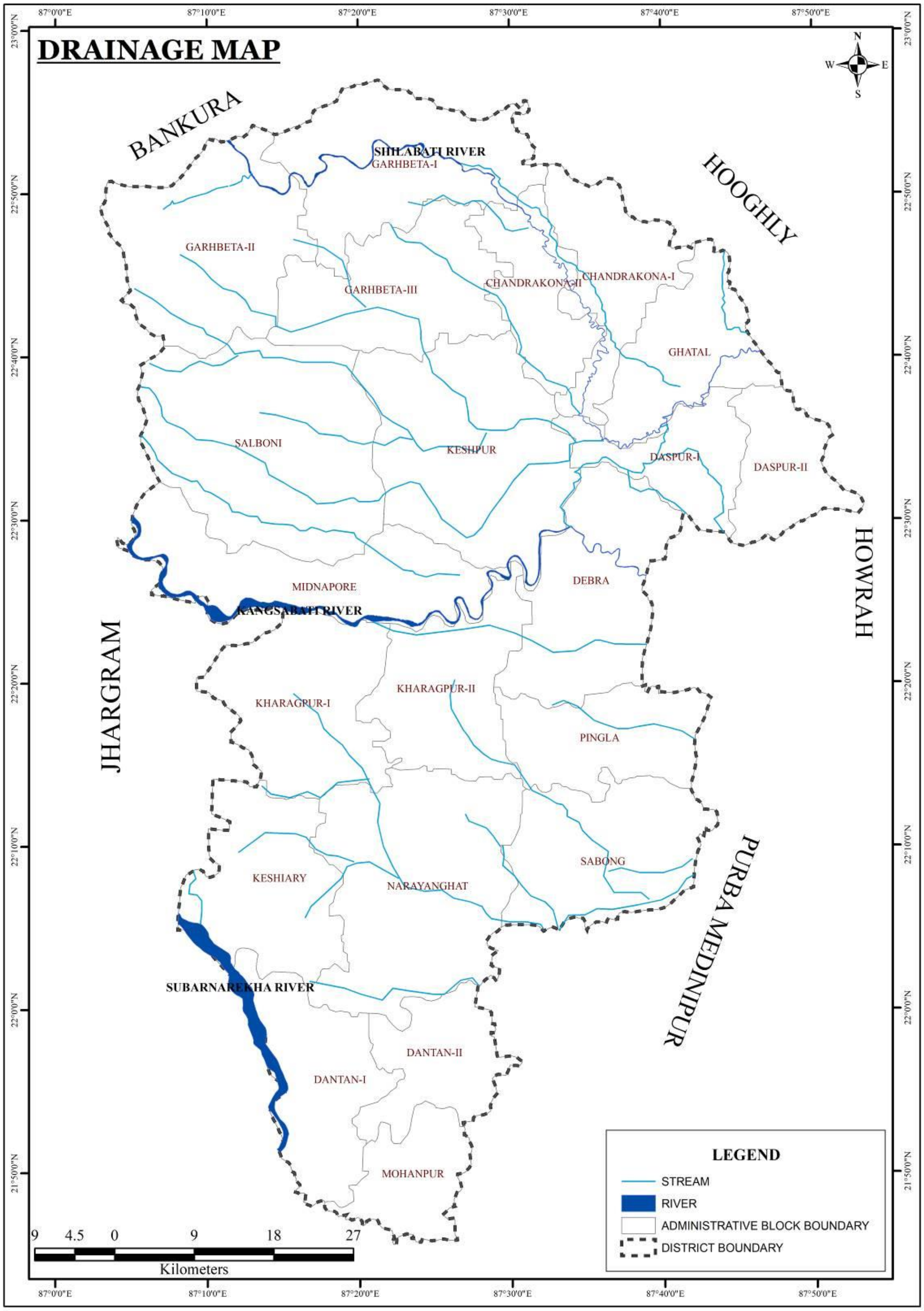


Figure 3.8: Drainage map of Paschim Medinipur District

(Source: National Informatics Centre)

h) Demography

Paschim Medinipur is one of districts of West Bengal in India, Paschim Medinipur population in 2022 is 6,297,653 (estimates as per aadhar uidai.gov.in Dec 2020 data). As per 2011 census of India, Paschim Medinipur has a population of 5,913,457 in 2011 out of which 3,007,885 are male and 2,905,572 are female. Literate people are 4,078,412 out of 2,266,913 are male and 1,811,499 are female. People living in Paschim Medinipur depend on multiple skills, total workers are 2,509,159 out of which men are 1,757,358 and women are 751,801. Total 436,384 Cultivators are depended on agriculture farming out of 403,904 are cultivated by men and 32,480 are women. 489,199 people works in agricultural land as labor, men are 363,115 and 126,084 are women (https://www.indiagrowing.com/West_Bengal/Paschim_Medinipur).

Table 3.4 shows the district demographic profile based on Census 2011. Block-wise literacy rate of the population is described as the percentage of literates. Figures 3.9 and 3.10 representing block wise population distribution and literacy rate respectively.

Table 3.3.4: Demographic distribution of Paschim Medinipur District

Sub-Division / C.D.Block / M	Area (Sq. Km.) (2001)	Male	Female	Total	Literacy Rate
Sadar Sub-Div.	**2441.50**	**634174**	**604636**	**1238810**	**76.23243**
Salboni	553.39	84253	80995	165248	74.87
Keshpur	483.15	147720	140769	288489	77.88
Garhbeta-I	361.87	102815	97587	200402	72.21
Garhbeta-II	392.55	66940	64163	131103	75.87
Garhbeta-III	312.12	74900	70954	145854	73.42
Medinipur	323.64	81043	76902	157945	70.48
Medinipur(M)	14.78	76503	73266	149769	88.99
Kharagpur Sub-Div.	**2913.17**	**1041081**	**992503**	**2033584**	**80.51395**
Debra	342.41	129224	125996	255220	82.03
Pingla	224.48	88433	82633	171066	83.57
Keshiary	292.09	67427	64634	132061	76.78
Dantan-I	257.07	77203	74173	151376	73.57
Dantan-II	185.56	68823	65537	134360	82.45
Narayangarh	499.48	136169	130506	266675	78.18
Mohanpur	137.49	49147	47176	96323	80.51
Sabong	305.00	122867	115819	238686	86.84
Kharagpur-I	313.31	121717	115511	237228	77.06
Kharagpur-II	265.63	82350	79478	161828	76.08
Kharagpur(M)	90.65	97721	91040	188761	85.76
Ghatal Sub-Div.	**953.09**	**459256**	**453731**	**912987**	**82.55271**
Chandrakona-I	193.54	60299	57786	118085	78.93

Sub-Division / C.D.Block / M	Area (Sq. Km.) (2001)	Male	Female	Total	Literacy Rate
Chandrakona-II	150.44	54686	52145	106831	76.96
Ghatal	216.05	96678	94060	190738	81.08
Daspur-I	168.30	87167	88607	175774	83.99
Daspur-II	165.45	100853	105234	206087	85.62
Chandrakona(M)	16.58	10464	9934	20398	83.23
Khirpai(M)	11.65	7439	7109	14548	82.39
Ramjibanpur(M)	10.36	8924	8440	17364	84.19
Kharar(M)	10.36	5894	5686	11580	85.51
Ghatal(M)	10.36	26852	24730	51582	89.48

(Source: Census, 2011)

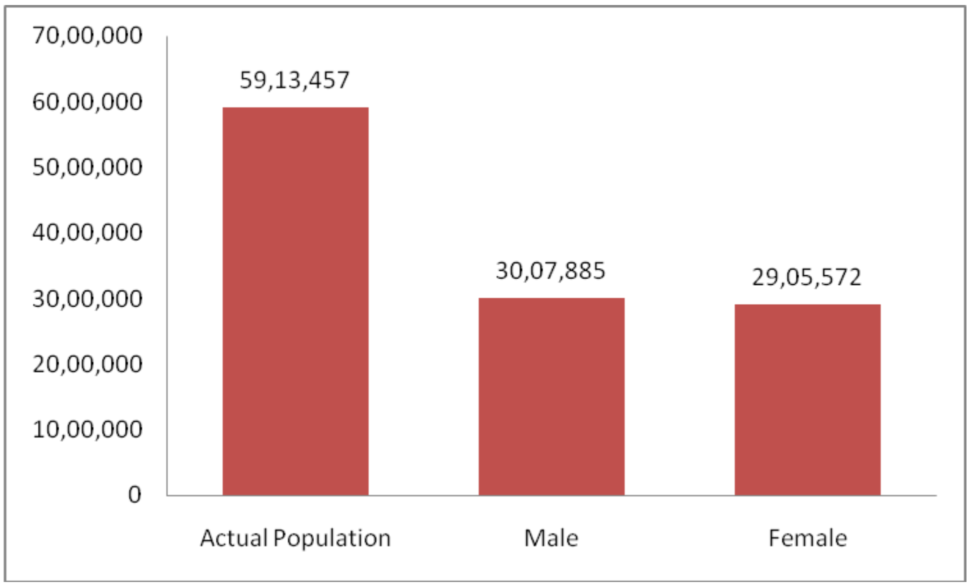


Figure 3.9: Population distribution of the District

(Source: Census, 2011)

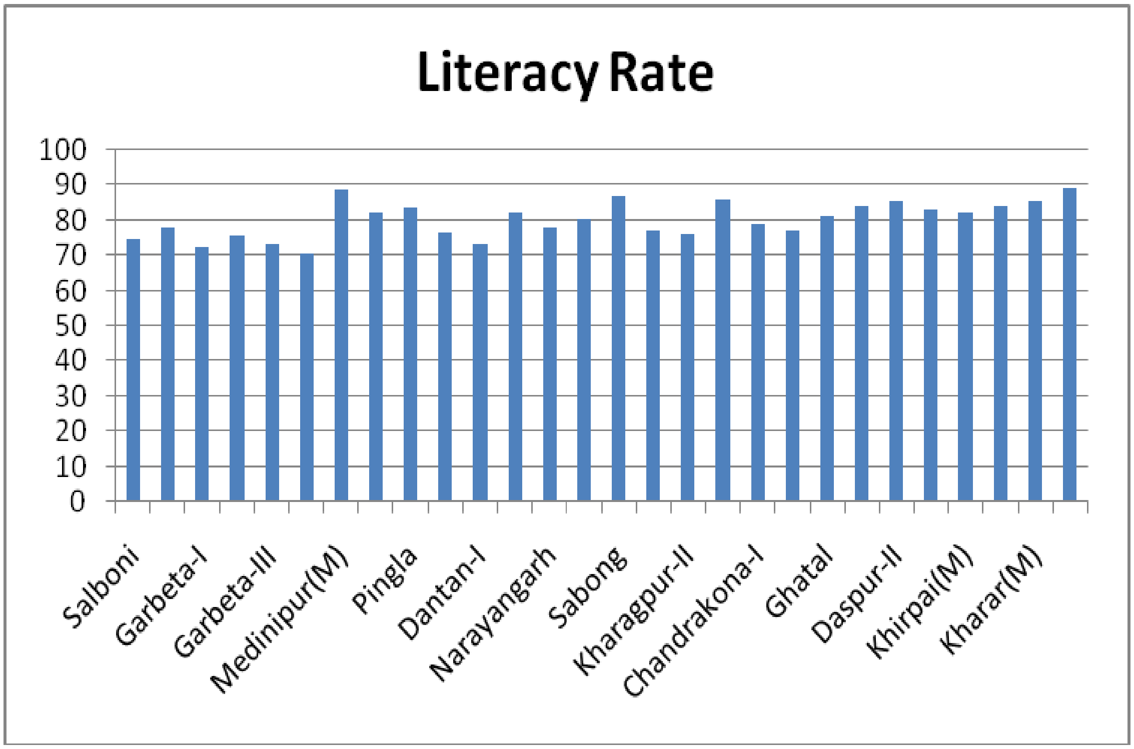


Figure 3.10: Block-wise Literacy rate of the District

(Source: Census, 2011)

i) Cropping pattern

Geographically Paschim Medinipur district is divided into several sub-micro regions viz. Silai Plain, Lower Kasai Plain, and Upland Medinipur. Deferent types of soils are found in the district. Alluvial soils and brown soils are found in the southern part while brown and red sandy soils are found in the northern part of Paschim Medinipur district. This soil is good for the cultivation of oil seeds, millets and maize. In low land plain region paddy is being cultivated.

In the lower Kasai Plain region alluvial soil is found which is highly suited for paddy cultivation. Besides, the river Kasai is flowing through this region which makes the soil more fertile and suitable for crop cultivation. Laterite rocks are also found in the north western part of this region.

The Upland Medinipur region is found in the north-west part of this district. This region is not ideal for cultivation. The Sandy soil found in the upper part of the district which is unproductive and therefore Sal trees and other jungle scrubs are found growing in this region. However, in the southern part of this region, oil seeds and barley are rarely grown.

As per a recent report published by Agriculture Directorate, Govt. of West Bengal, 616.7 thousand hectares of land is under paddy cultivation followed by 4.7 thousand hectares of land is being under wheat cultivation during 2010-11. The total reported area in the district is 928580 hectares. Net sown area is 60.34 per cent of total reporting area (Census, 2011).

j) Land Form and Seismicity

The land surface of the district is characterized by hard rock uplands, lateritic covered area, flat alluvial and deltaic plains. Extremely rugged topography is seen in the western part of the district and rolling topography is experienced in the lateritic covered area. These rolling plains gradually merge into flat alluvial and deltaic plains to the East and the South-East of the District. Seismologically, the district comes under seismic Zone –III.

The seismic hazard map of India was updated in 2000 (Figure 3.11) by the Bureau of Indian Standards (BIS). There are no major changes in the zones in West Bengal with the exception of the merging of Zones I and II of the 1984 BIS map. Western sections of the northern districts of Jalpaiguri and Coochbehar lie in Zone V. The remaining parts of these two districts, along with the districts of Darjeeling, Uttar Dinajpur, Dakshin Dinajpur, Maldah, 24 North Parganas and 24 South Parganas lie in Zone IV. The rest of the state along with the city of Kolkata lies in Zone III.

The maximum area of the district falls under the Seismic Zone III and rest of the part fall under Zone II, indicating the district under safe earthquake–prone zone.

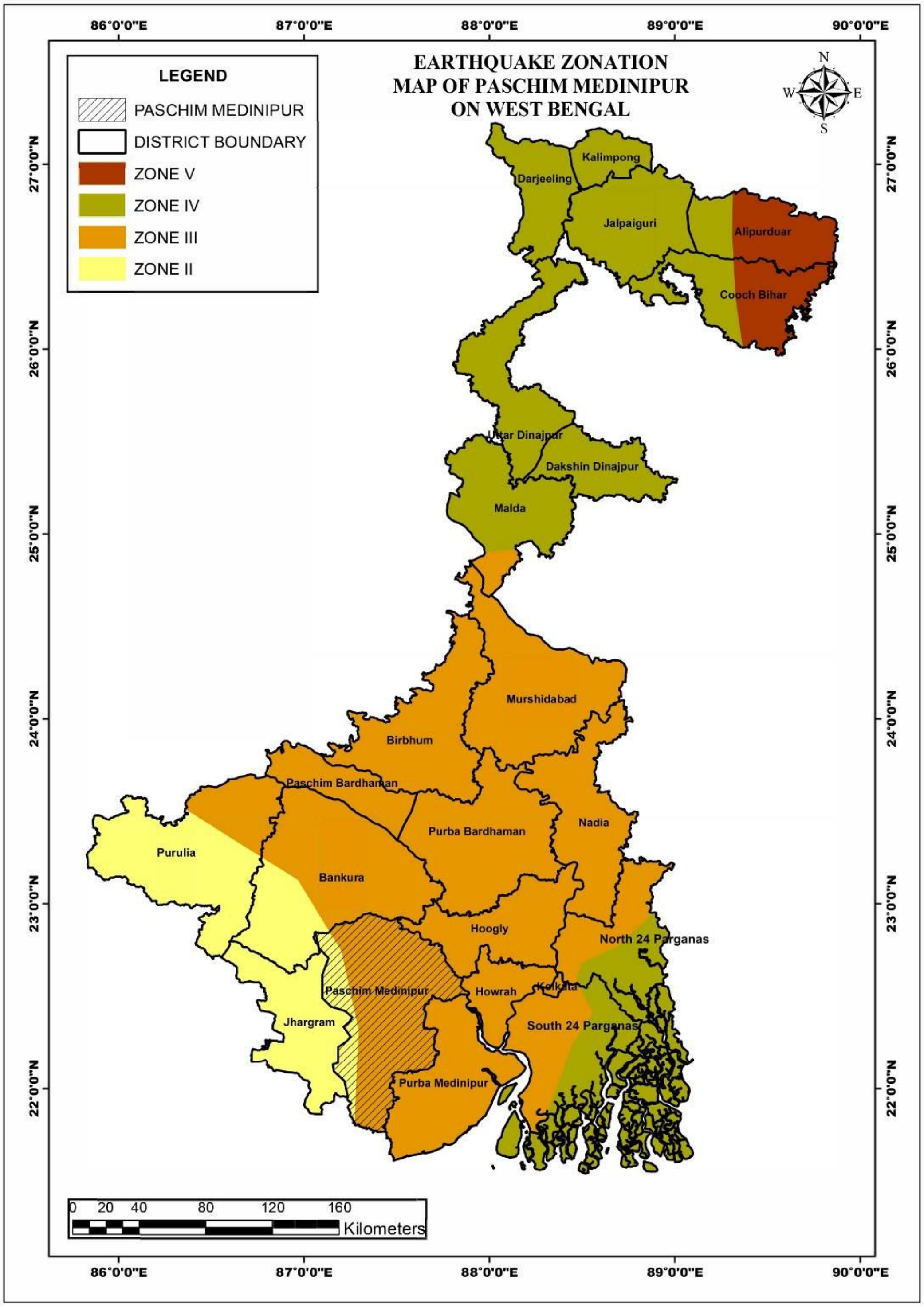


Figure 3.11: Earthquake zonation map of West Bengal highlighting the Paschim Medinipur district position

(Source: https://pib.gov.in/PressReleasePage.aspx?PRID=1740656)

- **Floods:**

The experience of drought and flood is common in the District. Entire Ghatal Sub Division and part of Kharagpur Sub Division are flood prone (about 142647 ha.) whereas Jhargram Sub Division and part of Kharagpur and Medinipur Sadar Sub Divisions are drought prone (about 335248 ha) (https://www.wbkvib.org.in/index.php/homepage/about-us/districts-profiles/114-paschim-medinipur).

The experiences of drought and flood are common in the district. Ghatal and the Southern parts of Kharagpur sub-divisions are affected by water logging during the rainy season. As a result, there is frequent loss of crop. Sabang, Pingla, Dantan-I and Narayangarh block in Kharagpur sub-division often suffer from such losses. Drought affects the population here frequently and causes damage to the limited agriculture in the area, affecting food security of the people living here. Though the district does not have a coastline, it is affected frequently by the cyclones during the months of October and November and untimely rains during April and May (http://wbdmd.gov.in/writereaddata/uploaded/DP/DPPaschim%20Midnapore34517.pdf).

A large portion of Paschim Medinipur district is a drought-prone area. This is due to undulating topography, laterite and porous soil having a little water holding capacity. Almost the whole western side of the district faces drought every year. The district had to face a severe drought in 2002 and it affected 24 blocks. As a result, cultivation of Aman paddy hampered tremendously and cattle lives were also affected. People of those affected blocks suffered a lot due to prevailing drought situation.

The major cause of flood in Kangsabati basin is not the local rainfall, but the spill way discharge of water from Kangsabati Dam. If the release of water from Kangsabati Dam can be regulated in a proper way, intensity of flood can be reduced.

The other reasons for flood in the district is the dam at the confluence of river Kangsabati and river Kumari at Ambikanagar in the district of Bankura which was constructed for providing irrigation as well as insurance against drought and moderate floods in the area. Before construction of Dam, there was free flow through the river and the river was capable to carry adequate floodwater. After construction of Dam, water carrying capacity of the river has been reduced gradually due to siltation of the river bed and non-release of flushing dose from the dam time to time.

k) Flora

The flora of district Paschim Medinipur comprises of lush green forests and plantation, shrub jungles and bushes. The deeper forests of this district fall under Northern Tropical Dry Forests and Tropical Deciduous Forests category. The trees mostly found in this area are Sal (Shorearobusta), Peasal (Pterocarpus marsupium), Kend (Diospyrosmelanoxylon), Mahul (Madhukalatifolia), Kusum (Schleicheratrijuga), Karam (Adina cordifolia), Asan (Terminalia tomentosa), Bahera (Terminalia belerica), Rahara (Soyamidafebrifuga), Dhaw (Anogeissuslatifolia) etc. The lesser forests include Eucalyptus, Akashmoni, Bamboo groves, Cashew nut trees etc (Census, 2011).

l) Fauna

The availability of wild fauna has reduced considerably in the forests during in the last Century. However, consequent upon implementation of wildlife protection schemes by the Government as well as different international organisations, the condition of the forests is gradually improving and is becoming favourable for wildlife habitat. In recent years, jungle cats, baboons, pythons, wild boar, dears, chitals and many variants of avifauna are increasingly being reported. Birds like ducks, storks, teals etc. are found in plenty. Jungle fowls are not many in numbers. Beside many non-venomous varieties, venomous snakes like Cobra, Kraits, Banded Kraits, Russel Vipers etc. are common habitants of the jungles. Wild elephants from forests in Jhargram, Garhbeta or Jamboni often visit to the nearby human habitations in search of crops and other foods. However, human-animal conflicts are rare due to scattered location of the jungles. (Census, 2011).

Location of Wild Life Sanctuary and National Parks are shown in the Map of West Bengal (Figure 3.12). As per the map of ENVIS Centre on Wildlife and Protected Areas, there is no National Park or Sanctuary situated within the Paschim Medinipur district. Hence, mining of river bed can be promoted in the district.

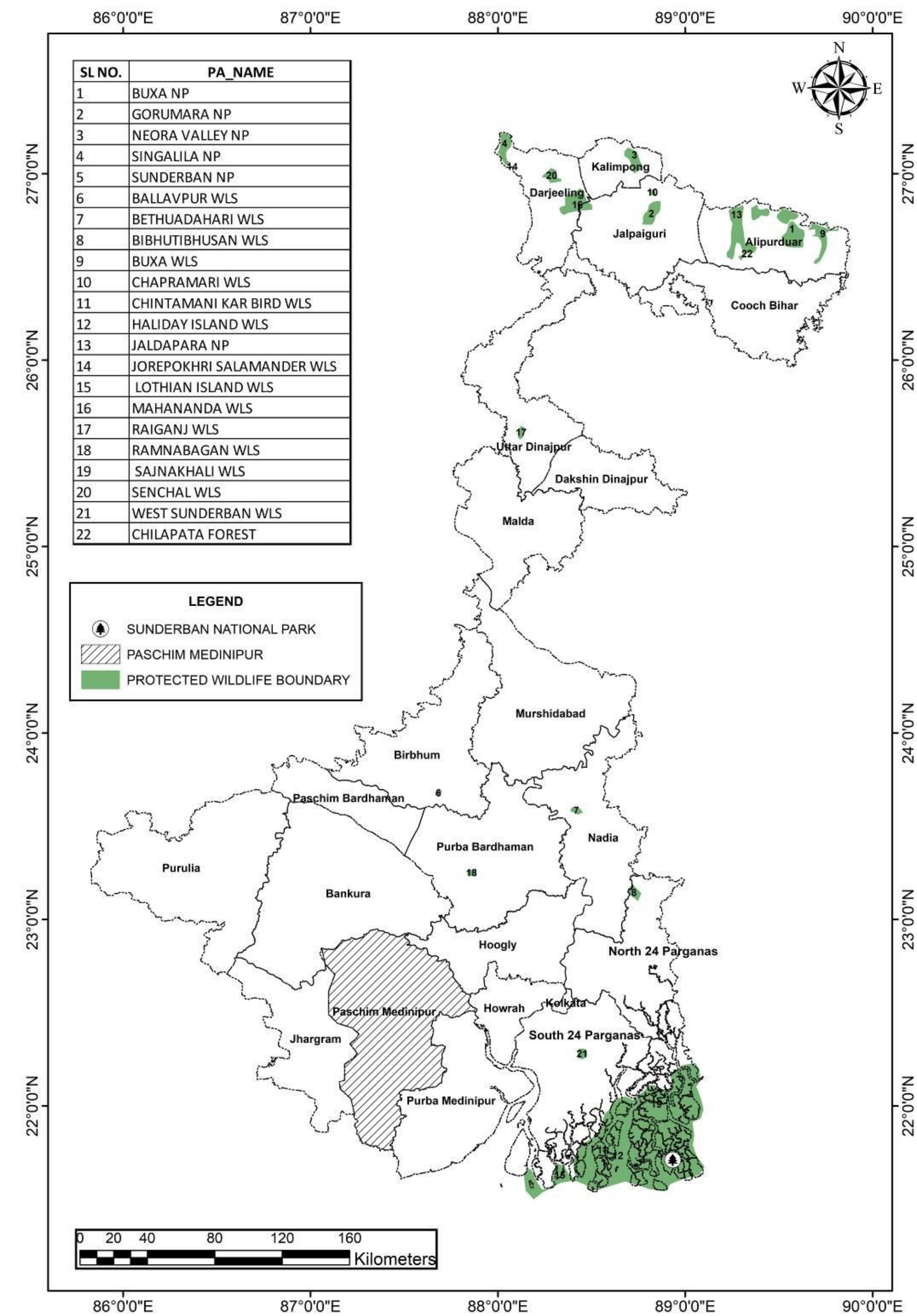


Figure 3.12: District location with respect to Wild Life Sanctuary of West Bengal

(Source: http://wiienvis.nic.in/)

4 Geomorphology

4.1 General Landforms

Geographically, the north and north-west regions of Paschim Medinipur district are a part of Chhotanagpur Plateau in its eastern end and covered with hard laterite stone. Geographically the district may be divided into three sub-micro regions:

Plain of Silai: This plain land is found in the northern part of the district bordering Bankura district and is a portion of East Chhotanagpur plateau. Most part of the region recent alluvium and laterite. Due to irregular alluvial deposition, the river bed causes floods in this area. Alluvial and brown soil is found in southern parts of this plain area. The Garhbeta-I and Garhbeta-II C.D. Blocks are included in this region.

Lower Kasai Plain: Lower Kasai plain is located either side of the Kasai River. Navigability of this river is negligible due to alluvial deposition. Huge depression is formed in the west and north-west area on the Kasai and Kaleghai rivers confluence and causes flood. This region is also known as 'Mayana Basin'.

Upland of Medinipur: This region is found in the north-western part of the Paschim Medinipur district and lies close to Odisha and Jharkhand. This upland is 2,029 sq. km. with sloping is from north-west to south-east. This is part of Chhotanagpur Plateau which is formed with laterite. Some hills which are found in the extreme north are 82 to 223 m in height. The Subarnarekha is the controlling river in this upland region. The land This river flows from the state of Jharkhand and flows towards south-east and empties at Bay of Bengal in Odisha.

The most characteristic geological feature of the district is the area of laterite and associated rocks of sand and gravel. At some places one finds hard beds of laterite. At other places it is decomposed and reorganized. Locally, the ferruginous rock is called kankar.

The area has an undulating micro-relief with highs and lows. The maximum elevation is found to be 319 m above mean sea level (msl) (figure 6). Generally, the elevation declines from north-west to eastern and south eastern direction. The slope amounts have shown that elevation is low in south-eastern and eastern part.

4.2 Soil and rock pattern

Soil type of Paschim Medinipur district can be divided into sixteen categories, represented as coarse loamy typic haplustalfs, coarse loamy typic ustifluvents, fine aeric ochraqualfs, fine loamy aeric ochraqualfs, fine loamy typic paleustalfs, fine loamy typic ustifluvents, fine loamy typic ustochreptas, fine loamy ulti paleustalfs, fine vertic haplaquaepts, fine vertic ochraqualfs, loamy lithic ustochrepts, loamy skeletal lithic ustochreprs, residential area, rocky outcrops, and very fine vertic haplaquepts (Table 4.1) (Bhunia et al. 2012).

Table 4.1: Soil characteristics of the Paschim Medinipur district and their percent of area covered

Soil Code	Description	Taxonomic name
W036	Very deep, poorly drained, fine cracking soils occuring on level to nearly level low lying alluvial plains with clayey surface associated with very deep, imperfectly drained, fine soils	Fine, Vertic Ochraqualfs
		Fine, Typic Ustochrepts
W038	Very deep, very poorly drained, fine cracking soils occuring on level to nearly level low lying alluvial plains with clayey surface associated with very deep, poorly drained, fine soils	Very Fine, Vertic Haplaquepts
		Fine, Typic Haplaquepts
W044	Very deep, poorly drained, fine cracking soils occuring on level to nearly level low lying alluvial plains with loamy surface associated with very deep, poorly drained, fine soils	Fine, Vertic Haplaquepts
		Fine, Aeric Haplaquepts
W047	Very deep, poorly drained, fine soils occuring on level to nearly level low lying alluvial plain with clayey surface and severely flooding associated with very deep, moderately well drained, fine loamy soils	Very Fine, Aeric Haplaquepts
		Fine loamy, Typic Ustochrepts
W064	Very deep, moderately well drained, coarse loamy soils occuring on very gently sloping flood plain with loamy surface,moderate erosion and moderate flooding associated with very deep, moderately well drained, fine loamy soils	Coarse loamy, Typic Ustifluvents
		Fine loamy, Typic Ustifluvents
W065	Very deep, moderately well drained, fine loamy soils occuring on very gently sloping flood plain with loamy surface,moderate erosion and moderate flooding associated with very deep, well drained, sandy soils	Fine loamy, Typic Ustifluvents
		Typic Ustifluvents
W066	Very deep, imperfectly drained, fine loamy soils occuring on level to nearly level flood clayey with loamy surface and moderate flooding associated with very deep, poorly drained, fine soils	Fine loamy, Typic Ustochrepts
		Fine, Aeric Haplaquepts
W067	Very deep, imperfectly drained, coarse loamy soils occuring on very gently sloping to undulating dissected upland with loamy surface and moderate erosion associated with very deep, moderately well drained, fine loamy soils	Coarse loamy, Typic Haplaquepts
		Fine loamy, Typic Haplaquepts
W068	Very deep, imperfectly drained, fine loamy soils occuring on very gently sloping to undulating dissected upland with loamy surface and moderate erosion associated with very deep, moderately well drained, fine loamy soils	Fine loamy, Ultic Paleaustalfs
		Fine loamy, Rhodic Paleaustalfs
W069	Very deep, poorly drained, fine loamy soils developed on old alluviam occuring on gently sloping to undulating	Fine loamy, Aeric Ochraqualfs

Soil Code	Description	Taxonomic name
	disected upland with loamy surface and slight erosion associated with very deep, poorly drained, fine soils	Fine, Aquic Haplaquepts
W076	Very deep, poorly/imperfectly drained, fine soils occuring on level to nearly level marshes in coastal plain with clayey surface moderate flooding and salinity associated with deep, well drained, sandy soils	Fine, Aeric Haplaquepts
		Typic Ustipsamments
W085	Very deep, poorly drained, fine soils occuring on level to nearly level marshes with clayey surface subject to severe flooding associated with deep, imperfectly drained, fine soils with severe flooding	Fine, Aeric Haplaquepts
		Fine, Typic Ustochrepts

The district broadly characterized by five types of soil viz., lateritic, older alluvial, red gravelly, red sandy, younger alluvial. Among them, older alluvial soil covers maximum area with 4065.36 km^2 (43.40%) followed by lateritic covering 3056.76 km^2 (32.63%) and red sandy soil type cover a minimum area with 402.98 km^2 (4.30%).

Figure 4.1 is showing soil pattern of the Paschim Medinipur district.

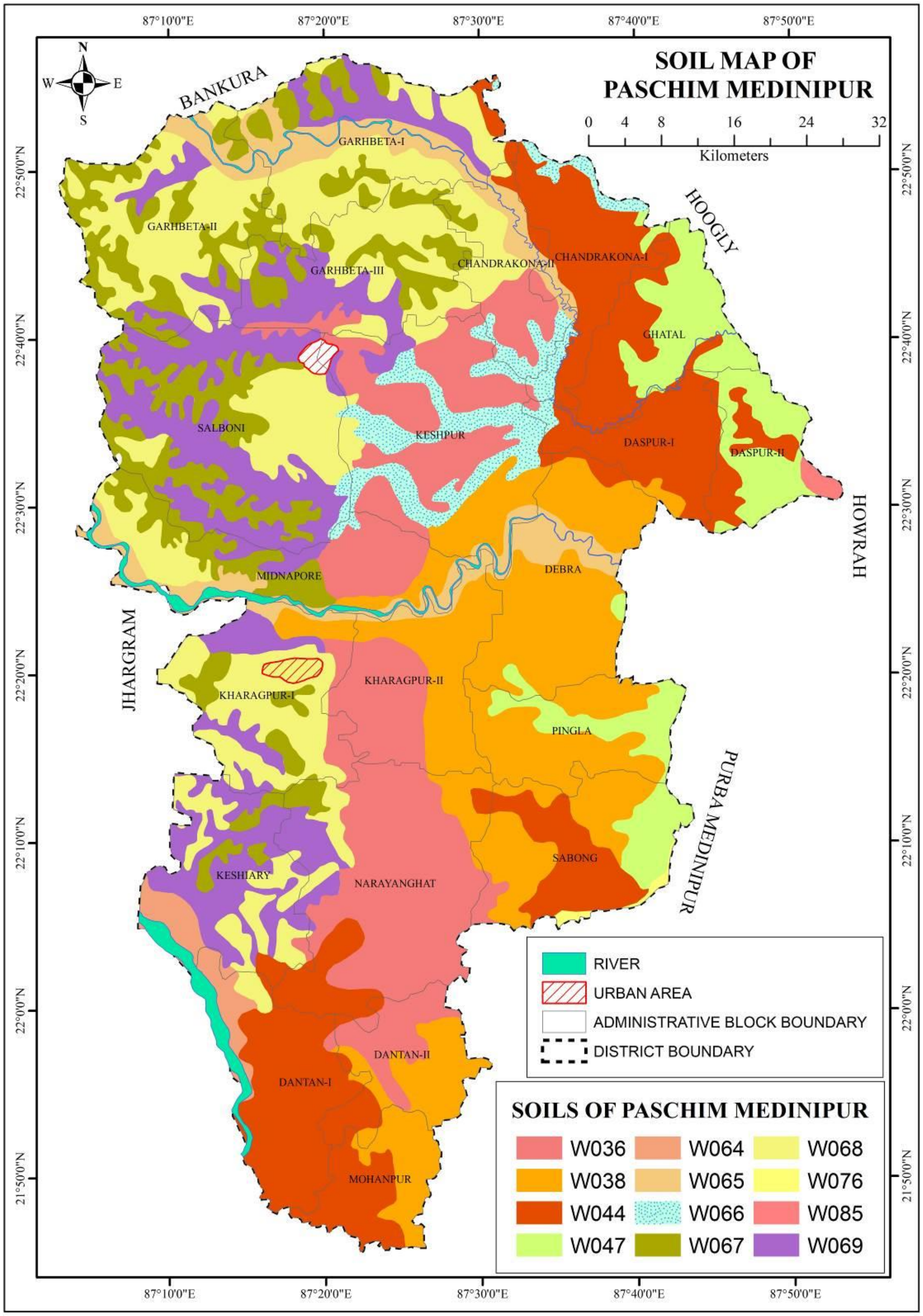


Figure 4.1: Soil Map of Paschim Medinipur District
(Source: https://esdac.jrc.ec.europa.eu/content/west-bengal-soils-sheet-2)

4.3 Different geomorphologic units

The geomorphology the district has been classified into alluvial plain older, dissected lateritic upland, alluvial plain younger, point bar, food plain, lateritic plain, channel bar, structural hill, bajada shallow, hilltop weathered, denudation hill, buried pediplain hill, weathered pediplain hill, buried pediplain shallow and valley fill shallow. Among the geomorphology classes, the lateritic plain covers the highest area of 2538.66 km2 (27.10%) followed by older alluvial plain covering 2369.92 km2 (25.29%).

According to genesis and evolution of landforms, the district can broadly be divided into two landforms. In the east, the soil is fertile alluvial and the area is flat. To the west, the Chhotanagpur Plateau gradually slopes down creating an undulating area with infertile laterite rocks and soil. The landscape changes from dense dry deciduous forests in the west to marshy wetlands in the east.

The alluvial portion may be further subdivided into two divisions. First, it is a strip of purely deltaic country intersected by numerous rivers and watercourses subject to tidal influences. Second, it is rest of the eastern half of the district. It is monotonous rice plain with numerous waterways and tidal creeks intersecting it. The tidal creeks are lined with embankments to prevent flooding of the fields. Much of the area is water-logged.

Geomorphological setting of Paschim Medinipur district can be divided into following units:-

i. Laterite covered platform sedimentary areas underlain by deposits of older alluvium bearing rolling plains.
ii. More or less Flat Alluviul Plain of Recent Age to the East and South-East.

Figure 4.2 shows the geomorphological variation of Paschim Medinipur district.

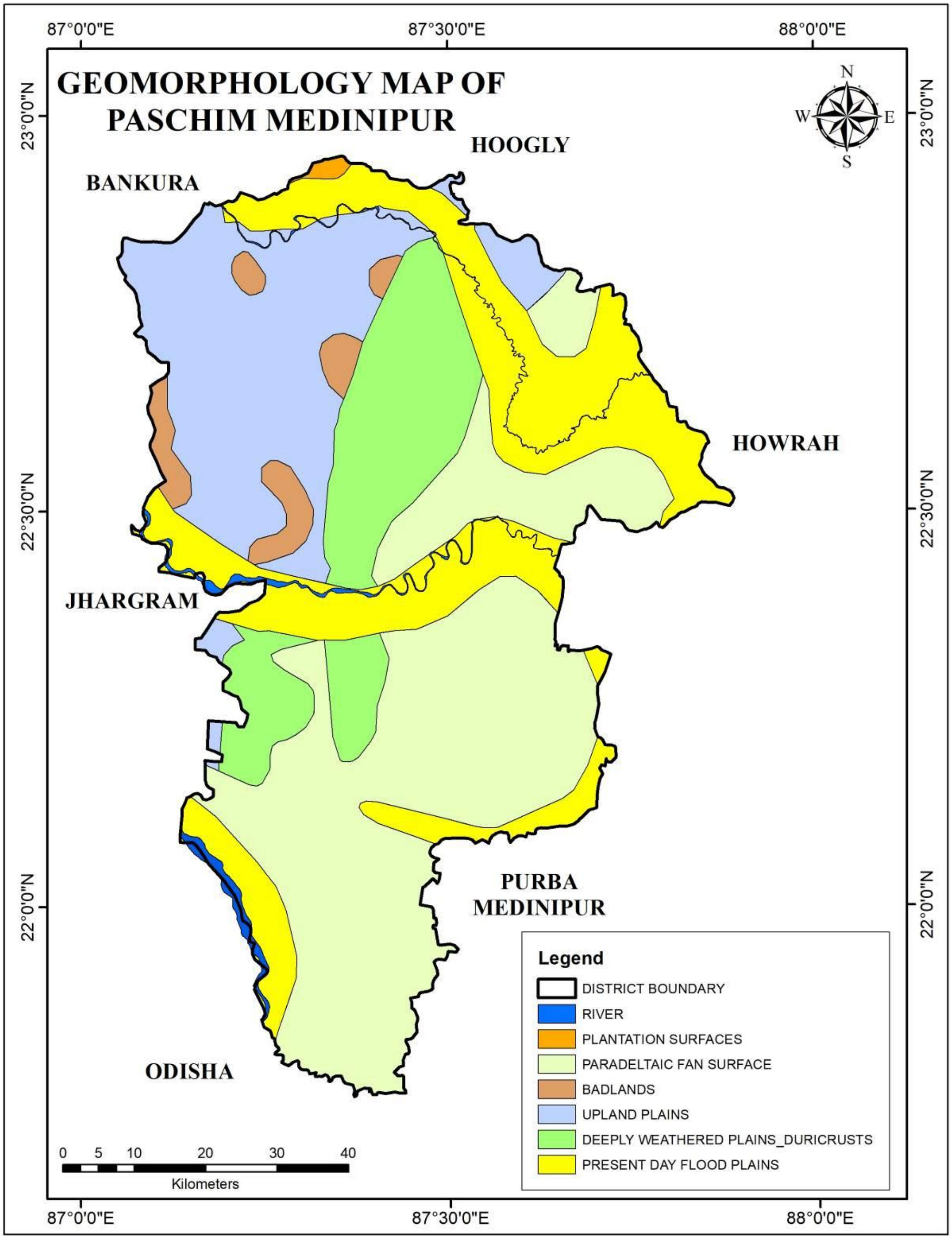


Figure 4.2: Geomorphological map of Paschim Medinipur District

(Source: Resourcesat-1&2 – Liss-3, Bhuvan India)

5 Land use pattern of the district

Paschim Medinipur is characterized by hard rock uplands, lateritic covered area, flat alluvial and deltaic plains. Extremely rugged topography is seen in the western part of the district and rolling topography is experienced in the lateritic covered area.

Census (2011), shows that the total forest land of the district is 171930 ha. Total land for agricultural use was 486200 ha in 2010-11. Table 5.1 gives land utilization status of Paschim Medinipur district. Figure 5.1 is the pie diagram representing broad land use pattern of the district.

Table 5.1: Classification of Land Utilisation Statistics in the district

(In thousand hectares)

Year	2006-07	2007-08	2008-09	2009-10	2010-11
Reporting Area (In Thousand Hectares)	928.58	928.58	928.58	928.59	928.58
Forest Area	171.93	171.93	171.94	171.93	171.93
Area under Non-agricultural use	156.93	157.55	158.9	159.37	156.59
Barren & unculturable land	1.74	1.7	1.95	2.45	2.48
Permanent pastures & other grazing land	0.89	1.13	0.97	0.83	0.58
Land under Misc. tree groves not included in Net area sown	9.49	9.27	9.37	10.04	10.02
Culturable waste land	6.32	5.46	5.43	4.06	3.99
Fallow land other than Current fallow	4.26	4.1	3.25	2.82	2.97
Current fallow	21.4	18.74	16.41	12.7	93.82
Net area sown	555.62	558.7	560.36	564.39	486.2

Source: Census, 2011

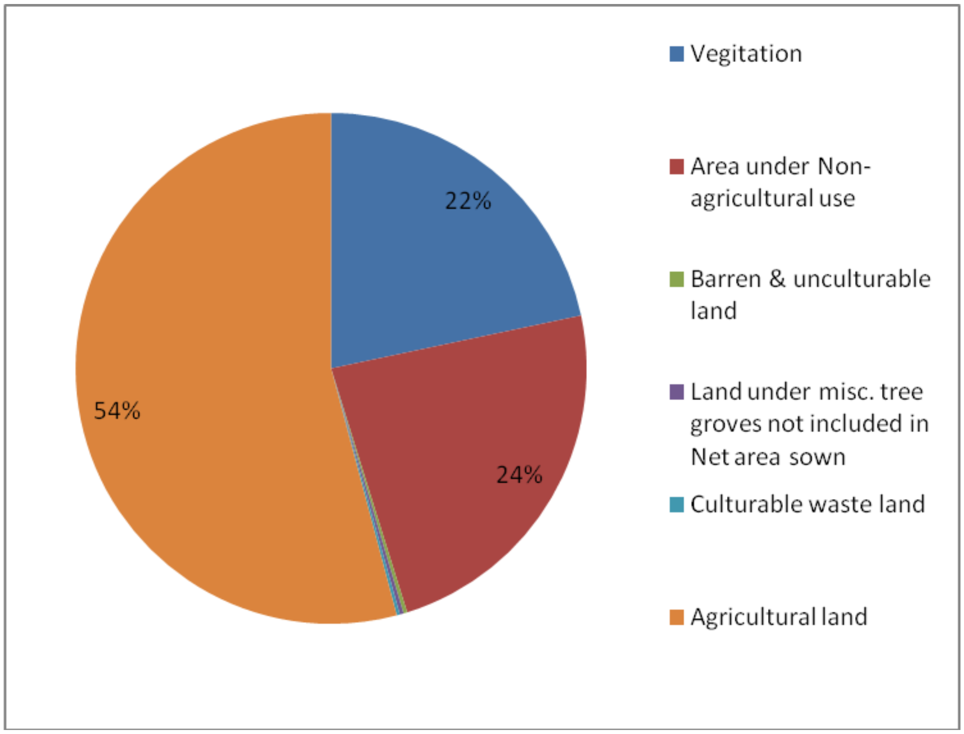


Figure 5.1: Land use pattern of Paschim Medinipur District

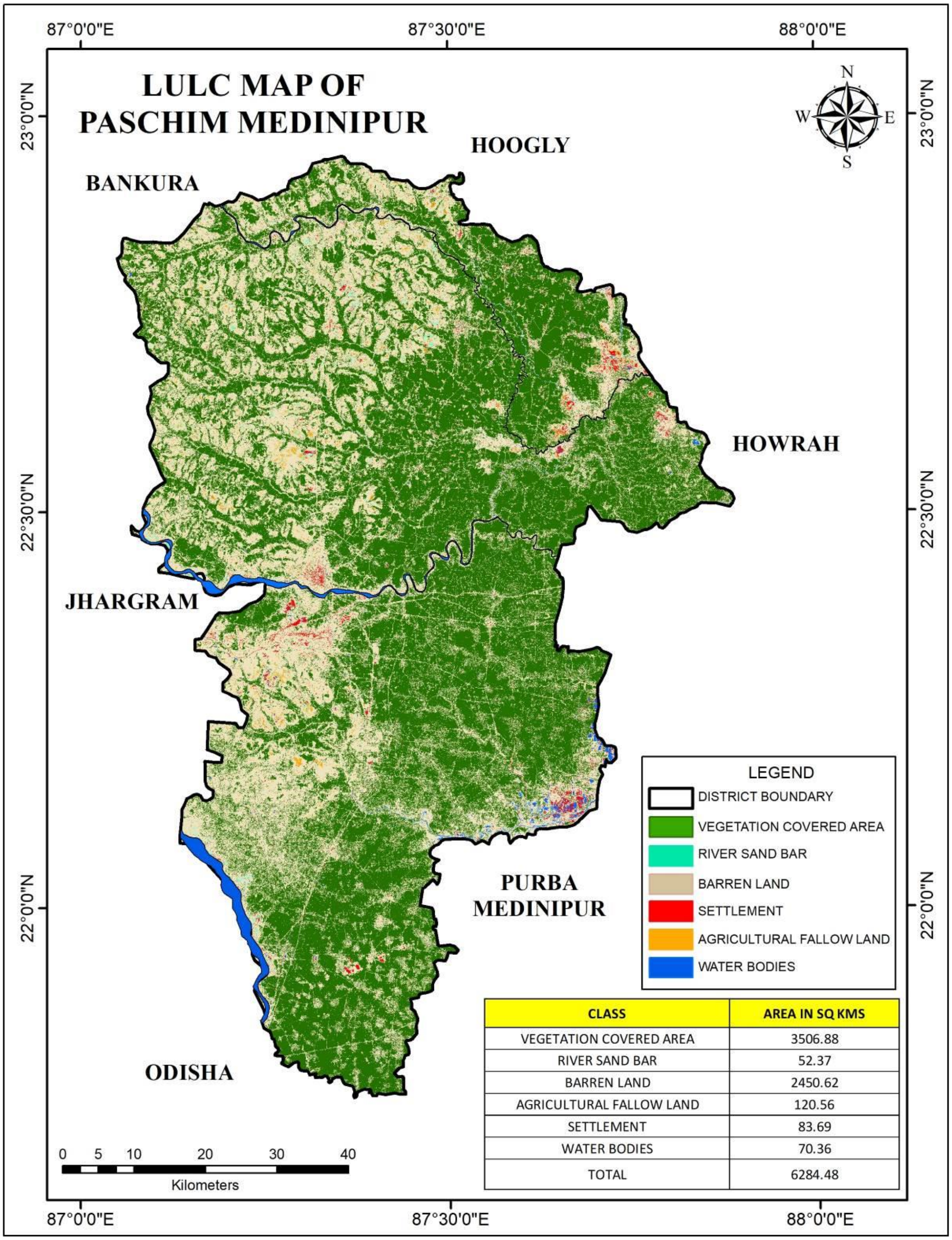
Table 5.2: Distribution of Villages according to Agricultural Land Use, 2011

Name of C.D. Block	Total area (in Hectares)	Percentage of cultivable area to total area	Percentage of irrigated area to cultivable area
Garhbeta-II	35571.52	58.85	86.82
Garhbeta-I	33516	67.3	78.21
Garhbeta-III	28640.61	55.03	74.9
Chandrakona-I	19125.37	80.54	76.26
Chandrakona-II	14497.54	80.94	87.41
Ghatal	21154.07	68.18	65.35
Daspur-I	16490.09	69.05	70.74
Daspur-II	16545.52	77.5	75.01
Keshpur	45645.88	74.49	56.62
Salbani	48568.25	51.74	71.38
Midnapore	28875.47	59.25	50.14
Kharagpur-I	26120.19	62.5	55.97
Kharagpur-II	25986.9	72.78	72.53
Debra	33258	84.11	90.31
Pingla	22168	79.52	86.08
Sabang	30205	79.54	81.82
Narayangarh	47976	71.24	47.55
Keshiary	28537	70.65	29.34

Name of C.D. Block	Total area (in Hectares)	Percentage of cultivable area to total area	Percentage of irrigated area to cultivable area
Dantan-I	24334	78.27	39.91
Dantan-II	18271	82.1	52.86
Mohanpur	13702	70.94	70.23

Table 5.2 shows the distribution of agricultural land, both irrigated and non-irrigated land in different blocks of Paschim Medinipur district. In the district around 71% land area is available for cultivation. Irrigation is considered as an important factor for cultivation. As per the Census 2011 dataset, 67% of the cultivable land is under irrigation. The proportions of cultivable area in Salboni block with respect to its total area are lowest. Keshiary and Datan-I blocks have less proportion of irrigated area.

Figure 5.2 is the Land Use Land Cover map of the district.



CLASS	AREA IN SQ KMS
VEGETATION COVERED AREA	3506.88
RIVER SAND BAR	52.37
BARREN LAND	2450.62
AGRICULTURAL FALLOW LAND	120.56
SETTLEMENT	83.69
WATER BODIES	70.36
TOTAL	6284.48

Figure 5.2: Land Use Land Cover map of Paschim Medinipur District
(Source: Resourcesat-1&2 – Liss-3, Bhuvan India)

5.1 Forest -detail of the district

The forest area of district Paschim Medinipur (Un-divided) is spread over 1,71,935 hectares of which protected area occupies 1,60,179.30 hectares and reserved area covers 6,182.34 hectares. The main vegetation of the forest are Sal, Teak, Babble, Maher, Amla etc. A large part of the district is surrounded by dense forest and the main areas are spread over C.D. Blocks Jhargram, Garhbeta, Midnapore, Kharagpur, Jamboni and Narayangarh (Census, 2011).

Table 5.3: Classification of Forest Area, Out-turn of Forest Produce, Revenue and Expenditure of Forest Department

Item	Unit	2009-10	2010-11	2011-12	2012-13	2013-14
1. Area by class of forest						
Reserved forest	Hectare	6182.00	6192.17	6192.17	6192.17	6192.17
Protected forest	"	160150.15	159487.53	159487.53	160173.48	160185.05
Unclassed state forest	"	8774.36	8647.04	8647.04	8774.37	8774.37
Khas forest	"	-	-	-	-	-
Vested waste land	"	-	3733.43	3733.43	3733.43	3733.43
Forest owned by corporate bodies	"	-	1577.75	1577.75	1577.75	1577.75
Forest owned by private individuals	"	-	-	-	-	576.10
Total		-	-	-	-	-
2. Forest Produce	-	**175106.51**	**179637.92**	**179637.92**	**180451.20**	**181038.87**
Timber	Thousand cu.metre	-	-	-	-	-
Fuel	"	1.69	2.32	3.79	2.01	3.91
Pole	Number	26.02	12.17	10.03	31.72	11.18
3. Revenue & Expenditure	-	-	-	-	-	-
Revenue	Rs. in thousand	144102	268365	173253	144102	489689
Expenditure	"	-	-	-	-	450

Source: http://wbpspm.gov.in/publications/District%20Statistical%20Handbook

5.2 Agriculture and Irrigation

Agricultural land of the district is of three types- Sali, Suna and Tara or Danga. 'Sali' is suitable for growing of aman rice, 'Suna' for various crops like 'aus' kharif, sugarcane, cotton, tobacco, mustard etc. 'Suna' is also used for production of fine kind of rice.

Agriculture is the most important occupation of the people of Paschim Medinipur district. The economy of the district is based on agriculture. The principal crop of the district is paddy though other crops like pulses, oilseeds, potatoes and sugarcane also grows in the district.

Production figures for the year 2010-11 show the production of rice at 1,718.6 thousand tons of which aman was 1,002.2 thousand tons, boro 629.6 thousand tones. Among others, total pulses produced was 4.1 thousand tons, total oil seeds was 94.7 thousand tons, total fibers (98.0 per cent jute) was 42.6 thousand bales (of 180 kg. each), potato was 2,482.4 thousand tones, dry chilies was 6,000 tones and ginger 2,500 tons (Census, 2011).

Medinipur Canal is the most important source of irrigation in the district. The water supply is derived from the river Kangsabati at Mohanpur where there is a regulating weir with head works and the Canal extends to Uluberia on the river Hugli. Besides Medinipur Canal, number of Deep Tube Wells, River Lift Irrigation and Shallow Tube wells are also used for irrigation.

Table 5.4 shows the crop production capacity of the Paschim Medinipur district.

Table 5.4: Production of Principal Crops in the Paschim Medinipur District

(In Thousand tonnes)

Crops	2009-10	2010-11	2011-12	2012-13	2013-14
Foodgrains :					
1. **Rice**	**1756.5**	**1718.6**	**1774.0**	**1880.2**	**1742.6**
Aus	61.6	86.8	75.7	85.8	87.3
Aman	1195.0	1002.2	1245.6	1315.9	1053.4
Boro	499.9	629.6	452.7	478.5	601.9
2. Wheat	12.5	11.3	9.4	11.0	10.9
3. Barley	-	-	-	-	-
4. Maize	2.9	2.4	2.4	3.0	6.4
5. Other Cereals	-	-	-	-	-
Total Cereals	**1771.9**	**1732.3**	**1785.8**	**1894.2**	**1759.9**
6. Gram	(b)	(b)	(b)	-	(b)
7. Tur	(b)	0.2	(b)	0.2	0.3
8. Other Pulses	4.1	3.9	3.0	3.5	4.2
Total Pulses	**4.1**	**4.1**	**3.0**	**3.7**	**4.5**
Total Foodgrains	**1776.0**	**1736.4**	**1788.8**	**1897.9**	**1764.4**
Oil Seeds :					
1. Rapeseed & Mustard	10.2	11.7	11.7	13.5	15.8
2. Linseed	-	-	-	(b)	(b)

Crops	2009-10	2010-11	2011-12	2012-13	2013-14
3. Other Oil seeds	83.7	83.0	67.2	82.2	88.4
Total Oil seeds	**93.9**	**94.7**	**78.9**	**95.7**	**104.2**
Fibres : *					
1. Jute	42.7	41.6	37.8	42.7	64.7
2. Mesta	-	-	-	4.6	-
3. Other Fibres	0.9	1.0	0.9	0.9	1.0
Total Fibres	**43.6**	**42.6**	**38.7**	**48.2**	**65.7**
Miscellaneous crops :					
1. Sugarcane	134.4	89.7	524.3	503.6	708.2
2. Potato	2448.1	2482.4	1148.6	1463.6	1224.1
3. Tobacco	-	-	-	-	-
4. Tea	-	-	-	-	-
5. Chillies (dry)	6.0	6.0	6.0	6.1	6.2
6. Ginger	2.5	2.5	2.5	2.5	2.6
Total Miscellaneous crops	**2591.0**	**2580.6**	**1681.4**	**1975.8**	**1941.1**

(Source: http://wbpspm.gov.in/publications/District%20Statistical%20Handbook)

5.3 Horticulture

The district has a suitable agro-climatic condition for cultivation of mulberry and horticulture crops such as mango, banana, guava, lemon, mousambi, papaya, cashew and jackfruit. The major agricultural fruit crops grown in the district are given in Table 5.5.

Table 5.5: Production of Fruits and Vegetables in the district

Name of Fruits / Vegetables	Production (Thousand tonnes)				
	2009-10	2010-11	2011-12	2012-13	2013-14
A. Fruits :					
Mango	12.49	14.49	16.43	16.58	10.50
Banana	37.18	38.00	39.08	40.27	39.38
Pineapple	1.26	1.26	1.25	1.20	0.90
Papaya	10.34	10.41	10.50	10.97	11.50
Guava	14.91	14.91	14.66	15.19	15.34
Jackfruit	9.76	9.76	9.80	9.94	9.85
Litchi	0.62	0.62	0.68	0.69	0.70
Mandarin Orange	-	-	-	-	-

Name of Fruits / Vegetables	Production (Thousand tonnes)				
	2009-10	2010-11	2011-12	2012-13	2013-14
Other Citrus	5.92	5.92	6.21	6.38	6.11
Sapota	2.81	2.81	2.82	2.51	2.62
Others	3.28	3.32	2.78	2.50	2.55
Total	**49.17**	**98.57**	**101.50**	**104.21**	**106.23**
B. Vegetables :					
Tomato	69.80	70.71	71.09	74.93	72.73
Cabbage	148.31	150.39	150.69	151.28	138.30
Cauliflower	109.91	111.36	111.66	111.30	101.50
Peas	2.89	2.98	1.98	1.99	2.16
Brinjal	178.80	162.72	186.90	186.75	174.50
Onion	43.23	44.41	44.42	45.03	44.20
Cucurbits	115.00	119.11	119.22	120.50	120.88
Ladies Finger	45.03	46.39	45.79	46.66	51.48
Radish	23.02	4.03	24.13	25.34	27.70
Others	111.42	155.23	114.95	117.37	116.84
Total	**838.47**	**847.41**	**867.33**	**870.83**	**881.15**

(Source: http://wbpspm.gov.in/publications/District%20Statistical%20Handbook)

The floriculture of the district consists of various types of orchids, decorative plants, temperate and tropical flowers, etc. Flowers like Tuberose, Marigold, Rose and seasonal flowers are main of Paschim Medinipur district (Table 5.6). In this district the most popular flower is marigold.

Table 5.6: Production of Flowers in the district

Name of Flowers	Production					
	Unit	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**
Rose	Crore Cut Flower	20.980	21.300	21.841	24.360	26.150
Chrysanthemum	"	1.818	1.818	1.880	1.790	2.000
Gladiolus	"	1.970	2.100	2.150	2.162	2.230
Tuberose	"	20.800	22.000	24.000	25.920	26.700
Marigold	' 000 MT	5.532	5.532	6.201	6.239	6.598
Jasmine	"	0.092	0.092	0.093	0.091	0.091
Seasonal Flower	"	1.383	1.393	1.440	1.450	1.300
Misc.Flower	"	0.395	0.397	0.398	0.354	0.247

(Source: http://wbpspm.gov.in/publications/District%20Statistical%20Handbook)

5.4 Mining

Paschim Medinipur district does not hold huge minerals deposits. The district is having riverbed deposits which are generating revenue for the district mainly. In-situ deposits, such as Lateritic rocks are found in many parts of the district. The extracted laterite is used for various purposes. In Paschim Medinipur district, claystone are also noted. It is mainly used in the manufacture of household utensils.

6 Geology

The district is underlain unconsolidated alluvium of recent age. The Paschim Medinipur district is covered by the Quarternary un-consolidated formations which are mainly divisible into two units:

i. Platforms sediments mainly covered by Laterite forming upland area
ii. Recent sediments forming plain area

The Laterite upland area are underlain by a thick sequence of Clay, Silt, Sand and various grades and gravel down to the depth of 350 m. The quarternary formation comprises newer alluvium of recent age and older alluvium of Pleistocene age. The older alluvium is restricted to the fringe area of the platform terrain towards west and Northwest and is overlain by newer alluvium towards east, south and south east. The older alluvium comprises predominantly of yellow to reddish brown clays with Kankar and ferruginous gravel and sand, fine to medium.

The newer alluvium consists of predominantly of clay with occasional intercalation of silt and fine sand and is light grey in colour. The Quaternary sediments are underlain by semi-consolidated Tertiary sediments of Mio-Pilocene age. The Tertiary sediments comprise of alternations of graded sand-silt clay sequence cyclic sedimentation. In consist of Quaternaries, the Tertiary are grey in colour with deeper lithofacis being steel grey.

The top of the Tertiary sediment is generally represented by Grey clay. This Grey Clay bed is persistent throughout the area and is considered as marker bed which separates the Upper Litho system and Lower Litho System.

The quartzo-feldspathic unconsolidated Quarternary sediments vary considerably in thickness from 120 m in the west to over 150 m in the east and from 150 m in the NW direction to over 180 m in SE direction. It is predominantly arenaceous in the north and northeast to most argillaceous in the south and southeast. The thickness of the newer alluvium varies between 10 to 60 m in the NW-SE direction. The newer alluvium is devoid of any significance granular zones.

Figure 6.1 is the geological map of un-divided Medinipur district.

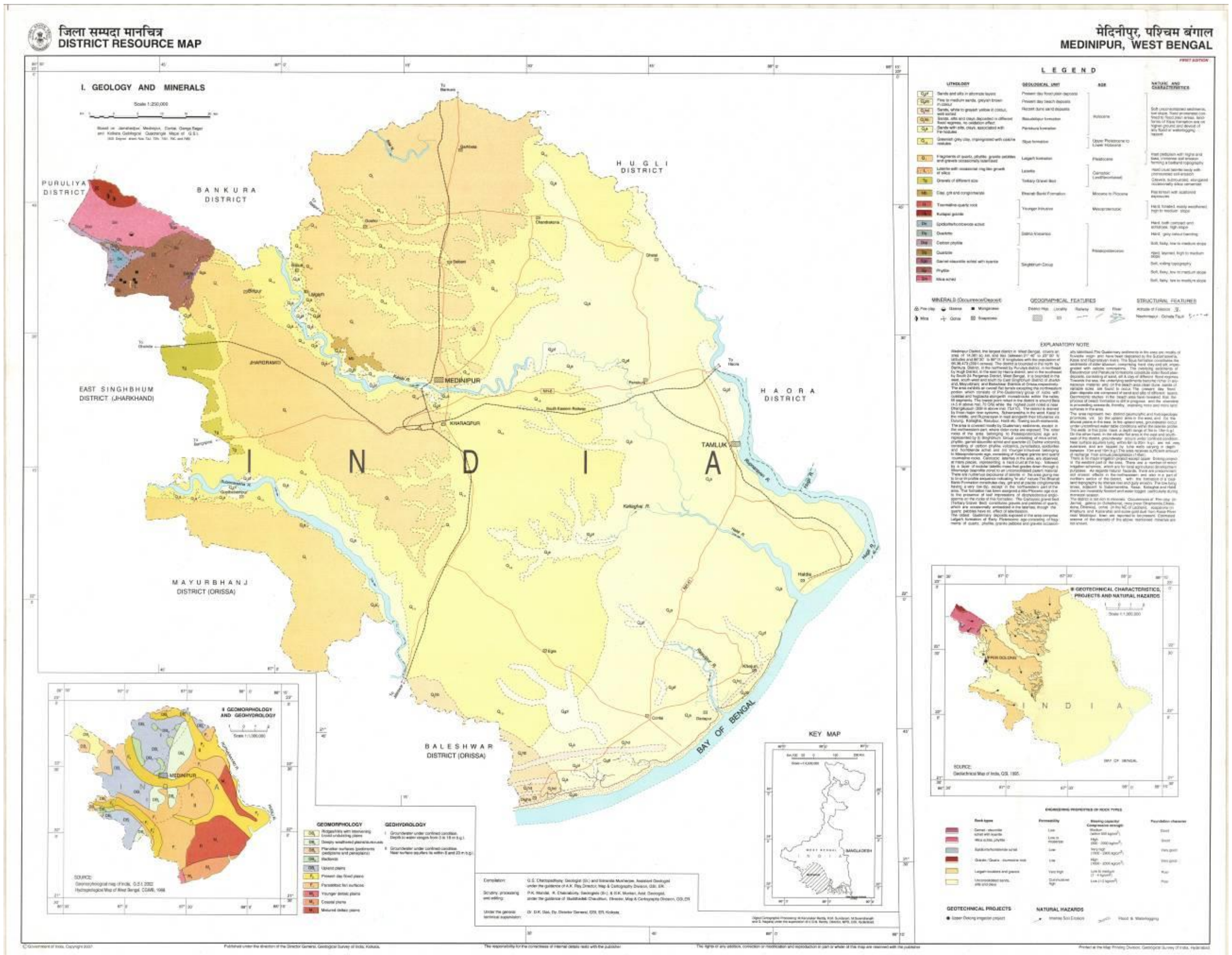


Figure 6.1: Geological map of Medinipur district

(Source: GSI, 2007)

Table 6.1: Geological succession of Paschim Medinipur

AGE	GEOLOGICAL UNIT	LITHOLOGY
Holocene	Present day flood plain deposits	Alternating layers of sand and silt
	Present day beach deposits	Fine medium greyish brown sands
	Recent dune sand	Well sorted white to greyish yellow sands
	Basudebpur Formation	Sand, silt and clay (un-oxidized or occasionally oxidized)
	Panskura Formation	Laterite
Upper Pleistocene to Holocene	Sijua Formation	Clay and grit
Pleistocene	Lalgarh Formation	Fragments of quartz, phyllite, granite occasionally laterite
Carboniferous to Triassic	Laterite	Laterite with occasional ring like growth of silica
	Tertiary Gravel bed	Gravels of different size
	Bhairab Banki	Clay, grit and conglomerate
Meso-proterozoic	Younger Volcanics	Tourmaline-quartz rock
		Kuilapal granite
Paleo-Proterozoic	Dalma Volcanics	Quartzite
		Epidote/ hornblende schist
	Singhbhum Group	Quartzite
		Mica schist, occasionally garnetiferous
		Calc-gneiss and granulite
		Garnet-staurolite schist with kayanite
		Garnetiferous phyllite

(Source: GSI, 2007)

7 Mineral wealth

7.1 Overview of mineral resources:

Occurrence of major minerals in the district of Paschim Medinipur is not well established. Main mineable mineral of the district is sand the riverbed.

7.2 Details of Resources:

The mineral resources of the district whose categorization and estimation have been done are furnished in this section.

7.2.1. Sand and other riverbed minerals:

I. Drainage

The rivers of district Paschim Medinipur, owing to the typical physiographical condition of the district, emerge from the Chhotanagpur Plateau to the West, flows East or South-East ward direction according to the slope of the land and meets Bay of Bengal to the South East or tributaries of Hugli (Hooghly) to the East. All the rivers in this region are rain-fed and flow to the fullest during Monsoon. Brief description the few major rivers (Table 7.1 and Table 7.2) of district Paschim Medinipur are given in the subsequent paragraphs.

Subarnarekha River: River Subarnarekha is a transboundary river flowing through the states of Jharkhand, West Bengal and Odisha. Being originated near Nagri Village in Jharkhand in the Chhotanagpur Plateau region, Subarnarekha enters district Paschim Medinipur near Bhatandiha in C. D. Block Gopiballavpur I, creating the borders of C. D. Blocks Gopiballavpur II with Gopiballavpur I; C. D. Block Sankrail and Keshiyari with C. D. Block Nayagram and Dantan and then exits the district to enter State of Odisha. Floods are common in the course of Subarnarekha and causes havoc during Monsoon.

Shilabati River: River Shilabati is the largest tributary of river Rupnarayan and as the main contributor in formation of the river Rupnarayan. River Shilabati emerges from the confluence of several smaller river streams generated from the Chhota Nagpur Plateau like Purandar, Shalad, Joy-Ponda, Parang, Betai, Donai, Amlagura etc. Shilabati has a comparatively broader drainage basin with substantial agricultural activities. The main course of Shilabati is originated in district Puruliya, passes through district Bankura and enters district Paschim Medinipur after meeting river Joy-ponda at village Kenja in C. D. Block Garhbeta II. It then flows in West – South-West direction and passes through C.D. Blocks Garhbeta I, Chandrakona II, Chandrakona I and Keshpur. From Keshpur, river Shilabati moves in North- North-East direction through C.D. Blocks Debra and Dantan.

Kangshabati River: River Kangshabati is one of the most important rivers of district Paschim Medinipur. Like other important rivers in the district, it's origin is in the Chhotanagpur Plateau in near Muruguma in Jhalda II C. D. Block of district Purulia. It then passes through district Bankura and enters district Paschim Medinipur near village Basantapur in Binpur I C.D. Block. Several important towns of district Paschim Medinipur like district Head Quarter Medinipur, Kharagpur are located near or on the banks of river Kangshabati. Kangshabati Irrigation Project and Kangshabati reservoir is built in the upper course of the river to utilise the river water for irrigation purpose across the Western districts of West Bengal.

a) Drainage System with description of main rivers

Table 7.1: Drainage system with description of main rivers

Sl.No.	Name of the River	Area drained (Sq.km)	% Area drained in the district
1	Shilabati	8.03	0.12%
2	Kansabati	42.972	0.68%
3	Subarnarekha	98.254	1.55%

b) Salient Features of important rivers and streams

Table.7.2: Salient Features of important rivers and streams

S.No.	Name of the River or Stream	Total Length in District (in Km)	Place of origin	Altitude at Origin
1	Shilabati	71.62	Chak Gopalpur village of Hura Block, Purulia	440m
2	Kangsabati	68.95	Jabarban peak of Ghoramarapahar	600m
3	Subarnarekha	67.353	Piska/Nagri, Ranchi, Jharkhand	689m

II. Annual deposition of riverbed minerals

Annual deposition of riverbed minerals is dependent on various factors which are explained below.

A) Geomorphological studies

Geomorphological characteristic of a river is foremost factor for annual deposition of sedimentary load. The study includes following parameter:

i) Place of Origin

Details of origin of rivers of Paschim Medinipur District are furnished in Table 7.3.

Table 7.3: Place of Origin of important rivers and streams

S.No.	Name of the River or Stream	Place of origin
1	Shilabati	Chak Gopalpur village of Hura Block, Purulia
2	Kangsabati	Jabarban peak of Ghoramarapahar
3	Subarnarekha	Piska/Nagri, Ranchi, Jharkhand

ii) Catchment Area

The Paschim Medinipur district is mainly drained by the Shilabati, Kangsabati and Subarnarekha. These rivers and its tributary rivers are forming the main catchment area.

iii) General profile of river stream

River profile has been studied along the cross-section lines which was chosen based on the drastic variation of the river widths, proximity of the operating sand 'ghats' and the position of the sand bars.

Relative disposition of rivers in Paschim Medinipur district along with the distribution of the section lines are shown in Figure 7.1. River profile section and cross section views are presented in Figures 7.2 and 7.3.

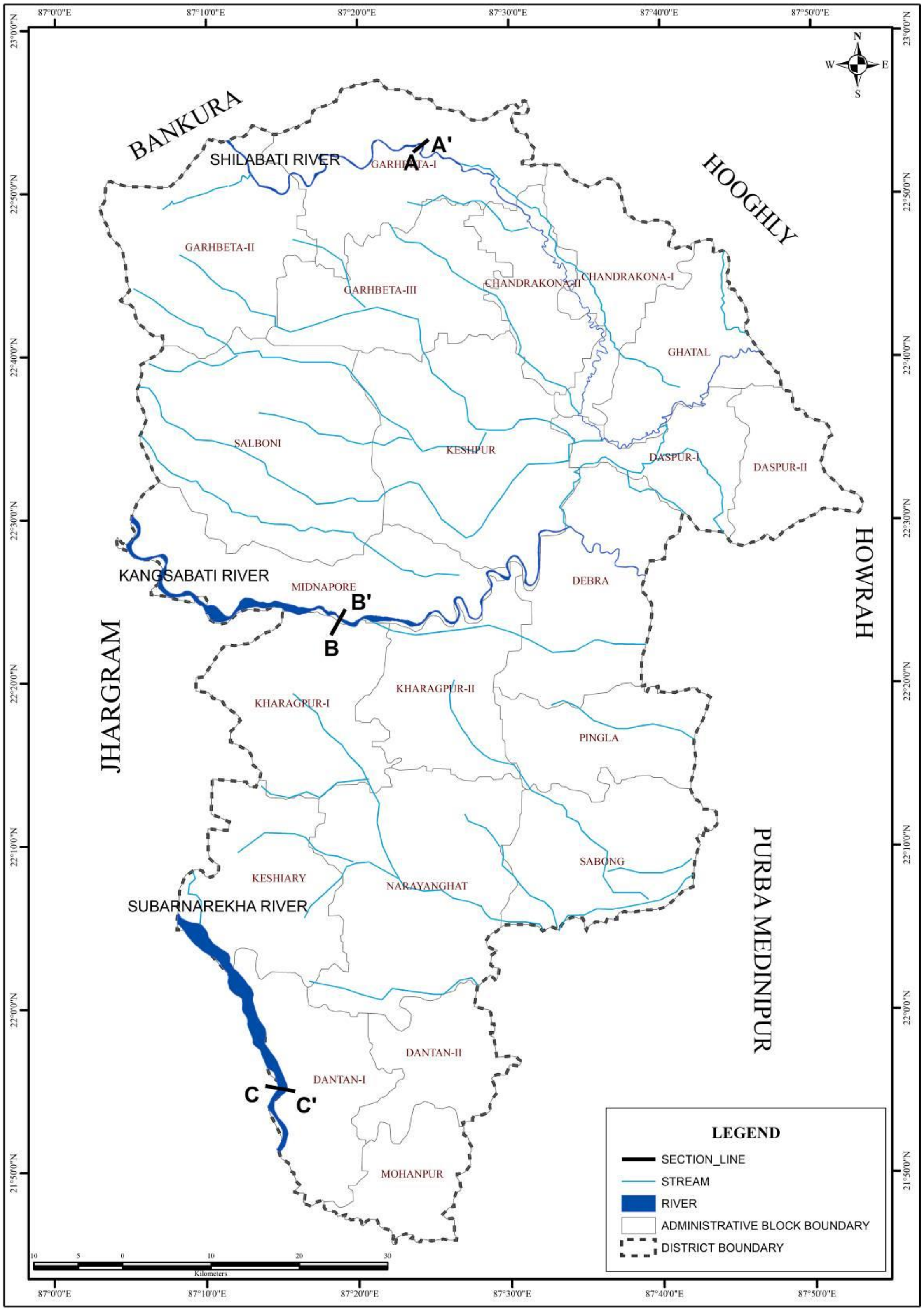


Figure 7.1: Map showing the major rivers along which profile section drawn

Figure 7.2A: Profile section of Shilabati River

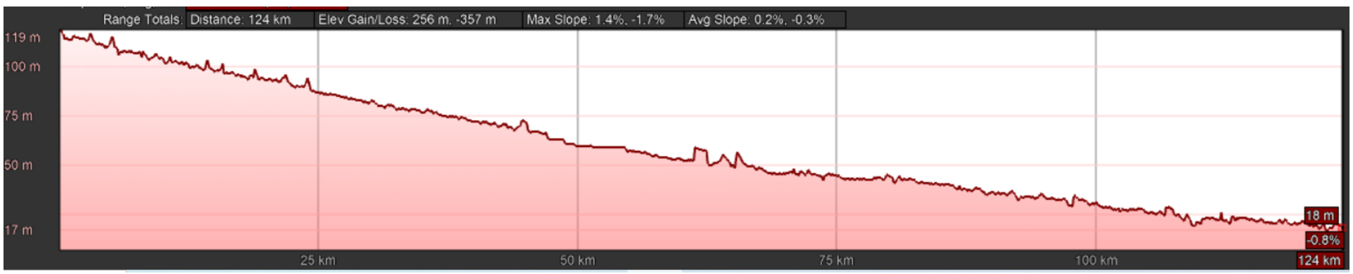


Figure 7.2B: Profile section of Kangsabati River

Figure 7.2C: Profile section of Subarnarekha River

Figure 7.3A: Cross section view of Shilabati River

Figure 7.3B: Cross section view of Kangsabati River

Figure 7.3C: Cross section view of Subarnarekha River

iv) Annual deposition factor

Annual deposition of riverbed materials depends on various factors, such as process of deposition, mode of sediment transport, sediment transport rate, and sediment yield of the river.

1. Process of deposition

Deposition is the processes where material being transported by a river is deposited. Deposition occurs when the forces responsible for sediment transportation are no longer sufficient to overcome the forces of gravity and friction, creating a resistance to motion; this is known as the null-point hypothesis. This can be when a river enters a shallow area or towards its mouth where it meets another body of water.

The principle underlying the null point theory is due to the gravitational force; finer sediments remain in the water column for longer durations allowing transportation outside the surf zone to deposit under calmer conditions. The gravitational effect or settling velocity determines the location of deposition for finer sediments, whereas a grain's internal angle of friction determines the deposition of larger grains on a shore profile.

Deposition of non-cohesive sediments: Large-grain sediments transported by either bedload or suspended load. In case of bedload, when there is insufficient bed shear stress and fluid turbulence are insufficient to keep the sediment moving, the grain cease horizontal movement and rapidly come to rest. In case of suspended load the grain settle longer distance vertically through the fluid before coming to rest.

Deposition of cohesive sediments: The cohesion of sediment occurs with the small grain sizes associated with silts and clays, or particles smaller than 4Φ or 62.5 µm. If these fine particles remain dispersed in the water column, Stokes law applies to the settling velocity of the individual grains. The face of a clay platelet has a slight negative charge where the edge has a slight positive charge when two platelets come into close proximity with each other the face of one particle and the edge of the other are electrostatically attracted, and then have a higher combined mass which leads to quicker deposition through a higher fall velocity.

2. Mode of sediment transport in rivers

Sediment transport in rivers provides a dynamic linkage between flow and channel form. Mainly there are three processes by which sediment load is transported and these are (i) rolling or traction, in which the particle moves along a sedimentary bed but is too heavy to be lifted from it; (ii) saltation; and (iii) suspension, in which particles remain permanently above the bed, sustained there by the turbulent flow of the water.

Another name for sediment transport is sediment load. The total load includes all particles moving as bedload, suspended load, and wash load.

Bed load: Bedload is the portion of sediment transport that rolls, slides or bounces along the bottom of a waterway. This sediment is not truly suspended, as it sustains intermittent contact with the streambed, and the movement is neither uniform nor continuous. Bedload occurs when the force of the water flow is strong enough to overcome the weight and cohesion of the sediment. While the particles are pushed along, they typically do not move as fast as the water around them, as the flow rate is not great enough to fully suspend them. Bedload transport can occur during low flows (smaller particles) or at high flows (for larger particles). Approximately 5-20% of total sediment transport is bedload. In situations where the flow rate is strong enough, some of the smaller bedload particles can be pushed up into the water column and become suspended.

Suspended load: While there is often overlap, the suspended load and suspended sediment are not the same thing. Suspended sediment are any particles found in the water column, whether the water is flowing or not. The suspended load, on the other hand, is the amount of sediment carried downstream within the water column by the water flow. Suspended loads require moving water, as the water flow creates small upward currents (turbulence) that keep the particles above the bed. The size of the particles that can be carried as suspended load is dependent on the flow rate. Larger particles are more likely to fall through the upward currents to the bottom, unless the flow rate increases, increasing the turbulence at the streambed. In addition, suspended sediment will not necessarily remain suspended if the flow rate slows.

Wash load: The wash load is a subset of the suspended load. This load is comprised of the finest suspended sediment (typically less than 0.00195 mm in diameter). The wash load is differentiated from the suspended load because it will not settle to the bottom of a waterway during a low or no flow period. Instead, these particles remain in permanent suspension as they are small enough to bounce off water molecules and stay afloat. However, during flow periods, the wash load and suspended load are indistinguishable.

3. 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. The sediment transport rate is commonly denoted by Qs.

4. Estimation of Sedimentation

There are two approaches to obtaining values describing sediment loads in streams. One is based on direct measurement of the quantities of interest, and the other on relations developed between hydraulic parameters and sedimenttransport potential.

The total bed material load is equal to the sum of the bedload and the bed material part of the suspended load; in terms of volume transport per unit width, qt = qb + qs. Here wash load, i.e. that part of the suspended load that is too fine to be contained in measurable quantities in the river bed, is excluded from qs.

There are number of equations to compute the total sediment load. Most of these equations have some theoretical and empirical bases.

In 1973, Ackers and White developed a general theory for sediment transport which was calibrated against the flume-transport data then available. Their functions have been widely accepted as one of the best available procedures for estimating the total bed over the full width of the flow section.

Dendy Bolton formula is often used to calculate the sedimentation yield. But use of these equations to predict sediment yield for a specific location would be unwise because of the wide variability caused by local factors not considered in the equations development. However, they may provide a quick, rough approximation of mean sediment yields on a regional basis. Computed sediment yields normally would be low for highly erosive areas and high for well stabilized drainage basins with high plant density because the equations are derived from average values. The equations express the general relationships between sediment yield, runoff, and drainage area.

5. Sediment Yield

The water that reaches a stream and its tributaries carries sediment eroded from the entire area drained by it. The total amount of erosional debris exported from such a drainage basin is its sediment load or sediment discharge and 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. Sediment yield is generally expressed as a volume or weight per unit area of drainage basin—e.g., as tons per square kilometre. Further, sediment yield is usually measured during a period of years, and the results are thus expressed as an annual average.

v) Replenishment Study (As per EMGSM guidelines, 2020):

Replenishment study for a river solely depends on estimation of sediment load for any river system and the estimation is a time consuming and should be done over a period. The process in general is very slow and hardly measurable on season-to-season basis except otherwise the effect of flood is induced which is again a cyclic phenomenon. Usually, replenishment or sediment deposition quantities can be estimated in the following ways as given below:

A. Replenishment study based on satellite imagery involves demarcation of sand bars potential for riverbed mining. Both pre and post monsoon images need to be analysed to established potential sand bars. Volume estimation of sand is done by multiplying Depth and Area of the sand bar. The sand bars are interpreted with the help of satellite imagery. Ground truthing has been done for 100% of the total identified sand bars. During ground truthing, width and length of each segment were physically measured. It has also been observed that in few cases, sand bars have attained more than 3 meters height from the average top level of the river beds. Considerations of sand resources have been restricted within 3 meters from the average top surface of the river bed.
B. Direct field measurement of the existing leases involving estimation of the volume diference of sand during pre and post-monsoon period. With systematic data acquisition, a model has developed for calculation of sediment yield and annual replenishment with variable components.
C. The replenishment estimation based on a theoretical empirical formula with the estimation of bed-load transport comprising of analytical models to calculate the replenishment estimation.

A. Replenishment estimation based on satellite imagery study

Sedimentation in any river is dependent on sediment yield which depends on soil erosion in river's catchment area. Catchment yield is computed using Strange's Monsoon runoff tables for runoff coefficient against rainfall return period. Peak flood discharge is calculated by using Dickens, Jarvis and Rational formula at 25, 50 and 100 years return period. The estimation of bed load transport is done using Ackers and White Equation.

Methodology Adopted: To delineate replenishment percentage in the river bed of the district, below mentioned steps have been followed.

- **Field data collation:**

Field data collations were done during June 2020 for pre monsoon period and during December 2020 for post monsoon period for the river ghats on continuous basis. Figure 7.4 shows the site view of Subarnarekha River. However, the non-operational areas were covered through traverses. In both the cases, relative elevation levels were captured through GPS/DGPS/ Electronic Total Station. Thickness of the sand bars was measured through sectional profiles. In few instances, sieve analysis of the sands was carried out to assess their particle size distribution.

Figure 7.4: Site View of River Subarnarekha

- **Selection of Study profiles:**

  Study profiles are selected based on the occurrence of the sand bars in the channel profiles. Aerial extents of each of the profiles are mapped from satellite imagery.

- **Data Compilation:**

  Following data were compiled for generation of the annual replenishment report:
  - Elevation levels of the different sand ghats and sand bars as measured at site.
  - Extents of the sand bars are measured from the pre monsoon satellite imagery.
  - Sand production data of the district.

- **Assessment of sediment load in the river:**

  Assessment of sediment load in a river is subjective to study of the whole catchment area, weathering index of the various rock types which acts as a source of sediments in the specific river bed, rainfall data over a period not less than 20 years, and finally the detail monitoring of the river bed upliftment with time axis. Again, the sediment load estimation is not a dependent variable of the district boundary, but it largely depends upon the aerial extent of the catchment areas, which crosses the district and state boundaries.

- **Estimation of annual sand deposition:**

The major sand producing rivers of Paschim Medinipur district are Shilabati Rivers, Kangsabati and Subarnarekha River. Planning has been done for systematic sand mining in the rivers.

While calculation of the areas of sand bar, a classification system has been adopted with three categories of land identified within the channel areas which is as follows:

a. The untapped sand bars.
b. The sand bars worked in the pre-monsoon period.
c. Main channel course within the channel.

A summary of sediment load comparison between pre- and post-monsoon periods for different rivers Paschim Medinipur district is given in Table 7.4 and details of each sand bars along with their sand resources in pre monsoon and post monsoon period are provided in Annexure-2. Maps showing distribution of sand bars on rivers of the Paschim Medinipur district during pre- and post-monsoon periods are depicted in Plate-2A and 2B respectively.

Table 7.4: Sediment Load comparison between Pre- and Post-monsoon periods for different rivers

River Name	Pre-Monsoon no of ghats	Post-Monsoon no of ghats	Pre-Monsoon Sediment Load (Mcum)	Post Monsoon Sediment Load (Mcum)	Difference (Mcum)	Difference (%)
Kangsabati River	58	31	16.05	16.73	0.69	4%
Shilabati River	48	19	3.10	3.53	0.43	14%
Subarnarekha River	22	26	26.52	27.79	1.27	5%
Total	**128**	**76**	**45.66582**	**48.0531**	**2.387278**	**5%**

Thus, in Paschim Medinipur district, about 2.39 million cum of sand has been found as an incremental volume increase when compared between pre- and post-monsoon sand reserve data. Percentage difference is about 105% which is replenishment and aggradation rate for the year.

Long-term satellite imagery study has also been carried out for sand producing rivers of Paschim Medinipur district to analyse the changes in river course. A representative map, showing long-term (from 2001 to 2021) erosion-accretion areas on both the banks of Kangsabati River, Paschim Medinipur has been prepared and furnished in Plate No. 5. Map shows changes in river channel through erosion and accretion of river bank and in the process the river shows widening of width of the river course by almost 762m to 1204m from 2001 to 2021.

B. Replenishment estimation based on field investigation

The study was carried out on existing mining leases. In order to assess the annual replenishment rate, an approach of direct measurement methodology has been adopted. The depth and area of the mining leases are measured through DGPS/Total station just before the closure of the mines in pre-monsoon period and the same areas are resurveyed in the post-monsoon period. The differences between the depths of the surveyed areas are accounted for the volumetric measurement of the replenished sand.

Table 7.5 represents field measurement of replenishment rate estimated for major rivers.

Table 7.5: Replenishment rate of the district

River Name	Location (Mauza)	Area	Surface RL	Thickness	Volume	After mining floor RL	Surface RL after Replenishment	Thickness Replenished	Volume Replenished	Difference in RL	Replenishment Rate
		m2	m	m	cum	m	m	m	cum	m	%
Shilabati	Kantore	19800.00	45.00	2.90	57420.00	42.10	44.91	2.81	55697.40	0.09	97.00%
Shilabati	Manikkundu	31500.00	15.00	2.90	91350.00	12.10	14.94	2.84	89340.30	0.06	97.80%
Shilabati	Kuldaha	3100.00	10.00	2.85	8835.00	7.15	9.94	2.79	8658.30	0.06	98.00%
Kangsabati	Ghanesharpur	50000.00	33.00	2.88	144000.00	30.12	32.93	2.81	140256.00	0.07	97.40%
Kangsabati	Kanjageriya	23000.00	13.00	2.90	66700.00	10.10	12.94	2.84	65366.00	0.06	98.00%
Kangsabati	Gokulnagar	6300.00	10.00	2.94	18522.00	7.06	9.96	2.90	18244.17	0.04	98.50%
Subarnarekha	Belmula	50000.00	23.00	2.90	145000.00	20.10	22.94	2.84	142100.00	0.06	98.00%
Subarnarekha	Hasimpur	36000.00	11.00	2.84	102240.00	8.16	10.96	2.80	100706.40	0.04	98.50%

Based on field investigation, the average replenishment rate for the year 2020 is about 97.9%.

C. Replenishment estimation based on a empirical formula:

The river reaches with sand provide the resource and thus it is necessary to ascertain the rate of replenishment of the mineral. Regular replenishment study needs to be carried out to keep a balance between deposition and extraction.

Sediment load deposition in a river is dependent on catchment area, weathering index of the various rock types of the catchment area, land-use pattern of the area, rainfall data and grain size distribution of the sediments. Again, the sediment load estimation is not a dependent variable of the district boundary, but it largely depends upon the aerial extents of the catchment areas, which crosses the district and state boundaries.

i. Methodology of the study:

The replenishment estimation is based on a theoretical empirical formula with the estimation of bedload transport comprising of analytical models to calculate the replenishment estimation. Sedimentation in riverbed depends on catchment yield, peak flood discharge due to rainfall, bed load transport rates and sediment yield characteristic of the river. Some of the common methods used for replenishment study are explained below.

a. Catchment Yield Calculation:

The total quantity of surface water that can be expected in a given period from a stream at the outlet of its catchment is known as yield of the catchment in that period. The annual yield from a catchment is the end product of various processes such as precipitation, infiltration and evapotranspiration operating on the catchment.

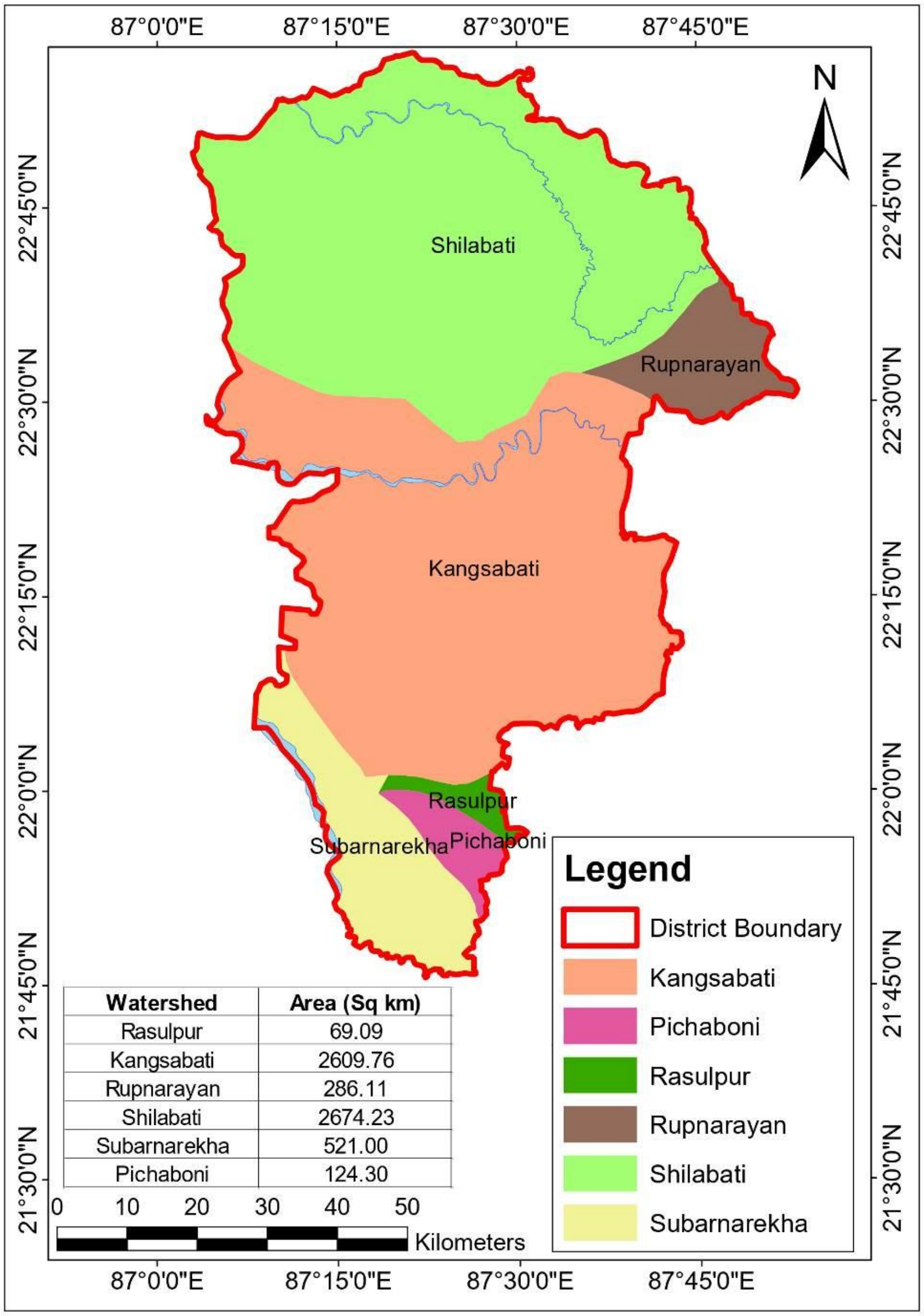


Figure 7.5: Watershed map of Paschim Medinipur district

Catchment Yield can be estimated using following formula:

Catchment Yield (m^3) =Catchment area (m^2) × Runoff coefficient (%) × Rainfall (m)

The runoff generated from the watershed is analyzed using Strange's Table to get the reliable yield results. Runoff from a catchment is dependent upon annual rainfall as well as catchment characteristics such as soil types and the type of groundcover / land usage. Remote sensing was used for demarcation of catchment area relevant to the drainage system. Runoff coefficient of the catchment has been established based on Strange's Table.

Strange (1892) studied the available rainfall and runoff and obtained yield ratios as functions of indicators representing catchment characteristics (Subramanya, 2008). Catchments are classified as good, average and bad according to the relative magnitudes of yield of sediment. For example, catchment with good forest cover and having soils of high permeability would be classified as bad, while catchment having soils of low permeability and having little or no vegetal cover is termed good. Based on the study Strange established runoff coefficient table as given in Table 7.6.

Table 7.6: Runoff coefficient of the catchment based on Strange's table

Total monsoon rainfall (mm)	Runoff coefficient (%)			Total monsoon rainfall (mm)	Runoff coefficient (%)		
	Good catchment	Average catchment	Bad catchment		Good catchment	Average catchment	Bad catchment
25.4	0.1	0.1	0.1	787.4	27.4	20.5	13.7
50.8	0.2	0.2	0.1	812.8	28.5	21.3	14.2
76.2	0.4	0.3	0.2	838.2	29.6	22.2	14.8
101.6	0.7	0.5	0.3	863.6	30.8	23.1	15.4
127	1	0.7	0.5	889	31.9	23.9	15.9
152.4	1.5	1.1	0.7	914.4	33	24.7	16.5
177.8	2.1	1.5	1	939.8	34.1	25.5	17
203.2	2.8	2.1	1.4	965.2	35.3	26.4	17.6
228.6	3.5	2.6	1.7	990.6	36.4	27.3	18.2
254	4.3	3.2	2.1	1016	37.5	28.1	18.7
279.4	5.2	3.9	2.6	1041.4	38.6	28.9	19.3
304.8	6.2	4.6	3.1	1066.8	39.8	29.8	19.9
330.2	7.2	5.4	3.6	1092.2	40.9	30.6	20.4
355.6	8.3	6.2	4.1	1117.6	42	31.5	21
381	9.4	7	4.7	1143	43.1	32.3	21.5
406.4	10.5	7.8	5.2	1168.4	44.3	33.2	22.1
431.8	11.6	8.7	5.8	1193.8	45.4	34	22.7
457.2	12.8	9.6	6.4	1219.2	46.5	34.8	23.2
482.6	13.9	10.4	6.9	1244.6	47.6	35.7	23.8
508	15	11.3	7.5	1270	48.8	36.6	24.4
533.4	16.1	12	8	1295.4	49.9	37.4	24.9

Total monsoon rainfall (mm)	Runoff coefficient (%)			Total monsoon rainfall (mm)	Runoff coefficient (%)		
	Good catchment	Average catchment	Bad catchment		Good catchment	Average catchment	Bad catchment
558.8	17.3	12.9	8.6	1320.8	51	38.2	25.5
584.2	18.4	13.8	9.2	1346.2	52.1	39	26
609.6	19.5	14.6	9.7	1371.6	53.3	39.9	26.6
635	20.6	15.4	10.3	1397	54.4	40.8	27.2
660.4	21.8	16.3	10.9	1422.4	55.5	41.6	27.7
685.8	22.9	17.1	11.4	1447.8	56.6	42.4	28.3
711.2	24	18	12	1473.2	57.8	43.3	28.9
736.6	25.1	18.8	12.5	1498.6	58.9	44.4	29.4
762	26.3	19.7	13.1	1524	60	45	30

Rainfalls return period for 25, 50 and 100 years calculated as below:

As per Weibull's Formula (Subramanya, 2008)**,**

Return period/Recurrence interval = (n+1)/m
Where: n number of years on record;
m is the rank of observed occurrences when arranged in descending order.

b. Peak Flood Discharge Calculation:

The term “peak discharge” stands for the highest concentration of runoff from the basin area. The accurate estimation of flood discharge remains one of the major challenges as it depends upon physical characteristic of the catchment area and the flood intensity, duration and distribution pattern. There have been many different approaches for determining the peak runoff from an area. As a result, many different models (equations) for peak discharge estimation have been developed. Formulas used for Peak Discharge calculation areas below:

As per Dicken’s formula (Subramanya, 2008)**,**

$$Q = CA^{3/4}$$

Where: Q is Maximum flood discharge (m^3/sec) in a river
A is Area of catchment in Sq. Km
C is Constant whose value varies widely between 2.8 to 5.6 for catchments in plains and 14 to 28 for catchments in hills

As per Jarvis formula (Subramanya, 2008)**,**

$$Q = CA^{1/2}$$

Where: Q is Maximum flood discharge (m^3/sec) in a river
A is Area of catchment in Sq. Km
C is Constant whose value varies between 1.77 as minimum and 177 as maximum. Limiting or 100 percent chance floods are given by the value of C of 177

As per Rational formula ((Subramanya, 2008)**,**

Q = CIA

Where: Q is Maximum flood discharge (m^3/sec) in a river

A is Area of catchment in Sq. Km

C is Runoff coefficient which depends on the characteristics of the catchment area. It is a ratio of runoff: rainfall

I is Intensity of rainfall (in m/sec)

c. Bed Load Transport Calculation:

The most important problems in river engineering are to predict bed load transport rates in torrential floods flowing from mountainous streams. Three modes of transport namely; rolling, sliding and saltation may occur simultaneously in bed load transport. The different modes of transportation are closely related and it is difficult, if not impossible, to separate them completely. There are number of equations to compute the total sediment load. Most of these equations have some theoretical and empirical bases.

Ackers and White Equation:

Ackers and White (1973) used dimensional analysis based on flow power concept and their proposed formula is as follows.

$$C_t = C_s G_s (d_{50}/h) (V/U_*)^{n'} [(F_{gr}/A_1) - 1]^m$$

The dimensionless particle d_{gr} is calculated by:

$$d_{gr} = d_{50} (g(G_s-1)/v^2)^{1/3}$$

The particle mobility factor $F_{gr}$is calculated by:

$$F_{gr} = (U \times n'/(Gs-1)g\ d_{50})^{1/2} \times (V/(5.66\log(10h/d_{50}))^{1-n'}$$

Where,

A_1	= Critical particle mobility factor
C_s	= Concentration coefficient in the sediment transport function
C_t	= Total sediment concentration
d_{50}	= Median grain size
d_{gr}	= Dimensionless particle diameter
F_{gr}	= Particle mobility parameter
g	= Acceleration ofgravity
D_s, S_g	= Specific gravity
h	= Water depth
m	= Exponent in the sediment transport function
n'	= Manning roughness coefficient
U_*	= Shear velocity
V	= Mean flow velocity
ν	= Kinematic viscosity

Meyer – Peter's equation (Source: Hydrologic Engineering Center):

Meyer-Peter's equation (Ponce, 1989) is based on experimental work carried out at the Federal Institute of Technology, Zurich. Mayer-Peter gave a dimensionless equation based on rational laws. Mayer- Peter equation gave an empirical formula of bed load transport rates in flumes and natural rivers. The simplified Meyer-Peter's equation is given below:

$$g_b = 0.417[\tau 0\ (\eta'/\ \eta)^{1.5} - \tau c]^{1.5}$$

Where,
gb = Rate of bed load transport (by weight) in N per m width of channel per second.

η' = Manning's coefficient pertaining to grain size on an unrippled bed and Strickler formula i.e. η' = (1/24) x d1/6 where d is the median size (d_{50}) of the bed sediment in m.

η = The actual observed value of the rugosity coefficient on rippled channels. Its value is generally taken as 0.020 for discharges of more than 11cumecs, and 0.0225 for lower discharges.

τc = Critical shear stress required to move the grain in N/m2 and given by equation τc = 0.687da, where da is mean or average size of the sediment in mm. This arithmetic average size is usually found to vary between d_{50} and d_{60}.

τ0= Unit tractive force produced by flowing water i.e.γwRS. Truly speaking, its value should be taken as the unit tractive force produced by the flowing water on bed = 0.97γwRS. R is the hydraulic mean depth of the channel (depth of flow for wider channel) and S is the bed slope.

d. **Sediment Yield Estimation:**

Sedimentation occurs as the velocity decreases along with its ability to carry sediment. Coarse sediments deposit first, then interfere with the channel conveyance, and may cause additional river meanders and distributaries. The area of the flowing water expands, the depth decreases, the velocity is reduced, and eventually even fine sediments begin to deposit. As a result, deltas may be formed in the upper portion of reservoirs. The deposited material may later be moved to deeper portions of the reservoir by hydraulic processes within the water body.

There are many sediment transport equations which are suitable for use in the prediction of the rate of replenishment of river. Some of the famous sediment transport equations are:

1. Dendy – Bolton Equation
2. Yang Equations
3. Engelund-Hansen Equation
4. Modified Universal Soil Loss Equation (MUSLE) developed by Williams and Berndt (1977)

Dendy – Bolton Equation:

Dendy – Bolton formula (Dendy and Bolton 1976) is often used to calculate the sedimentation yield because:-

- The formula uses catchment area and mean annual runoff as key determinants.
- It does not differentiate in basin wide smaller streams and their characteristics.
- Dendy and Bolton equation calculates all types of sediment yield i.e. sheet and rill erosion sediments, gully erosion sediments, channel bed and bank erosion sediments and mass movement etc.

