INITIAL ENVIRONMENTAL EXAMINATION FOR RDSS PROGRAMME IN BARDHAMAN WEST DISTRICT OF WEST BENGAL

(With Financial Assistance of ADB)

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WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED
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EXECUTIVE SUMMARY

1.0 INTRODUCTION

The West Bengal State Electricity Distribution Company Limited (WBSEDCL) is responsible for power distribution across most of West Bengal, serving about 18.1 million customers. The Revamped Sector Distribution Scheme (RDSS) is designed to enhance India's power distribution sector by improving the quality, reliability, and affordability of power while aiming for financial sustainability and operational efficiency. In West Bengal, the RDSS specifically aims to reduce Aggregate Technical & Commercial (AT&C) losses from 21.35% in FY21 to 12-15% by FY24-25 and eliminate the Aggregate Cost of Supply (ACS) - Aggregate Revenue Requirement (ARR) gap by FY24-25.

For the implementation of the RDSS Programme at ADB-funded Bardhaman West district, an Initial Environmental Examination (IEE), is required to be prepared for the identification of E&S issues and formulate EMP as per the Asian Development Bank's (ADB) Safeguard Policy Statement 2009 (SPS).

- The IEE assesses the potential environmental and social impacts of the proposed projects and suggests mitigation measures to minimize adverse effects.
- The objective of the IEE is to support sustainable development by balancing economic, social, and environmental considerations while ensuring compliance with relevant regulations and addressing community concerns.

The IEE report for Bardhaman West district includes chapters detailing the RDSS Programme, methodology, baseline environmental and social status, and specific environmental examinations for different programme components like the conversion of LTOH to AB cabling and bifurcation of 11kV HT feeder. The report also covers public consultation and information disclosure and provides an Environmental Management Plan along with conclusions and recommendations.

2.0 RDSS PROGRAMME DETAIL

The Revamped Distribution Sector Scheme (RDSS) is a comprehensive initiative aimed at improving the reliability and quality of power distribution in seven districts of West Bengal, including Bardhaman West. The program, supported by the Government of India and the Asian Development Bank (ADB), focuses on several key components in Bardhaman West: converting Low-Tension Overhead (LTOH) lines to Aerial Bunched (AB) cables, bifurcating 11KV HT feeders, augmenting the conductor size of 11KV lines using ACSR DOG conductors and installation of capacitor bank.

The conversion of LTOH lines to AB cables is intended to reduce line losses and enhance safety from electrical hazards. Feeder bifurcation is aimed at optimizing load distribution and

improving service reliability. The augmentation of conductor size is expected to reduce transmission losses and improve voltage regulation, contributing to a more robust and resilient power distribution system. Capacitor banks help to correct power factor, which reduces the reactive power demand on the system, thereby decreasing the load on generators and transformers.

The implementation of these components involves detailed processes, including GPS surveys, excavation, pole installation, stringing of cables, installation of switchgear, and the construction of capacitor banks. Safety measures, such as proper earthing, insulation, and protective equipment, are integral to the construction and operation phases. The program's success relies on careful planning, execution, and monitoring to ensure that the upgraded infrastructure meets the region's evolving energy demands while maintaining environmental and social safeguards.

3.0 METHODOLOGY

The Initial Environmental Examination (IEE) for Bardhaman West district follows guidelines set by the ADB, including a detailed methodology that involves assessing the potential impacts of these activities. This process includes field visits, data collection, and tools like Google Earth Pro and ArcGIS to overlay the existing distribution network with environmental and geographical features. Sensitive areas such as forests, water bodies, and cultural monuments are identified, and buffer zones are established to minimize potential impacts.

Public consultation is integral to the program, ensuring that stakeholders are involved at every stage and that information is disclosed transparently. The analysis of collected data helps in identifying environmental and social issues, leading to the development of mitigation measures tailored to specific activities within the district. These measures aim to preserve local ecosystems, protect water bodies, and address any potential disruptions to communities and livelihoods. The program's success relies on careful planning, execution, and monitoring, with an Environmental Management Plan (EMP) in place to guide the process.

4.0 BASELINE ENVIRONMENTAL & SOCIAL STATUS

The existing environmental & social baseline of programme area has been assessed to screen the potential environmental & social risks and impacts of various components of the proposed programme. A compendium of biophysical and social sensitivity in programme area has been compiled based on secondary data and spot verification during the field visit to provide an understanding of the scale and magnitude of sensitivity/vulnerability of the physical, ecological and social environment.

The parameters selected for environmental & social baseline status are district-specific geology, geomorphology, hydrology, soil, land use & land cover, forest cover, flora and fauna, climate (i.e. temperature, rainfall, humidity, air quality, ambient noise and demography, etc.) examination to check and assess the likely impact in subsequent chapters. By compiling data on these parameters, the study provides a foundation for implementing targeted mitigation measures to protect the region's ecological integrity and social well-being.