Dendy-Bolton determined the combined influence of runoff and drainage area on sediment yield to compute the sediment yield. They developed two equations i.e. for run off less than 2 inch and for run off more than 2 inch, which are given below:

For run off less than 2 inch:

$$(Q<2in)\ S=1289 \times (Q)^{0.46} \times [1.43-0.26 \text{ Log } (A)]$$

For run off more than 2 inches:

$$(Q > 2 \text{ in}):\ S= 1958\times (e^{-0.055\times Q}) \times [1.43-0.26 \text{ Log } (A)]$$

Where: S = Sediment yield (tons/sq miles/yr)

Q = Mean Annual runoff (inch)

A = Net drainage are in sq mile

Dendy-Bolton formula is often used to calculate the sediment yield. But use of these equations to predict sediment yield for a specific location would be unwise because of the wide variability caused by local factors not considered in the equations development. However, they may provide a quick, rough approximation of mean sediment yields on a regional basis for preliminary watershed planning. Computed sediment yields normally would be low for highly erosive areas and high for well stabilized drainage basins with high vegitation density because the equations are derived from average values. The equations express the general relationships between sediment yield, runoff, and drainage area. Many variables influence sediment yield from a drainage basin. They include climate, drainage area, soils, geology, topography, vegetation and land use. The effect of any of these variables may vary greatly from one geographic location to another, and the relative importance of controlling factors often varies within a given land resource area. Studies revealed that sediment yield per unit area generally decreases as drainage area increases. As drainage area increases, average land slope usually decreases; and there is less probability of an intense rainstorm over the entire basin. Both phenomena tend to decrease sediment yield per unit area.

Modified Universal Soil Loss Equation (MUSLE):

Modified universal soil loss equation (MUSLE) for estimation of sediment yield is also widely used. MUSLE is a modification of the Universal Soil Loss Equation (USLE). USLE is an estimate of sheet and rill soil movement down a uniform slope using rainfall energy as the erosive force acting on the soil (Wischmeier and Smith 1978). Depending on soil characteristics (texture, structure, organic matter, and permeability) some soils erode easily while others are inherently more resistant to the erosive action of rainfall.

MUSLE is similar to USLE except for the energy component. USLE depends strictly upon rainfall as the source of erosive energy. MUSLE uses storm-based runoff volumes and runoff peak flows to simulate erosion and sediment yield (Williams 1995). The use ofrunoff variables rather than rainfall erosivity as the driving force enables MUSLE to estimate sediment yields for individual storm events. The generalized formula of MUSLE is as below:

$$\mathbf{Y=11.8\times (Q \times qP).56 \times K \times Ls \times C \times P}$$

Where,

Y = sediment yield of stream (t/yr/km2),
Q = average annual runoff (m3),
K = soil erodibility factor,
qP = Highest discharge recorded (m3/s),
Ls = gradient/slope length,
C = cover management factor,
P = erosion control practice

ii. Estimation of Replenishment:

Paschim Medinipur district is mainly drained by the Shilabati, Kangsabati and Subarnarekha Rivers. These rivers and its tributary rivers are forming the main catchment area.

For replenishment study, following assumption/calculation are taken in to consideration:

- Catchment area (Watershed area) against each river has been calculated based on remote sensing data.
- Rainfall runoff coefficient as per Strange's table for the catchment area is consider 45%, as the rainfall in the district is more than 1485mm and the characteristic of the catchment of the district is average in nature.
- Peak flood discharge of the river of the district calculated based on Dicken's formula which is more applicable to north Indian and central Indian catchment. Here Dicken constant C is taken as 12 in present study as per published literature by Saha (2002).
- Bed load transport has not been computed in the regional aspect of the district, as the values are highly dependent on local factors such as particle mobility factor, roughness coefficient, Shear velocity, Mean flow velocity, Kinematic viscosity etc.
- Sedimentation yield calculated as per Dendy and Bolton formula as the equations express the general relationships between sediment yield, runoff, and drainage area.
- Computed sediment yields by Dendy Bolton formula normally would be low for highly erosive areas and high for well stabilized drainage basins with high plant density because the equations are derived from average values.
- Dendy and Boltan formula also say that actual sediment yield from individual drainage basin may vary 10-fold or even 100-fold from computed yields. Since the district river basins comprise sedimentary rocks with good average rainfall therefore the estimated replenishment is considered as 50-fold of computed results sediment yield.

The data estimated for each river in the district are given in Table 7.7.

Table 7.7: Replenishment parameter estimated for each river in the district

Estimation parameter	Shilabati	Kangsabati	Subarnarekha
Catchment Area (m^2)	2674230000	2609760000	521000000
Annual Rainfall (m) (in 2020)	1.55	1.55	1.55
Strange Runoff coefficient (%)	45%	45%	45%
Annual Run-off (m) (in 2020)	0.341	0.341	0.341
Catchment Yield (m^3)	1865275425	1820307600	363397500
Peak Flood Discharge (m^3/sec)	141117317.84	138558021.66	41381815.35
Flow depth d (m)	0.5	0.5	0.5
Channel width b (m)	200	180	150

Estimation parameter	Shilabati	Kangsabati	Subarnarekha
Mean velocity v (m/s)	0.06	0.05	0.05
Channel slope S_o (m/m)	0.001	0.001	0.001
Sediment Yield (Tons/year)	41671.52	40846.29	10439
Estimated Annual Replenishment (in million m3)	0.78037	0.76491	0.19549

Sedimentation rate of a river is dependent on the annual rainfall of the district. Sedimentation rate for the period 2016-2020 of each river is presented in Table 7.8 and Figure 7.6.

Table 7.8: Year-wise sedimentation rate for last 5 years of each river

Year	Shilabati	Kangsabati	Subarnarekha	Annual Rainfall
2016	21.89	21.99	28.15	**1391.3**
2017	15.45	15.51	19.86	**1552.1**
2018	26.95	27.07	34.65	**1294.9**
2019	12.85	12.91	16.52	**1637.1**
2020	15.58	15.65	20.04	**1547.6**

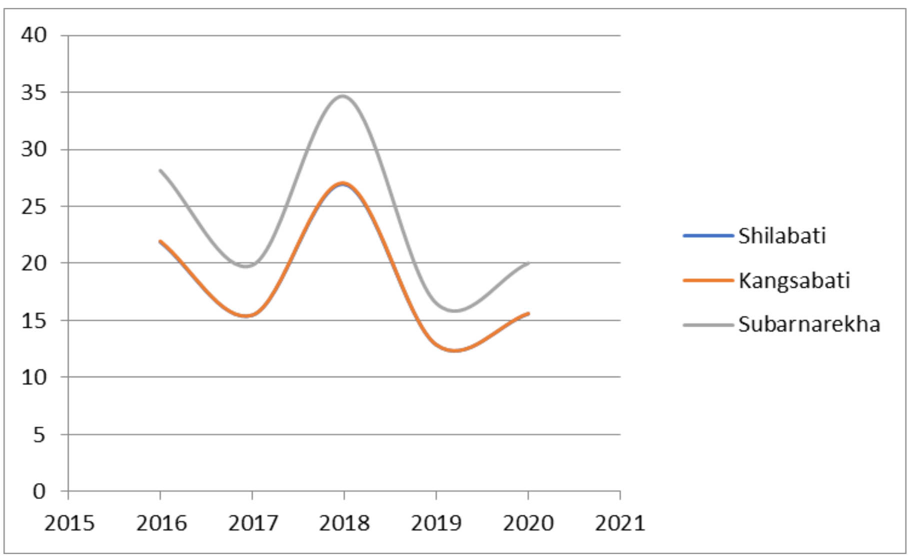


Figure 7.6: Graphical representation of year-wise sedimentation rate

The estimation of sedimentation rate based on empirical formula need critical analysis of different factors related to the LULC property of the catchment area, slope geometry, sediment erosion factor of catchment litho-type. This will help to assess replenishment rate more precisely.

Replenishment studies based on empirical formula for existing mining leases have also been conducted and are given in Table 7.9.

Table 7.9: River wise replenishment rate estimation based on empirical formula

River Name	Location	Lease Area	Surface RL Before mining	Mine out Thickness	Mine out Volume	Annual Rainfall-2020	Estimated Replenished Volume as per Dandy-Bolton	Replenishment Rate
		m2	m	m	cum	m	cum	%
Shilabati	Kantore	19800.00	45.00	2.90	57420.00	1.48	40194.00	70.00%
Shilabati	Manikkundu	31500.00	15.00	2.90	91350.00		66228.75	72.50%
Shilabati	Kuldaha	3100.00	10.00	2.85	8835.00		6449.55	73.00%
Kangsabati	Ghanesharpur	50000.00	33.00	2.88	144000.00		107280.00	74.50%
Kangsabati	Kanjageriya	23000.00	13.00	2.90	66700.00		50358.50	75.50%
Kangsabati	Gokulnagar	6300.00	10.00	2.94	18522.00		14076.72	76.00%
Subarnarekha	Belmula	50000.00	23.00	2.90	145000.00		107300.00	74.00%
Subarnarekha	Hasimpur	36000.00	11.00	2.84	102240.00		75146.40	73.50%

Illustration of Replenishment Estimation is given in Table 7.10.

Table 7.10: Illustration of replenishment rate calculation based on 3 methods

Based on Satellite imageries		Based on field investigation		Based on empirical formula	
Particulars	Estimation	Particulars	Estimation	Particulars	Estimation
		River Name	Kangsabati	River Name	Kangsabati
River	Kangsabati	Location	Ghanesharpur	Location	Ghanesharpur
Total Premonsoon Sand Bar Area	8023005 (sq.m)	Mining Area	50000 (Sq.m)	Lease Area	50000 (Sq.m)
Average Pre monsoon Thickness	2.0 (m)	Pre monsoon RL	33 (m)	Surface RL Before mining	33 (m)
Total Volume	16.05 (Mcum)	Sand Thickness	2.88 (m)	Mine out Thickness	2.88 (m)
Total Postmonsoon Sand Bar Area	6660897 (sq.m)	Volume excavated (Cum)	144000.00 (Cum)	Mine out Volume (Cum)	144000.00 (Cum)
Average Postmonsoon Thickness	2.5 (m)	Post monsoon RL	30.12 (m)	Drainage area for lease block	0.067 (Sq.km)
Total Volume	16.65 (M.cum)	Thickness	2.81 (m)	Monsoon Rainfall-2020	1.48 (m)
Total Pre and Post monsoon Volume Difference	0.61 (M.cum)	Volume deposited (Cum)	140256.00 (Cum)	Estimated Volume as per Dendy- Bolton (S = 1280 Q0.46[1.43 - 0.26 log(A)]) Where, Q is runoff, A is drainage area)	107280.00 (Cum)
Replenishment and Agrredation %	104%	Replenishment Rate	97.4%	Replenishment Rate	74.5%

Replenishment studies have been carried out in the district based on three different methodologies as illustrated in Table 7.10. Table 7.11 explained comparison of the outcome of these three methodologies adopted for the district.

Table 7.11: Comparison of replenishment study

Replenishment Study Method	Shilabati	Kangsabati	Subarnarekha
Estimated Annual Replenishment based on Sattelite imegaries **(*)**	103%	104%	105%
Estimated Annual Replenishment based on field investigation	97.6%	97.97%	98.25%
Estimated Annual Replenishment based on empirical formula	71.83%	75.33%	73.75%

(*) Replenishment study based on satellite imagery involves estimation of replenish volume along with aggredation volume.

vi) Total potential of minor mineral in the river bed

The major sand producing rivers of the Paschim Medinipur district are Shilabati, Kangsabati and Subarnarekha Rivers. The total mineable potential sand resources are 20.79 Mcum.

B. Geological studies

i) Lithology of the catchment area

The major portion of the district consists of a rolling country covered by laterite and alluvium. While metamorphic or gneissose rocks are found in the extreme west, in the east there is a wide plain of Recent alluvium. The most characteristic geological feature of the district is the area of laterite and associated rocks of sand and gravel. At some places one finds hard beds of laterite. At other places it is decomposed and reorganised. Locally, the ferruginous rock is called kankar.

ii) Tectonics and structural behavior of rocks

The most characteristic geological feature of the district is the area of laterite and associated rocks of sand and gravel. At some places one finds hard beds of laterite. At other places it is decomposed and reorganized. Locally, the ferruginous rock is called kankar.

The area has an undulating micro-relief with highs and lows. The maximum elevation is found to be 319 m above mean sea level (msl). Generally, the elevation declines from north-west to eastern and south eastern direction. The slope amounts have shown that elevation is low in south-eastern and eastern part.

C. Climate Factors

i) Intensity of rainfall

The average annual rainfall in the district is 1485mm. The variations in the annual rainfall within the district and from year to year are not large. The rainfall during the monsoon season – June to September – constitutes 70 percent of the annual rainfall; July and August are the rainiest months. The district receives a mean annual rainfall varying from 1295 mm to 1637mm.

ii) Climate zone

Paschim Medinipur district belongs to humid tropical monsoon climatic region. According to District Meteorological Department, there is very minor variation of temperature, rainfall and relative humidity in the district.

The climate of this district is characterized by an oppressive hot summer, high humidity nearly all the year round and a well distributed rainfall in the south west monsoon season. The year may be divided into four seasons. The cold season is from about the middle of November to the end of February. The period from March to May is the summer season. The south west monsoon season commences about the beginning of June and lasts till the end of September. October and the first half of November may be termed as post-monsoon season.

iii) Temperature variation

Temperature along with other meteorological conditions of the district is more or less uniform. The cold season commences by about the middle of November when the temperature begins to decrease. January is the coldest month with the mean daily maximum and minimum temperature at 28°C and 10°C respectively. By about the end of February the temperature begins to increase and April is s the hottest month, the mean maximum daily temperature is 39 °C and the mean minimum daily temperature is 25 °C.

Annual Deposition:

Annual deposition of riverbed minerals has been calculated on post-monsoon sand volume. The pre-monsoon sand volume of the river is the depleted resources and is replenished by the monsoon rainfall. For the purpose of estimating mineable mineral potential, the thickness of the sand bar considered extractable based on base flow level is given in Table 7.12.

Table 7.12: River wise Thickness of sand bar considered mineable

River Name	Considered Mining Thickness (m)
Shilabati River	2.5
Kangsabati River	2.50
Subarnarekha River	2.50

Based on geomorphology, geology, climate and mineable thickness of sand bar the annual deposition of riverbed minerals has been estimated. Sand bar area recommended for mineral concession in the table is calculated as per the Enforcement and Monitoring Guidelines for Sand Mining (EMGSM) 2020. As per guidelines, mining depth restricted to 3 meters depth and distance from the bank is ¼th of river width and not less than 7.5 meters. Also mining is prohibitated up to a distance of 1 kilometre (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side. The annual minable mineral potential is given in Table 7.13.

Table 7.13: Annual mineable mineral potential

Sl. No.	River or Stream	Portion of the river stream recommended for mineral concession	Length of area recommended for mineral concession (in meter)	Average width of area recommended for mineral concession (in meters)	Area recommended for mineral concession (in Sqm)	Mineable mineral potential (in Mcum) (60% of total mineral potential
1	Kangsabati River	17%	30095.25	244.9230769	4866063.755	7.30
2	Shilabati River	10%	21181.9	129.7777778	902189.9636	1.35
3	Subarnarekha River	23%	26736.28	803.75	8093242.192	12.13986

III. Riverbed Mineral Potential
Process of disposition etc:

Sand: Huge quantities of quality sands are found to occur in part of rivers. Smaller patches are also available locally in the other smaller rivers as well. Table 7.14 summarizes the potential riverbed mineral deposits of the district.

Table 7.14: Resources of Potential Riverbed Mineral

Boulder (Mcum)	Pebbles/Gravel (Mcum)	Sand/White sand (Mcum)	Total Mineable, Mineral Potential (Mcum)
-	-	20.79	20.79

Based on satellite imagery study and field investigation, potential zones for riverbed deposits for each river of the district have been identified and the details of the zones are provided in Table 7.15.

Table 7.15: Potential Zone of Riverbed Mineral

Sl.No	Rivers or Streams	Location of potential zones						Area within prohibited zone as per rule 3 of WBMMC Rules, 2016 (in sq.m)
		Administrative Block	Mouza	JL No.	Zone	Co-ordinates		
						Latitude	Longitude	
1	KANGSABATI RIVER	MIDNAPORE			1	22° 30' 4.005" N	87° 5' 3.889" E	174598.0151
						22° 29' 35.308" N	87° 5' 32.452" E	
		MIDNAPORE			2	22° 28' 31.425" N	87° 5' 3.492" E	137072.2274
						22° 27' 46.360" N	87° 6' 24.944" E	
		MIDNAPORE			3	22° 27' 6.756" N	87° 7' 20.252" E	194053.9887
						22° 25' 12.752" N	87° 9' 16.980" E	
		MIDNAPORE			4	22° 24' 45.117" N	87° 10' 4.042" E	389848.9516
						22° 24' 35.243" N	87° 15' 30.572" E	
		MIDNAPORE			5	22° 25' 9.889" N	87° 26' 47.583" E	8446.356772
						22° 24' 55.649" N	87° 26' 55.525" E	
		MIDNAPORE			6	22° 25' 51.900" N	87° 28' 45.467" E	13166.39886
						22° 26' 19.014" N	87° 28' 40.626" E	
		MIDNAPORE			7	22° 26' 38.132" N	87° 29' 21.198" E	16991.5547
						22° 26' 29.803" N	87° 29' 48.919" E	
		MIDNAPORE			8	22° 26' 59.752" N	87° 29' 54.242" E	8958.601059
						22° 27' 14.217" N	87° 29' 51.236" E	
		KESHPUR			9	22° 27' 7.553" N	87° 29' 48.636" E	4730.972376
						22° 27' 28.023" N	87° 29' 54.725" E	
		KESHPUR			10	22° 27' 21.094" N	87° 30' 47.480" E	30745.30555
						22° 26' 1.766" N	87° 31' 13.839" E	
		KESHPUR			11	22° 28' 10.930" N	87° 31' 56.591" E	4028.225751
						22° 28' 27.645" N	87° 31' 55.720" E	
		KESHPUR			12	22° 29' 9.633" N	87° 32' 0.062" E	16295.11654
						22° 29' 21.639" N	87° 32' 29.558" E	
		DEBRA	MAMUDABAD		13	22° 26' 37.562" N	87° 38' 24.268" E	4057.458732
						22° 26' 35.411" N	87° 38' 47.758" E	
2	SHILABATI RIVER	KESHPUR	KANKDAHA	209	1	22° 53' 16.756" N	87° 11' 24.203" E	37187.67897
						22° 50' 16.313" N	87° 14' 27.039" E	
		KESHPUR	PATHARBERIA	275	2	22° 50' 0.223" N	87° 14' 58.674" E	20667.87316
						22° 50' 46.640" N	87° 15' 27.549" E	
		GARHBETA 2	KANKDAHA	209	3	22° 53' 16.756" N	87° 11' 24.203" E	25503.52712
						22° 51' 17.962" N	87° 12' 55.089" E	
		GARHBETA 2	PATHARBERIA	275	4	22° 50' 33.391" N	87° 15' 28.316" E	9503.183032
						22° 50' 46.640" N	87° 15' 27.549" E	
		GARHBETA 1	MADANPUR		5	22° 50' 43.358" N	87° 17' 0.741" E	3807.255893
						22° 50' 51.787" N	87° 17' 4.595" E	
		GARHBETA 1	KHUNBERIA		6	22° 51' 18.701" N	87° 17' 26.641" E	16420.42649
						22° 51' 28.038" N	87° 17' 48.006" E	
		GARHBETA 1			7	22° 51' 55.891" N	87° 20' 47.531" E	29060.04439

Sl.No	Rivers or Streams	Location of potential zones						Area within prohibited
						22° 53' 0.262" N	87° 20' 57.641" E	
		GARHBETA 1			8	22° 52' 42.515" N	87° 22' 20.655" E	37987.69103
						22° 53' 0.134" N	87° 23' 54.624" E	
		GARHBETA 1			9	22° 52' 31.514" N	87° 24' 12.157" E	4992.089523
						22° 52' 19.586" N	87° 24' 17.743" E	
3	SUBARNAREKHA RIVER	KESHIARY			1	22° 5' 48.877" N	87° 8' 5.075" E	708212.0383
						22° 3' 18.143" N	87° 10' 47.842" E	
		KESHIARY			2	22° 2' 46.094" N	87° 11' 8.936" E	158973.3164
						22° 2' 19.254" N	87° 11' 34.733" E	
		DANTAN 1			3	21° 55' 11.926" N	87° 15' 7.860" E	977391.1094
						22° 2' 19.254" N	87° 11' 34.733" E	
		DANTAN 1			4	21° 54' 10.118" N	87° 14' 11.691" E	155327.3755
						21° 51' 56.402" N	87° 14' 59.180" E	

NO MINING ZONE:

As per the Enforcement and Monitoring Guidelines for Sand Mining (EMGSM) 2020 the restricted zone for mining is a distance from the bank is ¼th of river width and not be less than 7.5 meters. Also there is a no mining zone up to a distance of 1 kilometre (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side.

No mining zone has been marked for an area up to a width of 100 meters from the active edge of embankments. Also the concave side of the river is marked as no mining zone, as mining is this area will affect the course of river in future and will erode the river bank. A representative map of no mining zone shown on River Shilabati of Paschim Medinipur district is given in Figure 7.7. Table 7.16 summarized the area of no mining zones demarcated for each river of the district.

Table 7.16: No mining zone in the district

Sl.No	Rivers or Streams	Location of potential zones	Area within prohibited zone as per rule 3 of WBMMC Rules, 2016 (in sq.m)
		Administrative Block	
1	KANGSABATI RIVER	MIDNAPORE	174598.0151
		MIDNAPORE	137072.2274
		MIDNAPORE	194053.9887
		MIDNAPORE	389848.9516
		MIDNAPORE	8446.356772
		MIDNAPORE	13166.39886
		MIDNAPORE	16991.5547
		MIDNAPORE	8958.601059
		KESHPUR	4730.972376
		KESHPUR	30745.30555

Sl.No	Rivers or Streams	Location of potential zones	Area within prohibited zone as per rule 3 of WBMMC Rules, 2016 (in sq.m)
		Administrative Block	
		KESHPUR	4028.225751
		KESHPUR	16295.11654
		DEBRA	4057.458732
2	SHILABATI RIVER	GARHBETA 2	37187.67897
		GARHBETA 2	20667.87316
		GARHBETA 2	25503.52712
		GARHBETA 2	9503.183032
		GARHBETA 1	3807.255893
		GARHBETA 1	16420.42649
		GARHBETA 1	29060.04439
		GARHBETA 1	37987.69103
		GARHBETA 1	4992.089523
3	SUBARNAREKHA RIVER	KESHIARY	708212.0383
		KESHIARY	158973.3164
		DANTAN 1	977391.1094
		DANTAN 1	155327.3755

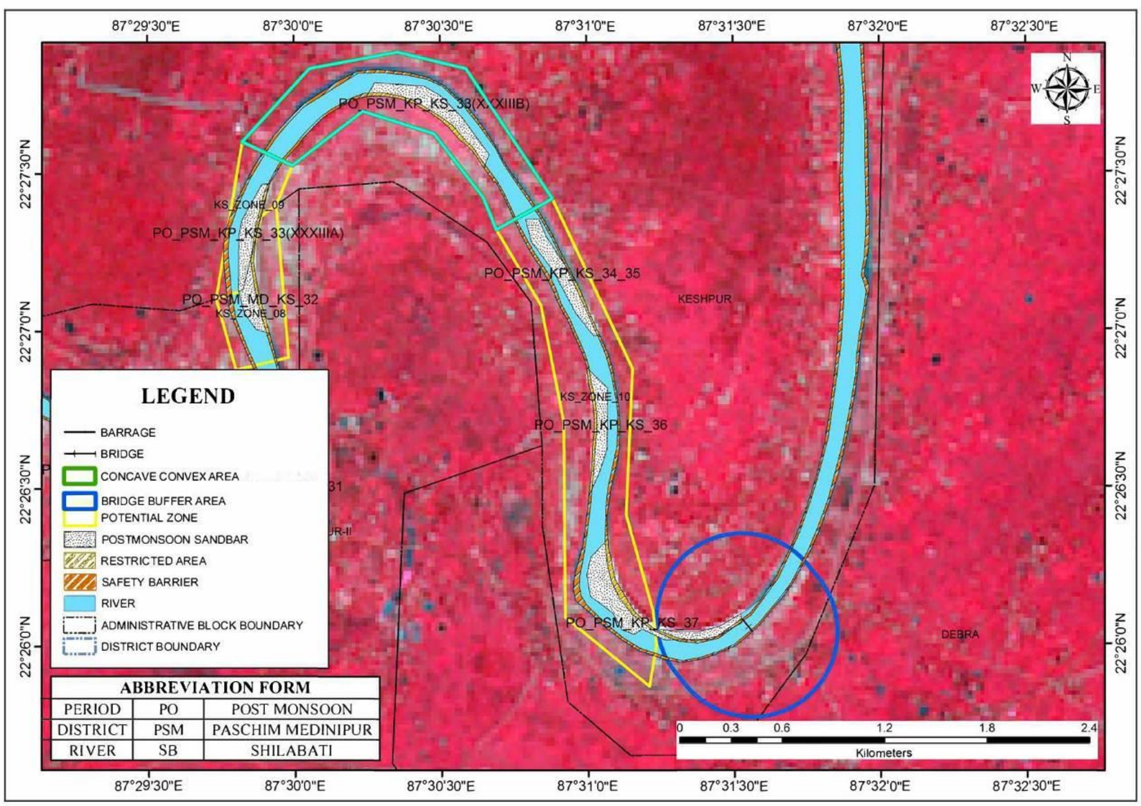


Figure 7.7: A representative map showing no-mining zone demarcated on Shilabati River

7.2.2. **In-situ Minerals:**

I. Mineral Reserve

Mineral resources of the district are still not well established, the district does not have reserve of any major mineral deposits.

II. Mineral Potential

Sand: Sand is the important riverbed mineral found to be potential for mining. Considerable quantity of quality sands is found to occur in the riverbed of the district.

Morrum: The western part the district represents the extension of the eastern margin of the Chhotanagpur plateau with the dominance of red lateritic and ferralitic soils. Occurrences of laterictic deposits are furnished as Annexure-5.

Table 7.3: In-situ Minerals Occurrences

Name of mineral	Name of associated minerals, if any	Host rock of mineralization	Area of mineralization	Depth of mineralization	Whether virgin or partially excavated	Name of land (whether free for mining/forest/agricultural	Mineral reserve (approximate) mentioning grade	Location of potential mineralized zones				Area within prohibited zone as per rule 3(7) of WBMMC Rules, 2016	Infrastructure available near the mineralized zone
								Administrative Block	Mouza	Plot Nos.	Co-ordinates		
Moorrum	Not Applicable	Not Applicable	Western part of district	20m	Yet to be excavated	Private, Revenue, Revenue Forest land	Yet to be explored	Garbeta, Salboni, Kharagpur, Keshiary				Not studied	Road connectivity present

7.3 Mineral development prospect of the district with respect to Minor Mineral

The district is not very rich in mineral resources and there are no mines in the district. However, collections of sand, stone from the river-bed of the river terrain are the minor mineral sources. In this district some of big rivers are flowing like Shilabati, Kangsabati, Subarnarekha, so in this region it has seen that the different geomorphic features like Alluvium Plain, Alluvial Fan etc, which are create by river deposition activity. So in this region there is huge deposition of sand, clay has found, so the sand mining or the sand industry should the very useful for this district.

7.4 Exploration requirement of the district

In the district the sand industry might be very much useful. Therefore, there is a need more scientific sand mining procedure. So, the scope of sand Exploration in this district is very high. Also, it is highly recommended to conduct detailed exploration with respect to lateritic deposits reported in the western part of the district to establish mineral resources of the district.

8 Overview of mining activity in the district

8.1 General overview

The district is not very rich in mineral resources and there are no large mines in the district. However, collection of sand, Bricks, from the river-bed is the minor mineral sources. These materials are primarily utilized for construction purpose.

8.2 List of existing mining leases of the districts

Details of List of existing mining leases of the districts are furnished in Table 8.1.

Table 8.1: Details of Sand mining leases of the districts

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
139/SB 2021	KESHIARI	Nekramara	129	Subarnarekha	Kachha Road	230,231	4.7	22° 4' 16.17''N	87° 9' 55.18''E	Durga Prasad Agarwala on behalf of Blueberry Nirman Pvt Ltd					0	EC Awaiting
790/SB 2021	MEDINIPUR SADAR	KALINAGAR	274	Kangsabati / Kansai	Kachha Road	643	1.54	22° 26' 51.75''N	87° 28' 39.02''E						0	
240/SB 2021	DASPUR-1	Kunjapur	70	Kangsabati / Kansai	Kachha Road	98	0.32	22° 33' 33.00''N	87° 42' 33.21''E	Ujjwal Samanta					0	EC Awaiting
242/SB 2021	MEDINIPUR SADAR	Ghaneshapur	109	Kangsabati / Kansai	Kachha Road	84,85,86	0.44	22° 24' 32.10''N	87° 10' 24.08''E	Kartick Jana					0	EC Awaiting
273/SB 2021	MEDINIPUR SADAR	Lohatikri	136	Kangsabati / Kansai	Kachha Road	695	5	22° 24' 53.55''N	87° 13' 53.41''E	Sima Mandal					0	EC Awaiting
293/SB 2021	MEDINIPUR SADAR	Lohatikri	136	Kangsabati / Kansai	Kachha Road	695,697	5	22° 25' 2.70''N	87° 13' 13.20''E	Anindu Kumar De					0	EC Awaiting
545/SB 2021	MEDINIPUR SADAR	Chakdaulat	285	Kangsabati / Kansai	Kachha Road	324	1.47	22° 25' 57.51''N	87° 28' 45.71''E	Iyamin Mandal					0	EC Awaiting
838/SB 2021	KESHIARI	UTTAR DAMBUR	127	Subarnarekha	Kachha Road	565	4.94	22° 4' 52.47''N	87° 9' 41.18''E						0	
654/SB 2021	CHANDROKONA-2	Shirsa	73	Shilabati	Kachha Road	1	0.26	22° 48' 28.17''N	87° 31' 41.56''E	Mijanuddin Khan					0	EC Awaiting
380/SB 2021	MEDINIPUR SADAR	Raghunathpur	271	Kangsabati / Kansai	Kachha Road	1041,1003,1002	4.89	22° 26' 39.24''N	87° 29' 21.08''E	Sk Rejabul					0	EC Awaiting
376/SB 2021	MEDINIPUR SADAR	Bhikanpur	36	Kangsabati / Kansai	Kachha Road	133,135	5	22° 27' 54.71''N	87° 6' 41.42''E	Pranab Bhakta					0	EC Awaiting
394/SB 2021	MEDINIPUR SADAR	Manidaha	110	Kangsabati / Kansai	Kachha Road	817,1289	3.5	22° 24' 17.45''N	87° 10' 49.76''E	Aniruddha Shasmal					0	EC Awaiting
852/SB 2021	KESHIARI	KULBANI	87	Subarnarekha	Kachha Road	1656	4.99	22° 5' 19.89''N	87° 8' 41.60''E						0	
369/SB 2021	MEDINIPUR SADAR	Bhatpara	84	Kangsabati / Kansai	Kachha Road	172,194	2.3	22° 25' 30.70''N	87° 9' 10.40''E	Subhrangsu Kumar Ghosh					0	EC Awaiting
385/SB 2021	MEDINIPUR SADAR	Bankura	50	Kangsabati / Kansai	Kachha Road	44,45	5	22° 26' 9.30''N	87° 6' 55.44''E	Sabetun Mandal					0	EC Awaiting
388/SB 2021	MEDINIPUR SADAR	Rerapal	132	Kangsabati / Kansai	Kachha Road	700	4.05	22° 24' 43.67''N	87° 12' 12.77''E	Md Moshiur Rahaman Khan					0	EC Awaiting
443/SB	MEDINIPUR	Bankura	50	Kangsabati /	Kachha	44,45,65	5	22° 25'	87° 6'	Shankar Prasad					0	EC Awaiting

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
2021	SADAR			Kansai	Road			57.32''N	57.58''E	Ghosh						
452/SB 2021	MEDINIPUR SADAR	Nischintapur	48	Kangsabati / Kansai	Kachha Road	1,2	2.8	22° 26' 51.20''N	87° 7' 17.60''E	Deep Dutta					0	EC Awaiting
456/SB 2021	MEDINIPUR SADAR	Naldumra	82	Kangsabati / Kansai	Kachha Road	46	5	22° 25' 28.20''N	87° 8' 8.90''E	Sheikh Firozuddin					0	EC Awaiting
463/SB 2021	MEDINIPUR SADAR	Manidaha	110	Kangsabati / Kansai	Kachha Road	1289	5	22° 24' 1.59''N	87° 11' 10.45''E	Tapas Samanta					0	EC Awaiting
121/SB 2021	KESHIARI	Amilasai	141	Subarnarekha	Kachha Road	346, 347	4.57	22° 2' 28.84''N	87° 11' 39.07''E	Kamala Kanta Sau on behalf of Radha Rani Bali Khadan					0	EC Awaiting
124/SB 2021	KESHIARI	Amilasai	141	Subarnarekha	Kachha Road	346, 347	4.83	22° 2' 32.50''N	87° 11' 35.01''E	Pawan Arora on behalf of Varity Vyapaar Pvt Ltd					0	EC Awaiting
127/SB 2021	KESHIARI	Amilasai	141	Subarnarekha	Kachha Road	346	4.91	22° 2' 37.08''N	87° 11' 12.67''E	Prashanta Mandal					0	EC Awaiting
128/SB 2021	KESHIARI	Amilasai	141	Subarnarekha	Kachha Road	346	2.49	22° 2' 45.57''N	87° 11' 25.53''E	Sk Najrul Islam					0	EC Awaiting
130/SB 2021	KESHIARI	Nekramara	129	Subarnarekha	Kachha Road	230,232, 229,228, 164,165, 166,163, 168,169, 171, ors	4.96	22° 3' 53.78''N	87° 10' 14.47''E	Uttam Kesh on behalf of Deal Construction					0	EC Awaiting
134/SB 2021	KESHIARI	Nekramara	129	Subarnarekha	Kachha Road	230,229, 140,141, 158	4.21	22° 4' 9.06''N	87° 10' 12.96''E	Kumarjit Giri on behalf of Kailash Construction					0	EC Awaiting
205/SB 2021	KESHPUR	Chhotapasha	535	Kangsabati / Kansai	Kachha Road	266	1.42	22° 29' 19.13''N	87° 32' 10.36''E	Sheikh Mursed Ali					0	EC Awaiting
206/SB 2021	KESHPUR	Malyan	625	Kangsabati / Kansai	Kachha Road	68,69	1.55	22° 28' 2.10''N	87° 31' 53.03''E	Sitesh Dhara					0	EC Awaiting
239/SB 2021	DASPUR-1	Poshtanka	121	Kangsabati / Kansai	Kachha Road	1	0.81	22° 33' 29.09''N	87° 38' 52.20''E	Dilip Maiti on behalf of Joy Guru Construction					0	EC Awaiting
230/SB 2021	KESHPUR	Bishwanathpur Patna	570	Kangsabati / Kansai	Kachha Road	363,362, 361,360, 373,364, 372,334	2.02	22° 28' 35.28''N	87° 31' 56.17''E	Rampada Rudra					0	EC Awaiting

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
231/SB 2021	KESHPUR	Bishwanathpur	569	Kangsabati / Kansai	Kachha Road	478	2.11	22° 28' 46.88''N	87° 31' 55.78''E	Sk Serajul Haque					0	EC Awaiting
519/SB 2021	MEDINIPUR SADAR	Gurgurapal	134	Kangsabati / Kansai	Kachha Road	485	3	22° 25' 7.48''N	87° 12' 42.99''E	Rajesh Chakraborty on behalf of Nexzen Projects and Development Pvt Ltd					0	EC Awaiting
592/SB 2021	GARHBETA-2	Suniakon	406	Shilabati	Kachha Road	1255,1256,1257,1258,1259,1261,1263,1416	0.96	22° 50' 36.34''N	87° 16' 36.61''E	Prabhas Ghosh					0	EC Awaiting
549/SB2021	MEDINIPUR SADAR	Rerapal	132	Kangsabati / Kansai	Kachha Road	552,700	4.08	22° 24' 58.98''N	87° 12' 14.82''E	Jagadish Ghosh					0	EC Awaiting
561/SB 2021	MEDINIPUR SADAR	Upardanga	83	Kangsabati / Kansai	Kachha Road	706	3.4	22° 25' 34.30''N	87° 8' 41.30''E	Kishore Sing					0	EC Awaiting
569/SB 2021	DEBRA	Paikpari	261	Kangsabati / Kansai	Kachha Road	127,148, 537	1.05	22° 28' 25.63''N	87° 34' 50.85''E	Arijit Dey on behalf of Maa Manjushree Enterprise					0	EC Awaiting
588/SB 2021	DEBRA	Mokarimpur	28	Kangsabati / Kansai	Kachha Road	816	0.3	22° 28' 53.85''N	87° 34' 50.22''E	Kinkar Maity					0	EC Awaiting
597/SB 2021	GARHBETA-1	Malbagicha	411	Shilabati	Kachha Road	48,56,57, 58,59,60, 61,62	1.14	22° 50' 30.38''N	87° 16' 46.69''E	Ataur Rahaman Mandal					0	EC Awaiting
600/SB 2021	GARHBETA-1	Bhattagram	399	Shilabati	Kachha Road	680	0.8	22° 51' 13.92''N	87° 17' 25.79''E	Bablu Sarkar					0	EC Awaiting
671/SB 2021	KHARGAPUR-1	Gumriyapal	1	Kangsabati / Kansai	Kachha Road	381,382	4.5	22° 24' 45.90''N	87° 15' 11.10''E	Balaram Ghosh					0	EC Awaiting
680/SB 2021	DATAN-1	Panitunia	92	Subarnarekha	Kachha Road	647	2	21° 56' 6.55''N	87° 14' 42.93''E	Sk Amir Ali					0	EC Awaiting
689/SB 2021	DATAN-1	Garadpur	94	Subarnarekha	Kachha Road	1,469	5	21° 54' 56.16''N	87° 14' 46.46''E	Ashik Sheikh					0	EC Awaiting
692/SB 2021	DATAN-1	Palasia	96	Subarnarekha	Kachha Road	1370,482	5	21° 53' 50.45''N	87° 14' 16.50''E	Munajerul Hossain on behalf of Swastik Traders					0	EC Awaiting
709/SB 2021	DATAN-1	Palasia	96	Subarnarekha	Kachha Road	1370,482	5	21° 53' 56.81''N	87° 14' 13.17''E	Kumarjit Giri on behalf of Kailash					0	EC Awaiting

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										Construction						
712/SB 2021	DATAN-1	Mirjapur	174	Subarnarekha	Kachha Road	61	5	21° 52' 40.30''N	87° 15' 13.20''E	Sk Golam Dastagir					0	EC Awaiting
723/SB 2021	DATAN-1	Moyarui	97	Subarnarekha	Kachha Road	2	4.96	21° 53' 30.42''N	87° 14' 36.51''E	Bina Singhania					0	EC Awaiting
725/SB 2021	DATAN-1	Palasia	96	Subarnarekha	Kachha Road	1370,482	5	21° 53' 35.35''N	87° 14' 27.55''E	Sk Aftabuddin					0	EC Awaiting
729/SB 2021	DATAN-1	Lalit	95	Subarnarekha	Kachha Road	973,1061	5	21° 54' 38.54''N	87° 14' 36.16''E	Rajkishore U Mahapatra					0	EC Awaiting
734/SB 2021	DATAN-1	Garadpur	94	Subarnarekha	Kachha Road	1,485	5	21° 54' 46.09''N	87° 14' 45.27''E	Dipdi Gope					0	EC Awaiting
749/SB 2021	MEDINIPUR SADAR	GURGURI PAL	134	Kangsabati / Kansai	Kachha Road	704	5	22° 24' 53.46''N	87° 12' 29.62''E						0	
748/SB 2021	MEDINIPUR SADAR	GURGURI PAL	134	Kangsabati / Kansai	Kachha Road	704	5	22° 24' 52.30''N	87° 12' 21.32''E						0	
764/SB 2021	MEDINIPUR SADAR	GURGURI PAL	134	Kangsabati / Kansai	Kachha Road	485	5	22° 25' 10.18''N	87° 12' 35.12''E						0	
767/SB 2021	MEDINIPUR SADAR	NISCHINT APUR	48	Kangsabati / Kansai	Kachha Road	1	1.9	22° 26' 44.80''N	87° 7' 16.80''E						0	
768/SB 2021	MEDINIPUR SADAR	GANGAD HARPUR	49	Kangsabati / Kansai	Kachha Road	2,6	4.5	22° 26' 34.00''N	87° 7' 13010.00''						0	
777/SB 2021	MEDINIPUR SADAR	Lohatikri	136	Kangsabati / Kansai	Kachha Road	695	5	22° 25' 5.75''N	87° 13' 11.04''E	Md Absarul Hossain Khan	19-12-2016	14-02-2017	14-02-2017	13-Feb-22	40302.188	
786/SB 2021	MEDINIPUR SADAR	BHATPAR A	84	Kangsabati / Kansai	Kachha Road	172,175, 194,195	3.9	22° 25' 33.60''N	87° 9' 1.20''E						0	
789/SB 2021	MEDINIPUR SADAR	BHATPAR A	84	Kangsabati / Kansai	Kachha Road	175,195	3.4	22° 25' 29.80''N	87° 9' 1.02''E						0	
792/SB 2021	MEDINIPUR SADAR	KALINAG AR	274	Kangsabati / Kansai	No Approach Road	863	1.19	22° 26' 6.41''N	87° 28' 44.69''E						0	
797/SB 2021	MEDINIPUR SADAR	Manguch ak	146	Kangsabati / Kansai	Kachha Road	193	5	22° 24' 40.59''N	87° 16' 20.47''E						0	
798/SB 2021	KESHPUR	FERUURA	631	Kangsabati / Kansai	Kachha Road	467	2.03	22° 27' 20.20''N	87° 31' 53.90''E						0	
803/SB 2021	MEDINIPUR SADAR	Ghanesh arpur	109	Kangsabati / Kansai	Kachha Road	88,89,98, 120,124	5	22° 24' 49.89''N	87° 9' 51.68''E	Biren Chandra Kapadi	03-02-	28-08-	28-08-	27-Aug-	40296.305	

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											2017	2017	2017	22		
815/SB 2021	KESHPUR	RAIPUR	320	Kangsabati / Kansai	Kachha Road	481	0.42	22° 33' 7.59''N	87° 34' 37.69''E						0	
818/SB 2021	CHANDROKONA-2	DHARMAPOTA	74	Shilabati	Kachha Road	930	0.81	22° 48' 54.73''N	87° 32' 6.66''E						0	
824/SB 2021	CHANDROKONA-2	CHHOTAKNA	122	Shilabati	Kachha Road	790	0.35	22° 45' 6.11''N	87° 33' 43.75''E						0	
828/SB 2021	KESHIARI	DAKSHIN DUMURKOLA	128	Subarnarekha	Kachha Road	198,199	4.99	22° 4' 21.59''N	87° 9' 50.09''E						0	
829/SB 2021	KESHIARI	DAKSHIN DUMURKOLA	128	Subarnarekha	Kachha Road	198,199	4.94	22° 4' 26.41''N	87° 9' 47.58''E						0	
830/SB 2021	MEDINIPUR SADAR	Ghaneshapur	109	Kangsabati / Kansai	Kachha Road	76,100,101,116	5	22° 24' 44.92''N	87° 9' 57.08''E	Dipak Patra on behalf of MS Patra Construction	19-12-2016	03-02-2017	03-02-2017	02-Feb-22	129659.643	
835/SB 2021	KESHIARI	UUTTAR DAMBUR	127	Subarnarekha	Kachha Road	565	4.28	22° 4' 41.62''N	87° 9' 47.04''E						0	
837/SB 2021	KESHIARI	UTTAR DAMBUUR	127	Subarnarekha	Kachha Road	565	4.99	22° 4' 48.46''N	87° 9' 54.75''E						0	
841/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.77	22° 5' 16.17''N	87° 8' 59.53''E						0	
843/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.85	22° 5' 18.42''N	87° 8' 47.23''E						0	
886/SB 2021	MEDINIPUR SADAR	Ghaneshapur	109	Kangsabati / Kansai	Kachha Road	76,87,101	5	22° 24' 40.19''N	87° 10' 2.67''E	Santu Sounth	19-12-2016	07-02-2017	07-02-2017	06-Feb-22	129659.643	
889/SB 2021	MEDINIPUR SADAR	Ghaneshapur	109	Kangsabati / Kansai	Kachha Road	76,101,116	5	22° 24' 38.71''N	87° 10' 10.21''E	Anandamaya Patra on behalf of Patra Enterprise	03-02-2017	19-04-2017	19-04-2017	18-Apr-22	39745.737	
895/SB 2021	MEDINIPUR SADAR	Ghaneshapur	109	Kangsabati / Kansai	Kachha Road	31,101,102,116	5	22° 24' 36.47''N	87° 10' 17.57''E	Benajir Nisha Bibi	14-09-2017	22-09-2017	22-09-2017	21-Sep-22	40434.117	
900/SB 2021	MEDINIPUR SADAR	Dherua	28	Kangsabati / Kansai	Kachha Road	922	5	22° 28' 29.44''N	87° 4' 58.80''E	Priodarshi Ghosh	14-09-2017	08-02-2017	08-02-2017	07-Feb-22	40484.465	
904/SB	MEDINIPUR	Dherua	28	Kangsabati /	Kachha	921,923	5	22° 28'	87° 5' 6.17''E	Asish Rana	19-	13-	13-	12-	129659.64	

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2021	SADAR			Kansai	Road			18.91''N			12-2016	02-2017	02-2017	Feb-22	3	
906/SB 2021	MEDINIPUR SADAR	Dherua	28	Kangsabati / Kansai	Kachha Road	923	5	22° 28' 12.17''N	87° 5' 1.75''E	Asish Rana	19-12-2016	24-01-2020	24-01-2020	23-Jan-25	129659.643	
911/SB 2021	MEDINIPUR SADAR	Bargachhia	15	Kangsabati / Kansai	Kachha Road	153,154, 169	5	22° 30' 9.90''N	87° 5' 6.93''E	Gopal Ghosh	03-02-2017	14-02-2017	14-02-2017	13-Feb-22	39989.011	
914/SB 2021	MEDINIPUR SADAR	Jamsole	137	Kangsabati / Kansai	Kachha Road	271	5	22° 24' 51.25''N	87° 14' 24.36''E	Sahem Khan	07-11-2017	29-03-2018	29-03-2018	28-Mar-23	40296.272	
918/SB 2021	MEDINIPUR SADAR	Jamsole	137	Kangsabati / Kansai	Kachha Road	271	5	22° 24' 47.16''N	87° 14' 8.08''E	Kousik Mandal	07-06-2017	19-04-2017	19-04-2017	18-Apr-22	40296.272	
947/SB 2021	DATAN-1	BELDANGRI	58	Subarnarekha	Kachha Road	312	5	21° 56' 9.10''N	87° 14' 47.37''E						0	
953/SB 2021	GARHBETA-1	KALIKAPUR	900	Shilabati	Kachha Road	1230	1.08	22° 49' 24.81''N	87° 30' 6.56''E	SUKANTA BANIK ON BEHALF OF BANIK AROMATIC	08-06-2018	08-06-2018	18-06-2018	17-Jun-23	17504.052	
955/SB 2021	DATAN-1	PALASIA	96	Subarnarekha	Kachha Road	1370,482	5	21° 53' 11.16''N	87° 14' 47.04''E						0	
958/SB 2021	DATAN-1	BELMULA	57	Subarnarekha	Kachha Road	781	5	21° 57' 4.36''N	87° 14' 21.55''E						0	
929/SB 2021	MEDINIPUR SADAR	Manidaha	110	Kangsabati / Kansai	Kachha Road	289	5	22° 24' 14.18''N	87° 11' 9.75''E	Dipak Patra on behalf of MS Patra Construction	03-02-2017	03-02-2017	03-02-2017	02-Feb-22	40296.272	
930/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.98	22° 5' 21.34''N	87° 8' 36.14''E						0	
933/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.99	22° 5' 19.66''N	87° 8' 25.98''E						0	
934/SB 2021	MEDINIPUR SADAR	Kankabati	142	Kangsabati / Kansai	Kachha Road	548	5	22° 24' 50.49''N	87° 15' 19.30''E	Sushil Pati	07-06-2017	26-04-2017	26-04-2017	25-Apr-22	40296.272	
935/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.84	22° 5' 28''N	87° 8' 28.35''E						0	
938/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.93	22° 5' 32.44''N	87° 8' 20.23''E						0	
940/SB	MEDINIPUR	Manidah	110	Kangsabati /	Kachha	1289	5	22° 24'	87° 11'	Mantu Chaulya on	07-	12-	12-	11-	40296.272	

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2021	SADAR	a		Kansai	Road			8.51''N	17.85''E	behalf of Suman Enterprise	11-2017	12-2017	12-2017	Dec-22		
941/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.94	22° 5' 23.49''N	87° 8' 16.64''E						0	
943/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.91	22° 5' 36.27''N	87° 8' 11.81''E						0	
946/SB 2021	MEDINIPUR SADAR	Juarhati	208	Kangsabati / Kansai	Kachha Road	1133	8.09	22° 24' 2.13''N	87° 21' 25.82''E	Amar Khan	16-07-2018	19-03-2019	19-03-2019	18-Mar-24	55069.692	
961/SB 2021	DATAN-1	BELMULA	57	Subarnarekha	Kachha Road	781	5	21° 56' 59.83''N	87° 14' 23.56''E						0	
963/SB 2021	DATAN-1	BELDANGRI	58	Subarnarekha	Kachha Road	312	5	21° 56' 24.21''N	87° 14' 33.64''E						0	
964/SB 2021	GARHBETA-1	DEWAN	901	Shilabati	Kachha Road	1390	0.47	22° 49' 39.91''N	87° 29' 35.28''E	ABHIJIT SANNIGRAHI	11-10-2018	01-02-2019	01-02-2019	31-Jan-24	8956.24	
966/SB 2021	DATAN-1	BELDANGRI	58	Subarnarekha	Kachha Road	312	5	21° 56' 28.75''N	87° 14' 36.07''E						0	
967/SB 2021	DATAN-1	BELDANGRI	58	Subarnarekha	Kachha Road	312	5	21° 56' 15.63''N	87° 14' 39.96''E						0	
969/SB 2021	GARHBETA-1	Raghunathpur	906	Shilabati	Kachha Road	1	0.86	22° 50' 43.15''N	87° 28' 50.39''E	ARUN KUMAR RANA ON BEHALF OF RANA ENGINEERING CO	14-09-2017	15-11-2017	15-11-2017	14-Nov-22	22301.459	
1067/SB2021	DATAN-1	Barasati	93	Subarnarekha	Kachha Road	477,479	4.8	21° 55' 10.02''N	87° 15' 9.55''E	Abhiroop Chowdhury	14-09-2017	22-09-2017	22-09-2017	21-Sep-22	93354.943	
1101/SB2021	DEBRA	Mokarimpur	28	Kangsabati / Kansai	Kachha Road	816	0.4	22° 28' 48.70''N	87° 34' 48.18''E	Ashis Bhunia	11-10-2018	28-01-2019	28-01-2019	27-Jan-24	5672.609	
974/SB 2021	GARHBETA-1	Raghunathpur	906	Shilabati	Kachha Road	207	0.88	22° 50' 33.30''N	87° 28' 54.15''E	Pradip Arora	07-11-2017	13-04-2018	13-04-2018	12-Apr-23	22820.097	
1056/SB2021	CHANDRAKONA-1	jara	152	Shilabati	Kachha Road	7176	0.49	22° 45' 34.39''N	87° 34' 24.56''E	Nantu Barik	14-09-2017	16-10-2017	16-10-2017	15-Oct-22	22820.097	
989/SB 2021	GARHBETA-1	Uchhaladanga	507	Shilabati	Kachha Road	1	0.43	22° 52' 15.63''N	87° 19' 4.81''E	Giridhari Dutta	14-09-2017	21-09-2017	21-09-2017	20-Sep-22	11150.729	

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994/SB 2021	GARHBETA-1	Kankrasol	593	Shilabati	Kachha Road	13,14,19, 20,21,22, 23,26,27, 28,29,34, 35,36,37 ors	0.73	22° 52' 41.32''N	87° 22' 34.27''E	Ashraful Islam Khan on behalf of MM Stone Supplier	07-06-2017	04-09-2018	04-09-2018	03-Sep-23	18930.308	
997/SB 2021	GARHBETA-1	Bara Panchrol	494	Shilabati	Kachha Road	22,19/1610	2.3	22° 51' 29.97''N	87° 17' 49.58''E	Kashinath Ghosh	07-06-2017	03-04-2017	03-04-2017	02-Apr-22	19142.626	
1006/SB2021	GARHBETA-1	Lakshyatapal	937	Shilabati	Kachha Road	1381	1.08	22° 52' 36.30''N	87° 24' 13.97''E	Sovon Ballov	14-09-2017	21-09-2017	21-09-2017	20-Sep-22	28006.483	
1012/SB2021	GARHBETA-2	Kenja	164	Shilabati	Kachha Road	1	1.66	22° 53' 23.84''N	87° 10' 21.83''E	Kajal Kumar Ghosh	07-06-2017	19-05-2017	19-05-2017	18-May-22	43047.002	
1015/SB2021	GARHBETA-2	Joypur	203	Shilabati	Kachha Road	1	0.77	22° 53' 18.43''N	87° 11' 23.69''E	Ganesh Dana on behalf of Dana Trading Co	03-02-2017	21-02-2017	21-02-2017	20-Feb-22	19967.585	
1017/SB2021	GARHBETA-2	Kantore	204	Shilabati	Kachha Road	1,2,3,445	2.3	22° 53' 16.91''N	87° 11' 32.30''E	Pradip Arora	07-11-2017	22-11-2017	22-11-2017	21-Nov-22	10528.363	
1020/SB2021	GARHBETA-2	Kantore	204	Shilabati	Kachha Road	1,445	3.21	22° 53' 15.96''N	87° 11' 34.15''E	Sri Krishna Nair	07-06-2017	13-02-2017	13-02-2017	12-Feb-22	97244.733	
1023/SB2021	GARHBETA-2	Kantore	204	Shilabati	Kachha Road	1,445	1.86	22° 53' 6.44''N	87° 11' 41.42''E	Ankush Arora on behalf of Trumph Sales Service	15-12-2017	10-01-2018	10-01-2018	09-Jan-23	36175.041	
1035/SB2021	GARHBETA-2	Kankdaha	209	Shilabati	Kachha Road	1	1	22° 52' 19.82''N	87° 12' 27.84''E	Pradip Arora	07-11-2017	22-11-2017	22-11-2017	21-Nov-22	25931.929	
1037/SB2021	GARHBETA-2	Kankdaha	209	Shilabati	Kachha Road	1	0.77	22° 52' 8.91''N	87° 12' 36.41''E	Pranabesh Mahata	07-11-2017	14-03-2018	14-03-2018	13-Mar-23	11272.285	
1057/SB2021	CHANDROKONA-2	Ishnagar	45	Shilabati	Kachha Road	9	2.5	22° 49' 5.11''N	87° 30' 49.66''E	Julfikkar Khan	03-02-2017	12-04-2018	12-04-2018	11-Apr-23	64829.822	
1059/SB2021	CHANDROKONA-2	Dharmapota	74	Shilabati	Kachha Road	540/921, 541/922, 542/923, 567/924,	1.13	22° 48' 59.09''N	87° 31' 58.02''E	Sk Aniruddha Rahaman on behalf of Sand Suppliers	19-12-2016	22-02-2017	22-02-2017	21-Feb-22	129659.643	

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						678/925, 678/926 ors										
1061/SB2021	CHANDROKONA-2	Panchami	39	Shilabati	Kachha Road	374	0.88	22° 49' 8.91"N	87° 30' 46.08"E	Tarasankar Bhattacharya	03-02-2017	21-09-2017	21-09-2017	20-Sep-22	22820.097	
1073/SB2021	DATAN-1	Garadpur	94	Subarnarekha	Kachha Road	1,485	5	21° 54' 50.73"N	87° 14' 46.62"E	Mithu Singha	07-11-2017	10-11-2017	10-11-2017	09-Nov-22	97244.733	
1116/SB2021	KHARGAPUR-1	Kalyanpur	105	Kangsabati / Kansai	Kachha Road	100	3.3	22° 24' 34.20"N	87° 16' 19.30"E	Anup Das	08-06-2018	03-06-2019	03-06-2019	02-Jun-24	106969.206	
1078/SB2021	DATAN-1	Hasimpur	99	Subarnarekha	Kachha Road	56,435	5	21° 53' 11.16"N	87° 14' 47.04"E	Kalyani Mahapatra on behalf of Kalichandi Associates	07-11-2017	10-11-2017	10-11-2017	09-Nov-22	97244.733	
1077/SB2021	DATAN-1	Palasia	96	Subarnarekha	Kachha Road	1370,482	5	21° 53' 43.25"N	87° 14' 22.14"E	Md Enamul Haque on behalf of Haque Mercantile Pvt Ltd	07-11-2017	15-11-2017	15-11-2017	14-Nov-22	97244.733	
1080/SB2021	DATAN-1	Hasimpur	99	Subarnarekha	Kachha Road	56,435	3.6	21° 52' 46.37"N	87° 15' 10.54"E	Ankush Arora on behalf of Trumph Sales Service	15-12-2017	10-02-2018	10-02-2018	09-Feb-23	70016.207	
1081/SB2021	DATAN-1	Belmula	57	Subarnarekha	Kachha Road	781	5	21° 57' 13.50"N	87° 14' 17.44"E	Saroj Kumar Roy	07-11-2017	10-11-2017	10-11-2017	09-Nov-22	97244.733	
1082/SB2021	DATAN-1	Beldangri	58	Subarnarekha	Kachha Road	312	5	21° 56' 20.00"N	87° 14' 47.44"E	Sk Aftabuddin	18-07-2017	28-08-2017	28-08-2017	27-Aug-22	97244.733	
1084/SB2021	DATAN-1	Sonakonia	175	Subarnarekha	Kachha Road	737	3.6	21° 51' 49.80"N	87° 15' 10.00"E	Pradip Mahapatra on behalf of Maa Durga Balikhadan	07-11-2017	07-06-2017	07-06-2017	06-Jun-22	70016.207	
1090/SB2021	DASPUR-1	Gokulnagar	28	Kangsabati / Kansai	Kachha Road	982	0.63	22° 33' 53.70"N	87° 41' 7.55"E	Rakesh Singh on behalf of Rajsons Commodities Trading Pvt Ltd	27-02-2018	10-10-2018	10-10-2018	09-Oct-23	10534.846	
1096/SB2021	DEBRA	Chakfateullah	27	Kangsabati / Kansai	Kachha Road	111	0.5	22° 29' 10.80"N	87° 34' 33.60"E	Dibyendu Samanta	15-03-2018	19-03-2018	19-03-2018	18-Mar-23	7779.579	
1098/S	DEBRA	Mokarim	28	Kangsabati /	Kachha	816	0.74	22° 29'	87° 34'	Sheikh Nazrul Islam	11-10-	05-02-	05-02-	04-Feb-	5267.423	

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
B2021		pur		Kansai	Road			0.09''N	49.74''E	on behalf of Perfect Engineers Co Operative Society Ltd	2018	2019	2019	24		
1107/SB2021	KESHPUR	Kanjageriya	629	Kangsabati / Kansai	Kachha Road	407,408, 409	2.3	22° 27' 20.91''N	87° 30' 47.07''E	Srabani Gayen Bari	15-03-2018	16-03-2018	16-03-2018	15-Mar-23	76823.339	
1112/SB2021	KESHPUR	Ferira	631	Kangsabati / Kansai	Kachha Road	467	1.1	22° 29' 14.51''N	87° 34' 27.70''E	Ranjan Pal	07-06-2017	28-03-2017	28-03-2017	27-Mar-22	34813.614	
1115/SB2021	KHARGAPUR-1	Gumriyapal	1	Kangsabati / Kansai	Kachha Road	381,382	3.2	22° 24' 29.94''N	87° 15' 49.06''E	Prabhas Ghosh	14-09-2017	16-03-2018	16-03-2018	15-Mar-23	103727.715	
1410/SB2021	MEDINIPUR SADAR	Goaldanga	51	Kangsabati / Kansai	Kachha Road	197,198, 487	5	22° 25' 50.16''N	87° 7' 9.85''E	Kalu Majhi					0	EC Awaiting
1118/SB2021	KHARGAPUR-1	Gumriyapal	1	Kangsabati / Kansai	Kachha Road	381,382	4.5	22° 24' 48.50''N	87° 15' 22.40''E	Arun Kumar Deshali	08-06-2018	13-01-2020	13-01-2020	12-Jan-25	145867.099	
1120/SB2021	KHARGAPUR-1	Gumriyapal	1	Kangsabati / Kansai	Kachha Road	381,382	2.25	22° 24' 38.90''N	87° 15' 27.00''E	Dayal Chalak	07-11-2017	19-12-2017	19-12-2017	18-Feb-22	58346.84	
1124/SB2021	KHARGAPUR-1	Gumriyapal	1	Kangsabati / Kansai	Kachha Road	381	4.5	22° 24' 32.10''N	87° 15' 53.80''E	Santu Maity	07-11-2017	18-02-2020	18-02-2020	19-Feb-25	46677.472	
1183/SB2021	DEBRA	Mamudabad	136	Kangsabati / Kansai	Kachha Road	17	1.4	22° 26' 43.45''N	87° 38' 22.60''E	Firoza Khatun	21-12-2016	14-02-2014	14-02-2014	07-Oct-21	9092.382	
1285/SB2021	CHANDRAKONA-1	Kuldaha	284	Shilabati	Kachha Road	977	0.3	22° 38' 36.04''N	87° 35' 15.25''E	Prasanta Karak	14-09-2017	21-09-2017	21-09-2017	20-Sep-22	7779.579	
1159/SB2021	MEDINIPUR SADAR	Gurgurapal	134	Kangsabati / Kansai	Kachha Road	483,485	5	22° 25' 1.07''N	87° 13' 0.41''E	Md Enamul Haque on behalf of Haque Mercantile Pvt Ltd					0	EC Awaiting
1167/SB2021	GARHBETA-1	Kalikapur	900	Shilabati	Kachha Road	1288	2.96	22° 49' 15.03''N	87° 30' 33.95''E	Tarun Barik					0	EC Awaiting
1201/SB2021	MEDINIPUR SADAR	Bargachhia	15	Kangsabati / Kansai	Kachha Road	153,162, 169	5	22° 30' 19.15''N	87° 4' 52.84''E	Radhu Maity	03-02-2017	21-06-2018	21-06-2018	20-Jun-23	40219.157	

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
1229/SB2021	MEDINIPUR SADAR	Chaladan	47	Kangsabati / Kansai	Kachha Road	45	5	22° 26' 59.40''N	87° 7' 25.12''E	Tanay Maity	03-02-2017	23-02-2017	23-02-2017	22-Feb-22	40296.272	
1241/SB2021	DEBRA	Kamalpur	26	Kangsabati / Kansai	Kachha Road	744	0.2	22° 29' 20.33''N	87° 34' 15.83''E	Sk Makbul Hossain	07-06-2017	20-12-2017	20-12-2017	19-Dec-22	3792.545	
1253/SB2021	CHANDRAKONA-1	Manikkundu	151	Shilabati	Kachha Road	1046	0.69	22° 45' 4.72''N	87° 35' 11.74''E	Premi Arora on behalf of Ambey Abasan Pvt Ltd	15-12-2017	19-03-2018	19-03-2018	18-Mar-23	13419.773	
1268/SB2021	GARHBETA-1	Barai	905	Shilabati	Kachha Road	999	0.63	22° 50' 20.51''N	87° 29' 8.97''E	Bablu Sarkar	09-06-2018	06-06-2018	06-06-2018	05-Jun-23	5717.99	
1275/SB2021	GARHBETA-1	Gangani	485	Shilabati	Kachha Road	1	2.95	22° 51' 34.89''N	87° 20' 22.07''E	Mohan Lal Singha	14-09-2017	21-09-2017	21-09-2017	20-Sep-22	76499.19	
1279/SB2021	CHANDROKONA-2	Dhaikhanda	132	Shilabati	Kachha Road	1	0.42	22° 47' 33.07''N	87° 32' 11.35''E	Prasanta Karak	14-09-2017	21-09-2017	21-09-2017	20-Sep-22	8557.536	
1302/SB2021	MEDINIPUR SADAR	Dherua	28	Kangsabati / Kansai	Kachha Road	922	5	22° 28' 21.53''N	87° 4' 56.10''E	Tapas Ghosh on behalf of MS Ghosh Enterprise	03-02-2017	26-05-2017	26-05-2017	25-May-22	40484.465	
1316/SB2021	MEDINIPUR SADAR	Chaladan	47	Kangsabati / Kansai	Kachha Road	2,3,36	5	22° 27' 22.65''N	87° 7' 13.50''E	Kalipada Bhuniya on behalf of Maa Kali Enterprise	15-12-2017	19-03-2018	19-03-2018	18-Mar-23	40296.272	
1327/SB2021	GARHBETA-2	Bhagardanga	366	Shilabati	Kachha Road	72	0.98	22° 50' 13.80''N	87° 15' 21.30''E	Ataur Rahaman Mandal	07-06-2017	14-02-2017	14-02-2017	13-Feb-22	14940.032	
1307/SB2021	MEDINIPUR SADAR	Mabgochak	146	Kangsabati / Kansai	Kachha Road	193	5	22° 24' 40.59''N	87° 16' 20.47''E						0	
1331/SB2021	GARHBETA-1	Bhalukmura	795	Shilabati	Kachha Road	16,63,77	2.02	22° 52' 13.70''N	87° 25' 34.65''E	Prasanta Karak					0	EC Awaiting
1395/SB2021	DASPUR-1	Kismatnarajol	16	Shilabati	Kachha Road	1238	0.67	22° 30' 50.23''N	87° 36' 7.63''E	Supriya Singh					0	EC Awaiting
1412/SB2021	MEDINIPUR SADAR	Jamsole	137	Kangsabati / Kansai	Kachha Road	323	3.5	22° 24' 59.00''N	87° 14' 24.92''E	Tanushree Ghosh					0	EC Awaiting
1415/SB2021	KESHPUR	Chakmansur	617	Kangsabati / Kansai	Kachha Road	193	1.1	22° 27' 28.72''N	87° 29' 52.77''E	Sitesh Dhara					0	EC Awaiting
1418/SB2021	DEBRA	Chakfateullah	27	Kangsabati / Kansai	Kachha Road	111	0.91	22° 29' 14.36''N	87° 34' 26.61''E						0	

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
126/SB 2021	KESHIARI	Amilasai	141	Subarnarekha	Kachha Road	346, 347	4.73	22° 2' 35.73''N	87° 11' 30.97''E	Gautam Patra					0	EC Awaiting
129/SB 2021	KESHIARI	Nekramara	129	Subarnarekha	Kachha Road	230,232, 229,228, 176,175, 183,185, 187,218, 182, ors	4.99	22° 3' 49.08''N	87° 10' 15.46''E	Shiba Prosad Ghosh					0	EC Awaiting
132/SB 2021	KESHIARI	Nekramara	129	Subarnarekha	Kachha Road	230,232, 229,159, 160,158, 164,161, 162,168, 169	4.9	22° 3' 58.73''N	87° 10' 13.22''E	Uttam Kumar Barik					0	EC Awaiting
135/SB 2021	KESHIARI	Bhasra	139	Subarnarekha	Kachha Road	2667	4.58	22° 3' 37.30''N	87° 10' 25.18''E	Ataur Rahaman Mandal					0	EC Awaiting
146/SB 2021	KESHIARI	Atanga	140	Subarnarekha	Kachha Road	213	2.16	22° 2' 53.45''N	87° 11' 22.97''E	Sek Barik					0	EC Awaiting
198/SB 2021	KESHPUR	Kapashtikri	530	Kangsabati / Kansai	Kachha Road	795	0.87	22° 29' 17.16''N	87° 33' 12.43''E	Pradyot Ghosh					0	EC Awaiting
232/SB 2021	KESHPUR	Bhimbar	531	Kangsabati / Kansai	Kachha Road	392,393	0.88	22° 29' 16.24''N	87° 33' 2.90''E	Swapan Das Bhowmik					0	EC Awaiting
241/SB 2021	DASPUR-1	Maheshpur	100	Kangsabati / Kansai	Kachha Road	318	0.48	22° 32' 50.57''N	87° 43' 4.19''E	Anubha Poria					0	EC Awaiting
378/SB 2021	MEDINIPUR SADAR	Rerapal	132	Kangsabati / Kansai	Kachha Road	700	4.2	22° 24' 42.69''N	87° 12' 8.16''E	Sanjib Mandal					0	EC Awaiting
401/SB 2021	MEDINIPUR SADAR	Kankabati	142	Kangsabati / Kansai	Kachha Road	548,549	2.4	22° 24' 43.50''N	87° 15' 12.54''E	Rajesh Chakraborty on behalf of Nexzen Projects and Development Pvt Ltd					0	EC Awaiting
447/SB 2021	MEDINIPUR SADAR	Nischintapur	48	Kangsabati / Kansai	Kachha Road	1,2,3,19, 20	3.6	22° 26' 57.80''N	87° 7' 18.60''E	Swapan Das Bhowmik					0	EC Awaiting
590/SB 2021	DEBRA	Mokarimpur	28	Kangsabati / Kansai	Kachha Road	816	0.4	22° 28' 41.82''N	87° 34' 45.44''E	Somen Kumar Bose					0	EC Awaiting
667/SB 2021	KHARGAPUR-1	Gumriyapal	1	Kangsabati / Kansai	Kachha Road	381	4.5	22° 24' 34.00''N	87° 16' 10.00''E	Anindu Kumar De					0	EC Awaiting
702/SB	DATAN-1	Lalitapur	95	Subarnarekha	Kachha	1060,106	5	21° 54'	87° 14'	Rajkishore					0	EC Awaiting

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
2021					Road	1		13.77''N	22.91''E	Mahapatra on behalf of MS Shiva Associates						
719/SB 2021	DATAN-1	Belmula	57	Subarnarekha	Kachha Road	781	5	21° 57' 5.55''N	87° 14' 18.81''E	Sankar Das					0	EC Awaiting
742/SB 2021	MEDINIPUR SADAR	Lohatikri	136	Kangsabati / Kansai	Kachha Road	695	5	22° 25' 4.22''N	87° 13' 13.95''E	Anup Doya	07-06-2017	19-04-2017	19-04-2017	18-Apr-22	40613.938	
750/SB 2021	MEDINIPUR SADAR	GURGURI PAL	134	Kangsabati / Kansai	Kachha Road	704	5	22° 24' 54.21''N	87° 12' 37.91''E						0	
753/SB 2021	MEDINIPUR SADAR	GURGURI PAL	134	Kangsabati / Kansai	Kachha Road	704	5	22° 24' 57.16''N	87° 12' 45.98''E						0	
756/SB 2021	MEDINIPUR SADAR	GURGURI PAL	134	Kangsabati / Kansai	Kachha Road	704	5	22° 24' 59.49''N	87° 12' 53.91''E						0	
759/SB 2021	MEDINIPUR SADAR	GURGURI PAL	134	Kangsabati / Kansai	Kachha Road	485	5	22° 25' 2.08''N	87° 12' 19.63''E						0	
762/SB 2021	MEDINIPUR SADAR	GURGURI PAL	134	Kangsabati / Kansai	Kachha Road	485	5	22° 25' 9.91''N	87° 12' 34.30''E						0	
796/SB 2021	KESHPUR	BRAHMA NGERYA	618	Kangsabati / Kansai	Kachha Road	78	2.56	22° 27' 40.45''N	87° 30' 2.11''E						0	
802/SB 2021	KESHPUR	BARACH ANDBAR	528	Kangsabati / Kansai	Kachha Road	479	0.61	22° 30' 37.98''N	87° 33' 31.22''E						0	
822/SB 2021	CHANDROK ONA-2	DHARMA POTA	74	Shilabati	Kachha Road	930	1.15	22° 48' 47.24''N	87° 32' 10.80''E						0	
833/SB 2021	KESHIARI	DAKSHIN DUMURK OLA	128	Subarnarekha	Kachha Road	198,199, 200	4.92	22° 4' 31.13''N	87° 9' 44.71''E						0	
842/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.96	22° 5' 16.97''N	87° 8' 52.76''E						0	
908/SB 2021	MEDINIPUR SADAR	Dherua	28	Kangsabati / Kansai	Kachha Road	923,924	5	22° 28' 0.57''N	87° 5' 11.55''E	Joydeep Chakraborty	07-11-2017	15-12-2017	15-12-2017	14-Dec-22	39565.008	
922/SB 2021	MEDINIPUR SADAR	Bhikanpu r	36	Kangsabati / Kansai	Kachha Road	133,135, 136	5	22° 27' 45.60''N	87° 6' 54.82''E	Sudeb Das	03-02-2017	07-02-2017	07-02-2017	06-Feb-22	40296.272	
925/SB 2021	MEDINIPUR SADAR	Gopalpur	149	Kangsabati / Kansai	Kachha Road	330	5	22° 24' 42.36''N	87° 17' 39.33''E	Bapi Maity	18-07-2017	23-05-2017	23-05-2017	22-May-22	40296.272	

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
942/SB 2021	KESHIARI	KULBONI	87	Subarnarekha	Kachha Road	1656	4.78	22° 5' 27.98''N	87° 8' 7.85''E						0	
948/SB 2021	DATAN-1	PANITUNIA	92	Subarnarekha	Kachha Road	599	3.8	21° 55' 41.49''N	87° 14' 51.08''E						0	
951/SB 2021	DATAN-1	PALASIA	96	Subarnarekha	Kachha Road	1370,482	5	21° 53' 31.05''N	87° 14' 35.87''E						0	
962/SB 2021	DATAN-1	BENMULA	57	Subarnarekha	Kachha Road	781	5	21° 56' 19.19''N	87° 14' 25.68''E						0	
968/SB 2021	DATAN-1	PANITUNIA	92	Subarnarekha	Kachha Road	599	4.4	21° 55' 27.51''N	87° 14' 26.11''E						0	
979/SB 2021	GARHBETA-1	Barai	905	Shilabati	Kachha Road	999	0.48	22° 50' 25.80''N	87° 29' 3.91''E	RAJIB ALI MALLIK	07-06-2017	09-03-2017	09-03-2017	08-Mar-22	12447.326	
985/SB 2021	GARHBETA-1	Barai	905	Shilabati	Kachha Road	999	1.2	22° 50' 11.16''N	87° 29' 11.24''E	Pradip Arora	07-11-2017	13-04-2018	13-04-2018	12-Apr-23	31118.314	
991/SB 2021	GARHBETA-1	Payrauri	519	Shilabati	Kachha Road	1	2.33	22° 51' 49.80''N	87° 19' 48.72''E	Ataur Rahaman Mandal	14-09-2017	19-09-2017	19-09-2017	18-Sep-22	60421.394	
1008/SB2021	GARHBETA-1	Lakshyatapal	937	Shilabati	Kachha Road	1382	0.78	22° 52' 26.35''N	87° 24' 12.60''E	Kamal Uddin Mandal	11-10-2018	07-02-2019	07-02-2019	06-Feb-24	12893.031	
1025/SB2021	GARHBETA-2	Kankdaha	209	Shilabati	Kachha Road	1	0.74	22° 52' 21.26''N	87° 12' 26.36''E	Susanta Ghosh on behalf of Bankura Mineral Industries	07-11-2017	09-11-2017	09-11-2017	08-Nov-22	9803.89	
1042/SB2021	CHANDRAKONA-1	Jara	152	Shilabati	Kachha Road	781	0.74	22° 45' 41.78''N	87° 34' 6.81''E	Prabir Ghosh	08-06-2018	20-09-2019	20-09-2019	19-Sep-24	10137.763	
1045/SB2021	CHANDRAKONA-1	Manikkundu	151	Shilabati	Kachha Road	1046,1165	2.31	22° 44' 53.87''N	87° 35' 11.99''E	Premi Arora on behalf of Ambey Abasan Pvt Ltd	15-12-2017	19-03-2018	19-03-2018	18-Mar-23	44927.066	
1051/SB2021	CHANDRAKONA-1	Manikkundu	151	Shilabati	Kachha Road	2589,2590	3.15	22° 44' 36.30''N	87° 35' 22.28''E	Premi Arora on behalf of Ambey Abasan Pvt Ltd	15-12-2017	19-03-2018	19-03-2018	18-Mar-23	44927.066	
1065/SB2021	CHANDROKONA-2	Gopalpur	147	Shilabati	Kachha Road	1113	0.33	22° 45' 43.12''N	87° 33' 31.99''E	Prasanta Karak	03-02-2017	21-02-2017	21-02-2017	20-Feb-22	40294.976	
1088/SB2021	DASPUR-1	Dubrajpur	9	Kangsabati / Kansai	Kachha Road	760	0.98	22° 32' 23.09''N	87° 35' 19.70''E	M Rahima Bibi	15-03-2018	27-03-2018	27-03-2018	26-Mar-23	17017.828	

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
1094/SB2021	DEBRA	Kamalpur	26	Kangsabati / Kansai	Kachha Road	744	0.4	22° 29' 16.74''N	87° 34' 20.90''E	Sk Makbul Hossain	07-06-2017	03-03-2017	03-03-2017	02-Mar-22	9724.473	
1111/SB2021	KESHPUR	Gopinathpur	632	Kangsabati / Kansai	Kachha Road	149,150	3.6	22° 26' 11.91''N	87° 31' 2.80''E	Sk Habu	07-11-2017	12-12-2017	12-12-2017	11-Dec-22	138573.744	
1125/SB2021	KHARGAPUR-1	Gumriyapal	1	Kangsabati / Kansai	Kachha Road	381	4.5	22° 24' 31.90''N	87° 16' 3.40''E	Arghya Ghosh and Kakali Ghosh on behalf of SG Infrabuild Pvt Ltd	15-12-2017	10-06-2019	10-06-2019	09-Jun-24	58346.84	
1174/SB2021	KHARGAPUR-1	Kalyanpur	105	Kangsabati / Kansai	Kachha Road	101	3	22° 24' 37.80''N	87° 16' 19.70''E	Mritunjoy Pal					0	EC Awaiting
1211/SB2021	MEDINIPUR SADAR	Dherua	28	Kangsabati / Kansai	Kachha Road	921	5	22° 28' 26.50''N	87° 5' 7.79''E	Bibek Gope	07-06-2017	03-05-2017	03-05-2017	02-May-22	38792.22	
1406/SB2021	DEBRA	Bishnupur	45	Kangsabati / Kansai	Kachha Road	317	0.48	22° 28' 11.58''N	87° 37' 2.73''E	Rakesh Singh					0	EC Awaiting

8.3 Detail of production of sand and other minerals during last three years

Last 3 years production of minor mineral of Paschim Medinipur district is furnished in Table 8.2.

Table 8.2: Details of production of sand as per mine plan in Paschim Medinipur district

Sl. No.	Year	Name of mineral	Total Production (inCft.)	Total Production in cum
1	2017-2018	Sand	59,980,000	1698428.43
2	2018-2019	Sand	59,550,000	1686252.3
3	2019-2020	Sand	65,500,000	1854735.95

Conversion factor: 1cum=35.315 cft

9 Details of revenue generated from mineral sector during last three years

Revenue generated for last 3 years in Paschim Medinipur district is furnished in Table 9.1.

Table 9.1: District revenue generation from mineral sector

Year	Royalty amount
2017-18	111,608,841.00
2018-19	111,532,548.00
2019-20	121,331,797.00

10 Transport

The most common transport system in Paschim Medinipur district is road transport (Figure 10.1). The district is well networked with other part of the State through roadways. National Highway (NH-6) passes through the district and connects other districts like Purba Medinipur, Bankura, Birbhum and Murshidabad. Besides the National Highway, few other State Highways also passes through the district. State Highway (SH)-4 connects Sarenga, Goaltore, Chandrakona, Ghatal and Panskura. SH-5 connects Banspahan, Narayanpur, Silda, Lodhasuli, Kharagpur (via NH-6), Keshiary and Belda. SH-7connects Ram Jibanpur, Khirpai, Chandrakona, Keshpur and Medinipur. SH-9 connects Beragaria and Silda.

With regard to railways, Kharagpur is very important junction of the South-Eastern Railways. Kharagpur junction has the world's third longest railway platform with a length of 1,072.5 metres. From Kharagpur the railway lines are extended to many important cities of the country. Presently 5 important lines pass through Kharagpur which are Howrah-Nagpur-Mumbai line, Howrah-Chennai main line, Howrah-Kharagpur line, Asansol–Tatanagar–Kharagpur line and Kharagpur-Puri line.

A transportation map demarcating approach road to the potential sand blocks from the nearest National Highway/ Sate Highway has been prepared and presented in Figure 10.2.

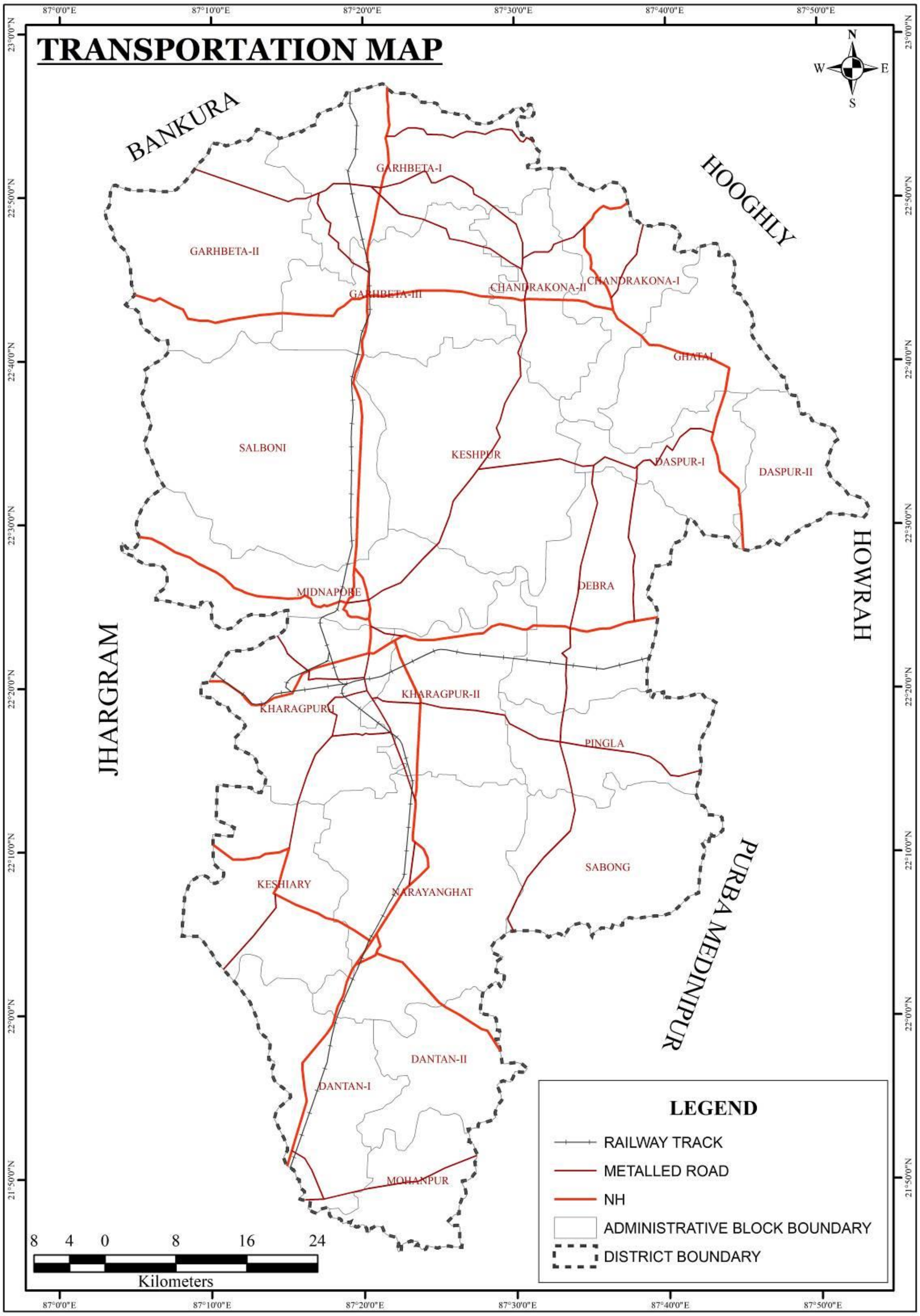

Figure 10.1: Transportation map of Paschim Medinipur District

(Source: National Informatics Centre)

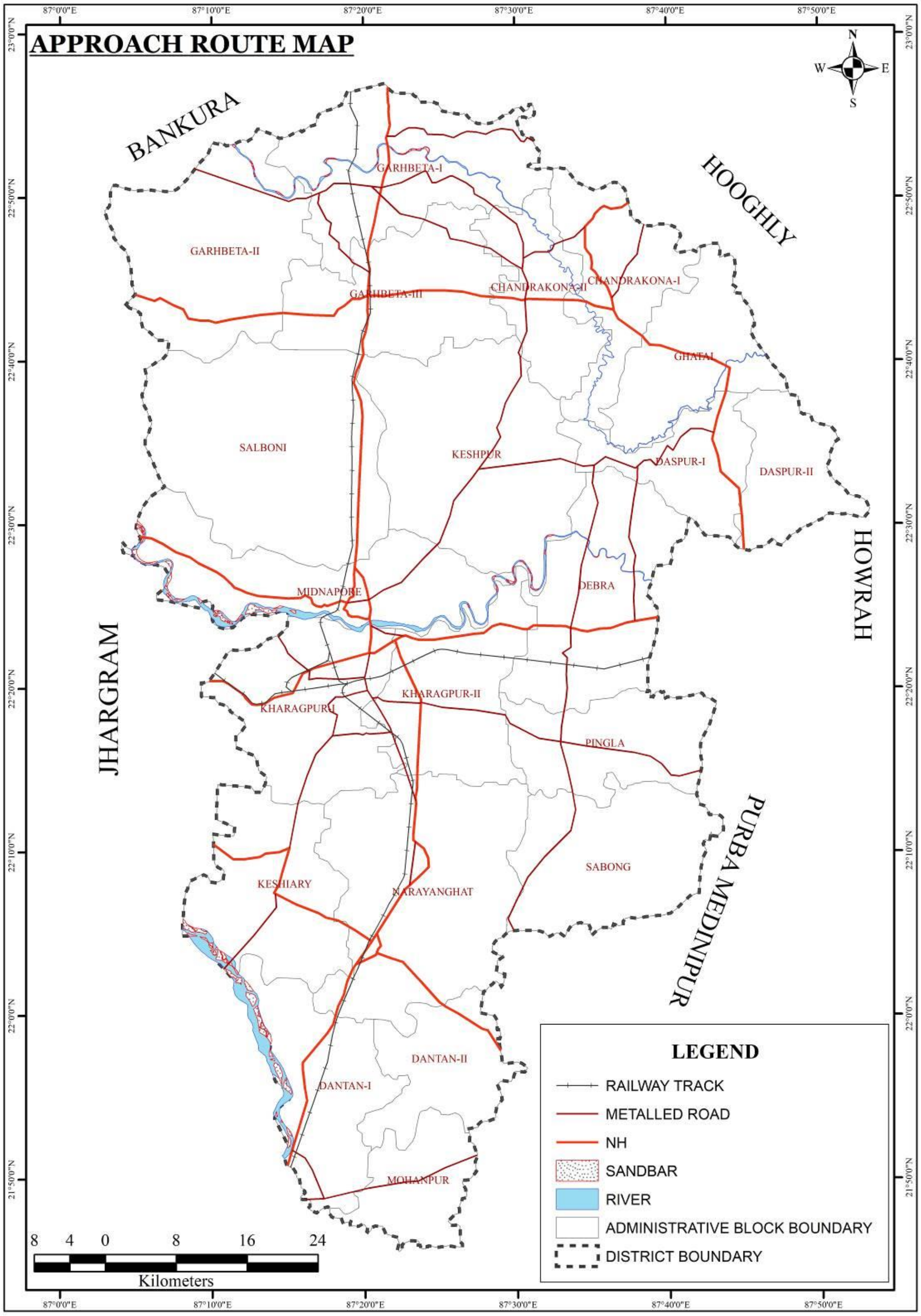

Figure 10.2: Map showing approach road to potential sand bars

(Source: National Informatics Centre)

11 Remedial measure to mitigate the impact of mining

11.1 Environmental Sensitivity

Paschim Medinipur district represents a unique geo-environmental setup. As human population increases, forests are being depleted for the extension of agricultural lands, introduction of new settlements, roadways etc

Due to unprecedented growth of population during the last few decades, nature has started reacting sharply to the accumulated human guilt. Soil erosion and its conservation play an important role.

The land use practices play the most important role in determining the stability factors in respect of landslide hazards. Stone quarrying from the slope is another way of human intervention that causes occasional slope failure.

11.2 Sand mining Impact

Another serious environmental problem around the globe in recent years is of sand and gravel mining. Sand mining is a process of extraction of sand from an open pit, river bed, sea beaches, ocean floor, river banks, deltas and island dunes. The extracted sand could be utilised for various types of manufacturing, such as concrete used in the construction of building and other structures. The sand can also be used as an abrasive. The demand for sand will increase with population growth and urbanization. The high demand of sand has has led to unsustainable sand mining process resulting in illegal mining.

Although most jurisdictions have legal limit on the location and volume of sand that can be mined, illegal sand extraction is taking place in many parts of the country due to rapid urbanisation and industrialisation.

Removal or extraction of too much sand from rivers leads to erosion of river banks. Deltas can recede due to sand mining. These destructive effects of sand mining ultimately results in loss of fertile land and property. It also destabilizes the ground and causes failure of engineering structures.

In-stream mining directly alters the channel geometry and bed elevation. Removing sediment from the channel disrupts the pre-existing balance between sediment supply and transporting capacity, typically inducing incision upstream and downstream of the extraction site. The resultant incision alters the frequency of floodplain inundation along the river courses, lowers valley floor water table and frequently leads to destruction of bridges and channelization structures.

Sand Mining in beaches disturbs the ecosystem of different fauna of the beaches. The sand mining from natural barriers, made up of sand, causes flooding of the natural habitat. The sand mining activity destroys the aesthetic beauty of beaches and river bank and makes the ecosystem unstable. If there are popular tourist destination, tourism potential of such areas will decline.

It can be concluded that there has been little in depth research on the environmental, social and political effects of land use practices and calls for urgent attention by the competent authority.

11.3 Remedial measure

11.3.1 Sustainable Mining Practices:

- The depth of mining in riverbed shall not exceed 3 meter or base flow level whichever is less, provided that where the Joint Inspection Committee certifies about excessive deposit or over accumulation of mineral in certain reaches requiring channelization, it can go above 3 meters.
- Mining shall be done in layers of 1 meter depth to avoid ponding effect and after first layer is excavated, the process will be repeated for the next layers.
- No stream should be diverted for the purpose of sand mining. No natural water course and/ or water resources are obstructed due to mining operations.
- No blasting shall be resorted to in river mining and without permission at any other place.

11.3.2 Monitoring the Mining of Mineral and its Transportation:

- For each mining lease site the access should be controlled in a way that vehicles carrying mineral from that area are tracked and accounted for.
- There should be regular monitoring of the mining activities in the State to ensure effective compliance of stipulated EC conditions and of the provisions under the Minor Mineral Concessions Rules framed by the State Government.

11.3.3 Noise Management:

- Noise arising out of mining and processing shall be abated and controlled at source to keep within permissible limit.
- Restricted sand mining operation has to be carried out between 6 am to 7 pm.

11.3.4 Air Pollution and Dust Management:

- The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly.

- Air pollution due to dust, exhaust emission or fumes during mining and processing phase should be controlled and kept in permissible limits specified under environmental laws.
- The mineral transportation shall be carried out through covered trucks only and the vehicles carrying the mineral shall not be overloaded. Wheel washing facility should be installed and used.

11.3.5 Bio-Diversity Protection:

- Restoration of flora affected by mining should be done immediately. Five times the number of trees destroyed by mining to be planted preferably of indigenous species. Each EC holder shall have to undertake plantation of trees over at least 20% of the total area of lease in the same plot or plots utilised for such working.
- No mining lease shall be granted in the forest area without forest clearance in accordance with the provisions of the Forest Conservation Act, 1980 and the rules made there under.
- Protection of natural home of any wild animal shall have to be ensured.
- No felling of tree near quarry is allowed. For mining lease within 10km of the National Park / Sanctuary or in Eco-Sensitive Zone of the Protected Area, recommendation of Standing Committee of National Board of Wild Life (NBWL) have to be obtained as per the Hon'ble Supreme Court order in I.A. No. 460 of 2004.
- Spring sources should not be affected due to mining activities. Necessary protection measures are to be incorporated.

11.3.6 Management of Instability and Erosion:

- Removal, stacking and utilization of top soil should be ensured during mining. Where top soil cannot be used concurrently, it shall be stored separately for future use keeping in view that the bacterial organism should not die and should be spread nearby area.
- The EC should stipulate conditions for adequate steps to check soil erosion and control debris flow etc. by constructing engineering structures
- Use of oversize material to control erosion and movement of sediments
- No overhangs shall be allowed to be formed due to mining and mining shall not be allowed in area where subsidence of rocks is likely to occur due to steep angle of slope.
- No extraction of stone / boulder / sand in landslide prone areas.
- Controlled clearance of riparian vegetation to be undertaken.

11.3.7 Waste Management:

- Site clearance and tidiness is very much needed to have less visual impact of mining.
- Dumping of waste shall be done in earmarked places as approved in Mining Plan.
- Rubbish burial shall not be done in the rivers.

11.3.8 Pollution Prevention:

- Take all possible precautions for the protection of environment and control of pollution.
- Effluent discharge should be kept to the minimum and it should meet the standards prescribed.

11.3.9 Protection of Infrastructure:

- Mining activities shall not be done for mine lease where mining can cause danger to site of flood protection works, places of cultural, religious, historical, and archeological importance.
- For carrying out mining in proximity to any bridge or embankment, appropriate safety zone should be worked out on case to case basis, taking into account the structural parameters, location aspects and flow rate, and no mining should be carried out in the safety zone so worked out.

Mining shall not be undertaken in a mining lease located in 300-500 meter of bridge, 300 meter upstream and downstream of water supply / irrigation scheme, 100 meters from the edge of National Highway and railway line, 50 meters from a reservoir, canal or building, 25 meter from the edge of State Highway and 10 meters from the edge of other roads except on special exemption by the Sub-Divisional level Joint Inspection Committee.

12 Suggested reclamation plan for already mined out areas

As per statute all mines/quarries are to be properly reclaimed before final closure of the mine. Reclamation plans should include:

a) A baseline survey of river cross section. The study of cross section is basis for delineating channel form. Cross-sections must be surveyed between two monumented endpoints set on the river banks, and elevations should be referenced based on benchmark set in the area;

b) The proposed mining cross-section data should be plotted over the baseline data to illustrate the vertical extent of the proposed excavation;

c) The cross-section of the replenished bar should be the same as the baseline data. This illustrates that the bar elevation after the bar is replenished will be the same as the bar before extraction;

d) A planimetric map showing the aerial extent of the excavation and extent of the riparian buffers;

e) A planting plan developed by a plant ecologist familiar with the flora of the river for any areas such as roads that need to be restored;

f) Each EC holder shall have to undertake plantation of trees over at least 20% of the total area of the plot or plots of land as subject to such working in accordance with a plan approved by the concerned Divisional Forest Officer holding jurisdiction, provided further the competent authority l.e, The Divisional Forest Officer may fix up norms for plantation of trees in a particular area regarding choice of species, spacing, nos of trees and maintenance etc.

f) A monitoring plan has to establish.

13 Risk assessment and disaster management plan

Risk analysis is the systematic study of risks encountered during various stages of mining operation. Risk analysis seek to identify the risks involved in mining operations, to understand how and when they arise, and estimate the impact (financial or otherwise) of adverse outcomes. The sand mining operation in the district is mainly done manually.

13.1 Identification of risk due to river sand mining

There is no land degradation due to mining activities as mining is done only on river bed dry surface. There will be no OB or waste generation as the sand is exposed in the river bed and is completely saleable. There will be neither any stacking of soil nor creation of OB dumps. The mining activity will be carried out upto a maximum depth of 3m below the surface level. So there is no chance of slope failure, bench failure in the mines. However there are some identified risks in the mining activity which are as follows:

1. Accident during sand loading and transportation
2. Inundation/ Flooding
3. Quick Sand Condition

13.2 Mitigation measures

13.2.1 Measures to prevent accidents during loading and transportation:

- During the loading, trucks should be brought to a lower level so that the loading operation suits the ergonomic condition of the workers.
- The workers will be provided with gloves and safety shoes during loading.
- Opening of the side covers of the truck should be done carefully and with warning to prevent injury to the loaders.
- Mining operations will be done during daylight only.
- The truck will be covered with tarpaulin and maintained to prevent any spillage.
- To avoid danger while reversing the trackless vehicles especially at the embankment and tipping points, all areas for reversing of lorries should be made man free as far as possible.
- All transportation within the main working will be carried out directly under the supervision and control of the management.
- Overloading should not be permitted and the maximum permissible speed limit should be ensured.
- There will be regular maintenance of the trucks and the drivers will have valid driving license.

13.2.2Measures to prevent incidents during Inundation/ Flooding:

To minimize the risk of flooding/ inundation following measures should be under taken:

- Mining will be completely closed during the monsoon months.
- Proper weather information particularly on rain should be kept during the operational period of mines so that precautionary measures will be undertaken.

13.2.3 Measures for mitigation to quick sand condition:

- Quick sand zone and deep water zone will be clearly demarcated and all the mine workers will be made aware of the location.
- Mining will be done strictly as per the approved mining plan.

13.3 Disaster management plan

As the depth of mining will be maximum of 3m below the surface level considering local condition, the risk related to mining activity is much less. The mining operation will be carried out under the supervision of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS. All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955 and other laws applicable to mine will strictly be complied. During heavy rainfall and during the monsoon season the mining activities will be closed. Proper coordination with Irrigation Department should be maintained so that at the time of releasing water, if any, from the dam suitable warning/information is given in advance. Special attention and requisite precautions shall be taken while working in areas of geological weakness like existence of slip, fault etc. The mining site will be supplied with first aid facilities and the entire mines worker will have access to that.

14 Conclusions and Recommendations

The District Survey Report has been prepared in conformity with the S O 141 (E), S O 3611 (E) and other sand mining guidelines published by MoEF&CC time to time as well as the requirement specified in WBMMCR, 2016.

Potential areas of economic mineralization and mineral deposition have been identified and list is furnished in the report. Estimation of annual sand deposition by replenishment study has been incorporated in the report.

The district survey report has been prepared by utilizing both primary and secondary data. The primary data generation involved the satellite imagery study, site inspection, survey, ground truthing etc. while secondary data has been acquired through various authenticated sources and satellite imagery studies.

The land surface of the district is characterized by hard rock uplands, lateritic covered area, flat alluvial and deltaic plains. Extremely rugged topography is seen in the western part of the district and rolling topography is experienced in the lateritic covered area. These rolling plains gradually merge into flat alluvial and deltaic plains to the East and the South-East of the District.

The district is characterized by humid tropical monsoon climate. The average annual rainfall in the district is 1485mm (2016-2020).

The maximum area of the district falls under the Seismic Zone III and rest of the part fall under Zone II, indicating the district is under safe earthquake–prone zone.

Paschim Medinipur district does not hold huge minerals deposits. Lateritic rocks are found in many parts of the district. The extracted laterite is used for various purposes. Claystone are also noted in the district. It is mainly used in the manufacture of household utensils.

The district is generating considerable revenue from mining of minor minerals such as riverbed sand deposits. Revenue generated in the district of Paschim Medinipur from Minor minerals during the period of April 2017 to January 2020 is Rs. 34.45 crores.

The district has an upside potential for development of riverbed sand. The occurrence has been reported by Directorate of Mines and Minerals, Government of West Bengal and others in previous instances. It requires further systematic and scientific approach to quantify the resource along with their grade assessment. The occurrences are mostly observed in the river Shilabati, Kangsabati and Subarnarekha River. This report also recommends undertaking detail exploration (G2 level) program to assess the mineral occurrences in the major rivers of the district and should have a proper development and production plan for the specified minerals.

14.1. Conclusion

I. The river beds of the district are enriched with sand which is highly potential for mining.

II. The replenishment study has been carried out during the preparation of this DSR. Both field-based surveys coupled with satellite imagery study and empirical studies were carried out to determine the rate of replenishment in each river of the district.

III. The determined values of various methods as adopted for replenishment study gives a comparable value and in all cases the values are found to be much more as compared to the capping limit (60%) as suggested in the Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) January 2020, Issued by Ministry of Environment, Forest and Climate Change (MoEF&CC) 2020.

IV. Field base study shows variation of replenishment from 97.0 to 98.5% in the district and for theoretical replenishment study based on mining lease shows variation from 70% to 76% with an average of 73.63% of replenishment rate in the district.

V. The total potential river bed deposit for the district comes to about 20.79 Mcum.

14.2. Recommendation:

1. The mining lease distribution for the district must be carried out by involving a district level committee constituted with inter-disciplinary members of various department including irrigation and waterways, DL&LRO, forest, biodiversity, wetland management, SWID or any other relevant department which the district authority may find suitable to include.
2. While recommending for Mining Leases, the District Level Committee should ensure the protection of Biodiversity Zones as recorded by relevant Government Agenesis from time to time.
3. During finalization of mining leases for the district, strict adherence of Supreme Court orders No 1501 dated 03/06/2022 should be followed.
4. Efforts should be given to restrict distribution of mining leases along the confluence zone of the rivers where rich aquatic habitats are reported.
5. Since the state of West Bengal has royalty system in volumetric measurement, specific gravity for sand and gravel has not been determined during this study. However, during the finalization of mining lease if it is found necessary to conduct such test may be initiated by the state government on case-to-case basis.
6. It is recommended to have a periodical review along with primary data collection during pre - and post-monsoon periods to record the seasonal variance of the sedimentation rate on annual basis and update replenishment rate of the district.

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PLATE 1

DRAINAGE MAP OF THE DISTRICT

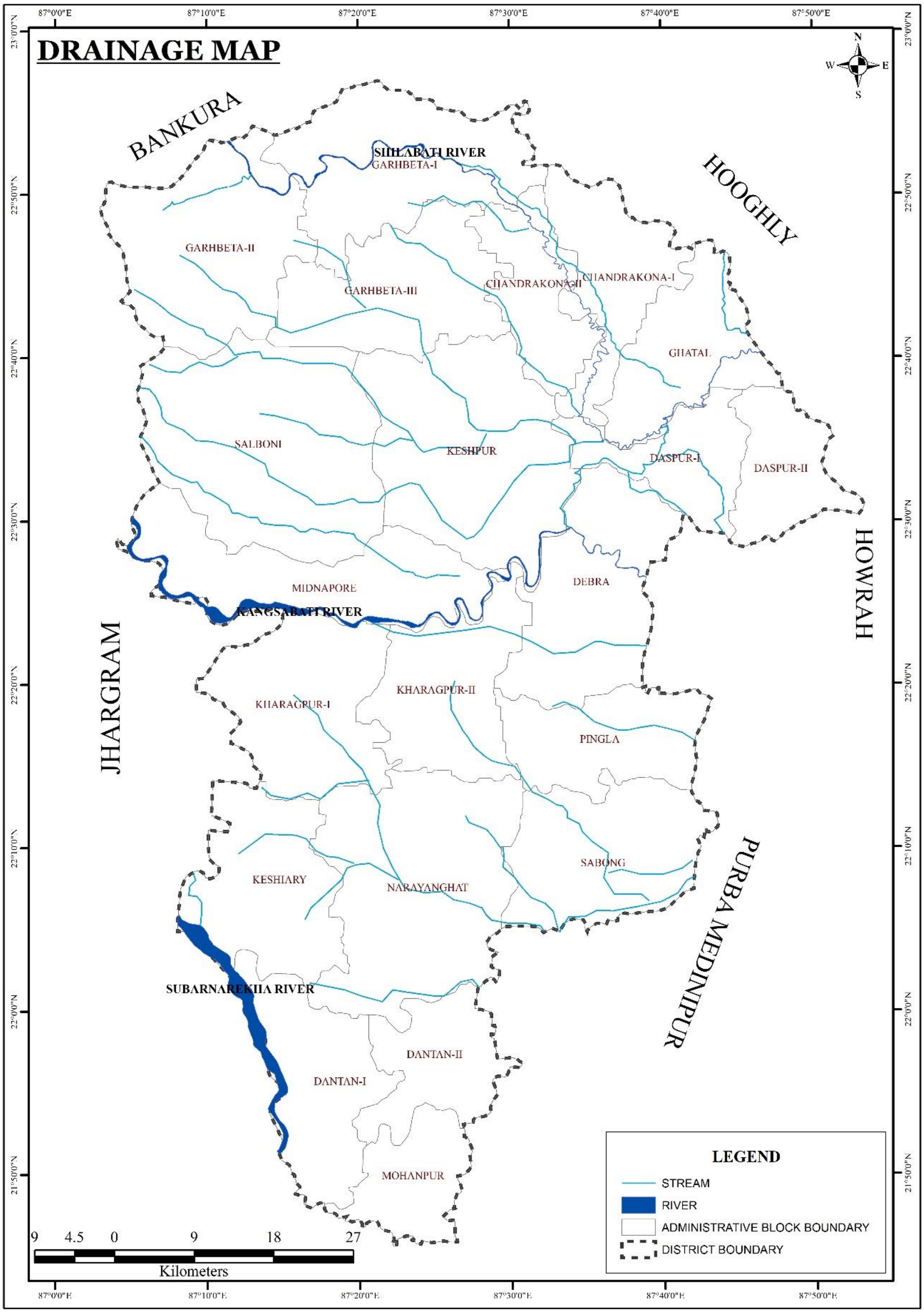
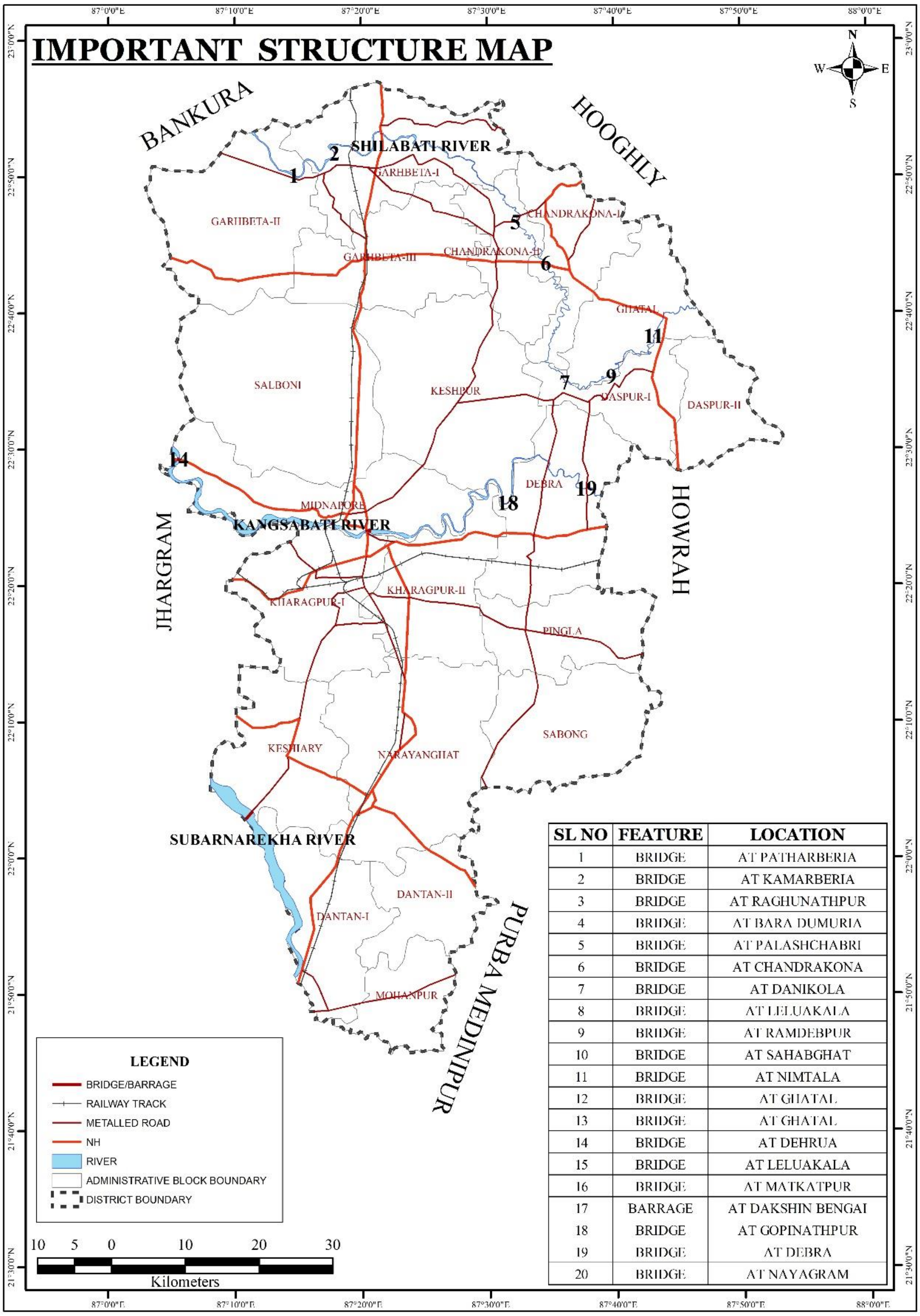


Plate 1A: Drainage Map of the District *(Source: National Informatics Centre -NIC Website, Sept 2020)*



SL NO	FEATURE	LOCATION
1	BRIDGE	AT PATHARBERIA
2	BRIDGE	AT KAMARBERIA
3	BRIDGE	AT RAGHUNATHPUR
4	BRIDGE	AT BARA DUMURIA
5	BRIDGE	AT PALASHCHABRI
6	BRIDGE	AT CHANDRAKONA
7	BRIDGE	AT DANIKOLA
8	BRIDGE	AT LELUAKALA
9	BRIDGE	AT RAMDEBPUR
10	BRIDGE	AT SAHABGHAT
11	BRIDGE	AT NIMTALA
12	BRIDGE	AT GHATAL
13	BRIDGE	AT GHATAL
14	BRIDGE	AT DEHRUA
15	BRIDGE	AT LELUAKALA
16	BRIDGE	AT MATKATPUR
17	BARRAGE	AT DAKSHIN BENGAI
18	BRIDGE	AT GOPINATHPUR
19	BRIDGE	AT DEBRA
20	BRIDGE	AT NAYAGRAM

Plate No 1B: Location Map of dams, barrages, bridge showing on drainage system of the district *(Source: National Informatics Centre -NIC Website, Sept 2020)*

PLATE 2A

DISTRIBUTION MAP OF SAND BARS ON RIVERS DURING PRE-MONSOON PERIOD

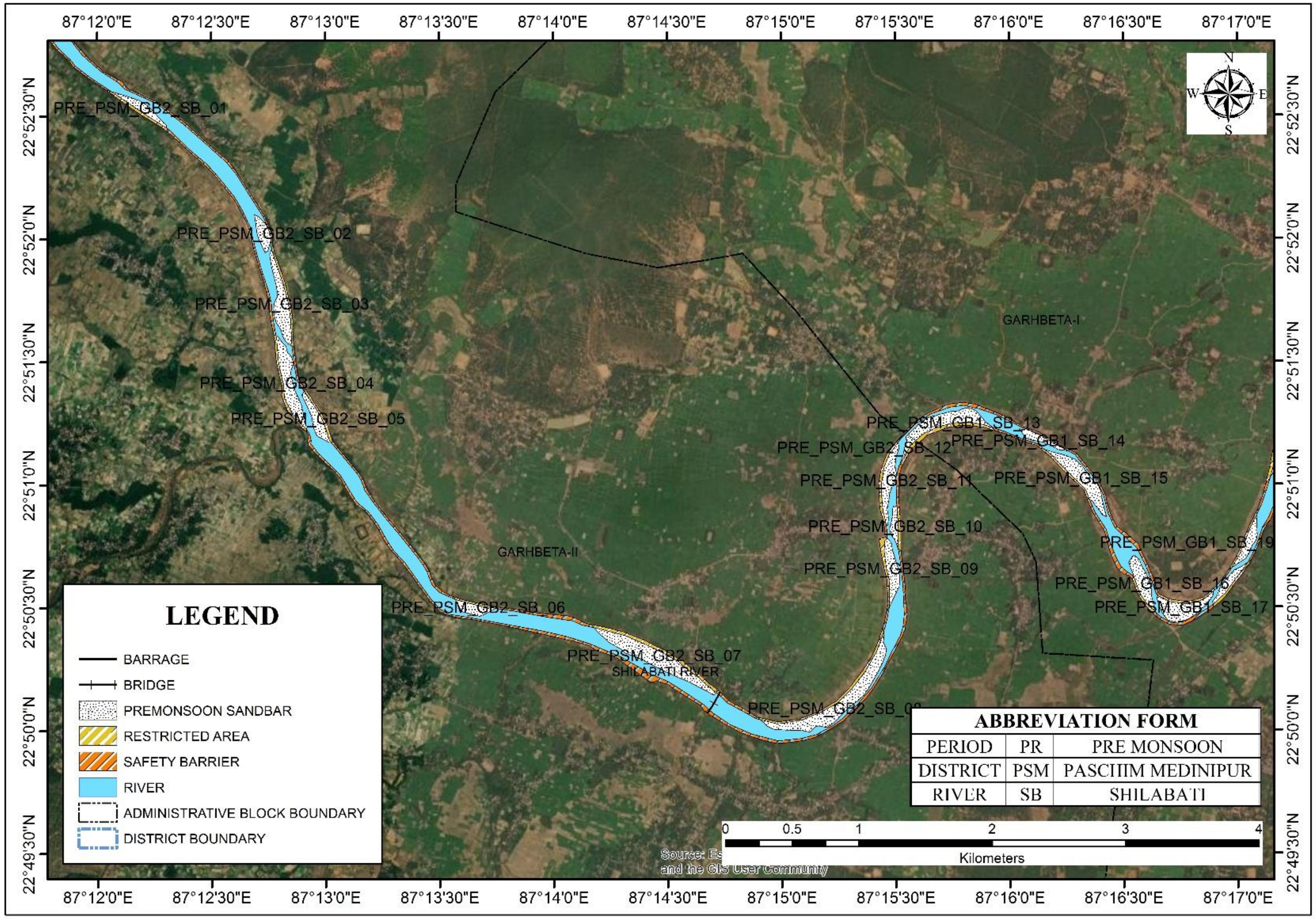


Plate 2A1: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

Plate 2A2: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

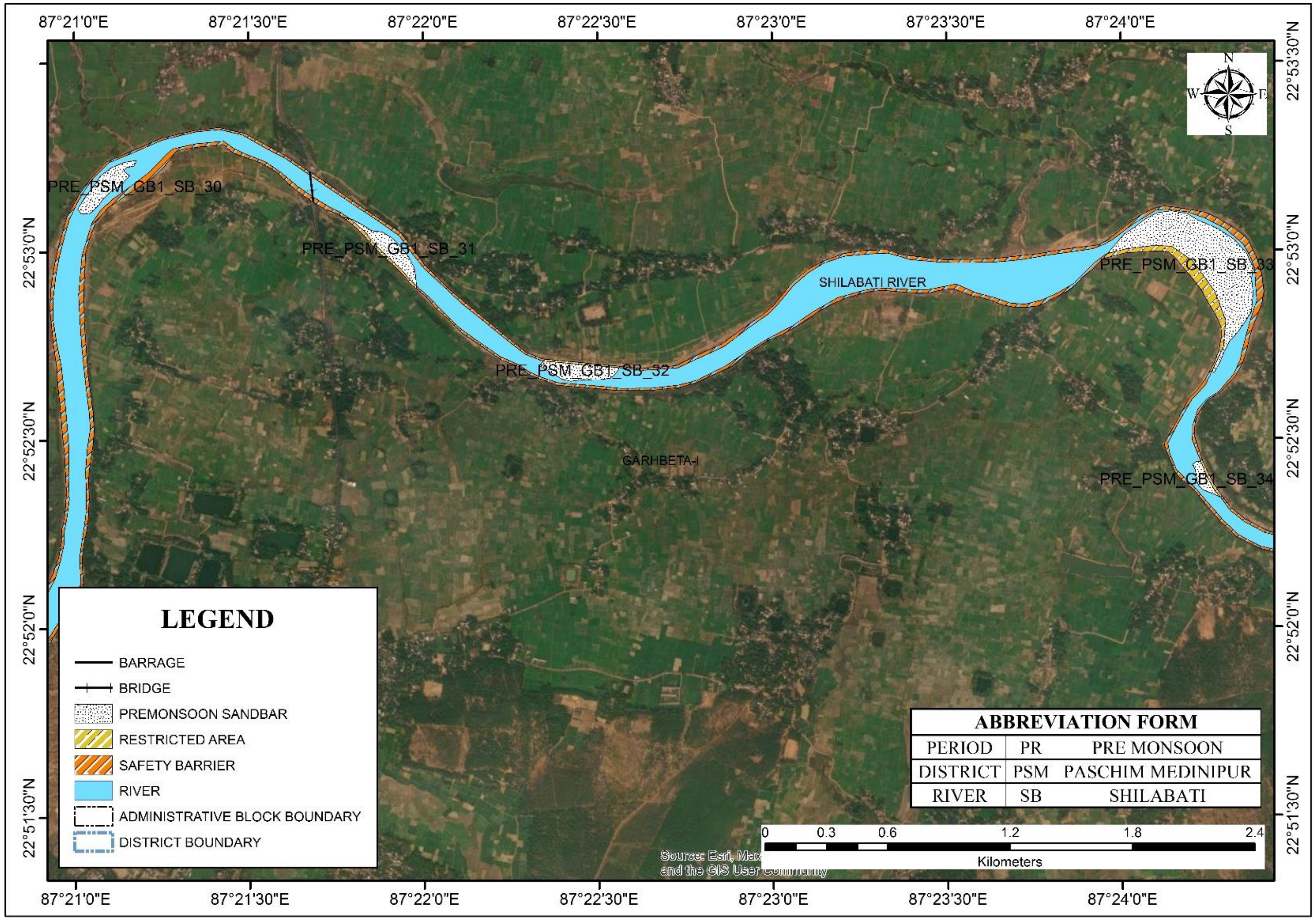


Plate 2A3: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

Plate 2A4: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

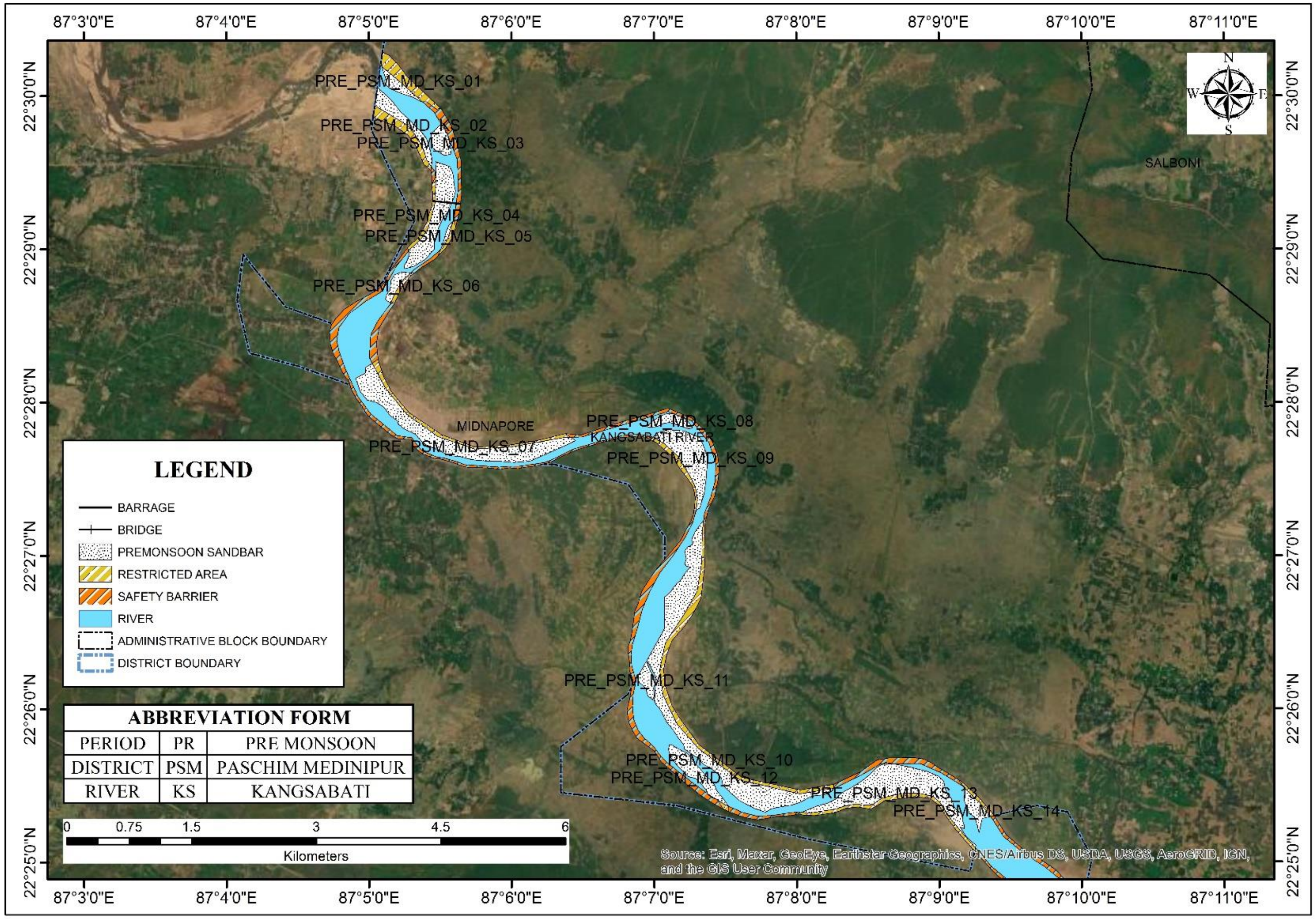


Plate 2A5: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

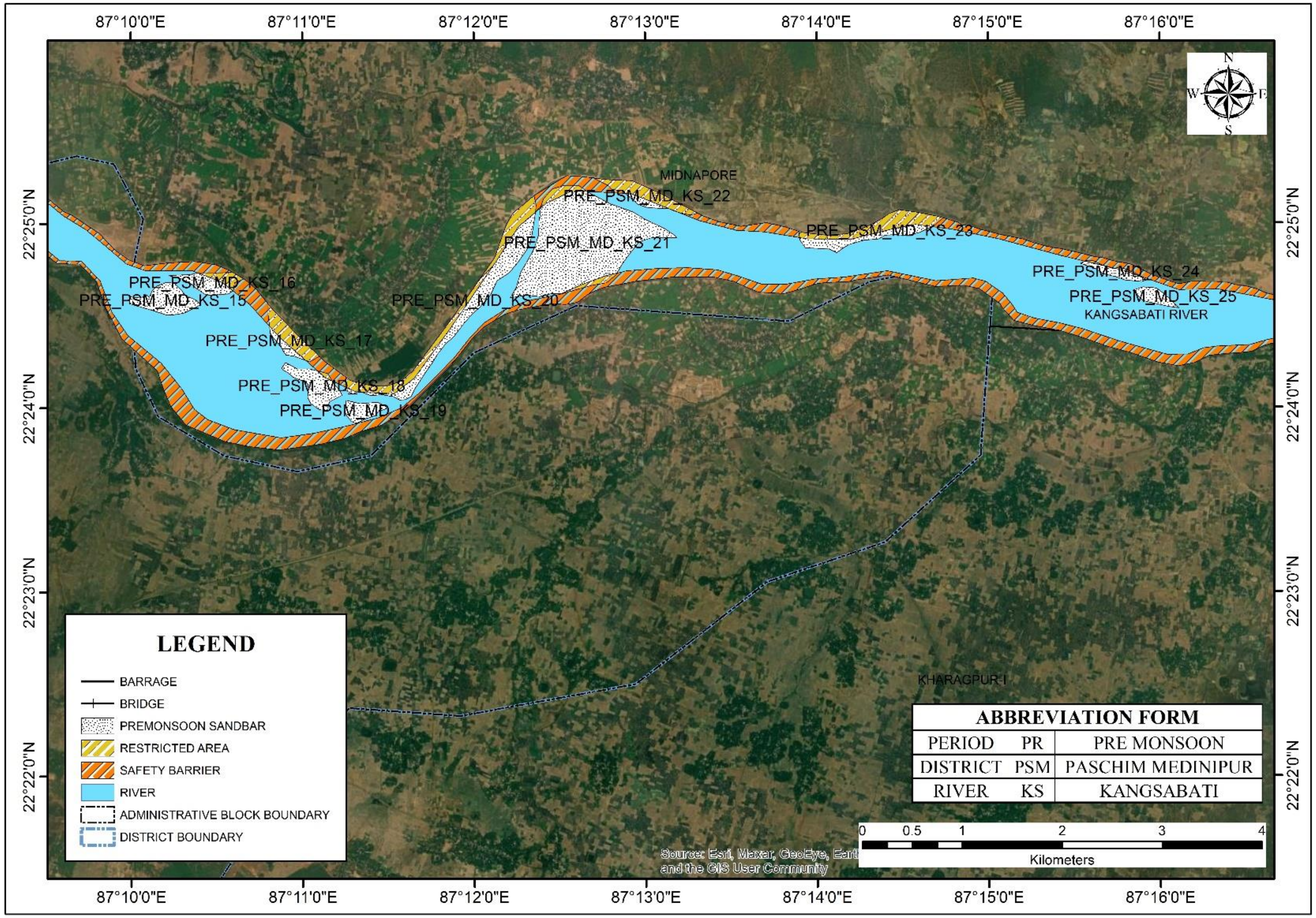


Plate 2A6: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

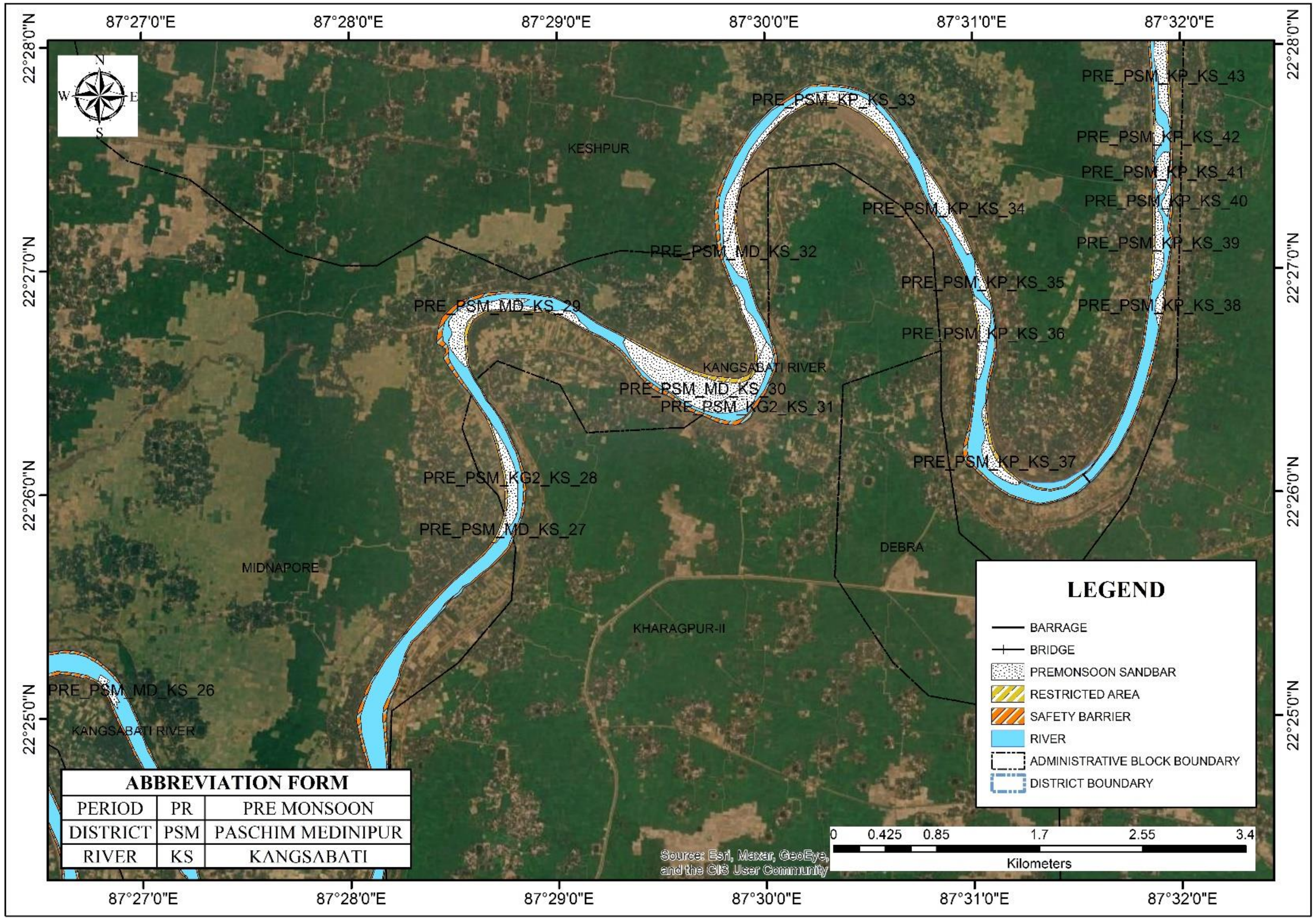


Plate 2A7: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

Plate 2A8: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

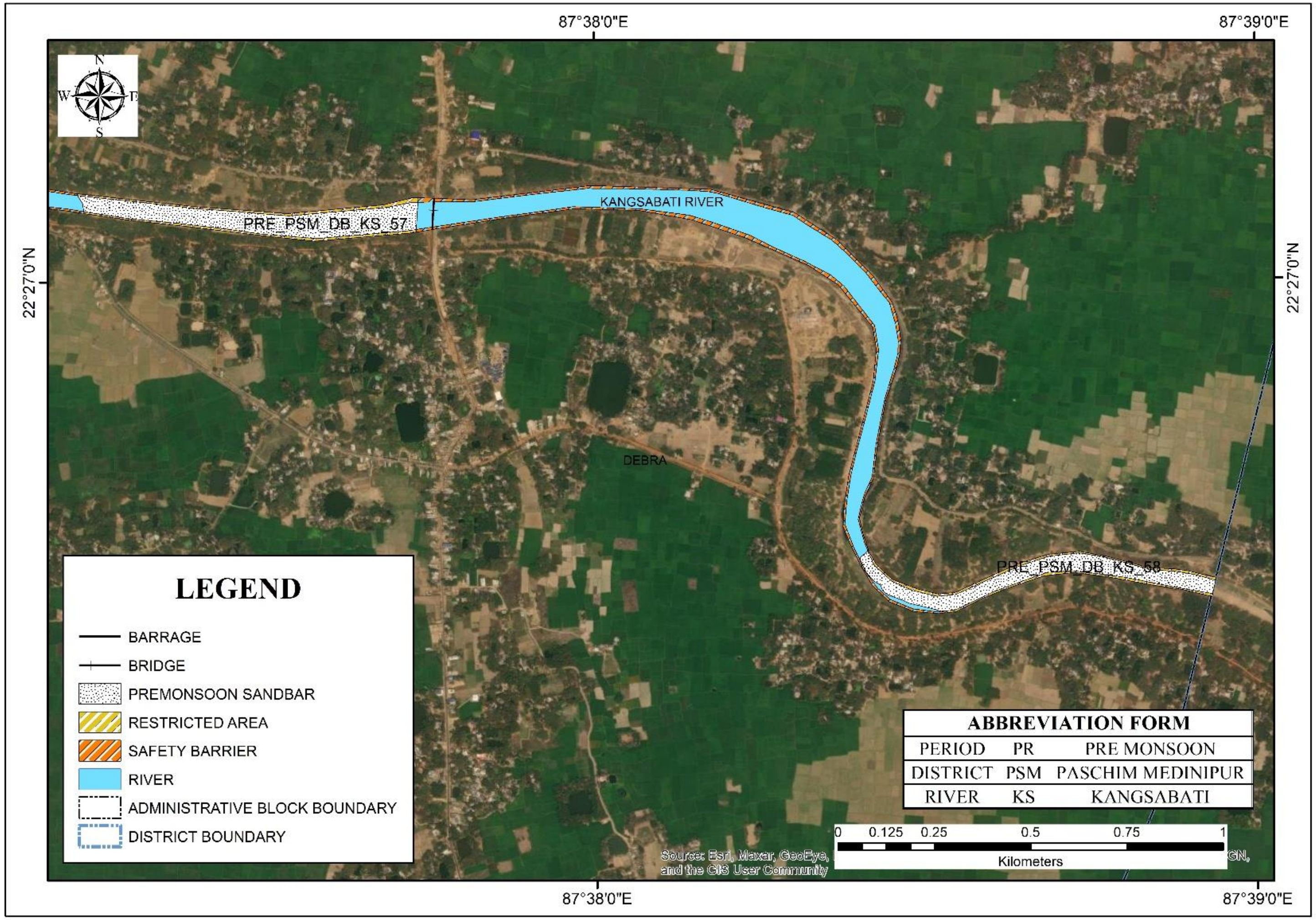


Plate 2A9: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

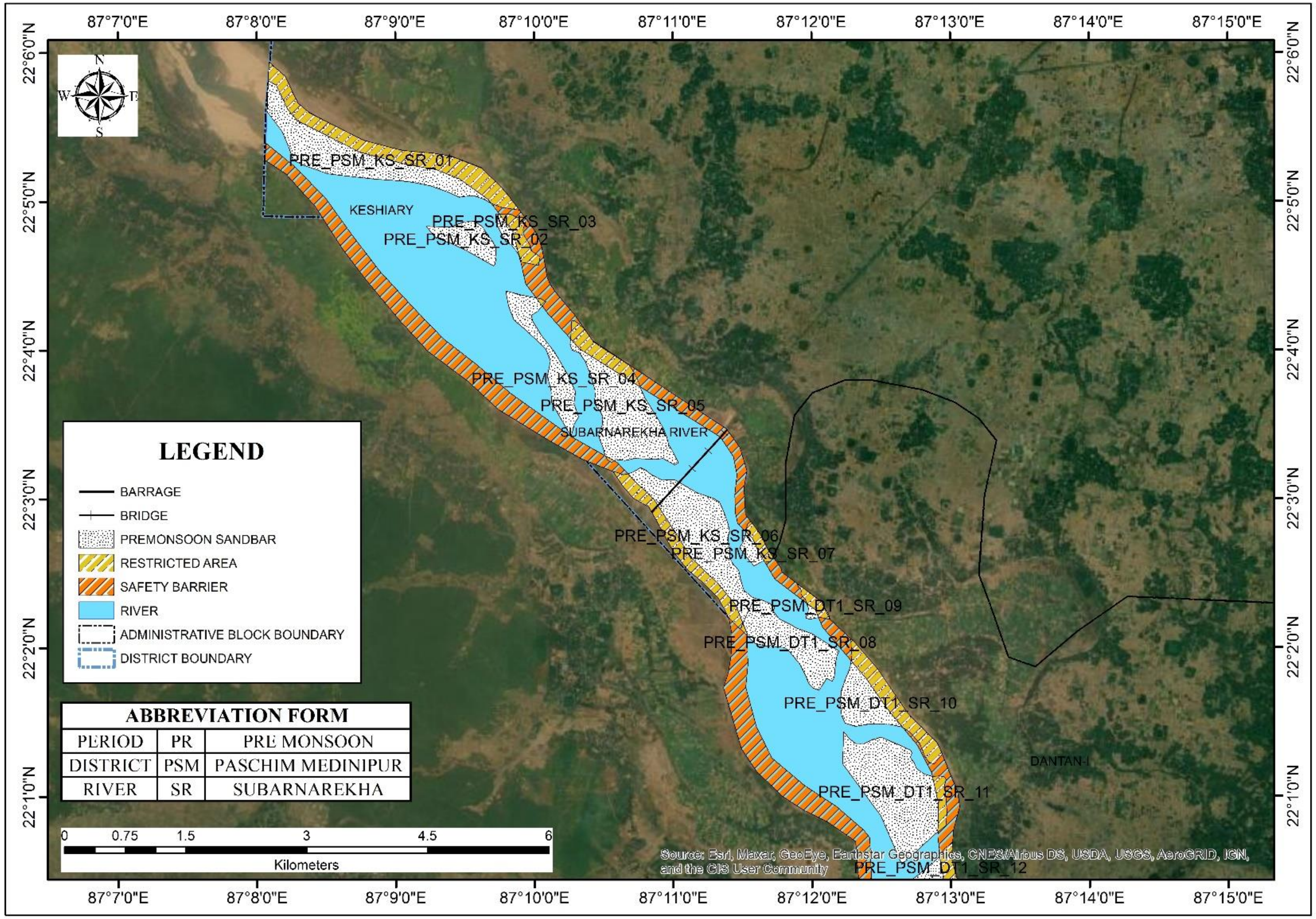


Plate 2A10: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

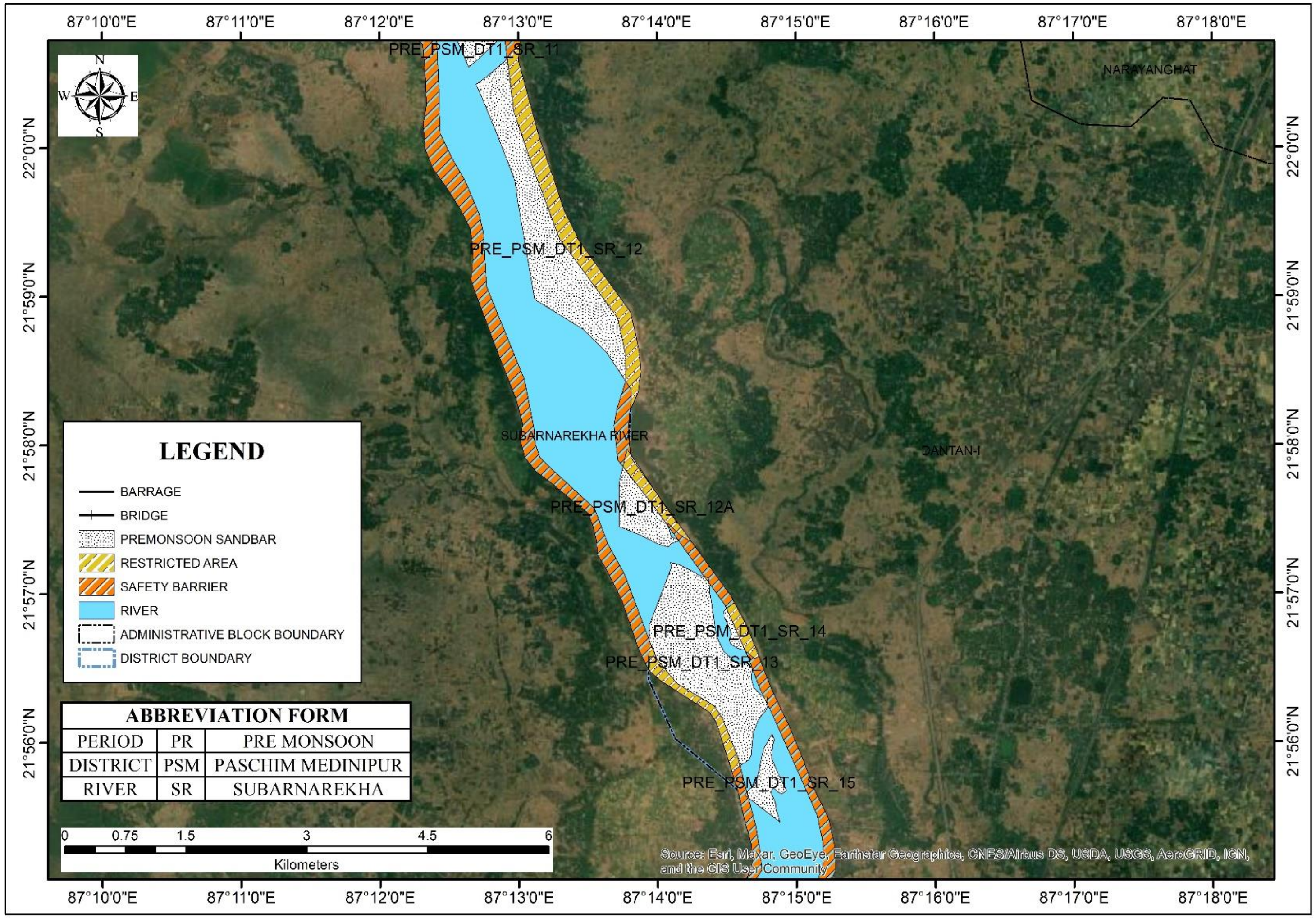


Plate 2A11: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

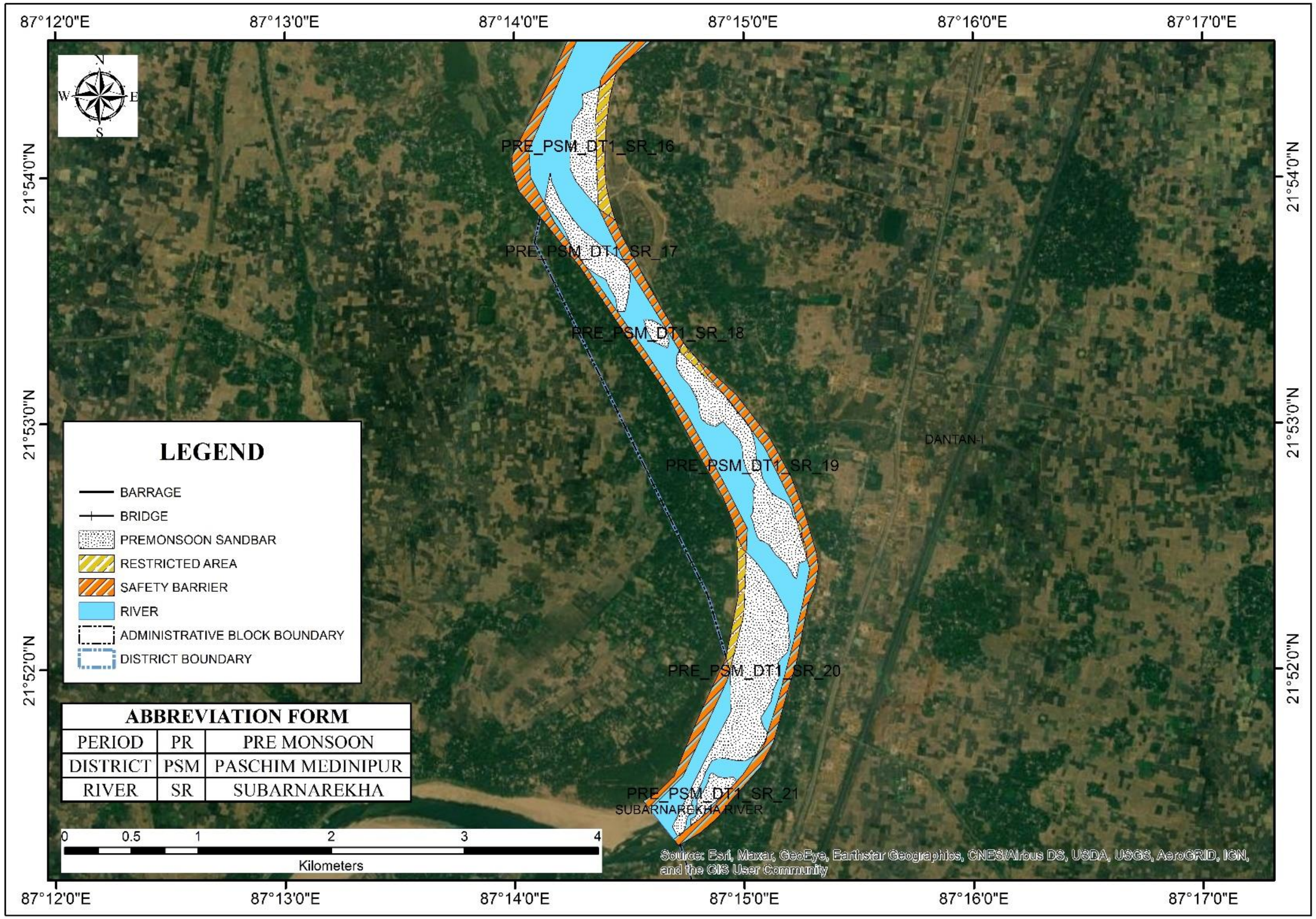


Plate 2A12: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

PLATE 2B

DISTRIBUTION MAP OF SAND BARS ON RIVERS DURING POST-MONSOON PERIOD

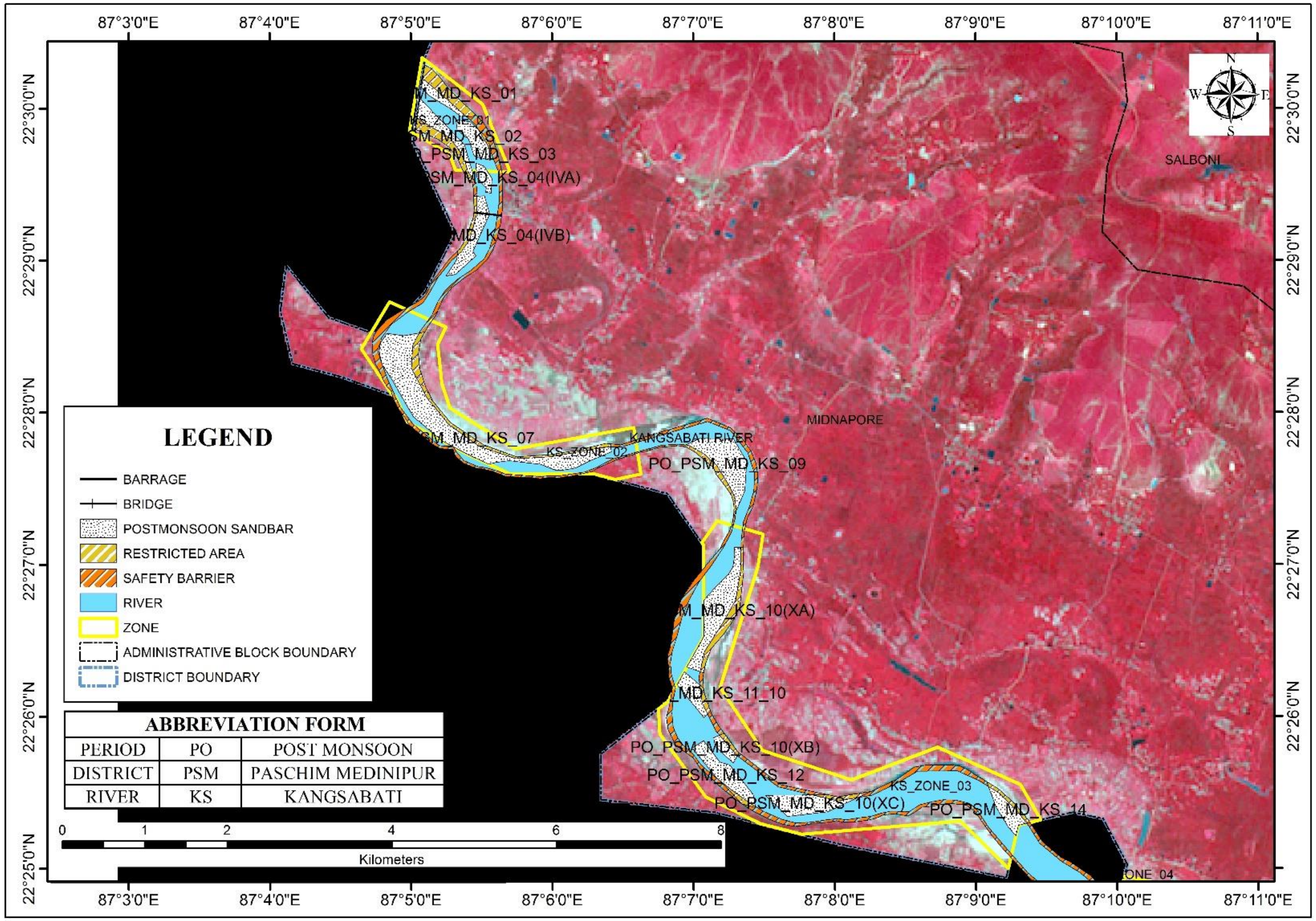


Plate 2B1: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

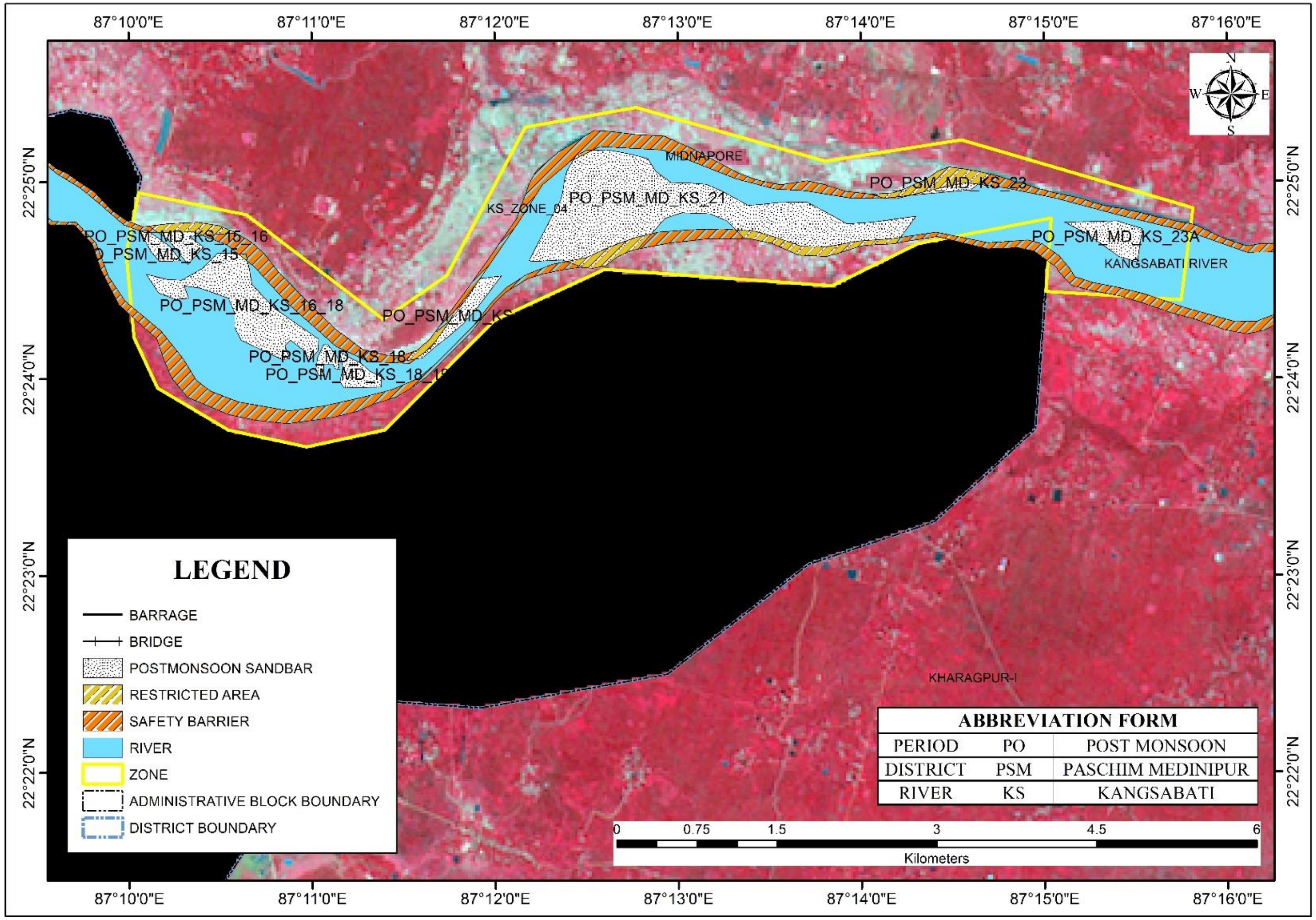


Plate 2B2: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

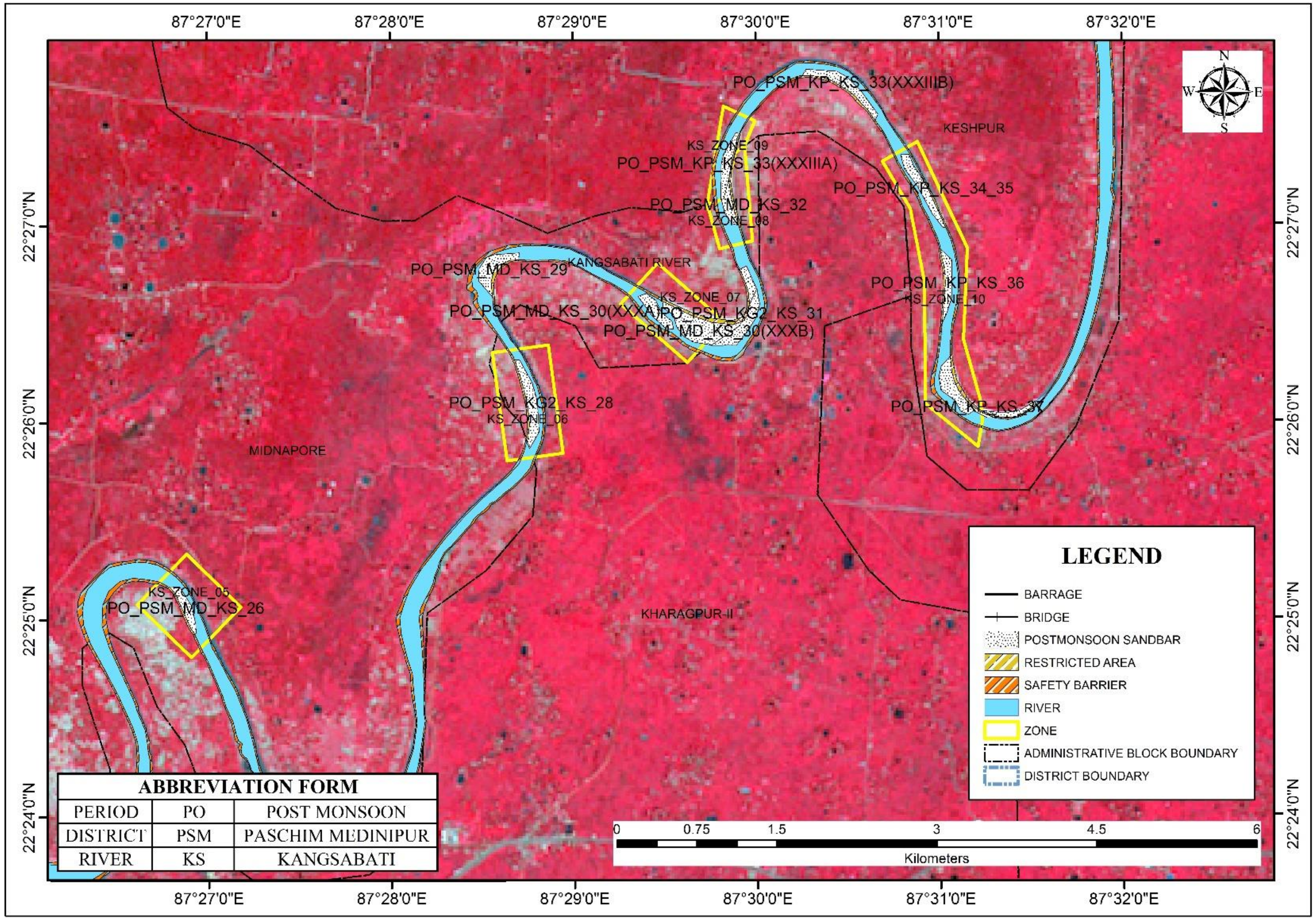


Plate 2B3: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

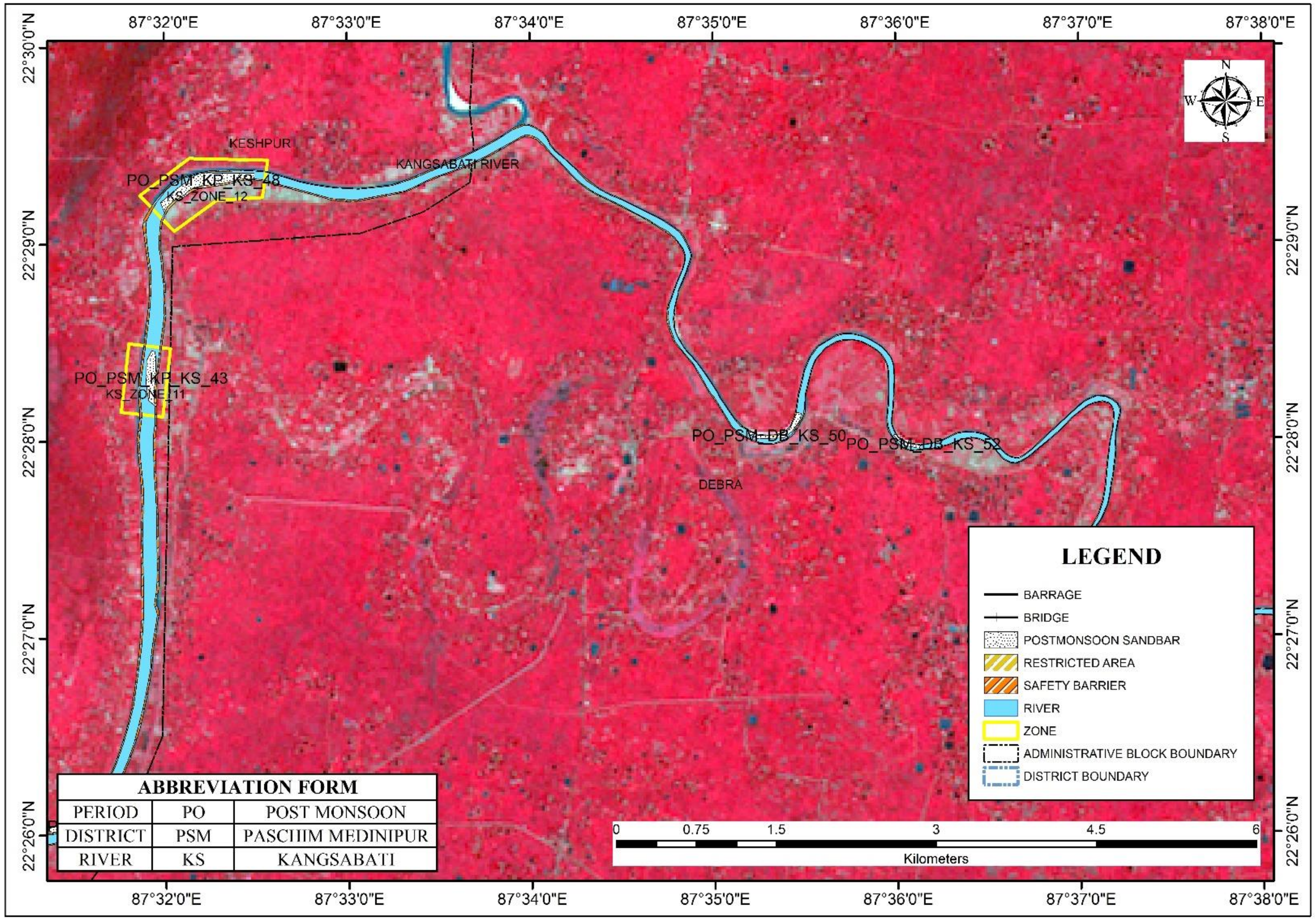


Plate 2B4: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

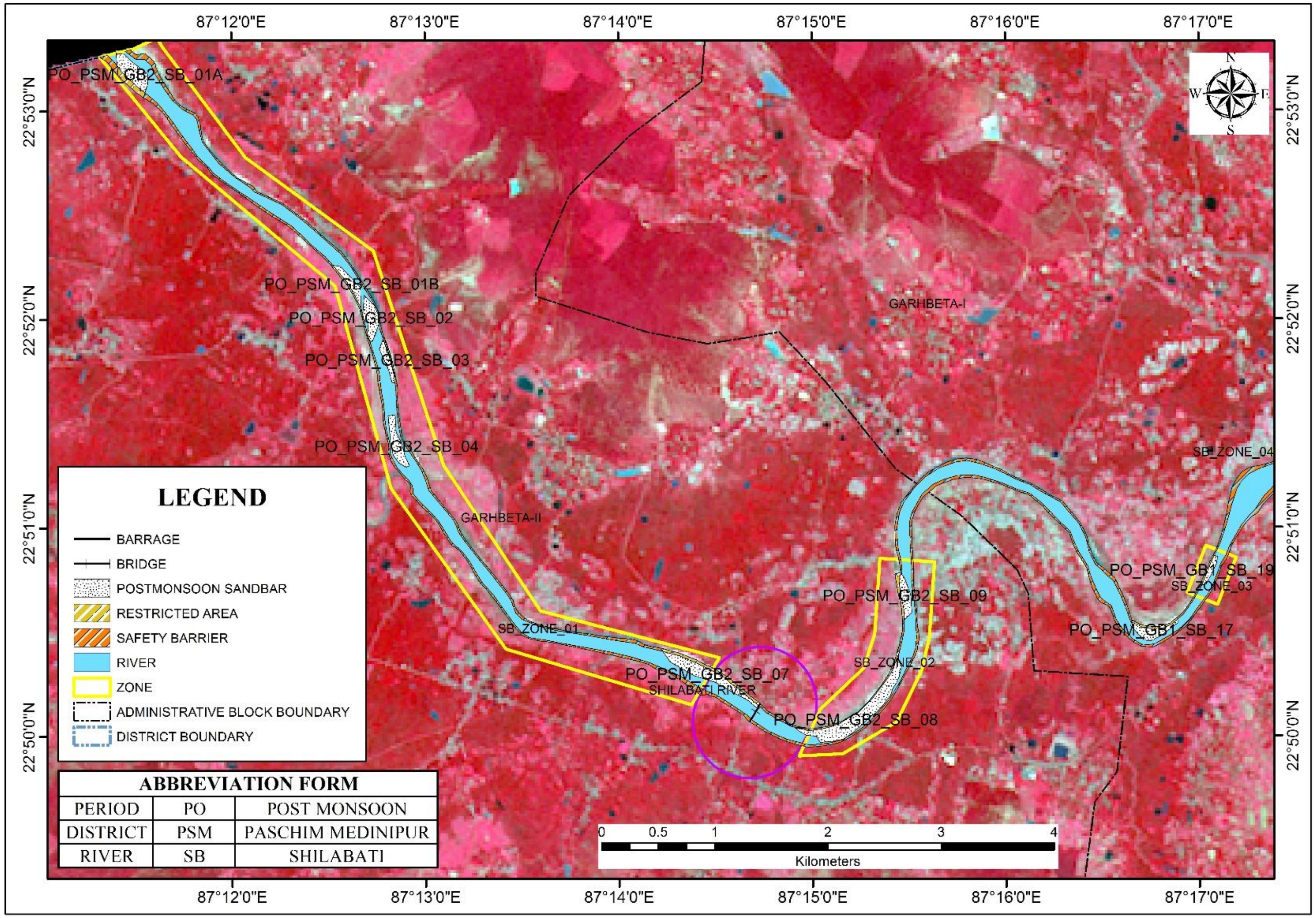


Plate 2B5: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

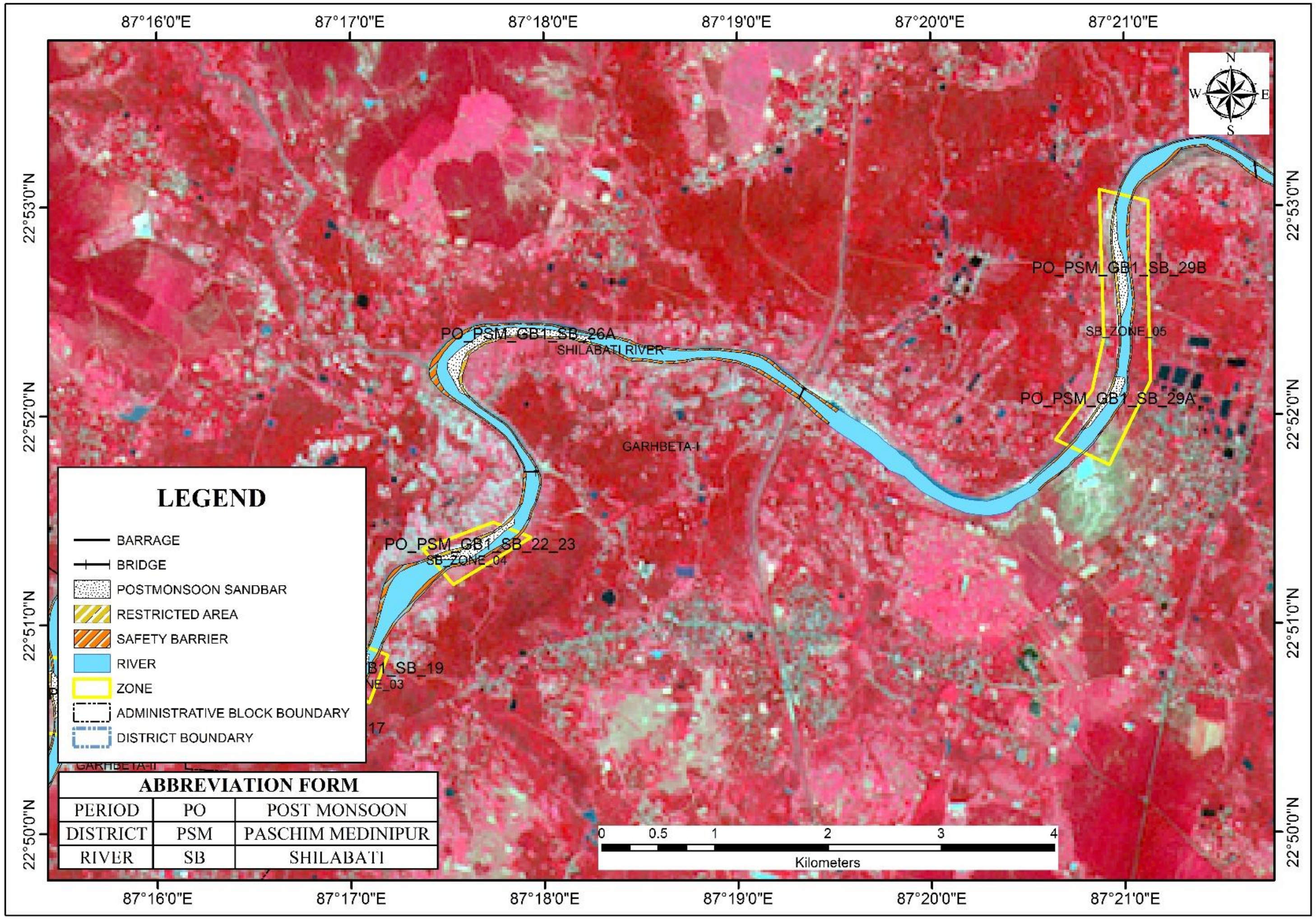


Plate 2B6: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

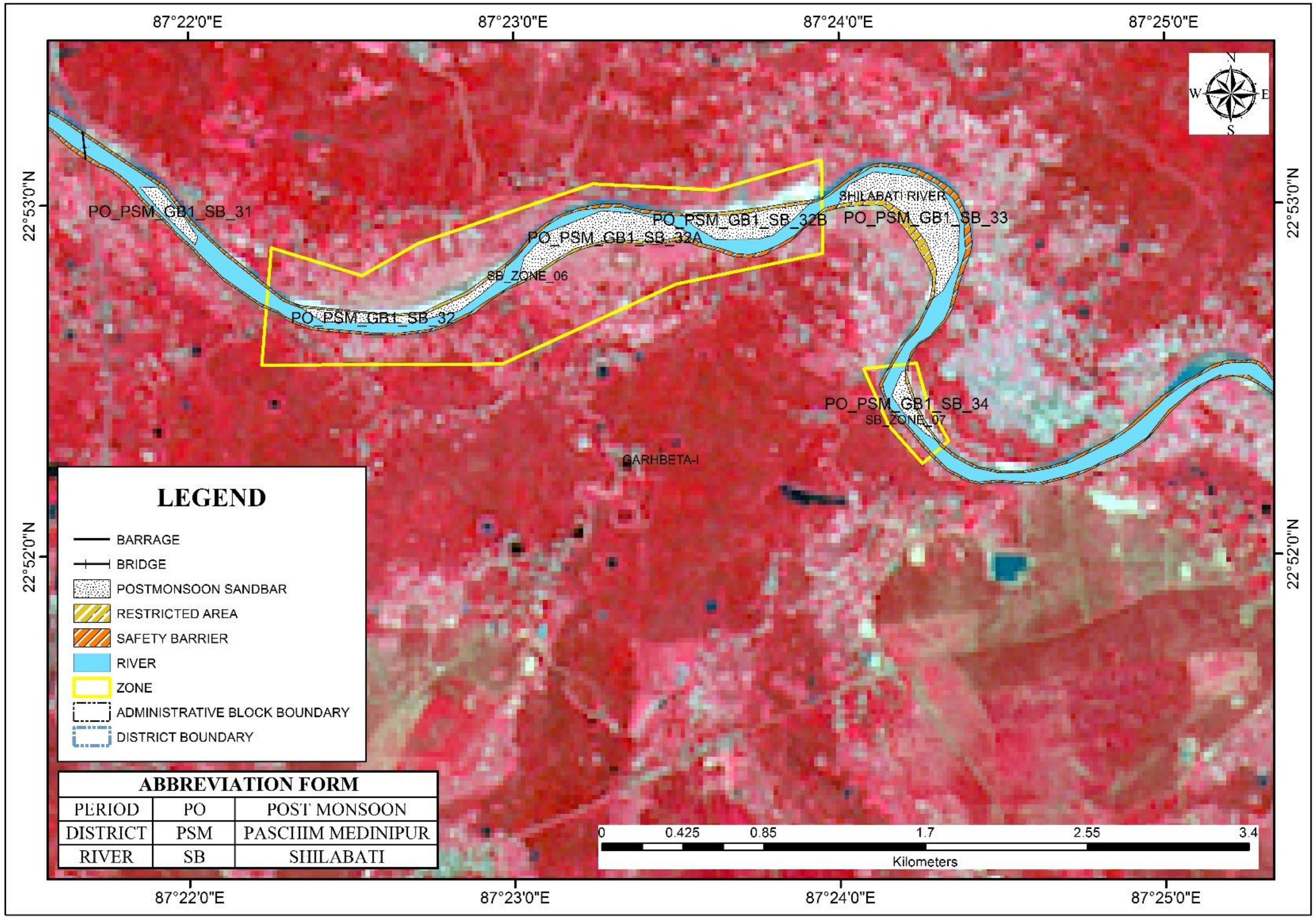


Plate 2B7: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

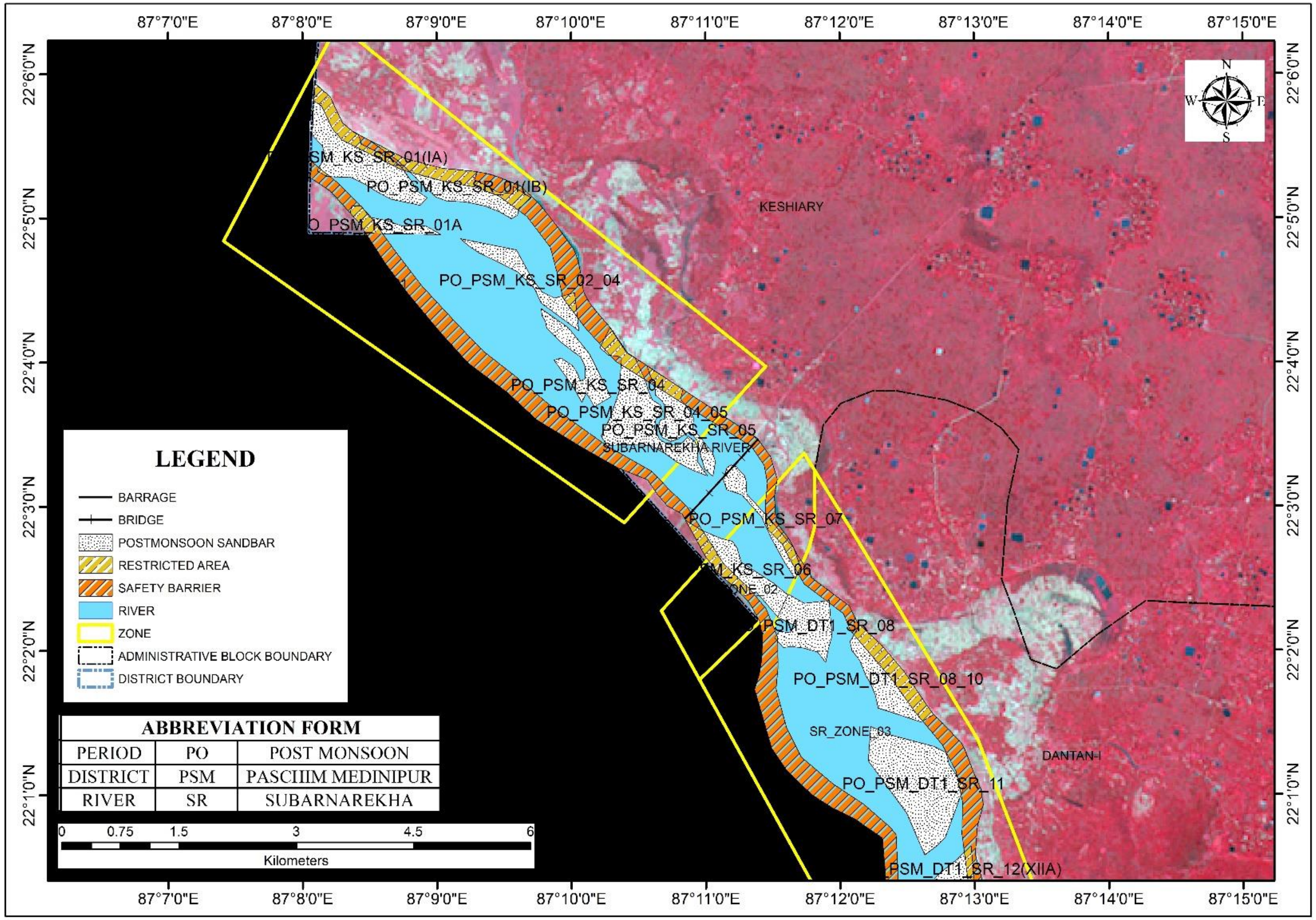


Plate 2B8: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

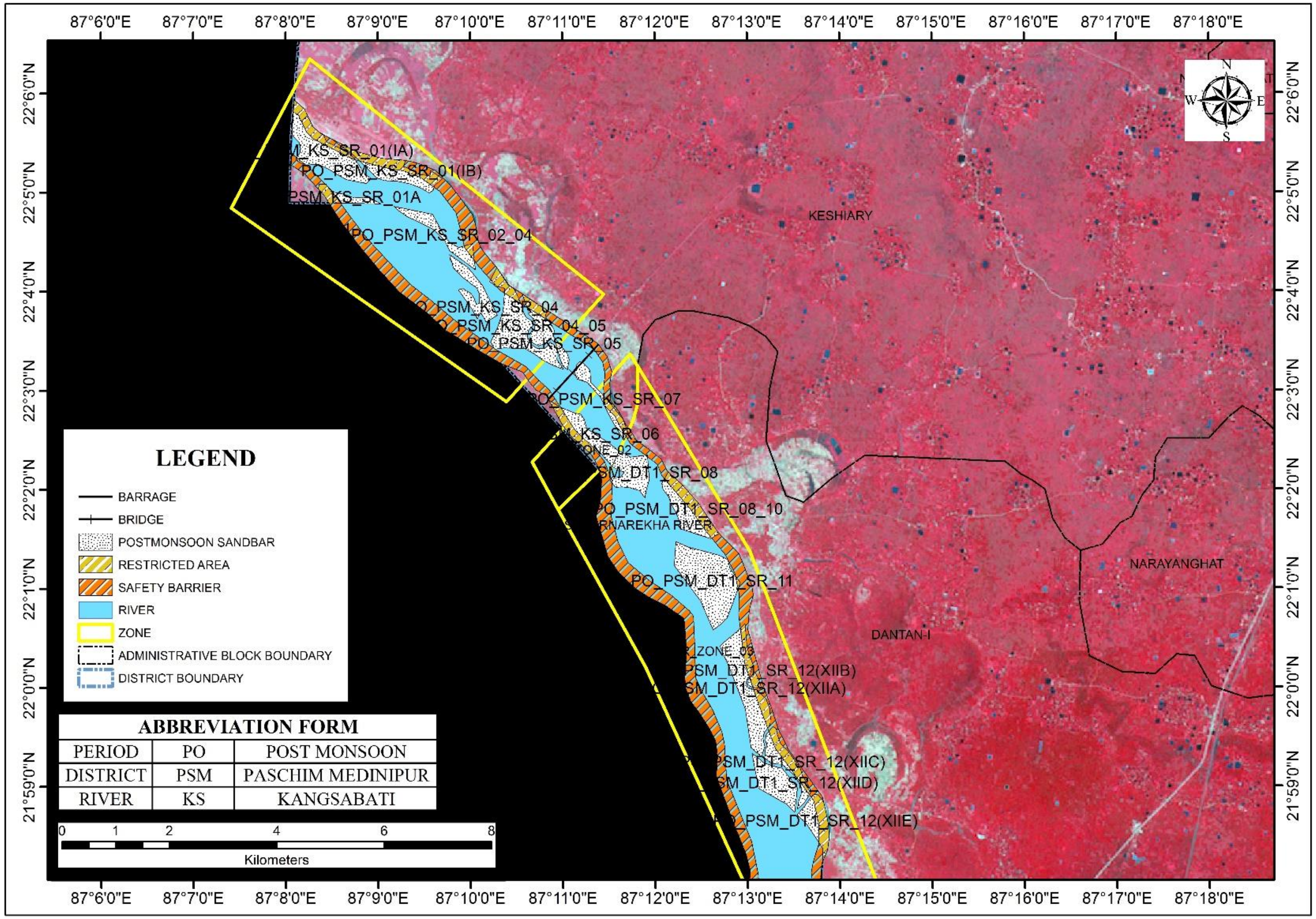


Plate 2B9: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

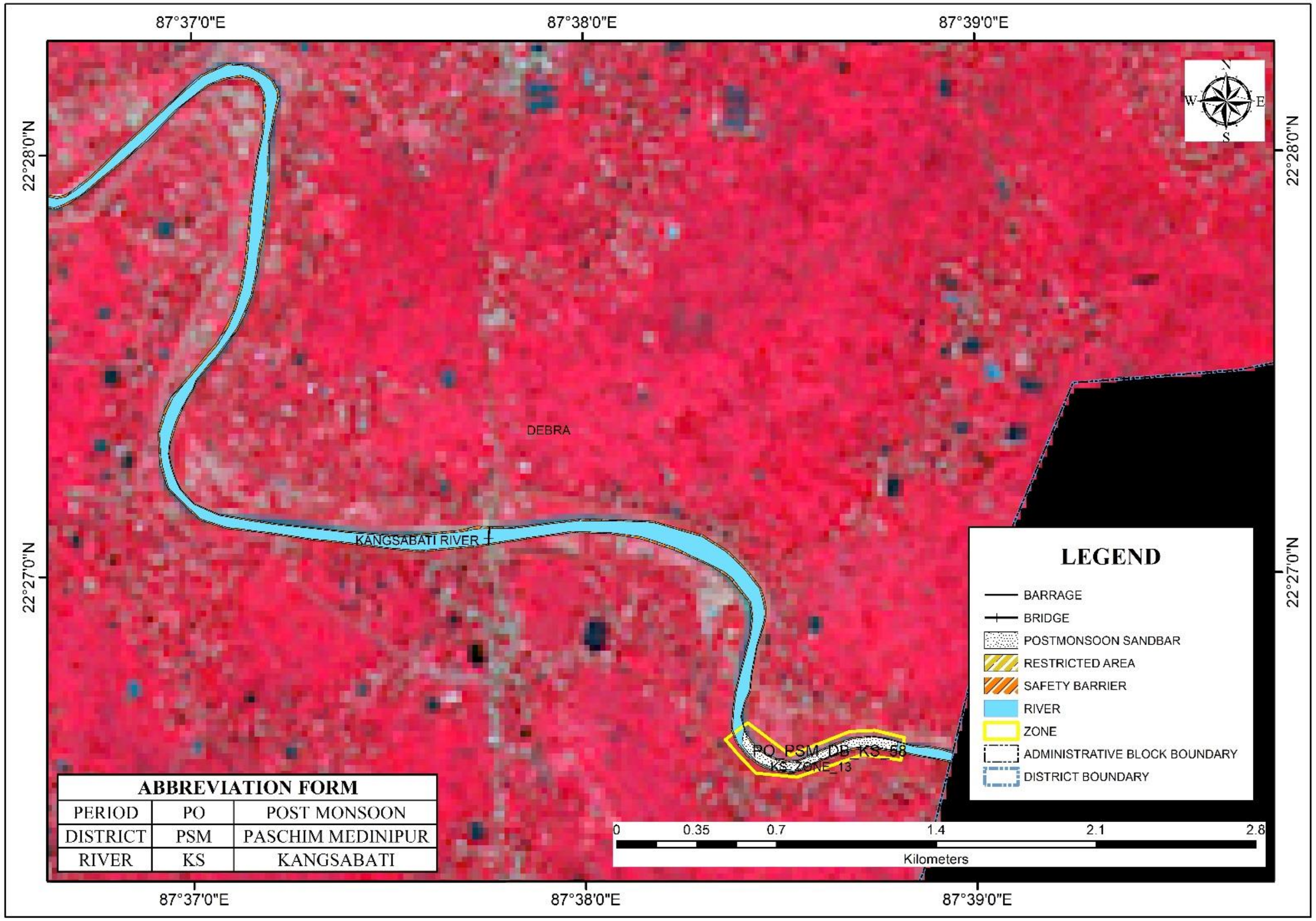


Plate 2B10: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

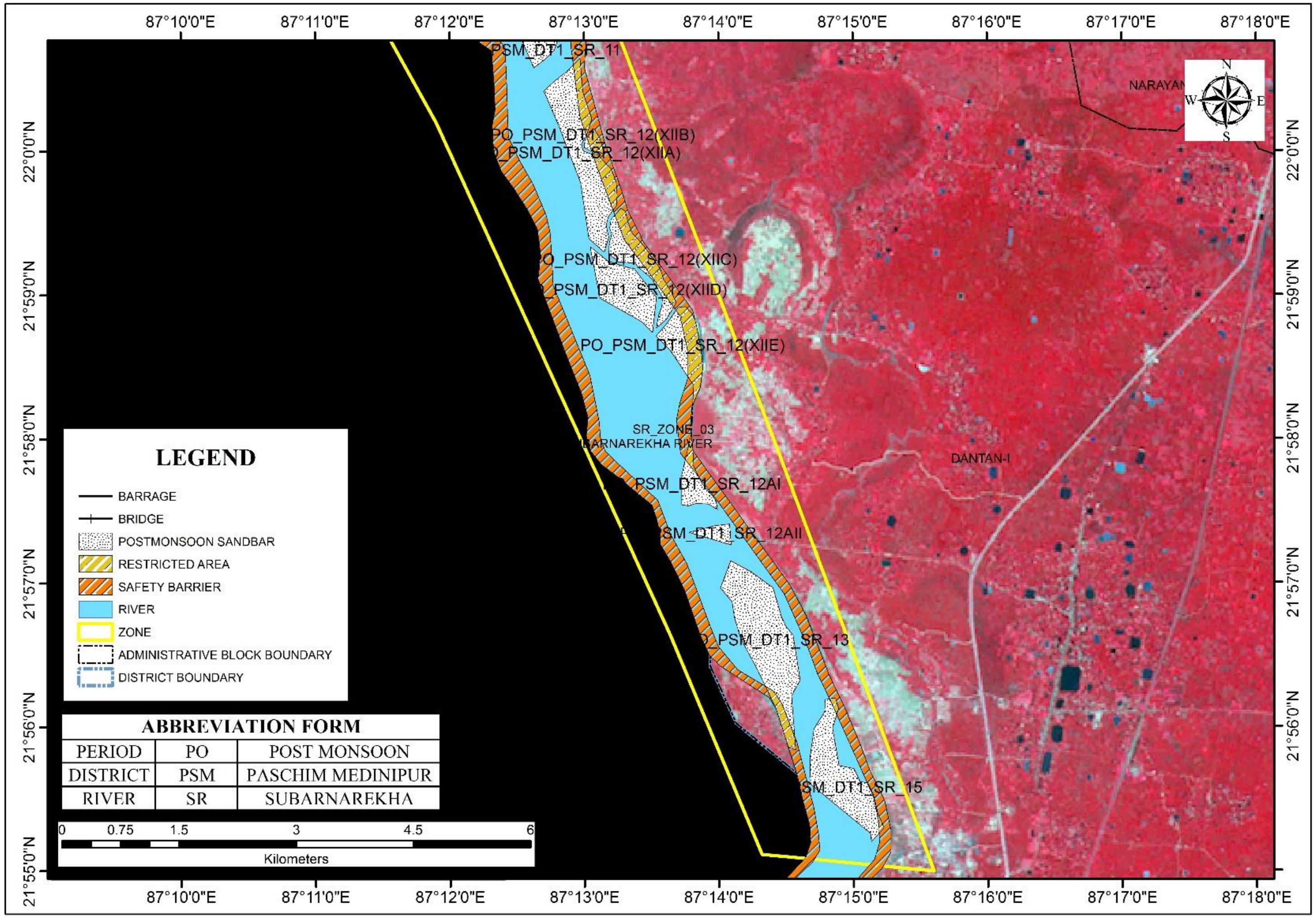


Plate 2B11: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

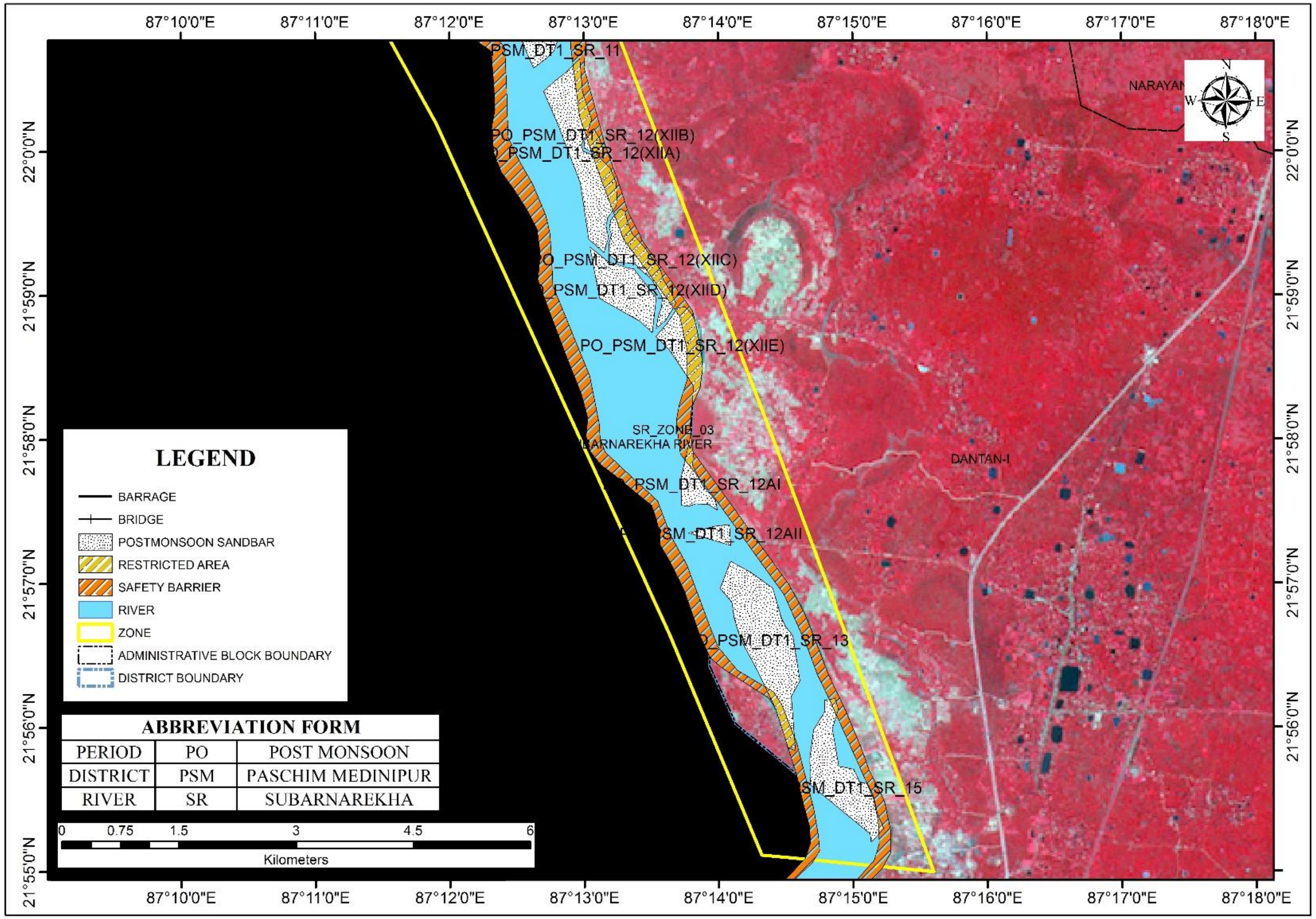
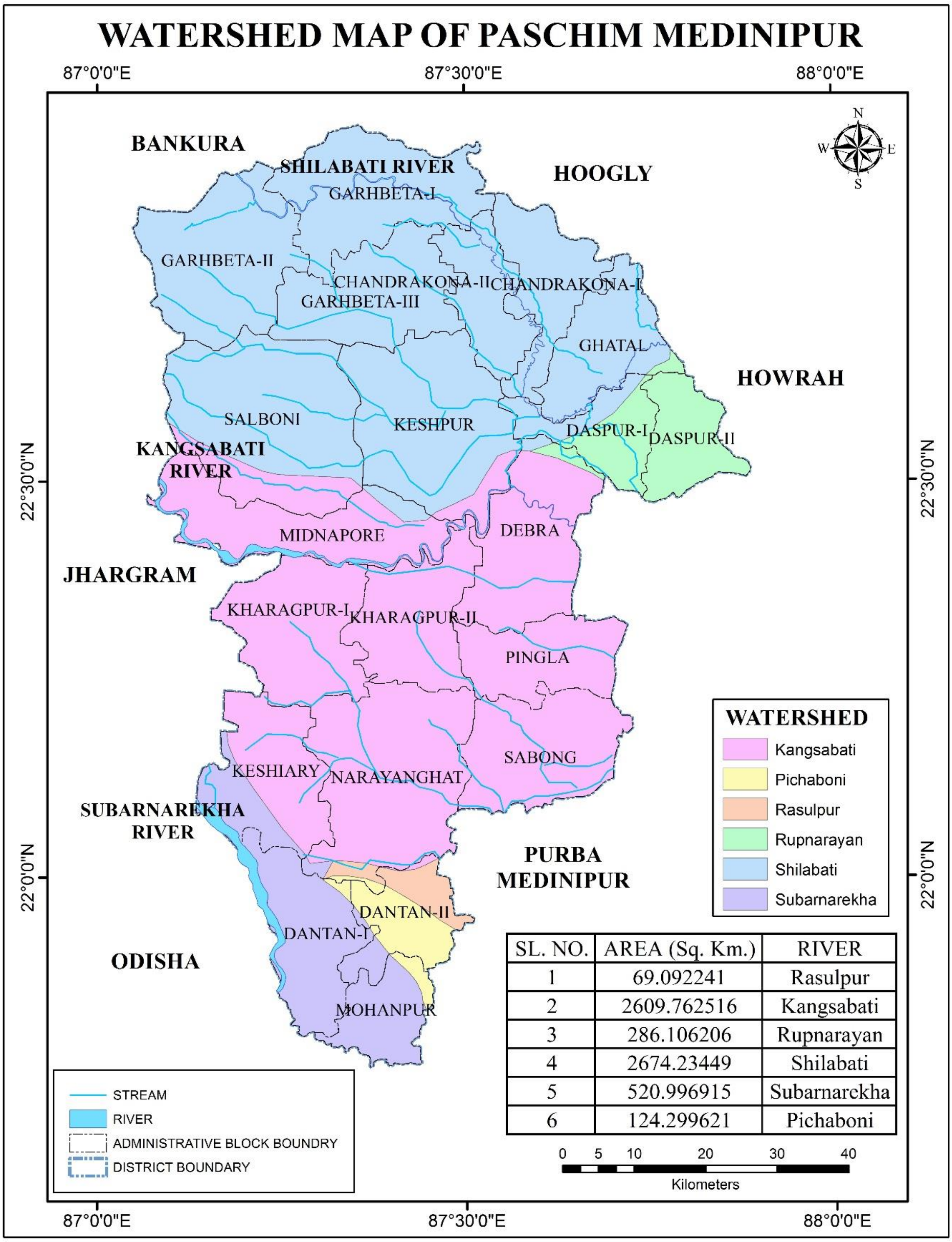


Plate 2B12: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Paschim Medinipur District

(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

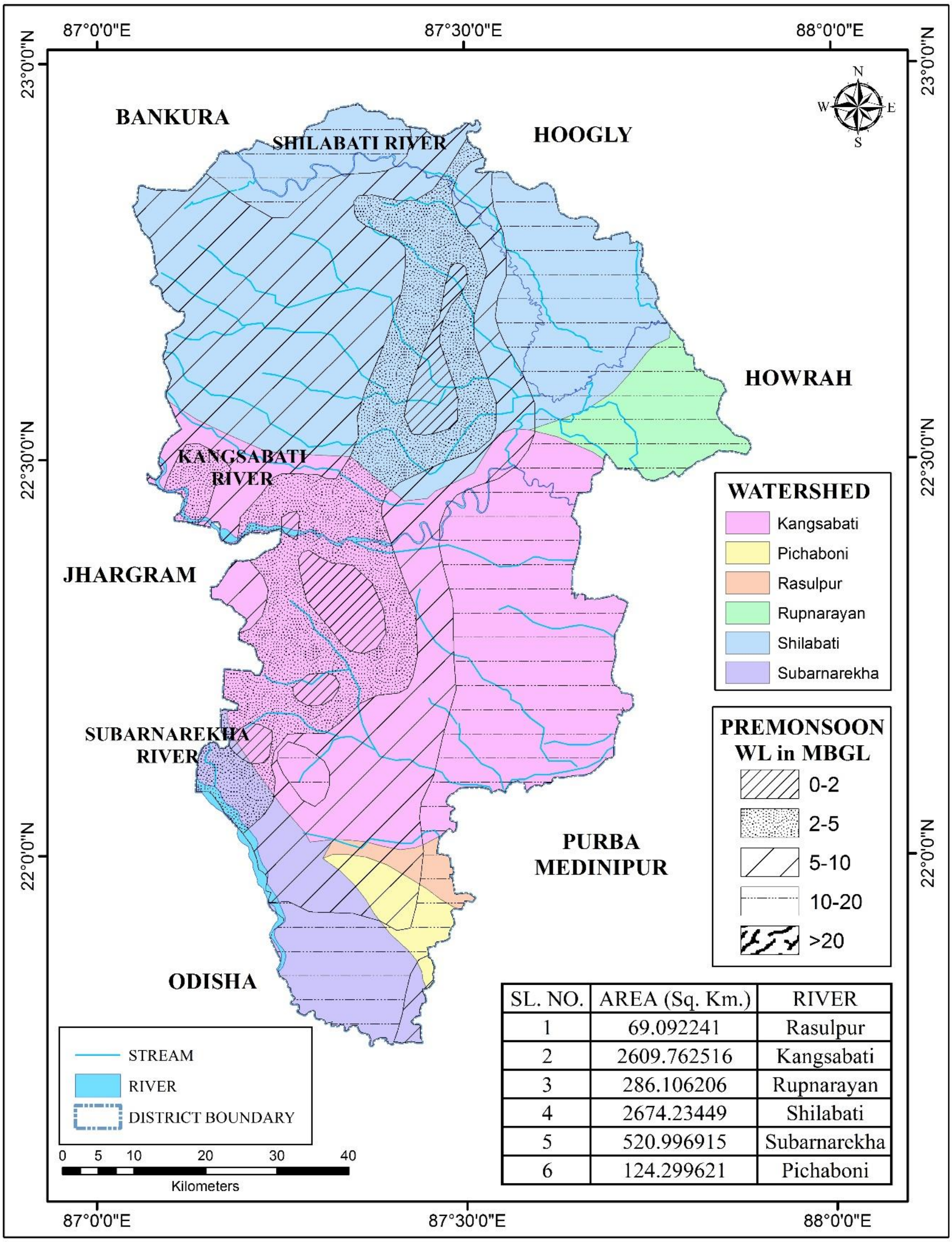
PLATE 3

WATERSHED MAP OF THE DISTRICT



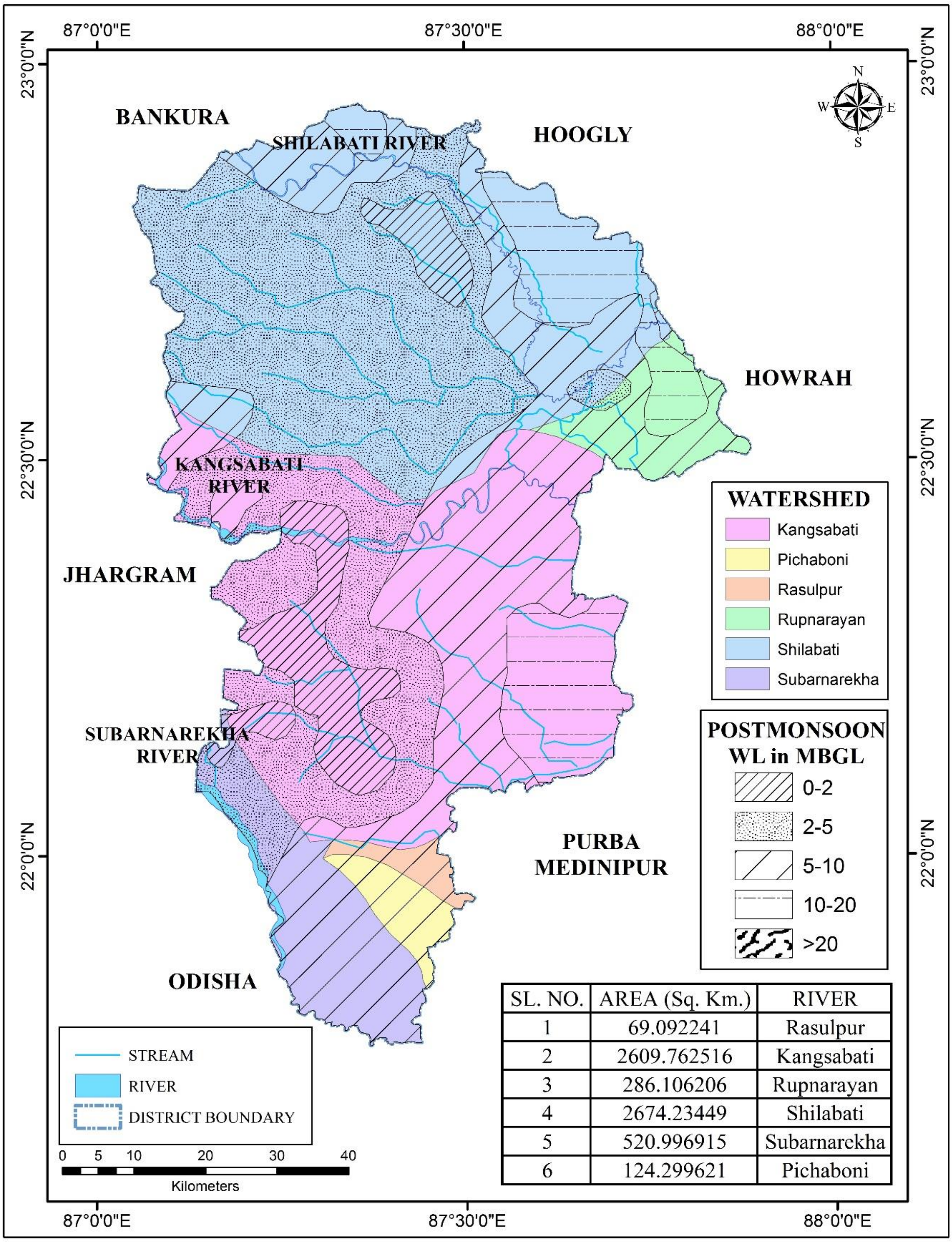
SL. NO.	AREA (Sq. Km.)	RIVER
1	69.092241	Rasulpur
2	2609.762516	Kangsabati
3	286.106206	Rupnarayan
4	2674.23449	Shilabati
5	520.996915	Subarnarekha
6	124.299621	Pichaboni

Plate 3A: Watershed Map of Paschim Medinipur District *(Source: World Wild Fund for Nature, September 2020)*



SL. NO.	AREA (Sq. Km.)	RIVER
1	69.092241	Rasulpur
2	2609.762516	Kangsabati
3	286.106206	Rupnarayan
4	2674.23449	Shilabati
5	520.996915	Subarnarekha
6	124.299621	Pichaboni

Plate 3B: District Watershed map showing ground water level during Post-monsoon period *(Source: World Wild Fund for Nature, September 2020)*



SL. NO.	AREA (Sq. Km.)	RIVER
1	69.092241	Rasulpur
2	2609.762516	Kangsabati
3	286.106206	Rupnarayan
4	2674.23449	Shilabati
5	520.996915	Subarnarekha
6	124.299621	Pichaboni

Plate 3C: District Watershed map showing ground water level during Post-monsoon period *(Source: World Wild Fund for Nature, September 2020)*

PLATE 4

FIELD SURVEY PHOTOGRAPHS

4A: Picture of Kangsabati Riverbed deposit (Date: 22-05-22, Lat: 22° 27' 42" N and Long: 87° 5' 59" E)

4B: Picture of Subarnarekha Riverbed deposit (Date: 22-05-22, Lat: 22° 2' 24" N and Long: 87° 11' 22" E)

PLATE 5

LONG TERM EROSION-ACCRETION MAP OF RIVER BANK

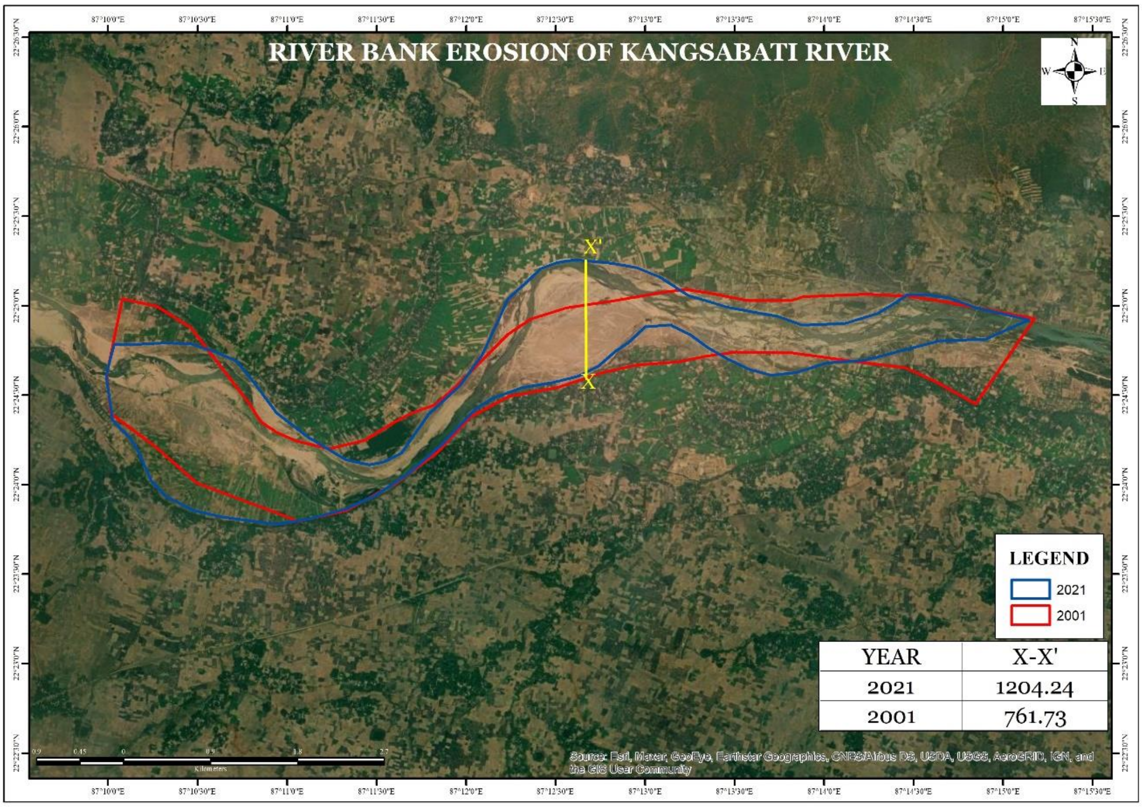


Plate 5: Map showing long-term (10-year or more) erosion-accretion areas on both the banks of Kangsabati River, Paschim Medinipur *(Source: ISRO RESOURCE Sat 2 LISS III Sensor)*

Annexure 1
Compliance as per Enforcement & Monitoring Guidelines for sand Mining, 2020 (MoEF& CC) for preparation of District Survey Report

Sl. No.	Particulars	Status
1	District Survey Report for sand mining shall be prepared before the auction/e-auction/grant of the mining lease/Letter of Intent (LoI) by Mining department or department dealing the mining activity in respective states.	Noted.
2	In order to make the inventory of River Bed Material, a detailed survey of the district needs to be carried out, to identify the source of River Bed Material and alternative source of sand (M-Sand). The source will include rivers, de-siltation of reservoir/dams, Patta lands/Khatedari Land, M-sand etc.	Complied with and explained in Chapter 7 pg no 58 to 85.
3	District Survey Report is to be prepared in such a way that it not only identifies the mineral-bearing area but also define the mining and no mining zones considering various environmental and social factors.	Complied with and furnished in pg no 83-84.
4	Identification of the source of Sand & M-Sand. The sources may be from Rivers, Lakes, Ponds, Dams, De-silting locations, Patta land/Khtedari lands. The details in case of Rivers such as [name, length of river, type (Perennial or Non-Perennial), Villages, Tehsil, District], in case of Lakes, Ponds, Dams, De-silting locations [Name, owned/maintained by (State Govt./PSU), area, Villages, Tehsil, District] in case of Patta land/Khtedari lands [Owner Name, Sy No, Area, Agricultural/Non-Agricultural, Villages, Tehsil, District], in case of M-Sand Plant [Owner Name, Sy No, Area, Quantity/Annum, Villages, Tehsil, District], needs to be recorded .	Complied with and given in table 7.4 pg 68.
5	Defining the sources of Sand/M-Sand in the district is the next step for identification of the potential area of deposition/aggradation wherein mining lease could be granted. Detailed survey needs to be carried out for quantification of minerals. The purpose of mining in the river bed is for channelization of rivers so as to avoid the possibility of flooding and to maintain the flow of the rivers. For this, the entire river stretch needs to be surveyed and original ground level (OGL) to be recorded and area of aggradation/deposition needs to be ascertained by comparing the level difference between the outside riverbed OGL and water level. Once the area of aggradation/deposition is identified, then the quantity of River Bed Material available needs to be calculated. The next step is channelization of the river bed and for this central ¾ th part of the river, width needs to be identified on a map. Out of the ¾ th part area, where there is a deposition/aggradation of the material needs to be identified. The remaining ¼ th area needs to be kept as no mining zone for the protection of banks. The specific gravity of the material also needs to be ascertained by analyzing the sample from a NABL accredited lab. Thus, the quantity of material available in metric ton needs to be calculated for mining and no mining zone.	Complied with and given in table 7.15 pg 82 to 83.