5.0 INITIAL ENVIRONMENTAL EXAMINATION FOR CONVERSION OF LTOH TO AB CABLING

The Environmental and Social (E&S) screening for the conversion of Low Tension Overhead (LTOH) to Aerial Bundled (AB) cabling involves evaluating the potential environmental and social impacts associated with the programme. LTOH conversion to AB cabling reduces transmission losses, improves safety, and minimizes maintenance issues. Proximity to protected areas, forests, water bodies, or ecologically sensitive zones and cultural resources (i.e. 100-300m buffer area) has been selected. Respective TKCs of WBSEDCL will run the works for sub-activities under component-A (i.e. Conversion of LTOH to AB Cable) as guided in the screening process and take appropriate mitigation measures to reduce the RoW or COI effect wherever possible for the RDSS programme. The screening process also considers legal and regulatory compliance, identifying any environmental clearances or permits needed and ensuring adherence to social safeguard policies.

For Bardhaman West district, the Initial Environmental Examination for Conversion of LTOH to AB Cabling has been taken to examine the existing distribution network falling within the buffer areas of environmentally sensitive receptors (Protected Forest, Reserve Forest, IBA, KBA, Wetland, etc.) and cultural resources (UNESCO World Heritage Sites, ASI Protected Monuments, State Protected Monuments, etc.) where it ensures that risks are recognized early, allowing for proactive management through mitigation measures.

6.0 INITIAL ENVIRONMENTAL EXAMINATION FOR BIFURCATION OF 11KV HT FEEDERS

The Initial Environmental Examination (IEE) undertaken for initiation of bifurcation of 11 kV feeders along the proposed route alignment indicates that no environmental sensitive receptors viz. reserve forest, protected area, Key Biodiversity Area, or Important Bird Area fall within the influence zone of the selected 11 kV feeder. However, few waterbodies fall close to the proposed alignment of selected feeders. The screening further reveals that there is no ASI-protected monument as well as state-protected monument falls within the influence zone of the selected 11 kV feeder's proposed route alignment. However, at a certain stretch, it crosses state & national highways and also railway line falls in the proposed alignment of selected feeders. As the proposed work would be primarily undertaken along the existing Road Network and no significant excavation and other activities are involved except the erection of poles avoiding environmental and social issues along the proposed route alignment for bifurcation of 11 kV feeders, therefore, no significant impact is likely to be caused. It may be pertinent to mention here that the required permission is to be undertaken for crossing SH-9, NH-19, NH-419, NH-14 and also for Railway Crossing under Amritnagar feeder. However, required public consultation and implementation of EMP need to be ensured at the time of undertaking construction activities for the bifurcation of 11 kV feeders.

Accordingly, it is suggested that the activities for bifurcation of selected 11 kV feeders (i.e. 7 feeders namely Amritnagar, Searsole, Damagoria, Nachan-I, Gobindapur, Haripur and Sukumarnagar) under the Bardhaman West district can be initiated.

7.0 INITIAL ENVIRONMENTAL EXAMINATION FOR AUGMENTATION OF CONDUCTOR SIZE OF 11KV LINE

For Bardhaman West district, the Initial Environmental Examination for Augmentation of Conductor size of 11kv line has been taken to examine the existing distribution network falling within the buffer areas of environmentally sensitive receptors (Protected Forest, Reserve Forest, IBA, KBA, Wetland, Waterbodies/River crossing, etc.) and cultural resources (UNESCO World Heritage Sites, ASI Protected Monuments, State Protected Monuments, Road/Railway crossing, etc.) where it ensures that risks are recognized early, allowing for proactive management through mitigation measures.

For augmentation of conductor size of 11KV Line in selected feeders (i.e. Kendua bazar, Dhemomain, Barakar-1, Barakar-II, Belrui, Kulti, Sitarampur, Mahalaxmi, 457, Girjapara, 2 no, Chanda, Kuardihi, Ballavpur, Ronai, Searsole, Nigha) have been undertaken.

8.0 PUBLIC CONSULTATION & INFORMATION DISCLOSURE

Through the process of public consultation and disclosures, WBSEDCL would envisage the participation of stakeholders at each stage of programme planning and implementation. WBSEDCL would be responsible not only for ensuring the participation of the community in the consultation process but to making it effective to ensure the integration of the feedback received from stakeholders into the programme plans where it deems fit.

The objectives of public consultation include discussing construction issues such as the conversion of Low-Tension Overhead (LTOH) lines to Aerial Bundled (AB) cable, addressing potential installation challenges, and highlighting benefits like improved safety and reliability. Additionally, it involves evaluating the bifurcation of 11 KV feeders, along with the augmentation of 33/11 KV substations and the installation of capacitor banks in substations.