Sl. No.	Particulars	Status
6	The permanent boundary pillars need to be erected after identification of an area of aggradation and deposition outside the bank of the river at a safe location for future surveying. The distance between boundary pillars on each side of the bank shall not be more than 100 meters.	Benchmark pillars are established in strategic locations while boundary pillars will be fixed while fixation of the mining lease boundary subsequent to district level verification.
7	Identifying the mining and no mining zone shall follow with defining the area of sensitivity by ascertaining the distance of the mining area from the protected area, forest, bridges, important structures, habitation etc. and based on the sensitivity the area needs to be defined in sensitive and non-sensitive area.	Complied with and furnished in pg no 83 to 84.
8	Demand and supply of the Riverbed Material through market survey needs to be carried out. In addition to this future demand for the next 5 years also needs to be considered.	Complied with and given in pg no 10-11.
9	It is suggested that as far as possible the sensitive areas should be avoided for mining, unless local safety condition arises. Such deviation shall be temporary & shall not be a permanent feature.	Complied with and furnished in pg no 82 to 83.
10	Sand and gravel could be extracted from the downstream of the sand bar at river bends. Retaining the upstream one to two-thirds of the bar and riparian vegetation is accepted as a method to promote channel stability.	Noted. The DSR is composing of all the potential sand zones for defining the resources. In a subsequent phase blocking of potential zones shall be done in due consultation with the district level committee. The areas mentioned in the observation points shall be excluded while blocking of sand mining leases which are part of these potential zones marked in this DSR.
11	The final area selected for the mining should be then divided into mining lease as per the requirement of State Government. It is suggested the mining lease area should be so selected as to cover the entire deposition area. Dividing a large area of deposition/aggradation into smaller mining leases should be avoided as it leads to loss of mineral and indirectly promote illegal mining.	Shall be Complied with.
12	Cluster situation shall be examined. A cluster is formed when one mining lease of homogenous mineral is within 500 meters of the other mining lease. In order to reduce the cluster formation mining lease size should be defined in such a way that distance between any two clusters preferably should not be less than 2.5 Km. Mining lease should be defined in such a way that the total area of the mining leases in a cluster should not be more than 10 Ha.	Noted. Due care will be taken while distribution of mining leases either to prevent cluster situation or keeping the prescribed distance in-between two mining clusters.
13	The number of a contiguous cluster needs to be ascertained. Contiguous cluster is formed when one cluster is at a distance of 2.5 Km from the other cluster.	Noted and shall be complied with.

Sl. No.	Particulars	Status
14	The mining outside the riverbed on Patta land/Khatedari land be granted when there is possibility of replenishment of material. In case, there is no replenishment then mining lease shall only be granted when there is no riverbed mining possibility within 5 KM of the Patta land/Khatedari land. For government projects, mining could be allowed on Patta land/Khatedari land but the mining should only be done by the Government agency and material should not be used for sale in the open market. Cluster situation as mentioned in para k above is also applicable for the mining in Patta land/Khatedari land.	Noted.
15	The State Government should define the transportation route from the mining lease considering the maximum production from the mines as at this stage the size of mining leases, their location, the quantity of mineral that can be mined safely etc. is available with the State Government. It is suggested that the transportation route should be selected in such a way that the movement of trucks/tippers/tractors from the villages having habitation should be avoided. The transportation route so selected should be verified by the State Government for its carrying capacity.	Noted and final transport route will be submitted during preparation of mine plan.
16	Potential site for mining having its impact on the forest, protected area, habitation, bridges etc, shall be avoided. For this, a sub-divisional committee may be formed which after the site visit shall decide its suitability for mining.	Shall be Complied with.
17	Public consultation-The Comments of the various stakeholders may be sought on the list of mining lease to be auctioned. The State Government shall give an advertisement in the local and national newspaper for seeking comments of the general public on the list of mining lease included in the DSR. The DSR should be placed in the public domain for at least one month from the date of publication of the advertisement for obtaining comments of the general public. The comments so received shall be placed before the sub-divisional committee for active consideration. The final list of sand mining areas [leases to be granted on riverbed &Patta land/Khatedari land, de-siltation location (ponds/lakes/dams), M-Sand Plants (alternate source of sand)] after the public hearing needs to be defined in the final DSR.	After publication of the West Bengal Sand Mining Policy, 2021, it is now eminent that State owned The West Bengal Mineral Development and Trading Corporation Limited (WBMDTCL) shall be responsible for mining of sand/ gravel/ river bed materials in whole state of West Bengal. However, the existing mining leases which were in effect before hand of this Gazzate notification July 2021 will be in operation till the year 2027-28. In order to have the rational distribution of mining leases as per the prevailing norms and guidelines grant of mining leases in the state of West Bengal shall be carried out in phases till all the blocks are under the ambit of WBMDTCL. This DSR thus consist of the identified potential sand deposite areas within which the existing and future mining leases shall occur. The details of the mining leases as and when granted shall follow the procedure described in EMGSM 2020 and prevailing norms.
18	The LOI should not be granted for mining area falling on both riverbed and outside riverbed. Therefore, in the same lease, both types of area should not be included.	Shall be Complied with.

Annexure 2

Estimation of Sand Resources based on sediment load comparison between Pre and Post Monsoon period

Abbreviation used in the table as below

ABBREVIATION FORM		
PERIOD	PR	PRE MONSOON
	PO	POST MONSOON
BLOCK	KS	KESHIARY
	DT1	DANTAN 1
	MD	MIDNAPORE
	GB1	GARHBETA 1
	GB2	GARHBETA 2
	DB	DEBRA
	KP	KESHPUR
	KG2	KHARAGPUR 2
RIVER	SR	SUBARNAREKHA
	KS	KANGSABATI
	SB	SHILABATI

Pre monsoon						Post monsoon					
S L No	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes s in m.**	**Sand Volume in M. Cum**	**S L No**	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes s in m.**	**Sand Volum e in M. Cum**
Estimation of Sand Resources in Pre monsoon period & Post monsoon period of Kangsabati River											
1	PRE_PSM_MD_KS_01	38	144421.004	2	0.29	1	PO_PSM_MD_KS_01	38.50	144499.7369	2.50	0.36
2	PRE_PSM_MD_KS_02	40	187982.3602	2	0.38	2	PO_PSM_MD_KS_02	40.50	191148.5883	2.50	0.48
3	PRE_PSM_MD_KS_03	38	61576.72031	2	0.12	3	PO_PSM_MD_KS_03	38.50	102436.8858	2.50	0.26
4	PRE_PSM_MD_KS_04	39	276538.4125	2	0.55	4	PO_PSM_MD_KS_04(IVA)	39.50	39976.13842	2.50	0.10
							PO_PSM_MD_KS_04(IVB)		158105.058	2.50	0.40
5	PRE_PSM_MD_KS_05	37	27408.86946	2	0.05		PO_PSM_MD_KS_05				
6	PRE_PSM_MD_KS_06	36	55313.54815	2	0.11		PO_PSM_MD_KS_06				
7	PRE_PSM_MD_KS_07	36	591270.4783	2	1.18	5	PO_PSM_MD_KS_07	36.50	819340.5681	2.50	2.05
8	PRE_PSM_MD_KS_08	35	50014.80097	2	0.10		PO_PSM_MD_KS_08				
9	PRE_PSM_MD_KS_09	35	284912.9559	2	0.57	6	PO_PSM_MD_KS_09	35.50	297421.1892	2.50	0.74
10	PRE_PSM_MD_KS_10	35	945890.1751	2	1.89	7	PO_PSM_MD_KS_10(XA)	35.50	376846.2555	2.50	0.94
							PO_PSM_MD_KS_10(XB)		54350.9235	2.50	0.14
							PO_PSM_MD_KS_10(XC)		193251.6707	2.50	0.48
11	PRE_PSM_MD_KS_11	34	50956.02645	2	0.10	8	PO_PSM_MD_KS_10_11	34.50	97941.20952	2.50	0.24
12	PRE_PSM_MD_KS_12	33	127108.7812	2	0.25	9	PO_PSM_MD_KS_12	33.50	176019.2359	2.50	0.44
13	PRE_PSM_MD_KS_13	33	569152.9496	2	1.14		PO_PSM_MD_KS_13				

Pre monsoon						Post monsoon					
S L No	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes**	**Sand Volume**	**S L No**	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes**	**Sand Volum**
14	PRE_PSM_MD_KS_14	32	80673.24293	2	0.16	10	PO_PSM_MD_KS_14	32.50	116125.8863	2.50	0.29
15	PRE_PSM_MD_KS_15	30	130064.6981	2	0.26	11	PO_PSM_MD_KS_15	30.50	49451.26378	2.50	0.12
						12	PO_PSM_MD_KS_15_16	0.50	121080.463	2.50	0.30
16	PRE_PSM_MD_KS_16	29	98584.2621	2	0.20	13	PO_PSM_MD_KS_16_18	29.50	523431.5888	2.50	1.31
17	PRE_PSM_MD_KS_17	30	109936.2904	2	0.22		PO_PSM_MD_KS_17				
18	PRE_PSM_MD_KS_18	31	118465.3187	2	0.24	14	PO_PSM_MD_KS_18	31.50	35132.23872	2.50	0.09
19	PRE_PSM_MD_KS_19	30	57683.80712	2	0.12	15	PO_PSM_MD_KS_18_19	31.50	79567.81147	2.50	0.20
20	PRE_PSM_MD_KS_20	29	450808.3829	2	0.90	16	PO_PSM_MD_KS_20	29.50	127711.8987	2.50	0.32
21	PRE_PSM_MD_KS_21	31	974121.2919	2	1.95	17	PO_PSM_MD_KS_21	31.50	1681622.857	2.50	4.20
22	PRE_PSM_MD_KS_22	27	117899.7294	2	0.24		PO_PSM_MD_KS_22				
23	PRE_PSM_MD_KS_23	26	227927.3746	2	0.46	18	PO_PSM_MD_KS_23	26.50	135199.5274	2.50	0.34
							PO_PSM_MD_KS_23A		143421.9658	2.50	0.36
24	PRE_PSM_MD_KS_24	25	47732.65035	2	0.10		PO_PSM_MD_KS_24				
25	PRE_PSM_MD_KS_25	24	46549.57227	2	0.09		PO_PSM_MD_KS_25				
26	PRE_PSM_MD_KS_26	18	13530.17795	2	0.03	19	PO_PSM_MD_KS_26	18.50	42171.58694	2.50	0.11
27	PRE_PSM_MD_KS_27	15	11318.62379	2	0.02		PO_PSM_MD_KS_27				
28	PRE_PSM_KG2_KS_28	16	73425.80063	2	0.15	20	PO_PSM_KG2_KS_28	16.50	80584.75406	2.50	0.20
29	PRE_PSM_MD_KS_29	15	133957.4841	2	0.27	21	PO_PSM_MD_KS_29	15.50	66311.41781	2.50	0.17
30	PRE_PSM_MD_KS_30	15	270451.6063	2	0.54	22	PO_PSM_MD_KS_30(XXXA)	15.50	38140.75729	2.50	0.10
							PO_PSM_MD_KS_30(XXXB)		166307.7873	2.50	0.42
31	PRE_PSM_KG2_KS_31	15	87656.38512	2	0.18	23	PO_PSM_KG2_KS_31	15.50	60874.91332	2.50	0.15
32	PRE_PSM_MD_KS_32	13	48364.15427	2	0.10	24	PO_PSM_MD_KS_32	13.50	35903.17717	2.50	0.09
33	PRE_PSM_KP_KS_33	13	192556.2352	2	0.39	25	PO_PSM_KP_KS_33(XXXIIIA)	13.50	46270.83839	2.50	0.12
							PO_PSM_KP_KS_33(XXXIIIB)		76669.0178	2.50	0.19
34	PRE_PSM_KP_KS_34	13	67559.29488	2	0.14		PO_PSM_KP_KS_34_35		59484.38788	2.50	0.15
35	PRE_PSM_KP_KS_35	14	16706.32673	2	0.03						
36	PRE_PSM_KP_KS_36	13	56917.65726	2	0.11	26	PO_PSM_KP_KS_36	13.50	48918.48943	2.50	0.12
37	PRE_PSM_KP_KS_37	15	58135.35005	2	0.12	27	PO_PSM_KP_KS_37	15.50	103722.248	2.50	0.26
38	PRE_PSM_KP_KS_38	15	17561.44874	2	0.04		PO_PSM_KP_KS_38				
39	PRE_PSM_KP_KS_39	12	51950.4157	2	0.10		PO_PSM_KP_KS_39				
40	PRE_PSM_KP_KS_40	10	11272.49398	2	0.02		PO_PSM_KP_KS_40				
41	PRE_PSM_KP_KS_41	10	30200.86825	2	0.06		PO_PSM_KP_KS_41				
42	PRE_PSM_KP_KS_42	10	20448.59937	2	0.04		PO_PSM_KP_KS_42				
43	PRE_PSM_KP_KS_43	10	139564.0739	2	0.28	28	PO_PSM_KP_KS_43	10.50	40237.91847	2.50	0.10
44	PRE_PSM_KP_KS_44	11	12643.26541	2	0.03		PO_PSM_KP_KS_44				
45	PRE_PSM_KP_KS_45	10	60009.09269	2	0.12		PO_PSM_KP_KS_45				
46	PRE_PSM_KP_KS_46	12	11306.62124	2	0.02		PO_PSM_KP_KS_46				

Pre monsoon						Post monsoon					
S L No	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes**	**Sand Volume**	**S L No**	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes**	**Sand Volum**
47	PRE_PSM_KP_KS_47	10	17696.41482	2	0.04		PO_PSM_KP_KS_47				
48	PRE_PSM_KP_KS_48	10	108543.7253	2	0.22	29	PO_PSM_KP_KS_48	10.50	96463.66412	2.50	0.24
49	PRE_PSM_KP_KS_49	9	32842.64458	2	0.07		PO_PSM_KP_KS_49				
50	PRE_PSM_DB_KS_50	8	301050.344	2	0.60	30	PO_PSM_DB_KS_50	8.50	25884.69431	2.50	0.06
51	PRE_PSM_DB_KS_51	7	26700.99458	2	0.05		PO_PSM_DB_KS_51				
52	PRE_PSM_DB_KS_52	7	26928.82978	2	0.05	31	PO_PSM_DB_KS_52	7.50	8868.909954	2.50	0.02
53	PRE_PSM_DB_KS_53	7	44153.0877	2	0.09		PO_PSM_DB_KS_53				
54	PRE_PSM_DB_KS_54	7	69118.87465	2	0.14		PO_PSM_DB_KS_54				
55	PRE_PSM_DB_KS_55	8	43637.94511	2	0.09		PO_PSM_DB_KS_55				
56	PRE_PSM_DB_KS_56	7	31645.00437	2	0.06		PO_PSM_DB_KS_56				
57	PRE_PSM_DB_KS_57	7	56522.48216	2	0.11		PO_PSM_DB_KS_57				
58	PRE_PSM_DB_KS_58	6	45635.3046	2	0.09		PO_PSM_DB_KS_58	6.50	32085.21284	2.50	0.08
Estimation of Sand Resources in Pre monsoon period & Post monsoon period of Shilabati River											
1	PRE_PSM_GB2_SB_01	41	29217.40349	2	0.06	1	PO_PSM_GB2_SB_01A	41.5	60676.62264	2.50	0.15
						2	PO_PSM_GB2_SB_01B	41.5	47725.35836	2.50	0.12
2	PRE_PSM_GB2_SB_02	40	19842.73467	2	0.04	3	PO_PSM_GB2_SB_02	40.5	55827.41804	2.50	0.14
3	PRE_PSM_GB2_SB_03	41	58977.48844	2	0.12	4	PO_PSM_GB2_SB_03	41.5	19211.75632	2.50	0.05
4	PRE_PSM_GB2_SB_04	44	64917.8899	2	0.13	5	PO_PSM_GB2_SB_04	44.5	35141.19932	2.50	0.09
5	PRE_PSM_GB2_SB_05	40	31337.58536	2	0.06		PO_PSM_GB2_SB_05				
6	PRE_PSM_GB2_SB_06	39	21808.69347	2	0.04		PO_PSM_GB2_SB_06				
7	PRE_PSM_GB2_SB_07	39	112892.8595	2	0.23	6	PO_PSM_GB2_SB_07	39.5	90336.1257	2.50	0.23
8	PRE_PSM_GB2_SB_08	38	119048.9347	2	0.24		PO_PSM_GB2_SB_08	38.5	133146.1154	2.50	0.33
9	PRE_PSM_GB2_SB_09	38	42185.26733	2	0.08	7	PO_PSM_GB2_SB_09	38.5	35297.57001	2.50	0.088
10	PRE_PSM_GB2_SB_10	38	18411.40853	2	0.04		PO_PSM_GB2_SB_10				
11	PRE_PSM_GB2_SB_11	37	47358.37522	2	0.09		PO_PSM_GB2_SB_11				
12	PRE_PSM_GB2_SB_12	37	10347.79806	2	0.02		PO_PSM_GB2_SB_12				
13	PRE_PSM_GB1_SB_13	37	66797.88245	2	0.13		PO_PSM_GB1_SB_13				
14	PRE_PSM_GB1_SB_14	37	15142.4369	2	0.03		PO_PSM_GB1_SB_14				
15	PRE_PSM_GB1_SB_15	37	58463.55978	2	0.12		PO_PSM_GB1_SB_15				
16	PRE_PSM_GB1_SB_16	38	38228.88451	2	0.08		PO_PSM_GB1_SB_16				
17	PRE_PSM_GB1_SB_17	39	50578.98675	2	0.10	8	PO_PSM_GB1_SB_17	39.5	36688.34176	2.50	0.09
18	PRE_PSM_GB1_SB_18	36	23161.58046	2	0.05		PO_PSM_GB1_SB_18				
19	PRE_PSM_GB1_SB_19	36	26517.96834	2	0.05	9	PO_PSM_GB1_SB_19	36.5	35294.26906	2.50	0.088
20	PRE_PSM_GB1_SB_20	37	21510.91677	2	0.04		PO_PSM_GB1_SB_20				
21	PRE_PSM_GB1_SB_21	36	15907.84992	2	0.03		PO_PSM_GB1_SB_21				
22	PRE_PSM_GB1_SB_22	35	54708.69417	2	0.11	10	PO_PSM_GB1_SB_22_23	34.5	87506.88659	2.50	0.22
23	PRE_PSM_GB1_SB_23	35	28314.86538	2	0.06						
24	PRE_PSM_GB1_SB_24	35	10751.02957	2	0.02		PO_PSM_GB1_SB_24				

Pre monsoon						Post monsoon					
S L No	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes**	**Sand Volume**	**S L No**	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes**	**Sand Volum**
25	PRE_PSM_GB1_SB_25	35	7795.074457	2	0.02		PO_PSM_GB1_SB_25				
26	PRE_PSM_GB1_SB_26	34	17162.27888	2	0.03	11	PO_PSM_GB1_SB_26A	34.5	131735.461	2.50	0.33
27	PRE_PSM_GB1_SB_27	33	19969.23797	2	0.04		PO_PSM_GB1_SB_27				
28	PRE_PSM_GB1_SB_28	33	32770.40143	2	0.07		PO_PSM_GB1_SB_28				
29	PRE_PSM_GB1_SB_29	34	9740.162849	2	0.02	12	PO_PSM_GB1_SB_29A	34.5	34967.63304	2.50	0.09
						13	PO_PSM_GB1_SB_29B	34.5	76489.14508	2.50	0.19
30	PRE_PSM_GB1_SB_30	33	25655.85328	2	0.05		PO_PSM_GB1_SB_30				
31	PRE_PSM_GB1_SB_31	29	29296.9812	2	0.06	14	PO_PSM_GB1_SB_31	29.5	43694.0438	2.50	0.11
32	PRE_PSM_GB1_SB_32	29	27638.55147	2	0.06	15	PO_PSM_GB1_SB_32	29.5	62580.25808	2.50	0.16
						16	PO_PSM_GB1_SB_32A	0.5	128840.1597	2.50	0.32
						17	PO_PSM_GB1_SB_32B	0.5	78434.58016	2.50	0.20
33	PRE_PSM_GB1_SB_33	31	190547.622	2	0.38	18	PO_PSM_GB1_SB_33	31.5	173790.0933	2.50	0.43
34	PRE_PSM_GB1_SB_34	29	10448.38914	2	0.02	19	PO_PSM_GB1_SB_34	29.5	46132.87345	2.50	0.12
35	PRE_PSM_GB1_SB_35	28	21722.53988	2	0.04		PO_PSM_GB1_SB_35				
36	PRE_PSM_GB1_SB_36	27	5613.582545	2	0.01		PO_PSM_GB1_SB_36				
37	PRE_PSM_GB1_SB_37	26	14613.14329	2	0.03		PO_PSM_GB1_SB_37				
38	PRE_PSM_GB1_SB_38	27	56769.62943	2	0.11		PO_PSM_GB1_SB_38				
39	PRE_PSM_GB1_SB_39	25	2383.097284	2	0.00		PO_PSM_GB1_SB_39				
40	PRE_PSM_GB1_SB_40	24	7528.174358	2	0.02		PO_PSM_GB1_SB_40				
41	PRE_PSM_GB1_SB_41	25	7193.724816	2	0.01		PO_PSM_GB1_SB_41				
42	PRE_PSM_GB1_SB_42	23	8598.869753	2	0.02		PO_PSM_GB1_SB_42				
43	PRE_PSM_GB1_SB_43	25	24142.49892	2	0.05		PO_PSM_GB1_SB_43				
44	PRE_PSM_GB1_SB_44	21	24047.95668	2	0.05		PO_PSM_GB1_SB_44				
45	PRE_PSM_GB1_SB_45	22	1905.245746	2	0.00		PO_PSM_GB1_SB_45				
46	PRE_PSM_GB1_SB_46	23	8082.156422	2	0.02		PO_PSM_GB1_SB_46				
47	PRE_PSM_GB1_SB_47	22	3842.377841	2	0.01		PO_PSM_GB1_SB_47				
48	PRE_PSM_GB1_SB_48	21	5945.903931	2	0.01		PO_PSM_GB1_SB_48				
Estimation of Sand Resources in Pre monsoon period & Post monsoon period of Subarnarekha River											
1	PRE_PSM_KS_SR_01	22	1486463.648	2	2.97	1	PO_PSM_KS_SR_01(IA)	22.5	802322.8516	2.50	2.01
						2	PO_PSM_KS_SR_01(IB)		502694.364	2.50	1.26
						3	PO_PSM_KS_SR_01A		361027.8682	2.50	0.90
2	PRE_PSM_KS_SR_02	22	229073.0388	2	0.46	4	PO_PSM_KS_SR_02_04	22.5	286734.4444	2.50	0.72
3	PRE_PSM_KS_SR_03	21	163791.4078	2	0.33	5	PO_PSM_KS_SR_03				
4	PRE_PSM_KS_SR_04	19	375855.2172	2	0.75	6	PO_PSM_KS_SR_04	19.5	521355.06	2.50	1.30
						7	PO_PSM_KS_SR_04_05	20.5	742343.5582	2.50	1.86
5	PRE_PSM_KS_SR_05	20	981270.1018	2	1.96	8	PO_PSM_KS_SR_05	20.5	332510.7826	2.50	0.83
6	PRE_PSM_KS_SR_06	20	1202949.132	2	2.41	9	PO_PSM_KS_SR_06	20.5	433929.7817	2.50	1.08

Pre monsoon						**Post monsoon**					
S L No	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes**	**Sand Volume**	**S L No**	**Sand Bar_Code**	**RL (m)**	**Area in sq.m.**	**Sand Thicknes**	**Sand Volum**
7	PRE_PSM_KS_SR_07	18	117737.8818	2	0.24	10	PO_PSM_KS_SR_07	18.5	223249.4147	2.50	0.56
8	PRE_PSM_DT1_SR_08	17	537661.887	2	1.08	11	PO_PSM_DT1_SR_08	60	388958.1215	2.50	0.97
9	PRE_PSM_DT1_SR_09	17	69792.22628	2	0.14		PO_PSM_DT1_SR_09				
10	PRE_PSM_DT1_SR_10	16	624701.3256	2	1.25	12	PO_PSM_DT1_SR_08_10	16.5	538708.1033	2.50	1.35
11	PRE_PSM_DT1_SR_11	15	1129700.648	2	2.26	13	PO_PSM_DT1_SR_11	15.5	1064342.423	2.50	2.66
12	PRE_PSM_DT1_SR_12	18	2430600.095	2	4.86	14	PO_PSM_DT1_SR_12(XIIA)	18.5	839157.2159	2.50	2.10
						15	PO_PSM_DT1_SR_12(XIIB)		46793.71338	2.50	0.12
						16	PO_PSM_DT1_SR_12(XIIC)		353495.3306	2.50	0.88
						17	PO_PSM_DT1_SR_12(XIID)		427814.9494	2.50	1.07
						18	PO_PSM_DT1_SR_12(XIIE)		338726.6776	2.50	0.85
13	PRE_PSM_DT1_SR_12 A	18	486217.5506	2	0.97	19	PO_PSM_DT1_SR_12AI	18.5	172285.6444	2.50	0.43
						20	PO_PSM_DT1_SR_12AII		74892.06652	2.50	0.19
14	PRE_PSM_DT1_SR_13	14	1766724.71	2	3.53	21	PO_PSM_DT1_SR_13	14.5	1026304.157	2.50	2.57
15	PRE_PSM_DT1_SR_14	14	134171.4338	2	0.27		PO_PSM_DT1_SR_14				
16	PRE_PSM_DT1_SR_15	15	208455.1643	2	0.42	22	PO_PSM_DT1_SR_15	15.5	655049.7208	2.50	1.64
17	PRE_PSM_DT1_SR_16	13	208853.0321	2	0.42		PO_PSM_DT1_SR_16				
18	PRE_PSM_DT1_SR_17	13	154535.1703	2	0.31	23	PO_PSM_DT1_SR_17	13.5	80790.57578	2.50	0.20
						24	PO_PSM_DT1_SR_17A	13.5	50496.38538	2.50	0.13
19	PRE_PSM_DT1_SR_18	11	22819.12606	2	0.05		PO_PSM_DT1_SR_18				
20	PRE_PSM_DT1_SR_19	10	331025.0705	2	0.66	25	PO_PSM_DT1_SR_19	10.5	539891.327	2.50	1.35
21	PRE_PSM_DT1_SR_20	9	551167.6153	2	1.10	26	PO_PSM_DT1_SR_20	9.5	310865.5809	2.50	0.78
22	PRE_PSM_DT1_SR_21	8	46494.26862	2	0.09		PO_PSM_DT1_SR_21				

Annexure 3
Boundary Coordinates of Potential Blocks of Paschim Medinipur District

Abbreviation used in the table as below

ABBREVIATION FORM		
PERIOD	PR	PRE MONSOON
	PO	POST MONSOON
BLOCK	KS	KESHIARY
	DT1	DANTAN 1
	MD	MIDNAPORE
	GB1	GARHBETA 1
	GB2	GARHBETA 2
	DB	DEBRA
	KP	KESHPUR
	KG2	KHARAGPUR 2
RIVER	SR	SUBARNAREKHA
	KS	KANGSABATI
	SB	SHILABATI

CODE	POINT_NO	LATITUDE	LONGITUDE
PO_PSM_KS_SR_01(IA)	1	22° 5' 8.505" N	87° 8' 55.736" E
	2	22° 5' 5.410" N	87° 8' 52.630" E
	3	22° 5' 6.447" N	87° 8' 47.534" E
	4	22° 5' 7.900" N	87° 8' 39.780" E
	5	22° 5' 10.589" N	87° 8' 34.242" E
	6	22° 5' 14.105" N	87° 8' 28.263" E
	7	22° 5' 17.002" N	87° 8' 21.839" E
	8	22° 5' 17.370" N	87° 8' 12.386" E
	9	22° 5' 21.212" N	87° 8' 7.269" E
	10	22° 5' 24.035" N	87° 8' 9.436" E
	11	22° 5' 26.719" N	87° 8' 9.882" E
	12	22° 5' 30.231" N	87° 8' 8.999" E
	13	22° 5' 34.583" N	87° 8' 4.484" E
	14	22° 5' 34.637" N	87° 8' 4.487" E
	15	22° 5' 47.037" N	87° 8' 4.999" E
	16	22° 5' 48.831" N	87° 8' 5.159" E
	17	22° 5' 46.976" N	87° 8' 8.541" E
	18	22° 5' 37.162" N	87° 8' 13.518" E
	19	22° 5' 32.684" N	87° 8' 17.761" E
	20	22° 5' 20.097" N	87° 8' 44.526" E
	21	22° 5' 19.885" N	87° 8' 45.372" E
	22	22° 5' 15.533" N	87° 8' 48.652" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	23	22° 5' 11.193" N	87° 8' 51.528" E
PO_PSM_KS_SR_01(IB)	1	22° 5' 1.238" N	87° 9' 36.059" E
	2	22° 4' 59.795" N	87° 9' 33.398" E
	3	22° 5' 2.692" N	87° 9' 28.083" E
	4	22° 5' 5.176" N	87° 9' 21.438" E
	5	22° 5' 6.837" N	87° 9' 12.797" E
	6	22° 5' 7.258" N	87° 9' 4.377" E
	7	22° 5' 8.914" N	87° 8' 59.503" E
	8	22° 5' 12.429" N	87° 8' 55.518" E
	9	22° 5' 19.147" N	87° 8' 48.324" E
	10	22° 5' 15.433" N	87° 9' 3.173" E
	11	22° 5' 12.838" N	87° 9' 17.944" E
	12	22° 5' 9.214" N	87° 9' 27.727" E
	13	22° 5' 3.288" N	87° 9' 36.532" E
PO_PSM_KS_SR_01A	1	22° 4' 59.021" N	87° 8' 37.776" E
	2	22° 4' 56.743" N	87° 8' 44.865" E
	3	22° 4' 57.151" N	87° 8' 50.184" E
	4	22° 4' 56.733" N	87° 8' 55.280" E
	5	22° 4' 53.222" N	87° 9' 1.909" E
	6	22° 4' 53.230" N	87° 9' 1.497" E
	7	22° 4' 53.673" N	87° 8' 35.832" E
	8	22° 5' 0.349" N	87° 8' 30.684" E
PO_PSM_KS_SR_02_04	1	22° 4' 29.422" N	87° 9' 46.880" E
	2	22° 4' 26.732" N	87° 9' 52.638" E
	3	22° 4' 27.621" N	87° 9' 56.124" E
	4	22° 4' 26.847" N	87° 9' 56.301" E
	5	22° 4' 18.742" N	87° 10' 2.778" E
	6	22° 4' 13.090" N	87° 10' 3.480" E
	7	22° 4' 24.672" N	87° 9' 46.653" E
	8	22° 4' 30.871" N	87° 9' 43.558" E
	9	22° 4' 37.694" N	87° 9' 36.032" E
	10	22° 4' 42.454" N	87° 9' 25.844" E
	11	22° 4' 45.559" N	87° 9' 18.978" E
	12	22° 4' 48.661" N	87° 9' 14.107" E
	13	22° 4' 51.556" N	87° 9' 10.565" E
	14	22° 4' 46.782" N	87° 9' 35.599" E
	15	22° 4' 35.416" N	87° 9' 42.234" E
PO_PSM_KS_SR_04	1	22° 4' 3.585" N	87° 10' 8.122" E
	2	22° 3' 45.607" N	87° 10' 17.627" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	3	22° 3' 41.484" N	87° 10' 10.311" E
	4	22° 3' 45.410" N	87° 10' 8.100" E
	5	22° 3' 47.064" N	87° 10' 6.551" E
	6	22° 3' 43.357" N	87° 10' 4.791" E
	7	22° 3' 43.803" N	87° 10' 4.517" E
	8	22° 3' 49.994" N	87° 10' 0.723" E
	9	22° 4' 0.989" N	87° 9' 52.367" E
	10	22° 4' 1.739" N	87° 9' 55.490" E
	11	22° 3' 58.636" N	87° 10' 0.582" E
	12	22° 3' 55.742" N	87° 10' 2.573" E
	13	22° 3' 52.230" N	87° 10' 4.120" E
	14	22° 3' 53.054" N	87° 10' 6.115" E
	15	22° 3' 58.424" N	87° 10' 6.121" E
	16	22° 4' 2.143" N	87° 10' 4.353" E
	17	22° 4' 4.418" N	87° 10' 1.032" E
	18	22° 4' 8.554" N	87° 9' 55.276" E
	19	22° 4' 14.137" N	87° 9' 49.079" E
	20	22° 4' 17.236" N	87° 9' 48.417" E
	21	22° 4' 19.302" N	87° 9' 47.090" E
	22	22° 4' 22.401" N	87° 9' 46.651" E
	23	22° 4' 14.540" N	87° 9' 58.607" E
PO_PSM_KS_SR_04_05	1	22° 3' 28.029" N	87° 10' 39.319" E
	2	22° 3' 25.546" N	87° 10' 43.304" E
	3	22° 3' 25.540" N	87° 10' 48.621" E
	4	22° 3' 27.603" N	87° 10' 50.839" E
	5	22° 3' 29.254" N	87° 10' 52.171" E
	6	22° 3' 27.185" N	87° 10' 55.048" E
	7	22° 3' 26.082" N	87° 10' 55.565" E
	8	22° 3' 18.143" N	87° 10' 47.842" E
	9	22° 3' 18.520" N	87° 10' 47.061" E
	10	22° 3' 22.244" N	87° 10' 41.527" E
	11	22° 3' 25.348" N	87° 10' 35.549" E
	12	22° 3' 25.560" N	87° 10' 30.010" E
	13	22° 3' 25.775" N	87° 10' 22.035" E
	14	22° 3' 25.176" N	87° 10' 16.069" E
	15	22° 3' 25.328" N	87° 10' 15.841" E
	16	22° 3' 28.810" N	87° 10' 13.706" E
	17	22° 3' 29.389" N	87° 10' 13.352" E
	18	22° 3' 37.965" N	87° 10' 17.840" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	19	22° 3' 48.081" N	87° 10' 21.397" E
	20	22° 3' 58.983" N	87° 10' 22.296" E
	21	22° 3' 52.776" N	87° 10' 32.906" E
	22	22° 3' 51.786" N	87° 10' 33.366" E
	23	22° 3' 48.481" N	87° 10' 34.248" E
	24	22° 3' 44.348" N	87° 10' 36.237" E
	25	22° 3' 42.279" N	87° 10' 39.780" E
	26	22° 3' 39.386" N	87° 10' 40.884" E
	27	22° 3' 36.292" N	87° 10' 37.778" E
	28	22° 3' 32.781" N	87° 10' 37.109" E
PO_PSM_KS_SR_05	1	22° 3' 32.556" N	87° 10' 54.169" E
	2	22° 3' 28.412" N	87° 10' 57.832" E
	3	22° 3' 26.881" N	87° 10' 56.342" E
	4	22° 3' 27.597" N	87° 10' 56.157" E
	5	22° 3' 31.112" N	87° 10' 52.838" E
	6	22° 3' 29.463" N	87° 10' 49.734" E
	7	22° 3' 28.226" N	87° 10' 47.960" E
	8	22° 3' 26.991" N	87° 10' 44.413" E
	9	22° 3' 28.647" N	87° 10' 40.649" E
	10	22° 3' 31.333" N	87° 10' 39.101" E
	11	22° 3' 34.225" N	87° 10' 39.105" E
	12	22° 3' 35.876" N	87° 10' 39.772" E
	13	22° 3' 36.494" N	87° 10' 41.767" E
	14	22° 3' 41.037" N	87° 10' 42.215" E
	15	22° 3' 43.723" N	87° 10' 40.668" E
	16	22° 3' 46.412" N	87° 10' 37.569" E
	17	22° 3' 48.477" N	87° 10' 37.572" E
	18	22° 3' 50.484" N	87° 10' 36.822" E
	19	22° 3' 42.374" N	87° 10' 50.681" E
	20	22° 3' 39.786" N	87° 10' 52.849" E
	21	22° 3' 36.480" N	87° 10' 54.617" E
PO_PSM_KS_SR_07	1	22° 2' 32.195" N	87° 11' 41.093" E
	2	22° 2' 29.788" N	87° 11' 39.910" E
	3	22° 2' 37.160" N	87° 11' 34.860" E
	4	22° 2' 46.667" N	87° 11' 29.335" E
	5	22° 2' 55.553" N	87° 11' 24.916" E
	6	22° 2' 59.069" N	87° 11' 21.571" E
	7	22° 3' 0.436" N	87° 11' 22.901" E
	8	22° 2' 56.537" N	87° 11' 26.795" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	9	22° 2' 54.672" N	87° 11' 26.841" E
	10	22° 2' 50.023" N	87° 11' 27.943" E
	11	22° 2' 44.164" N	87° 11' 34.212" E
	12	22° 2' 38.137" N	87° 11' 37.342" E
PO_PSM_KS_SR_06	1	22° 2' 23.108" N	87° 11' 36.627" E
	2	22° 2' 22.722" N	87° 11' 36.437" E
	3	22° 2' 14.018" N	87° 11' 32.160" E
	4	22° 2' 24.370" N	87° 11' 22.437" E
	5	22° 2' 23.937" N	87° 11' 21.058" E
	6	22° 2' 25.798" N	87° 11' 19.407" E
	7	22° 2' 36.138" N	87° 11' 7.901" E
	8	22° 2' 41.394" N	87° 11' 4.360" E
	9	22° 2' 46.094" N	87° 11' 8.936" E
	10	22° 2' 45.448" N	87° 11' 11.832" E
	11	22° 2' 42.554" N	87° 11' 14.043" E
	12	22° 2' 36.769" N	87° 11' 15.808" E
	13	22° 2' 28.078" N	87° 11' 30.196" E
PO_PSM_DT1_SR_08	1	22° 2' 14.018" N	87° 11' 32.160" E
	2	22° 2' 22.722" N	87° 11' 36.437" E
	3	22° 2' 23.108" N	87° 11' 36.627" E
	4	22° 2' 23.382" N	87° 11' 36.762" E
	5	22° 2' 19.538" N	87° 11' 43.984" E
	6	22° 2' 20.628" N	87° 11' 53.836" E
	7	22° 2' 19.690" N	87° 11' 55.158" E
	8	22° 2' 6.099" N	87° 11' 56.370" E
	9	22° 2' 0.318" N	87° 11' 54.590" E
	10	22° 1' 54.950" N	87° 11' 53.475" E
	11	22° 1' 59.291" N	87° 11' 49.937" E
	12	22° 2' 0.951" N	87° 11' 43.737" E
	13	22° 2' 1.577" N	87° 11' 38.421" E
	14	22° 2' 1.210" N	87° 11' 34.615" E
	15	22° 2' 3.864" N	87° 11' 32.034" E
	16	22° 2' 5.544" N	87° 11' 32.006" E
	17	22° 2' 6.405" N	87° 11' 31.635" E
	18	22° 2' 7.986" N	87° 11' 32.670" E
	19	22° 2' 7.361" N	87° 11' 37.543" E
	20	22° 2' 10.249" N	87° 11' 39.984" E
	21	22° 2' 13.809" N	87° 11' 32.058" E
PO_PSM_DT1_SR_08_10	1	22° 1' 30.510" N	87° 12' 36.712" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	2	22° 1' 30.113" N	87° 12' 35.970" E
	3	22° 1' 33.431" N	87° 12' 25.342" E
	4	22° 1' 35.920" N	87° 12' 16.929" E
	5	22° 1' 41.292" N	87° 12' 15.607" E
	6	22° 1' 46.044" N	87° 12' 13.620" E
	7	22° 1' 49.558" N	87° 12' 11.410" E
	8	22° 1' 55.757" N	87° 12' 8.761" E
	9	22° 1' 59.892" N	87° 12' 5.223" E
	10	22° 2' 3.611" N	87° 12' 4.342" E
	11	22° 2' 6.460" N	87° 12' 6.124" E
	12	22° 1' 47.516" N	87° 12' 23.348" E
	13	22° 1' 35.112" N	87° 12' 32.633" E
PO_PSM_DT1_SR_11	1	22° 0' 38.678" N	87° 12' 43.203" E
	2	22° 0' 34.775" N	87° 12' 37.623" E
	3	22° 0' 52.248" N	87° 12' 29.558" E
	4	22° 1' 13.017" N	87° 12' 13.217" E
	5	22° 1' 14.019" N	87° 12' 12.428" E
	6	22° 1' 28.283" N	87° 12' 13.595" E
	7	22° 1' 24.968" N	87° 12' 21.786" E
	8	22° 1' 19.986" N	87° 12' 41.714" E
	9	22° 1' 17.294" N	87° 12' 47.247" E
	10	22° 1' 12.336" N	87° 12' 48.569" E
	11	22° 1' 7.607" N	87° 12' 52.069" E
	12	22° 0' 59.864" N	87° 12' 53.827" E
	13	22° 0' 51.267" N	87° 12' 50.531" E
	14	22° 0' 41.978" N	87° 12' 46.751" E
PO_PSM_DT1_SR_12(XIIA)	1	21° 59' 19.956" N	87° 13' 9.660" E
	2	21° 59' 17.891" N	87° 13' 8.992" E
	3	21° 59' 23.458" N	87° 13' 2.224" E
	4	21° 59' 46.932" N	87° 12' 58.469" E
	5	22° 0' 10.488" N	87° 12' 48.832" E
	6	22° 0' 23.862" N	87° 12' 42.660" E
	7	22° 0' 25.109" N	87° 12' 42.084" E
	8	22° 0' 28.967" N	87° 12' 46.732" E
	9	22° 0' 33.503" N	87° 12' 52.719" E
	10	22° 0' 35.890" N	87° 12' 55.287" E
	11	22° 0' 14.326" N	87° 12' 58.206" E
	12	22° 0' 6.558" N	87° 13' 1.022" E
	13	22° 0' 2.928" N	87° 12' 58.874" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	14	22° 0' 0.036" N	87° 12' 59.755" E
	15	21° 59' 58.792" N	87° 13' 3.297" E
	16	21° 59' 58.748" N	87° 13' 3.853" E
	17	21° 59' 52.423" N	87° 13' 6.145" E
	18	21° 59' 35.298" N	87° 13' 12.969" E
	19	21° 59' 32.553" N	87° 13' 10.786" E
	20	21° 59' 29.043" N	87° 13' 9.895" E
	21	21° 59' 24.085" N	87° 13' 10.995" E
PO_PSM_DT1_SR_12(XIIB)	1	22° 0' 5.698" N	87° 13' 1.333" E
	2	22° 0' 0.116" N	87° 13' 3.356" E
	3	22° 0' 0.213" N	87° 13' 2.621" E
	4	22° 0' 1.507" N	87° 13' 0.085" E
	5	22° 0' 4.626" N	87° 13' 0.436" E
PO_PSM_DT1_SR_12(XIIC)	1	21° 58' 49.667" N	87° 13' 36.490" E
	2	21° 58' 46.231" N	87° 13' 32.240" E
	3	21° 58' 51.393" N	87° 13' 33.171" E
	4	21° 58' 55.005" N	87° 13' 34.653" E
	5	21° 58' 58.963" N	87° 13' 35.028" E
	6	21° 59' 6.714" N	87° 13' 30.243" E
	7	21° 59' 11.197" N	87° 13' 24.714" E
	8	21° 59' 13.265" N	87° 13' 22.687" E
	9	21° 59' 13.791" N	87° 13' 15.306" E
	10	21° 59' 17.239" N	87° 13' 11.067" E
	11	21° 59' 21.713" N	87° 13' 11.259" E
	12	21° 59' 25.326" N	87° 13' 12.371" E
	13	21° 59' 27.909" N	87° 13' 11.453" E
	14	21° 59' 31.523" N	87° 13' 12.012" E
	15	21° 59' 33.340" N	87° 13' 13.749" E
	16	21° 59' 23.081" N	87° 13' 17.837" E
	17	21° 59' 11.502" N	87° 13' 27.120" E
	18	21° 58' 54.908" N	87° 13' 39.970" E
	19	21° 58' 53.794" N	87° 13' 39.264" E
PO_PSM_DT1_SR_12(XIID)	1	21° 58' 58.967" N	87° 13' 32.260" E
	2	21° 58' 44.275" N	87° 13' 30.512" E
	3	21° 58' 49.111" N	87° 13' 25.237" E
	4	21° 58' 58.748" N	87° 13' 7.035" E
	5	21° 59' 18.561" N	87° 13' 3.072" E
	6	21° 59' 20.141" N	87° 13' 2.756" E
	7	21° 59' 14.141" N	87° 13' 10.693" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	8	21° 59' 11.375" N	87° 13' 19.916" E
	9	21° 59' 11.028" N	87° 13' 22.314" E
PO_PSM_DT1_SR_12(XIIE)	1	21° 58' 36.986" N	87° 13' 46.108" E
	2	21° 58' 26.126" N	87° 13' 46.091" E
	3	21° 58' 37.332" N	87° 13' 38.087" E
	4	21° 58' 41.465" N	87° 13' 33.579" E
	5	21° 58' 42.824" N	87° 13' 32.095" E
	6	21° 58' 48.461" N	87° 13' 37.226" E
	7	21° 58' 53.447" N	87° 13' 40.925" E
	8	21° 58' 53.550" N	87° 13' 41.022" E
	9	21° 58' 51.241" N	87° 13' 42.810" E
PO_PSM_DT1_SR_12AI	1	21° 57' 34.424" N	87° 13' 58.695" E
	2	21° 57' 30.465" N	87° 13' 59.427" E
	3	21° 57' 32.880" N	87° 13' 55.372" E
	4	21° 57' 33.060" N	87° 13' 49.837" E
	5	21° 57' 32.032" N	87° 13' 46.514" E
	6	21° 57' 32.552" N	87° 13' 43.447" E
	7	21° 57' 32.552" N	87° 13' 43.447" E
	8	21° 57' 44.865" N	87° 13' 43.440" E
	9	21° 57' 51.296" N	87° 13' 45.048" E
	10	21° 57' 44.020" N	87° 13' 51.115" E
	11	21° 57' 41.145" N	87° 13' 52.618" E
PO_PSM_DT1_SR_12AII	1	21° 57' 24.434" N	87° 14' 4.767" E
	2	21° 57' 15.768" N	87° 14' 5.453" E
	3	21° 57' 20.996" N	87° 13' 46.654" E
	4	21° 57' 23.755" N	87° 13' 58.124" E
PO_PSM_DT1_SR_13	1	21° 56' 12.796" N	87° 14' 32.321" E
	2	21° 55' 55.913" N	87° 14' 33.673" E
	3	21° 56' 9.667" N	87° 14' 27.957" E
	4	21° 56' 14.836" N	87° 14' 24.202" E
	5	21° 56' 16.818" N	87° 14' 20.657" E
	6	21° 56' 23.661" N	87° 14' 17.212" E
	7	21° 56' 36.752" N	87° 14' 9.670" E
	8	21° 56' 45.534" N	87° 14' 6.917" E
	9	21° 56' 52.076" N	87° 14' 5.821" E
	10	21° 56' 57.804" N	87° 14' 0.686" E
	11	21° 57' 9.113" N	87° 14' 5.325" E
	12	21° 57' 4.628" N	87° 14' 14.144" E
	13	21° 56' 57.901" N	87° 14' 24.095" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	14	21° 56' 45.601" N	87° 14' 27.939" E
	15	21° 56' 41.881" N	87° 14' 29.815" E
	16	21° 56' 38.158" N	87° 14' 33.019" E
	17	21° 56' 19.331" N	87° 14' 36.206" E
PO_PSM_DT1_SR_15	1	21° 55' 15.434" N	87° 15' 11.339" E
	2	21° 55' 11.926" N	87° 15' 7.860" E
	3	21° 55' 15.502" N	87° 15' 7.498" E
	4	21° 55' 35.067" N	87° 14' 41.979" E
	5	21° 55' 36.028" N	87° 14' 40.726" E
	6	21° 55' 47.484" N	87° 14' 40.579" E
	7	21° 55' 59.013" N	87° 14' 42.259" E
	8	21° 56' 6.234" N	87° 14' 47.067" E
	9	21° 56' 11.225" N	87° 14' 47.261" E
	10	21° 56' 11.528" N	87° 14' 49.313" E
	11	21° 56' 9.636" N	87° 14' 50.290" E
	12	21° 56' 4.989" N	87° 14' 52.502" E
	13	21° 55' 59.345" N	87° 14' 50.561" E
	14	21° 55' 43.678" N	87° 14' 53.485" E
	15	21° 55' 42.463" N	87° 15' 0.123" E
	16	21° 55' 36.952" N	87° 15' 2.881" E
	17	21° 55' 36.462" N	87° 15' 5.997" E
	18	21° 55' 30.367" N	87° 15' 8.815" E
	19	21° 55' 19.830" N	87° 15' 11.231" E
PO_PSM_DT1_SR_17	1	21° 53' 52.423" N	87° 14' 17.841" E
	2	21° 53' 50.446" N	87° 14' 16.362" E
	3	21° 53' 50.534" N	87° 14' 14.518" E
	4	21° 53' 57.161" N	87° 14' 8.435" E
	5	21° 54' 10.118" N	87° 14' 11.691" E
	6	21° 54' 8.006" N	87° 14' 12.887" E
	7	21° 54' 3.444" N	87° 14' 13.525" E
	8	21° 53' 58.537" N	87° 14' 14.716" E
	9	21° 53' 55.523" N	87° 14' 16.002" E
PO_PSM_DT1_SR_17A	1	21° 53' 36.705" N	87° 14' 30.696" E
	2	21° 53' 29.791" N	87° 14' 35.260" E
	3	21° 53' 30.633" N	87° 14' 30.252" E
	4	21° 53' 32.701" N	87° 14' 28.320" E
PO_PSM_DT1_SR_19	1	21° 52' 40.592" N	87° 15' 12.499" E
	2	21° 52' 39.509" N	87° 15' 12.810" E
	3	21° 52' 41.697" N	87° 15' 7.557" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	4	21° 52' 45.064" N	87° 15' 0.509" E
	5	21° 52' 48.941" N	87° 14' 57.888" E
	6	21° 52' 53.850" N	87° 14' 55.269" E
	7	21° 53' 5.083" N	87° 14' 53.352" E
	8	21° 53' 9.575" N	87° 14' 51.855" E
	9	21° 53' 5.608" N	87° 14' 56.168" E
	10	21° 52' 54.028" N	87° 15' 5.442" E
PO_PSM_DT1_SR_20	1	21° 52' 0.396" N	87° 15' 4.027" E
	2	21° 51' 56.402" N	87° 14' 59.180" E
	3	21° 51' 57.306" N	87° 14' 56.338" E
	4	21° 51' 57.309" N	87° 14' 56.338" E
	5	21° 51' 59.472" N	87° 14' 56.320" E
	6	21° 51' 59.808" N	87° 14' 56.213" E
	7	21° 52' 13.347" N	87° 14' 59.864" E
	8	21° 52' 34.412" N	87° 15' 0.786" E
	9	21° 52' 39.666" N	87° 14' 57.928" E
	10	21° 52' 37.449" N	87° 15' 0.081" E
	11	21° 52' 31.247" N	87° 15' 4.358" E
	12	21° 52' 23.884" N	87° 15' 7.664" E
	13	21° 52' 13.686" N	87° 15' 7.922" E
	14	21° 52' 7.621" N	87° 15' 6.805" E
PO_PSM_MD_KS_01	1	22° 30' 5.220" N	87° 5' 13.577" E
	2	22° 29' 56.904" N	87° 5' 23.584" E
	3	22° 29' 56.966" N	87° 5' 21.275" E
	4	22° 30' 0.196" N	87° 5' 16.554" E
	5	22° 30' 3.297" N	87° 5' 10.860" E
	6	22° 30' 5.493" N	87° 5' 7.250" E
	7	22° 30' 8.395" N	87° 5' 4.569" E
	8	22° 30' 9.768" N	87° 5' 4.781" E
	9	22° 30' 11.881" N	87° 5' 5.108" E
PO_PSM_MD_KS_02	1	22° 29' 45.736" N	87° 5' 22.795" E
	2	22° 29' 35.524" N	87° 5' 26.035" E
	3	22° 29' 35.588" N	87° 5' 24.131" E
	4	22° 29' 38.671" N	87° 5' 23.200" E
	5	22° 29' 43.082" N	87° 5' 20.888" E
	6	22° 29' 48.463" N	87° 5' 16.609" E
	7	22° 29' 56.145" N	87° 5' 2.673" E
	8	22° 30' 2.396" N	87° 5' 3.640" E
	9	22° 30' 4.005" N	87° 5' 3.889" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	10	22° 29' 54.647" N	87° 5' 13.633" E
PO_PSM_MD_KS_03	1	22° 29' 42.726" N	87° 5' 34.042" E
	2	22° 29' 39.663" N	87° 5' 33.765" E
	3	22° 29' 41.216" N	87° 5' 27.237" E
	4	22° 29' 41.991" N	87° 5' 26.682" E
	5	22° 29' 46.251" N	87° 5' 25.296" E
	6	22° 29' 48.058" N	87° 5' 24.464" E
	7	22° 29' 51.546" N	87° 5' 19.743" E
	8	22° 29' 55.677" N	87° 5' 19.190" E
	9	22° 29' 54.770" N	87° 5' 25.301" E
	10	22° 29' 51.889" N	87° 5' 28.609" E
	11	22° 29' 44.730" N	87° 5' 33.196" E
PO_PSM_MD_KS_04(IVA)	1	22° 29' 37.212" N	87° 5' 31.124" E
	2	22° 29' 35.308" N	87° 5' 32.452" E
	3	22° 29' 35.463" N	87° 5' 27.860" E
	4	22° 29' 38.505" N	87° 5' 27.513" E
PO_PSM_MD_KS_07	1	22° 28' 31.425" N	87° 5' 3.492" E
	2	22° 28' 26.615" N	87° 5' 0.738" E
	3	22° 28' 17.494" N	87° 5' 0.177" E
	4	22° 28' 5.787" N	87° 5' 6.836" E
	5	22° 27' 55.457" N	87° 5' 15.903" E
	6	22° 27' 46.672" N	87° 5' 29.044" E
	7	22° 27' 41.845" N	87° 5' 44.409" E
	8	22° 27' 42.524" N	87° 5' 59.408" E
	9	22° 27' 46.296" N	87° 6' 22.000" E
	10	22° 27' 46.360" N	87° 6' 24.944" E
	11	22° 27' 44.498" N	87° 6' 25.210" E
	12	22° 27' 41.147" N	87° 6' 16.597" E
	13	22° 27' 38.054" N	87° 6' 9.790" E
	14	22° 27' 37.283" N	87° 6' 4.790" E
	15	22° 27' 37.285" N	87° 6' 1.180" E
	16	22° 27' 39.612" N	87° 5' 55.071" E
	17	22° 27' 41.040" N	87° 5' 41.740" E
	18	22° 27' 40.398" N	87° 5' 36.046" E
	19	22° 27' 39.645" N	87° 5' 33.065" E
	20	22° 27' 43.452" N	87° 5' 24.182" E
	21	22° 27' 48.484" N	87° 5' 14.118" E
	22	22° 27' 48.865" N	87° 5' 13.358" E
	23	22° 27' 58.358" N	87° 5' 1.062" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	24	22° 28' 6.493" N	87° 4' 55.928" E
	25	22° 28' 12.948" N	87° 4' 52.043" E
	26	22° 28' 18.705" N	87° 4' 47.919" E
	27	22° 28' 19.277" N	87° 4' 47.698" E
	28	22° 28' 20.628" N	87° 4' 47.225" E
	29	22° 28' 24.581" N	87° 4' 46.464" E
	30	22° 28' 27.492" N	87° 4' 47.023" E
	31	22° 28' 31.280" N	87° 4' 49.776" E
	32	22° 28' 30.371" N	87° 4' 57.053" E
PO_PSM_MD_KS_10(XA)	1	22° 26' 25.724" N	87° 7' 4.705" E
	2	22° 26' 17.671" N	87° 7' 2.851" E
	3	22° 26' 19.506" N	87° 6' 57.210" E
	4	22° 26' 19.550" N	87° 6' 57.236" E
	5	22° 26' 31.497" N	87° 7' 4.405" E
	6	22° 26' 45.871" N	87° 7' 4.405" E
	7	22° 26' 50.901" N	87° 7' 9.186" E
	8	22° 26' 56.060" N	87° 7' 14.884" E
	9	22° 26' 59.027" N	87° 7' 16.830" E
	10	22° 27' 3.673" N	87° 7' 17.528" E
	11	22° 27' 6.771" N	87° 7' 17.392" E
	12	22° 27' 6.756" N	87° 7' 20.252" E
	13	22° 26' 57.723" N	87° 7' 20.099" E
	14	22° 26' 46.021" N	87° 7' 18.052" E
	15	22° 26' 36.904" N	87° 7' 12.490" E
PO_PSM_MD_KS_10_11	1	22° 26' 0.997" N	87° 7' 6.006" E
	2	22° 25' 59.533" N	87° 7' 4.421" E
	3	22° 26' 12.598" N	87° 6' 53.065" E
	4	22° 26' 17.700" N	87° 6' 56.126" E
	5	22° 26' 12.547" N	87° 7' 2.685" E
	6	22° 26' 5.245" N	87° 7' 3.762" E
PO_PSM_MD_KS_10(XB)	1	22° 25' 44.532" N	87° 7' 18.624" E
	2	22° 25' 41.582" N	87° 7' 16.902" E
	3	22° 25' 48.300" N	87° 7' 9.132" E
	4	22° 25' 51.656" N	87° 7' 8.580" E
	5	22° 25' 52.572" N	87° 7' 11.065" E
	6	22° 25' 44.582" N	87° 7' 18.554" E
PO_PSM_MD_KS_12	1	22° 25' 29.185" N	87° 7' 25.360" E
	2	22° 25' 24.516" N	87° 7' 26.234" E
	3	22° 25' 25.929" N	87° 7' 23.707" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	4	22° 25' 31.098" N	87° 7' 16.076" E
	5	22° 25' 34.968" N	87° 7' 10.826" E
	6	22° 25' 36.554" N	87° 7' 9.122" E
	7	22° 25' 47.533" N	87° 6' 59.413" E
	8	22° 25' 50.498" N	87° 7' 4.275" E
	9	22° 25' 41.974" N	87° 7' 11.210" E
	10	22° 25' 40.938" N	87° 7' 15.235" E
	11	22° 25' 36.030" N	87° 7' 19.535" E
PO_PSM_MD_KS_10(XC)	1	22° 25' 28.970" N	87° 7' 50.654" E
	2	22° 25' 26.649" N	87° 8' 1.299" E
	3	22° 25' 27.949" N	87° 8' 9.840" E
	4	22° 25' 22.319" N	87° 7' 57.007" E
	5	22° 25' 20.525" N	87° 7' 39.929" E
	6	22° 25' 28.793" N	87° 7' 30.635" E
	7	22° 25' 28.919" N	87° 7' 35.078" E
PO_PSM_MD_KS_14	1	22° 25' 16.973" N	87° 9' 18.035" E
	2	22° 25' 12.752" N	87° 9' 16.980" E
	3	22° 25' 16.442" N	87° 9' 13.636" E
	4	22° 25' 23.933" N	87° 9' 8.647" E
	5	22° 25' 32.300" N	87° 9' 5.305" E
	6	22° 25' 29.859" N	87° 9' 9.608" E
	7	22° 25' 23.140" N	87° 9' 17.005" E
	8	22° 25' 17.751" N	87° 9' 21.539" E
PO_PSM_MD_KS_15	1	22° 24' 45.117" N	87° 10' 4.042" E
	2	22° 24' 44.713" N	87° 10' 5.273" E
	3	22° 24' 44.730" N	87° 10' 6.994" E
	4	22° 24' 40.482" N	87° 10' 13.438" E
	5	22° 24' 36.090" N	87° 10' 17.042" E
	6	22° 24' 35.839" N	87° 10' 10.100" E
	7	22° 24' 38.768" N	87° 10' 7.327" E
	8	22° 24' 45.053" N	87° 10' 3.726" E
PO_PSM_MD_KS_15_16	1	22° 24' 40.298" N	87° 10' 24.543" E
	2	22° 24' 34.969" N	87° 10' 19.354" E
	3	22° 24' 38.672" N	87° 10' 16.304" E
	4	22° 24' 42.634" N	87° 10' 12.700" E
	5	22° 24' 44.755" N	87° 10' 9.500" E
	6	22° 24' 44.869" N	87° 10' 21.191" E
	7	22° 24' 43.796" N	87° 10' 24.140" E
	8	22° 24' 43.487" N	87° 10' 19.734" E

CODE	POINT_NO	LATITUDE	LONGITUDE
PO_PSM_MD_KS_16_18	1	22° 24' 33.312" N	87° 10' 39.527" E
	2	22° 24' 28.837" N	87° 10' 40.354" E
	3	22° 24' 21.514" N	87° 10' 47.841" E
	4	22° 24' 17.304" N	87° 10' 54.288" E
	5	22° 24' 12.119" N	87° 11' 2.172" E
	6	22° 24' 8.505" N	87° 11' 1.983" E
	7	22° 24' 5.496" N	87° 10' 59.017" E
	8	22° 24' 8.768" N	87° 10' 57.263" E
	9	22° 24' 11.785" N	87° 10' 53.010" E
	10	22° 24' 10.152" N	87° 10' 51.157" E
	11	22° 24' 6.106" N	87° 10' 52.725" E
	12	22° 24' 5.937" N	87° 10' 50.134" E
	13	22° 24' 11.803" N	87° 10' 36.816" E
	14	22° 24' 15.763" N	87° 10' 34.692" E
	15	22° 24' 20.152" N	87° 10' 34.698" E
	16	22° 24' 24.629" N	87° 10' 32.667" E
	17	22° 24' 27.650" N	87° 10' 23.602" E
	18	22° 24' 28.430" N	87° 10' 18.143" E
	19	22° 24' 24.643" N	87° 10' 19.619" E
	20	22° 24' 24.303" N	87° 10' 15.454" E
	21	22° 24' 26.202" N	87° 10' 9.811" E
	22	22° 24' 31.971" N	87° 10' 5.746" E
	23	22° 24' 30.346" N	87° 10' 12.647" E
	24	22° 24' 30.152" N	87° 10' 17.312" E
	25	22° 24' 33.811" N	87° 10' 24.255" E
	26	22° 24' 38.400" N	87° 10' 29.261" E
	27	22° 24' 38.147" N	87° 10' 35.817" E
	28	22° 24' 35.830" N	87° 10' 38.939" E
PO_PSM_MD_KS_18	1	22° 24' 6.673" N	87° 11' 8.347" E
	2	22° 24' 2.955" N	87° 11' 9.008" E
	3	22° 24' 3.163" N	87° 11' 7.528" E
	4	22° 24' 4.541" N	87° 11' 6.938" E
	5	22° 24' 4.544" N	87° 11' 3.754" E
	6	22° 24' 0.896" N	87° 11' 4.046" E
	7	22° 24' 1.035" N	87° 11' 2.269" E
	8	22° 24' 2.826" N	87° 11' 1.235" E
	9	22° 24' 6.612" N	87° 11' 1.906" E
	10	22° 24' 10.464" N	87° 11' 3.836" E
	11	22° 24' 10.463" N	87° 11' 5.243" E

CODE	POINT_NO	LATITUDE	LONGITUDE
PO_PSM_MD_KS_18_19	1	22° 23' 57.501" N	87° 11' 22.771" E
	2	22° 23' 57.308" N	87° 11' 10.556" E
	3	22° 23' 59.169" N	87° 11' 9.151" E
	4	22° 24' 1.027" N	87° 11' 9.598" E
	5	22° 24' 3.367" N	87° 11' 10.193" E
	6	22° 24' 8.325" N	87° 11' 9.016" E
	7	22° 24' 6.117" N	87° 11' 13.158" E
	8	22° 24' 4.806" N	87° 11' 16.044" E
	9	22° 24' 2.324" N	87° 11' 19.002" E
	10	22° 24' 0.667" N	87° 11' 22.775" E
PO_PSM_MD_KS_20	1	22° 24' 6.365" N	87° 11' 36.183" E
	2	22° 24' 6.033" N	87° 11' 33.926" E
	3	22° 24' 9.672" N	87° 11' 39.067" E
	4	22° 24' 25.834" N	87° 11' 51.676" E
	5	22° 24' 29.383" N	87° 11' 54.287" E
	6	22° 24' 30.574" N	87° 11' 55.318" E
	7	22° 24' 31.322" N	87° 12' 2.204" E
	8	22° 24' 28.228" N	87° 11' 59.682" E
	9	22° 24' 21.007" N	87° 11' 53.675" E
	10	22° 24' 16.744" N	87° 11' 49.597" E
	11	22° 24' 13.238" N	87° 11' 45.224" E
	12	22° 24' 10.077" N	87° 11' 40.852" E
PO_PSM_MD_KS_21	1	22° 24' 57.172" N	87° 13' 14.217" E
	2	22° 24' 52.750" N	87° 13' 23.002" E
	3	22° 24' 52.960" N	87° 13' 27.052" E
	4	22° 24' 53.597" N	87° 13' 33.300" E
	5	22° 24' 53.691" N	87° 13' 42.324" E
	6	22° 24' 50.779" N	87° 13' 48.219" E
	7	22° 24' 47.004" N	87° 13' 55.501" E
	8	22° 24' 47.530" N	87° 14' 3.831" E
	9	22° 24' 49.337" N	87° 14' 18.063" E
	10	22° 24' 42.899" N	87° 14' 13.016" E
	11	22° 24' 42.453" N	87° 14' 9.720" E
	12	22° 24' 41.822" N	87° 13' 59.423" E
	13	22° 24' 40.116" N	87° 13' 48.893" E
	14	22° 24' 40.236" N	87° 13' 40.564" E
	15	22° 24' 42.828" N	87° 13' 32.586" E
	16	22° 24' 44.882" N	87° 13' 25.185" E
	17	22° 24' 45.275" N	87° 13' 18.997" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	18	22° 24' 47.919" N	87° 13' 16.285" E
	19	22° 24' 50.186" N	87° 13' 10.504" E
	20	22° 24' 50.521" N	87° 13' 1.366" E
	21	22° 24' 48.807" N	87° 12' 55.810" E
	22	22° 24' 44.114" N	87° 12' 51.349" E
	23	22° 24' 42.999" N	87° 12' 46.197" E
	24	22° 24' 39.999" N	87° 12' 37.400" E
	25	22° 24' 36.889" N	87° 12' 29.992" E
	26	22° 24' 35.710" N	87° 12' 23.472" E
	27	22° 24' 36.159" N	87° 12' 22.127" E
	28	22° 24' 35.635" N	87° 12' 11.021" E
	29	22° 24' 51.328" N	87° 12' 19.720" E
	30	22° 24' 54.338" N	87° 12' 21.575" E
	31	22° 24' 56.596" N	87° 12' 22.273" E
	32	22° 25' 0.575" N	87° 12' 22.857" E
	33	22° 25' 3.263" N	87° 12' 23.671" E
	34	22° 25' 6.807" N	87° 12' 25.931" E
	35	22° 25' 9.629" N	87° 12' 32.144" E
	36	22° 25' 9.699" N	87° 12' 37.100" E
	37	22° 25' 8.291" N	87° 12' 44.965" E
	38	22° 25' 6.993" N	87° 12' 50.169" E
	39	22° 25' 3.117" N	87° 12' 52.824" E
	40	22° 24' 59.669" N	87° 12' 57.794" E
	41	22° 24' 59.553" N	87° 13' 3.925" E
	42	22° 24' 59.115" N	87° 13' 9.361" E
PO_PSM_MD_KS_23	1	22° 24' 55.686" N	87° 14' 16.339" E
	2	22° 24' 55.632" N	87° 14' 15.788" E
	3	22° 24' 58.322" N	87° 14' 27.576" E
	4	22° 24' 59.516" N	87° 14' 34.612" E
	5	22° 24' 59.049" N	87° 14' 38.414" E
	6	22° 24' 57.378" N	87° 14' 36.124" E
PO_PSM_MD_KS_23A	1	22° 24' 43.415" N	87° 15' 31.975" E
	2	22° 24' 35.243" N	87° 15' 30.572" E
	3	22° 24' 36.973" N	87° 15' 24.675" E
	4	22° 24' 44.090" N	87° 15' 13.698" E
	5	22° 24' 47.435" N	87° 15' 6.763" E
	6	22° 24' 47.838" N	87° 15' 23.885" E
	7	22° 24' 45.459" N	87° 15' 32.210" E
PO_PSM_MD_KS_26	1	22° 24' 55.826" N	87° 26' 55.935" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	2	22° 24' 55.649" N	87° 26' 55.525" E
	3	22° 24' 56.083" N	87° 26' 55.313" E
	4	22° 24' 57.325" N	87° 26' 54.318" E
	5	22° 25' 1.771" N	87° 26' 52.166" E
	6	22° 25' 4.873" N	87° 26' 50.677" E
	7	22° 25' 7.871" N	87° 26' 49.298" E
	8	22° 25' 9.889" N	87° 26' 47.583" E
	9	22° 25' 9.935" N	87° 26' 47.488" E
	10	22° 25' 10.090" N	87° 26' 50.650" E
	11	22° 25' 4.090" N	87° 26' 54.629" E
	12	22° 24' 58.649" N	87° 26' 55.870" E
PO_PSM_KG2_KS_28	1	22° 25' 56.926" N	87° 28' 48.621" E
	2	22° 25' 51.900" N	87° 28' 45.467" E
	3	22° 25' 54.115" N	87° 28' 44.662" E
	4	22° 25' 55.410" N	87° 28' 45.072" E
	5	22° 25' 59.281" N	87° 28' 45.530" E
	6	22° 26' 5.479" N	87° 28' 44.829" E
	7	22° 26' 13.333" N	87° 28' 42.690" E
	8	22° 26' 19.014" N	87° 28' 40.626" E
	9	22° 26' 18.904" N	87° 28' 42.328" E
	10	22° 26' 11.940" N	87° 28' 46.451" E
	11	22° 26' 6.290" N	87° 28' 48.135" E
PO_PSM_MD_KS_30(XXXA)	1	22° 26' 28.252" N	87° 29' 32.789" E
	2	22° 26' 28.052" N	87° 29' 30.641" E
	3	22° 26' 31.990" N	87° 29' 26.064" E
	4	22° 26' 38.132" N	87° 29' 21.198" E
	5	22° 26' 39.087" N	87° 29' 23.941" E
	6	22° 26' 37.013" N	87° 29' 26.970" E
	7	22° 26' 33.359" N	87° 29' 28.809" E
	8	22° 26' 30.525" N	87° 29' 32.353" E
	1	22° 26' 29.803" N	87° 29' 48.919" E
	2	22° 26' 23.650" N	87° 29' 42.890" E
	3	22° 26' 24.240" N	87° 29' 39.218" E
	4	22° 26' 25.971" N	87° 29' 36.114" E
	5	22° 26' 28.938" N	87° 29' 33.829" E
	6	22° 26' 32.382" N	87° 29' 32.878" E
	7	22° 26' 34.596" N	87° 29' 29.479" E
	8	22° 26' 36.654" N	87° 29' 29.219" E
	9	22° 26' 32.318" N	87° 29' 38.683" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	10	22° 26' 30.181" N	87° 29' 45.340" E
PO_PSM_MD_KS_32	1	22° 27' 7.554" N	87° 29' 48.640" E
	2	22° 27' 7.796" N	87° 29' 49.448" E
	3	22° 27' 14.491" N	87° 29' 51.273" E
	4	22° 27' 13.262" N	87° 29' 51.106" E
	5	22° 27' 7.786" N	87° 29' 51.920" E
	6	22° 27' 2.723" N	87° 29' 53.291" E
	7	22° 26' 59.752" N	87° 29' 54.242" E
	8	22° 27' 0.272" N	87° 29' 52.157" E
	9	22° 27' 3.446" N	87° 29' 49.725" E
PO_PSM_KP_KS_33(XXXIIIA)	1	22° 27' 7.553" N	87° 29' 48.636" E
	2	22° 27' 7.526" N	87° 29' 48.547" E
	3	22° 27' 18.249" N	87° 29' 48.666" E
	4	22° 27' 21.207" N	87° 29' 49.344" E
	5	22° 27' 27.940" N	87° 29' 53.441" E
	6	22° 27' 28.023" N	87° 29' 54.725" E
	7	22° 27' 26.831" N	87° 29' 54.043" E
	8	22° 27' 19.145" N	87° 29' 51.905" E
	9	22° 27' 14.491" N	87° 29' 51.273" E
	10	22° 27' 7.796" N	87° 29' 49.448" E
	11	22° 27' 7.560" N	87° 29' 48.661" E
	12	22° 27' 7.554" N	87° 29' 48.640" E
PO_PSM_KP_KS_34_35	1	22° 26' 59.000" N	87° 31' 2.126" E
	2	22° 26' 58.884" N	87° 31' 1.321" E
	3	22° 27' 3.094" N	87° 30' 57.781" E
	4	22° 27' 11.508" N	87° 30' 52.925" E
	5	22° 27' 16.822" N	87° 30' 48.649" E
	6	22° 27' 21.094" N	87° 30' 47.480" E
	7	22° 27' 21.154" N	87° 30' 50.220" E
	8	22° 27' 17.983" N	87° 30' 51.616" E
	9	22° 27' 12.375" N	87° 30' 55.511" E
	10	22° 27' 9.193" N	87° 30' 57.185" E
	11	22° 27' 4.436" N	87° 30' 59.500" E
PO_PSM_KP_KS_36	1	22° 26' 32.997" N	87° 31' 2.484" E
	2	22° 26' 29.736" N	87° 31' 0.902" E
	3	22° 26' 30.036" N	87° 31' 0.931" E
	4	22° 26' 34.216" N	87° 31' 1.336" E
	5	22° 26' 37.210" N	87° 31' 1.513" E
	6	22° 26' 41.236" N	87° 31' 1.973" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	7	22° 26' 44.282" N	87° 31' 1.928" E
	8	22° 26' 47.381" N	87° 31' 1.495" E
	9	22° 26' 50.120" N	87° 31' 0.784" E
	10	22° 26' 52.309" N	87° 31' 0.443" E
	11	22° 26' 48.962" N	87° 31' 4.172" E
	12	22° 26' 37.467" N	87° 31' 4.055" E
PO_PSM_KP_KS_37	1	22° 26' 5.755" N	87° 31' 9.113" E
	2	22° 26' 2.903" N	87° 31' 12.990" E
	3	22° 26' 2.594" N	87° 31' 13.752" E
	4	22° 26' 1.766" N	87° 31' 13.839" E
	5	22° 26' 3.025" N	87° 31' 11.110" E
	6	22° 26' 1.998" N	87° 31' 9.477" E
	7	22° 26' 2.901" N	87° 31' 6.889" E
	8	22° 26' 6.073" N	87° 31' 5.123" E
	9	22° 26' 9.323" N	87° 31' 0.470" E
	10	22° 26' 13.387" N	87° 30' 59.819" E
	11	22° 26' 16.689" N	87° 31' 0.572" E
	12	22° 26' 19.597" N	87° 31' 3.525" E
	13	22° 26' 15.065" N	87° 31' 4.038" E
	14	22° 26' 12.326" N	87° 31' 4.695" E
	15	22° 26' 9.069" N	87° 31' 6.349" E
PO_PSM_KP_KS_43	1	22° 28' 14.351" N	87° 31' 56.480" E
	2	22° 28' 10.930" N	87° 31' 56.591" E
	3	22° 28' 12.505" N	87° 31' 54.551" E
	4	22° 28' 17.601" N	87° 31' 53.830" E
	5	22° 28' 24.760" N	87° 31' 54.006" E
	6	22° 28' 27.645" N	87° 31' 55.720" E
	7	22° 28' 27.435" N	87° 31' 56.756" E
	8	22° 28' 24.887" N	87° 31' 57.043" E
	9	22° 28' 20.248" N	87° 31' 57.076" E
	10	22° 28' 19.151" N	87° 31' 56.887" E
	11	22° 28' 16.674" N	87° 31' 56.544" E
PO_PSM_KP_KS_48	1	22° 29' 21.639" N	87° 32' 29.558" E
	2	22° 29' 19.921" N	87° 32' 29.470" E
	3	22° 29' 20.073" N	87° 32' 27.621" E
	4	22° 29' 19.772" N	87° 32' 24.786" E
	5	22° 29' 18.958" N	87° 32' 21.339" E
	6	22° 29' 18.501" N	87° 32' 18.892" E
	7	22° 29' 18.204" N	87° 32' 15.224" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	8	22° 29' 17.802" N	87° 32' 11.834" E
	9	22° 29' 17.139" N	87° 32' 9.498" E
	10	22° 29' 16.163" N	87° 32' 7.827" E
	11	22° 29' 14.776" N	87° 32' 5.989" E
	12	22° 29' 13.134" N	87° 32' 2.927" E
	13	22° 29' 11.694" N	87° 32' 1.143" E
	14	22° 29' 9.633" N	87° 32' 0.062" E
	15	22° 29' 12.792" N	87° 31' 58.782" E
	16	22° 29' 16.974" N	87° 32' 4.057" E
	17	22° 29' 19.714" N	87° 32' 8.216" E
	18	22° 29' 21.421" N	87° 32' 10.697" E
	19	22° 29' 21.454" N	87° 32' 10.821" E
	20	22° 29' 21.811" N	87° 32' 13.619" E
PO_PSM_GB2_SB_01A	1	22° 53' 7.908" N	87° 11' 34.048" E
	2	22° 53' 5.364" N	87° 11' 33.172" E
	3	22° 53' 7.169" N	87° 11' 30.628" E
	4	22° 53' 11.150" N	87° 11' 26.176" E
	5	22° 53' 13.086" N	87° 11' 24.565" E
	6	22° 53' 16.756" N	87° 11' 24.203" E
	7	22° 53' 16.435" N	87° 11' 26.770" E
	8	22° 53' 14.626" N	87° 11' 28.764" E
	9	22° 53' 10.791" N	87° 11' 33.960" E
PO_PSM_GB2_SB_01B	1	22° 52' 9.266" N	87° 12' 39.867" E
	2	22° 52' 3.300" N	87° 12' 40.108" E
	3	22° 52' 6.990" N	87° 12' 38.178" E
	4	22° 52' 10.245" N	87° 12' 36.177" E
	5	22° 52' 15.517" N	87° 12' 31.561" E
	6	22° 52' 15.722" N	87° 12' 31.363" E
	7	22° 52' 15.331" N	87° 12' 33.785" E
PO_PSM_GB2_SB_02	1	22° 51' 55.974" N	87° 12' 44.601" E
	2	22° 51' 53.566" N	87° 12' 43.483" E
	3	22° 51' 54.251" N	87° 12' 42.648" E
	4	22° 51' 55.912" N	87° 12' 42.113" E
	5	22° 51' 58.937" N	87° 12' 42.377" E
	6	22° 51' 59.911" N	87° 12' 40.996" E
	7	22° 52' 1.398" N	87° 12' 40.622" E
	8	22° 52' 6.992" N	87° 12' 41.052" E
	9	22° 52' 3.943" N	87° 12' 44.323" E
	10	22° 52' 1.104" N	87° 12' 45.582" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	11	22° 51' 59.814" N	87° 12' 45.636" E
	12	22° 51' 59.024" N	87° 12' 45.694" E
PO_PSM_GB2_SB_03	1	22° 51' 44.474" N	87° 12' 50.180" E
	2	22° 51' 41.758" N	87° 12' 50.615" E
	3	22° 51' 41.856" N	87° 12' 49.704" E
	4	22° 51' 45.643" N	87° 12' 48.596" E
	5	22° 51' 51.567" N	87° 12' 45.708" E
	6	22° 51' 54.435" N	87° 12' 46.913" E
	7	22° 51' 54.133" N	87° 12' 47.020" E
	8	22° 51' 49.071" N	87° 12' 48.906" E
PO_PSM_GB2_SB_04	1	22° 51' 17.962" N	87° 12' 55.089" E
	2	22° 51' 17.551" N	87° 12' 53.974" E
	3	22° 51' 18.793" N	87° 12' 51.822" E
	4	22° 51' 21.067" N	87° 12' 49.969" E
	5	22° 51' 25.198" N	87° 12' 49.158" E
	6	22° 51' 32.358" N	87° 12' 48.426" E
	7	22° 51' 32.630" N	87° 12' 50.655" E
	8	22° 51' 27.605" N	87° 12' 50.944" E
	9	22° 51' 24.505" N	87° 12' 52.574" E
	10	22° 51' 20.442" N	87° 12' 53.756" E
PO_PSM_GB2_SB_09	1	22° 50' 35.534" N	87° 15' 30.764" E
	2	22° 50' 33.391" N	87° 15' 28.316" E
	3	22° 50' 36.764" N	87° 15' 28.212" E
	4	22° 50' 39.914" N	87° 15' 27.438" E
	5	22° 50' 43.426" N	87° 15' 26.943" E
	6	22° 50' 46.059" N	87° 15' 27.004" E
	7	22° 50' 46.640" N	87° 15' 27.549" E
	8	22° 50' 45.450" N	87° 15' 28.555" E
	9	22° 50' 40.766" N	87° 15' 30.403" E
PO_PSM_GB1_SB_19	1	22° 50' 43.501" N	87° 17' 2.057" E
	2	22° 50' 43.358" N	87° 17' 0.741" E
	3	22° 50' 46.620" N	87° 17' 2.146" E
	4	22° 50' 49.715" N	87° 17' 3.489" E
	5	22° 50' 51.787" N	87° 17' 4.595" E
	6	22° 50' 51.549" N	87° 17' 5.639" E
	7	22° 50' 49.622" N	87° 17' 5.338" E
	8	22° 50' 46.527" N	87° 17' 3.772" E
PO_PSM_GB1_SB_22_23	1	22° 51' 18.820" N	87° 17' 36.669" E
	2	22° 51' 18.701" N	87° 17' 26.641" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	3	22° 51' 19.200" N	87° 17' 26.215" E
	4	22° 51' 20.486" N	87° 17' 31.239" E
	5	22° 51' 22.334" N	87° 17' 36.591" E
	6	22° 51' 23.363" N	87° 17' 38.710" E
	7	22° 51' 24.753" N	87° 17' 40.774" E
	8	22° 51' 26.707" N	87° 17' 44.956" E
	9	22° 51' 28.288" N	87° 17' 47.349" E
	10	22° 51' 27.690" N	87° 17' 48.921" E
	11	22° 51' 26.648" N	87° 17' 47.381" E
	12	22° 51' 22.801" N	87° 17' 42.768" E
PO_PSM_GB1_SB_29A	1	22° 51' 56.568" N	87° 20' 49.137" E
	2	22° 51' 55.891" N	87° 20' 47.531" E
	3	22° 51' 58.084" N	87° 20' 49.356" E
	4	22° 52' 2.317" N	87° 20' 52.324" E
	5	22° 52' 5.065" N	87° 20' 54.901" E
	6	22° 52' 8.145" N	87° 20' 56.558" E
	7	22° 52' 10.836" N	87° 20' 57.417" E
	8	22° 52' 10.655" N	87° 20' 59.944" E
	9	22° 52' 9.484" N	87° 21' 0.238" E
	10	22° 52' 5.290" N	87° 20' 58.370" E
	11	22° 52' 4.538" N	87° 20' 55.843" E
PO_PSM_GB1_SB_29B	1	22° 52' 31.648" N	87° 21' 0.741" E
	2	22° 52' 27.460" N	87° 20' 58.917" E
	3	22° 52' 28.743" N	87° 20' 58.940" E
	4	22° 52' 32.220" N	87° 20' 58.652" E
	5	22° 52' 34.354" N	87° 20' 58.472" E
	6	22° 52' 38.416" N	87° 20' 58.073" E
	7	22° 52' 41.859" N	87° 20' 57.674" E
	8	22° 52' 45.716" N	87° 20' 56.866" E
	9	22° 52' 49.400" N	87° 20' 56.281" E
	10	22° 52' 52.463" N	87° 20' 56.289" E
	11	22° 52' 56.420" N	87° 20' 56.782" E
	12	22° 52' 59.344" N	87° 20' 57.384" E
	13	22° 53' 0.262" N	87° 20' 57.641" E
	14	22° 52' 54.164" N	87° 20' 57.753" E
	15	22° 52' 49.138" N	87° 20' 58.185" E
	16	22° 52' 45.349" N	87° 20' 59.662" E
	17	22° 52' 40.459" N	87° 21' 0.689" E
	18	22° 52' 35.571" N	87° 21' 1.345" E

CODE	POINT_NO	LATITUDE	LONGITUDE
PO_PSM_GB1_SB_32	1	22° 52' 41.861" N	87° 22' 49.821" E
	2	22° 52' 39.818" N	87° 22' 40.529" E
	3	22° 52' 40.062" N	87° 22' 24.707" E
	4	22° 52' 42.515" N	87° 22' 20.655" E
	5	22° 52' 41.456" N	87° 22' 33.575" E
	6	22° 52' 41.397" N	87° 22' 34.395" E
	7	22° 52' 41.011" N	87° 22' 37.662" E
	8	22° 52' 41.410" N	87° 22' 43.681" E
	9	22° 52' 44.798" N	87° 22' 51.676" E
	10	22° 52' 47.748" N	87° 22' 55.882" E
	11	22° 52' 49.366" N	87° 22' 58.379" E
	12	22° 52' 47.898" N	87° 22' 58.010" E
	13	22° 52' 44.605" N	87° 22' 53.766" E
PO_PSM_GB1_SB_32A	1	22° 52' 55.181" N	87° 23' 32.054" E
	2	22° 52' 54.409" N	87° 23' 32.085" E
	3	22° 52' 54.615" N	87° 23' 31.588" E
	4	22° 52' 53.767" N	87° 23' 26.757" E
	5	22° 52' 53.773" N	87° 23' 24.157" E
	6	22° 52' 54.046" N	87° 23' 18.307" E
	7	22° 52' 53.622" N	87° 23' 15.613" E
	8	22° 52' 52.514" N	87° 23' 11.245" E
	9	22° 52' 50.373" N	87° 23' 7.153" E
	10	22° 52' 47.973" N	87° 23' 3.339" E
	11	22° 52' 46.724" N	87° 23' 0.685" E
	12	22° 52' 51.056" N	87° 23' 1.881" E
	13	22° 52' 55.313" N	87° 23' 6.276" E
	14	22° 52' 58.937" N	87° 23' 16.167" E
	15	22° 52' 58.509" N	87° 23' 22.332" E
	16	22° 52' 57.118" N	87° 23' 28.048" E
PO_PSM_GB1_SB_32B	1	22° 53' 0.134" N	87° 23' 54.624" E
	2	22° 52' 57.198" N	87° 23' 51.301" E
	3	22° 52' 54.660" N	87° 23' 47.728" E
	4	22° 52' 54.047" N	87° 23' 45.052" E
	5	22° 52' 53.998" N	87° 23' 37.251" E
	6	22° 52' 56.210" N	87° 23' 33.246" E
	7	22° 52' 58.066" N	87° 23' 31.279" E
	8	22° 52' 58.054" N	87° 23' 32.201" E
	9	22° 52' 58.074" N	87° 23' 37.661" E
	10	22° 52' 58.441" N	87° 23' 42.640" E

CODE	POINT_NO	LATITUDE	LONGITUDE
	11	22° 52' 59.220" N	87° 23' 47.620" E
	12	22° 52' 59.726" N	87° 23' 51.744" E
PO_PSM_GB1_SB_34	1	22° 52' 20.535" N	87° 24' 16.999" E
	2	22° 52' 19.586" N	87° 24' 17.743" E
	3	22° 52' 20.723" N	87° 24' 15.783" E
	4	22° 52' 24.243" N	87° 24' 11.782" E
	5	22° 52' 27.209" N	87° 24' 9.562" E
	6	22° 52' 31.197" N	87° 24' 11.357" E
	7	22° 52' 31.514" N	87° 24' 12.157" E
	8	22° 52' 29.697" N	87° 24' 12.122" E
	9	22° 52' 27.699" N	87° 24' 12.934" E
	10	22° 52' 26.472" N	87° 24' 13.515" E
	11	22° 52' 23.889" N	87° 24' 14.632" E
	12	22° 52' 21.614" N	87° 24' 16.000" E

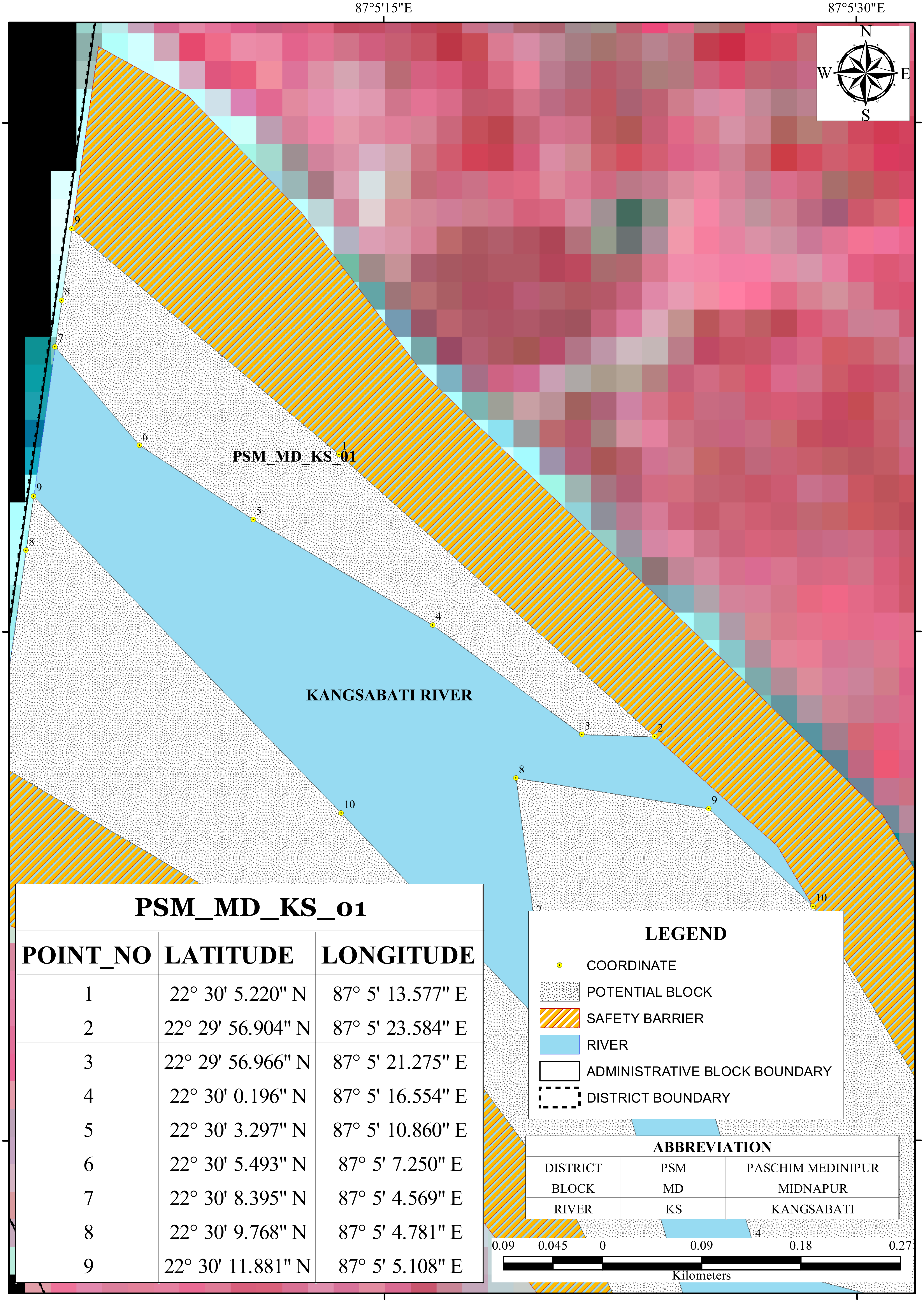
CODE	POINT NO	LATITUDE	LONGITUDE
PO_PSM_GB2_SB_07	1	22° 50' 18.885" N	87° 14' 28.676" E
	2	22° 50' 16.343" N	87° 14' 27.058" E
	3	22° 50' 17.398" N	87° 14' 23.370" E
	4	22° 50' 21.333" N	87° 14' 15.951" E
	5	22° 50' 24.433" N	87° 14' 13.532" E
	6	22° 50' 23.139" N	87° 14' 18.784" E
	7	22° 50' 21.066" N	87° 14' 23.960" E
	8	22° 50' 19.305" N	87° 14' 27.856" E
PO_PSM_GB2_SB_08	1	22° 49' 58.614" N	87° 15' 7.150" E
	2	22° 49' 58.313" N	87° 15' 5.961" E
	3	22° 49' 58.481" N	87° 15' 4.327" E
	4	22° 49' 58.099" N	87° 15' 2.455" E
	5	22° 50' 0.060" N	87° 15' 0.922" E
	6	22° 50' 0.085" N	87° 14' 59.756" E
	7	22° 50' 0.192" N	87° 14' 58.659" E
	8	22° 50' 1.640" N	87° 14' 59.351" E
	9	22° 50' 2.440" N	87° 15' 4.768" E
	10	22° 50' 2.732" N	87° 15' 5.696" E
	11	22° 50' 3.096" N	87° 15' 6.777" E
	12	22° 50' 3.625" N	87° 15' 8.126" E
	13	22° 50' 4.198" N	87° 15' 9.275" E
	14	22° 50' 5.301" N	87° 15' 11.327" E
	15	22° 50' 6.509" N	87° 15' 13.575" E

CODE	POINT NO	LATITUDE	LONGITUDE
	16	22° 50' 6.767" N	87° 15' 14.027" E
	17	22° 50' 6.894" N	87° 15' 14.187" E
	18	22° 50' 8.235" N	87° 15' 15.628" E
	19	22° 50' 9.819" N	87° 15' 17.312" E
	20	22° 50' 11.264" N	87° 15' 18.836" E
	21	22° 50' 13.068" N	87° 15' 20.318" E
	22	22° 50' 15.268" N	87° 15' 22.129" E
	23	22° 50' 16.731" N	87° 15' 23.308" E
	24	22° 50' 17.644" N	87° 15' 23.940" E
	25	22° 50' 19.216" N	87° 15' 24.892" E
	26	22° 50' 23.974" N	87° 15' 26.794" E
	27	22° 50' 22.703" N	87° 15' 26.682" E
	28	22° 50' 21.409" N	87° 15' 26.798" E
	29	22° 50' 19.921" N	87° 15' 27.568" E
	30	22° 50' 17.114" N	87° 15' 26.820" E
	31	22° 50' 15.353" N	87° 15' 25.985" E
	32	22° 50' 13.510" N	87° 15' 24.763" E
	33	22° 50' 11.694" N	87° 15' 24.136" E
	34	22° 50' 10.594" N	87° 15' 23.094" E
	35	22° 50' 8.586" N	87° 15' 21.664" E
	36	22° 50' 7.569" N	87° 15' 20.445" E
	37	22° 50' 6.607" N	87° 15' 19.522" E
	38	22° 50' 6.031" N	87° 15' 18.451" E
	39	22° 50' 5.316" N	87° 15' 17.470" E
	40	22° 50' 4.354" N	87° 15' 16.458" E
	41	22° 50' 3.750" N	87° 15' 15.655" E
	42	22° 50' 2.788" N	87° 15' 14.613" E
	43	22° 50' 0.974" N	87° 15' 12.382" E
	44	22° 50' 0.123" N	87° 15' 11.103" E
	45	22° 49' 59.451" N	87° 15' 10.025" E
	46	22° 49' 59.234" N	87° 15' 9.603" E
	47	22° 49' 58.943" N	87° 15' 8.576" E
PO_PSM_DB_KS_58	1	22° 26' 33.694" N	87° 38' 28.905" E
	2	22° 26' 33.222" N	87° 38' 30.947" E
	3	22° 26' 33.387" N	87° 38' 32.669" E
	4	22° 26' 34.496" N	87° 38' 35.303" E
	5	22° 26' 35.740" N	87° 38' 38.382" E
	6	22° 26' 36.572" N	87° 38' 41.089" E
	7	22° 26' 36.836" N	87° 38' 43.867" E

CODE	POINT NO	LATITUDE	LONGITUDE
	8	22° 26' 36.500" N	87° 38' 46.087" E
	9	22° 26' 36.037" N	87° 38' 47.883" E
	10	22° 26' 34.807" N	87° 38' 47.637" E
	11	22° 26' 35.516" N	87° 38' 43.695" E
	12	22° 26' 35.319" N	87° 38' 41.317" E
	13	22° 26' 34.727" N	87° 38' 39.204" E
	14	22° 26' 34.126" N	87° 38' 37.380" E
	15	22° 26' 32.641" N	87° 38' 33.556" E
	16	22° 26' 32.542" N	87° 38' 33.318" E
	17	22° 26' 32.112" N	87° 38' 32.372" E
	18	22° 26' 32.258" N	87° 38' 29.496" E
	19	22° 26' 32.446" N	87° 38' 28.930" E
	20	22° 26' 33.113" N	87° 38' 26.818" E
	21	22° 26' 33.128" N	87° 38' 26.793" E
	22	22° 26' 33.623" N	87° 38' 25.953" E
	23	22° 26' 34.291" N	87° 38' 25.293" E
	24	22° 26' 34.713" N	87° 38' 24.820" E
	25	22° 26' 35.459" N	87° 38' 24.223" E
	26	22° 26' 35.863" N	87° 38' 23.960" E
	27	22° 26' 36.420" N	87° 38' 23.994" E
	28	22° 26' 37.297" N	87° 38' 24.187" E
	29	22° 26' 37.837" N	87° 38' 24.352" E
	30	22° 26' 37.688" N	87° 38' 24.395" E
	31	22° 26' 36.872" N	87° 38' 24.696" E
	32	22° 26' 36.685" N	87° 38' 24.857" E
	33	22° 26' 35.690" N	87° 38' 25.713" E
	34	22° 26' 34.653" N	87° 38' 27.063" E
	35	22° 26' 33.831" N	87° 38' 28.548" E

Annexure 4
Map showing of Potential Blocks of Paschim Medinipur District

POTENTIAL BLOCK PSM_MD_KS_01 OF KANGSABATI RIVER



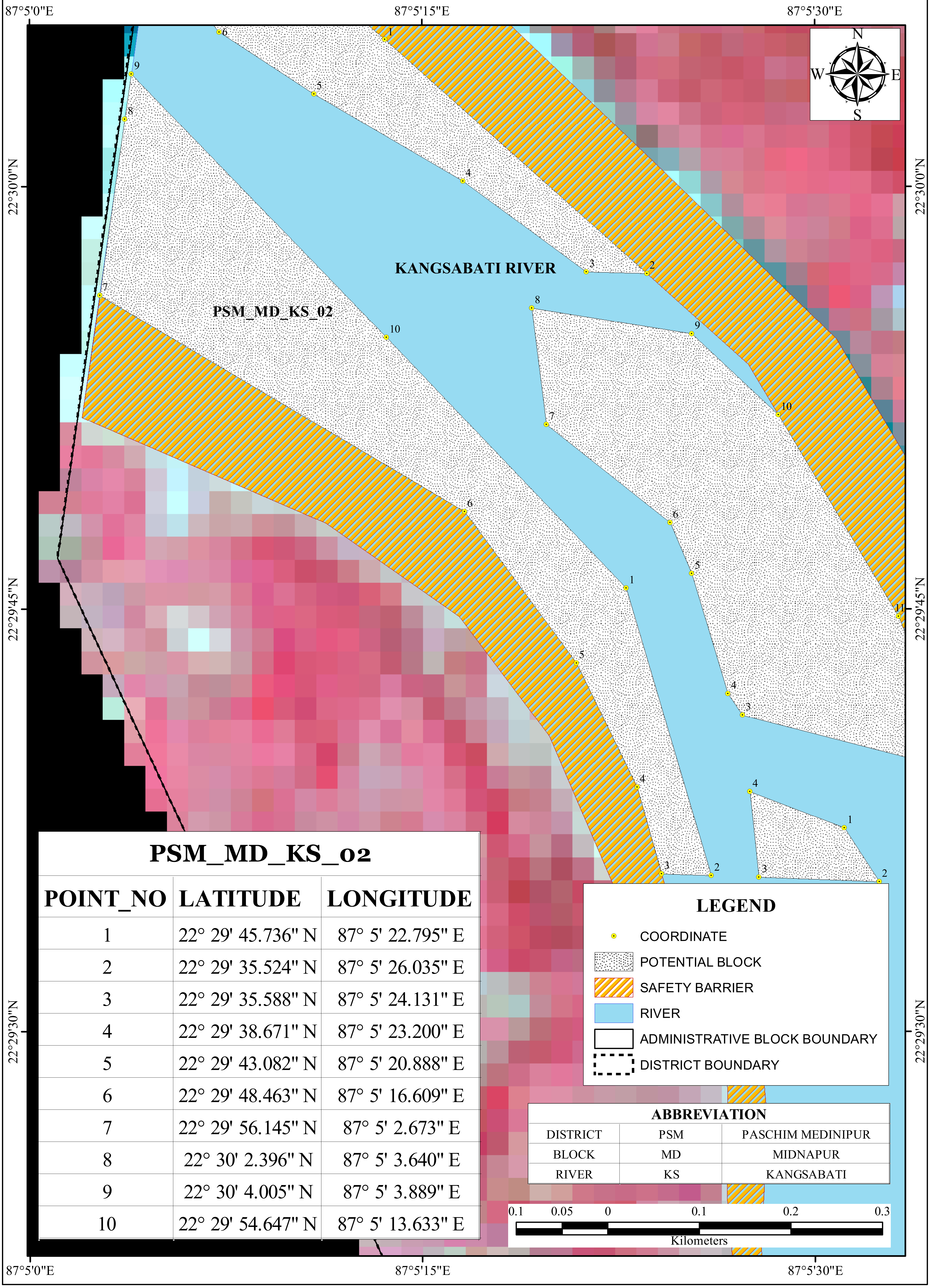
PSM_MD_KS_01

POINT_NO	LATITUDE	LONGITUDE
1	22° 30' 5.220" N	87° 5' 13.577" E
2	22° 29' 56.904" N	87° 5' 23.584" E
3	22° 29' 56.966" N	87° 5' 21.275" E
4	22° 30' 0.196" N	87° 5' 16.554" E
5	22° 30' 3.297" N	87° 5' 10.860" E
6	22° 30' 5.493" N	87° 5' 7.250" E
7	22° 30' 8.395" N	87° 5' 4.569" E
8	22° 30' 9.768" N	87° 5' 4.781" E
9	22° 30' 11.881" N	87° 5' 5.108" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

POTENTIAL PSM_MD_KS_02 OF KANGSABATI RIVER



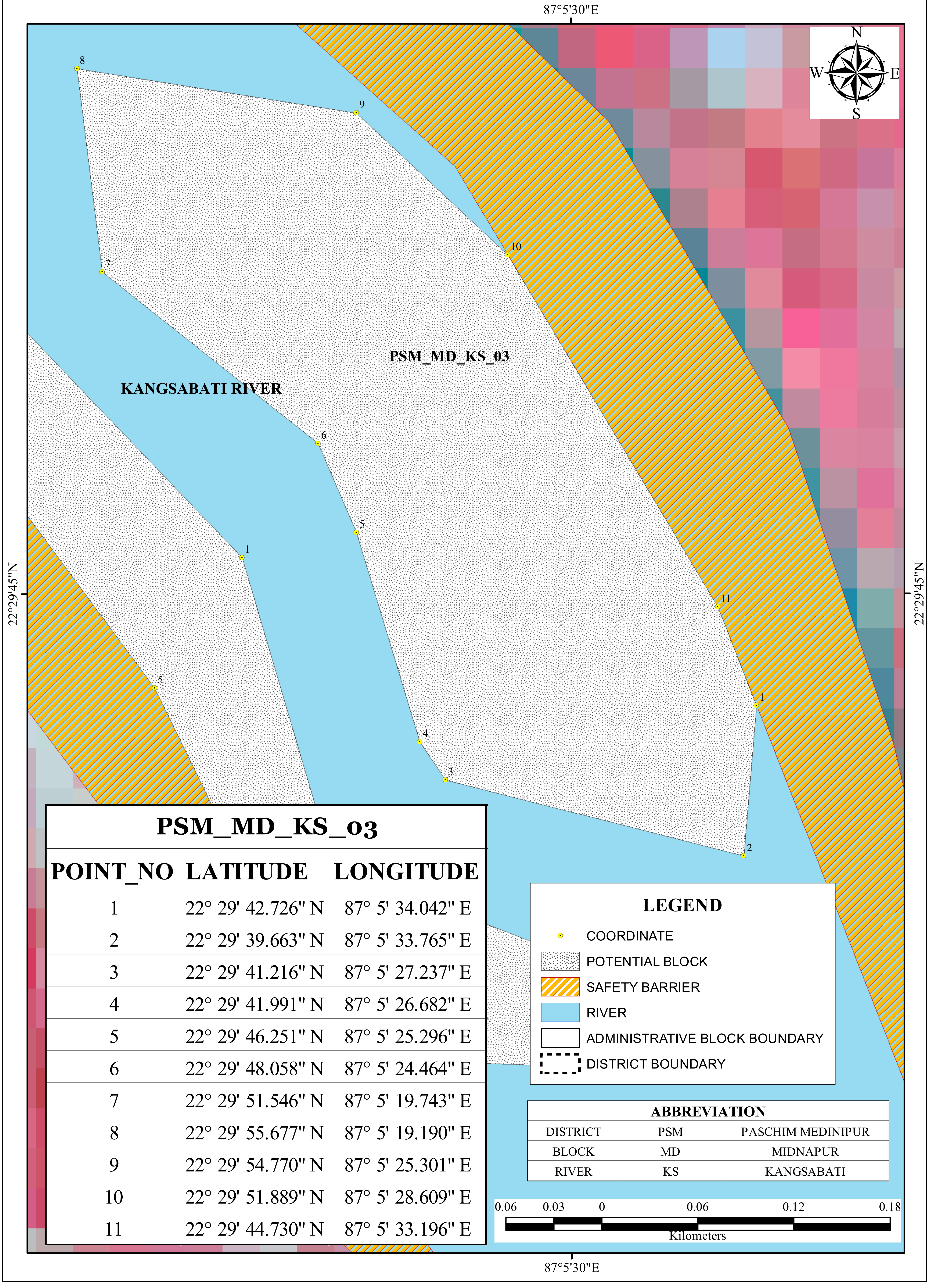
PSM_MD_KS_02

POINT_NO	LATITUDE	LONGITUDE
1	22° 29' 45.736" N	87° 5' 22.795" E
2	22° 29' 35.524" N	87° 5' 26.035" E
3	22° 29' 35.588" N	87° 5' 24.131" E
4	22° 29' 38.671" N	87° 5' 23.200" E
5	22° 29' 43.082" N	87° 5' 20.888" E
6	22° 29' 48.463" N	87° 5' 16.609" E
7	22° 29' 56.145" N	87° 5' 2.673" E
8	22° 30' 2.396" N	87° 5' 3.640" E
9	22° 30' 4.005" N	87° 5' 3.889" E
10	22° 29' 54.647" N	87° 5' 13.633" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_MD_KS_03 OF KANGSABATI RIVER



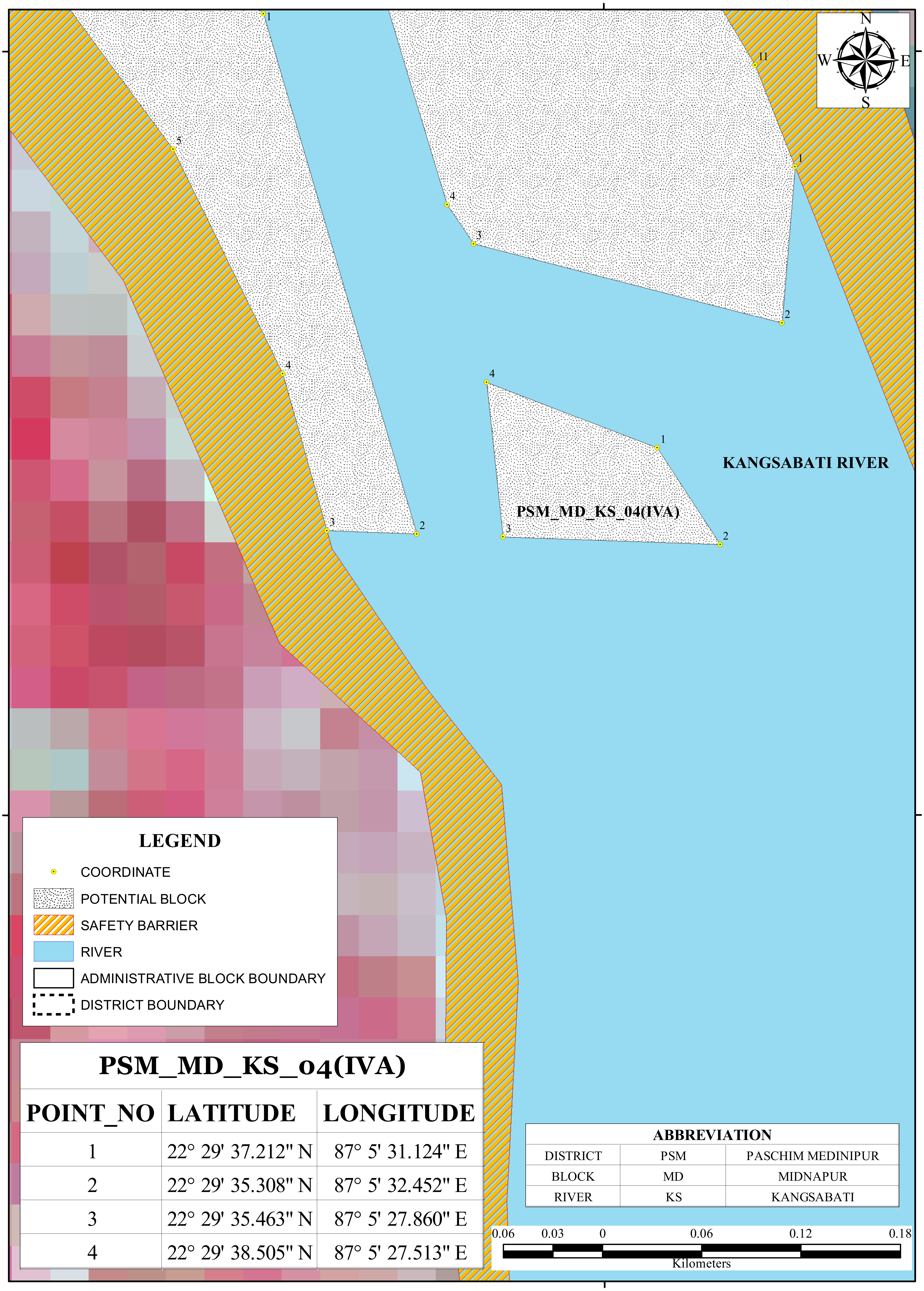
PSM_MD_KS_03

POINT_NO	LATITUDE	LONGITUDE
1	22° 29' 42.726" N	87° 5' 34.042" E
2	22° 29' 39.663" N	87° 5' 33.765" E
3	22° 29' 41.216" N	87° 5' 27.237" E
4	22° 29' 41.991" N	87° 5' 26.682" E
5	22° 29' 46.251" N	87° 5' 25.296" E
6	22° 29' 48.058" N	87° 5' 24.464" E
7	22° 29' 51.546" N	87° 5' 19.743" E
8	22° 29' 55.677" N	87° 5' 19.190" E
9	22° 29' 54.770" N	87° 5' 25.301" E
10	22° 29' 51.889" N	87° 5' 28.609" E
11	22° 29' 44.730" N	87° 5' 33.196" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_MD_KS_04(IVA) OF KANGSABATI RIVER

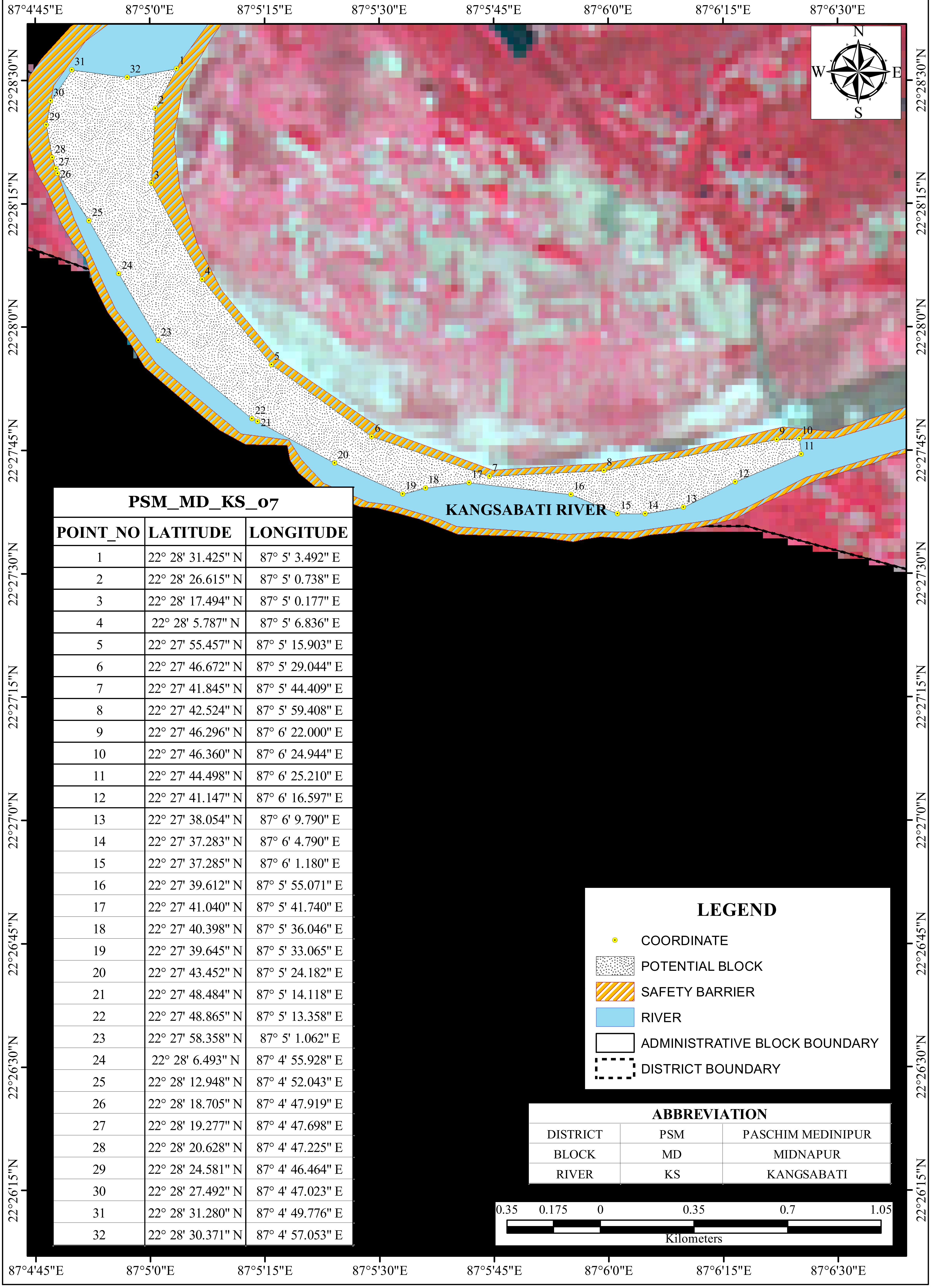


PSM_MD_KS_04(IVA)

POINT_NO	LATITUDE	LONGITUDE
1	22° 29' 37.212" N	87° 5' 31.124" E
2	22° 29' 35.308" N	87° 5' 32.452" E
3	22° 29' 35.463" N	87° 5' 27.860" E
4	22° 29' 38.505" N	87° 5' 27.513" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_MD_KS_07 OF KANGSABATI RIVER



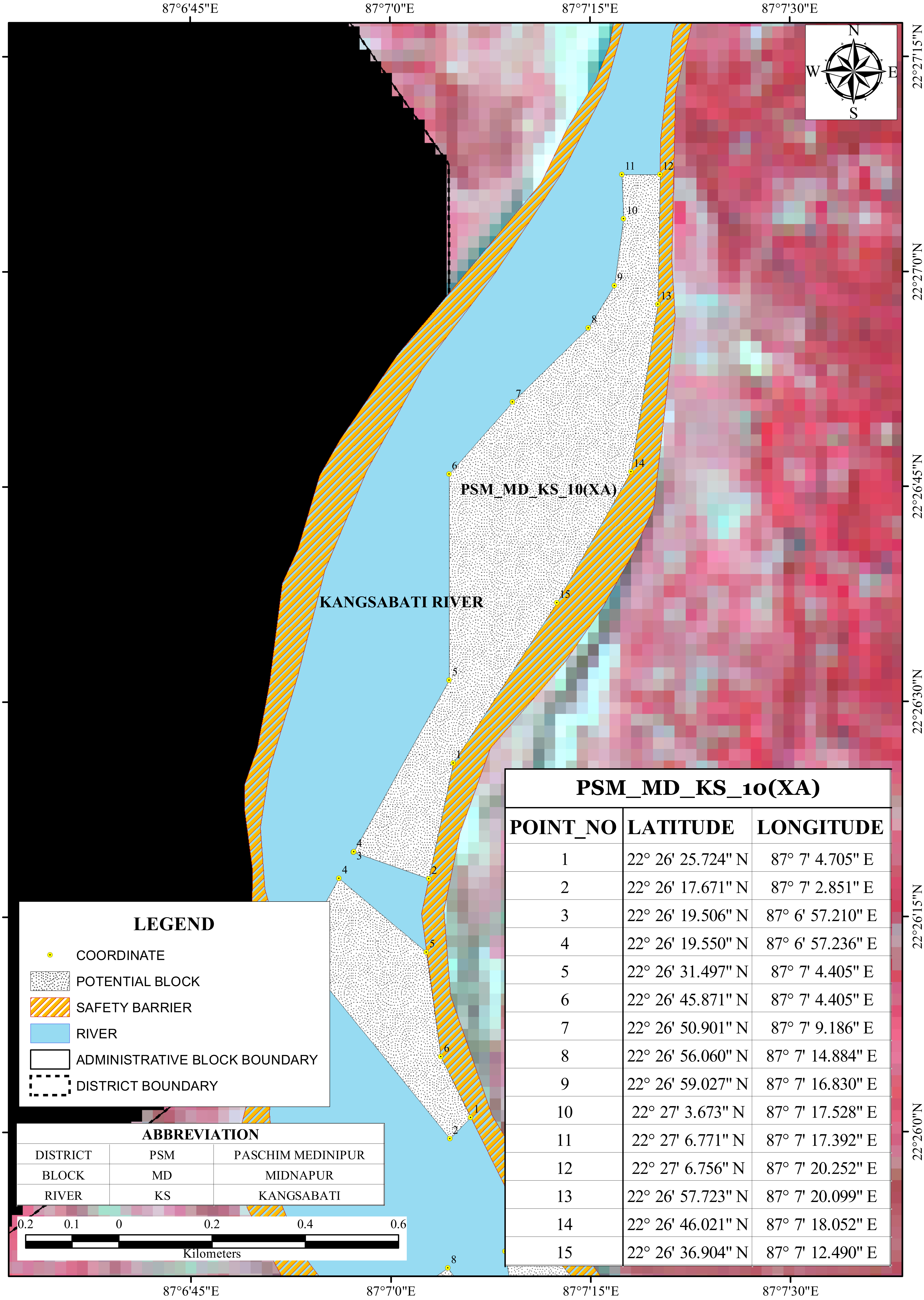
PSM_MD_KS_07		
POINT_NO	LATITUDE	LONGITUDE
1	22° 28' 31.425" N	87° 5' 3.492" E
2	22° 28' 26.615" N	87° 5' 0.738" E
3	22° 28' 17.494" N	87° 5' 0.177" E
4	22° 28' 5.787" N	87° 5' 6.836" E
5	22° 27' 55.457" N	87° 5' 15.903" E
6	22° 27' 46.672" N	87° 5' 29.044" E
7	22° 27' 41.845" N	87° 5' 44.409" E
8	22° 27' 42.524" N	87° 5' 59.408" E
9	22° 27' 46.296" N	87° 6' 22.000" E
10	22° 27' 46.360" N	87° 6' 24.944" E
11	22° 27' 44.498" N	87° 6' 25.210" E
12	22° 27' 41.147" N	87° 6' 16.597" E
13	22° 27' 38.054" N	87° 6' 9.790" E
14	22° 27' 37.283" N	87° 6' 4.790" E
15	22° 27' 37.285" N	87° 6' 1.180" E
16	22° 27' 39.612" N	87° 5' 55.071" E
17	22° 27' 41.040" N	87° 5' 41.740" E
18	22° 27' 40.398" N	87° 5' 36.046" E
19	22° 27' 39.645" N	87° 5' 33.065" E
20	22° 27' 43.452" N	87° 5' 24.182" E
21	22° 27' 48.484" N	87° 5' 14.118" E
22	22° 27' 48.865" N	87° 5' 13.358" E
23	22° 27' 58.358" N	87° 5' 1.062" E
24	22° 28' 6.493" N	87° 4' 55.928" E
25	22° 28' 12.948" N	87° 4' 52.043" E
26	22° 28' 18.705" N	87° 4' 47.919" E
27	22° 28' 19.277" N	87° 4' 47.698" E
28	22° 28' 20.628" N	87° 4' 47.225" E
29	22° 28' 24.581" N	87° 4' 46.464" E
30	22° 28' 27.492" N	87° 4' 47.023" E
31	22° 28' 31.280" N	87° 4' 49.776" E
32	22° 28' 30.371" N	87° 4' 57.053" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

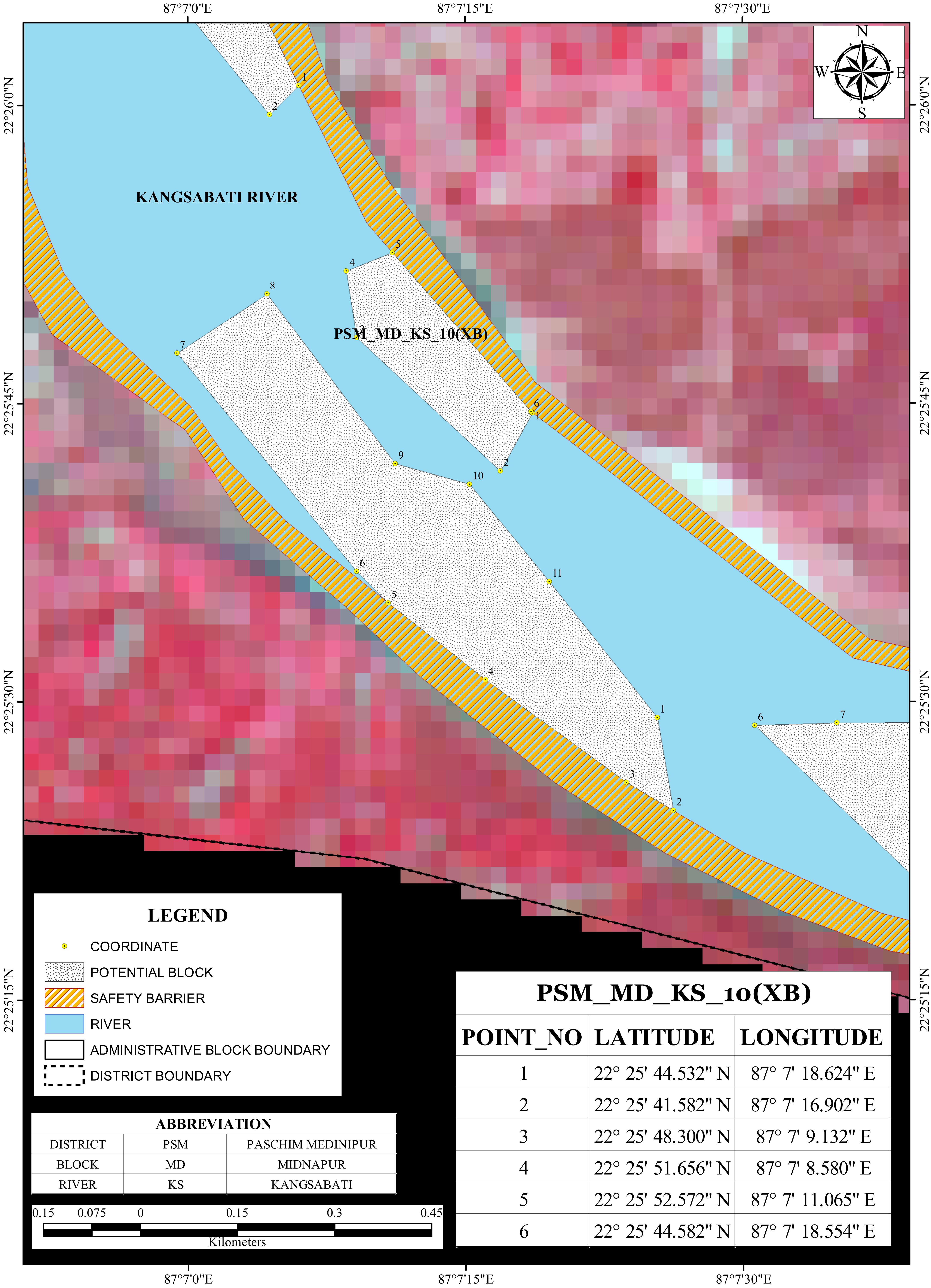
POTENTIAL BLOCK PSM_MD_KS_10(XA) OF KANGSABATI RIVER



PSM_MD_KS_10(XA)

POINT_NO	LATITUDE	LONGITUDE
1	22° 26' 25.724" N	87° 7' 4.705" E
2	22° 26' 17.671" N	87° 7' 2.851" E
3	22° 26' 19.506" N	87° 6' 57.210" E
4	22° 26' 19.550" N	87° 6' 57.236" E
5	22° 26' 31.497" N	87° 7' 4.405" E
6	22° 26' 45.871" N	87° 7' 4.405" E
7	22° 26' 50.901" N	87° 7' 9.186" E
8	22° 26' 56.060" N	87° 7' 14.884" E
9	22° 26' 59.027" N	87° 7' 16.830" E
10	22° 27' 3.673" N	87° 7' 17.528" E
11	22° 27' 6.771" N	87° 7' 17.392" E
12	22° 27' 6.756" N	87° 7' 20.252" E
13	22° 26' 57.723" N	87° 7' 20.099" E
14	22° 26' 46.021" N	87° 7' 18.052" E
15	22° 26' 36.904" N	87° 7' 12.490" E

POTENTIAL BLOCK PSM_MD_KS_10(XB) OF KANGSABATI RIVER



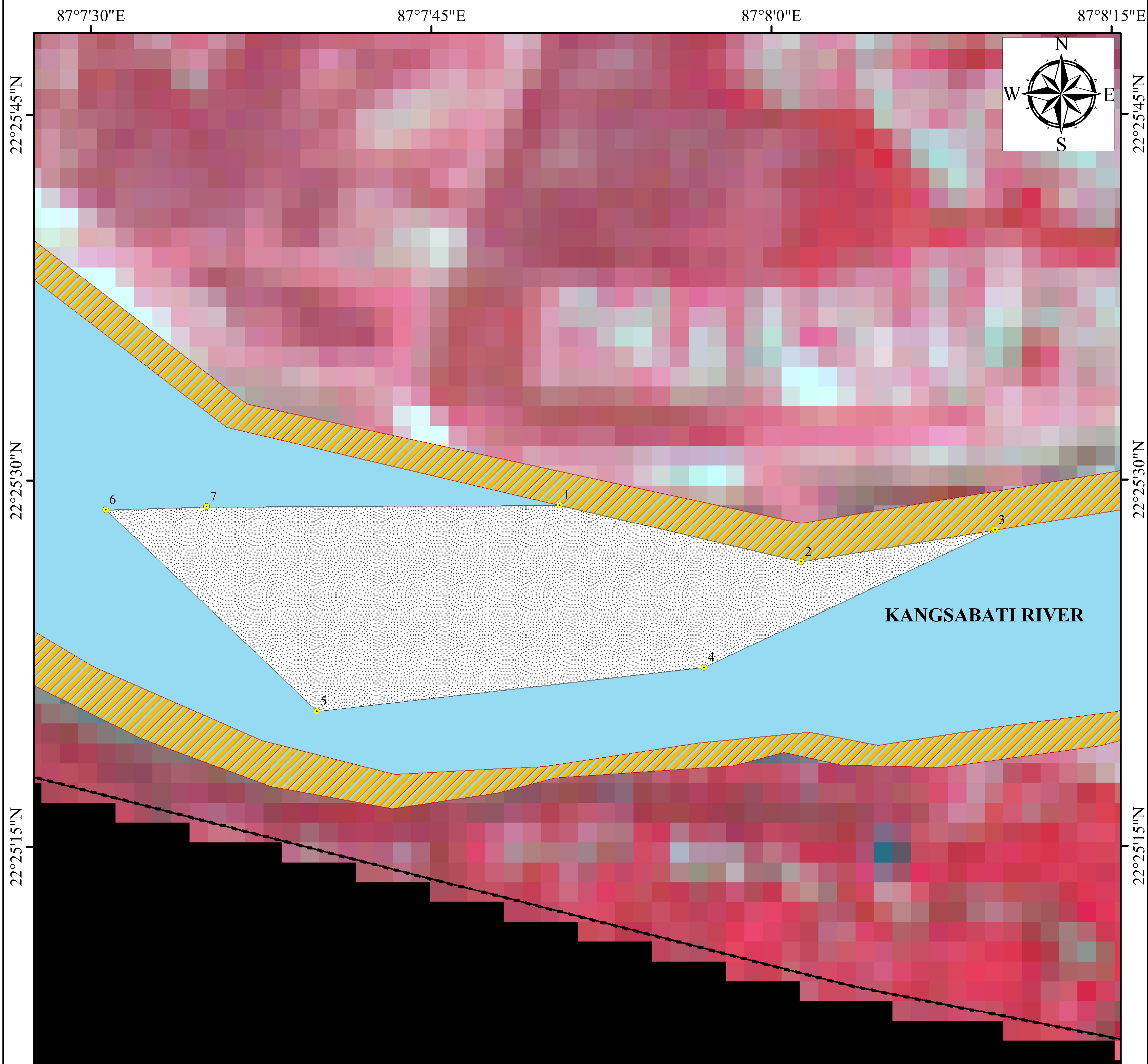
ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

PSM_MD_KS_10(XB)

POINT_NO	LATITUDE	LONGITUDE
1	22° 25' 44.532" N	87° 7' 18.624" E
2	22° 25' 41.582" N	87° 7' 16.902" E
3	22° 25' 48.300" N	87° 7' 9.132" E
4	22° 25' 51.656" N	87° 7' 8.580" E
5	22° 25' 52.572" N	87° 7' 11.065" E
6	22° 25' 44.582" N	87° 7' 18.554" E

POTENTIAL BLOCK PSM_MD_KS_10(XC) OF KANGSABATI RIVER



LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

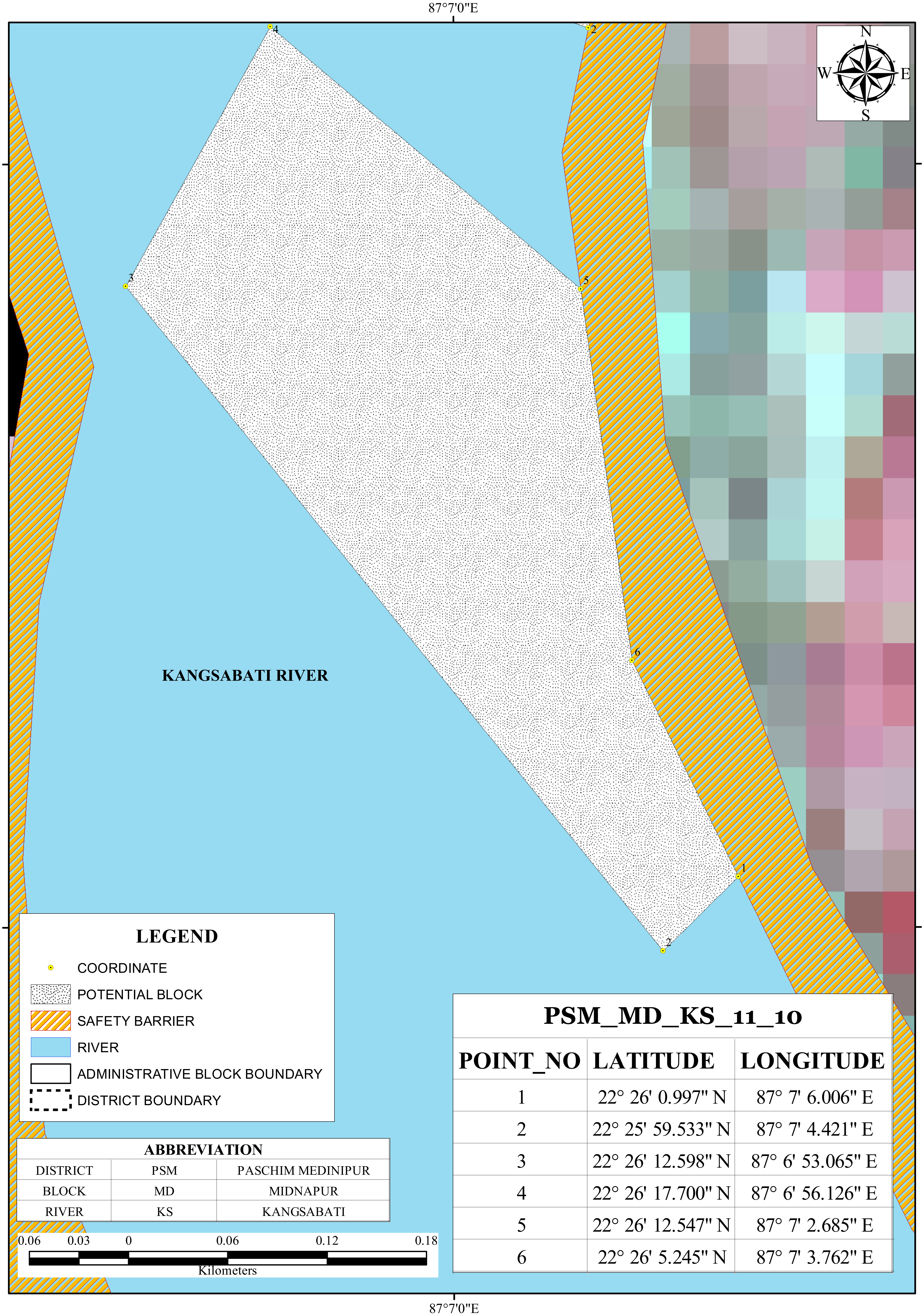
0.15 0.075 0 0.15 0.3 0.45
Kilometers

PSM_MD_KS_10(XC)

POINT_NO	LATITUDE	LONGITUDE
1	22° 25' 28.970" N	87° 7' 50.654" E
2	22° 25' 26.649" N	87° 8' 1.299" E
3	22° 25' 27.949" N	87° 8' 9.840" E
4	22° 25' 22.319" N	87° 7' 57.007" E
5	22° 25' 20.525" N	87° 7' 39.929" E
6	22° 25' 28.793" N	87° 7' 30.635" E
7	22° 25' 28.919" N	87° 7' 35.078" E

87°7'30"E 87°7'45"E 87°8'0"E 87°8'15"E

POTENTIAL BLOCK PSM_MD_KS_11_10 OF KANGSABATI RIVER



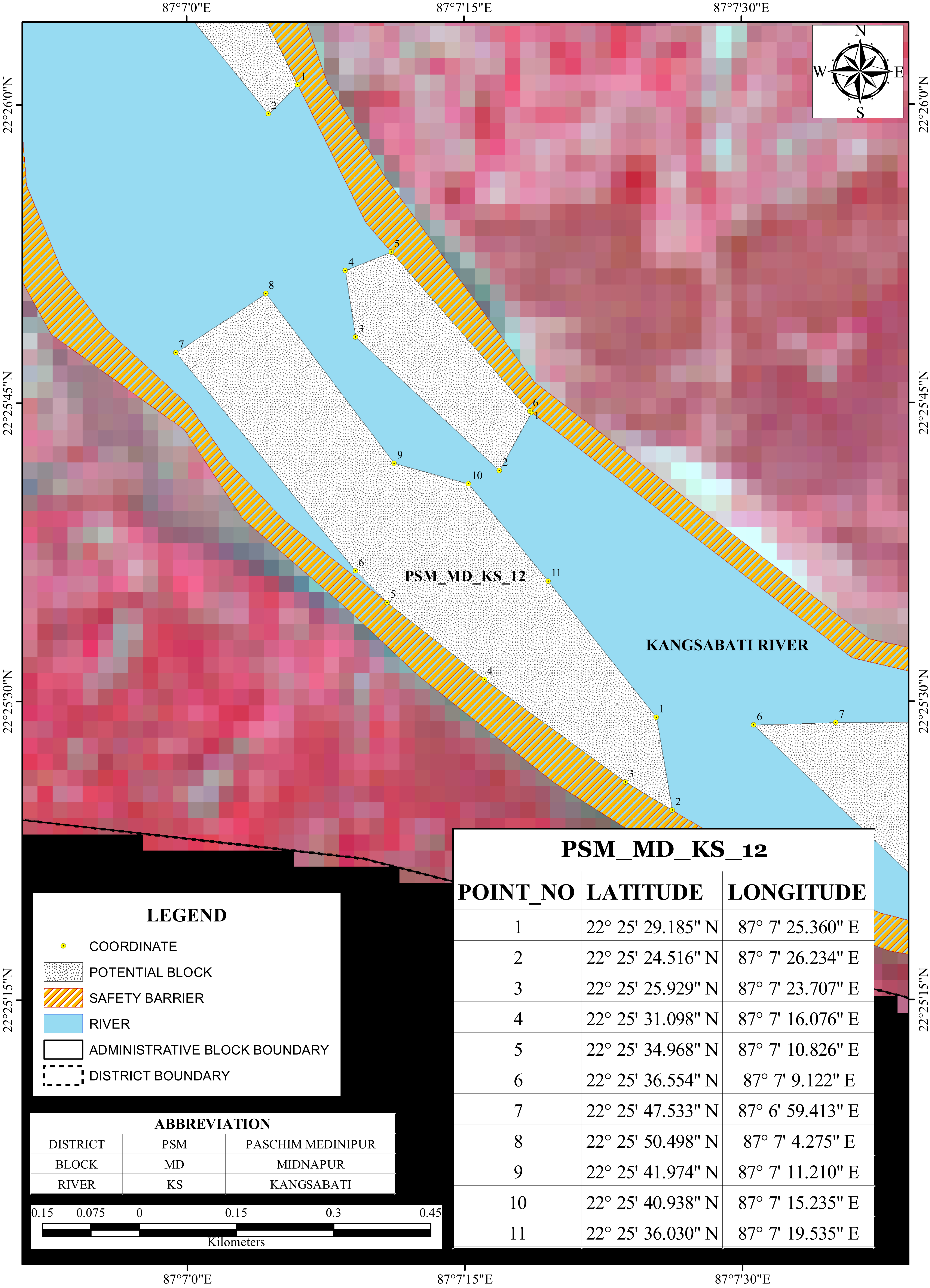
ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

PSM_MD_KS_11_10

POINT_NO	LATITUDE	LONGITUDE
1	22° 26' 0.997" N	87° 7' 6.006" E
2	22° 25' 59.533" N	87° 7' 4.421" E
3	22° 26' 12.598" N	87° 6' 53.065" E
4	22° 26' 17.700" N	87° 6' 56.126" E
5	22° 26' 12.547" N	87° 7' 2.685" E
6	22° 26' 5.245" N	87° 7' 3.762" E

POTENTIAL BLOCK PSM_MD_KS_12 OF KANGSABATI RIVER

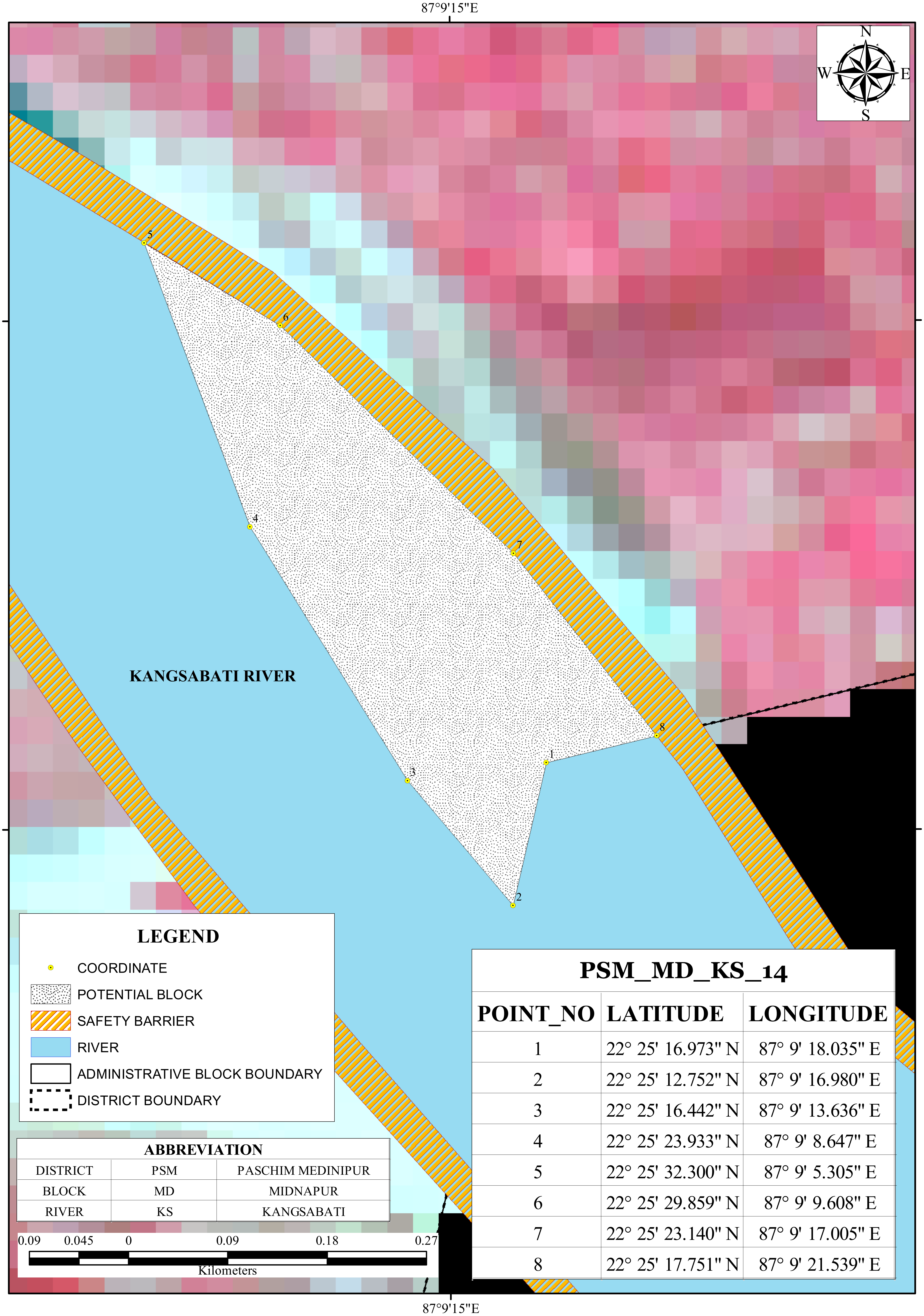


ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

PSM_MD_KS_12

POINT_NO	LATITUDE	LONGITUDE
1	22° 25' 29.185" N	87° 7' 25.360" E
2	22° 25' 24.516" N	87° 7' 26.234" E
3	22° 25' 25.929" N	87° 7' 23.707" E
4	22° 25' 31.098" N	87° 7' 16.076" E
5	22° 25' 34.968" N	87° 7' 10.826" E
6	22° 25' 36.554" N	87° 7' 9.122" E
7	22° 25' 47.533" N	87° 6' 59.413" E
8	22° 25' 50.498" N	87° 7' 4.275" E
9	22° 25' 41.974" N	87° 7' 11.210" E
10	22° 25' 40.938" N	87° 7' 15.235" E
11	22° 25' 36.030" N	87° 7' 19.535" E

POTENTIAL BLOCK PSM_MD_KS_14 OF KANGSABATI RIVER

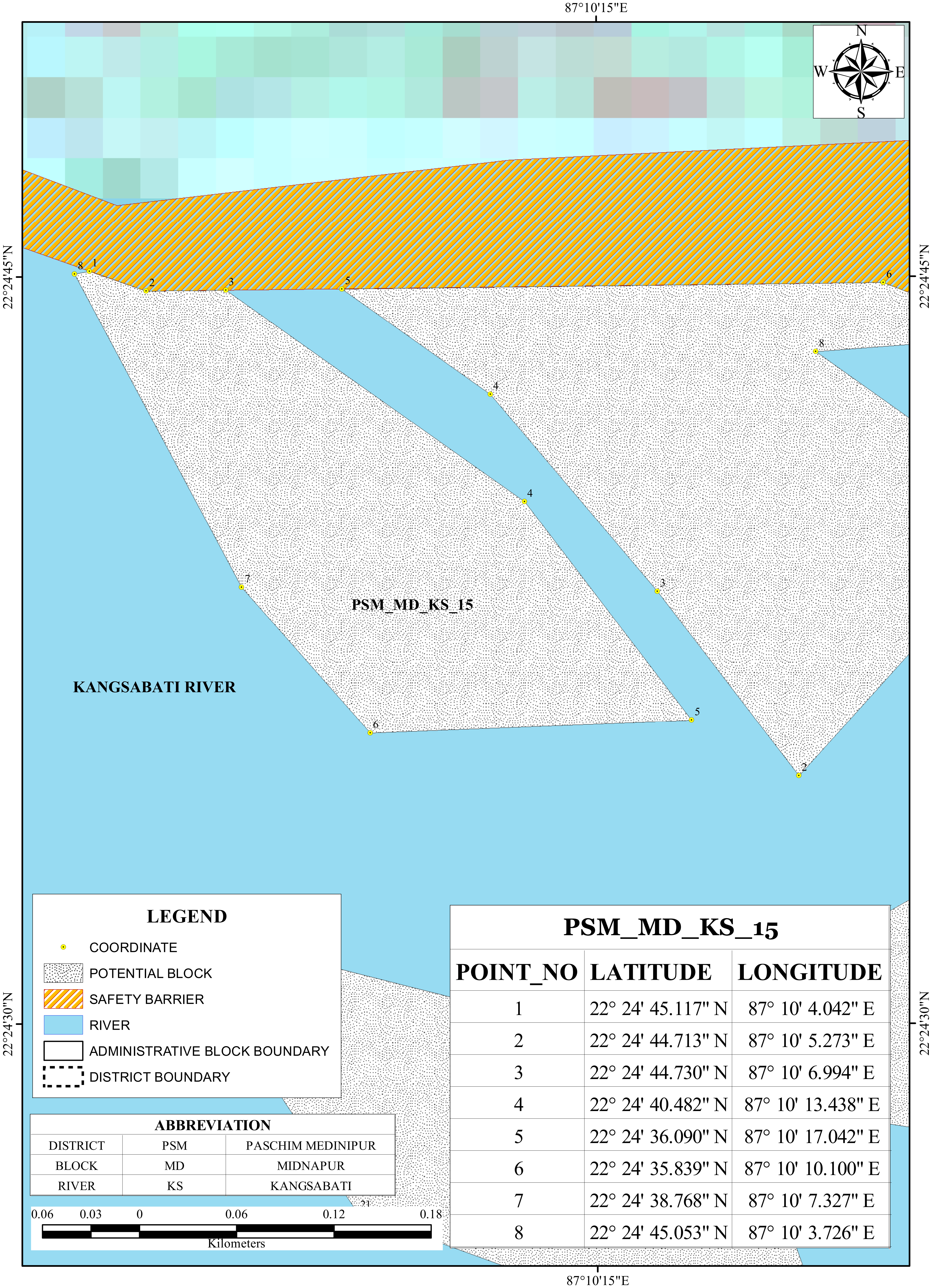


ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

PSM_MD_KS_14

POINT_NO	LATITUDE	LONGITUDE
1	22° 25' 16.973" N	87° 9' 18.035" E
2	22° 25' 12.752" N	87° 9' 16.980" E
3	22° 25' 16.442" N	87° 9' 13.636" E
4	22° 25' 23.933" N	87° 9' 8.647" E
5	22° 25' 32.300" N	87° 9' 5.305" E
6	22° 25' 29.859" N	87° 9' 9.608" E
7	22° 25' 23.140" N	87° 9' 17.005" E
8	22° 25' 17.751" N	87° 9' 21.539" E

POTENTIAL BLOCK PSM_MD_KS_15 OF KANGSABATI RIVER

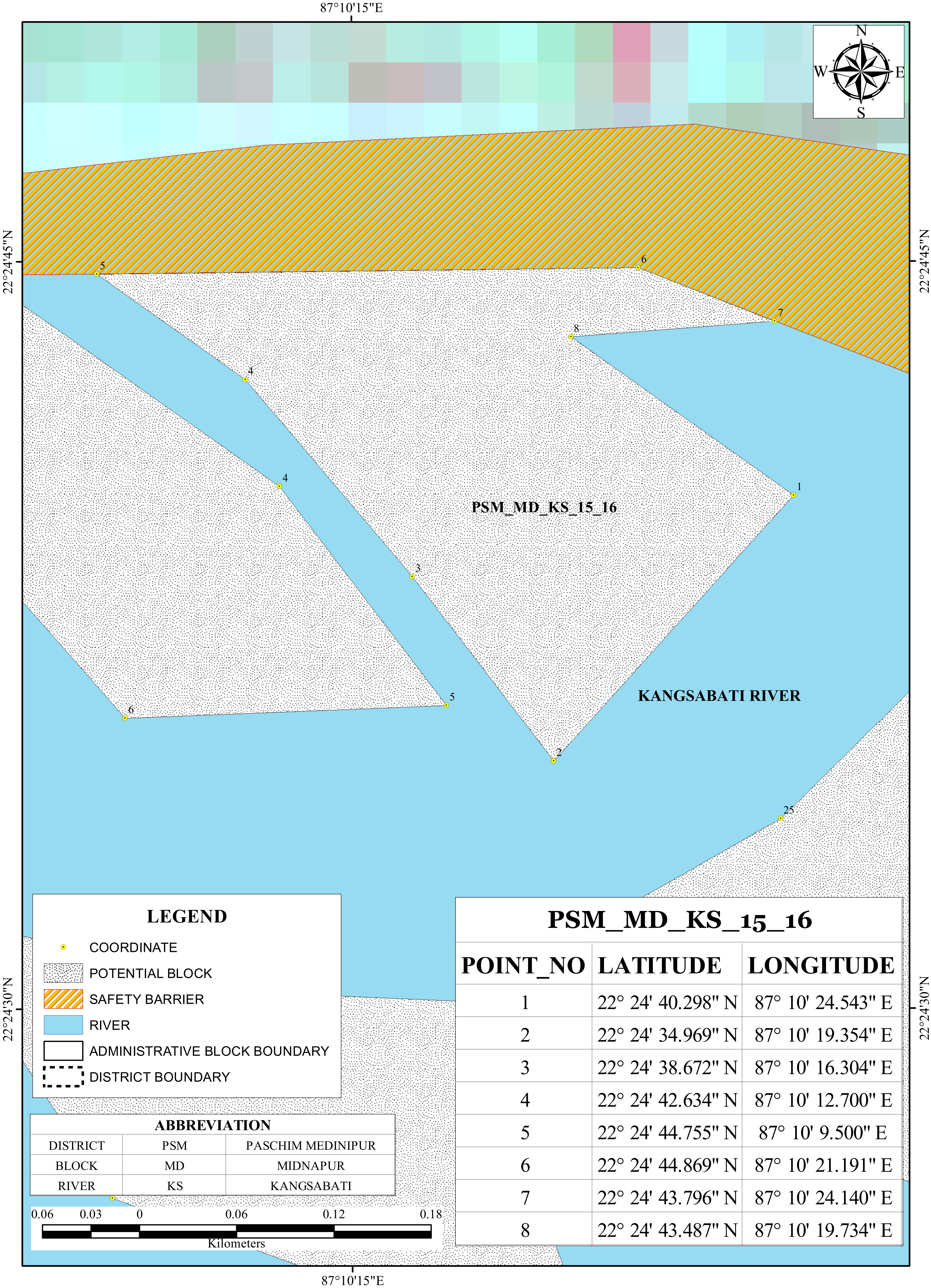


ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

PSM_MD_KS_15

POINT_NO	LATITUDE	LONGITUDE
1	22° 24' 45.117" N	87° 10' 4.042" E
2	22° 24' 44.713" N	87° 10' 5.273" E
3	22° 24' 44.730" N	87° 10' 6.994" E
4	22° 24' 40.482" N	87° 10' 13.438" E
5	22° 24' 36.090" N	87° 10' 17.042" E
6	22° 24' 35.839" N	87° 10' 10.100" E
7	22° 24' 38.768" N	87° 10' 7.327" E
8	22° 24' 45.053" N	87° 10' 3.726" E

POTENTIAL BLOCK PSM_MD_KS_15_16 OF KANGSABATI RIVER



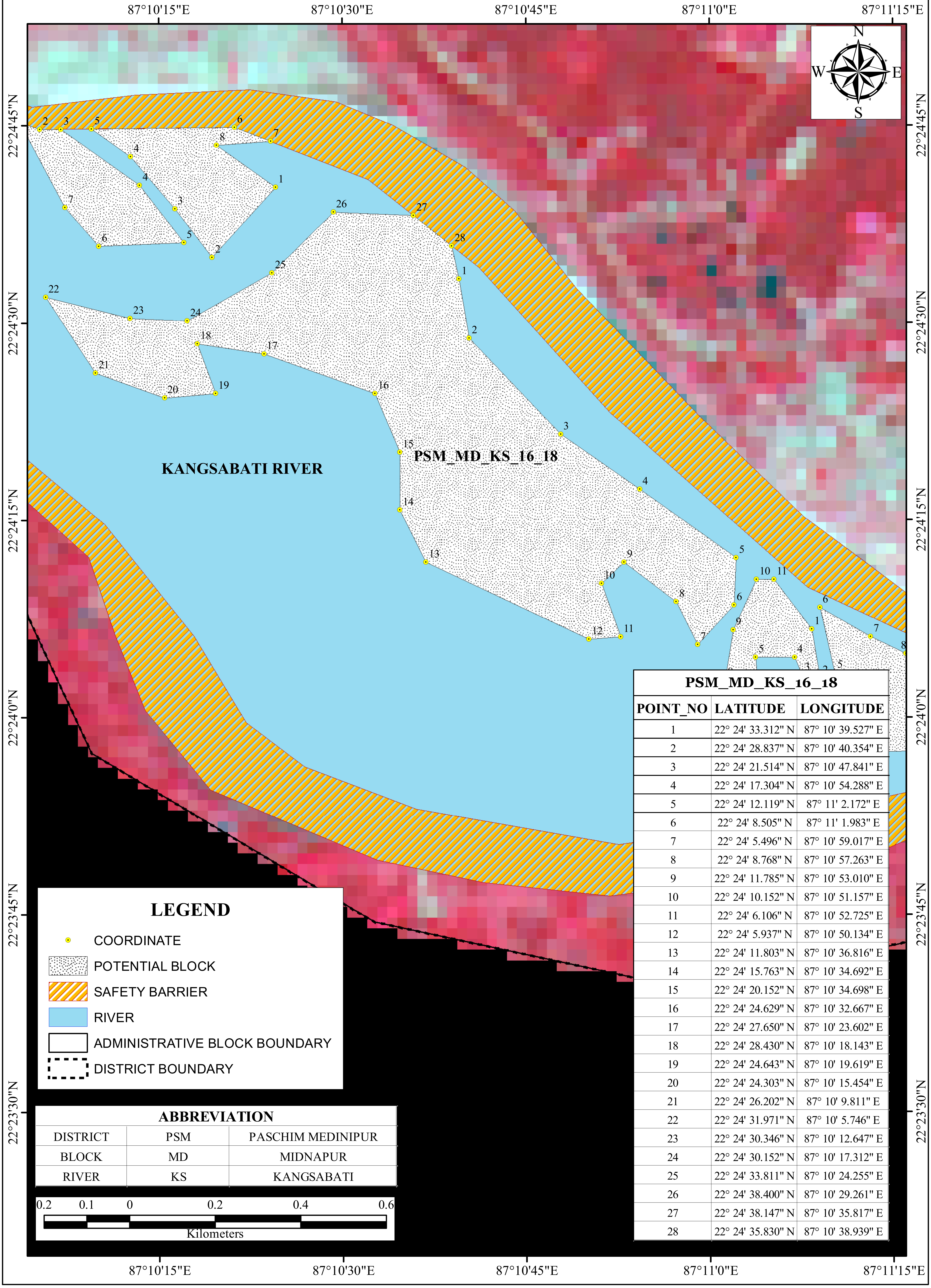
ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

PSM_MD_KS_15_16

POINT_NO	LATITUDE	LONGITUDE
1	22° 24' 40.298" N	87° 10' 24.543" E
2	22° 24' 34.969" N	87° 10' 19.354" E
3	22° 24' 38.672" N	87° 10' 16.304" E
4	22° 24' 42.634" N	87° 10' 12.700" E
5	22° 24' 44.755" N	87° 10' 9.500" E
6	22° 24' 44.869" N	87° 10' 21.191" E
7	22° 24' 43.796" N	87° 10' 24.140" E
8	22° 24' 43.487" N	87° 10' 19.734" E

POTENTIAL BLOCK PSM_MD_KS_16_18 OF KANGSABATI RIVER



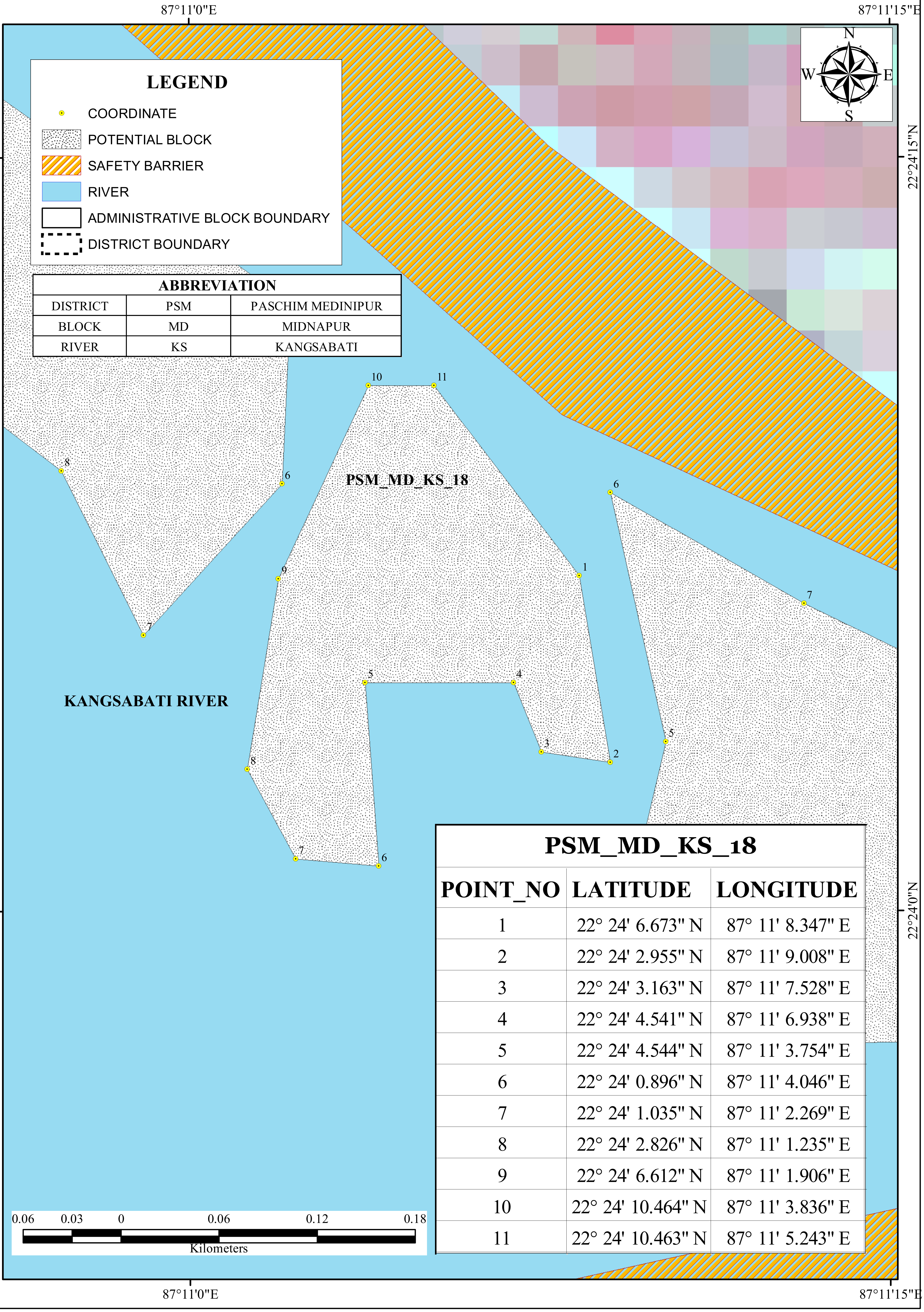
ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

PSM_MD_KS_16_18

POINT_NO	LATITUDE	LONGITUDE
1	22° 24' 33.312" N	87° 10' 39.527" E
2	22° 24' 28.837" N	87° 10' 40.354" E
3	22° 24' 21.514" N	87° 10' 47.841" E
4	22° 24' 17.304" N	87° 10' 54.288" E
5	22° 24' 12.119" N	87° 11' 2.172" E
6	22° 24' 8.505" N	87° 11' 1.983" E
7	22° 24' 5.496" N	87° 10' 59.017" E
8	22° 24' 8.768" N	87° 10' 57.263" E
9	22° 24' 11.785" N	87° 10' 53.010" E
10	22° 24' 10.152" N	87° 10' 51.157" E
11	22° 24' 6.106" N	87° 10' 52.725" E
12	22° 24' 5.937" N	87° 10' 50.134" E
13	22° 24' 11.803" N	87° 10' 36.816" E
14	22° 24' 15.763" N	87° 10' 34.692" E
15	22° 24' 20.152" N	87° 10' 34.698" E
16	22° 24' 24.629" N	87° 10' 32.667" E
17	22° 24' 27.650" N	87° 10' 23.602" E
18	22° 24' 28.430" N	87° 10' 18.143" E
19	22° 24' 24.643" N	87° 10' 19.619" E
20	22° 24' 24.303" N	87° 10' 15.454" E
21	22° 24' 26.202" N	87° 10' 9.811" E
22	22° 24' 31.971" N	87° 10' 5.746" E
23	22° 24' 30.346" N	87° 10' 12.647" E
24	22° 24' 30.152" N	87° 10' 17.312" E
25	22° 24' 33.811" N	87° 10' 24.255" E
26	22° 24' 38.400" N	87° 10' 29.261" E
27	22° 24' 38.147" N	87° 10' 35.817" E
28	22° 24' 35.830" N	87° 10' 38.939" E

POTENTIAL BLOCK PSM_MD_KS_18 OF KANGSABATI RIVER

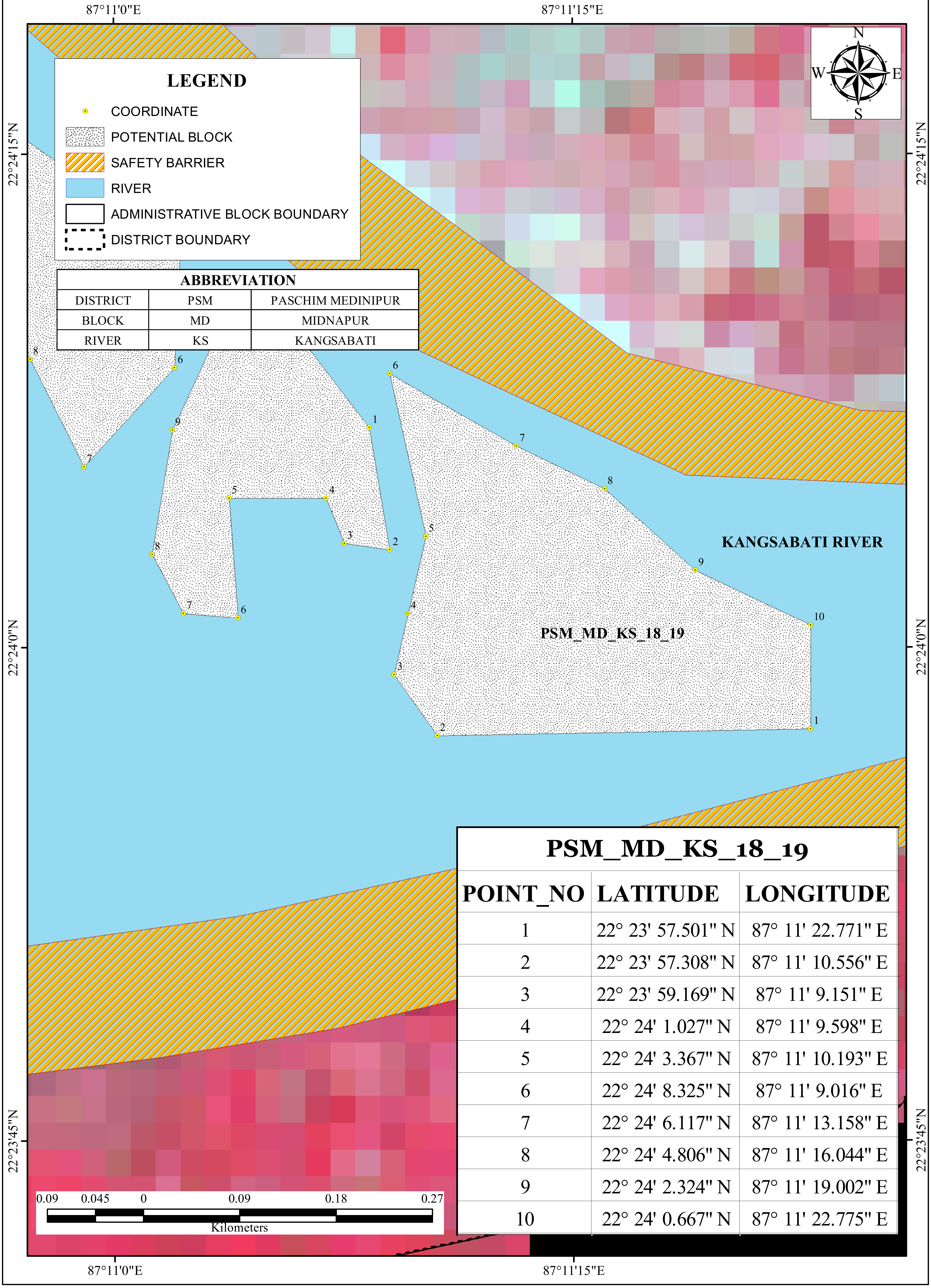


ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

PSM_MD_KS_18

POINT_NO	LATITUDE	LONGITUDE
1	22° 24' 6.673" N	87° 11' 8.347" E
2	22° 24' 2.955" N	87° 11' 9.008" E
3	22° 24' 3.163" N	87° 11' 7.528" E
4	22° 24' 4.541" N	87° 11' 6.938" E
5	22° 24' 4.544" N	87° 11' 3.754" E
6	22° 24' 0.896" N	87° 11' 4.046" E
7	22° 24' 1.035" N	87° 11' 2.269" E
8	22° 24' 2.826" N	87° 11' 1.235" E
9	22° 24' 6.612" N	87° 11' 1.906" E
10	22° 24' 10.464" N	87° 11' 3.836" E
11	22° 24' 10.463" N	87° 11' 5.243" E

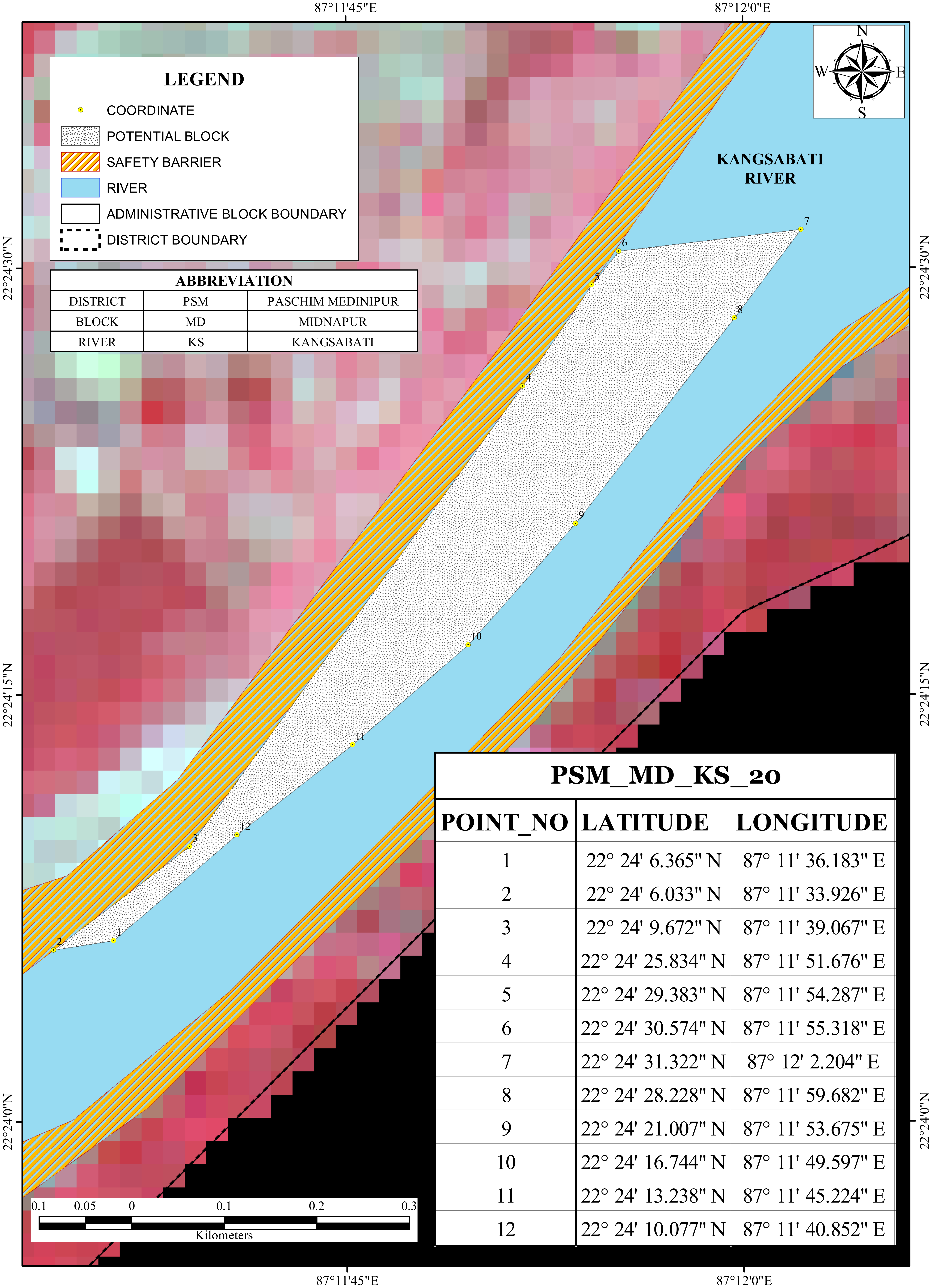
POTENTIAL BLOCK PSM_MD_KS_18_19 OF KANGSABATI RIVER



PSM_MD_KS_18_19

POINT_NO	LATITUDE	LONGITUDE
1	22° 23' 57.501" N	87° 11' 22.771" E
2	22° 23' 57.308" N	87° 11' 10.556" E
3	22° 23' 59.169" N	87° 11' 9.151" E
4	22° 24' 1.027" N	87° 11' 9.598" E
5	22° 24' 3.367" N	87° 11' 10.193" E
6	22° 24' 8.325" N	87° 11' 9.016" E
7	22° 24' 6.117" N	87° 11' 13.158" E
8	22° 24' 4.806" N	87° 11' 16.044" E
9	22° 24' 2.324" N	87° 11' 19.002" E
10	22° 24' 0.667" N	87° 11' 22.775" E

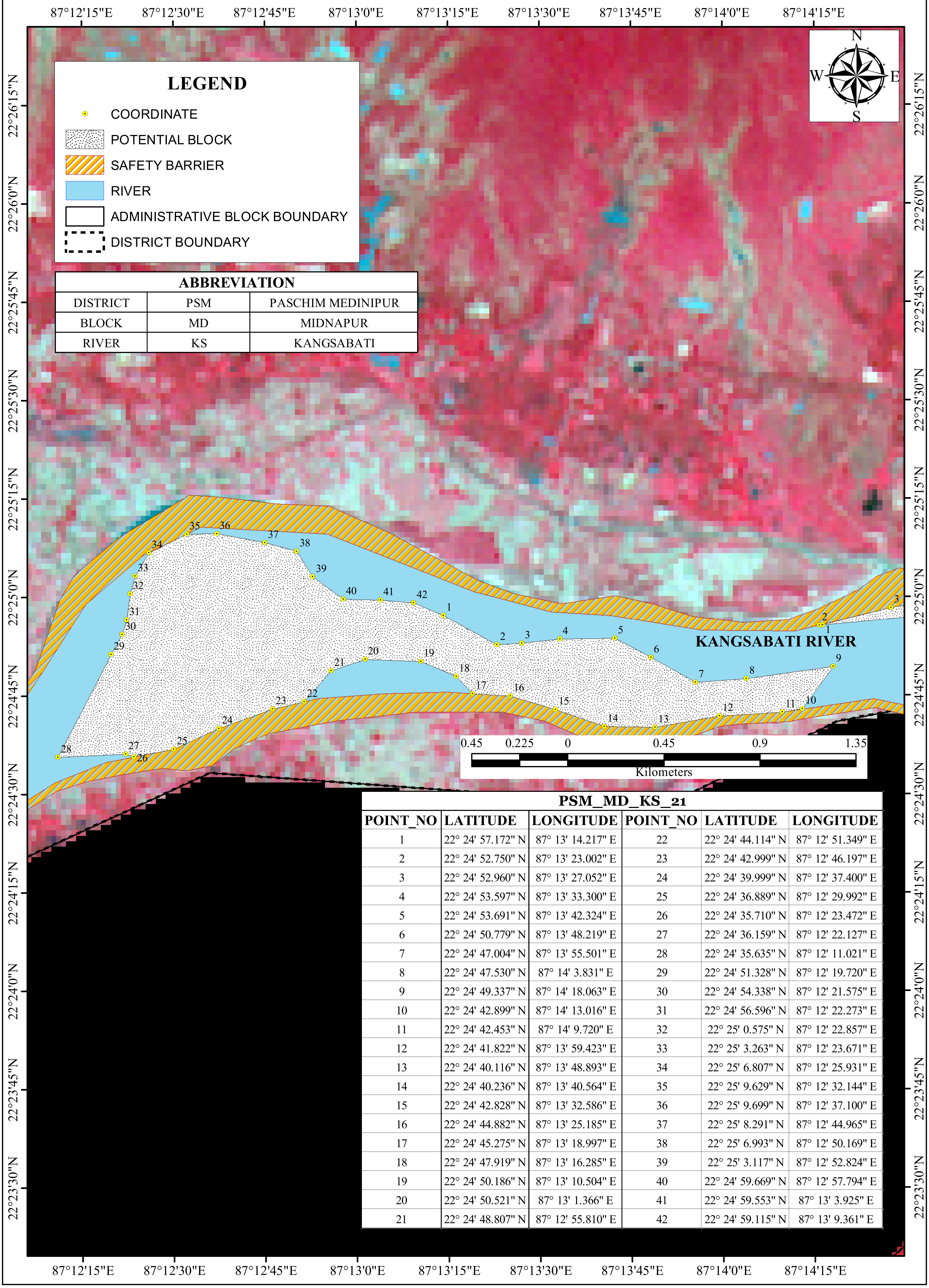
POTENTIAL BLOCK PSM_MD_KS_20 OF KANGSABATI RIVER



PSM_MD_KS_20

POINT_NO	LATITUDE	LONGITUDE
1	22° 24' 6.365" N	87° 11' 36.183" E
2	22° 24' 6.033" N	87° 11' 33.926" E
3	22° 24' 9.672" N	87° 11' 39.067" E
4	22° 24' 25.834" N	87° 11' 51.676" E
5	22° 24' 29.383" N	87° 11' 54.287" E
6	22° 24' 30.574" N	87° 11' 55.318" E
7	22° 24' 31.322" N	87° 12' 2.204" E
8	22° 24' 28.228" N	87° 11' 59.682" E
9	22° 24' 21.007" N	87° 11' 53.675" E
10	22° 24' 16.744" N	87° 11' 49.597" E
11	22° 24' 13.238" N	87° 11' 45.224" E
12	22° 24' 10.077" N	87° 11' 40.852" E

POTENTIAL BLOCK PSM_MD_KS_21 OF KANGSABATI RIVER



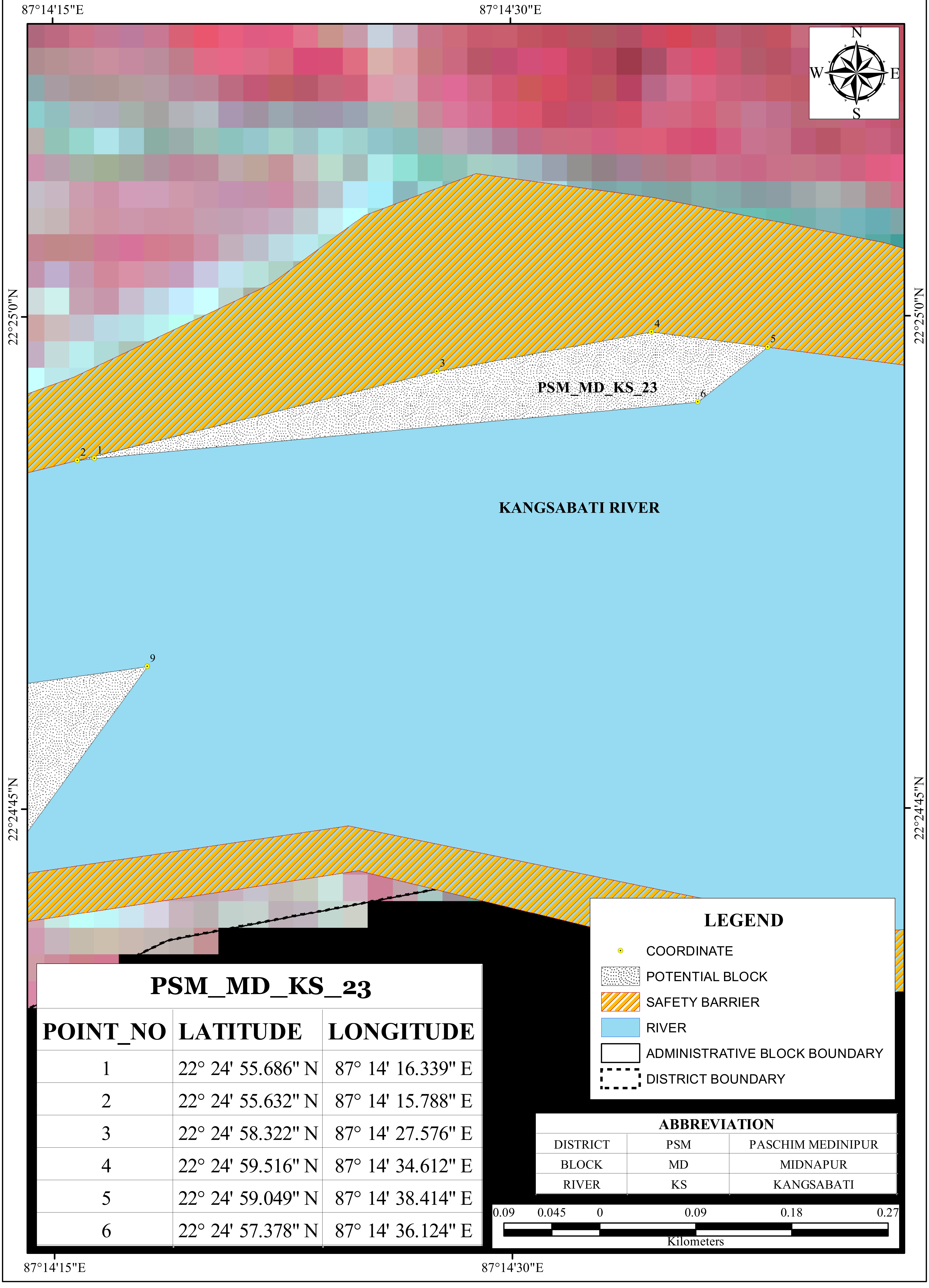
ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

PSM_MD_KS_21

POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	22° 24' 57.172" N	87° 13' 14.217" E	22	22° 24' 44.114" N	87° 12' 51.349" E
2	22° 24' 52.750" N	87° 13' 23.002" E	23	22° 24' 42.999" N	87° 12' 46.197" E
3	22° 24' 52.960" N	87° 13' 27.052" E	24	22° 24' 39.999" N	87° 12' 37.400" E
4	22° 24' 53.597" N	87° 13' 33.300" E	25	22° 24' 36.889" N	87° 12' 29.992" E
5	22° 24' 53.691" N	87° 13' 42.324" E	26	22° 24' 35.710" N	87° 12' 23.472" E
6	22° 24' 50.779" N	87° 13' 48.219" E	27	22° 24' 36.159" N	87° 12' 22.127" E
7	22° 24' 47.004" N	87° 13' 55.501" E	28	22° 24' 35.635" N	87° 12' 11.021" E
8	22° 24' 47.530" N	87° 14' 3.831" E	29	22° 24' 51.328" N	87° 12' 19.720" E
9	22° 24' 49.337" N	87° 14' 18.063" E	30	22° 24' 54.338" N	87° 12' 21.575" E
10	22° 24' 42.899" N	87° 14' 13.016" E	31	22° 24' 56.596" N	87° 12' 22.273" E
11	22° 24' 42.453" N	87° 14' 9.720" E	32	22° 25' 0.575" N	87° 12' 22.857" E
12	22° 24' 41.822" N	87° 13' 59.423" E	33	22° 25' 3.263" N	87° 12' 23.671" E
13	22° 24' 40.116" N	87° 13' 48.893" E	34	22° 25' 6.807" N	87° 12' 25.931" E
14	22° 24' 40.236" N	87° 13' 40.564" E	35	22° 25' 9.629" N	87° 12' 32.144" E
15	22° 24' 42.828" N	87° 13' 32.586" E	36	22° 25' 9.699" N	87° 12' 37.100" E
16	22° 24' 44.882" N	87° 13' 25.185" E	37	22° 25' 8.291" N	87° 12' 44.965" E
17	22° 24' 45.275" N	87° 13' 18.997" E	38	22° 25' 6.993" N	87° 12' 50.169" E
18	22° 24' 47.919" N	87° 13' 16.285" E	39	22° 25' 3.117" N	87° 12' 52.824" E
19	22° 24' 50.186" N	87° 13' 10.504" E	40	22° 24' 59.669" N	87° 12' 57.794" E
20	22° 24' 50.521" N	87° 13' 1.366" E	41	22° 24' 59.553" N	87° 13' 3.925" E
21	22° 24' 48.807" N	87° 12' 55.810" E	42	22° 24' 59.115" N	87° 13' 9.361" E

POTENTIAL BLOCK PSM_MD_KS_23 OF KANGSABATI RIVER



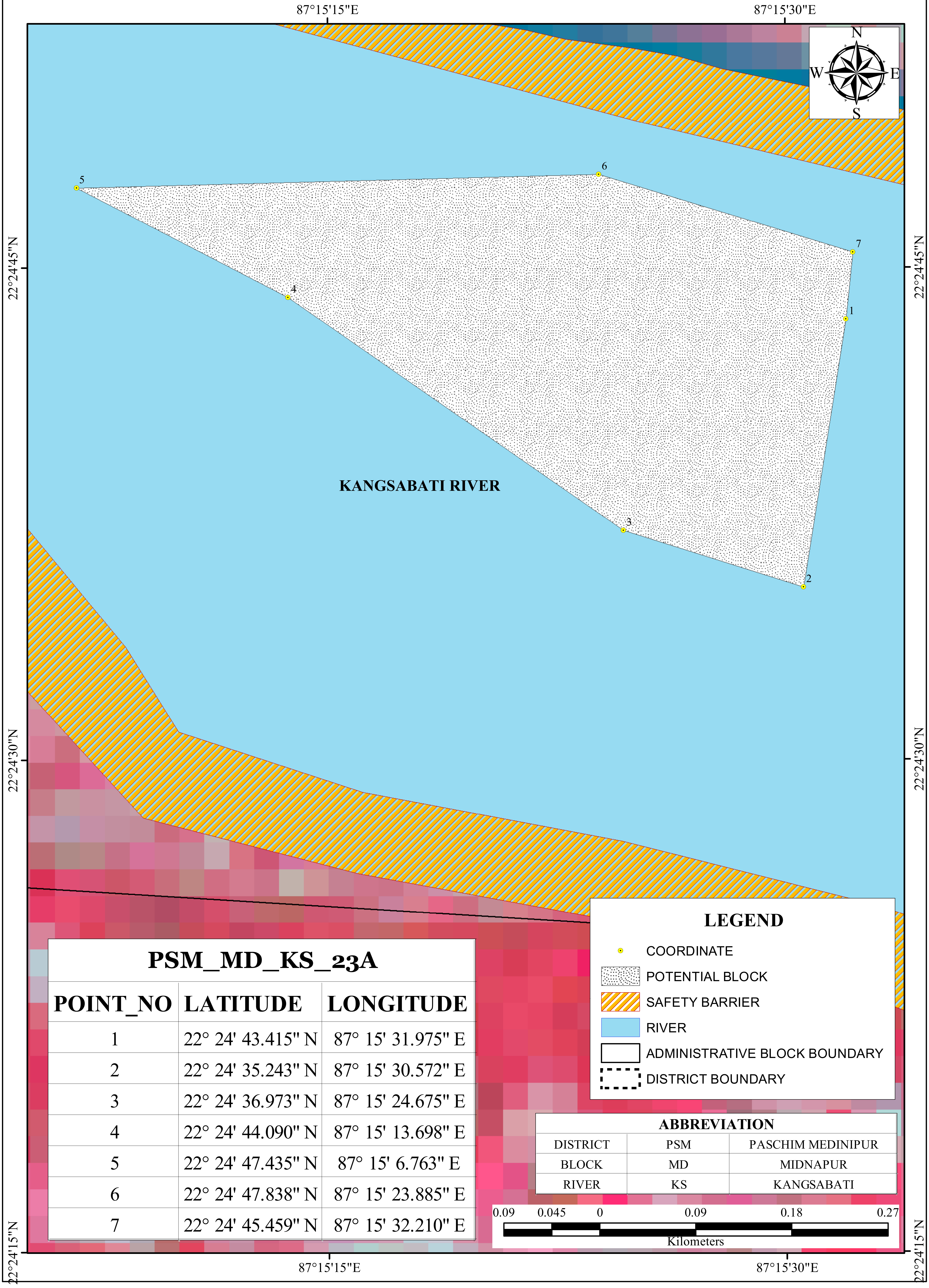
PSM_MD_KS_23		
POINT_NO	LATITUDE	LONGITUDE
1	22° 24' 55.686" N	87° 14' 16.339" E
2	22° 24' 55.632" N	87° 14' 15.788" E
3	22° 24' 58.322" N	87° 14' 27.576" E
4	22° 24' 59.516" N	87° 14' 34.612" E
5	22° 24' 59.049" N	87° 14' 38.414" E
6	22° 24' 57.378" N	87° 14' 36.124" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_MD_KS_23A OF KANGSABATI RIVER



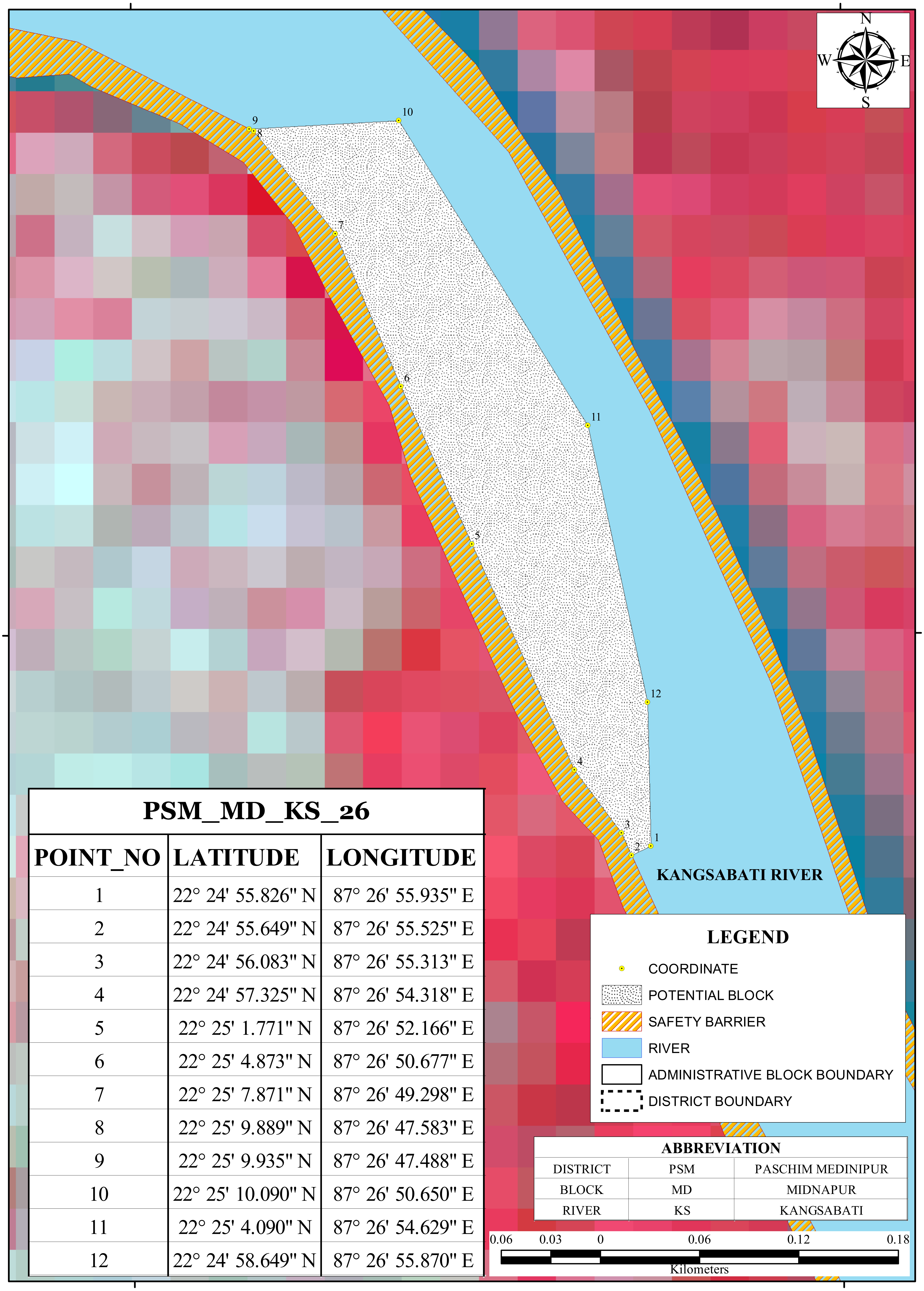
PSM_MD_KS_23A

POINT_NO	LATITUDE	LONGITUDE
1	22° 24' 43.415" N	87° 15' 31.975" E
2	22° 24' 35.243" N	87° 15' 30.572" E
3	22° 24' 36.973" N	87° 15' 24.675" E
4	22° 24' 44.090" N	87° 15' 13.698" E
5	22° 24' 47.435" N	87° 15' 6.763" E
6	22° 24' 47.838" N	87° 15' 23.885" E
7	22° 24' 45.459" N	87° 15' 32.210" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

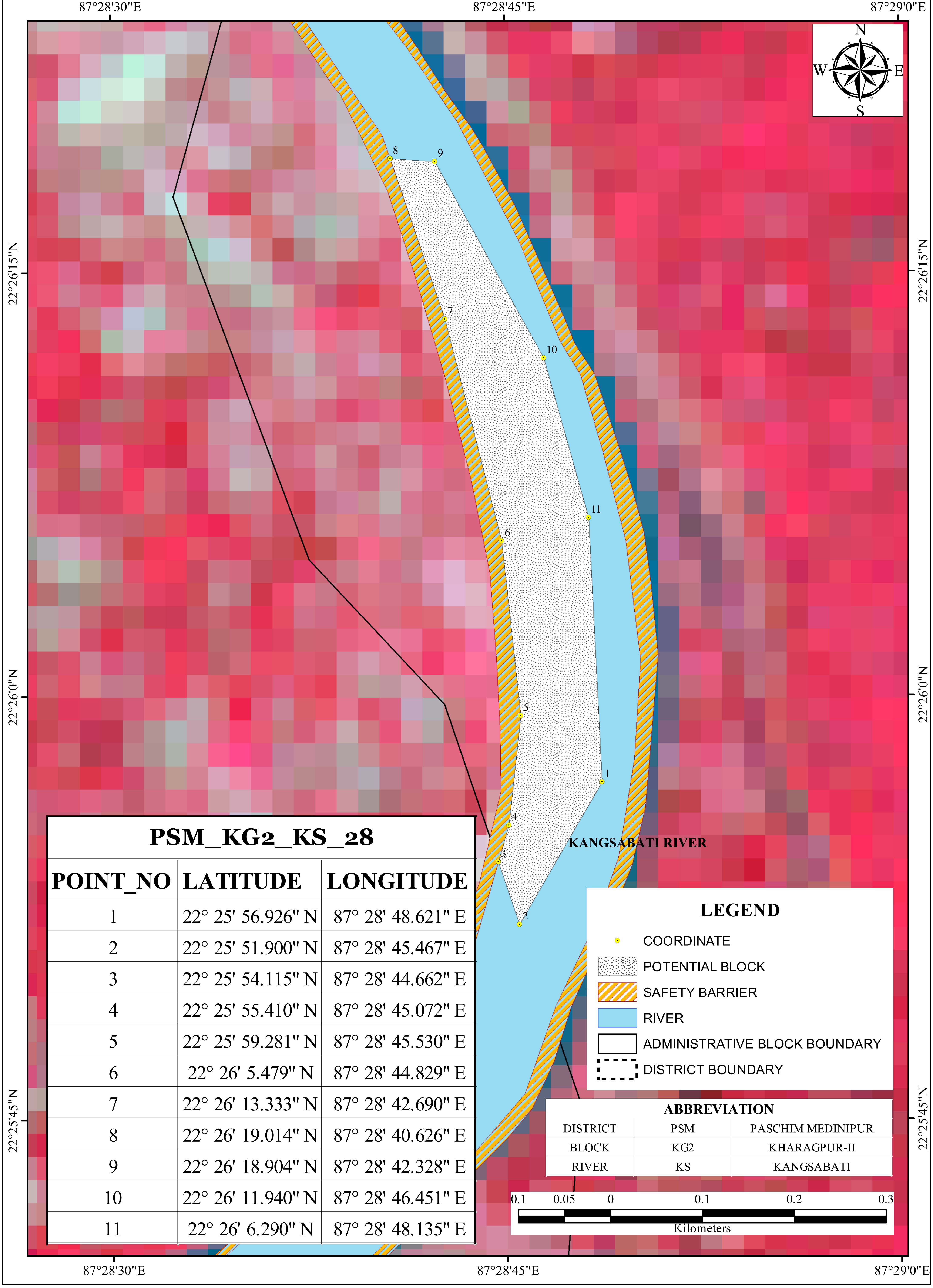
POTENTIAL BLOCK PSM_MD_KS_26 OF KANGSABATI RIVER



PSM_MD_KS_26		
POINT_NO	LATITUDE	LONGITUDE
1	22° 24' 55.826" N	87° 26' 55.935" E
2	22° 24' 55.649" N	87° 26' 55.525" E
3	22° 24' 56.083" N	87° 26' 55.313" E
4	22° 24' 57.325" N	87° 26' 54.318" E
5	22° 25' 1.771" N	87° 26' 52.166" E
6	22° 25' 4.873" N	87° 26' 50.677" E
7	22° 25' 7.871" N	87° 26' 49.298" E
8	22° 25' 9.889" N	87° 26' 47.583" E
9	22° 25' 9.935" N	87° 26' 47.488" E
10	22° 25' 10.090" N	87° 26' 50.650" E
11	22° 25' 4.090" N	87° 26' 54.629" E
12	22° 24' 58.649" N	87° 26' 55.870" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_KG2_KS_28 OF KANGSABATI RIVER



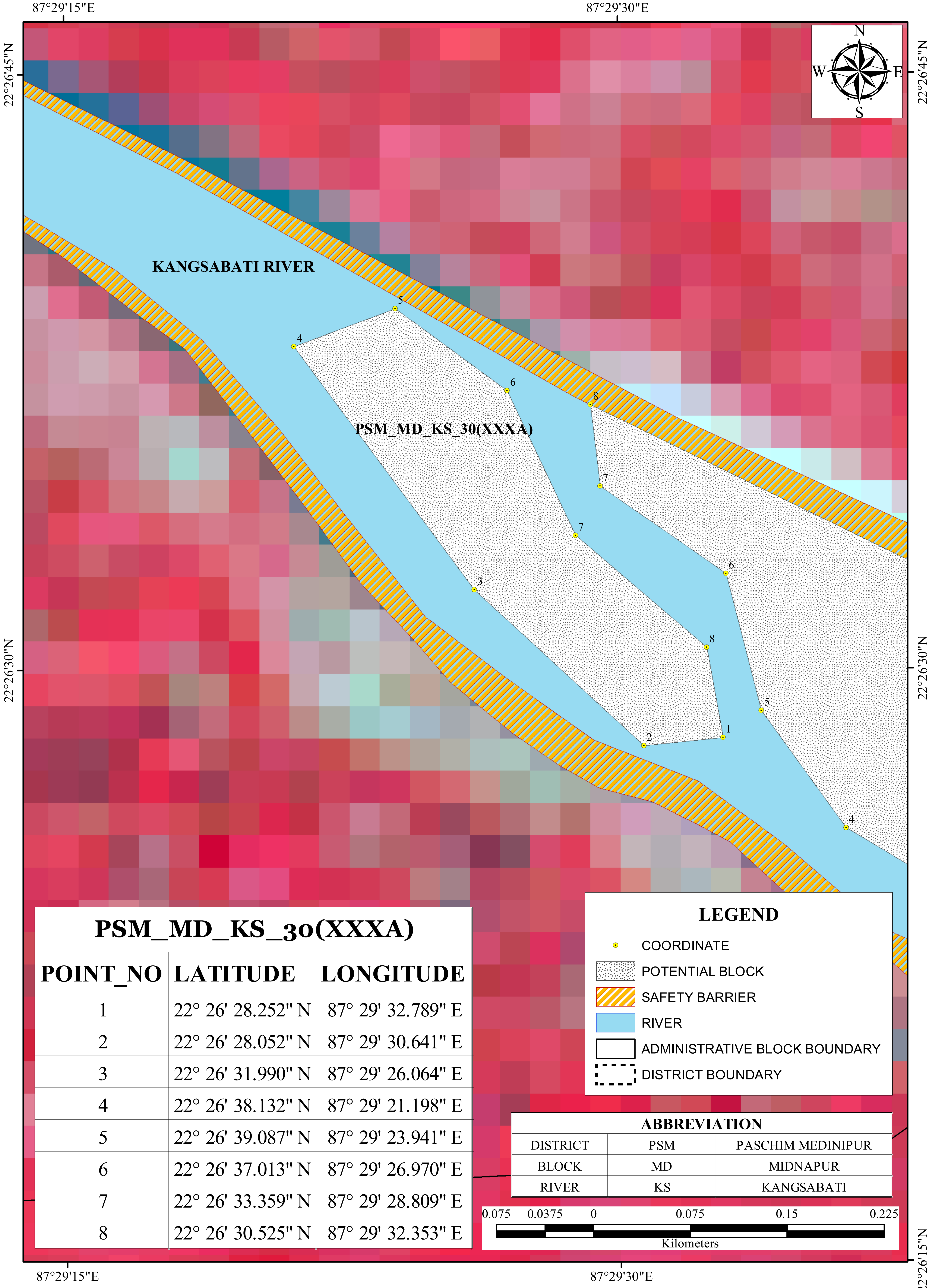
PSM_KG2_KS_28

POINT_NO	LATITUDE	LONGITUDE
1	22° 25' 56.926" N	87° 28' 48.621" E
2	22° 25' 51.900" N	87° 28' 45.467" E
3	22° 25' 54.115" N	87° 28' 44.662" E
4	22° 25' 55.410" N	87° 28' 45.072" E
5	22° 25' 59.281" N	87° 28' 45.530" E
6	22° 26' 5.479" N	87° 28' 44.829" E
7	22° 26' 13.333" N	87° 28' 42.690" E
8	22° 26' 19.014" N	87° 28' 40.626" E
9	22° 26' 18.904" N	87° 28' 42.328" E
10	22° 26' 11.940" N	87° 28' 46.451" E
11	22° 26' 6.290" N	87° 28' 48.135" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KG2	KHARAGPUR-II
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_MD_KS_30(XXXA) OF KANGSABATI RIVER



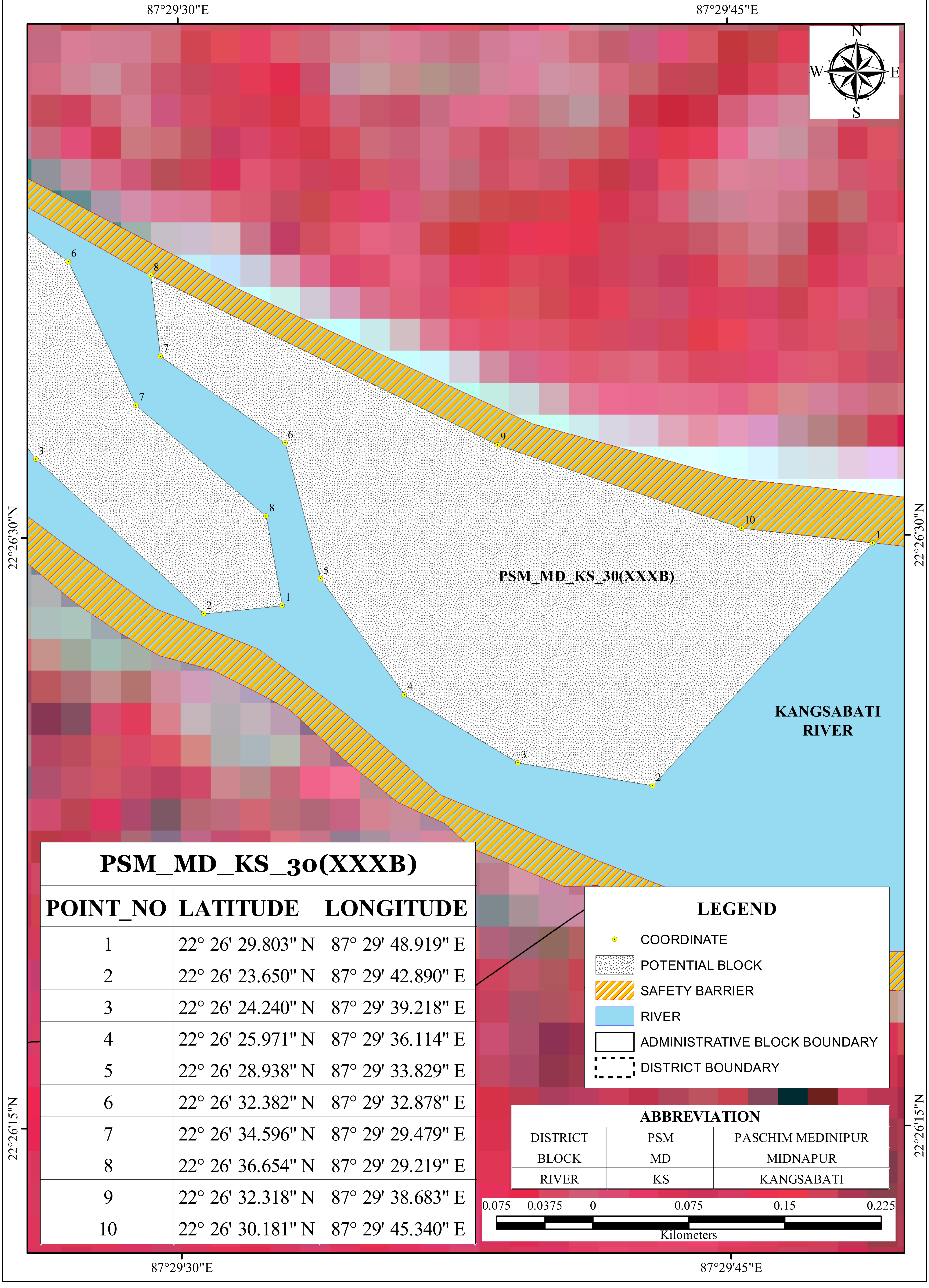
PSM_MD_KS_30(XXXA)

POINT_NO	LATITUDE	LONGITUDE
1	22° 26' 28.252" N	87° 29' 32.789" E
2	22° 26' 28.052" N	87° 29' 30.641" E
3	22° 26' 31.990" N	87° 29' 26.064" E
4	22° 26' 38.132" N	87° 29' 21.198" E
5	22° 26' 39.087" N	87° 29' 23.941" E
6	22° 26' 37.013" N	87° 29' 26.970" E
7	22° 26' 33.359" N	87° 29' 28.809" E
8	22° 26' 30.525" N	87° 29' 32.353" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_MD_KS_30(XXXB) OF KANGSABATI RIVER



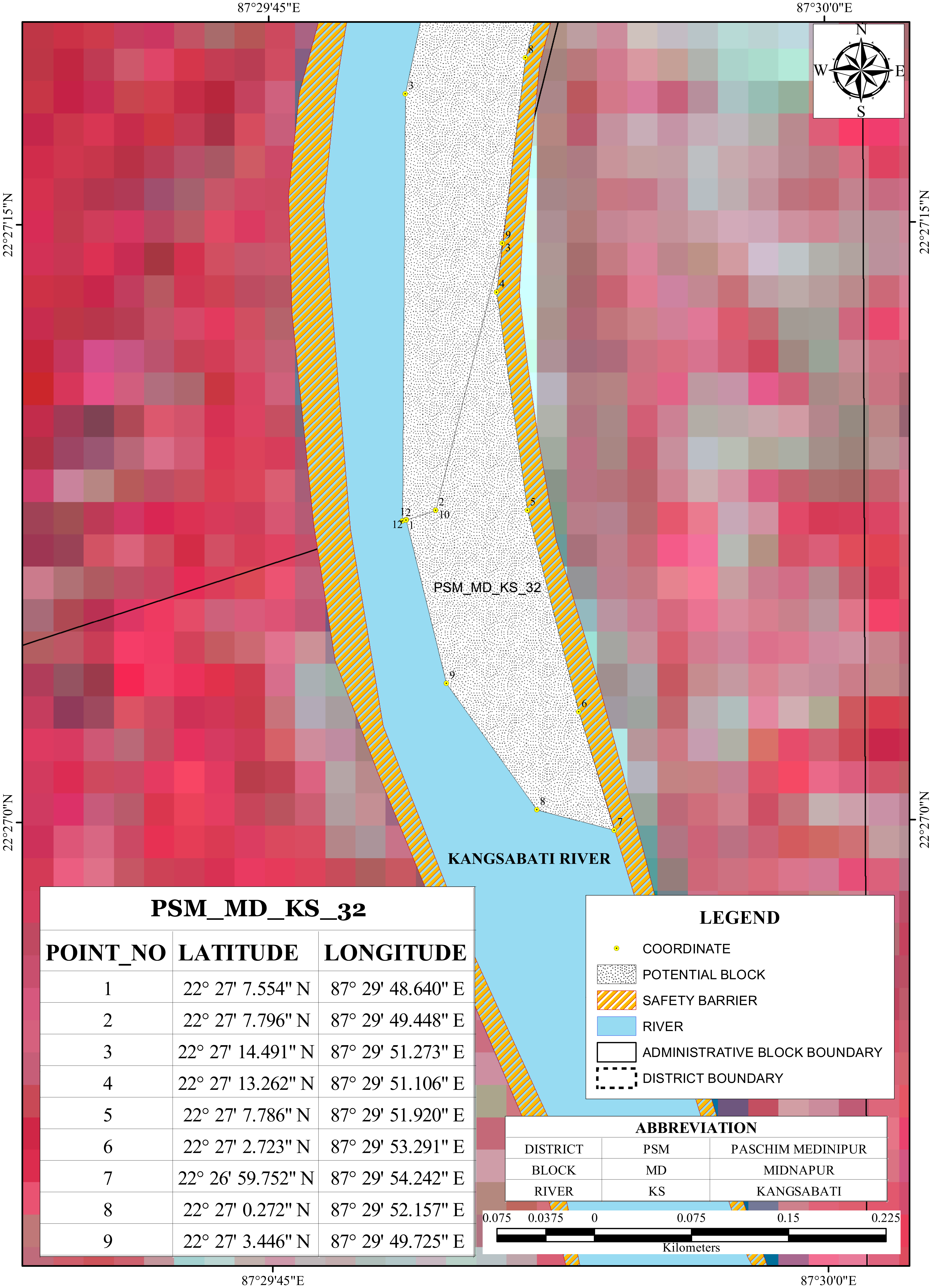
PSM_MD_KS_30(XXXB)

POINT_NO	LATITUDE	LONGITUDE
1	22° 26' 29.803" N	87° 29' 48.919" E
2	22° 26' 23.650" N	87° 29' 42.890" E
3	22° 26' 24.240" N	87° 29' 39.218" E
4	22° 26' 25.971" N	87° 29' 36.114" E
5	22° 26' 28.938" N	87° 29' 33.829" E
6	22° 26' 32.382" N	87° 29' 32.878" E
7	22° 26' 34.596" N	87° 29' 29.479" E
8	22° 26' 36.654" N	87° 29' 29.219" E
9	22° 26' 32.318" N	87° 29' 38.683" E
10	22° 26' 30.181" N	87° 29' 45.340" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_MD_KS_32 OF KANGSABATI RIVER



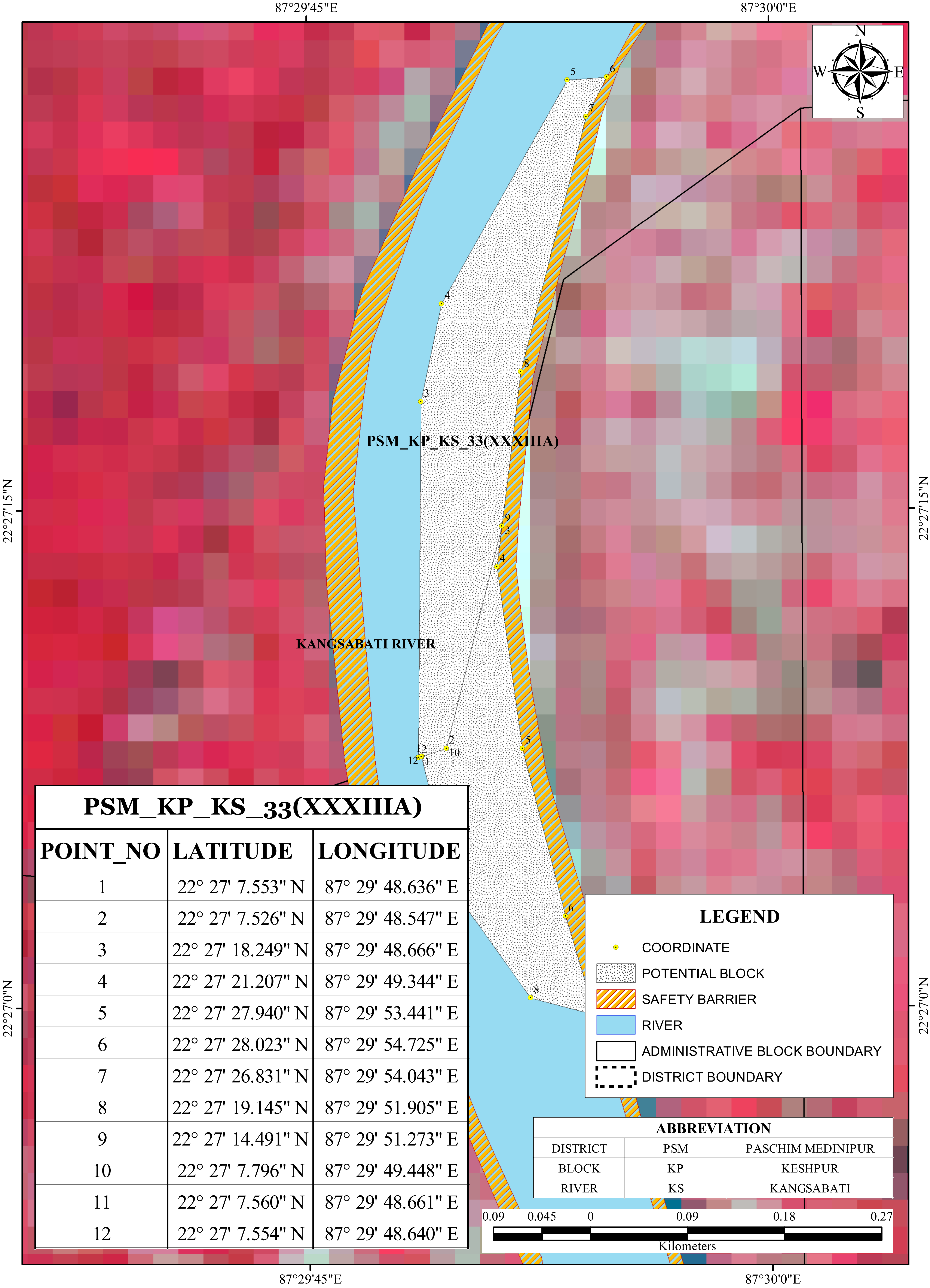
PSM_MD_KS_32

POINT_NO	LATITUDE	LONGITUDE
1	22° 27' 7.554" N	87° 29' 48.640" E
2	22° 27' 7.796" N	87° 29' 49.448" E
3	22° 27' 14.491" N	87° 29' 51.273" E
4	22° 27' 13.262" N	87° 29' 51.106" E
5	22° 27' 7.786" N	87° 29' 51.920" E
6	22° 27' 2.723" N	87° 29' 53.291" E
7	22° 26' 59.752" N	87° 29' 54.242" E
8	22° 27' 0.272" N	87° 29' 52.157" E
9	22° 27' 3.446" N	87° 29' 49.725" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	MD	MIDNAPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_KP_KS_33(XXXIIIA) OF KANGSABATI RIVER



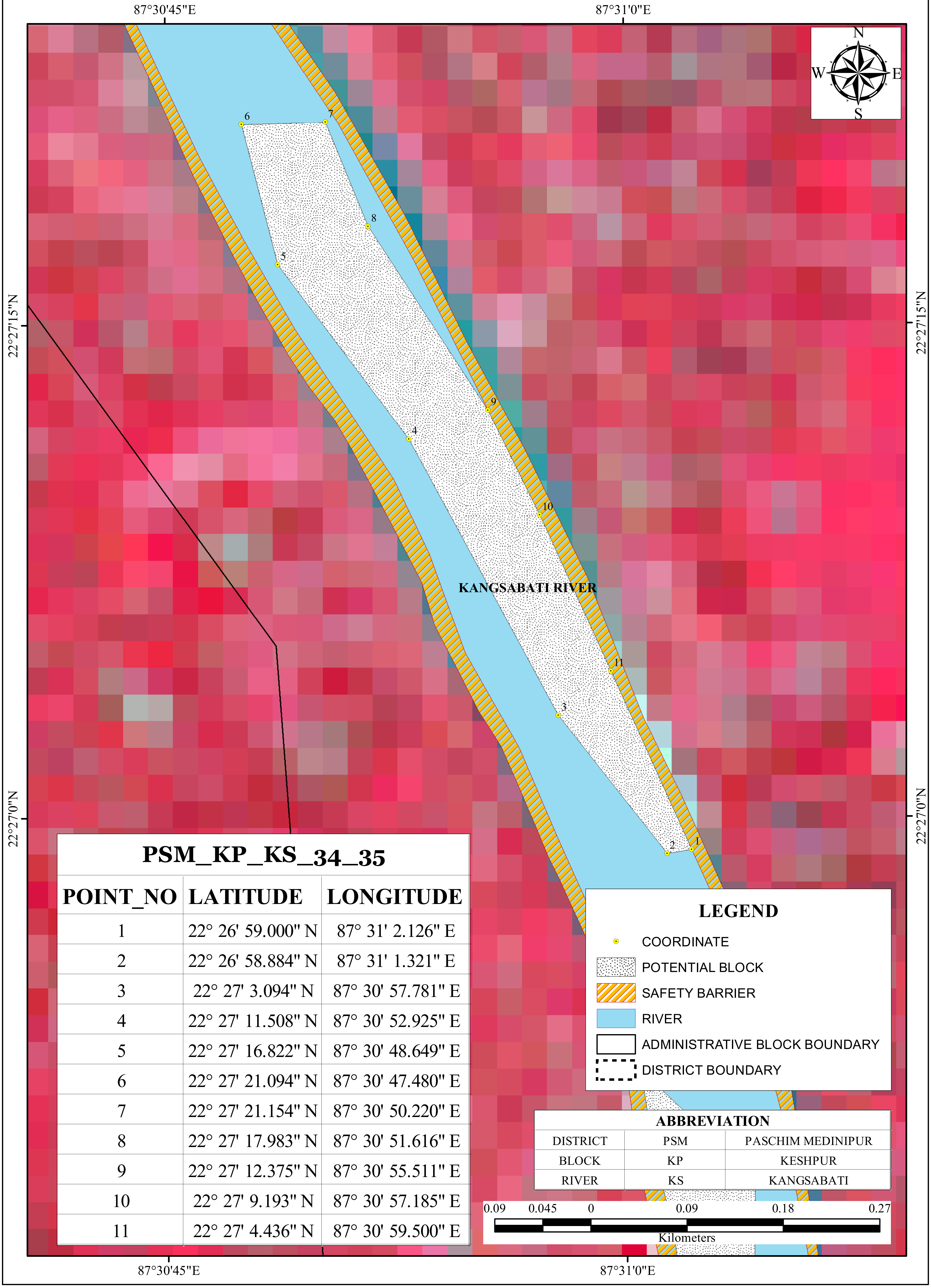
PSM_KP_KS_33(XXXIIIA)

POINT_NO	LATITUDE	LONGITUDE
1	22° 27' 7.553" N	87° 29' 48.636" E
2	22° 27' 7.526" N	87° 29' 48.547" E
3	22° 27' 18.249" N	87° 29' 48.666" E
4	22° 27' 21.207" N	87° 29' 49.344" E
5	22° 27' 27.940" N	87° 29' 53.441" E
6	22° 27' 28.023" N	87° 29' 54.725" E
7	22° 27' 26.831" N	87° 29' 54.043" E
8	22° 27' 19.145" N	87° 29' 51.905" E
9	22° 27' 14.491" N	87° 29' 51.273" E
10	22° 27' 7.796" N	87° 29' 49.448" E
11	22° 27' 7.560" N	87° 29' 48.661" E
12	22° 27' 7.554" N	87° 29' 48.640" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KP	KESHPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_KP_KS_34_35 OF KANGSABATI RIVER



PSM_KP_KS_34_35

POINT_NO	LATITUDE	LONGITUDE
1	22° 26' 59.000" N	87° 31' 2.126" E
2	22° 26' 58.884" N	87° 31' 1.321" E
3	22° 27' 3.094" N	87° 30' 57.781" E
4	22° 27' 11.508" N	87° 30' 52.925" E
5	22° 27' 16.822" N	87° 30' 48.649" E
6	22° 27' 21.094" N	87° 30' 47.480" E
7	22° 27' 21.154" N	87° 30' 50.220" E
8	22° 27' 17.983" N	87° 30' 51.616" E
9	22° 27' 12.375" N	87° 30' 55.511" E
10	22° 27' 9.193" N	87° 30' 57.185" E
11	22° 27' 4.436" N	87° 30' 59.500" E

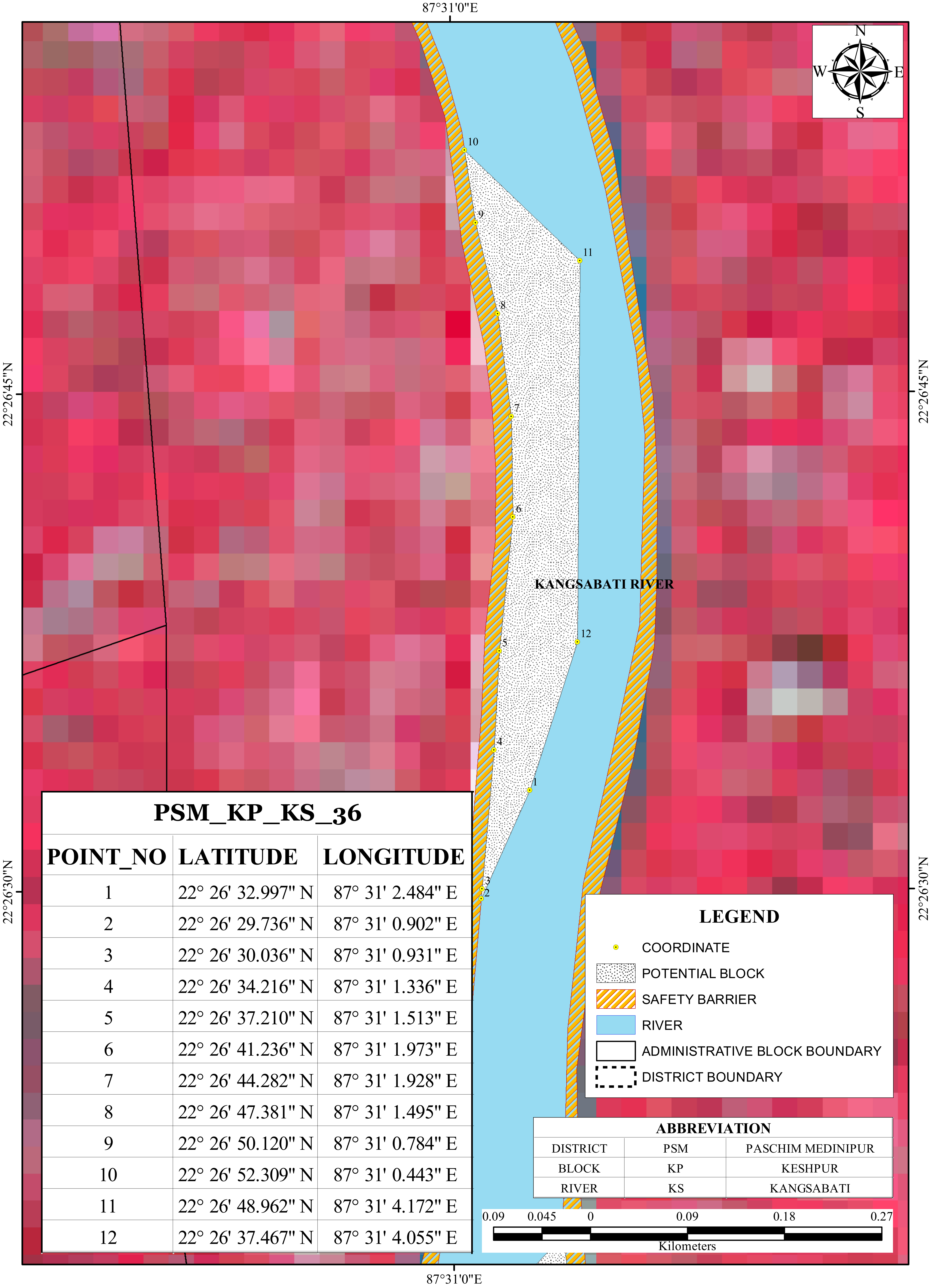
LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KP	KESHPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_KP_KS_36 OF KANGSABATI RIVER



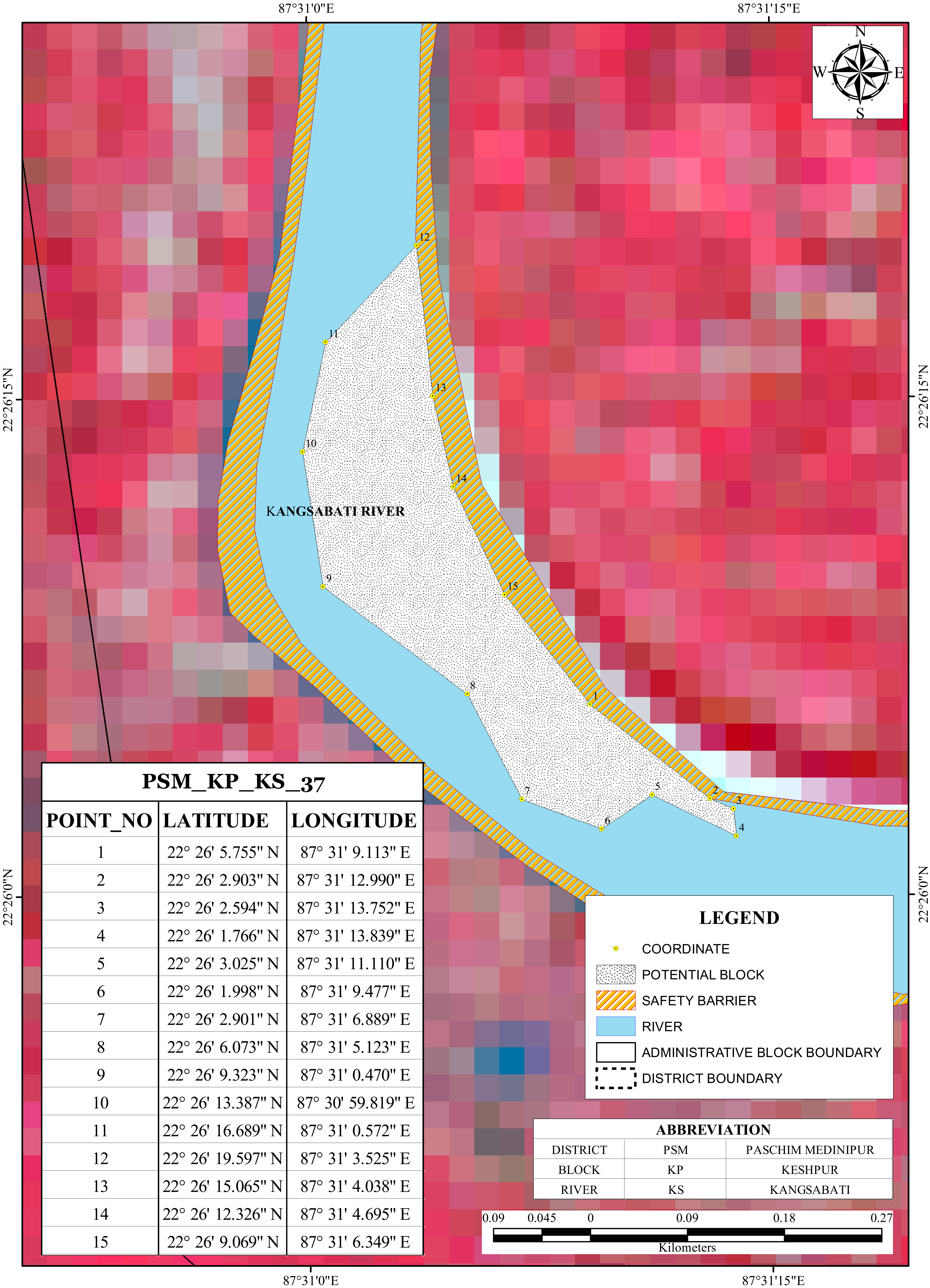
PSM_KP_KS_36

POINT_NO	LATITUDE	LONGITUDE
1	22° 26' 32.997" N	87° 31' 2.484" E
2	22° 26' 29.736" N	87° 31' 0.902" E
3	22° 26' 30.036" N	87° 31' 0.931" E
4	22° 26' 34.216" N	87° 31' 1.336" E
5	22° 26' 37.210" N	87° 31' 1.513" E
6	22° 26' 41.236" N	87° 31' 1.973" E
7	22° 26' 44.282" N	87° 31' 1.928" E
8	22° 26' 47.381" N	87° 31' 1.495" E
9	22° 26' 50.120" N	87° 31' 0.784" E
10	22° 26' 52.309" N	87° 31' 0.443" E
11	22° 26' 48.962" N	87° 31' 4.172" E
12	22° 26' 37.467" N	87° 31' 4.055" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KP	KESHPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_KP_KS_37 OF KANGSABATI RIVER



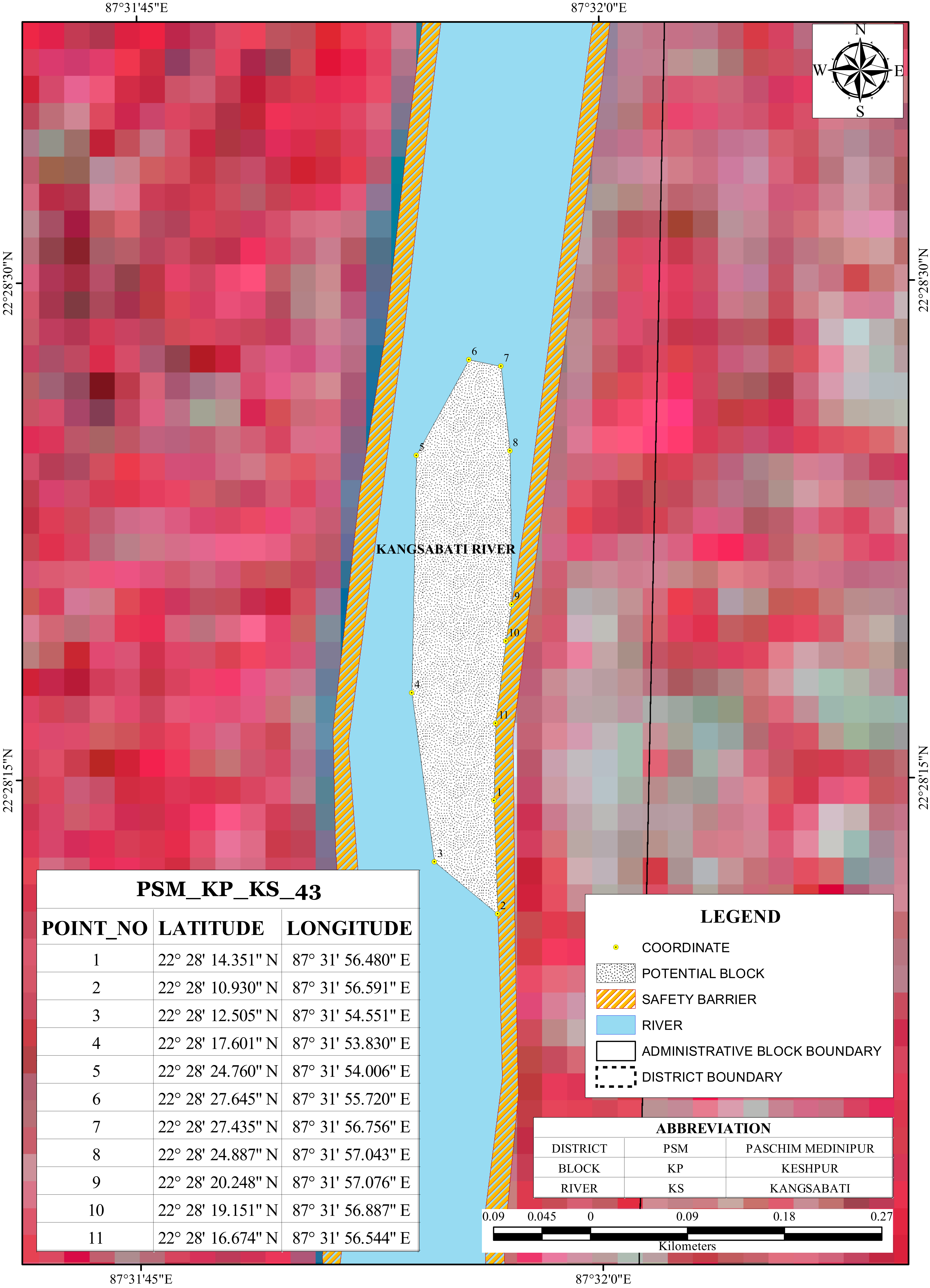
PSM_KP_KS_37

POINT_NO	LATITUDE	LONGITUDE
1	22° 26' 5.755" N	87° 31' 9.113" E
2	22° 26' 2.903" N	87° 31' 12.990" E
3	22° 26' 2.594" N	87° 31' 13.752" E
4	22° 26' 1.766" N	87° 31' 13.839" E
5	22° 26' 3.025" N	87° 31' 11.110" E
6	22° 26' 1.998" N	87° 31' 9.477" E
7	22° 26' 2.901" N	87° 31' 6.889" E
8	22° 26' 6.073" N	87° 31' 5.123" E
9	22° 26' 9.323" N	87° 31' 0.470" E
10	22° 26' 13.387" N	87° 30' 59.819" E
11	22° 26' 16.689" N	87° 31' 0.572" E
12	22° 26' 19.597" N	87° 31' 3.525" E
13	22° 26' 15.065" N	87° 31' 4.038" E
14	22° 26' 12.326" N	87° 31' 4.695" E
15	22° 26' 9.069" N	87° 31' 6.349" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KP	KESHPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_KP_KS_43 OF KANGSABATI RIVER



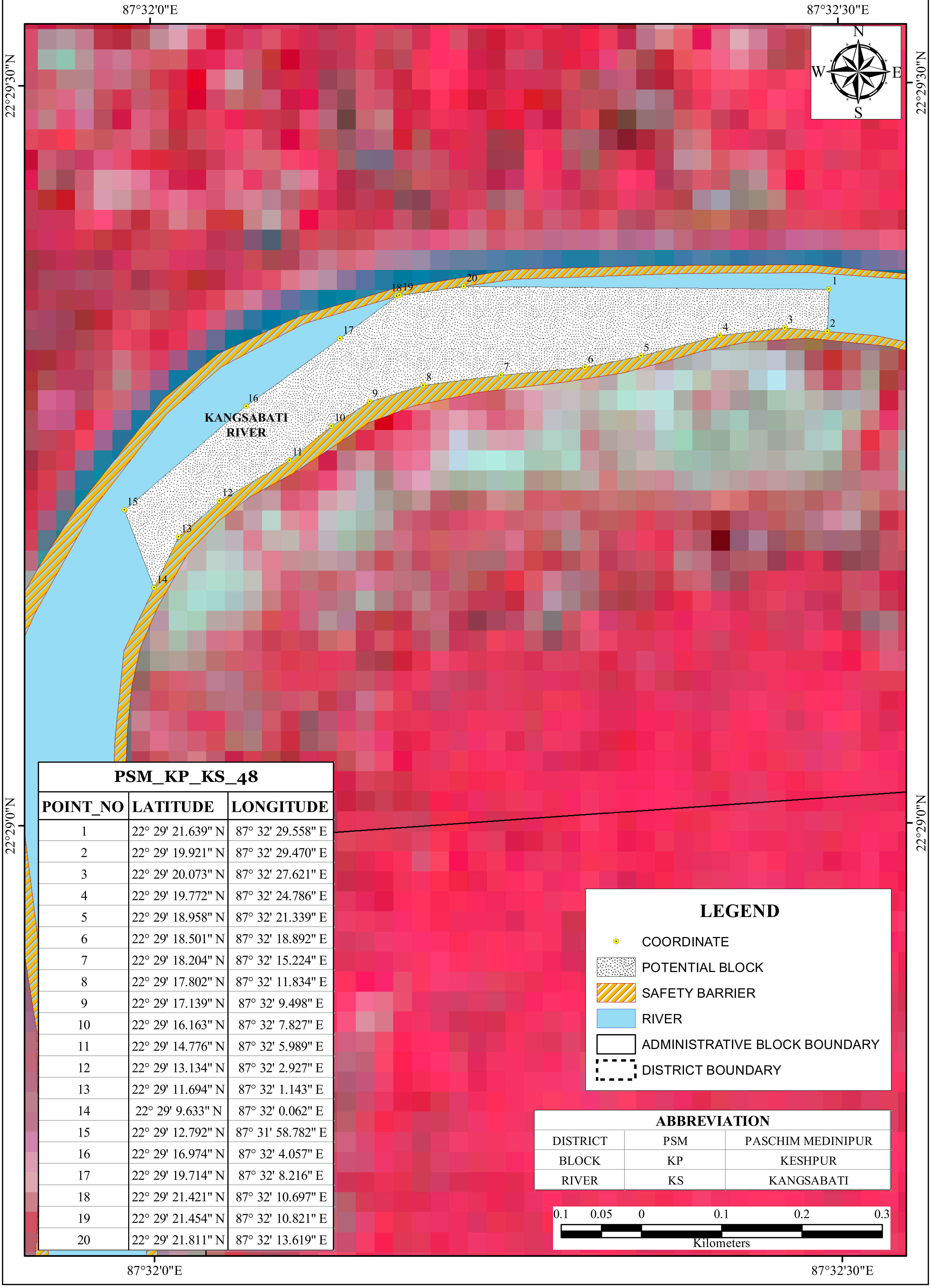
PSM_KP_KS_43

POINT_NO	LATITUDE	LONGITUDE
1	22° 28' 14.351" N	87° 31' 56.480" E
2	22° 28' 10.930" N	87° 31' 56.591" E
3	22° 28' 12.505" N	87° 31' 54.551" E
4	22° 28' 17.601" N	87° 31' 53.830" E
5	22° 28' 24.760" N	87° 31' 54.006" E
6	22° 28' 27.645" N	87° 31' 55.720" E
7	22° 28' 27.435" N	87° 31' 56.756" E
8	22° 28' 24.887" N	87° 31' 57.043" E
9	22° 28' 20.248" N	87° 31' 57.076" E
10	22° 28' 19.151" N	87° 31' 56.887" E
11	22° 28' 16.674" N	87° 31' 56.544" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KP	KESHPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_KP_KS_48 OF KANGSABATI RIVER



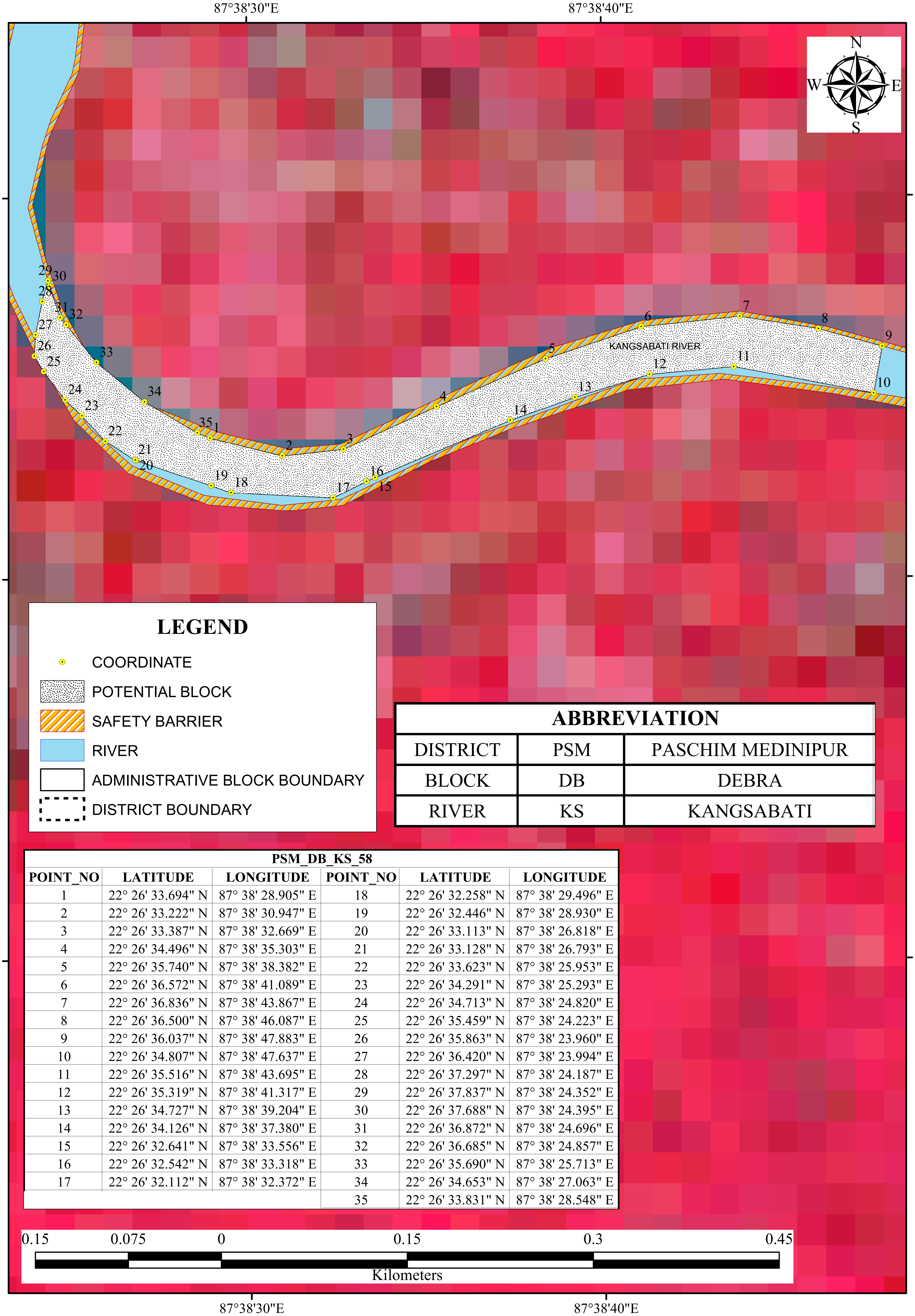
PSM_KP_KS_48

POINT_NO	LATITUDE	LONGITUDE
1	22° 29' 21.639" N	87° 32' 29.558" E
2	22° 29' 19.921" N	87° 32' 29.470" E
3	22° 29' 20.073" N	87° 32' 27.621" E
4	22° 29' 19.772" N	87° 32' 24.786" E
5	22° 29' 18.958" N	87° 32' 21.339" E
6	22° 29' 18.501" N	87° 32' 18.892" E
7	22° 29' 18.204" N	87° 32' 15.224" E
8	22° 29' 17.802" N	87° 32' 11.834" E
9	22° 29' 17.139" N	87° 32' 9.498" E
10	22° 29' 16.163" N	87° 32' 7.827" E
11	22° 29' 14.776" N	87° 32' 5.989" E
12	22° 29' 13.134" N	87° 32' 2.927" E
13	22° 29' 11.694" N	87° 32' 1.143" E
14	22° 29' 9.633" N	87° 32' 0.062" E
15	22° 29' 12.792" N	87° 31' 58.782" E
16	22° 29' 16.974" N	87° 32' 4.057" E
17	22° 29' 19.714" N	87° 32' 8.216" E
18	22° 29' 21.421" N	87° 32' 10.697" E
19	22° 29' 21.454" N	87° 32' 10.821" E
20	22° 29' 21.811" N	87° 32' 13.619" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KP	KESHPUR
RIVER	KS	KANGSABATI

POTENTIAL BLOCK PSM_DB_KS_58 OF KANGSABATI RIVER



LEGEND

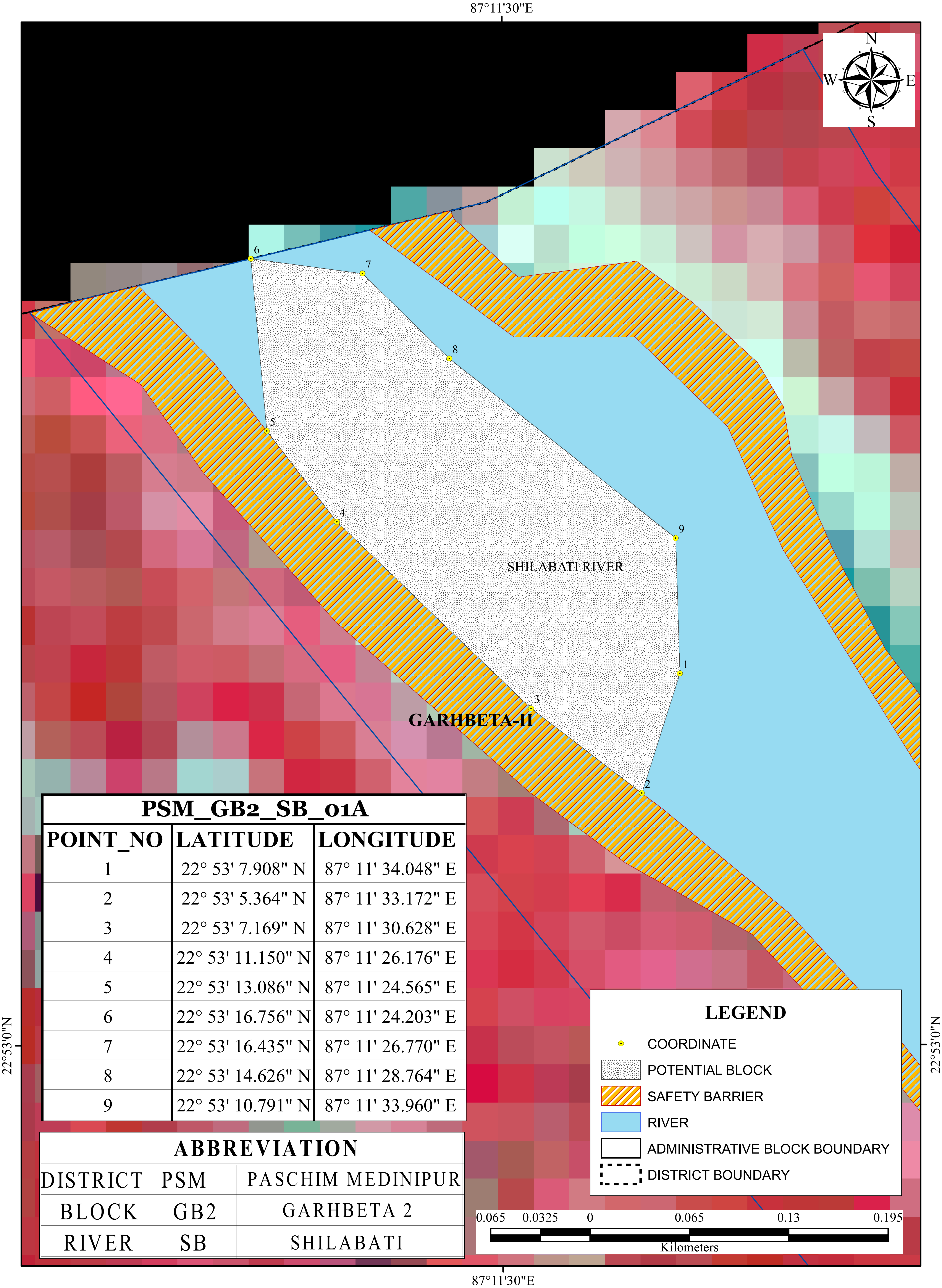
- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DB	DEBRA
RIVER	KS	KANGSABATI

PSM_DB_KS_58

POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	22° 26' 33.694" N	87° 38' 28.905" E	18	22° 26' 32.258" N	87° 38' 29.496" E
2	22° 26' 33.222" N	87° 38' 30.947" E	19	22° 26' 32.446" N	87° 38' 28.930" E
3	22° 26' 33.387" N	87° 38' 32.669" E	20	22° 26' 33.113" N	87° 38' 26.818" E
4	22° 26' 34.496" N	87° 38' 35.303" E	21	22° 26' 33.128" N	87° 38' 26.793" E
5	22° 26' 35.740" N	87° 38' 38.382" E	22	22° 26' 33.623" N	87° 38' 25.953" E
6	22° 26' 36.572" N	87° 38' 41.089" E	23	22° 26' 34.291" N	87° 38' 25.293" E
7	22° 26' 36.836" N	87° 38' 43.867" E	24	22° 26' 34.713" N	87° 38' 24.820" E
8	22° 26' 36.500" N	87° 38' 46.087" E	25	22° 26' 35.459" N	87° 38' 24.223" E
9	22° 26' 36.037" N	87° 38' 47.883" E	26	22° 26' 35.863" N	87° 38' 23.960" E
10	22° 26' 34.807" N	87° 38' 47.637" E	27	22° 26' 36.420" N	87° 38' 23.994" E
11	22° 26' 35.516" N	87° 38' 43.695" E	28	22° 26' 37.297" N	87° 38' 24.187" E
12	22° 26' 35.319" N	87° 38' 41.317" E	29	22° 26' 37.837" N	87° 38' 24.352" E
13	22° 26' 34.727" N	87° 38' 39.204" E	30	22° 26' 37.688" N	87° 38' 24.395" E
14	22° 26' 34.126" N	87° 38' 37.380" E	31	22° 26' 36.872" N	87° 38' 24.696" E
15	22° 26' 32.641" N	87° 38' 33.556" E	32	22° 26' 36.685" N	87° 38' 24.857" E
16	22° 26' 32.542" N	87° 38' 33.318" E	33	22° 26' 35.690" N	87° 38' 25.713" E
17	22° 26' 32.112" N	87° 38' 32.372" E	34	22° 26' 34.653" N	87° 38' 27.063" E
			35	22° 26' 33.831" N	87° 38' 28.548" E

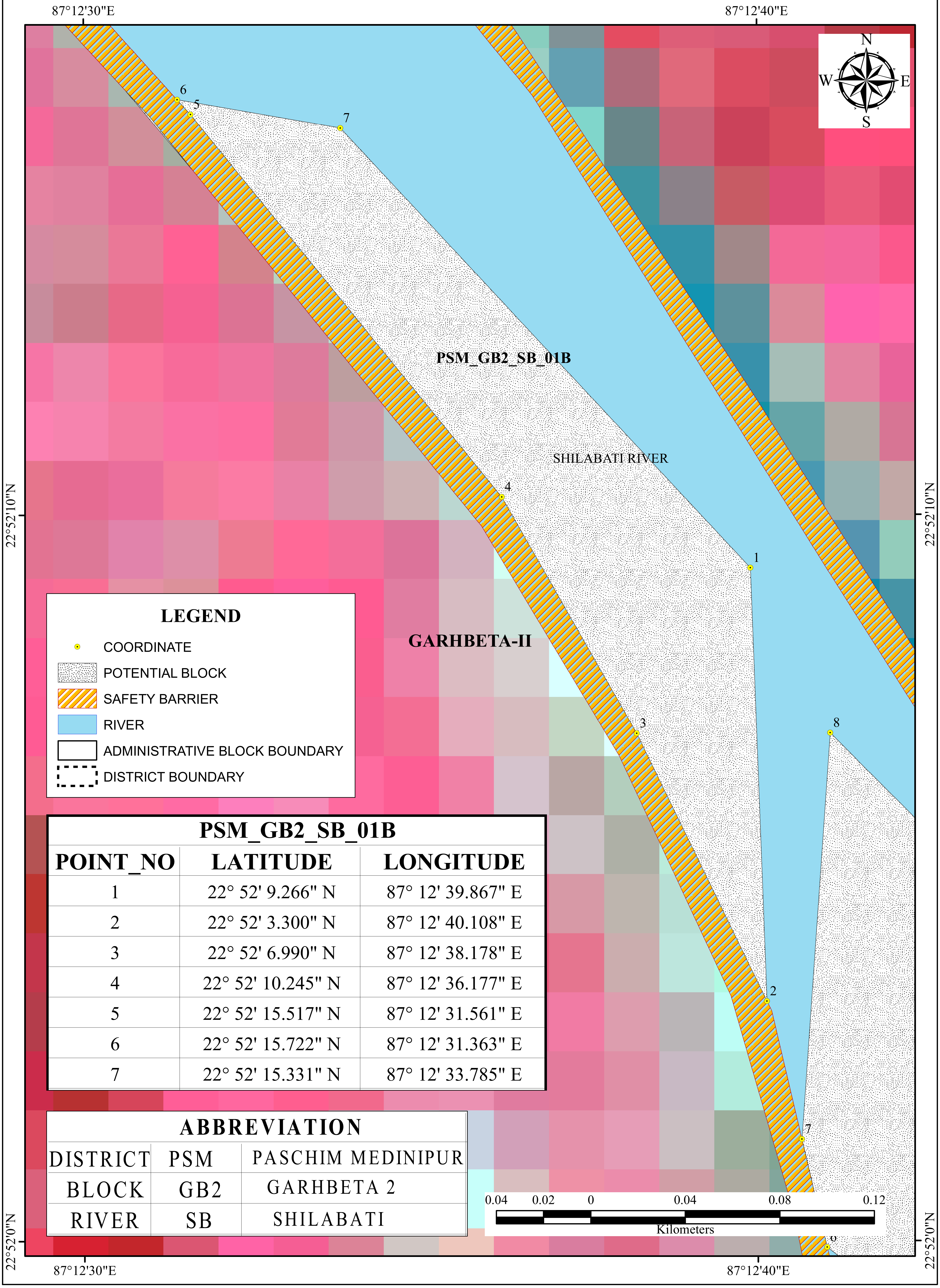
POTENTIAL BLOCK PSM_GB2_SB_01A OF SHILABATI RIVER



PSM_GB2_SB_01A		
POINT_NO	LATITUDE	LONGITUDE
1	22° 53' 7.908" N	87° 11' 34.048" E
2	22° 53' 5.364" N	87° 11' 33.172" E
3	22° 53' 7.169" N	87° 11' 30.628" E
4	22° 53' 11.150" N	87° 11' 26.176" E
5	22° 53' 13.086" N	87° 11' 24.565" E
6	22° 53' 16.756" N	87° 11' 24.203" E
7	22° 53' 16.435" N	87° 11' 26.770" E
8	22° 53' 14.626" N	87° 11' 28.764" E
9	22° 53' 10.791" N	87° 11' 33.960" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB2	GARHBETA 2
RIVER	SB	SHILABATI

POTENTIAL BLOCK PSM_GB2_SB_01B OF SHILABATI RIVER



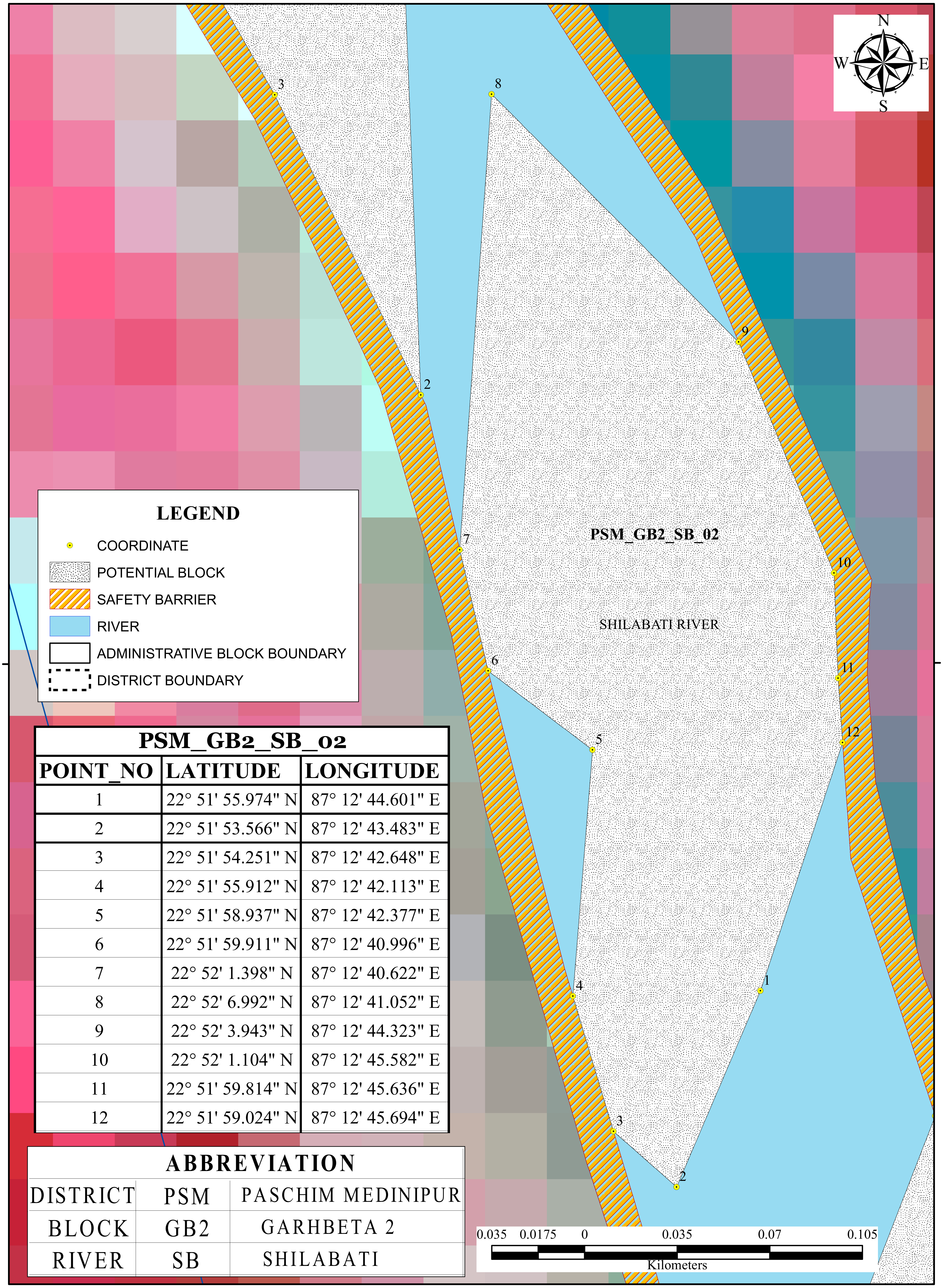
PSM_GB2_SB_01B

POINT_NO	LATITUDE	LONGITUDE
1	22° 52' 9.266" N	87° 12' 39.867" E
2	22° 52' 3.300" N	87° 12' 40.108" E
3	22° 52' 6.990" N	87° 12' 38.178" E
4	22° 52' 10.245" N	87° 12' 36.177" E
5	22° 52' 15.517" N	87° 12' 31.561" E
6	22° 52' 15.722" N	87° 12' 31.363" E
7	22° 52' 15.331" N	87° 12' 33.785" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB2	GARHBETA 2
RIVER	SB	SHILABATI

POTENTIAL BLOCK PSM_GB2_SB_02 OF SHILABATI RIVER



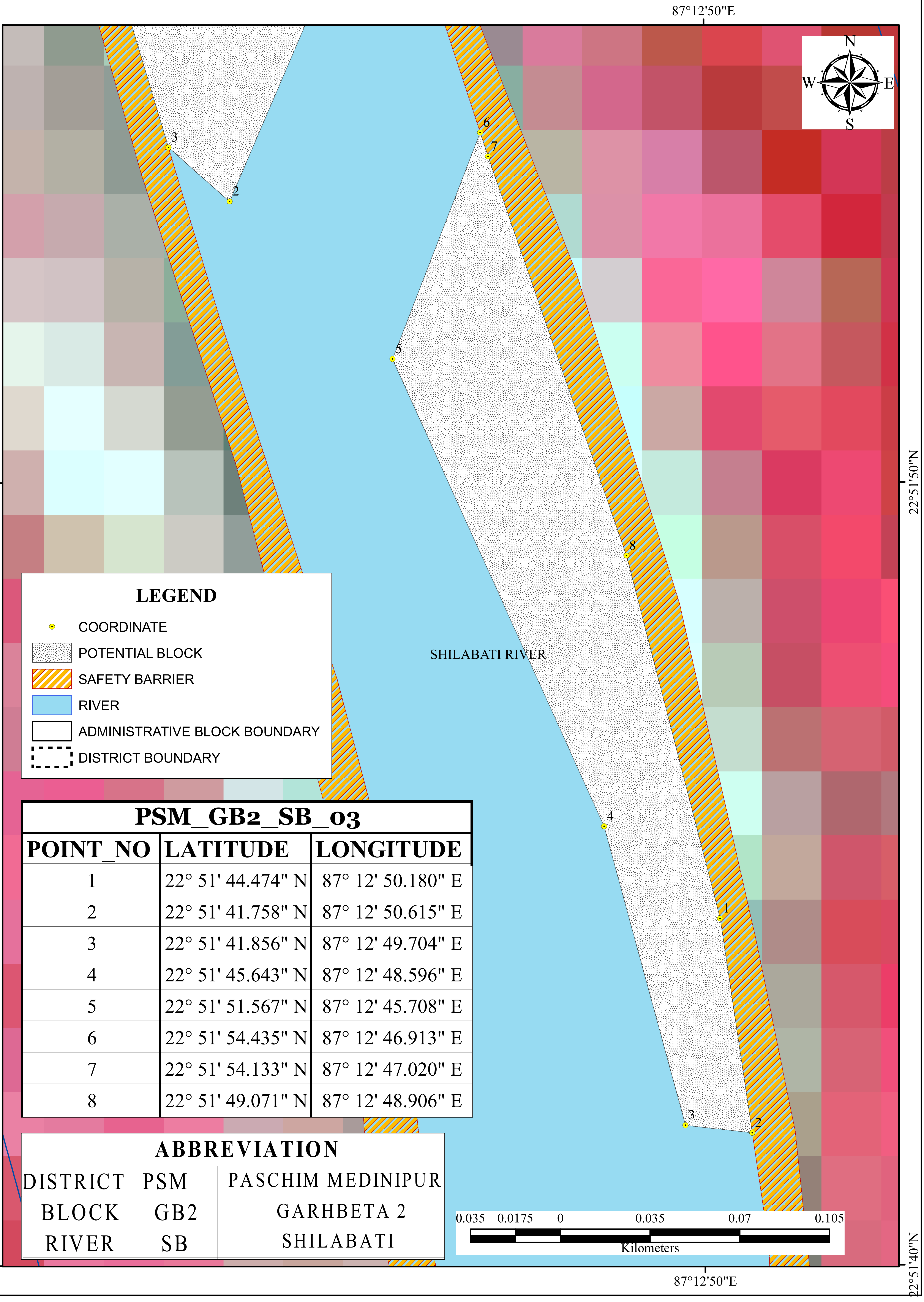
PSM_GB2_SB_02

POINT_NO	LATITUDE	LONGITUDE
1	22° 51' 55.974" N	87° 12' 44.601" E
2	22° 51' 53.566" N	87° 12' 43.483" E
3	22° 51' 54.251" N	87° 12' 42.648" E
4	22° 51' 55.912" N	87° 12' 42.113" E
5	22° 51' 58.937" N	87° 12' 42.377" E
6	22° 51' 59.911" N	87° 12' 40.996" E
7	22° 52' 1.398" N	87° 12' 40.622" E
8	22° 52' 6.992" N	87° 12' 41.052" E
9	22° 52' 3.943" N	87° 12' 44.323" E
10	22° 52' 1.104" N	87° 12' 45.582" E
11	22° 51' 59.814" N	87° 12' 45.636" E
12	22° 51' 59.024" N	87° 12' 45.694" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB2	GARHBETA 2
RIVER	SB	SHILABATI

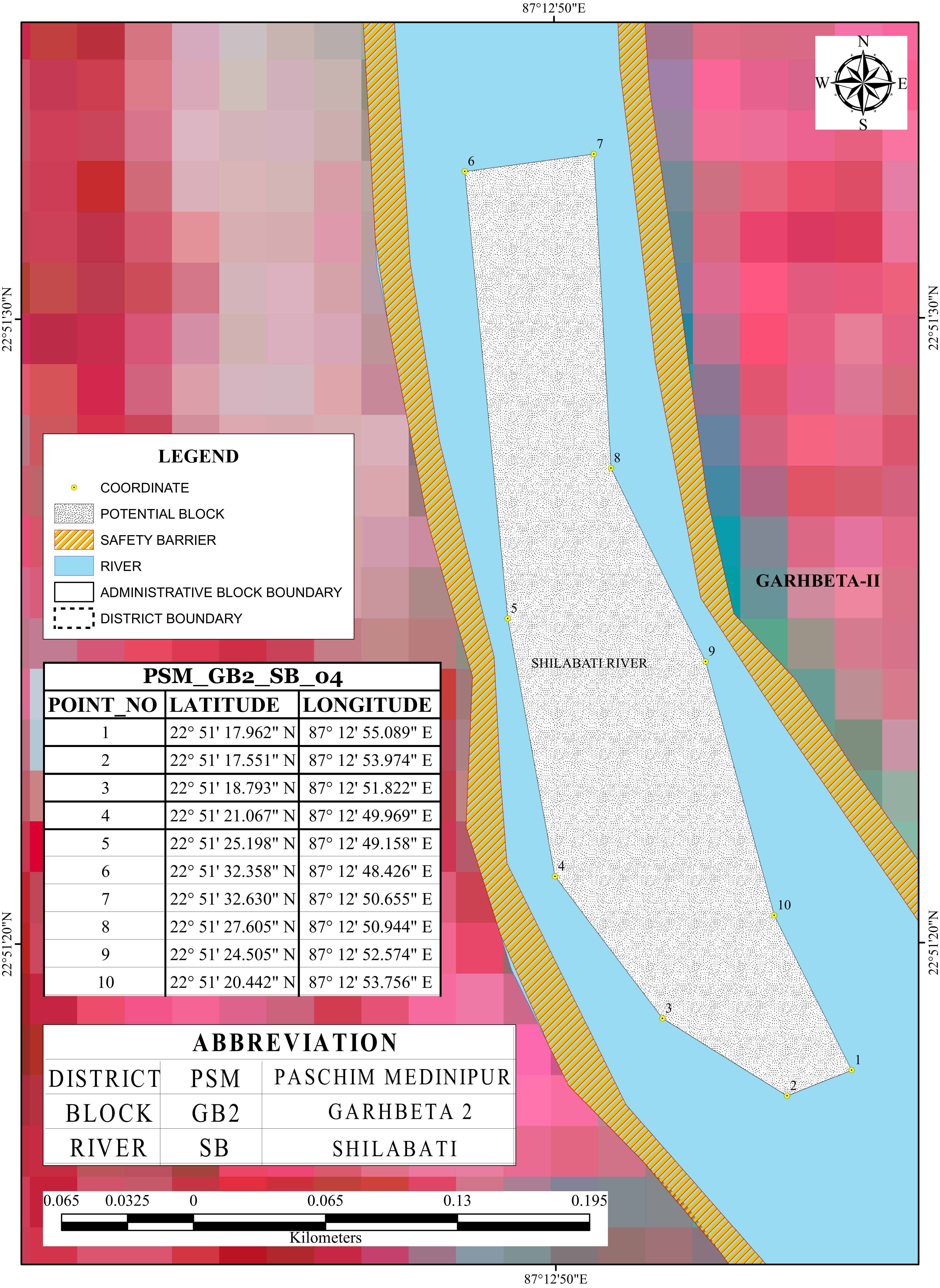
POTENTIAL BLOCK PSM_GB2_SB_03 OF SHILABATI RIVER



PSM_GB2_SB_03		
POINT_NO	LATITUDE	LONGITUDE
1	22° 51' 44.474" N	87° 12' 50.180" E
2	22° 51' 41.758" N	87° 12' 50.615" E
3	22° 51' 41.856" N	87° 12' 49.704" E
4	22° 51' 45.643" N	87° 12' 48.596" E
5	22° 51' 51.567" N	87° 12' 45.708" E
6	22° 51' 54.435" N	87° 12' 46.913" E
7	22° 51' 54.133" N	87° 12' 47.020" E
8	22° 51' 49.071" N	87° 12' 48.906" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB2	GARHBETA 2
RIVER	SB	SHILABATI

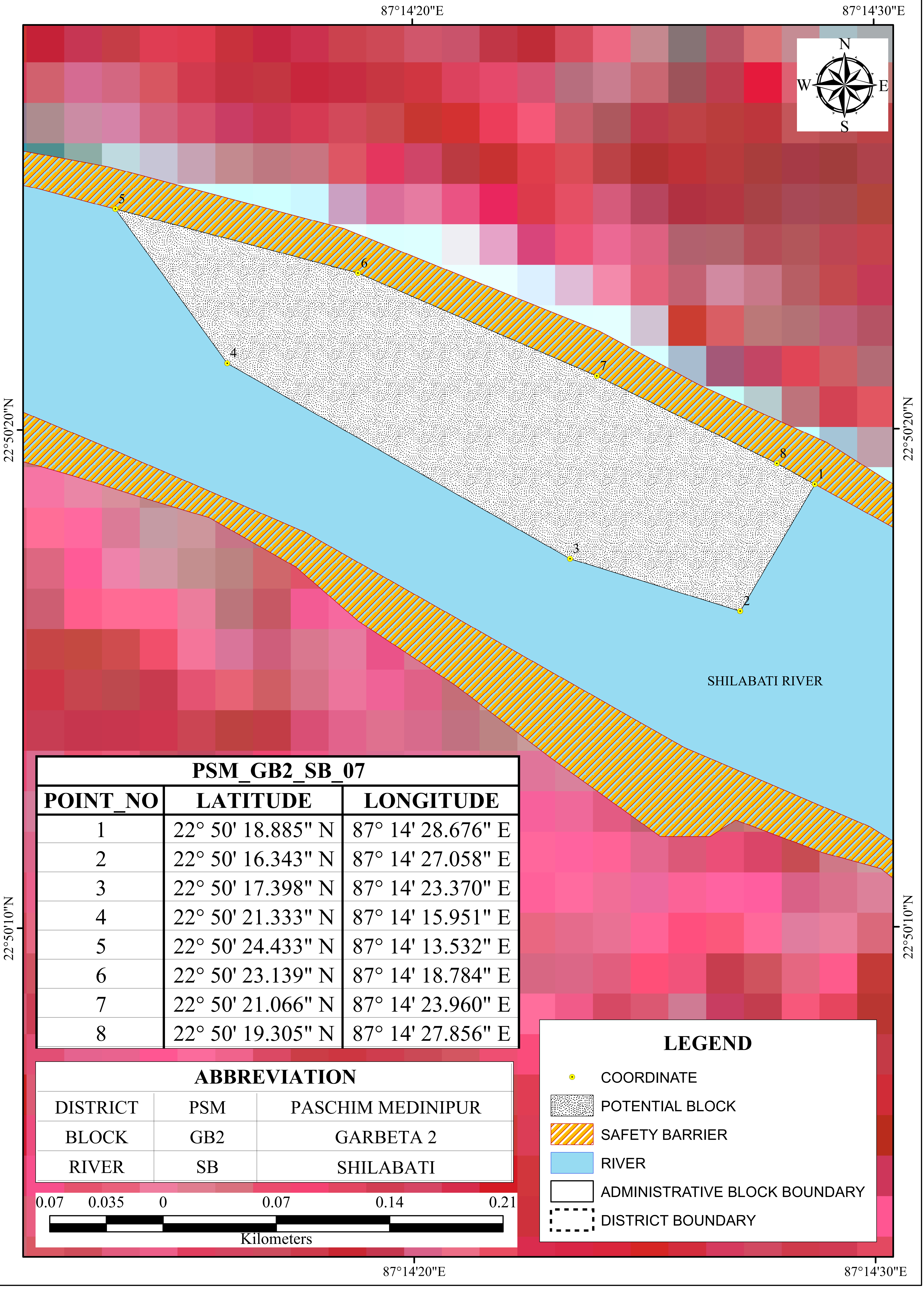
POTENTIAL BLOCK PSM_GB2_SB_04 OF SHILABATI RIVER



PSM_GB2_SB_04		
POINT_NO	LATITUDE	LONGITUDE
1	22° 51' 17.962" N	87° 12' 55.089" E
2	22° 51' 17.551" N	87° 12' 53.974" E
3	22° 51' 18.793" N	87° 12' 51.822" E
4	22° 51' 21.067" N	87° 12' 49.969" E
5	22° 51' 25.198" N	87° 12' 49.158" E
6	22° 51' 32.358" N	87° 12' 48.426" E
7	22° 51' 32.630" N	87° 12' 50.655" E
8	22° 51' 27.605" N	87° 12' 50.944" E
9	22° 51' 24.505" N	87° 12' 52.574" E
10	22° 51' 20.442" N	87° 12' 53.756" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB2	GARHBETA 2
RIVER	SB	SHILABATI

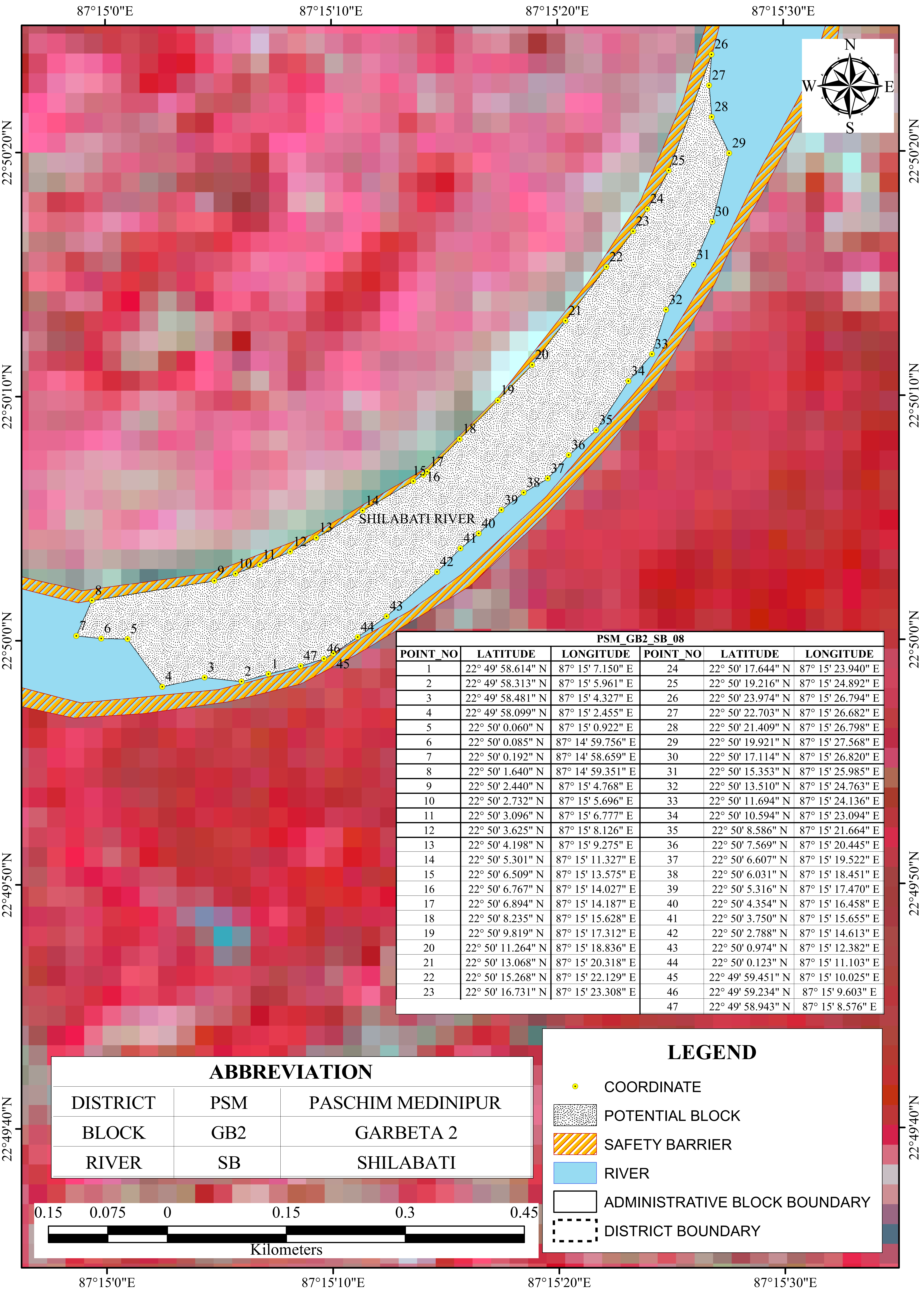
POTENTIAL BLOCK PSM_GB2_SB_07 OF SHILABATI RIVER



PSM_GB2_SB_07		
POINT_NO	LATITUDE	LONGITUDE
1	22° 50' 18.885" N	87° 14' 28.676" E
2	22° 50' 16.343" N	87° 14' 27.058" E
3	22° 50' 17.398" N	87° 14' 23.370" E
4	22° 50' 21.333" N	87° 14' 15.951" E
5	22° 50' 24.433" N	87° 14' 13.532" E
6	22° 50' 23.139" N	87° 14' 18.784" E
7	22° 50' 21.066" N	87° 14' 23.960" E
8	22° 50' 19.305" N	87° 14' 27.856" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB2	GARBETA 2
RIVER	SB	SHILABATI

POTENTIAL BLOCK PSM_GB2_SB_08 OF SHILABATI RIVER

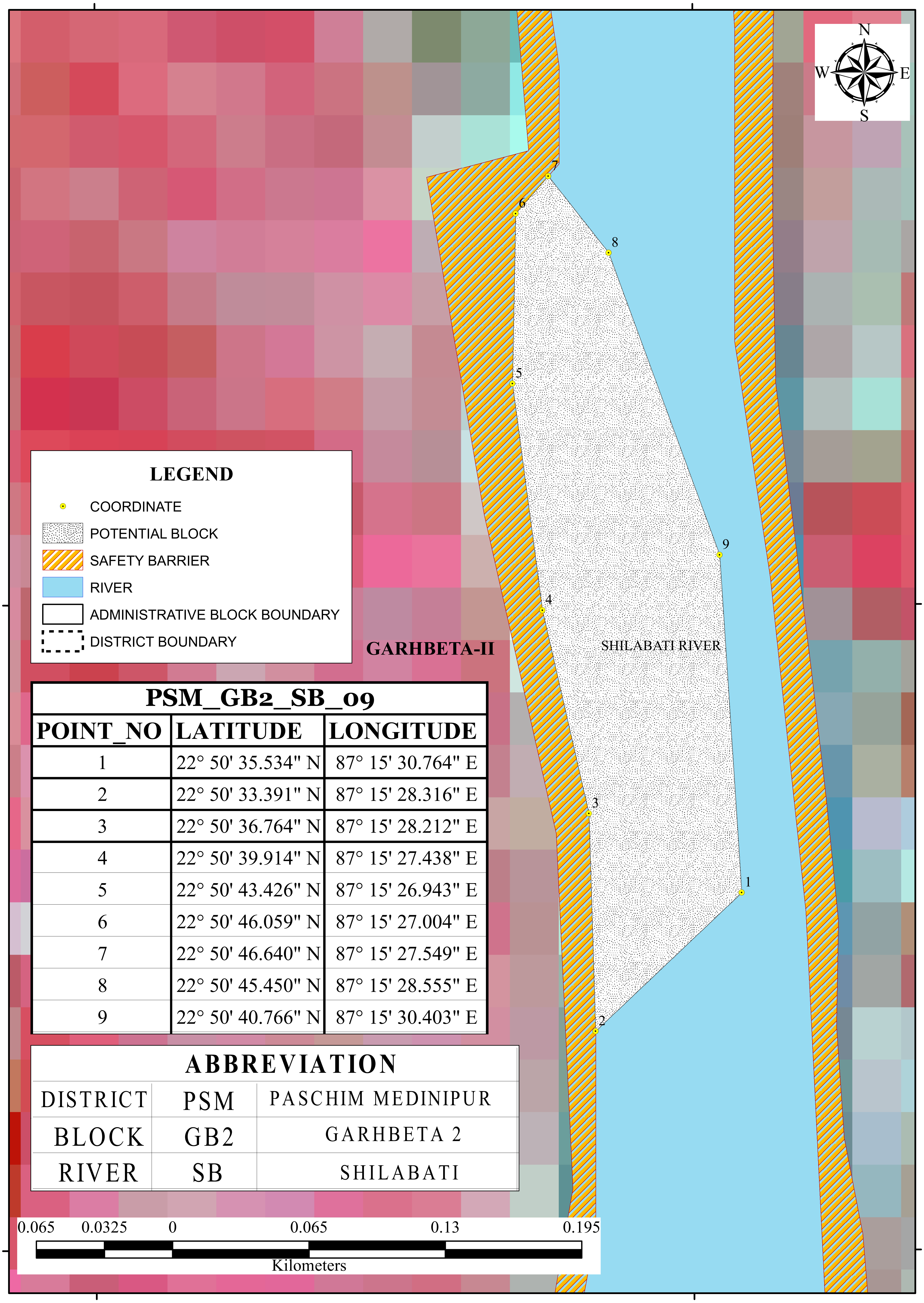


PSM_GB2_SB_08					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	22° 49' 58.614" N	87° 15' 7.150" E	24	22° 50' 17.644" N	87° 15' 23.940" E
2	22° 49' 58.313" N	87° 15' 5.961" E	25	22° 50' 19.216" N	87° 15' 24.892" E
3	22° 49' 58.481" N	87° 15' 4.327" E	26	22° 50' 23.974" N	87° 15' 26.794" E
4	22° 49' 58.099" N	87° 15' 2.455" E	27	22° 50' 22.703" N	87° 15' 26.682" E
5	22° 50' 0.060" N	87° 15' 0.922" E	28	22° 50' 21.409" N	87° 15' 26.798" E
6	22° 50' 0.085" N	87° 14' 59.756" E	29	22° 50' 19.921" N	87° 15' 27.568" E
7	22° 50' 0.192" N	87° 14' 58.659" E	30	22° 50' 17.114" N	87° 15' 26.820" E
8	22° 50' 1.640" N	87° 14' 59.351" E	31	22° 50' 15.353" N	87° 15' 25.985" E
9	22° 50' 2.440" N	87° 15' 4.768" E	32	22° 50' 13.510" N	87° 15' 24.763" E
10	22° 50' 2.732" N	87° 15' 5.696" E	33	22° 50' 11.694" N	87° 15' 24.136" E
11	22° 50' 3.096" N	87° 15' 6.777" E	34	22° 50' 10.594" N	87° 15' 23.094" E
12	22° 50' 3.625" N	87° 15' 8.126" E	35	22° 50' 8.586" N	87° 15' 21.664" E
13	22° 50' 4.198" N	87° 15' 9.275" E	36	22° 50' 7.569" N	87° 15' 20.445" E
14	22° 50' 5.301" N	87° 15' 11.327" E	37	22° 50' 6.607" N	87° 15' 19.522" E
15	22° 50' 6.509" N	87° 15' 13.575" E	38	22° 50' 6.031" N	87° 15' 18.451" E
16	22° 50' 6.767" N	87° 15' 14.027" E	39	22° 50' 5.316" N	87° 15' 17.470" E
17	22° 50' 6.894" N	87° 15' 14.187" E	40	22° 50' 4.354" N	87° 15' 16.458" E
18	22° 50' 8.235" N	87° 15' 15.628" E	41	22° 50' 3.750" N	87° 15' 15.655" E
19	22° 50' 9.819" N	87° 15' 17.312" E	42	22° 50' 2.788" N	87° 15' 14.613" E
20	22° 50' 11.264" N	87° 15' 18.836" E	43	22° 50' 0.974" N	87° 15' 12.382" E
21	22° 50' 13.068" N	87° 15' 20.318" E	44	22° 50' 0.123" N	87° 15' 11.103" E
22	22° 50' 15.268" N	87° 15' 22.129" E	45	22° 49' 59.451" N	87° 15' 10.025" E
23	22° 50' 16.731" N	87° 15' 23.308" E	46	22° 49' 59.234" N	87° 15' 9.603" E
			47	22° 49' 58.943" N	87° 15' 8.576" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB2	GARBETA 2
RIVER	SB	SHILABATI

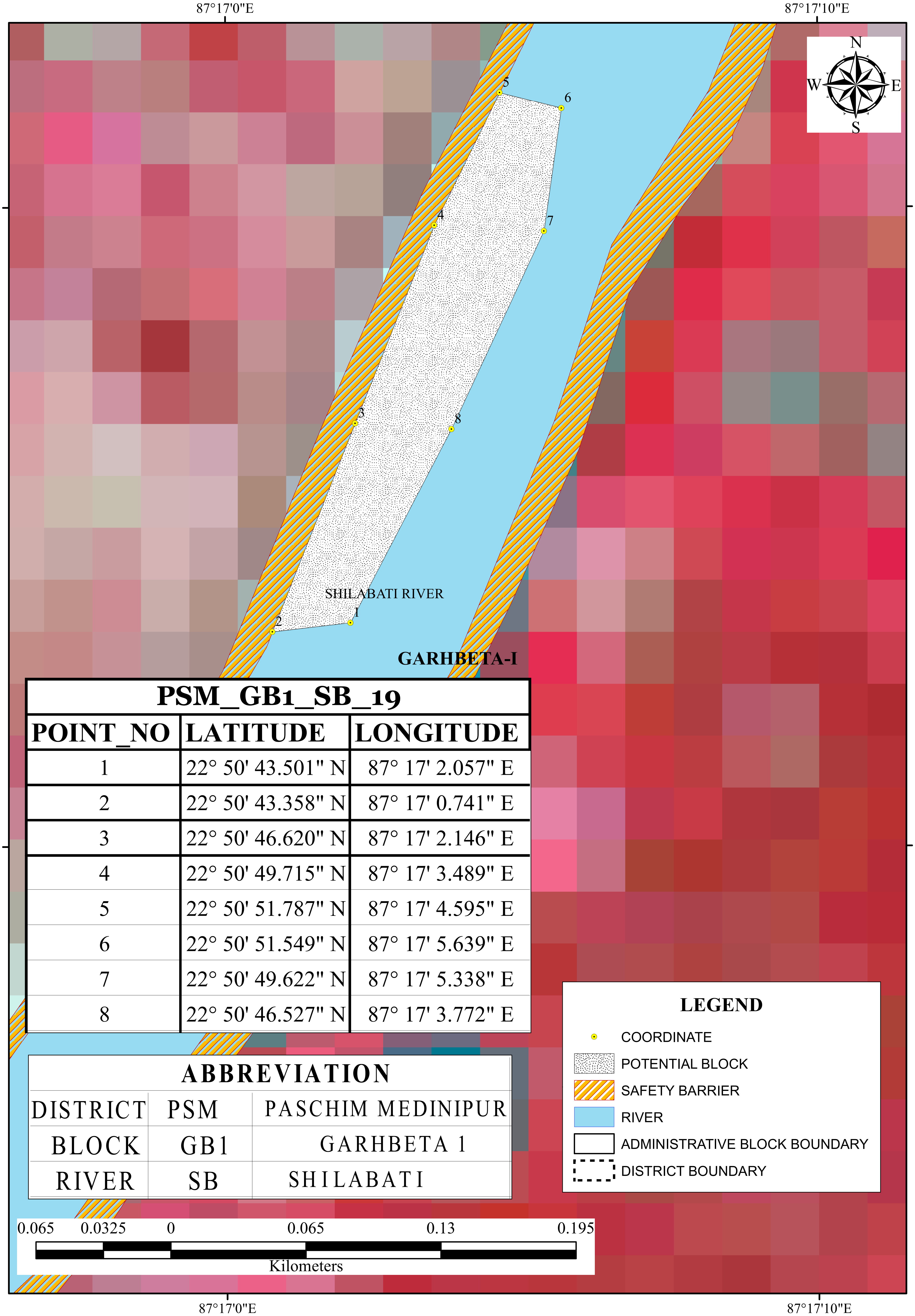
POTENTIAL BLOCK PSM_GB2_SB_09 OF SHILABATI RIVER



PSM_GB2_SB_09		
POINT_NO	LATITUDE	LONGITUDE
1	22° 50' 35.534" N	87° 15' 30.764" E
2	22° 50' 33.391" N	87° 15' 28.316" E
3	22° 50' 36.764" N	87° 15' 28.212" E
4	22° 50' 39.914" N	87° 15' 27.438" E
5	22° 50' 43.426" N	87° 15' 26.943" E
6	22° 50' 46.059" N	87° 15' 27.004" E
7	22° 50' 46.640" N	87° 15' 27.549" E
8	22° 50' 45.450" N	87° 15' 28.555" E
9	22° 50' 40.766" N	87° 15' 30.403" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB2	GARHBETA 2
RIVER	SB	SHILABATI

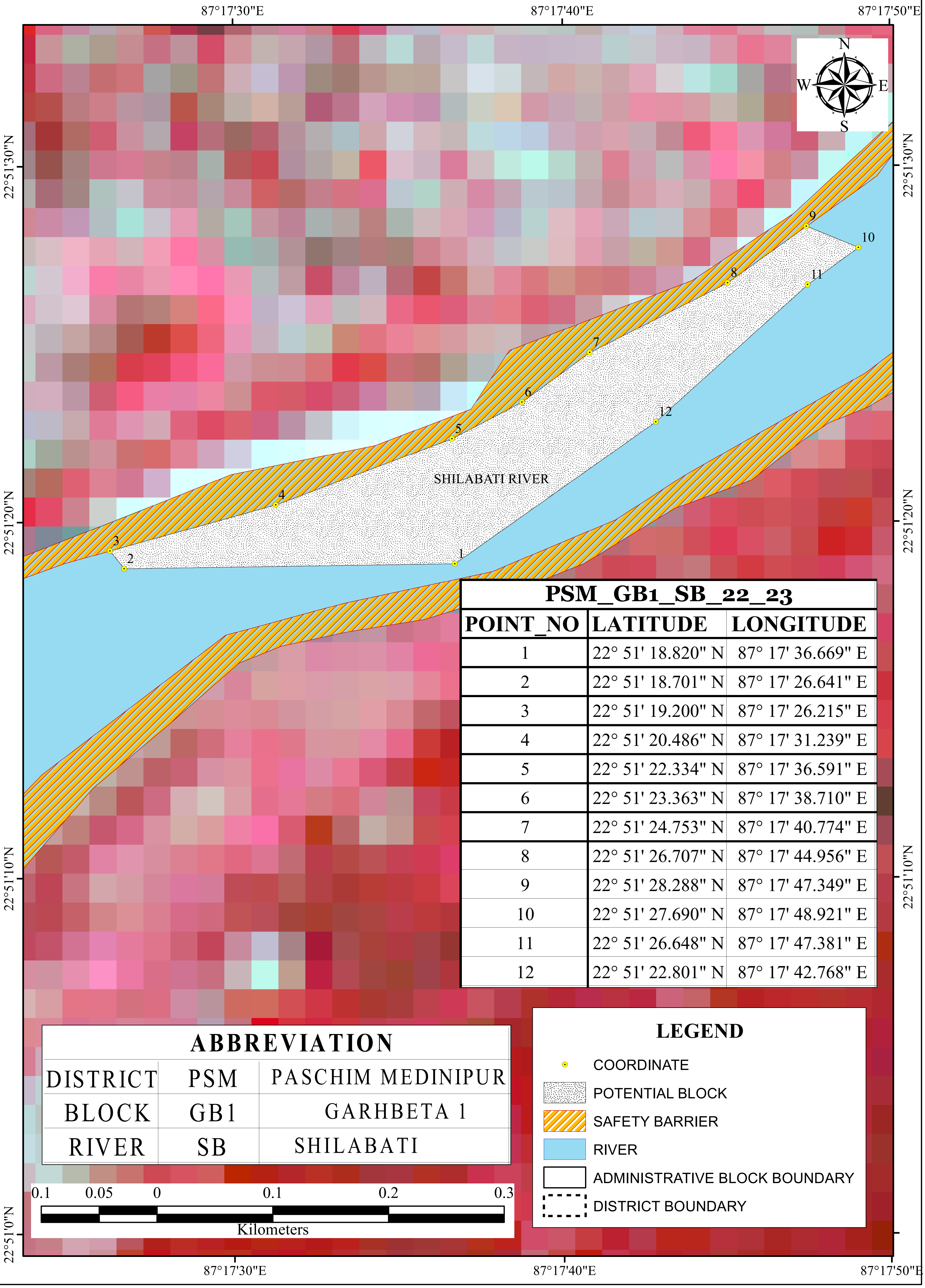
POTENTIAL BLOCK PSM_GB1_SB_19 OF SHILABATI RIVER



PSM_GB1_SB_19		
POINT_NO	LATITUDE	LONGITUDE
1	22° 50' 43.501" N	87° 17' 2.057" E
2	22° 50' 43.358" N	87° 17' 0.741" E
3	22° 50' 46.620" N	87° 17' 2.146" E
4	22° 50' 49.715" N	87° 17' 3.489" E
5	22° 50' 51.787" N	87° 17' 4.595" E
6	22° 50' 51.549" N	87° 17' 5.639" E
7	22° 50' 49.622" N	87° 17' 5.338" E
8	22° 50' 46.527" N	87° 17' 3.772" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB1	GARHBETA 1
RIVER	SB	SHILABATI

POTENTIAL BLOCK PSM_GB1_SB_22_23 OF SHILABATI RIVER



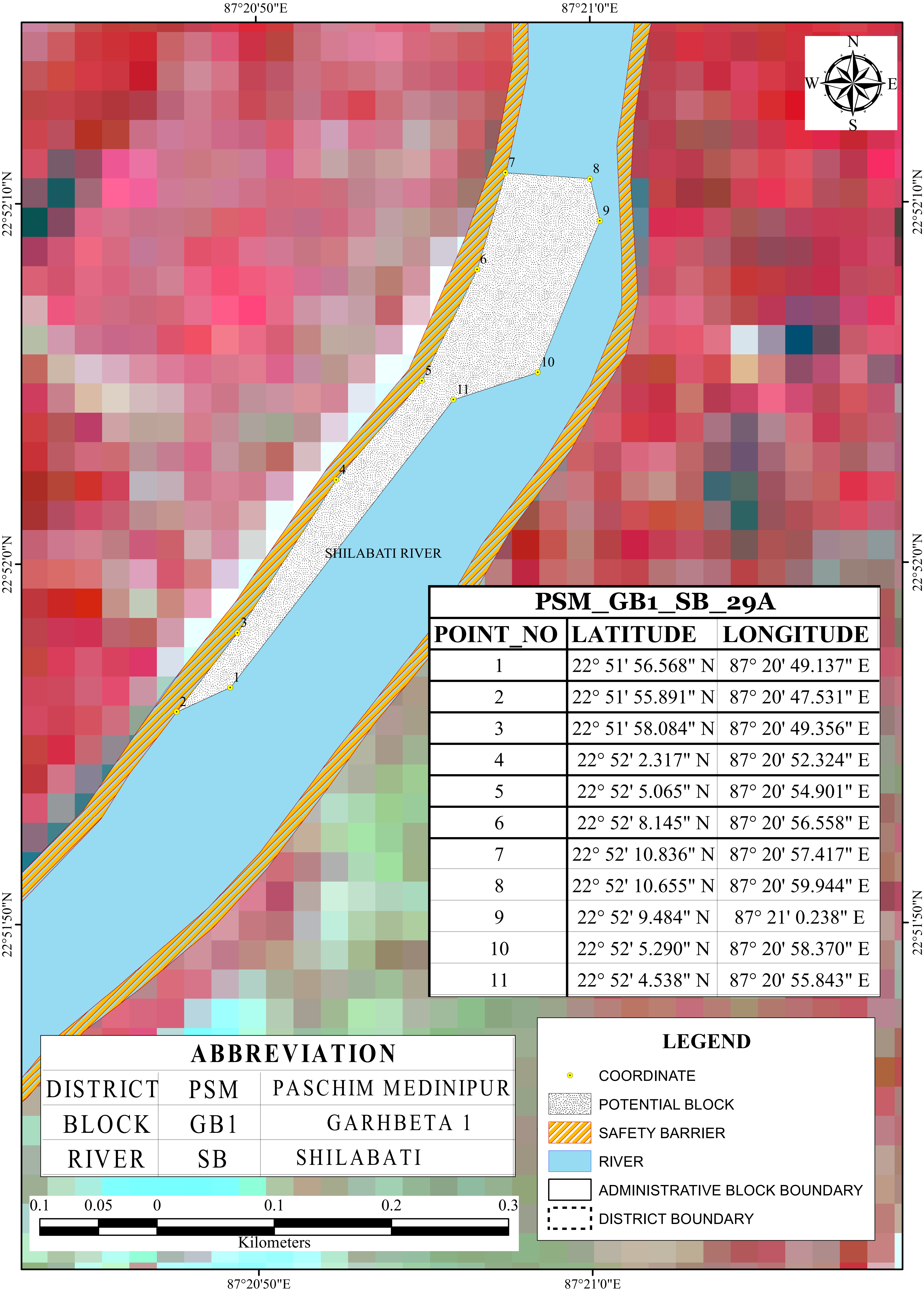
PSM_GB1_SB_22_23		
POINT_NO	LATITUDE	LONGITUDE
1	22° 51' 18.820" N	87° 17' 36.669" E
2	22° 51' 18.701" N	87° 17' 26.641" E
3	22° 51' 19.200" N	87° 17' 26.215" E
4	22° 51' 20.486" N	87° 17' 31.239" E
5	22° 51' 22.334" N	87° 17' 36.591" E
6	22° 51' 23.363" N	87° 17' 38.710" E
7	22° 51' 24.753" N	87° 17' 40.774" E
8	22° 51' 26.707" N	87° 17' 44.956" E
9	22° 51' 28.288" N	87° 17' 47.349" E
10	22° 51' 27.690" N	87° 17' 48.921" E
11	22° 51' 26.648" N	87° 17' 47.381" E
12	22° 51' 22.801" N	87° 17' 42.768" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB1	GARHBETA 1
RIVER	SB	SHILABATI

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

POTENTIAL BLOCK PSM_GB1_SB_29A OF SHILABATI RIVER



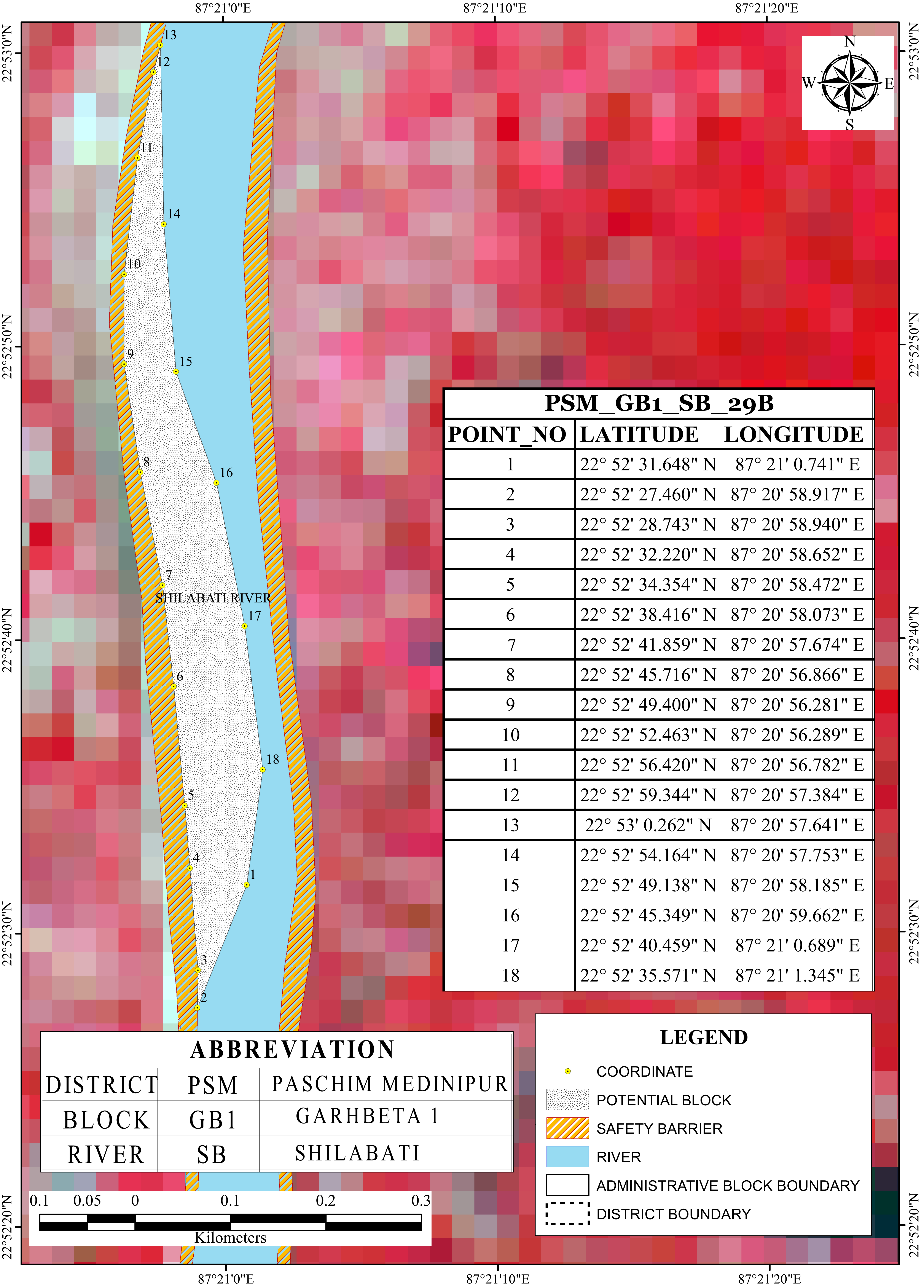
PSM_GB1_SB_29A		
POINT_NO	LATITUDE	LONGITUDE
1	22° 51' 56.568" N	87° 20' 49.137" E
2	22° 51' 55.891" N	87° 20' 47.531" E
3	22° 51' 58.084" N	87° 20' 49.356" E
4	22° 52' 2.317" N	87° 20' 52.324" E
5	22° 52' 5.065" N	87° 20' 54.901" E
6	22° 52' 8.145" N	87° 20' 56.558" E
7	22° 52' 10.836" N	87° 20' 57.417" E
8	22° 52' 10.655" N	87° 20' 59.944" E
9	22° 52' 9.484" N	87° 21' 0.238" E
10	22° 52' 5.290" N	87° 20' 58.370" E
11	22° 52' 4.538" N	87° 20' 55.843" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB1	GARHBETA 1
RIVER	SB	SHILABATI

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

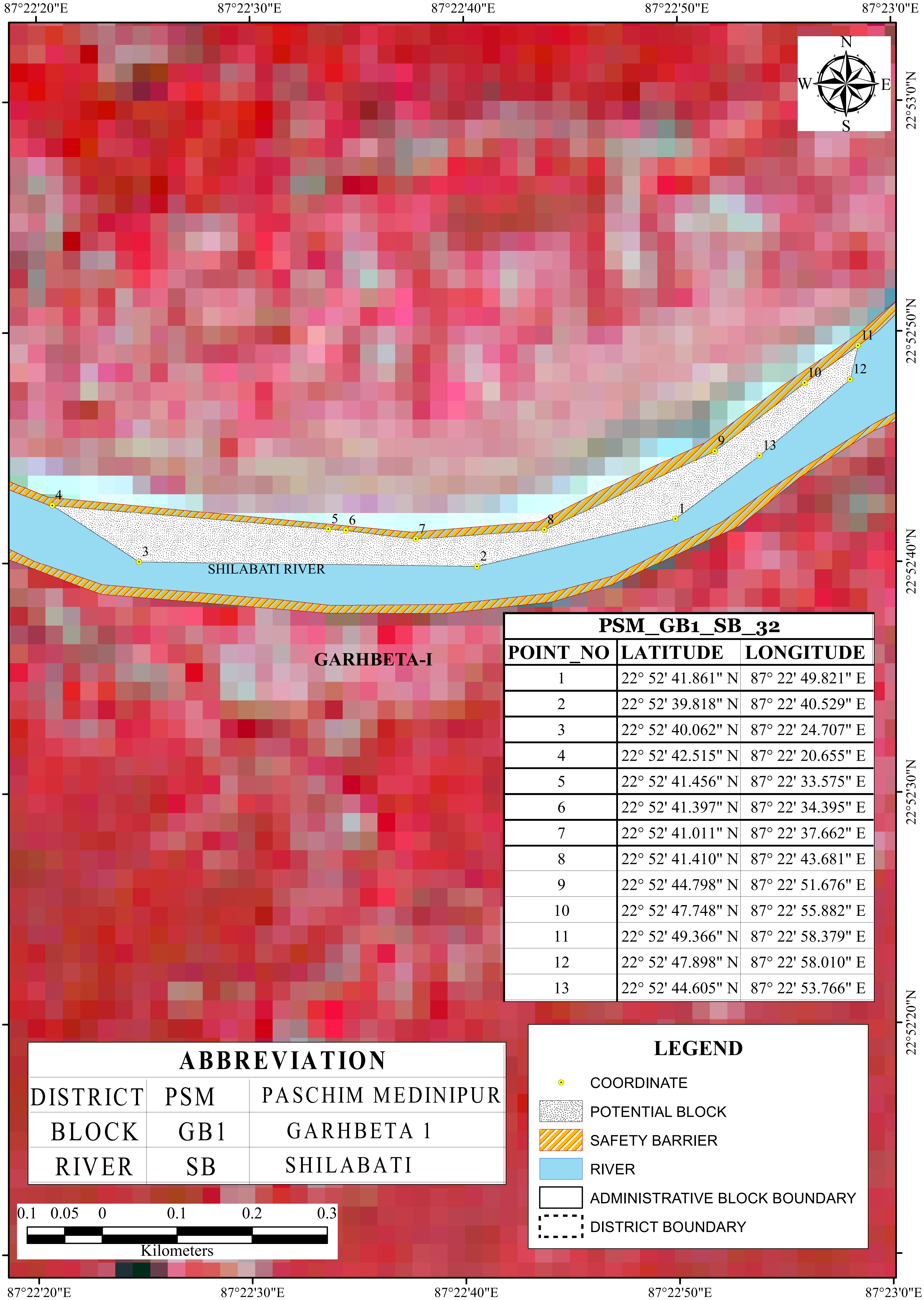
POTENTIAL BLOCK PSM_GB1_SB_29B OF SHILABATI RIVER



PSM_GB1_SB_29B		
POINT_NO	LATITUDE	LONGITUDE
1	22° 52' 31.648" N	87° 21' 0.741" E
2	22° 52' 27.460" N	87° 20' 58.917" E
3	22° 52' 28.743" N	87° 20' 58.940" E
4	22° 52' 32.220" N	87° 20' 58.652" E
5	22° 52' 34.354" N	87° 20' 58.472" E
6	22° 52' 38.416" N	87° 20' 58.073" E
7	22° 52' 41.859" N	87° 20' 57.674" E
8	22° 52' 45.716" N	87° 20' 56.866" E
9	22° 52' 49.400" N	87° 20' 56.281" E
10	22° 52' 52.463" N	87° 20' 56.289" E
11	22° 52' 56.420" N	87° 20' 56.782" E
12	22° 52' 59.344" N	87° 20' 57.384" E
13	22° 53' 0.262" N	87° 20' 57.641" E
14	22° 52' 54.164" N	87° 20' 57.753" E
15	22° 52' 49.138" N	87° 20' 58.185" E
16	22° 52' 45.349" N	87° 20' 59.662" E
17	22° 52' 40.459" N	87° 21' 0.689" E
18	22° 52' 35.571" N	87° 21' 1.345" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB1	GARHBETA 1
RIVER	SB	SHILABATI

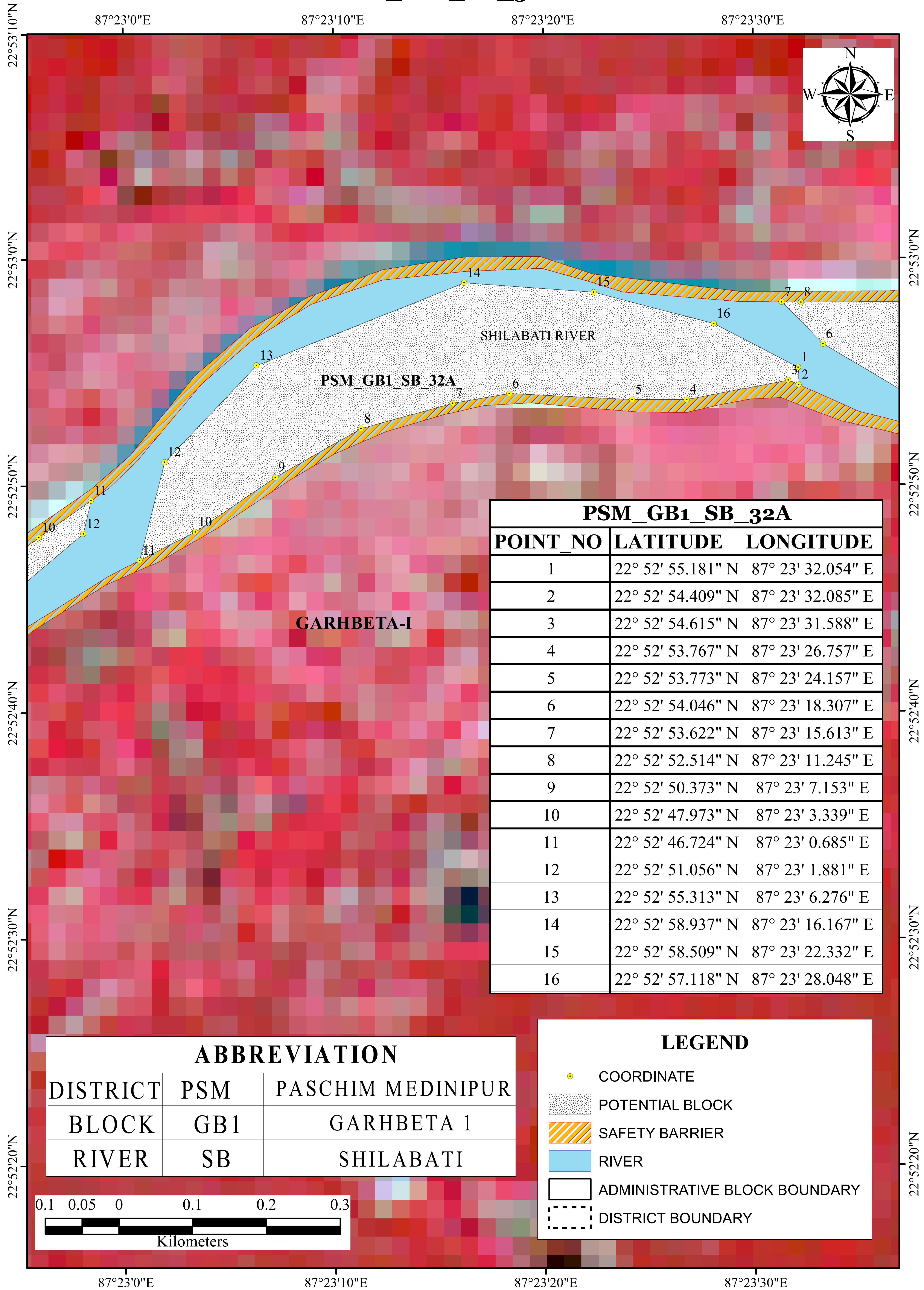
POTENTIAL BLOCK PSM_GB1_SB_32 OF SHILABATI RIVER



PSM_GB1_SB_32		
POINT_NO	LATITUDE	LONGITUDE
1	22° 52' 41.861" N	87° 22' 49.821" E
2	22° 52' 39.818" N	87° 22' 40.529" E
3	22° 52' 40.062" N	87° 22' 24.707" E
4	22° 52' 42.515" N	87° 22' 20.655" E
5	22° 52' 41.456" N	87° 22' 33.575" E
6	22° 52' 41.397" N	87° 22' 34.395" E
7	22° 52' 41.011" N	87° 22' 37.662" E
8	22° 52' 41.410" N	87° 22' 43.681" E
9	22° 52' 44.798" N	87° 22' 51.676" E
10	22° 52' 47.748" N	87° 22' 55.882" E
11	22° 52' 49.366" N	87° 22' 58.379" E
12	22° 52' 47.898" N	87° 22' 58.010" E
13	22° 52' 44.605" N	87° 22' 53.766" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB1	GARHBETA 1
RIVER	SB	SHILABATI

POTENTIAL BLOCK PSM_GB1_SB_32A OF SHILABATI RIVER



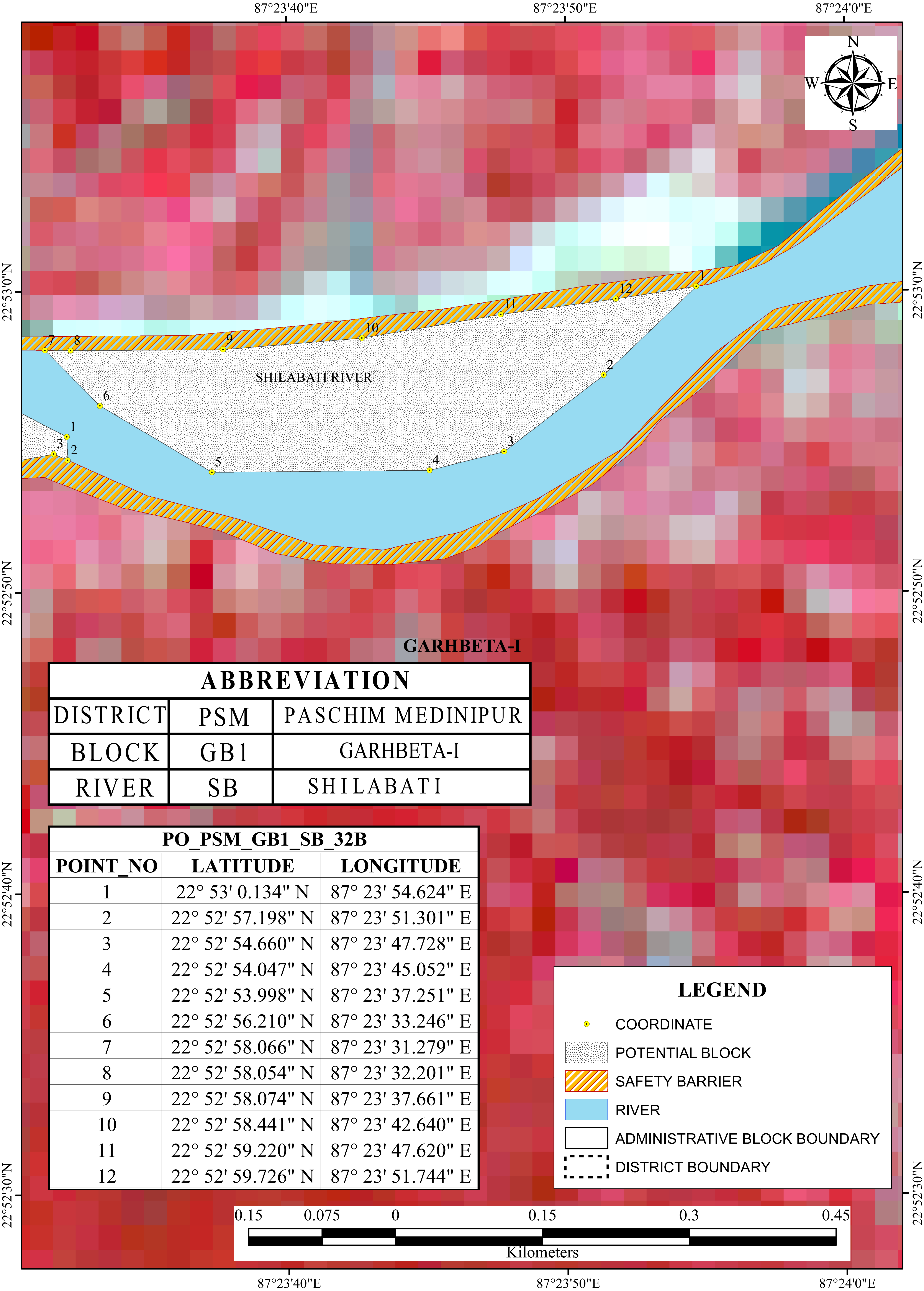
PSM_GB1_SB_32A		
POINT_NO	LATITUDE	LONGITUDE
1	22° 52' 55.181" N	87° 23' 32.054" E
2	22° 52' 54.409" N	87° 23' 32.085" E
3	22° 52' 54.615" N	87° 23' 31.588" E
4	22° 52' 53.767" N	87° 23' 26.757" E
5	22° 52' 53.773" N	87° 23' 24.157" E
6	22° 52' 54.046" N	87° 23' 18.307" E
7	22° 52' 53.622" N	87° 23' 15.613" E
8	22° 52' 52.514" N	87° 23' 11.245" E
9	22° 52' 50.373" N	87° 23' 7.153" E
10	22° 52' 47.973" N	87° 23' 3.339" E
11	22° 52' 46.724" N	87° 23' 0.685" E
12	22° 52' 51.056" N	87° 23' 1.881" E
13	22° 52' 55.313" N	87° 23' 6.276" E
14	22° 52' 58.937" N	87° 23' 16.167" E
15	22° 52' 58.509" N	87° 23' 22.332" E
16	22° 52' 57.118" N	87° 23' 28.048" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB1	GARHBETA 1
RIVER	SB	SHILABATI

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

POTENTIAL BLOCK PSM_GB1_SB_32B OF SHILABATI RIVER

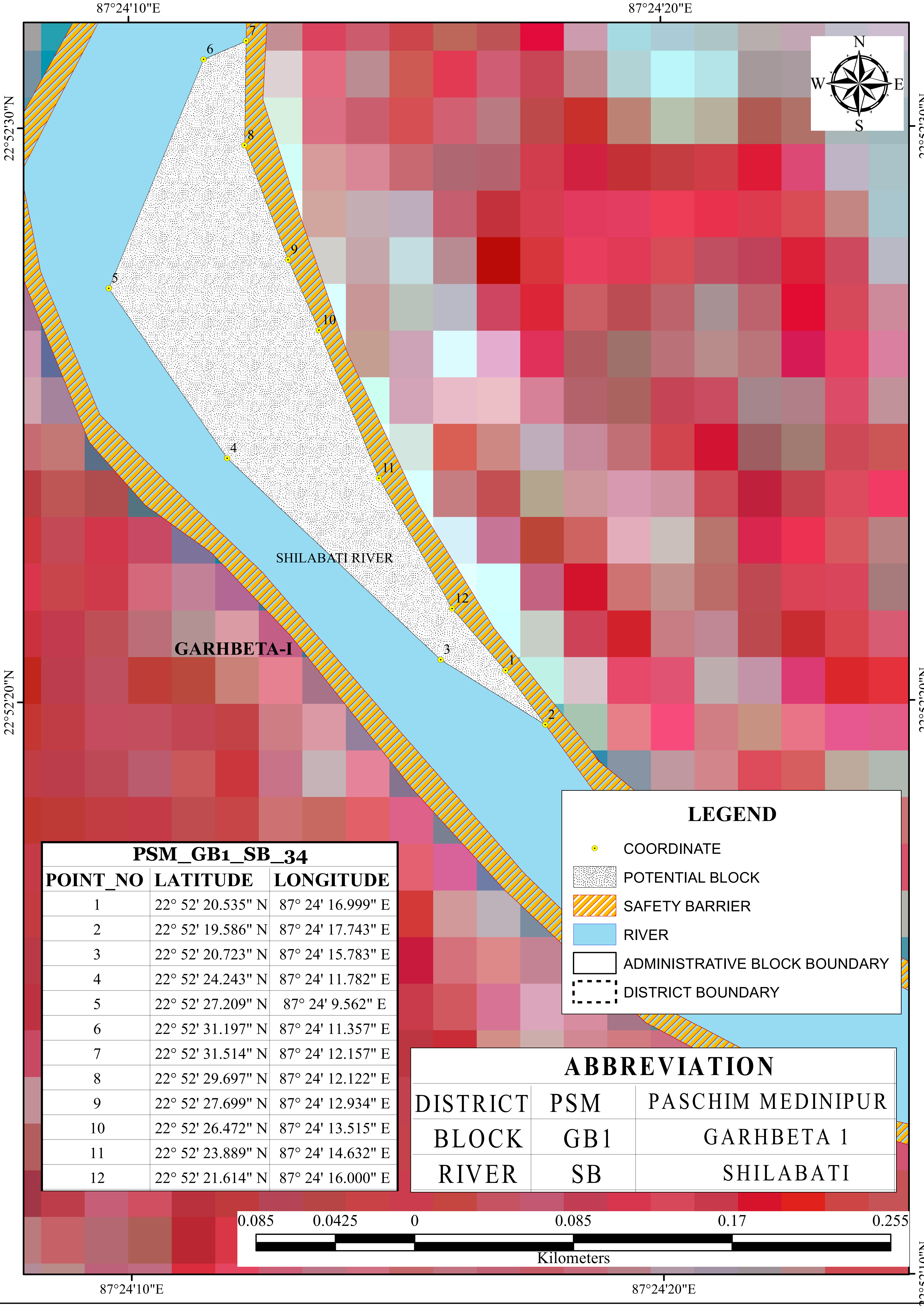


ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB1	GARHBETA-I
RIVER	SB	SHILABATI

PO_PSM_GB1_SB_32B

POINT_NO	LATITUDE	LONGITUDE
1	22° 53' 0.134" N	87° 23' 54.624" E
2	22° 52' 57.198" N	87° 23' 51.301" E
3	22° 52' 54.660" N	87° 23' 47.728" E
4	22° 52' 54.047" N	87° 23' 45.052" E
5	22° 52' 53.998" N	87° 23' 37.251" E
6	22° 52' 56.210" N	87° 23' 33.246" E
7	22° 52' 58.066" N	87° 23' 31.279" E
8	22° 52' 58.054" N	87° 23' 32.201" E
9	22° 52' 58.074" N	87° 23' 37.661" E
10	22° 52' 58.441" N	87° 23' 42.640" E
11	22° 52' 59.220" N	87° 23' 47.620" E
12	22° 52' 59.726" N	87° 23' 51.744" E

POTENTIAL BLOCK PSM_GB1_SB_34 OF SHILABATI RIVER



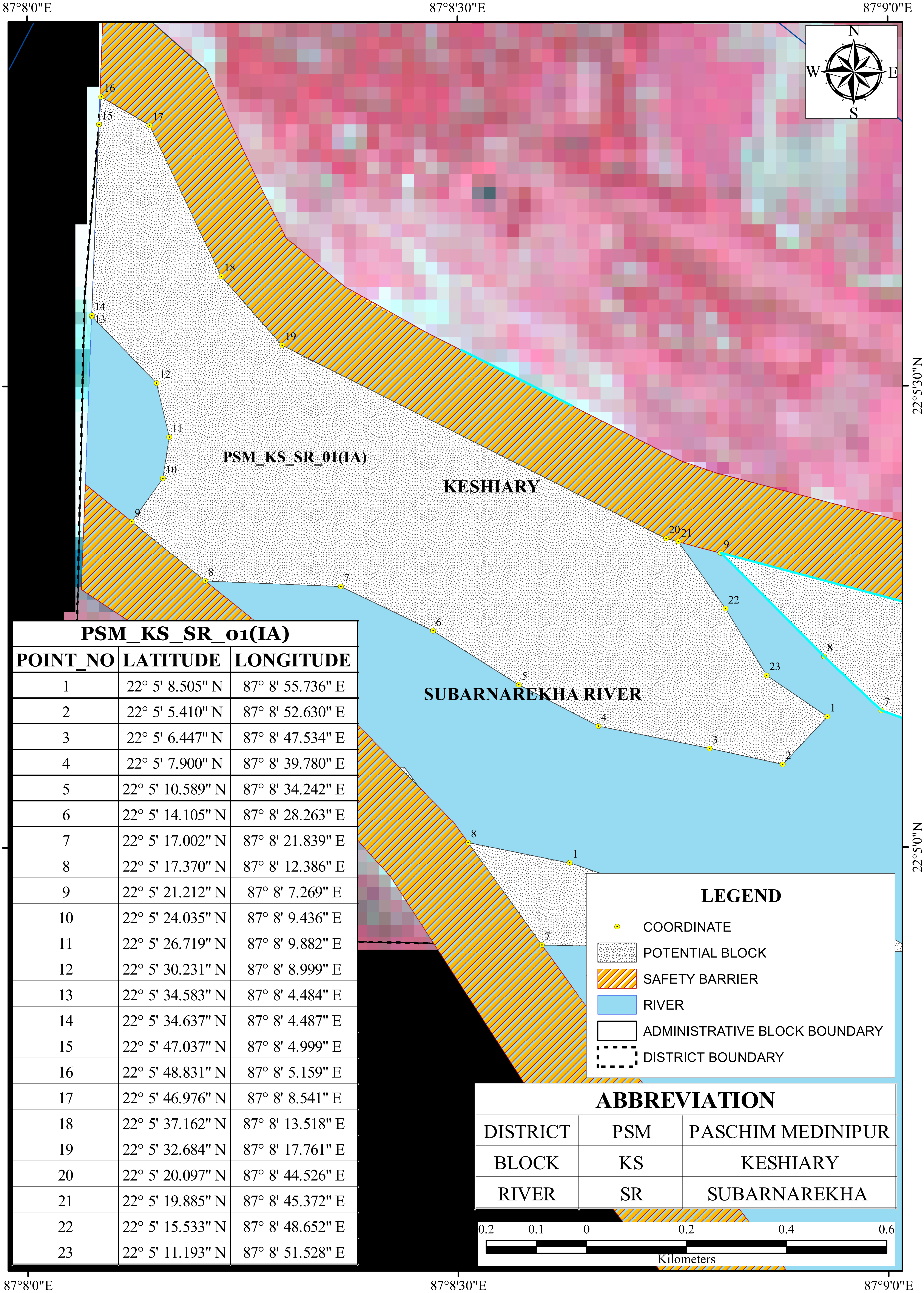
PSM_GB1_SB_34

POINT_NO	LATITUDE	LONGITUDE
1	22° 52' 20.535" N	87° 24' 16.999" E
2	22° 52' 19.586" N	87° 24' 17.743" E
3	22° 52' 20.723" N	87° 24' 15.783" E
4	22° 52' 24.243" N	87° 24' 11.782" E
5	22° 52' 27.209" N	87° 24' 9.562" E
6	22° 52' 31.197" N	87° 24' 11.357" E
7	22° 52' 31.514" N	87° 24' 12.157" E
8	22° 52' 29.697" N	87° 24' 12.122" E
9	22° 52' 27.699" N	87° 24' 12.934" E
10	22° 52' 26.472" N	87° 24' 13.515" E
11	22° 52' 23.889" N	87° 24' 14.632" E
12	22° 52' 21.614" N	87° 24' 16.000" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	GB1	GARHBETA 1
RIVER	SB	SHILABATI

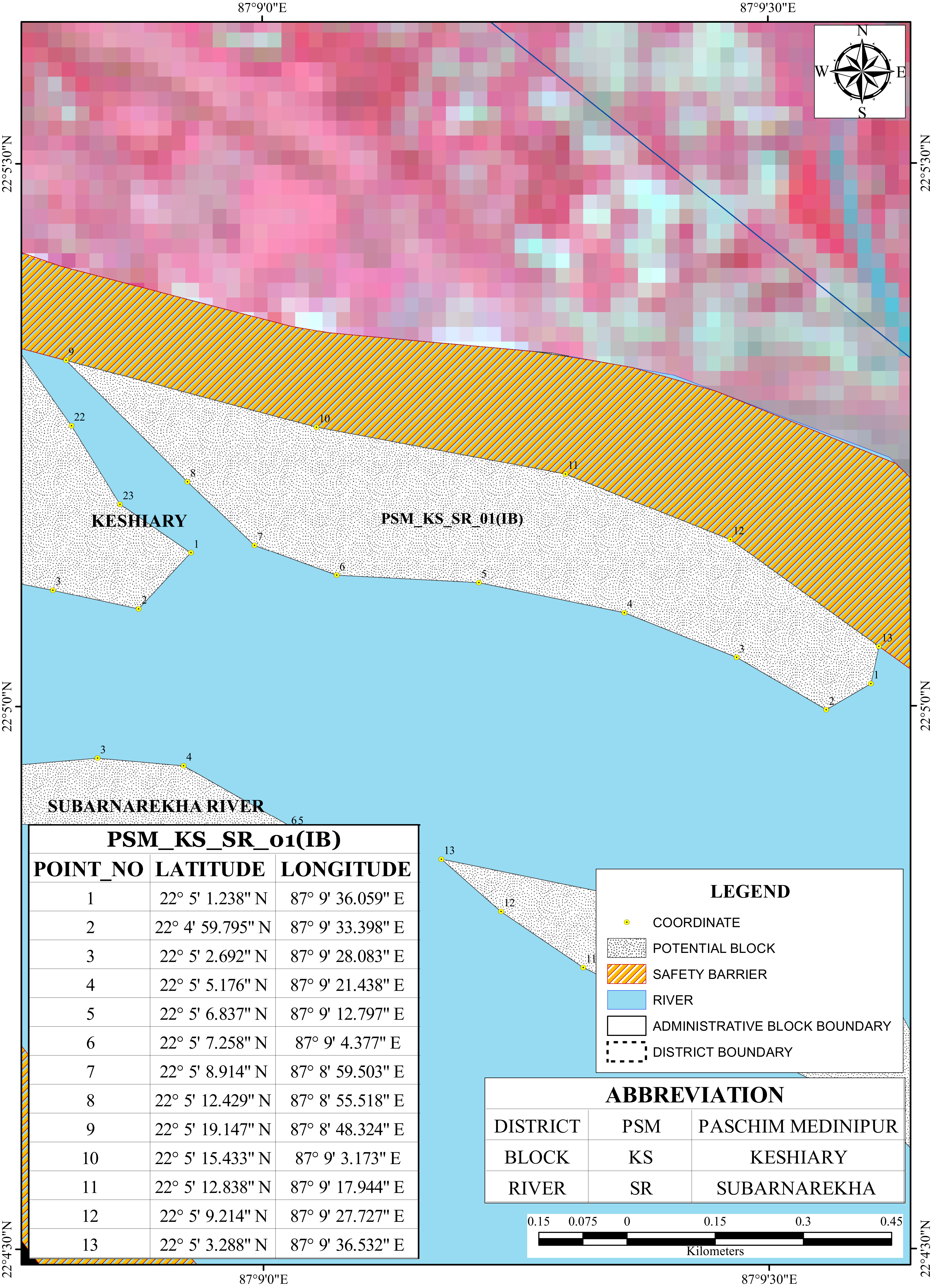
POTENTIAL BLOCK PSM_KS_SR_01(IA) OF SUBARNAREKHA RIVER



PSM_KS_SR_01(IA)		
POINT_NO	LATITUDE	LONGITUDE
1	22° 5' 8.505" N	87° 8' 55.736" E
2	22° 5' 5.410" N	87° 8' 52.630" E
3	22° 5' 6.447" N	87° 8' 47.534" E
4	22° 5' 7.900" N	87° 8' 39.780" E
5	22° 5' 10.589" N	87° 8' 34.242" E
6	22° 5' 14.105" N	87° 8' 28.263" E
7	22° 5' 17.002" N	87° 8' 21.839" E
8	22° 5' 17.370" N	87° 8' 12.386" E
9	22° 5' 21.212" N	87° 8' 7.269" E
10	22° 5' 24.035" N	87° 8' 9.436" E
11	22° 5' 26.719" N	87° 8' 9.882" E
12	22° 5' 30.231" N	87° 8' 8.999" E
13	22° 5' 34.583" N	87° 8' 4.484" E
14	22° 5' 34.637" N	87° 8' 4.487" E
15	22° 5' 47.037" N	87° 8' 4.999" E
16	22° 5' 48.831" N	87° 8' 5.159" E
17	22° 5' 46.976" N	87° 8' 8.541" E
18	22° 5' 37.162" N	87° 8' 13.518" E
19	22° 5' 32.684" N	87° 8' 17.761" E
20	22° 5' 20.097" N	87° 8' 44.526" E
21	22° 5' 19.885" N	87° 8' 45.372" E
22	22° 5' 15.533" N	87° 8' 48.652" E
23	22° 5' 11.193" N	87° 8' 51.528" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KS	KESHIARY
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_KS_SR_01(IB) OF SUBARNAREKHA RIVER



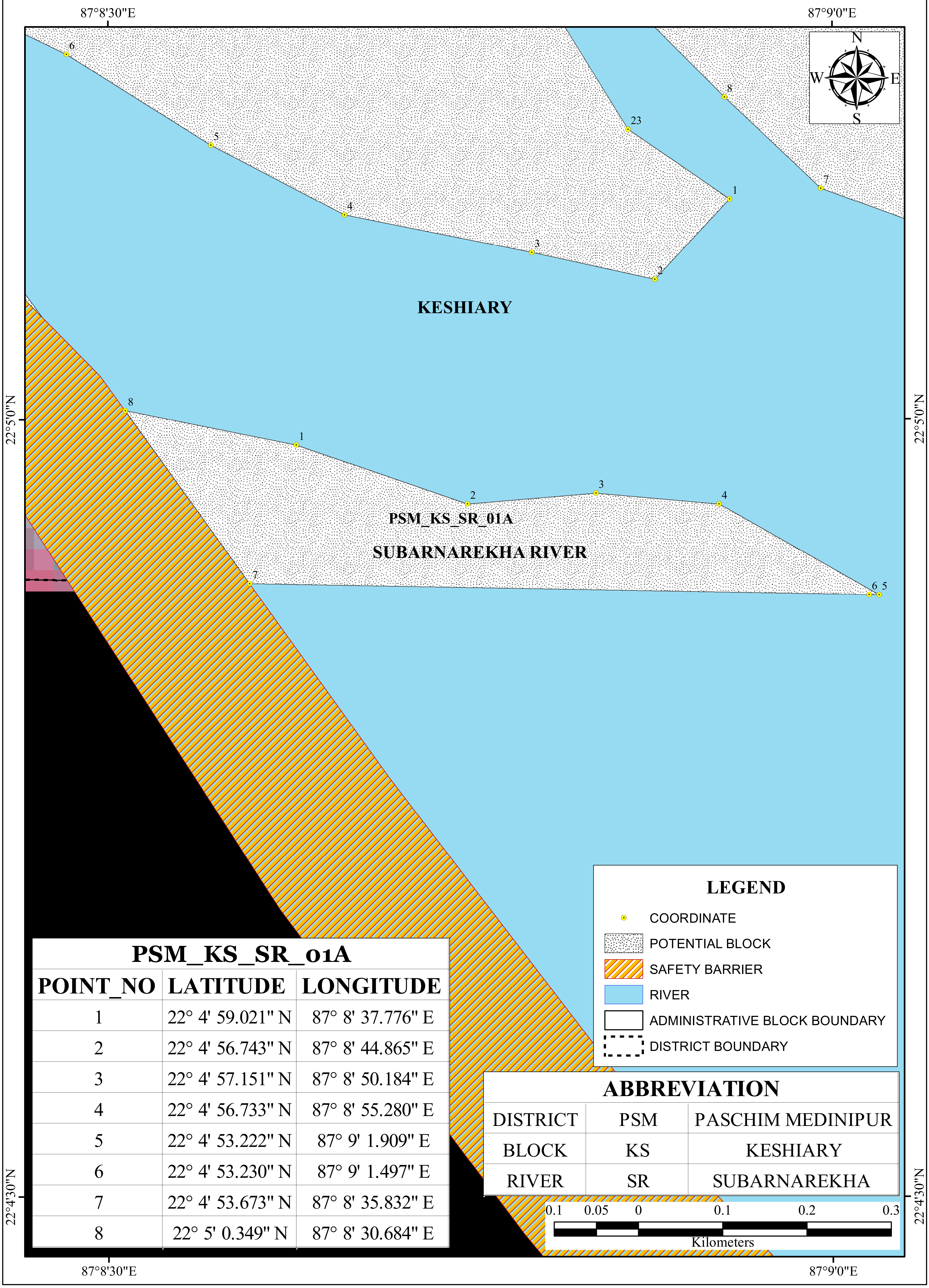
PSM_KS_SR_01(IB)

POINT_NO	LATITUDE	LONGITUDE
1	22° 5' 1.238" N	87° 9' 36.059" E
2	22° 4' 59.795" N	87° 9' 33.398" E
3	22° 5' 2.692" N	87° 9' 28.083" E
4	22° 5' 5.176" N	87° 9' 21.438" E
5	22° 5' 6.837" N	87° 9' 12.797" E
6	22° 5' 7.258" N	87° 9' 4.377" E
7	22° 5' 8.914" N	87° 8' 59.503" E
8	22° 5' 12.429" N	87° 8' 55.518" E
9	22° 5' 19.147" N	87° 8' 48.324" E
10	22° 5' 15.433" N	87° 9' 3.173" E
11	22° 5' 12.838" N	87° 9' 17.944" E
12	22° 5' 9.214" N	87° 9' 27.727" E
13	22° 5' 3.288" N	87° 9' 36.532" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KS	KESHIARY
RIVER	SR	SUBARNAREKHA

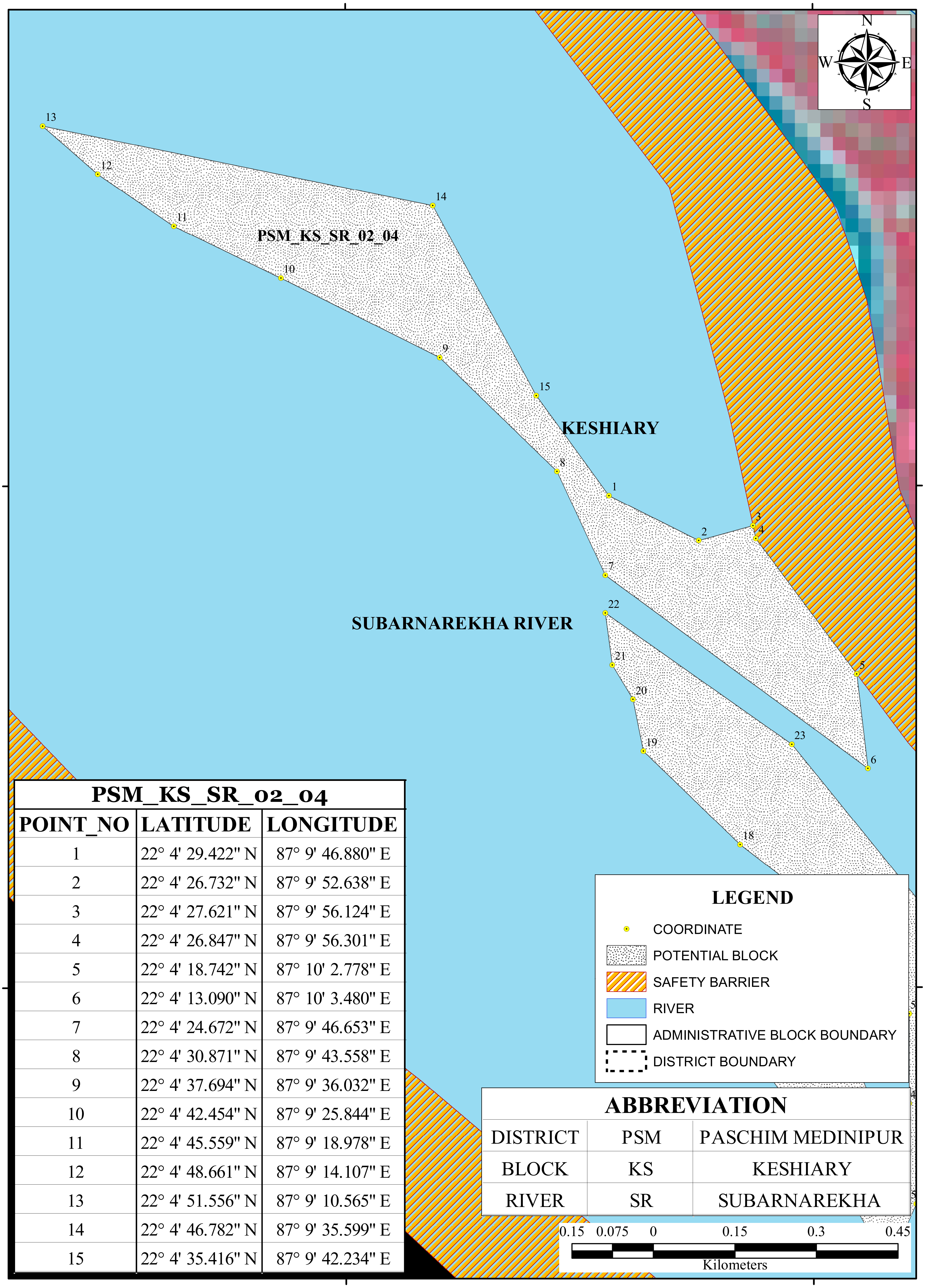
POTENTIAL BLOCK PSM_KS_SR_01A OF SUBARNAREKHA RIVER



PSM_KS_SR_01A		
POINT_NO	LATITUDE	LONGITUDE
1	22° 4' 59.021" N	87° 8' 37.776" E
2	22° 4' 56.743" N	87° 8' 44.865" E
3	22° 4' 57.151" N	87° 8' 50.184" E
4	22° 4' 56.733" N	87° 8' 55.280" E
5	22° 4' 53.222" N	87° 9' 1.909" E
6	22° 4' 53.230" N	87° 9' 1.497" E
7	22° 4' 53.673" N	87° 8' 35.832" E
8	22° 5' 0.349" N	87° 8' 30.684" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KS	KESHIARY
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_KS_SR_02_04 OF SUBARNAREKHA RIVER



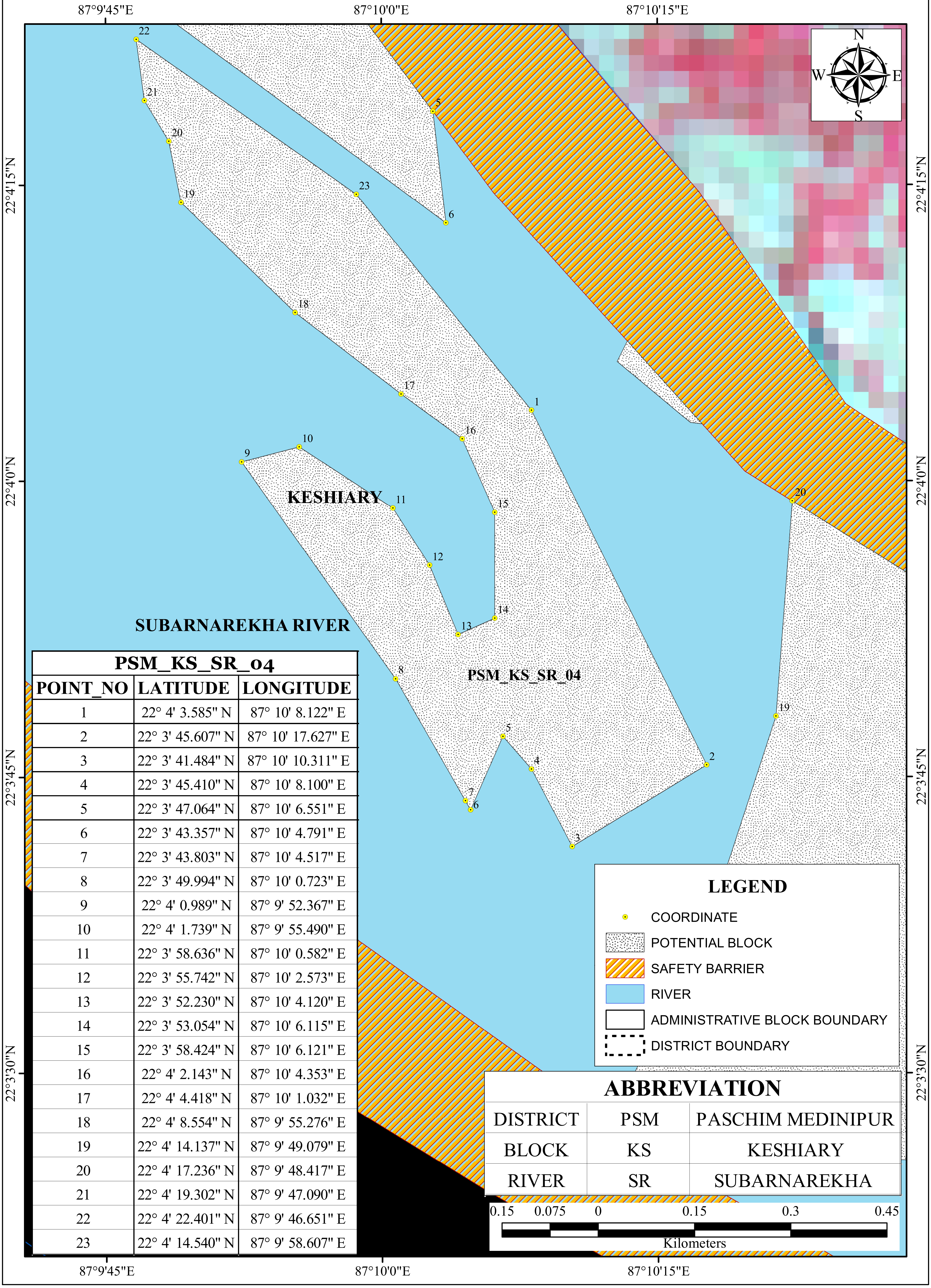
PSM_KS_SR_02_04

POINT_NO	LATITUDE	LONGITUDE
1	22° 4' 29.422" N	87° 9' 46.880" E
2	22° 4' 26.732" N	87° 9' 52.638" E
3	22° 4' 27.621" N	87° 9' 56.124" E
4	22° 4' 26.847" N	87° 9' 56.301" E
5	22° 4' 18.742" N	87° 10' 2.778" E
6	22° 4' 13.090" N	87° 10' 3.480" E
7	22° 4' 24.672" N	87° 9' 46.653" E
8	22° 4' 30.871" N	87° 9' 43.558" E
9	22° 4' 37.694" N	87° 9' 36.032" E
10	22° 4' 42.454" N	87° 9' 25.844" E
11	22° 4' 45.559" N	87° 9' 18.978" E
12	22° 4' 48.661" N	87° 9' 14.107" E
13	22° 4' 51.556" N	87° 9' 10.565" E
14	22° 4' 46.782" N	87° 9' 35.599" E
15	22° 4' 35.416" N	87° 9' 42.234" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KS	KESHIARY
RIVER	SR	SUBARNAREKHA

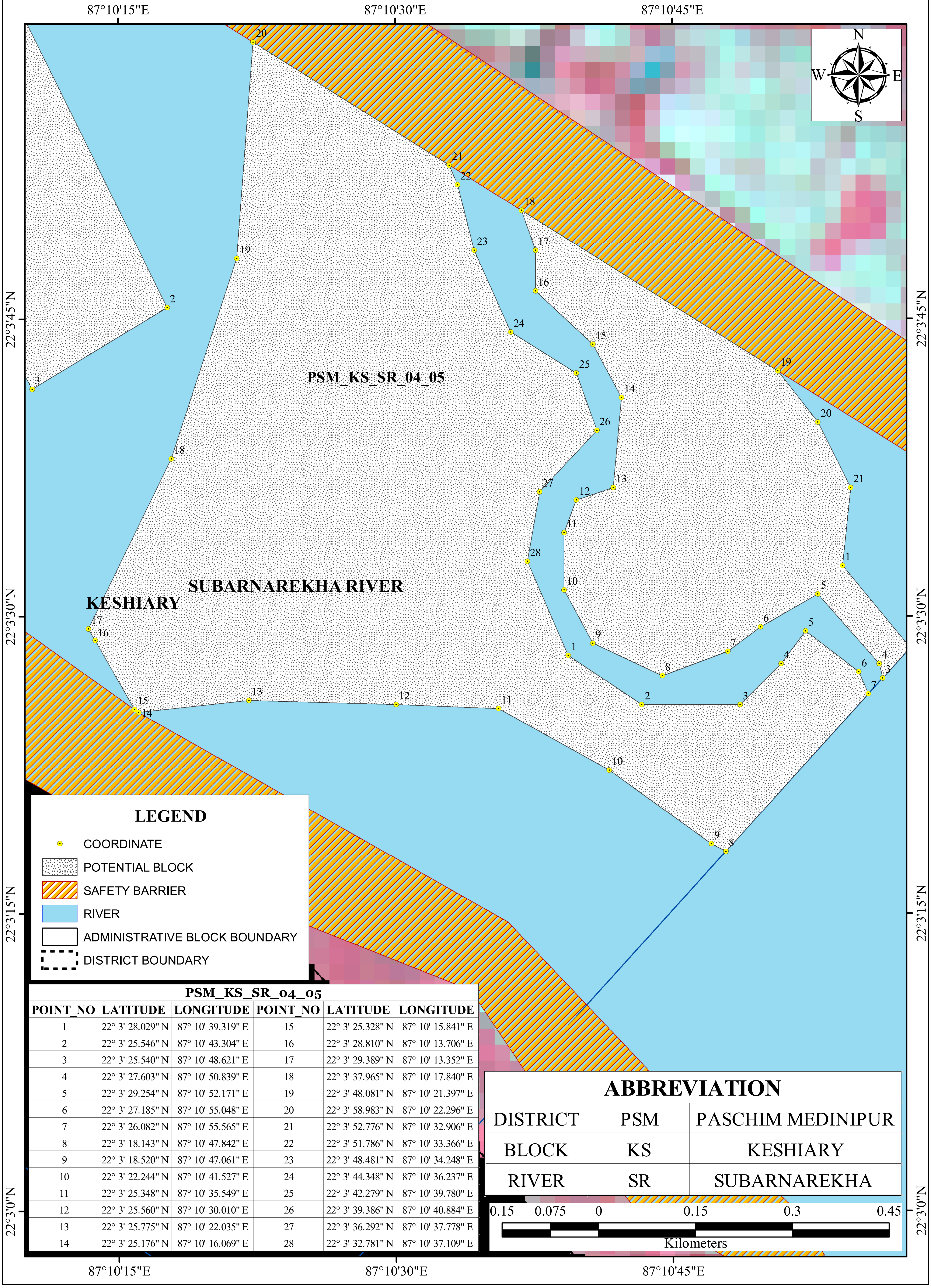
POTENTIAL BLOCK PSM_KS_SR_04 OF SUBARNAREKHA RIVER



PSM_KS_SR_04		
POINT_NO	LATITUDE	LONGITUDE
1	22° 4' 3.585" N	87° 10' 8.122" E
2	22° 3' 45.607" N	87° 10' 17.627" E
3	22° 3' 41.484" N	87° 10' 10.311" E
4	22° 3' 45.410" N	87° 10' 8.100" E
5	22° 3' 47.064" N	87° 10' 6.551" E
6	22° 3' 43.357" N	87° 10' 4.791" E
7	22° 3' 43.803" N	87° 10' 4.517" E
8	22° 3' 49.994" N	87° 10' 0.723" E
9	22° 4' 0.989" N	87° 9' 52.367" E
10	22° 4' 1.739" N	87° 9' 55.490" E
11	22° 3' 58.636" N	87° 10' 0.582" E
12	22° 3' 55.742" N	87° 10' 2.573" E
13	22° 3' 52.230" N	87° 10' 4.120" E
14	22° 3' 53.054" N	87° 10' 6.115" E
15	22° 3' 58.424" N	87° 10' 6.121" E
16	22° 4' 2.143" N	87° 10' 4.353" E
17	22° 4' 4.418" N	87° 10' 1.032" E
18	22° 4' 8.554" N	87° 9' 55.276" E
19	22° 4' 14.137" N	87° 9' 49.079" E
20	22° 4' 17.236" N	87° 9' 48.417" E
21	22° 4' 19.302" N	87° 9' 47.090" E
22	22° 4' 22.401" N	87° 9' 46.651" E
23	22° 4' 14.540" N	87° 9' 58.607" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KS	KESHIARY
RIVER	SR	SUBARNAREKHA

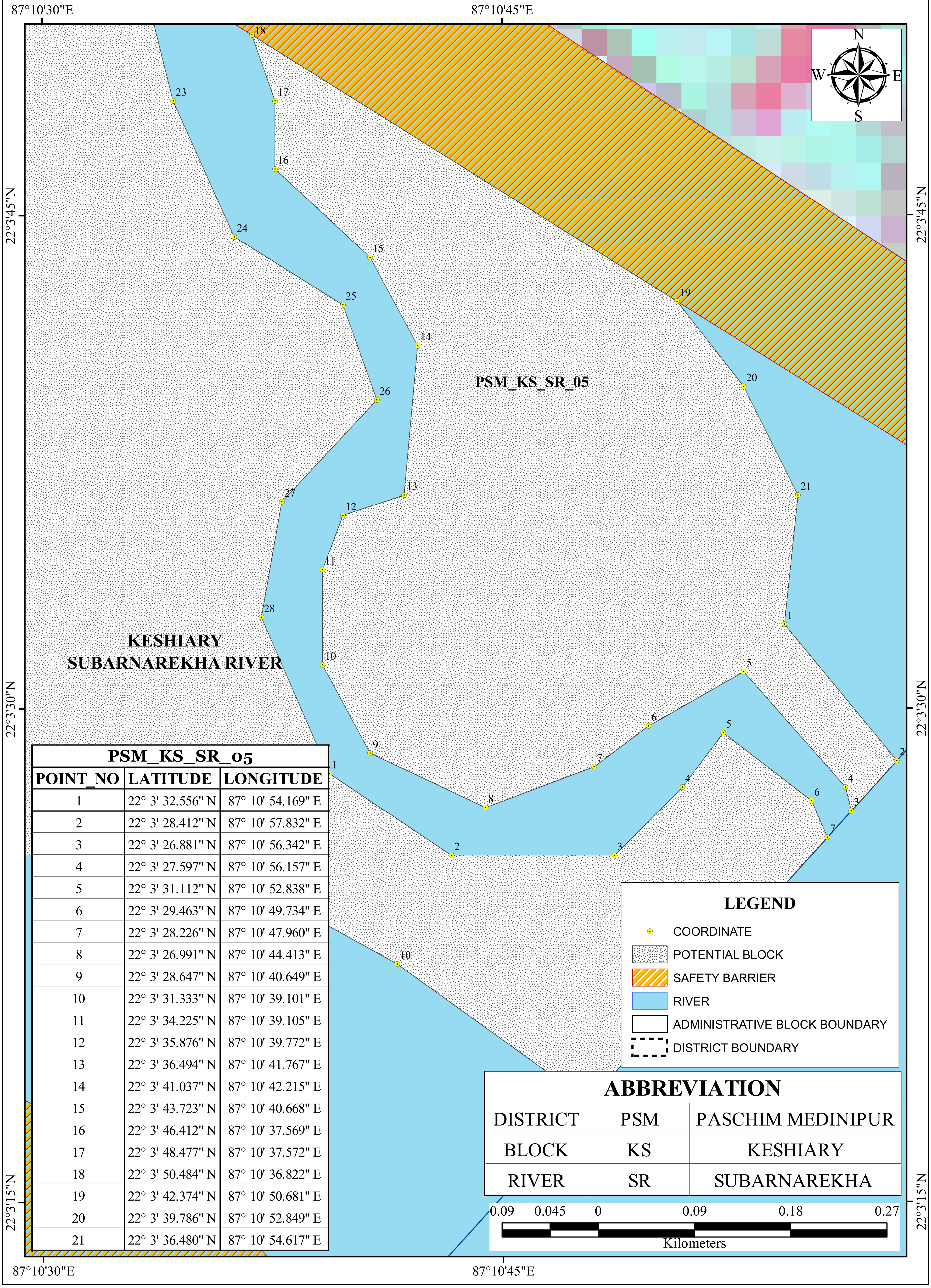
POTENTIAL BLOCK PSM_KS_SR_04_05 OF SUBARNAREKHA RIVER



PSM_KS_SR_04_05					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	22° 3' 28.029" N	87° 10' 39.319" E	15	22° 3' 25.328" N	87° 10' 15.841" E
2	22° 3' 25.546" N	87° 10' 43.304" E	16	22° 3' 28.810" N	87° 10' 13.706" E
3	22° 3' 25.540" N	87° 10' 48.621" E	17	22° 3' 29.389" N	87° 10' 13.352" E
4	22° 3' 27.603" N	87° 10' 50.839" E	18	22° 3' 37.965" N	87° 10' 17.840" E
5	22° 3' 29.254" N	87° 10' 52.171" E	19	22° 3' 48.081" N	87° 10' 21.397" E
6	22° 3' 27.185" N	87° 10' 55.048" E	20	22° 3' 58.983" N	87° 10' 22.296" E
7	22° 3' 26.082" N	87° 10' 55.565" E	21	22° 3' 52.776" N	87° 10' 32.906" E
8	22° 3' 18.143" N	87° 10' 47.842" E	22	22° 3' 51.786" N	87° 10' 33.366" E
9	22° 3' 18.520" N	87° 10' 47.061" E	23	22° 3' 48.481" N	87° 10' 34.248" E
10	22° 3' 22.244" N	87° 10' 41.527" E	24	22° 3' 44.348" N	87° 10' 36.237" E
11	22° 3' 25.348" N	87° 10' 35.549" E	25	22° 3' 42.279" N	87° 10' 39.780" E
12	22° 3' 25.560" N	87° 10' 30.010" E	26	22° 3' 39.386" N	87° 10' 40.884" E
13	22° 3' 25.775" N	87° 10' 22.035" E	27	22° 3' 36.292" N	87° 10' 37.778" E
14	22° 3' 25.176" N	87° 10' 16.069" E	28	22° 3' 32.781" N	87° 10' 37.109" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KS	KESHIARY
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_KS_SR_05 OF SUBARNAREKHA RIVER

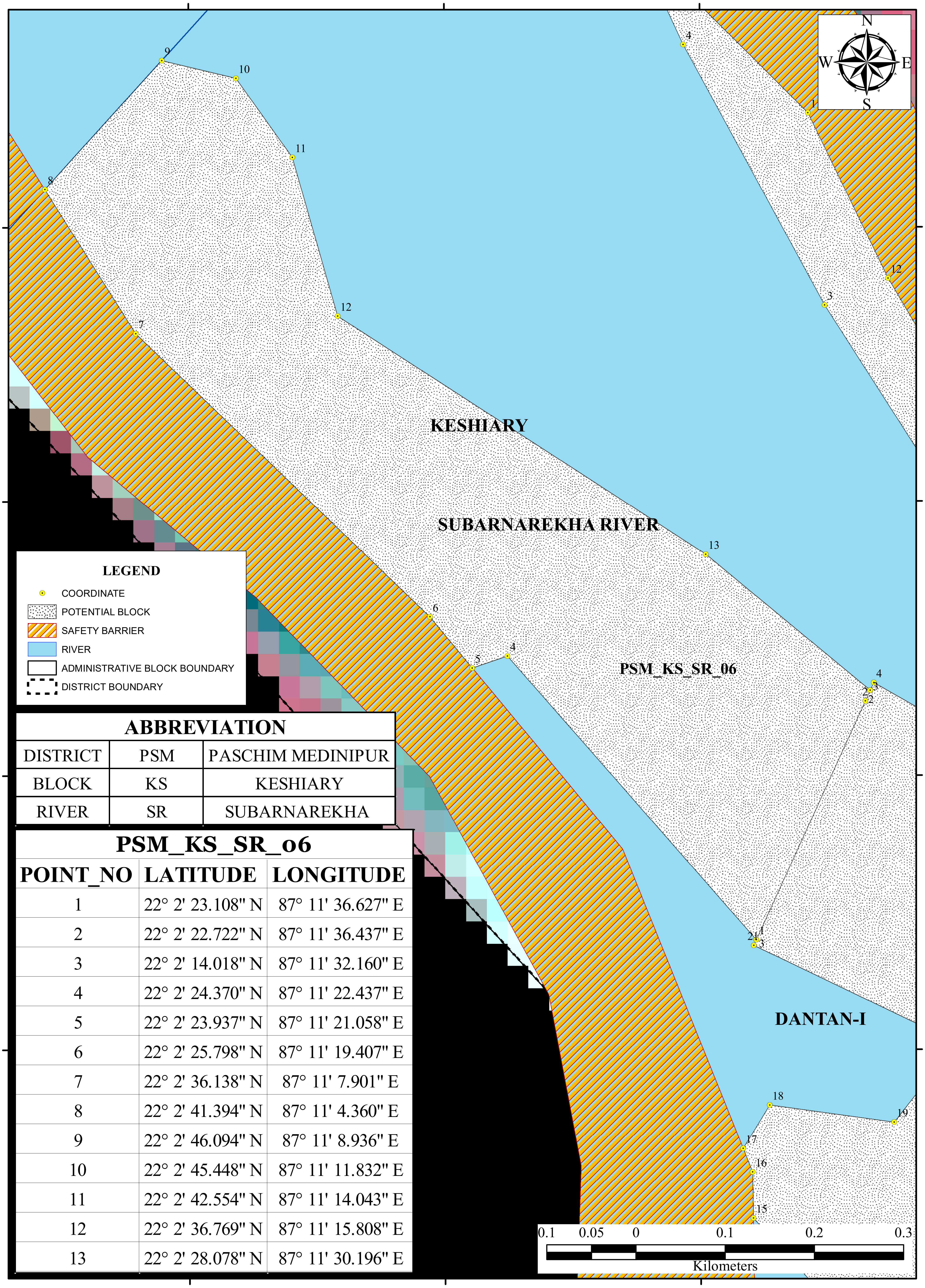


PSM_KS_SR_05		
POINT_NO	LATITUDE	LONGITUDE
1	22° 3' 32.556" N	87° 10' 54.169" E
2	22° 3' 28.412" N	87° 10' 57.832" E
3	22° 3' 26.881" N	87° 10' 56.342" E
4	22° 3' 27.597" N	87° 10' 56.157" E
5	22° 3' 31.112" N	87° 10' 52.838" E
6	22° 3' 29.463" N	87° 10' 49.734" E
7	22° 3' 28.226" N	87° 10' 47.960" E
8	22° 3' 26.991" N	87° 10' 44.413" E
9	22° 3' 28.647" N	87° 10' 40.649" E
10	22° 3' 31.333" N	87° 10' 39.101" E
11	22° 3' 34.225" N	87° 10' 39.105" E
12	22° 3' 35.876" N	87° 10' 39.772" E
13	22° 3' 36.494" N	87° 10' 41.767" E
14	22° 3' 41.037" N	87° 10' 42.215" E
15	22° 3' 43.723" N	87° 10' 40.668" E
16	22° 3' 46.412" N	87° 10' 37.569" E
17	22° 3' 48.477" N	87° 10' 37.572" E
18	22° 3' 50.484" N	87° 10' 36.822" E
19	22° 3' 42.374" N	87° 10' 50.681" E
20	22° 3' 39.786" N	87° 10' 52.849" E
21	22° 3' 36.480" N	87° 10' 54.617" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KS	KESHIARY
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_KS_SR_06 OF SUBARNAREKHA RIVER

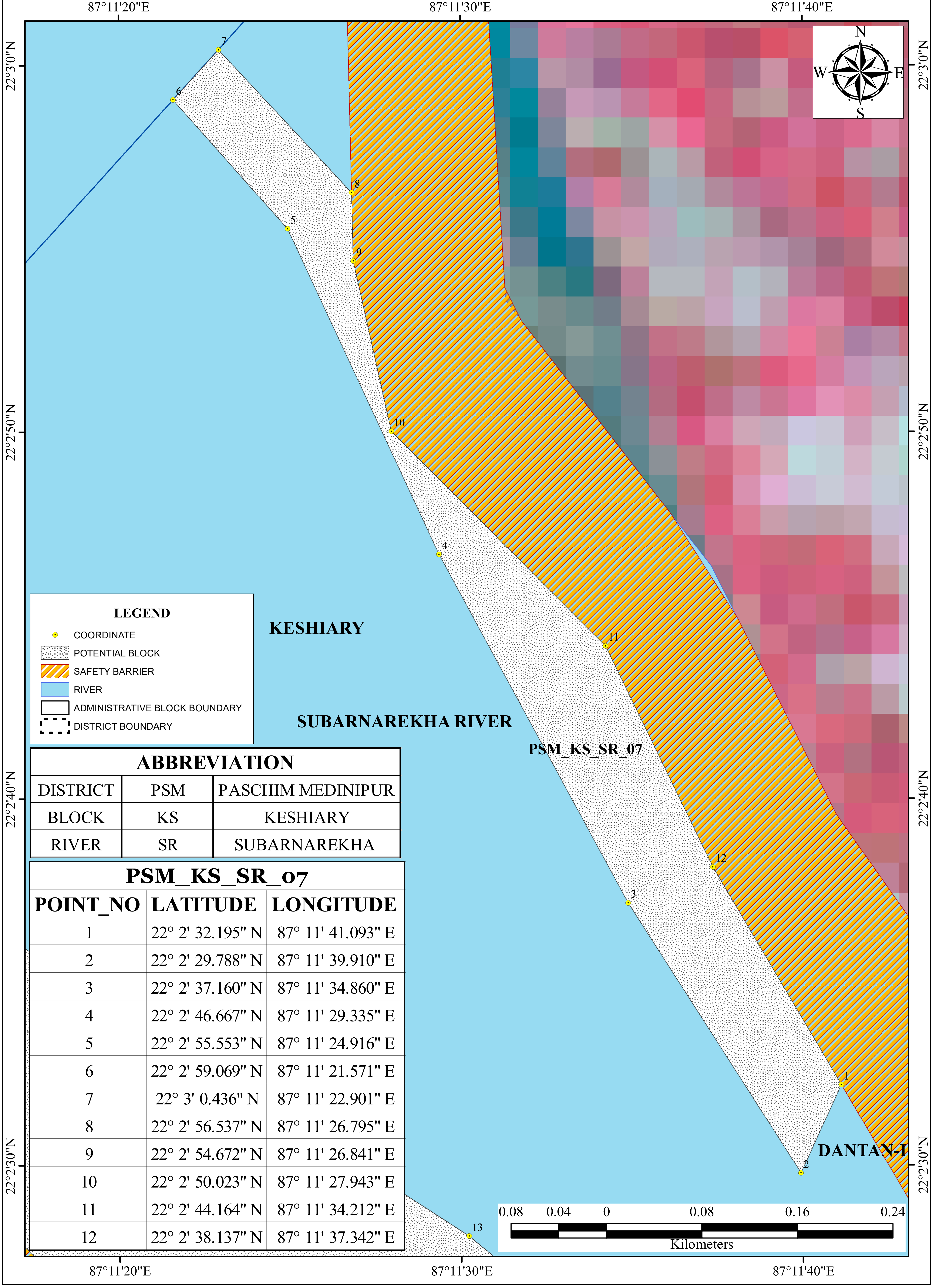


ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KS	KESHIARY
RIVER	SR	SUBARNAREKHA

PSM_KS_SR_06

POINT_NO	LATITUDE	LONGITUDE
1	22° 2' 23.108" N	87° 11' 36.627" E
2	22° 2' 22.722" N	87° 11' 36.437" E
3	22° 2' 14.018" N	87° 11' 32.160" E
4	22° 2' 24.370" N	87° 11' 22.437" E
5	22° 2' 23.937" N	87° 11' 21.058" E
6	22° 2' 25.798" N	87° 11' 19.407" E
7	22° 2' 36.138" N	87° 11' 7.901" E
8	22° 2' 41.394" N	87° 11' 4.360" E
9	22° 2' 46.094" N	87° 11' 8.936" E
10	22° 2' 45.448" N	87° 11' 11.832" E
11	22° 2' 42.554" N	87° 11' 14.043" E
12	22° 2' 36.769" N	87° 11' 15.808" E
13	22° 2' 28.078" N	87° 11' 30.196" E

POTENTIAL BLOCK PSM_KS_SR_07 OF SUBARNAREKHA RIVER

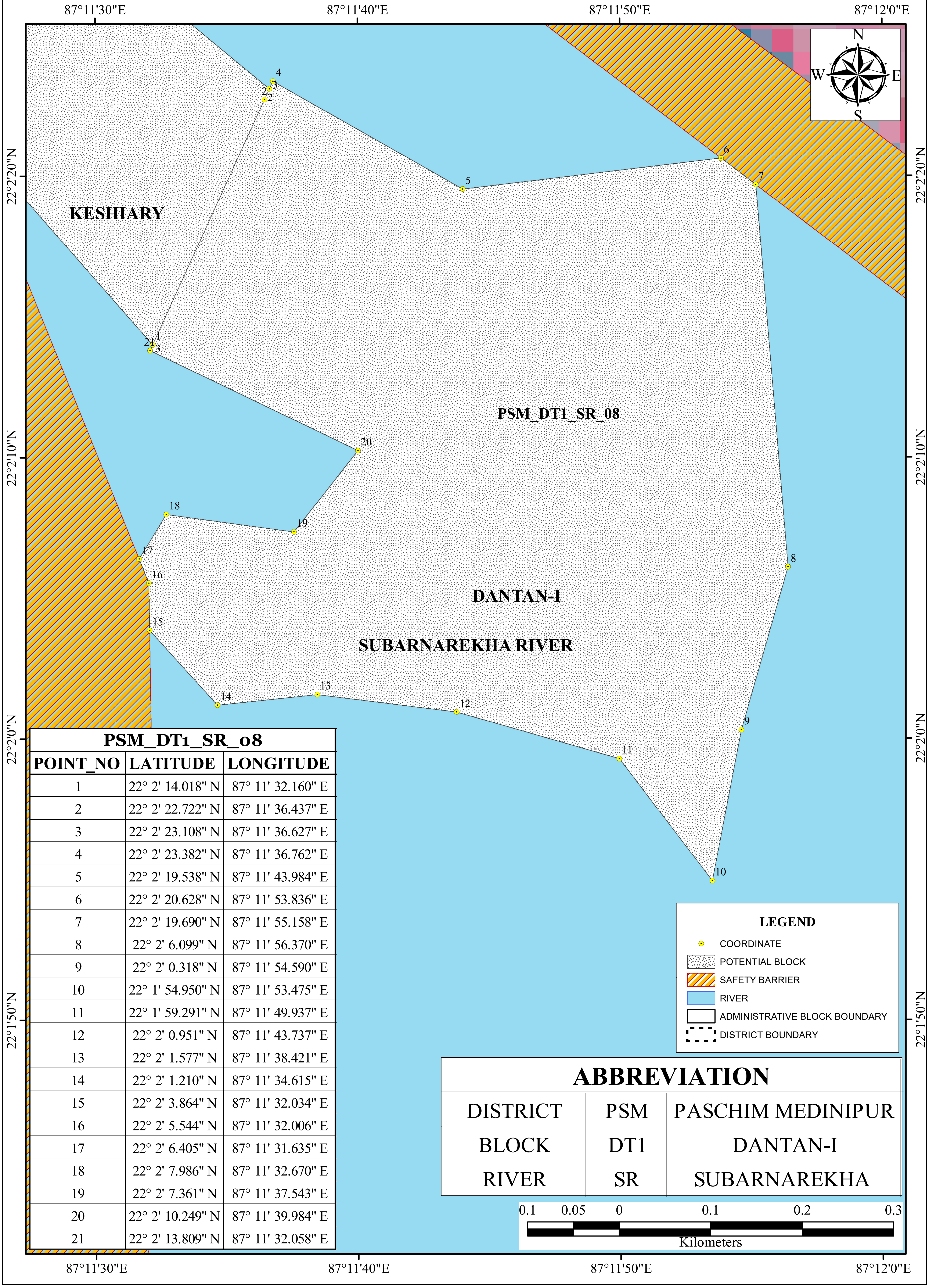


ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	KS	KESHIARY
RIVER	SR	SUBARNAREKHA

PSM_KS_SR_07

POINT_NO	LATITUDE	LONGITUDE
1	22° 2' 32.195" N	87° 11' 41.093" E
2	22° 2' 29.788" N	87° 11' 39.910" E
3	22° 2' 37.160" N	87° 11' 34.860" E
4	22° 2' 46.667" N	87° 11' 29.335" E
5	22° 2' 55.553" N	87° 11' 24.916" E
6	22° 2' 59.069" N	87° 11' 21.571" E
7	22° 3' 0.436" N	87° 11' 22.901" E
8	22° 2' 56.537" N	87° 11' 26.795" E
9	22° 2' 54.672" N	87° 11' 26.841" E
10	22° 2' 50.023" N	87° 11' 27.943" E
11	22° 2' 44.164" N	87° 11' 34.212" E
12	22° 2' 38.137" N	87° 11' 37.342" E

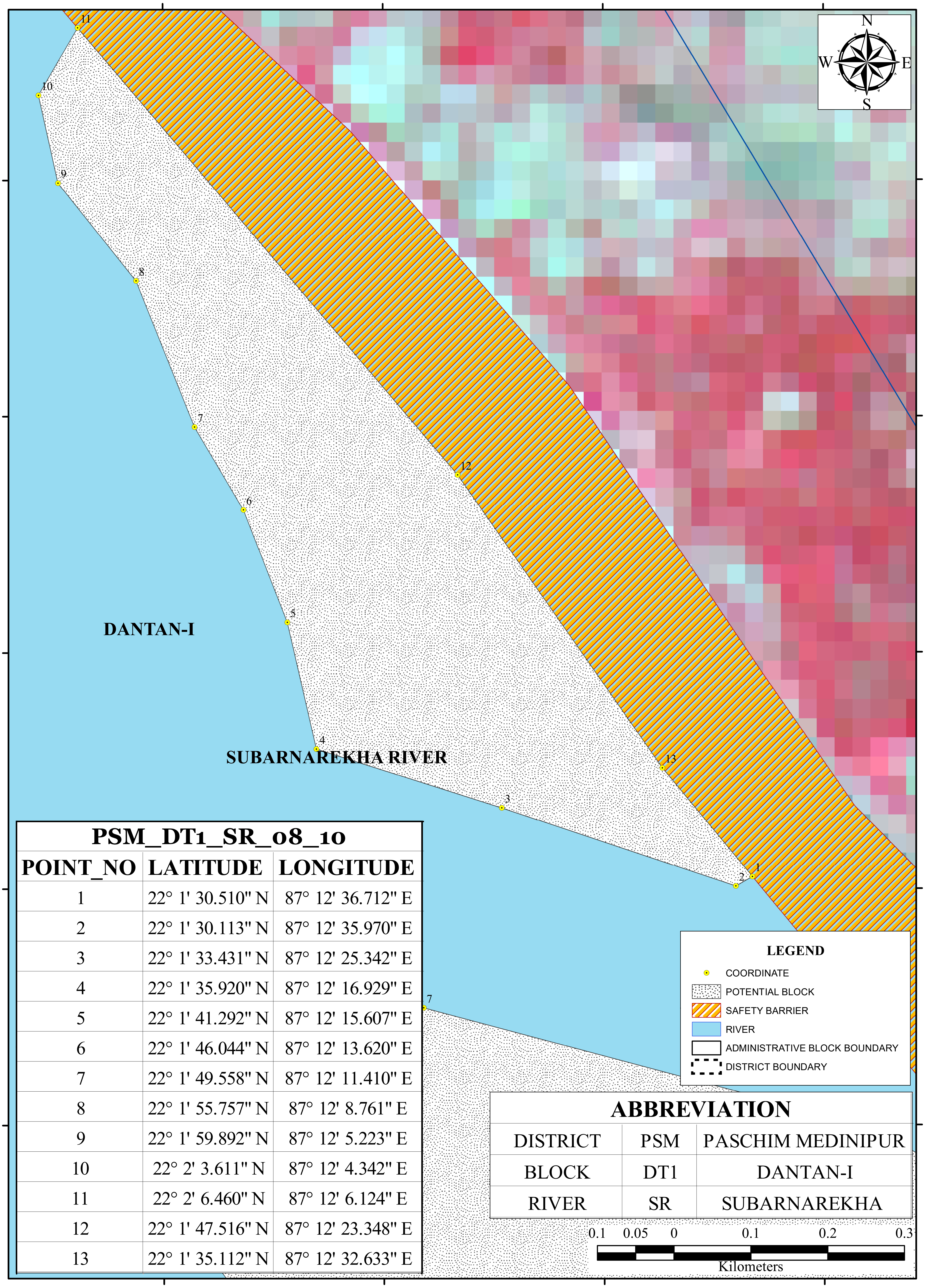
POTENTIAL BLOCK PSM_DT1_SR_08 OF SUBARNAREKHA RIVER



PSM_DT1_SR_08		
POINT_NO	LATITUDE	LONGITUDE
1	22° 2' 14.018" N	87° 11' 32.160" E
2	22° 2' 22.722" N	87° 11' 36.437" E
3	22° 2' 23.108" N	87° 11' 36.627" E
4	22° 2' 23.382" N	87° 11' 36.762" E
5	22° 2' 19.538" N	87° 11' 43.984" E
6	22° 2' 20.628" N	87° 11' 53.836" E
7	22° 2' 19.690" N	87° 11' 55.158" E
8	22° 2' 6.099" N	87° 11' 56.370" E
9	22° 2' 0.318" N	87° 11' 54.590" E
10	22° 1' 54.950" N	87° 11' 53.475" E
11	22° 1' 59.291" N	87° 11' 49.937" E
12	22° 2' 0.951" N	87° 11' 43.737" E
13	22° 2' 1.577" N	87° 11' 38.421" E
14	22° 2' 1.210" N	87° 11' 34.615" E
15	22° 2' 3.864" N	87° 11' 32.034" E
16	22° 2' 5.544" N	87° 11' 32.006" E
17	22° 2' 6.405" N	87° 11' 31.635" E
18	22° 2' 7.986" N	87° 11' 32.670" E
19	22° 2' 7.361" N	87° 11' 37.543" E
20	22° 2' 10.249" N	87° 11' 39.984" E
21	22° 2' 13.809" N	87° 11' 32.058" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

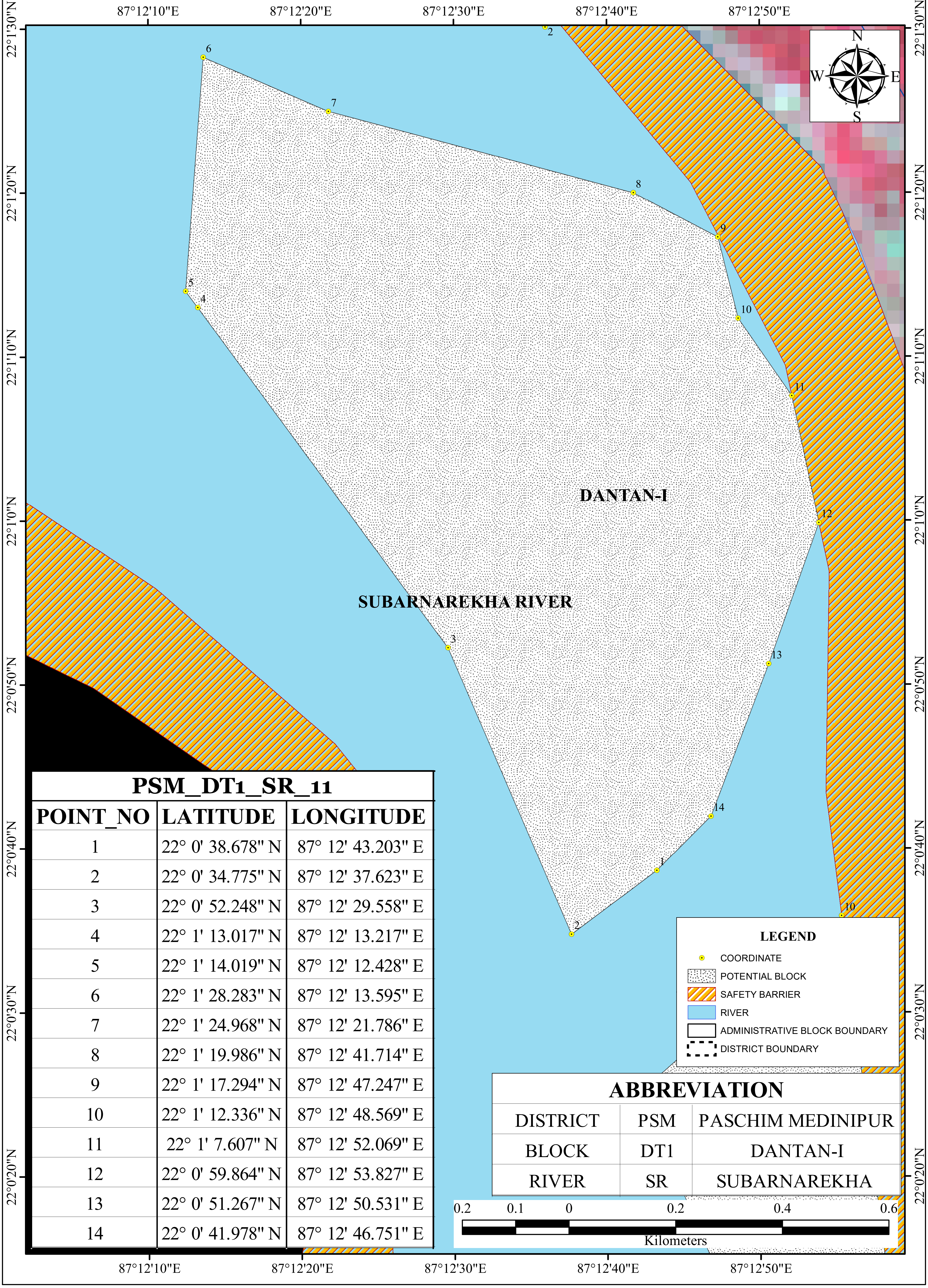
POTENTIAL BLOCK PSM_DT1_SR_08_10 OF SUBARNAREKHA RIVER



PSM_DT1_SR_08_10		
POINT_NO	LATITUDE	LONGITUDE
1	22° 1' 30.510" N	87° 12' 36.712" E
2	22° 1' 30.113" N	87° 12' 35.970" E
3	22° 1' 33.431" N	87° 12' 25.342" E
4	22° 1' 35.920" N	87° 12' 16.929" E
5	22° 1' 41.292" N	87° 12' 15.607" E
6	22° 1' 46.044" N	87° 12' 13.620" E
7	22° 1' 49.558" N	87° 12' 11.410" E
8	22° 1' 55.757" N	87° 12' 8.761" E
9	22° 1' 59.892" N	87° 12' 5.223" E
10	22° 2' 3.611" N	87° 12' 4.342" E
11	22° 2' 6.460" N	87° 12' 6.124" E
12	22° 1' 47.516" N	87° 12' 23.348" E
13	22° 1' 35.112" N	87° 12' 32.633" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_11 OF SUBARNAREKHA RIVER



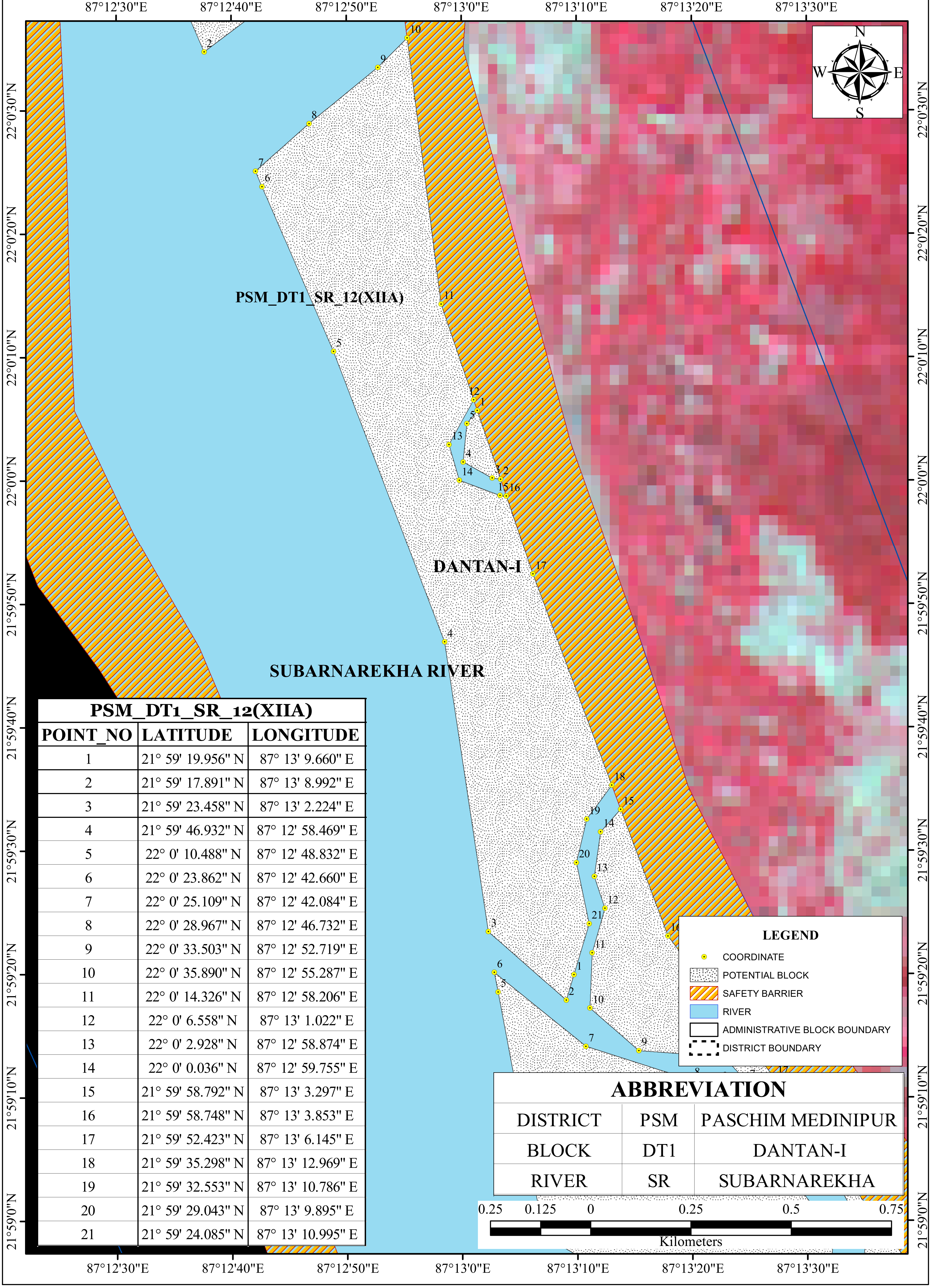
PSM_DT1_SR_11

POINT_NO	LATITUDE	LONGITUDE
1	22° 0' 38.678" N	87° 12' 43.203" E
2	22° 0' 34.775" N	87° 12' 37.623" E
3	22° 0' 52.248" N	87° 12' 29.558" E
4	22° 1' 13.017" N	87° 12' 13.217" E
5	22° 1' 14.019" N	87° 12' 12.428" E
6	22° 1' 28.283" N	87° 12' 13.595" E
7	22° 1' 24.968" N	87° 12' 21.786" E
8	22° 1' 19.986" N	87° 12' 41.714" E
9	22° 1' 17.294" N	87° 12' 47.247" E
10	22° 1' 12.336" N	87° 12' 48.569" E
11	22° 1' 7.607" N	87° 12' 52.069" E
12	22° 0' 59.864" N	87° 12' 53.827" E
13	22° 0' 51.267" N	87° 12' 50.531" E
14	22° 0' 41.978" N	87° 12' 46.751" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_12(XIIA) OF SUBARNAREKHA RIVER

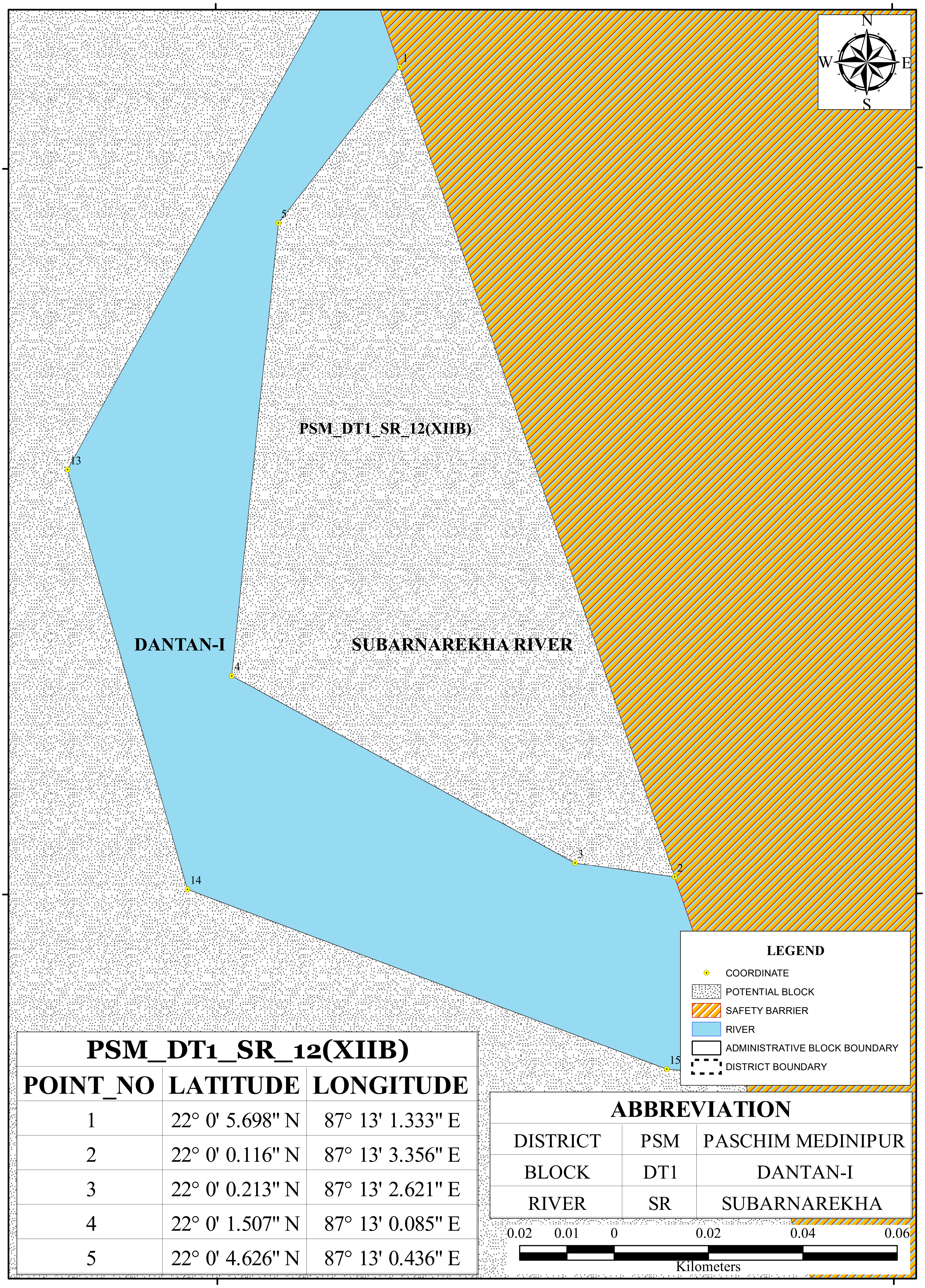


PSM_DT1_SR_12(XIIA)		
POINT_NO	LATITUDE	LONGITUDE
1	21° 59' 19.956" N	87° 13' 9.660" E
2	21° 59' 17.891" N	87° 13' 8.992" E
3	21° 59' 23.458" N	87° 13' 2.224" E
4	21° 59' 46.932" N	87° 12' 58.469" E
5	22° 0' 10.488" N	87° 12' 48.832" E
6	22° 0' 23.862" N	87° 12' 42.660" E
7	22° 0' 25.109" N	87° 12' 42.084" E
8	22° 0' 28.967" N	87° 12' 46.732" E
9	22° 0' 33.503" N	87° 12' 52.719" E
10	22° 0' 35.890" N	87° 12' 55.287" E
11	22° 0' 14.326" N	87° 12' 58.206" E
12	22° 0' 6.558" N	87° 13' 1.022" E
13	22° 0' 2.928" N	87° 12' 58.874" E
14	22° 0' 0.036" N	87° 12' 59.755" E
15	21° 59' 58.792" N	87° 13' 3.297" E
16	21° 59' 58.748" N	87° 13' 3.853" E
17	21° 59' 52.423" N	87° 13' 6.145" E
18	21° 59' 35.298" N	87° 13' 12.969" E
19	21° 59' 32.553" N	87° 13' 10.786" E
20	21° 59' 29.043" N	87° 13' 9.895" E
21	21° 59' 24.085" N	87° 13' 10.995" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

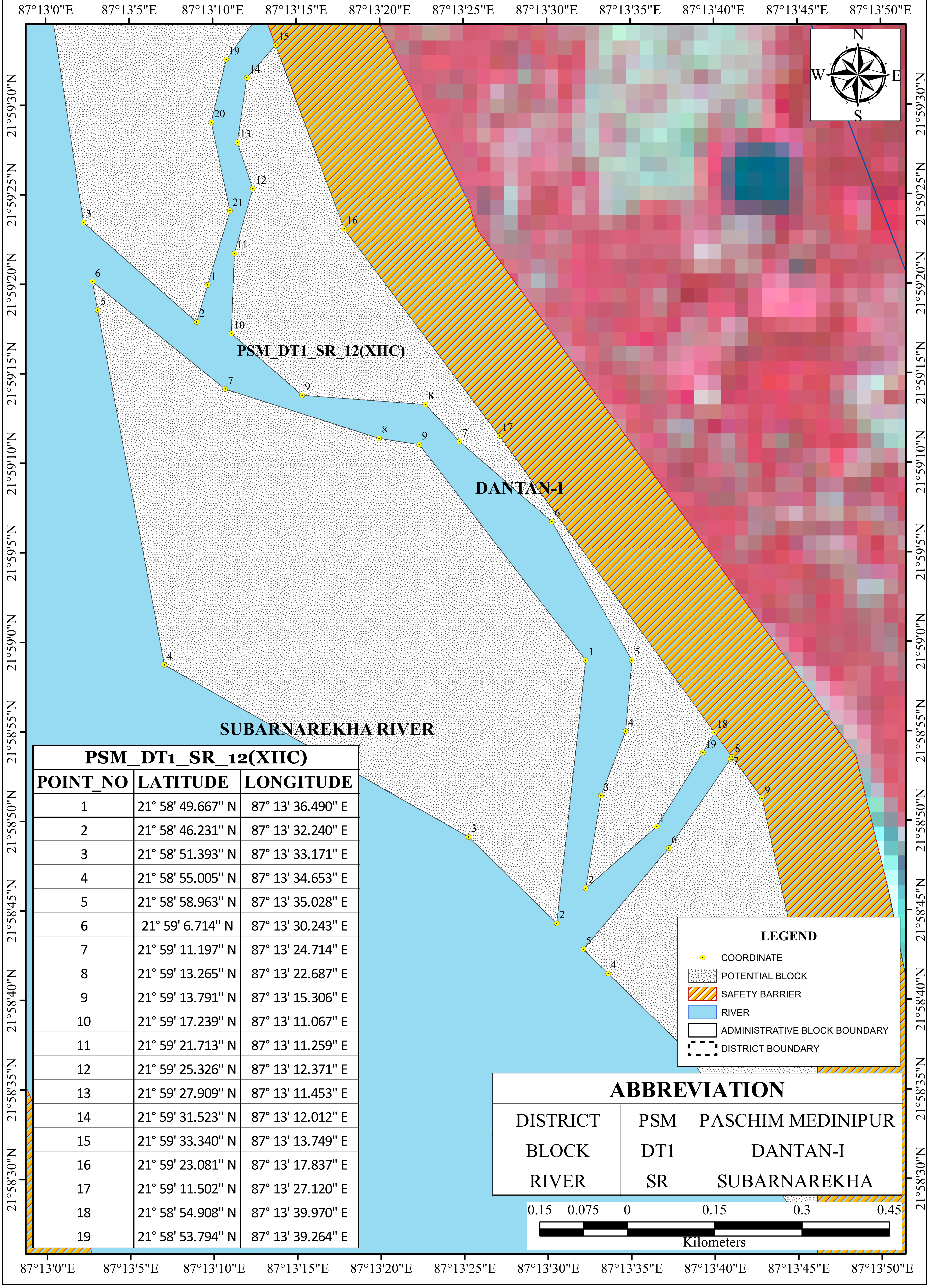
POTENTIAL BLOCK PSM_DT1_SR_12(XIIB) OF SUBARNAREKHA RIVER



PSM_DT1_SR_12(XIIB)		
POINT_NO	LATITUDE	LONGITUDE
1	22° 0' 5.698" N	87° 13' 1.333" E
2	22° 0' 0.116" N	87° 13' 3.356" E
3	22° 0' 0.213" N	87° 13' 2.621" E
4	22° 0' 1.507" N	87° 13' 0.085" E
5	22° 0' 4.626" N	87° 13' 0.436" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

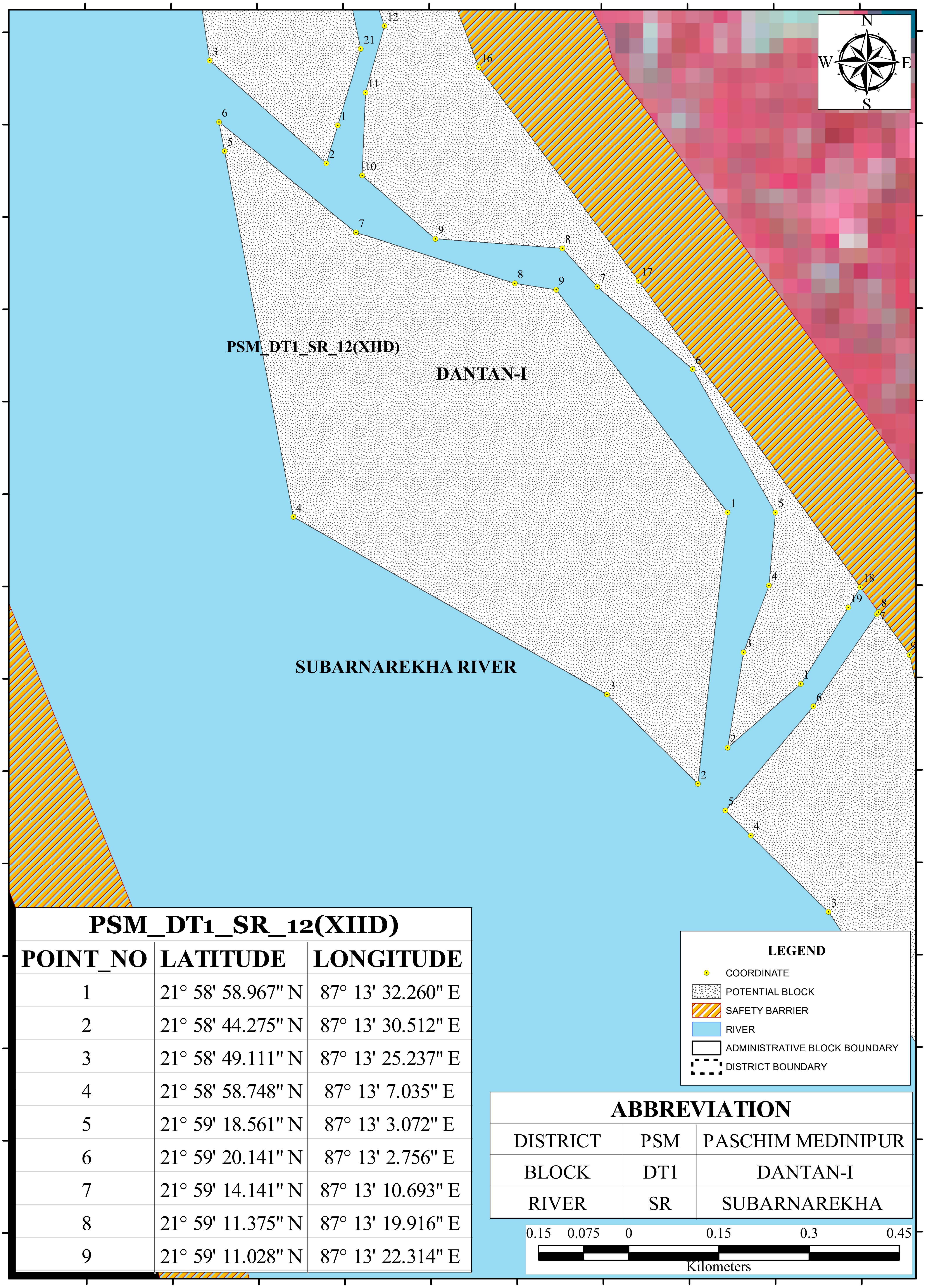
POTENTIAL BLOCK PSM_DT1_SR_12(XIIC) OF SUBARNAREKHA RIVER



PSM_DT1_SR_12(XIIC)		
POINT_NO	**LATITUDE**	**LONGITUDE**
1	21° 58' 49.667" N	87° 13' 36.490" E
2	21° 58' 46.231" N	87° 13' 32.240" E
3	21° 58' 51.393" N	87° 13' 33.171" E
4	21° 58' 55.005" N	87° 13' 34.653" E
5	21° 58' 58.963" N	87° 13' 35.028" E
6	21° 59' 6.714" N	87° 13' 30.243" E
7	21° 59' 11.197" N	87° 13' 24.714" E
8	21° 59' 13.265" N	87° 13' 22.687" E
9	21° 59' 13.791" N	87° 13' 15.306" E
10	21° 59' 17.239" N	87° 13' 11.067" E
11	21° 59' 21.713" N	87° 13' 11.259" E
12	21° 59' 25.326" N	87° 13' 12.371" E
13	21° 59' 27.909" N	87° 13' 11.453" E
14	21° 59' 31.523" N	87° 13' 12.012" E
15	21° 59' 33.340" N	87° 13' 13.749" E
16	21° 59' 23.081" N	87° 13' 17.837" E
17	21° 59' 11.502" N	87° 13' 27.120" E
18	21° 58' 54.908" N	87° 13' 39.970" E
19	21° 58' 53.794" N	87° 13' 39.264" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_12(XIID) OF SUBARNAREKHA RIVER



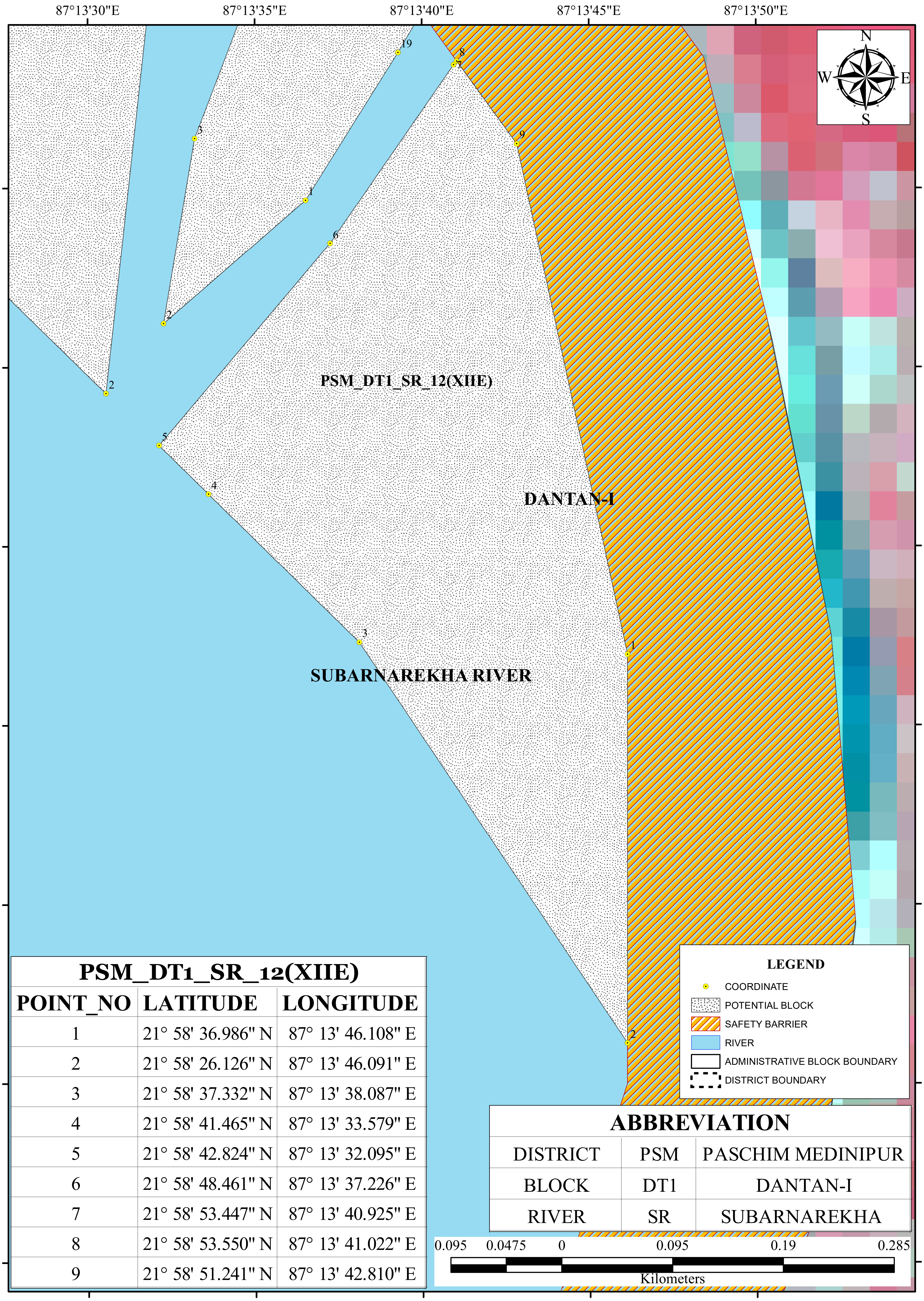
PSM_DT1_SR_12(XIID)

POINT_NO	LATITUDE	LONGITUDE
1	21° 58' 58.967" N	87° 13' 32.260" E
2	21° 58' 44.275" N	87° 13' 30.512" E
3	21° 58' 49.111" N	87° 13' 25.237" E
4	21° 58' 58.748" N	87° 13' 7.035" E
5	21° 59' 18.561" N	87° 13' 3.072" E
6	21° 59' 20.141" N	87° 13' 2.756" E
7	21° 59' 14.141" N	87° 13' 10.693" E
8	21° 59' 11.375" N	87° 13' 19.916" E
9	21° 59' 11.028" N	87° 13' 22.314" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_12(XIIE) OF SUBARNAREKHA RIVER



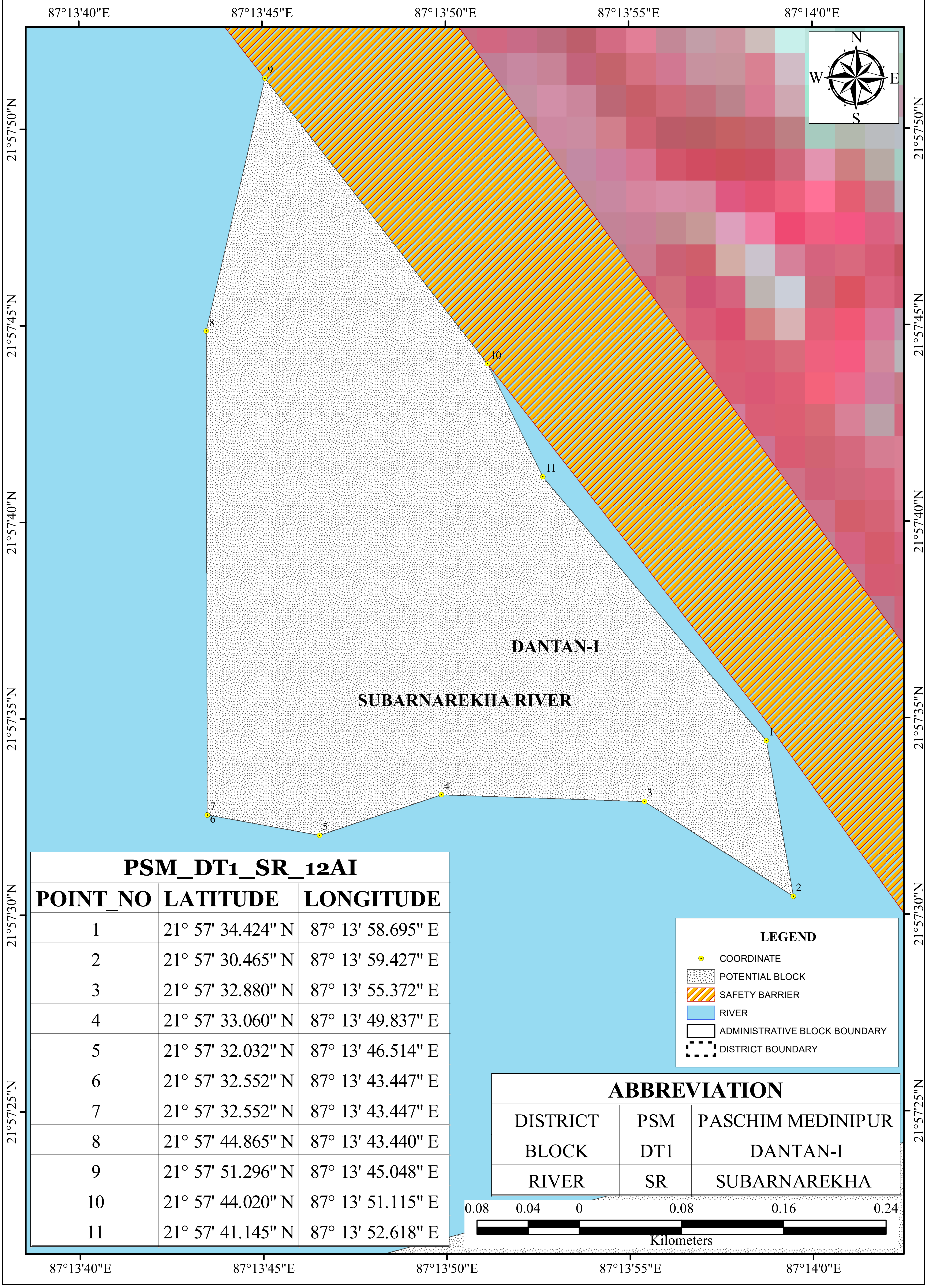
PSM_DT1_SR_12(XIIE)

POINT_NO	LATITUDE	LONGITUDE
1	21° 58' 36.986" N	87° 13' 46.108" E
2	21° 58' 26.126" N	87° 13' 46.091" E
3	21° 58' 37.332" N	87° 13' 38.087" E
4	21° 58' 41.465" N	87° 13' 33.579" E
5	21° 58' 42.824" N	87° 13' 32.095" E
6	21° 58' 48.461" N	87° 13' 37.226" E
7	21° 58' 53.447" N	87° 13' 40.925" E
8	21° 58' 53.550" N	87° 13' 41.022" E
9	21° 58' 51.241" N	87° 13' 42.810" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_12AI OF SUBARNAREKHA RIVER



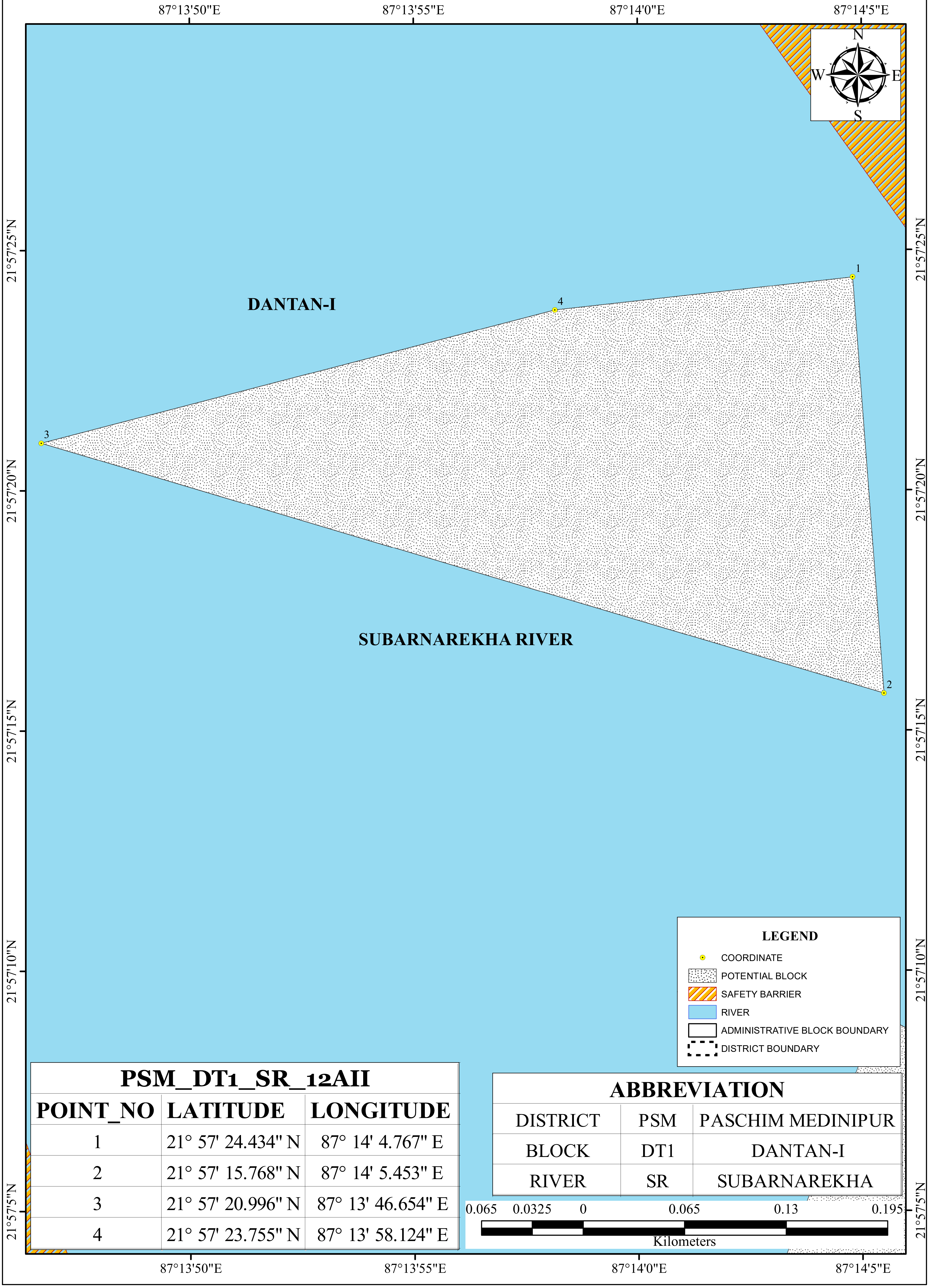
PSM_DT1_SR_12AI

POINT_NO	LATITUDE	LONGITUDE
1	21° 57' 34.424" N	87° 13' 58.695" E
2	21° 57' 30.465" N	87° 13' 59.427" E
3	21° 57' 32.880" N	87° 13' 55.372" E
4	21° 57' 33.060" N	87° 13' 49.837" E
5	21° 57' 32.032" N	87° 13' 46.514" E
6	21° 57' 32.552" N	87° 13' 43.447" E
7	21° 57' 32.552" N	87° 13' 43.447" E
8	21° 57' 44.865" N	87° 13' 43.440" E
9	21° 57' 51.296" N	87° 13' 45.048" E
10	21° 57' 44.020" N	87° 13' 51.115" E
11	21° 57' 41.145" N	87° 13' 52.618" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_12AII OF SUBARNAREKHA RIVER



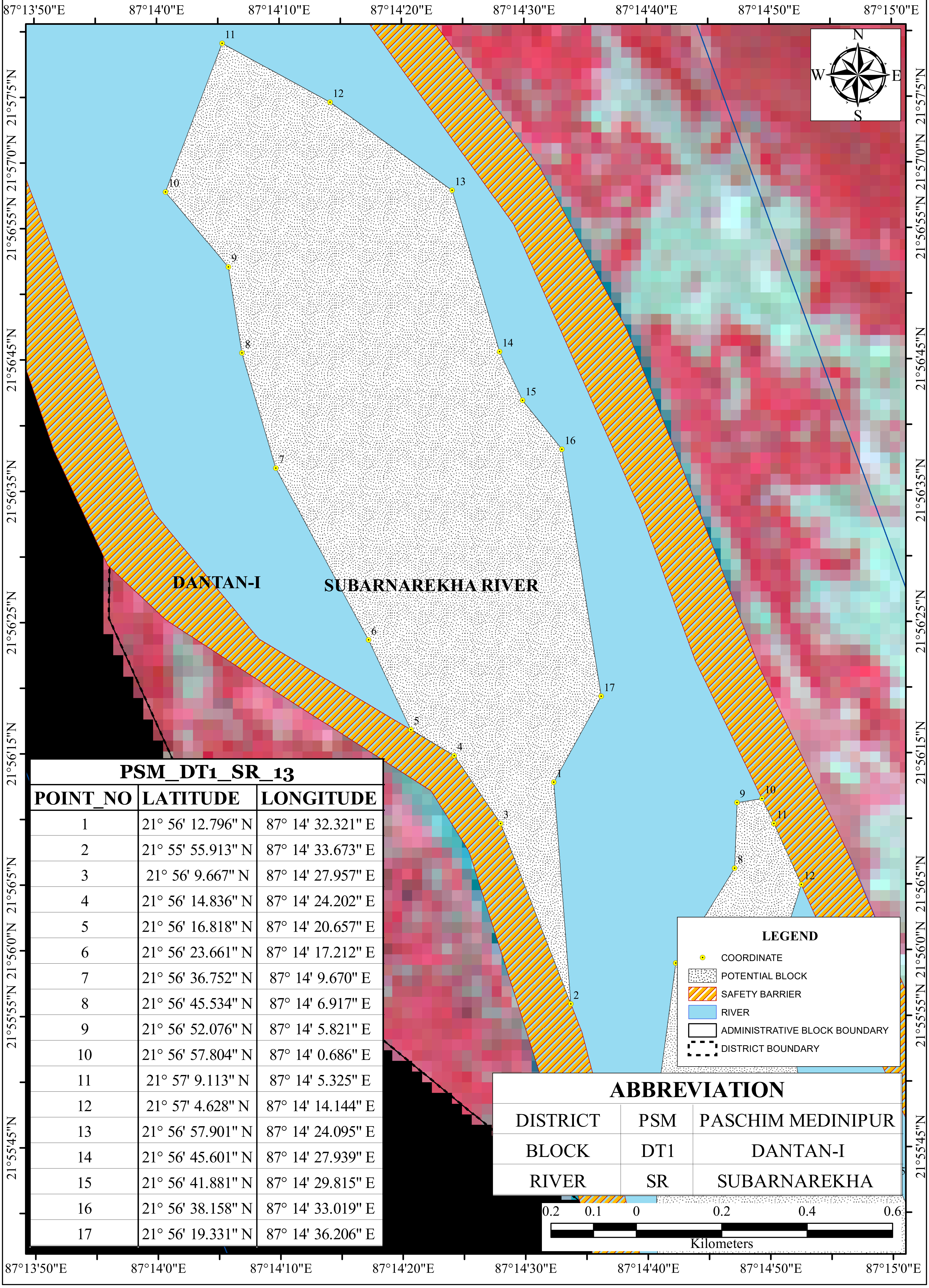
PSM_DT1_SR_12AII

POINT_NO	LATITUDE	LONGITUDE
1	21° 57' 24.434" N	87° 14' 4.767" E
2	21° 57' 15.768" N	87° 14' 5.453" E
3	21° 57' 20.996" N	87° 13' 46.654" E
4	21° 57' 23.755" N	87° 13' 58.124" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_13 OF SUBARNAREKHA RIVER



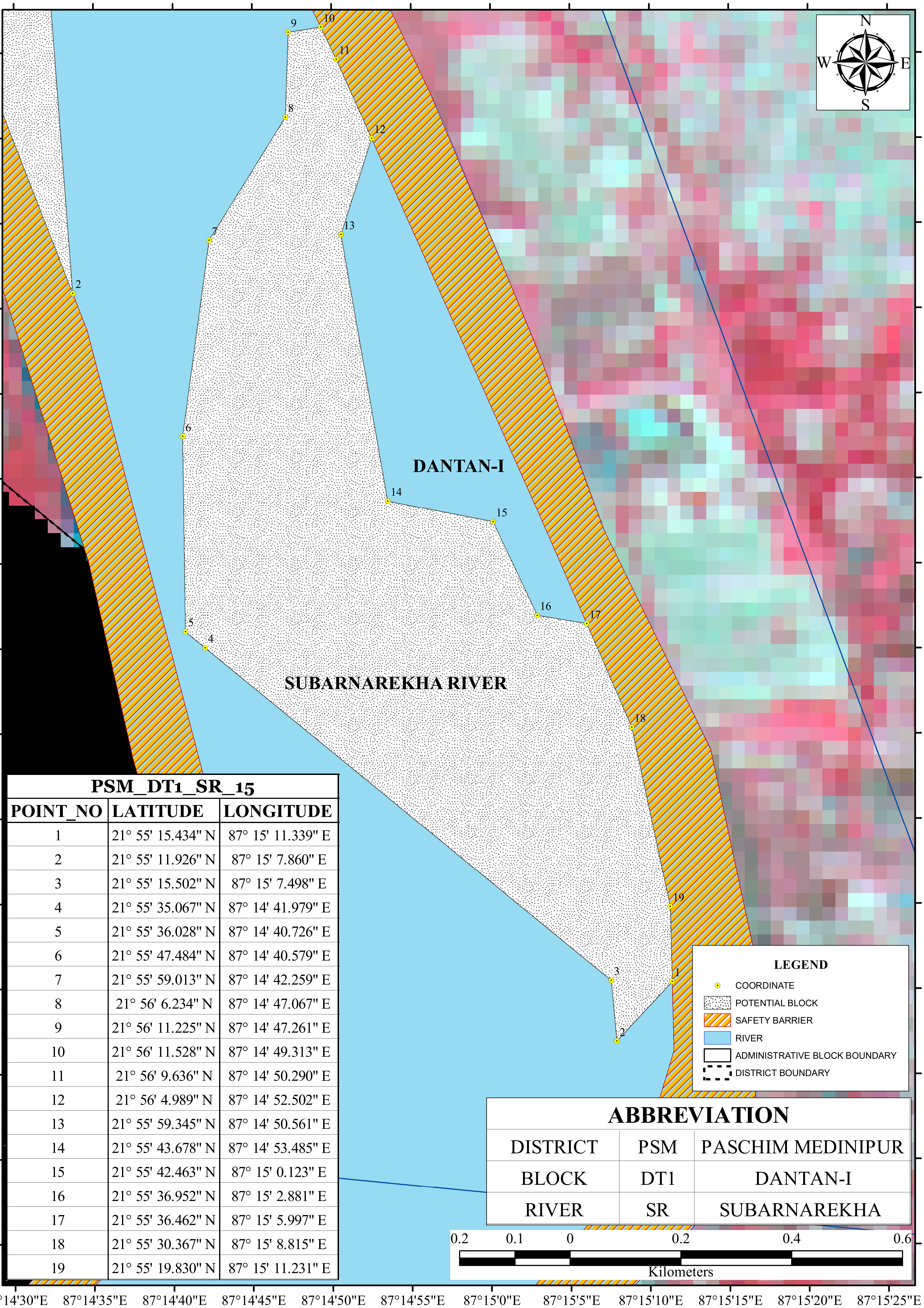
PSM_DT1_SR_13

POINT_NO	LATITUDE	LONGITUDE
1	21° 56' 12.796" N	87° 14' 32.321" E
2	21° 55' 55.913" N	87° 14' 33.673" E
3	21° 56' 9.667" N	87° 14' 27.957" E
4	21° 56' 14.836" N	87° 14' 24.202" E
5	21° 56' 16.818" N	87° 14' 20.657" E
6	21° 56' 23.661" N	87° 14' 17.212" E
7	21° 56' 36.752" N	87° 14' 9.670" E
8	21° 56' 45.534" N	87° 14' 6.917" E
9	21° 56' 52.076" N	87° 14' 5.821" E
10	21° 56' 57.804" N	87° 14' 0.686" E
11	21° 57' 9.113" N	87° 14' 5.325" E
12	21° 57' 4.628" N	87° 14' 14.144" E
13	21° 56' 57.901" N	87° 14' 24.095" E
14	21° 56' 45.601" N	87° 14' 27.939" E
15	21° 56' 41.881" N	87° 14' 29.815" E
16	21° 56' 38.158" N	87° 14' 33.019" E
17	21° 56' 19.331" N	87° 14' 36.206" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_15 OF SUBARNAREKHA RIVER



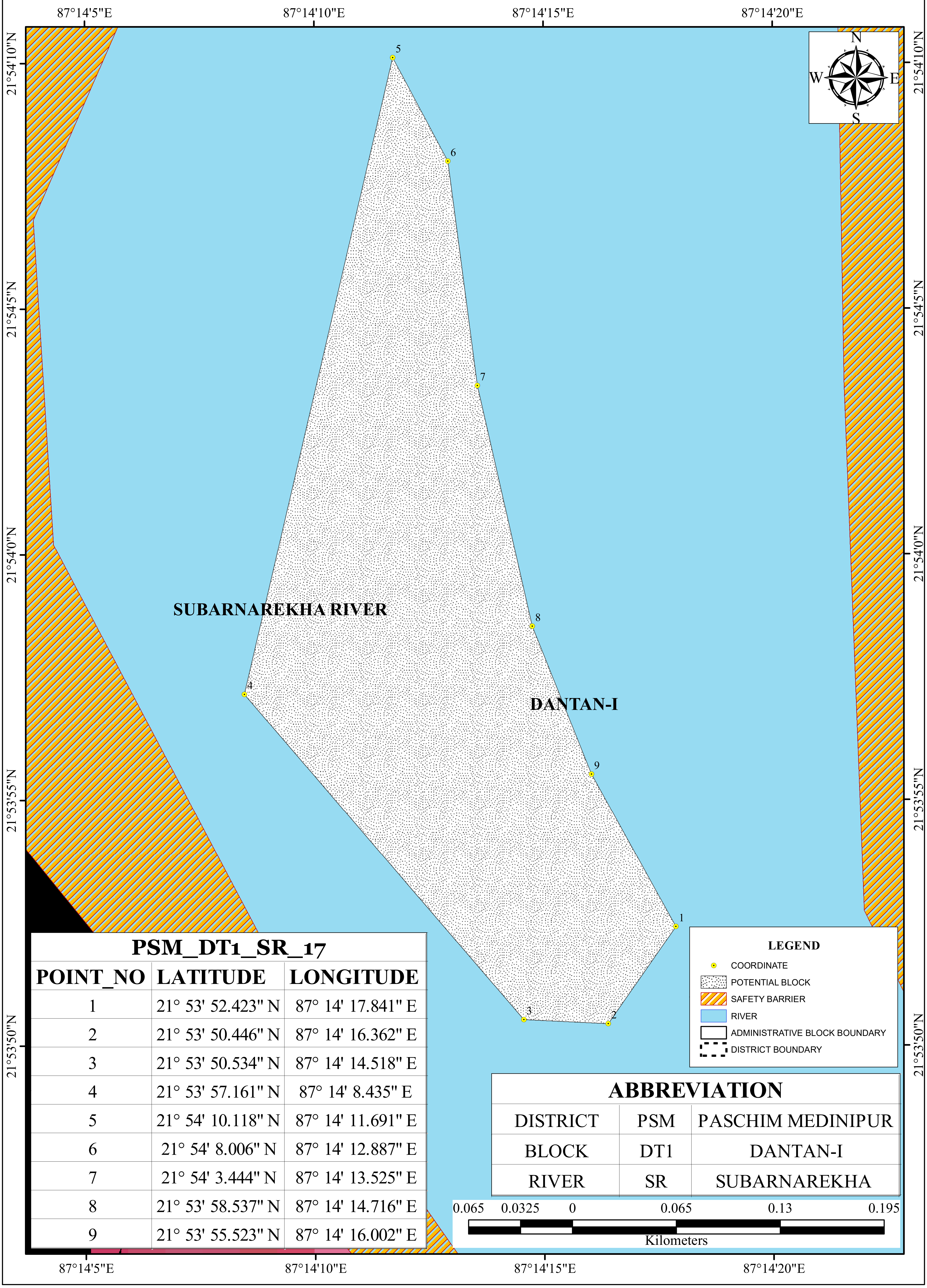
PSM_DT1_SR_15

POINT_NO	LATITUDE	LONGITUDE
1	21° 55' 15.434" N	87° 15' 11.339" E
2	21° 55' 11.926" N	87° 15' 7.860" E
3	21° 55' 15.502" N	87° 15' 7.498" E
4	21° 55' 35.067" N	87° 14' 41.979" E
5	21° 55' 36.028" N	87° 14' 40.726" E
6	21° 55' 47.484" N	87° 14' 40.579" E
7	21° 55' 59.013" N	87° 14' 42.259" E
8	21° 56' 6.234" N	87° 14' 47.067" E
9	21° 56' 11.225" N	87° 14' 47.261" E
10	21° 56' 11.528" N	87° 14' 49.313" E
11	21° 56' 9.636" N	87° 14' 50.290" E
12	21° 56' 4.989" N	87° 14' 52.502" E
13	21° 55' 59.345" N	87° 14' 50.561" E
14	21° 55' 43.678" N	87° 14' 53.485" E
15	21° 55' 42.463" N	87° 15' 0.123" E
16	21° 55' 36.952" N	87° 15' 2.881" E
17	21° 55' 36.462" N	87° 15' 5.997" E
18	21° 55' 30.367" N	87° 15' 8.815" E
19	21° 55' 19.830" N	87° 15' 11.231" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_17 OF SUBARNAREKHA RIVER



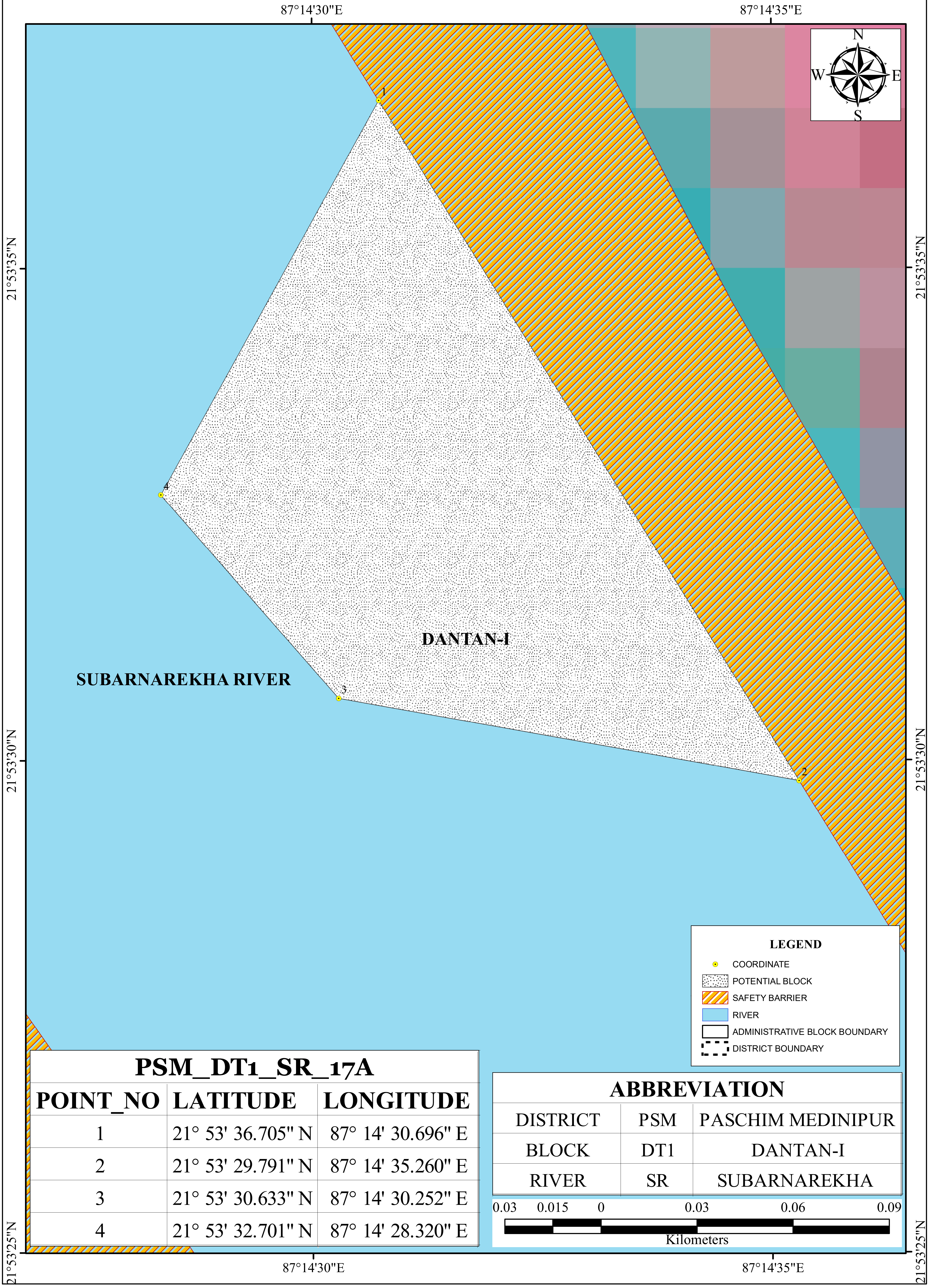
PSM_DT1_SR_17

POINT_NO	LATITUDE	LONGITUDE
1	21° 53' 52.423" N	87° 14' 17.841" E
2	21° 53' 50.446" N	87° 14' 16.362" E
3	21° 53' 50.534" N	87° 14' 14.518" E
4	21° 53' 57.161" N	87° 14' 8.435" E
5	21° 54' 10.118" N	87° 14' 11.691" E
6	21° 54' 8.006" N	87° 14' 12.887" E
7	21° 54' 3.444" N	87° 14' 13.525" E
8	21° 53' 58.537" N	87° 14' 14.716" E
9	21° 53' 55.523" N	87° 14' 16.002" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

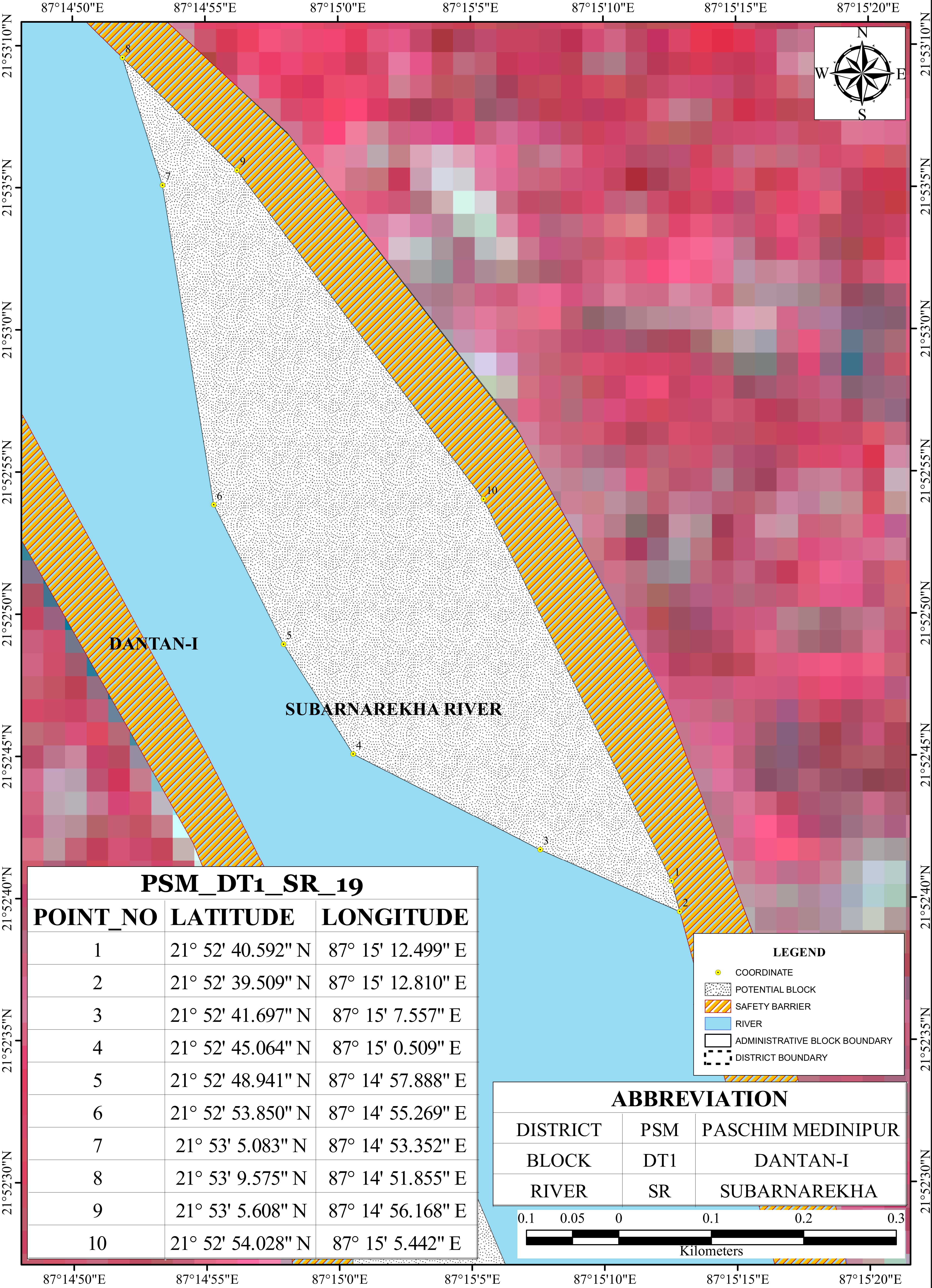
POTENTIAL BLOCK PSM_DT1_SR_17A OF SUBARNAREKHA RIVER



PSM_DT1_SR_17A		
POINT_NO	LATITUDE	LONGITUDE
1	21° 53' 36.705" N	87° 14' 30.696" E
2	21° 53' 29.791" N	87° 14' 35.260" E
3	21° 53' 30.633" N	87° 14' 30.252" E
4	21° 53' 32.701" N	87° 14' 28.320" E

ABBREVIATION		
DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_19 OF SUBARNAREKHA RIVER



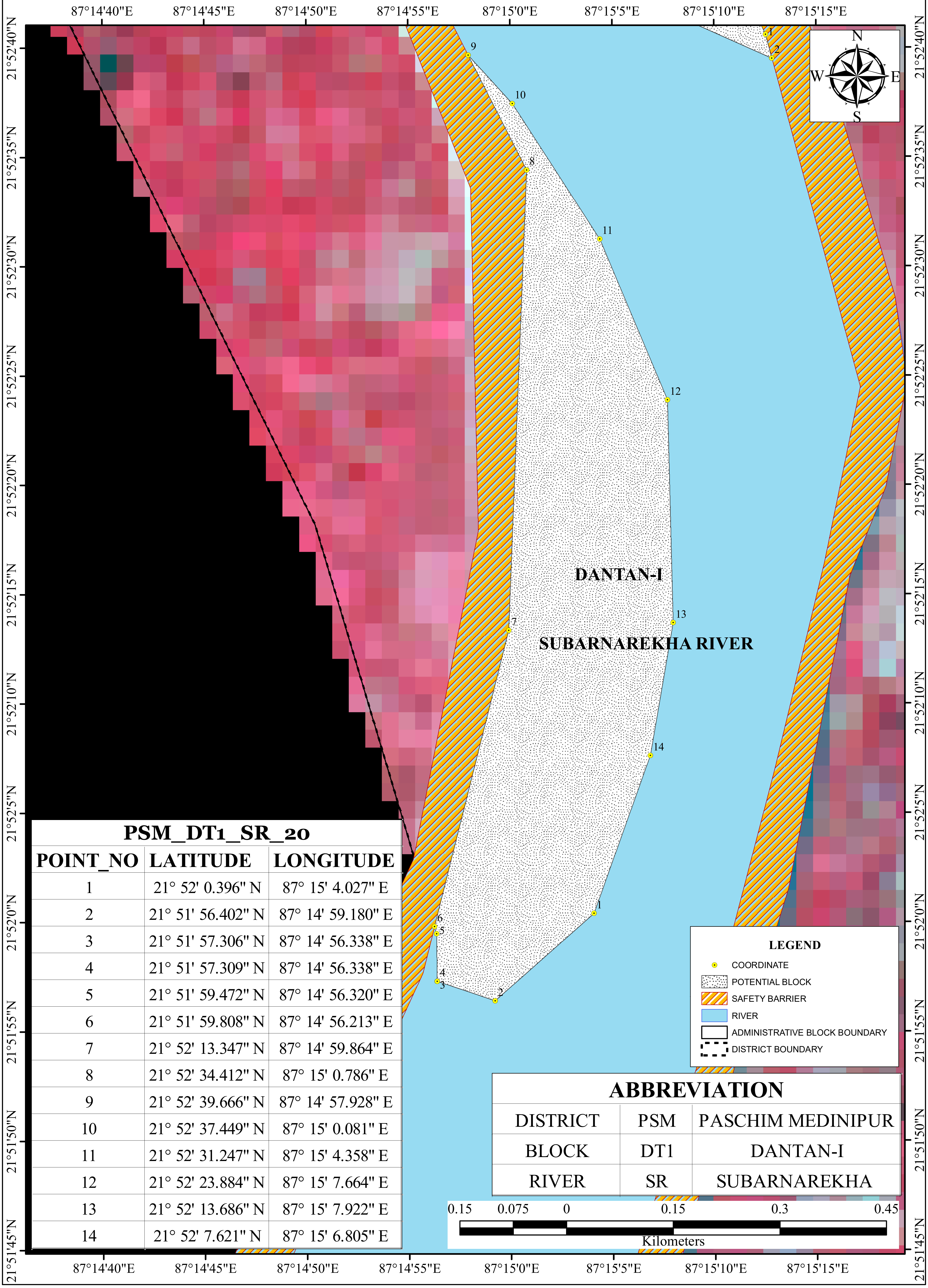
PSM_DT1_SR_19

POINT_NO	LATITUDE	LONGITUDE
1	21° 52' 40.592" N	87° 15' 12.499" E
2	21° 52' 39.509" N	87° 15' 12.810" E
3	21° 52' 41.697" N	87° 15' 7.557" E
4	21° 52' 45.064" N	87° 15' 0.509" E
5	21° 52' 48.941" N	87° 14' 57.888" E
6	21° 52' 53.850" N	87° 14' 55.269" E
7	21° 53' 5.083" N	87° 14' 53.352" E
8	21° 53' 9.575" N	87° 14' 51.855" E
9	21° 53' 5.608" N	87° 14' 56.168" E
10	21° 52' 54.028" N	87° 15' 5.442" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

POTENTIAL BLOCK PSM_DT1_SR_20 OF SUBARNAREKHA RIVER



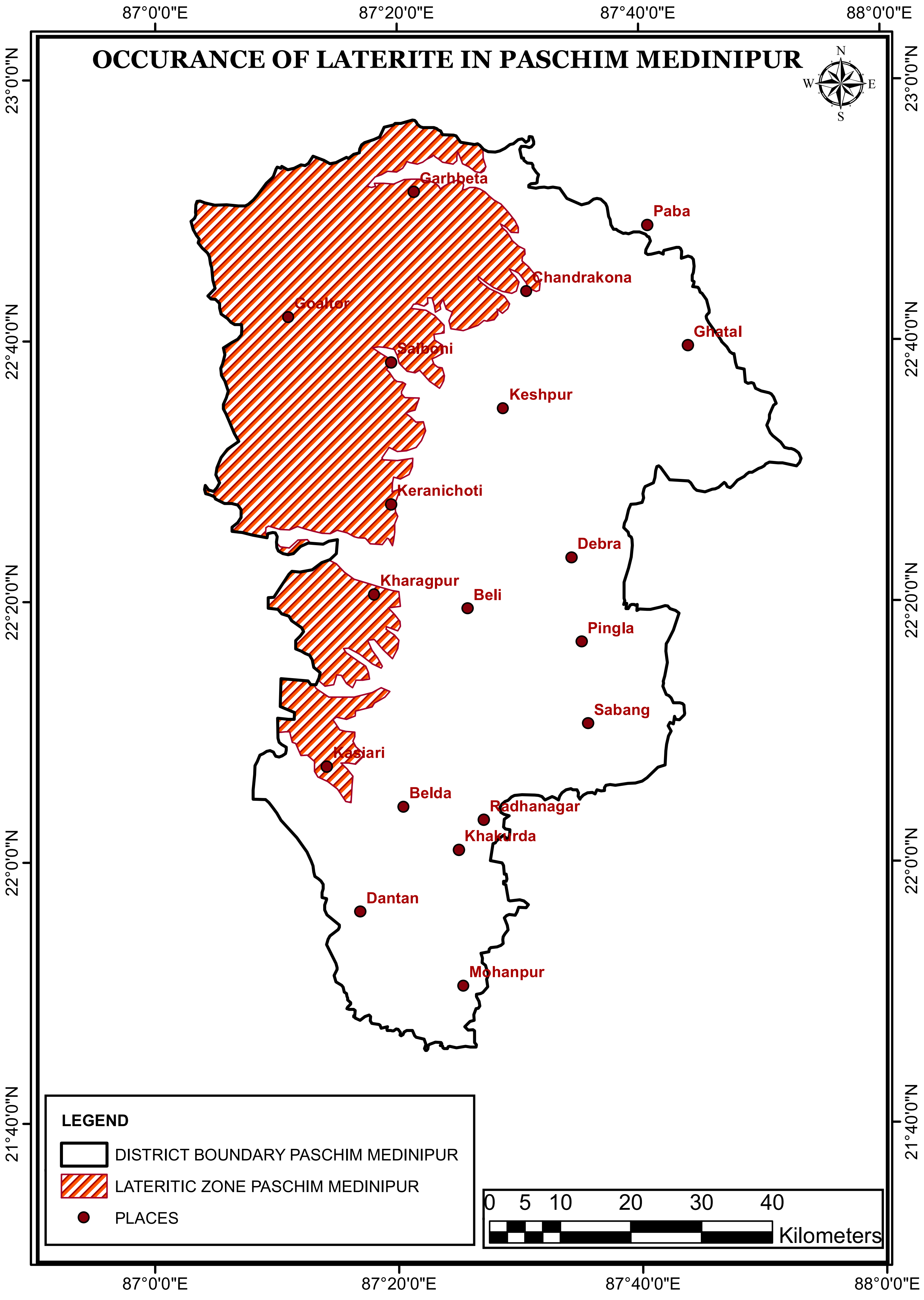
PSM_DT1_SR_20

POINT_NO	LATITUDE	LONGITUDE
1	21° 52' 0.396" N	87° 15' 4.027" E
2	21° 51' 56.402" N	87° 14' 59.180" E
3	21° 51' 57.306" N	87° 14' 56.338" E
4	21° 51' 57.309" N	87° 14' 56.338" E
5	21° 51' 59.472" N	87° 14' 56.320" E
6	21° 51' 59.808" N	87° 14' 56.213" E
7	21° 52' 13.347" N	87° 14' 59.864" E
8	21° 52' 34.412" N	87° 15' 0.786" E
9	21° 52' 39.666" N	87° 14' 57.928" E
10	21° 52' 37.449" N	87° 15' 0.081" E
11	21° 52' 31.247" N	87° 15' 4.358" E
12	21° 52' 23.884" N	87° 15' 7.664" E
13	21° 52' 13.686" N	87° 15' 7.922" E
14	21° 52' 7.621" N	87° 15' 6.805" E

ABBREVIATION

DISTRICT	PSM	PASCHIM MEDINIPUR
BLOCK	DT1	DANTAN-I
RIVER	SR	SUBARNAREKHA

Annexure 5
Map showing In-situ mineral occurrences in Paschim Medinipur District


OCCURANCE OF LATERITE IN PASCHIM MEDINIPUR
87°0'0"E
87°20'0"E
87°40'0"E
88°0'0"E
23°0'0"N
22°40'0"N
22°20'0"N
22°0'0"N
21°40'0"N
N
S
E
W
Garhbeta
Paba
Chandrakona
Goaltor
Ghatal
Salboni
Keshpur
Keranichoti
Debra
Kharagpur
Beli
Pingla
Sabang
Kesiari
Belda
Radhanagar
Khakurda
Dantan
Mohanpur
LEGEND
DISTRICT BOUNDARY PASCHIM MEDINIPUR
LATERITIC ZONE PASCHIM MEDINIPUR
PLACES
0 5 10 20 30 40
Kilometers

Annexure 6

SEIAA 73rd Meeting (8th September, 2022) Minutes of Meeting

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State Environment Impact Assessment Authority
Pranisampad Bhawan, 5th Floor, Sector-III, Salt Lake, Kolkata - 700106
(West Bengal)
Minutes of SEIAA Meeting
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Subject:- 73rd meeting of SEIAA

Venue:- **Conference Room of Environment Department, Prani Sampad Bhavan, 5th Floor, LB Block, Sector III, Salt Lake, Kolkata 700106.**

From :- **08 September 2022**

To :- **08 September 2022**

1. Proposal No. :- **SIA/WB/IND2/152174/2020** File No- **EN/T-II-1/013/2020** Proposed Exploratory Drilling (10 wells) in NELP VII Block WB-ONN-2005/4, situated in North 24 Parganas and Nadia Districts, West Bengal by **M/s. Oil & Natural Gas Corporation Limited. HSE MBA Basin**	Type- EC

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/IND2/152174/2020** dated **17 Jul 2020** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **1(b) Offshore and onshore oil and gas exploration, development & production**, under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

SEAC recommended the proposed project for Environmental Clearance with the following additional condition:

1. Short term need-based activities to be identified and implemented. Name of the beneficiary should be displayed at site.

PROJECT DETAILS

The project of M/s **HSE MBA BASIN** located in as follows :

State of the project				
S. No.	**State**	**District**	**Tehsil**	**Village**
1.	West Bengal	Nadia	Ranaghat - I	Noapara
2.	West Bengal	Nadia	Ranaghat - II	Matikumra
3.	West Bengal	Nadia	Haringhata	Haringhata
4.	West Bengal	North 24 Parganas	Habra - I	Asokenagar
5.	West Bengal	North 24 Parganas	Habra - II	Beraberi

The production details / project configuration is as follows :

Project configuration/product details						
S. No.	**Project configuration/product details**	**Quantity**	**Unit**	**Other Unit**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**

1.	Crude Oil & Natural Gas	0	9	MMT (oil) and BCM (Gas)	Road	

Raw Material Requirement is as follows :

Raw Material Requirement details								
S. No.	**Item**	**Quantity per annum**	**Unit**	**Other Unit**	**Source**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**	**Distance of Source from Project Site(Kilometers)**
1.	High speed diesel	600	9	Kilo Liters	IOC Depot	Road		45

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and accepted the same.

RECOMMENDATIONS OF SEIAA

The application for EC is approved.

Conclusion

Recommended

S.No	Conditions
(1)	**A. Specific conditions:-** i) No drilling shall be carried out in Protected Areas/forest area. ii) Approach road shall be made pucca to minimize generation of suspended dust. iii) Total water requirement shall not exceed 22 KLD/well proposed to be met through tankers. Mobile ETP shall be installed coupled with RO to reuse the treated water in drilling system. Size of the waste shall not exceed from the hole volume of the well + volume of drill cutting expected to be generated and volume of discarded mud if any. Two feet free board may be left to accommodate rain water. There shall be separate storm water channel and rain water shall not be allowed to mix with waste water. Alternatively, if possible, pit less drilling be practiced instead of above. iv) No lead acid batteries shall be utilized in the project/site. **B. General Conditions** I. **Statutory compliance** (i) The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, if drilling is carried in Forest areas. (ii) The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the State pollution Control Board. (iii) Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016

shall be obtained and the provisions contained in the Rules shall be strictly adhered to.

(iv) The project proponent shall obtain and adhere to statutory clearance under the Coastal Regulation Zone Notification, 2011, if applicable.

II. Air quality monitoring and preservation

i) The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be complied with.

ii) The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.

iii) Ambient air quality shall be monitored at the nearest human settlements as per the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 for PM10, PM2.5, SO2, NOX, CO, CH4, HC, Nonmethane HC etc.

iv) During exploration, production, storage and handling, the fugitive emission of methane, if any, shall be monitored.

v) The project proponent also to ensure trapping/storing of the CO_2 generated, if any, during the process and handling.

vi) Approach road shall be made pucca to minimize generation of suspended dust.

III. Water quality monitoring and preservation

i) As proposed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged to any surface water body, sea and/or on land. Domestic sewage shall be disposed off through septic tank/soak pit.

ii) The effluent discharge shall conform to the standards prescribed under the Environment (Protection) Rules, 1986, or as specified by the State Pollution Control Board while granting Consent under the Air/Water Act, whichever is more stringent.

iii) The project proponent shall construct the garland drain all around the drilling site to prevent runoff of any oil containing waste into the nearby water bodies. Separate drainage system shall be created for oil contaminated and non-oil contaminated. Effluent shall be properly treated and treated wastewater shall conform to CPCB standards.

iv) Drill cuttings separated from drilling fluid shall be adequately washed and disposed in HDPE lined pit. Waste mud shall be tested for hazardous contaminants and disposed according to HWMH Rules, 2016. No effluent/drilling mud/drill cutting shall be discharged/disposed off into nearby surface water bodies. The project proponent shall comply with the guidelines for disposal of solid waste, drill cutting and drilling fluids for onshore drilling operation notified vide GSR.546(E) dated 30th August, 2005.

IV. Noise monitoring and prevention

i) Acoustic enclosure shall be provided to DG set for controlling the noise pollution.

ii) The overall noise levels in and around the drilling location areas shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation.

iii) The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.

V. Energy Conservation measures

i) The energy sources for lighting purposes shall preferably be LED based.

VI. Waste management

i) Oil spillage prevention and mitigation scheme shall be prepared. In case of oil spillage/ contamination, action plan shall be prepared to clean the site by adopting proven technology. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers.

ii) Oil content in the drill cuttings shall be monitored by Authorized agency and report shall be sent to the State Environment Impact Assessment Authority.

VII. Safety and Human health issues

i) Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

ii) Blow Out Preventer system shall be installed to prevent well blowouts during drilling operations. BOP measures during drilling shall focus on maintaining well bore hydrostatic pressure by proper pre-well planning and drilling fluid logging etc.

iii) The project proponent shall prepare operating manual in respect of all activities, which would cover all safety & environment related issues and measures to be taken for protection. One set of environmental manual shall be made available at the drilling site/ project site. Awareness shall be created at each level of the management. All the schedules and results of environmental monitoring shall be available at the project site office. Remote monitoring of site should be done.

iv) On completion of drilling, the project proponent should plug the drilled wells safely and obtain certificate from environment safety angle from the concerned authority.

v) The project proponent shall take measures after completion of drilling process by well plugging and secured enclosures, decommissioning of rig upon abandonment of the well and drilling site shall be restored the area in original condition. In the event that no economic quantity of hydrocarbon is found a full abandonment plan shall be implemented for the drilling site in accordance with the applicable Indian Petroleum Regulations.

vi) The project proponent shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. Possibility of using ground flare shall be explored. At the place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during operation.

vii) Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.

viii) The project proponent shall develop a contingency plan for H_2S release including all necessary aspects from evacuation to resumption of normal operations. The workers shall be provided with personal H_2S detectors in locations of high risk of exposure along with self-containing breathing apparatus

ix) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

x) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

xi) The project proponent shall carry out long term subsidence study by collecting base line data before initiating drilling operation till the project lasts. The data so collected shall be submitted six monthly to the Ministry of Environment, Forests & Climate

Change / State Environment Impact Assessment Authority / State Pollution Control Board.

VIII. Environment Management Plan (EMP)

i) The project proponent should submit the proposed EMP on a six monthly basis. The Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020 should be strictly followed.

ii) Need based activities for local people is part of the EMP.

iii) The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest /wildlife norms/ conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board as a part of six-monthly report.

iv) A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of Senior Executive, who will directly report to the head of the organization.

v) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose.

vi) Year wise progress of implementation of action plan shall be reported to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board along with the Six-Monthly Compliance Report.

vii) Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

IX. Additional conditions

(1) Short term need-based activities to be identified and implemented. Name of the beneficiary should be displayed at site.

X. Miscellaneous

i) The environmental clearance accorded shall be valid for a period of 10 years for the proposed project or till the exploration period whichever is earlier.

ii) This is EC issued for exploratory wells only and those wells shall not be converted to production wells without prior permission from State Environment Impact Assessment Authority.

iii) The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.

iv) The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

v) The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

vi) The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions to Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board.

vii) The project proponent shall submit the environmental statement for each financial year in Form-V to the State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

viii) The project proponent shall inform the State Environment Impact Assessment Authority, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

ix) Restoration of the project site shall be carried out satisfactorily and report shall be sent to the State Environment Impact Assessment Authority.

x) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

xi) The project proponent shall abide by all the commitments and recommendations made in the EMP report and also that during their presentation to the State Expert Appraisal Committee.

xii) No further expansion or modifications in the project shall be carried out without prior approval of the State Environment Impact Assessment Authority.

xiii) The State Environment Impact Assessment Authority / State Pollution Control Board shall monitor compliance of the stipulated conditions.

xiv) The project authorities should extend full cooperation to the officer(s) of the State Environment Impact Assessment Authority / State Pollution Control Board by furnishing the requisite data / information/monitoring reports.

xv) The State Environment Impact Assessment Authority reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The State Environment Impact Assessment Authority may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.

xvi) Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xvii) Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

xviii) The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 read with subsequent amendments therein.

2. Proposal No. :- **SIA/WB/IND2/277881/2022** File No- **EN/T-II-1/042/2022** Proposed Onshore Exploratory drilling of 7 wells in Bengal Onshore OALP-III Block BPONHP-2018/1 situated in North 24 Parganas district (villages Phulsara, Uttar Shibpur, Aziznagar, Patharghata) and South 24 Parganas district (villages Begampur, Andulgari, Netra), West Bengal by **M/s. Oil & Natural Gas Corporation Limited**	Type- **EC**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/IND2/277881/2022** dated **13 Jun 2022** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **1(b) Offshore and onshore oil and gas exploration, development & production**, under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

SEAC recommended the proposed project for Environmental Clearance with the following additional condition:

1. Short term need-based activities to be identified and implemented. Name of the beneficiary should be displayed at site.

PROJECT DETAILS

The project of M/s **OIL AND NATURAL GAS CORPORATION LIMITED** located in as follows :

State of the project				
S. No.	**State**	**District**	**Tehsil**	**Village**
1.	West Bengal	North 24 Parganas	Gaighata	Phulsara, Mondalpara
2.	West Bengal	North 24 Parganas	Deganga	Aziznagar
3.	West Bengal	North 24 Parganas	Baduria	Uttar Shibpur, Chandipur
4.	West Bengal	North 24 Parganas	Rajarhat	Chatkabaria, Patharghata
5.	West Bengal	South 24 Parganas	Bhangar - I	Andulgari, Hadiya
6.	West Bengal	South 24 Parganas	Canning - II	Netra
7.	West Bengal	South 24 Parganas	Baruipur	Begampur

The production details / project configuration is as follows :

Project configuration/product details						
S. No.	**Project configuration/product details**	**Quantity**	**Unit**	**Other Unit**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**
1.	Drilling of 7 no.s of exploratory wells within OALP-III Block BP-ONHP-2018/1 to a maximum depth of 2500-6000 m	7	9	No.s	Others	Not Applicable

Raw Material Requirement is as follows :

Raw Material Requirement details								
S. No.	**Item**	**Quantity per annum**	**Unit**	**Other Unit**	**Source**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**	**Distance of Source from Project Site(Kilometers)**
(1.)	HSD for DGs	6	4		IOC Depot	Road		45

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and accepted the same.

RECOMMENDATIONS OF SEIAA

The application for EC is approved.

Conclusion

Recommended

S.No	Conditions
	A. Specific conditions:- i) No drilling shall be carried out in Protected Areas/forest area. ii) Approach road shall be made pucca to minimize generation of suspended dust. iii) Total water requirement shall not exceed 22 KLD/well proposed to be met through tankers. Mobile ETP shall be installed coupled with RO to reuse the treated water in drilling system. Size of the waste shall not exceed from the hole volume of the well + volume of drill cutting expected to be generated and volume of discarded mud if any. Two feet free board may be left to accommodate rain water. There shall be separate storm water channel and rain water shall not be allowed to mix with waste water. Alternatively, if possible, pit less drilling be practiced instead of above. iv) No lead acid batteries shall be utilized in the project/site.
(1)	**B. General Conditions** **I. Statutory compliance** i) The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, if drilling is carried in Forest areas. ii) The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the State pollution Control Board. iii) Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to. iv) The project proponent shall obtain and adhere to statutory clearance under the Coastal Regulation Zone Notification, 2011, if applicable. **II. Air quality monitoring and preservation** i) The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be complied with.

ii) The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.

iii) Ambient air quality shall be monitored at the nearest human settlements as per the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 for PM10, PM2.5, SO2, NOX, CO, CH4, HC, Nonmethane HC etc.

iv) During exploration, production, storage and handling, the fugitive emission of methane, if any, shall be monitored.

v) The project proponent also to ensure trapping/storing of the CO_2 generated, if any, during the process and handling.

vi) Approach road shall be made pucca to minimize generation of suspended dust.

III. Water quality monitoring and preservation

i) As proposed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged to any surface water body, sea and/or on land. Domestic sewage shall be disposed off through septic tank/soak pit.

ii) The effluent discharge shall conform to the standards prescribed under the Environment (Protection) Rules, 1986, or as specified by the State Pollution Control Board while granting Consent under the Air/Water Act, whichever is more stringent.

iii) The project proponent shall construct the garland drain all around the drilling site to prevent runoff of any oil containing waste into the nearby water bodies. Separate drainage system shall be created for oil contaminated and non-oil contaminated. Effluent shall be properly treated and treated wastewater shall conform to CPCB standards.

iv) Drill cuttings separated from drilling fluid shall be adequately washed and disposed in HDPE lined pit. Waste mud shall be tested for hazardous contaminants and disposed according to HWMH Rules, 2016. No effluent/drilling mud/drill cutting shall be discharged/disposed off into nearby surface water bodies. The project proponent shall comply with the guidelines for disposal of solid waste, drill cutting and drilling fluids for onshore drilling operation notified vide GSR.546(E) dated 30th August, 2005.

IV. Noise monitoring and prevention

i) Acoustic enclosure shall be provided to DG set for controlling the noise pollution.

ii) The overall noise levels in and around the drilling location areas shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation.

iii) The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.

V. Energy Conservation measures

i) The energy sources for lighting purposes shall preferably be LED based.

VI. Waste management

i) Oil spillage prevention and mitigation scheme shall be prepared. In case of oil spillage/ contamination, action plan shall be prepared to clean the site by adopting proven technology. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers.

ii) Oil content in the drill cuttings shall be monitored by Authorized agency and report shall be sent to the State Environment Impact Assessment Authority.

VII. Safety and Human health issues

i) Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

ii) Blow Out Preventer system shall be installed to prevent well blowouts during drilling operations. BOP measures during drilling shall focus on maintaining well bore hydrostatic pressure by proper pre-well planning and drilling fluid logging etc.

iii) The project proponent shall prepare operating manual in respect of all activities, which would cover all safety & environment related issues and measures to be taken for protection. One set of environmental manual shall be made available at the drilling site/ project site. Awareness shall be created at each level of the management. All the schedules and results of environmental monitoring shall be available at the project site office. Remote monitoring of site should be done.

iv) On completion of drilling, the project proponent should plug the drilled wells safely and obtain certificate from environment safety angle from the concerned authority.

v) The project proponent shall take measures after completion of drilling process by well plugging and secured enclosures, decommissioning of rig upon abandonment of the well and drilling site shall be restored the area in original condition. In the event that no economic quantity of hydrocarbon is found a full abandonment plan shall be implemented for the drilling site in accordance with the applicable Indian Petroleum Regulations.

vi) The project proponent shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. Possibility of using ground flare shall be explored. At the place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during operation.

vii) Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.

viii) The project proponent shall develop a contingency plan for H_2S release including all necessary aspects from evacuation to resumption of normal operations. The workers shall be provided with personal H_2S detectors in locations of high risk of exposure along with self-containing breathing apparatus

ix) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

x) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

xi) The project proponent shall carry out long term subsidence study by collecting base line data before initiating drilling operation till the project lasts. The data so collected shall be submitted six monthly to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board.

VIII. Environment Management Plan (EMP)

i) The project proponent should submit the proposed EMP on a six monthly basis. The Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020 should be strictly followed.

ii) Need based activities for local people is part of the EMP.

iii) The company shall have a well laid down environmental policy duly approve by the Board of

Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest /wildlife norms/ conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board as a part of six-monthly report.

iv) A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of Senior Executive, who will directly report to the head of the organization.

v) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose.

vi) Year wise progress of implementation of action plan shall be reported to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board along with the Six-Monthly Compliance Report.

vii) Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

IX. Additional conditions

i) Short term need-based activities to be identified and implemented. Name of the beneficiary should be displayed at site.

X. Miscellaneous

i) The environmental clearance accorded shall be valid for a period of 10 years for the proposed project or till the exploration period whichever is earlier.

ii) This is EC issued for exploratory wells only and those wells shall not be converted to production wells without prior permission from State Environment Impact Assessment Authority.

iii) The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.

iv) The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

v) The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

vi) The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions to Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board.

vii) The project proponent shall submit the environmental statement for each financial year in Form-V to the State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

viii) The project proponent shall inform the State Environment Impact Assessment Authority, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

ix) Restoration of the project site shall be carried out satisfactorily and report shall be sent to the State Environment Impact Assessment Authority.

x) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

xi) The project proponent shall abide by all the commitments and recommendations made in the EMP report and also that during their presentation to the State Expert Appraisal Committee.

xii) No further expansion or modifications in the project shall be carried out without prior approval of the State Environment Impact Assessment Authority.

xiii) The State Environment Impact Assessment Authority / State Pollution Control Board shall monitor compliance of the stipulated conditions.

xiv) The project authorities should extend full cooperation to the officer(s) of the State Environment Impact Assessment Authority / State Pollution Control Board by furnishing the requisite data / information/monitoring reports.

xv) The State Environment Impact Assessment Authority reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The State Environment Impact Assessment Authority may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.

xvi) Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xvii) Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

xviii) The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 read with subsequent amendments therein.

3. Proposal No. :- **SIA/WB/MIS/267917/2022** File No- **EN/T-II-1/026/2022** Proposed construction of Business Building at Premises No.-22-0706, Plot No- SV-7, Diplomatic Enclave in AA-II E, New Town, Rajarhat, West Bengal by **M/s. Nxtra Data Limited**	Type- **EC**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/MIS/267917/2022** dated **14 Apr 2022** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **8(a) Building and Construction projects**, under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

SEAC recommended the project for Environmental Clearance.

PROJECT DETAILS

The project of M/s **NXTRA DATA LIMITED** located in as follows :

State of the project

S. No.	State	District	Tehsil	Village
(1.)	Maharashtra	Thane	Ambarnath	Badlapur MIDC
(2.)	West Bengal	North 24 Parganas	Rajarhat	-

14. **Project configuration/product details**

S. No.	Project configuration/product details	Quantity	Unit	Other Unit	Mode of Transport/Transmission of Product	Other Mode of Transport
Development of an B+G+6 storied Business Building. Total built up area is 29857.970 sqm and land area is 11,528.67 sq.m						

Raw Material Requirement details

S. No.	Item	Quantity per annum	Unit	Other Unit	Source	Mode of Transport/Transmission of Product	Other Mode of Transport	Distance of Source from Project Site(Kilometers)
NIL								

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and observed that in the sanction plan, in the title of the project the predominant use is mentioned as 'Business' Building. The project application, the project is mentioned as Data Centre which falls under 'IT & ITES' use category. Further in the Building Permit as well as the population calculation sheet, the use is mentioned as 'Residential'. A clarification regarding the building use category is required to be submitted by the PP.

RECOMMENDATIONS OF SEIAA

Therefore, the application for EC is deferred (Additional Information).

Conclusion

Deferred

4. Proposal No. :- **SIA/WB/MIS/55503/2019** File No- **SIA/WB/NCP/82292/2018** Proposed expansion of Residential Complex at Rajarhat Road, R.S. Dag No. 470(P), 473, 474, 475, 476, 477, 478, 479, 480, 481(P), 483, 489, 490, 491, 492, 493, 494, 495, 496, 497, 499, 500, 501(P), 502(P), 503(P), 504(P), 506(P), 507(P), 509(P), 526(P), 531, 532, 533 & 501/716(P) recorded in L.R. Khatian Nos. 2821, 3233, 3281, 3283, 3248, 3285, 3286, 3282, 2849, 2848, 2887, 2846, 3234, 3315, 2855, 2856, 2857, 2858, 2859, 3318, 3317, 3412, 3341, 3340, 2803, 2806, 2805, 2802, 2801, 2800, 2804, 2807, 3302, 3304, 3306, 3301, 3303, 3305, 3312, 2853, 3136, 3307, 3309, 3311, 3310, 3308, 3313, 3411, 3314, 3288, 3287, 2830, 2829, 2828, 2827, 2826, 2825, 2845, 2844, 2843, 2842, 2841, 2840, 2839, 2838, 2837, 2836, 2835, 2834, 2833, 2832, 3240, 2815, 3316, 2854, 2809, 2808, 2814, 2819, 2850, 2851, 2852, 2822, 2823, 2824, 2796,	Type- **EC**

2797, 2798, 2799, 2816, 2817, 2818, 2810, 2811, 2812, 2813, 2792, 2793, 2794, 2795, 2820, 3073, 3072, 3238, 3236, 3237, 3235, 3239, 3296, 2860, 2861, 2862, 2863, 2864, 3071, 3265, 4092, 3279, 3070, 2866, 2831 & 2865, J.L. No. 28, Mouza: Bhatenda, Under Rajarhat Bishnupur Gram Panchayat 1, P.O. & P.S. – Rajarhat, Dist. – North 24 Parganas, West Bengal by **M/s. Ganesh Tracom Pvt. Ltd. & Others (VIOLATION CASE)**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/MIS/55503/2019** dated **30 Sep 2020** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **8(b) Townships and Area Development projects**, under Category **"B1"** of EIA Notification 2006 and the proposal is appraised at State level.

Earlier the project proponent (PP) had obtained EC vide No. 2704/EN/T-II-1/082/2014 dated 07.12.2016 for residential complex at Rajarhat Road, Mouza: Bhatenda, J.L. No. 28, PS – Rajarhat, Under Rajarhat Bishnupur GP 1, Dist. – North 24 Parganas.

The project proponent obtained ToR vide Memo No. 976-2N-49/2014(E) dated 02.09.2019.

SEAC recommended the proposed project for Environmental Clearance under violation category with the condition that the project proponent shall develop tree plantation as approved by DFO.

PROJECT DETAILS

The project of M/s **GANESH TRACOM PVT LTD AND OTHERS** located in as follows :

State of the project				
S. No.	**State**	**District**	**Tehsil**	**Village**
(1.)	West Bengal	North 24 Parganas	Rajarhat	Bhatenda

14. **Project configuration/product details**

S. No.	**Project configuration/product details**	**Quantity**	**Unit**	**Other Unit**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**
The ongoing phase obtained Environmental Clearance from SEIAA, West Bengal (EC No. 2704/EN/T-II-I/082/2014 dated 07.12.2016). Total numbers of flats in existing phase is 1215. In the proposed expansion phase, another 144 residential flats will be constructed. Thus, total number of flats (including the ongoing & proposed phases) in this project will be 1215 + 144 = 1359 nos. Built up area of the existing phase is 1,44,246.78 sq. m. and in the proposed expansion phase additional built up area will be 18,410.65 sq.m. Thus, total built up area including the existing & expansion phases will be (1,44,246.78 + 18,410.65) sq.m = 1,62,657.43 sq.m.						

Raw Material Requirement is as follows :

Raw Material Requirement details								
S. No.	**Item**	**Quantity per annum**	**Unit**	**Other Unit**	**Source**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**	**Distance of Source from Project Site(Kilometers)**
(1.)	Building & construction raw materials	1000	1		Local	Road		10

	(sand, Cement & steel)							

Details of previous ToR is as follows :

Details of previous ToR

ToR issued vide Memo No. 976-2N-49/2014(E) dated 02.09.2019

Expansion Details :

S. No.	Product/Activity (Capacity / Area)	Quantity		Unit	Other Unit
		From	To		
(1.)	Built Up Area	144246.78	18410.65	Others	sq. metre

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and accepted the same.

RECOMMENDATIONS OF SEIAA

The application for EC is approved based on the Building Plan approved by the Executive Officer, Rajarhat Panchayat Samity vide No. 926/RPS dated 28.08.2018.

Conclusion

Recommended

S.No	Conditions
(1)	**I. Statutory compliance:** i. The project proponent shall obtain all necessary clearance/ permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws. ii. The approval of the Competent Authority shall be obtained for structural safety of buildings due to earthquakes, adequacy of firefighting equipment etc. as per National Building Code including protection measures from lightening etc. iii. The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project. iv. The project proponent shall obtain clearance from the National Board for Wildlife, if applicable. v. The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control Board/ Committee. vi. The project proponent shall obtain the necessary permission for drawl of ground water /surface water required for the project from the competent authority. vii. A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project should be obtained. viii. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department shall be obtained, as applicable, by project

proponents from the respective competent authorities.

ix. The provisions of the Solid Waste (Management) Rules, 2016, e-Waste (Management) Rules, 2016, and the Plastics Waste (Management) Rules, 2016 shall be followed.

x. The project proponent shall follow the ECBC/ECBC-R prescribed by Bureau of Energy Efficiency, Ministry of Power strictly.

xi. The project proponent should strictly comply with the guidelines for High Rise Buildings, issued by MoEF, GoI vide No. 21-270/2008-IA.III dated 07.02.2012.

xii. The project proponent shall comply with the EMP as proposed in terms of Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020.

II. Air quality monitoring and preservation

i. Notification GSR 94(E) dated 25.01.2018 of MoEF&CC regarding Mandatory Implementation of Dust Mitigation Measures for Construction and Demolition Activities for projects requiring Environmental Clearance shall be complied with.

ii. A management plan shall be drawn up and implemented to contain the current exceedance in ambient air quality at the site.

iii. The project proponent shall install system to carryout Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM25) covering upwind and downwind directions during the construction period.

iv. Diesel power generating sets proposed as source of backup power should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use of low sulphur diesel. The location of the DG sets may be decided with in consultation with State Pollution Control Board.

v. Construction site shall be adequately barricaded before the construction begins. Dust, smoke & other air pollution prevention measures shall be provided for the building as well as the site. These measures shall include screens for the building under construction, continuous dust/ wind breaking walls all around the site (at least 3 meter height). Plastic/tarpaulin sheet covers shall be provided for vehicles bringing in sand, cement, murram and other construction materials prone to causing dust pollution at the site as well as taking out debris from the site.

vi. Sand, murram, loose soil, cement, stored on site shall be covered adequately so as to prevent dust pollution.

vii. Wet jet shall be provided for grinding and stone cutting.

viii. Unpaved surfaces and loose soil shall be adequately sprinkled with water to suppress dust.

ix. All construction and demolition debris shall be stored at the site (and not dumped on the roads or open spaces outside) before they are properly disposed. All demolition and construction waste shall be managed as per the provisions of the Construction and Demolition Waste Rules 2016.

x. The diesel generator sets to be used during construction phase shall be low sulphur diesel type and shall conform to Environmental (Protection) prescribed for air and noise emission standards.

xi. The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Low sulphur diesel shall be used. The location of the DG set and exhaust pipe height shall be as per the provisions of the Central Pollution Control Board (CPCB) norms.

xii. For indoor air quality the ventilation provisions as per National Building Code of India.

III. Water quality monitoring and preservation

i. The natural drain system should be maintained for ensuring unrestricted flow of water. No construction shall be allowed to obstruct the natural drainage through the site, on wetland and water bodies. Check dams, bio-swales, landscape, and other sustainable urban drainage systems (SUDS) are allowed for maintaining the drainage pattern and to harvest rain water.

ii. Buildings shall be designed to follow the natural topography as much as possible. Minimum cutting and filling should be done.

iii. Total fresh water use shall not exceed the proposed requirement as provided in the project details.

iv. The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office of Ministry of Environment, Forest and Climate Change (MoEF&CC) along with State Level Environment Impact Assessment Authority (SEIAA) and West Bengal Pollution

Control Board (WBPCB) along with six monthly Monitoring reports.

v. A certificate shall be obtained from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed, the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users.

vi. At least 20% of the open spaces as required by the local building bye-laws shall be pervious. Use of Grass pavers, paver blocks with at least 50% opening, landscape etc. would be considered as pervious surface.

vii. Installation of dual pipe plumbing for supplying fresh water for drinking, cooking and bathing etc. and other for supply of recycled water for flushing, landscape irrigation, car washing, thermal cooling, conditioning etc. shall be done.

viii. Use of water saving devices/ fixtures (viz. low flow flushing systems; use of low flow faucets tap aerators etc.) for water conservation shall be incorporated in the building plan.

ix. Separation of grey and black water should be done by the use of dual plumbing system. In case of single stack system separate recirculation lines for flushing by giving dual plumbing system be done.

x. Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.

xi. The local bye-law provisions on rain water harvesting should be followed. If local byelaw provision is not available, adequate provision for storage and recharge should be followed as per the Ministry of Urban Development Model Building Byelaws, 2016. Rain water harvesting recharge pits/storage tanks shall be provided for ground water recharging as per the CGWB norms.

xii. A rain water harvesting plan needs to be designed where the recharge bores of minimum one recharge bore per 5,000 square meters of built up area and storage capacity of minimum one day of total fresh water requirement shall be provided. In areas where ground water recharge is not feasible, the rain water should be harvested and stored for reuse. The ground water shall not be withdrawn without approval from the Competent Authority.

xiii. All recharge should be limited to shallow aquifer.

xiv. No ground water shall be used during construction phase of the project.

xv. Any ground water dewatering should be properly managed and shall conform to the approvals and the guidelines of the State Water Investigation Directorate (SWID) in the matter. Formal approval shall be taken from the SWID for any ground water abstraction or dewatering.

xvi. Sewage shall be treated in the STP with tertiary treatment. The treated effluent from STP shall be recycled/re-used for flushing, AC make up water and gardening.

xvii. No sewage or untreated effluent water would be discharged through storm water drains.

xviii. Onsite sewage treatment of capacity of treating 100% waste water to be installed. The installation of the Sewage Treatment Plant (STP) shall be certified by an independent expert and a report in this regard shall be submitted to the Regional Office of MoEF&CC along with SEIAA and WBPCB before the project is commissioned for operation. Treated waste water shall be reused on site for landscape, flushing, cooling tower, and other end-uses. Excess treated water shall be discharged as per statutory norms notified by MoEF&CC. Natural treatment systems shall be promoted.

xix. Periodical monitoring of water quality of treated sewage shall be conducted. Necessary measures should be made to mitigate the odour problem from STP.

xx. Sludge from the onsite sewage treatment, including septic tanks, shall be collected, conveyed and disposed as per the Ministry of Urban Development, Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Sewerage and Sewage Treatment Systems, 2013.

IV. Noise monitoring and prevention

i. Ambient noise levels shall conform to residential area/commercial area/industrial area/silence zone both during day and night as per Noise Pollution (Control and Regulation) Rules, 2000. Incremental pollution loads on the ambient air and noise quality shall be closely monitored during construction phase. Adequate measures shall be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB / SPCB.

ii. Noise level survey shall be carried as per the prescribed guidelines and report in this regard shall be submitted to Regional Office of the MoEF&CC along with SEIAA and WBPCB as a part of six-monthly compliance report.

iii. Acoustic enclosures for DG sets, noise barriers for ground-run bays, ear plugs for operating personnel shall be implemented as mitigation measures for noise impact due to ground sources.

V. Energy Conservation measures

i. Compliance with the Energy Conservation Building Code (ECBC) of Bureau of Energy Efficiency shall be ensured. Buildings in the States which have notified their own ECBC, shall comply with the State ECBC.

ii. Outdoor and common area lighting shall be LED.

iii. Concept of passive solar design that minimize energy consumption in buildings by using design elements, such as building orientation, landscaping, efficient building envelope, appropriate fenestration, increased day lighting design and thermal mass etc. shall be incorporated in the building design. Wall, window, and roof u-values shall be as per ECBC specifications.

iv. Energy conservation measures like installation of CFLs/ LED for the lighting the area outside the building should be integral part of the project design and should be in place before project commissioning.

v. Solar, wind or other Renewable Energy shall be installed to meet electricity generation equivalent to 1% of the demand load or as per the state level/ local building bye-laws requirement, whichever is higher.

vi. Solar power shall be used for lighting in the apartment to reduce the power load on grid. Separate electric meter shall be installed for solar power. Solar water heating shall be provided to meet 20% of the hot water demand of the commercial and institutional building or as per the requirement of the local building bye-laws, whichever is higher. Residential buildings are also recommended to meet its hot water demand from solar water heaters, as far as possible.

VI. Waste Management

i. A certificate from the competent authority handling municipal solid wastes, indicating the existing civic capacities of handling and their adequacy to cater to the M.S.W. generated from project shall be obtained.

ii. Disposal of muck during construction phase shall not create any adverse effect on the neighboring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.

iii. Separate wet and dry bins must be provided in each unit and at the ground level for facilitating segregation of waste. Solid waste shall be segregated into wet garbage and inert materials.

iv. Organic waste compost/ Vermiculture pit/ Organic Waste Converter within the premises with a minimum capacity of 0.3 kg /person/day must be installed.

v. All non-biodegradable waste shall be handed over to authorized recyclers for which a written tie up must be done with the authorized recyclers.

vi. Any hazardous waste generated during construction phase, shall be disposed off as per applicable rules and norms with necessary approvals of the State Pollution Control Board.

vii. Use of environment friendly materials in bricks, blocks and other construction materials, shall be required for at least 20% of the construction material quantity. These include Fly Ash bricks, hollow bricks, AACs, Fly Ash Lime Gypsum blocks, Compressed earth blocks, and other environment friendly materials.

viii. Fly ash should be used as building material in the construction as per the provision of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003 and 25th January, 2016. Ready mixed concrete must be used in building construction.

ix. Any wastes from construction and demolition activities related thereto shall be managed so as to strictly conform to the Construction and Demolition Rules, 2016.

x. Used CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/ rules of the regulatory authority to avoid mercury contamination.

VII. Water Body Conservation:-

i. Existing water body (if any) should not be lined and their embankments should not be cemented. The water body is to be kept in natural conditions without disturbing the ecological habitat.

VIII. Green Cover

i. The unit should strictly abide by The West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006 and subsequent rules. The proponent should undertake plantation of trees over at least 20% of the total area.

ii. No tree can be felled/transplant unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned regulatory authority. Old trees should be retained based on girth and age regulations as may be prescribed by the Forest Department. Plantations to be ensured species (cut) to species (planted).

iii. The proponent should plant at least 710 nos. trees. The landscape planning should include plantation of native species. The species with heavy foliage, broad leaves and wide canopy cover are desirable. Water intensive and/or invasive species should not be used for landscaping. The project proponent should follow plantation plan approved by DFO, 24 Parganas (North) Division vide Memo no. 1829/17-T-9 dated 07.10.2021.

iv. Where the trees need to be cut with prior permission from the concerned local Authority, compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). Area for green belt development shall be provided as per the details provided in the project document.

v. Topsoil should be stripped to a depth of 20 cm from the areas proposed for buildings, roads, paved areas, and external services. It should be stockpiled appropriately in designated areas and reapplied during plantation of the proposed vegetation on site.

vi. Compensatory tree plantation of area approx. 2000 sqm. to be undertaken in WBHIDCO area as proposed.

IX. Transport

i. A comprehensive mobility plan, as per MoUD best practices guidelines (URDPFI), shall be prepared to include motorized, non-motorized, public, and private networks. Road should be designed with due consideration for environment, and safety of users. The road system can be designed with these basic criteria.
   a. Hierarchy of roads with proper segregation of vehicular and pedestrian traffic.
   b. Traffic calming measures.
   c. Proper design of entry and exit points.
   d. Parking norms as per local regulation.

ii. Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards be operated only during non-peak hours.

iii. A detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is maintained and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or proposed to be carried out by the project or other agencies in this 05 Kms radius of the site in different scenarios of space and time and the traffic management plan shall be duly validated and certified by the State Urban Development department and the P.W.D./competent authority for road augmentation and shall also have their consent to the implementation of components of the plan which involve the participation of these departments.

X. Human health issues

i. All workers working at the construction site and involved in loading, unloading, carriage of construction material and construction debris or working in any area with dust pollution shall be provided with dust mask.

ii. For indoor air quality the ventilation provisions as per National Building Code of India.

iii. Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

iv. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

v. Occupational health surveillance of the workers shall be done on a regular basis.

vi. A First Aid Room shall be provided in the project both during construction and operations of the project.

XI. Environment Management Plan (EMP)

i. The project proponent should submit the proposed EMP on a six monthly basis. The Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020 should be strictly followed.

ii. Need based activities for local people is part of the EMP. Details of such activities for expansion project (in addition to the activities for the existing project) is uploaded in the PARIVESH portal by the project proponent.

iii. The company shall have a well laid down environmental policy duly approved by the Board of Directors.

The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms /conditions. The company shall have defined system of reporting infringements /deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the Regional Office of MoEF&CC along with SEIAA and WBPCB as a part of six-monthly report.

iv. A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.

v. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose.

vi. Year wise progress of implementation of action plan shall be reported to the Regional Office of MoEF&CC along with SEIAA and WBPCB along with the Six Monthly Compliance Report.

XII. Additional condition

1. The project proponent shall develop tree plantation as approved by the DFO.

XIII. Miscellaneous

i. The environmental clearance accorded shall be valid for a period of 10 years for the proposed project.

ii. The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEFCC/SEIAA website where it is displayed.

iii. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

iv. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

v. The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the Ministry of Environment, Forest and Climate Change at environment clearance portal with a copy to SEIAA and WBPCB.

vi. The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

vii. The project proponent shall inform the Regional Office of the MoEF&CC along with SEIAA and WBPCB, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

viii. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

ix. The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during their presentation to the State Expert Appraisal Committee (SEAC).

x. No further expansion or modifications in the plant shall be carried out without prior approval of the SEIAA.

xi. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xii. The SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

xiii. The SEIAA reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

xiv. The Regional Office of the MoEF&CC/SEIAA/WBPCB shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer(s) of the Regional Office of MoEF&CC / SEIAA/WBPCB by furnishing the requisite data / information/monitoring reports.

xv. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other

	orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter. xvi. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

5. Proposal No. :- **SIA/WB/NCP/72819/2018** File No- **EN/T-II-1/012/2018** Proposed expansion of Residential Complex by at 33A, Canal South Road, Kolkata – 700 015, KMC Ward No. 57, PO – Beliaghata, PS – Tangra, West Bengal by **M/s. Springcity Buildcon LLP & Others.**	Type- **EC**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/NCP/72819/2018** dated **07 Mar 2018** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **8(a) Building and Construction projects** under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

Earlier the project had obtained EC vide no. 2705/EN/T-II-I/007/2015 dated 07.12.2016 in the name of M/s. Nishant Fiscal Services Pvt. Ltd. & Ors. for a built up area of 1,03,624.34 sq.m. from SEIAA, WB.

The project had received stipulated conditions for environmental clearance for expansion project vide Memo No. 1954/EN/T-II-1/012/2018 dated 10.08.2018 for a built-up area of 113283.96 sq.m. and land area of 38,709.81 sq.m (as per U.L.C.) and 29,481.034 sq.m (as per Survey).

The project was placed in the 67th meeting of SEIAA held on 12.07.2022 and it was observed that some documents required to be uploaded in the PARIVESH Portal. The project proponent uploaded documents on 03.08.2022.

PROJECT DETAILS

The project of M/s **SPRINGCITY BUILDCON LLP AND OTHERS** located in as follows :

State of the project

S. No.	State	District	Tehsil	Village
(1.)	West Bengal	Kolkata	Kolkata	

14. **Project configuration/product details**

S. No.	Project configuration/product details	Quantity	Unit	Other Unit	Mode of Transport/Transmission of Product	Other Mode of Transport
G + 34 Storied = 3 No. G + 19 Storied = 1 No. B + G + 7 Storied = 1 No. (MLCP) G + 2 Storied = 1 No. (Assembly)						

Raw Material Requirement details

S. No.	Item	Quantity per annum	Unit	Other Unit	Source	Mode of Transport/Transmission of Product	Other Mode of Transport	Distance of Source from Project Site(Kilometers)
NIL								

Details of Previous ToR								
S. No.	Item	Quantity	Unit	Other Unit	Source	Mode of Transport/Transmission of Product	Other Mode of Transport	Distance of Source from Project Site(Kilometers)
NIL								

1.2. Expansion Details :					
S. No.	Product/Activity (Capacity / Area)	Quantity		Unit	Other Unit
		From	To		
Vertical expansion of (G + 31) to (G + 34) & (G + 29) to (G + 32) storey					

DELIBERATION IN SEIAA

SEIAA considered the submission made by the project proponent vide their letter No. NIL dated 03.08.2022 uploaded on 03.08.2022 and accepted the same.

RECOMMENDATIONS OF SEIAA

The application for EC is approved based on the KMC Building Permit No. 2016070060 dated 05.04.2021.

Conclusion

Recommended

S.No	Conditions
(1)	**I. Statutory compliance:** i. The project proponent shall obtain all necessary clearance/ permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws. ii. The approval of the Competent Authority shall be obtained for structural safety of buildings due to earthquakes, adequacy of firefighting equipment etc. as per National Building Code including protection measures from lightening etc. iii. The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project. iv. The project proponent shall obtain clearance from the National Board for Wildlife, if applicable. v. The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control Board/ Committee. vi. The project proponent shall obtain the necessary permission for drawl of ground water /surface water required for the project from the competent authority. vii. A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project should be obtained. viii. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department shall be obtained, as

applicable, by project proponents from the respective competent authorities.

ix. The provisions of the Solid Waste (Management) Rules, 2016, e-Waste (Management) Rules, 2016, and the Plastics Waste (Management) Rules, 2016 shall be followed.

x. The project proponent shall follow the ECBC/ECBC-R prescribed by Bureau of Energy Efficiency, Ministry of Power strictly.

xi. The project proponent should strictly comply with the guidelines for High Rise Buildings, issued by MoEF, GoI vide No. 21-270/2008-IA.III dated 07.02.2012.

xii. The project proponent shall comply with the EMP as proposed in terms of Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020.

II. Air quality monitoring and preservation

i. Notification GSR 94(E) dated 25.01.2018 of MoEF&CC regarding Mandatory Implementation of Dust Mitigation Measures for Construction and Demolition Activities for projects requiring Environmental Clearance shall be complied with.

ii. A management plan shall be drawn up and implemented to contain the current exceedance in ambient air quality at the site.

iii. The project proponent shall install system to carryout Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM25) covering upwind and downwind directions during the construction period.

iv. Diesel power generating sets proposed as source of backup power should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use of low sulphur diesel is mandatory. The location of the DG sets may be decided in consultation with State Pollution Control Board.

v. Construction site shall be adequately barricaded before the construction begins. Dust, smoke & other air pollution prevention measures shall be provided for the building as well as the site. These measures shall include screens for the building under construction, continuous dust/ wind breaking walls all around the site (at least 3 meter height). Plastic/tarpaulin sheet covers shall be provided for vehicles bringing in sand, cement, murram and other construction materials prone to causing dust pollution at the site as well as taking out debris from the site.

vi. Sand, murram, loose soil, cement, stored on site shall be covered adequately so as to prevent dust pollution.

vii. Wet jet shall be provided for grinding and stone cutting.

viii. Unpaved surfaces and loose soil shall be adequately sprinkled with water to suppress dust.

ix. All construction and demolition debris shall be stored at the site (and not dumped on the roads or open spaces outside) before they are properly disposed. All demolition and construction waste shall be managed as per the provisions of the Construction and Demolition Waste Rules 2016.

x. The diesel generator sets to be used during construction phase shall be low sulphur diesel type and shall conform to Environmental (Protection) prescribed for air and noise emission standards.

xi. The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Low sulphur diesel shall be used. The location of the DG set and exhaust pipe height shall be as per the provisions of the Central Pollution Control Board (CPCB) norms.

xii. For indoor air quality the ventilation provisions as per National Building Code of India.

III. Water quality monitoring and preservation

i. The natural drainage system should be maintained for ensuring unrestricted flow of water. No construction shall be allowed to obstruct the natural drainage through the site, on wetland and water bodies. Check dams, bio-swales, landscape, and other sustainable urban drainage systems (SUDS) are allowed for maintaining the drainage pattern and to harvest rain water.

ii. Buildings shall be designed to follow the natural topography as much as possible. Minimum cutting and filling should be done.

iii. Total fresh water use shall not exceed the proposed requirement as provided in the project details.

iv. The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office of Ministry of Environment, Forest and Climate Change (MoEF&CC) along with State Level Environment Impact Assessment Authority (SEIAA) and West Bengal Pollution Control Board (WBPCB) along with six monthly Monitoring reports.

v. A certificate shall be obtained from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed, the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users.

vi. At least 20% of the open spaces as required by the local building bye-laws shall be pervious. Use of Grass pavers, paver blocks with at least 50% opening, landscape etc. would be considered as pervious surface.

vii. Installation of dual pipe plumbing for supply of recycled water and other for flushing, landscape irrigation, car washing, thermal cooling, conditioning etc. and for supplying fresh water for drinking, cooking and bathing etc. shall to be done.

viii. Use of water saving devices/ fixtures (viz. low flow flushing systems; use of low flow faucets tap aerators etc.) for water conservation shall be incorporated in the building plan.

ix. Separation of grey and black water should be done by the use of dual plumbing system. In case of single stack system separate recirculation lines for flushing by giving dual plumbing system be done.

x. Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.

xi. The local bye-law provisions on rain water harvesting should be followed. If local byelaw provision is not available, adequate provision for storage and recharge should be followed as per the Ministry of Urban Development Model Building Byelaws, 2016. Rain water harvesting recharge pits/storage tanks shall be provided for ground water recharging as per the CGWB norms.

xii. A rain water harvesting plan needs to be designed where the recharge bores of minimum one recharge bore per 5,000 square meters of built up area and storage capacity of minimum one day of total fresh water requirement shall be provided. In areas where ground water recharge is not feasible, the rain water should be harvested and stored for reuse. The ground water shall not be withdrawn without approval from the Competent Authority.

xiii. All recharge should be limited to shallow aquifer.

xiv. No ground water shall be used during construction phase of the project.

xv. Any ground water dewatering should be properly managed and shall conform to the approvals and the guidelines of the State Water Investigation Directorate (SWID) in the matter. Formal approval shall be taken from the SWID for any ground water abstraction or dewatering.

xvi. Sewage shall be treated in the STP with tertiary treatment. The treated effluent from STP shall be recycled/re-used for flushing, AC make up water and gardening.

xvii. No sewage or untreated effluent water would be discharged through storm water drains.

xviii. Onsite sewage treatment of capacity of treating 100% waste water to be installed. The installation of the Sewage Treatment Plant (STP) shall be certified by an independent expert and a report in this regard shall be submitted to the Regional Office of MoEF&CC along with SEIAA and WBPCB before the project is commissioned for operation. Treated waste water shall be reused on site for landscape, flushing, cooling tower, and other end-uses. Excess treated water shall be discharged as per statutory norms notified by

MoEF&CC. Natural treatment systems shall be promoted.

xix. Periodical monitoring of water quality of treated sewage shall be conducted. Necessary measures should be made to mitigate the odour problem from STP.

xx. Sludge from the onsite sewage treatment, including septic tanks, shall be collected, conveyed and disposed as per the Ministry of Urban Development, Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Sewerage and Sewage Treatment Systems, 2013.

IV. Noise monitoring and prevention

i. Ambient noise levels shall conform to residential area/commercial area/industrial area/silence zone both during day and night as per Noise Pollution (Control and Regulation) Rules, 2000. Incremental pollution loads on the ambient air and noise quality shall be closely monitored during construction phase. Adequate measures shall be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB / SPCB.

ii. Noise level survey shall be carried out as per the prescribed guidelines and report in this regard shall be submitted to Regional Office of the MoEF&CC along with SEIAA and WBPCB as a part of six-monthly compliance report.

iii. Acoustic enclosures for DG sets, noise barriers for ground-run bays, ear plugs for operating personnel shall be implemented as mitigation measures for noise impact due to ground sources.

V. Energy Conservation measures

i. Compliance with the Energy Conservation Building Code (ECBC) of Bureau of Energy Efficiency shall be ensured. Buildings in the States which have notified their own ECBC, shall comply with the State ECBC.

ii. Outdoor and common area lighting shall be LED.

iii. Concept of passive solar design that minimize energy consumption in buildings by using design elements, such as building orientation, landscaping, efficient building envelope, appropriate fenestration, increased day lighting design and thermal mass etc. shall be incorporated in the building design. Wall, window, and roof u-values shall be as per ECBC specifications.

iv. Energy conservation measures like installation of CFLs/ LED for the lighting the area outside the building should be integral part of the project design and should be in place before project commissioning.

v. Solar, wind or other Renewable Energy shall be installed to meet electricity generation equivalent to 1% of the demand load or as per the state level/ local building bye-laws requirement, whichever is higher.

vi. Solar power shall be used for lighting in the apartment to reduce the power load on grid. Separate electric meter shall be installed for solar power. Solar water heating shall be provided to meet 20% of the hot water demand of the commercial and institutional building or as per the requirement of the local building bye-laws, whichever is higher. Residential buildings are also recommended to meet its hot water demand from solar water heaters, as far as possible.

VI. Waste Management

i. A certificate from the competent authority handling municipal solid wastes, indicating the existing civic capacities of handling and their adequacy to cater to the M.S.W. generated from project shall be obtained.

ii. Disposal of muck during construction phase shall not create any adverse effect on the neighboring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.

iii. Separate wet and dry bins must be provided in each unit and at the ground level for facilitating segregation of waste. Solid waste shall be segregated into wet garbage and inert materials.

iv. Organic waste compost/ Vermiculture pit/ Organic Waste Converter within the premises with a minimum capacity of 0.3 kg /person/day must be installed.

v. All non-biodegradable waste shall be handed over to authorized recyclers for which a written tie up must be done with the authorized recyclers.

vi. Any hazardous waste generated during construction phase, shall be disposed off as per applicable rules and norms with necessary approvals of the State Pollution Control Board.

vii. Use of environment friendly materials in bricks, blocks and other construction materials, shall be required for at least 20% of the construction material quantity. These include Fly Ash bricks, hollow bricks, AACs, Fly Ash Lime Gypsum blocks, Compressed earth blocks, and other environment friendly materials.

viii. Fly ash should be used as building material in the construction as per the provision of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003 and 25th January, 2016. Ready mixed concrete must be used in building construction.

ix. Any wastes from construction and demolition activities related thereto shall be managed so as to strictly conform to the Construction and Demolition Waste Management Rules, 2016.

x. Used CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/ rules of the regulatory authority to avoid mercury contamination.

VII. Water Body Conservation:-

i. Existing water body (if any) should not be lined and their embankments should not be cemented. The water body is to be kept in natural conditions without disturbing the ecological habitat.

VIII. Green Cover

i. The unit should strictly abide by The West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006 and subsequent rules. The proponent should undertake plantation of trees over at least 20% of the total area.

ii. No tree can be felled/transplanted unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned regulatory authority. Old trees should be retained based on girth and age regulations as may be prescribed by the Forest Department. Plantations to be ensured species (cut) to species (planted).

iii. The proponent should plant at least 410 nos. trees. The landscape planning should include plantation of native species. The species with heavy foliage, broad leaves and wide canopy cover are desirable. Water intensive and/or invasive species should not be used for landscaping. The project proponent should follow plantation plan approved by DFO, Forest Utilisation Division vide Memo no. 967/13-1 dated 17.08.2021.

iv. Where the trees need to be cut with prior permission from the concerned Local Authority, compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). Area for green belt development shall be provided as per the details provided in the project document.

v. Topsoil should be stripped to a depth of 20 cm from the areas proposed for buildings, roads, paved areas, and external services. It should be stockpiled appropriately in designated areas and reapplied during plantation of the proposed vegetation on site.

IX. Transport

i. A comprehensive mobility plan, as per MoUD best practices guidelines (URDPFI), shall be prepared to include motorized, non-motorized, public, and private networks. Road should be designed with due consideration for environment, and safety of users. The road system can be designed with these basic criteria.

   e. Hierarchy of roads with proper segregation of vehicular and pedestrian traffic.
   f. Traffic calming measures.
   g. Proper design of entry and exit points.
   h. Parking norms as per local regulation.

ii. Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards and to be operated only during non-peak hours.

iii. A detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is maintained and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or proposed to be carried out by the project or other agencies in this 05 Kms radius of the site in different scenarios of space and time and the traffic management plan shall be duly validated and certified by the State Urban Development department and the P.W.D./competent authority for road augmentation and shall also have their consent to the implementation of components of the plan which involve the participation of these departments.

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i. All workers working at the construction site and involved in loading, unloading, carriage of construction material and construction debris or working in any area with dust pollution shall be provided with dust mask.

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iii. Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

iv. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

v. Occupational health surveillance of the workers shall be done on a regular basis.

vi. A First Aid Room shall be provided in the project both during construction and operations of the project.

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iii. The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms /conditions. The company shall have defined system of reporting infringements /deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the Regional Office of MoEF&CC along with SEIAA and WBPCB as a part of six-monthly report.

iv. A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of Senior Executive, who will directly report to the head of the organization.

v. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose.

vi. Year wise progress of implementation of action plan shall be reported to the Regional Office of MoEF&CC along with SEIAA and WBPCB along with the Six-Monthly Compliance Report.

XII. Miscellaneous

i. The environmental clearance accorded shall be valid for a period of 10 years for the proposed project.

ii. The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEFCC/SEIAA website where it is displayed.

iii. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

iv. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

v. The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the Ministry of Environment, Forest and Climate Change at environment clearance portal with a copy to SEIAA and WBPCB.

vi. The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

vii. The project proponent shall inform the Regional Office of the MoEF&CC along with SEIAA and WBPCB, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

viii. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

ix. The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during their presentation to the State Expert Appraisal Committee (SEAC).

x. No further expansion or modifications in the plant shall be carried out without prior approval of the SEIAA.

xi. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xii. The SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

xiii. The SEIAA reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

xiv. The Regional Office of the MoEF&CC/SEIAA/WBPCB shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer(s) of the Regional Office of MoEF&CC / SEIAA/WBPCB by furnishing the requisite data / information/monitoring reports.

xv. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.

xvi. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

6. Proposal No. :- **SIA/WB/NCP/75645/2018** File No- **EN/T-II-1/061/2018**
Proposed Residential Building at Premises No.46A/1, Biplabi Barin Ghosh Sarani (Formerly an apportioned portion of premises No. 46A, Biplabi Barin Ghosh Sarani), Kolkata-700067, Ward No-14, Borough No –III, P.S.- Maniktala Under KMC, West Bengal by **M/s. Swastik Projects Pvt. Ltd.** Type- **EC**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/NCP/75645/2018** dated **16 Jul 2018** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **8(a) Building and Construction projects** under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

Earlier the project had received Environmental Clearance vide No. Memo No. 2176/EN/T-II-1/081/2012 dated 25.09.2017 for a built up area of 27947.489 sq.m. on a land parcel of 9474.00 sq.m. Initially the proposal was for the construction of 01 Residential Block of B+G+12 storied having 188 nos. flats. Thereafter, the project proposal was revised / modified and the proponent applied in prescribed format for environmental clearance and uploaded the application in the PARIVESH portal on 16.07.2018. The project had received stipulated conditions for environmental clearance for the project vide Memo No. 29/EN/T-II-1/061/2018 dated 04.01.2019 for a built-up area of 31636.43 sq.m. and land area of 9474.00 sq.m.

A field inspection of the project site to ascertain the present status of the project was conducted by WBPCB on 11.06.2022. It was reported that no construction work was started.

SEAC recommended Environmental Clearance for the proposed project in cancellation of the earlier EC issued vide No. 2176/EN/T-II-1/081/2012 dated 25.09.2017.

The project was placed in the 70th meeting of SEIAA held on 22.08.2022 and it was observed that some documents required to be uploaded in the PARIVESH Portal. The project proponent uploaded documents on 30.08.2022.

PROJECT DETAILS

The project of M/s **SWASTIK PROJECTS PVT. LTD.** located in as follows :

State of the project				
S. No.	**State**	**District**	**Tehsil**	**Village**
(1.)	West Bengal	Kolkata	Kolkata	

14. **Project configuration/product details**						
S. No.	**Project configuration/product details**	**Quantity**	**Unit**	**Other Unit**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**
Building and Construction project of Total built-up area of 31636.43 sqm on a Land Area of 9474.00 sqm.						

Raw Material Requirement details								
S. No.	**Item**	**Quantity per annum**	**Unit**	**Other Unit**	**Source**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**	**Distance of Source from Project Site(Kilometers)**
NIL								

DELIBERATION IN SEIAA

SEIAA considered the submission made by the PP vide their letter no. NIL dated 30.08.2022 uploaded on 30.08.2022 and observed that there are 5 title deed uploaded by the PP wherein the total land area adds upto 34682 sqm. All the title deed are bearing the Premises No. as 46A, Biplabi Barin Ghosh Sarani. In all other documents eg. Sanction plan and ULC document, the Premises No. is mentioned as 46A/1, Biplabi Barin Ghosh Sarani and the land area as 9474 sqm. PP needs to submit a clarification (boundary declaration/ any other document) in this regard.

RECOMMENDATIONS OF SEIAA

Therefore, the application for EC is deferred (Additional Information).

Conclusion

Deferred

CONSIDERATION/RECONSIDERATION OF EC PROPOSAL (Extension/Amendment/Corrigendum)

1. Proposal No. :- **SIA/WB/IND/278173/2022** File No- **EN/ T- II-1/051/ 2014**

Extension of validity of Environmental Clearance for the proposed expansion of existing standalone cement grinding unit from 0.6 MTPA to 1.8 MTPA at Village – Madhukunda, P.O-Sunuri, P.S – Santuri, PIN – 723 121, Dist. – Purulia, West Bengal by **M/s. Damodhar Cement Works, ACC Limited**

Type Of Project : **Extension**

INTRODUCTION

The proponent made online application vide proposal no. SIA/WB/IND/278173/2022 dated 18.07.2022 seeking extension of validity of Environmental Clearance under the provisions of the EIA Notification, 2006 for the above mentioned proposed project.
The PP had obtained Environmental Clearance for the proposed expansion of existing standalone cement grinding unit from 0.6 MTPA to 1.8 MTPA vide no. 287/EN/T-II1/051/2014 dated 05.02.2016 issued by SEIAA, WB. The validity period of existing EC is upto 04.02.2023.

SEAC recommended that the validity extension of EC may be granted for a period of further 3 (three) years i.e. upto 04.02.2026 as per the EIA Notification, 2006 and its subsequent amendments.

PROJECT DETAILS

The project of M/s **DAMODHAR CEMENT WORKS, ACC LIMITED** located in

State of the project			
S. No.	**State**	**District**	**Tehsil**
(1.)	West Bengal	Purulia	Raghunathpur

The salient features of the project submitted by the project proponent is available at Report under online proposal no. **SIA/WB/IND/278173/2022**

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and accepted the same.

RECOMMENDATIONS OF SEIAA

Approved extension of validity of Environmental Clearance.

Conclusion

Recommended

MISCELLANEOUS

1. Discussion on draft DSRs of **Purba Medinipur, Paschim Medinipur and Purba Bardhaman**.

   DSRs of Purba Medinipur, Paschim Medinipur and Purba Bardhaman are approved.

2. ToR application for the proposed Modification of "Aerotropolis Township" at Andal, Vill. – Tamla, Dhokinkhanda, Mahira, Khandra, Amloka, Banguli, Durgapur Taluk, District: Paschim Bardhhaman, West Bengal by **M/s. Bengal Aerotroplis project Limited**. Proposal No. **SIA/WB/MIS/80933/2022**.

   Background

   Earlier M/s. Bengal Aerotroplis project Limited had obtained EC from SEIAA, WB vide No. EN/2041/T-II-1/025/2009 dated 11.08.2011 for Greenfield Aerotropolis Township (Phase I) at Andal, Vill. – Tamla, Dhokinkhanda, Mahira, Khandra, Amloka, Banguli, Durgapur Taluk, District: Burdwan, West Bengal.

   Now the PP has applied for modification of "Aerotropolis Township" at Andal, Vill. – Tamla, Dhokinkhanda, Mahira, Khandra, Amloka, Banguli, Durgapur Taluk, District: Paschim Bardhhaman, West Bengal.

   The matter was placed in the 69th meeting of SEIAA held on 10.08.2022 and it was decided to request the project proponent to mention the exact distance of the project area from the municipal limits of Durgapur and also submit Google earth image showing the Lat-Long of the proposed project area along with the municipal limits of Durgapur since the location of the proposed project area appears to be close to Durgapur Municipal Corporation area, which is declared as a 'Severely Polluted Area'.

   The project proponent submitted reply vide their letter Ref No. BAPL/DGP/INFRA(PI)/L/MS-SEIAA/22-23/269 dated 29.08.2022 uploaded on 30.08.2022.

   SEIAA considered the reply submitted by the PP and in view of the O.M. No. 22-23/2018-IA.III[E115231] dated 05.07.2022 of MoEF&CC, the above project which is categorised as a 'B1' project is transferred to MoEF&CC for further necessary action.