In Baraboni block at Taldanga, 54.5% of the attendees were male and 45.5% were female. At Sonai Badyakar Para in Kanksha block, the consultation saw a higher female turnout with 55.1% female and 44.9% male participants. In Salanpur block at Rupnarayanpur, 72.4% of attendees were male and 27.6% were female. The consultation at Dakshin Khanda Moiri in Andal block had 91.7% male and 8.3% female participation. In Durgapur-Fardipur block at Nochan Ukra, 81.8% of the attendees were male and 18.2% were female. At Gobindopur in Padaveswar block, all participants were male, making up 100% of the attendance. Lastly, in Jamuria block at Shri Danga, 73.3% of attendees were male and 26.7% were female. These percentages reflect varied gender participation across different blocks of Bardhaman West district, with some blocks showing a more balanced gender representation, particularly in Kanksha, where female participation was notably high.

9.0 ENVIRONMENTAL MANAGEMENT PLAN

The EMP is prepared as per the SPS 2009 of ADB. The EMP covers information on the management and/or mitigation measures that will be taken into consideration to address impacts during pre-construction, construction and post-construction phases of the programme. The EMP specifies the mitigation and management measures which the PIU will undertake to demonstrate how the programme will mobilize organizational capacity and resources to implement these measures.

The identified impacts are insignificant and are related to clearing operations of RoW, traffic diversions, setting and operation of construction camps, transportation of materials, air & noise pollution due to construction activities and operation of construction equipment, tree trimming/cutting, damage of utilities and physical community structure. Appropriate mitigation measures are identified for all major construction and operation activities under the RDSS Programme in Bardhaman West district with the financial assistance of ADB.

The EMP applies to all sub-activities under the Programme, including mitigation measures and monitoring requirements presented in the matrix form. This EMP Matrix will form part of the contract document with General Environment, Health & Safety (EHS) Conditions of Contract (CoC) forall contractors.

10.0 CONCLUSION & RECOMMENDATION

The findings of the environmental and social screening of selected feeders indicate that impacts are mostly similar and sub-activities are unlikely to cause any significant environmental or social impacts. Most of the impacts are likely to occur during the construction stage, are temporary, and can be mitigated with minor to negligible residual impacts. The implementation of prescribed mitigation measures will minimize/avoid the adverse impacts. Moreover, the impacts shall be monitored continually by implementing and updating the Environmental Management Plan and Environmental Monitoring Plan.

1.0 INTRODUCTION

1.1 BACKGROUND

West Bengal State Electricity Distribution Company Limited (WBSEDCL) is a power distribution licensee for almost the entire State of West Bengal, except for certain areas, for which private distribution licensees cater. WBSEDCL accounts for about 80% of the power supply in the State and caters to almost 18.1 million customers.

The Revamped Sector Distribution Scheme (RDSS) is a comprehensive initiative to transform India's power distribution sector by enhancing power supply quality, reliability, and affordability while achieving financial sustainability and operational efficiency. The primary objectives include improving power supply quality, reducing Aggregate Technical & Commercial (AT&C) losses to 12-15% by FY 2024-25, and eliminating the Aggregate Cost of Supply (ACS) - Aggregate Revenue Requirement (ARR) gap by FY 2024-25. Specifically for West Bengal, the RDSS aims to reduce AT&C losses from 21.35% in FY21 to 12-15% by FY24-25 and eliminate the ACS-ARR gap from Re 1.00 in FY21 to zero by FY24-25.

For the implementation of the RDSS works, including ADB RBL-funded works covered under the RDSS Programme at seven ADB-funded districts [namely, (i) Hooghly (ii) Bardhaman East (iii) Bardhaman West (iv) Birbhum (v) Nadia (vi) Murshidabad and (vii) Malda]. This Initial Environmental Examination (IEE) for Bardhaman West district is prepared to guide screening of potential impacts on environmental and social sensitive receptors that will ensure alignment and compliance of activities under the programme with applicable national and state legislations/regulations on the environment, involuntary resettlement and indigenous peoples, and additionally for works as per the Asian Development Bank's (ADB) Safeguard Policy Statement 2009 (SPS) principles.

1.2 OBJECTIVE

The objective of conducting an Initial Environmental Examination (IEE) is to assess the potential environmental impacts of a proposed project, both positive and negative, and determine their significance. This process involves identifying key environmental risks, proposing mitigation measures to minimize adverse effects, and ensuring compliance with relevant environmental regulations. The IEE facilitates informed decision-making by programme stakeholders and supports sustainable development by balancing economic, social, and environmental considerations while addressing the concerns of affected communities.

The purpose of this IEE is, therefore, to establish environmental and social screening, assessments and processes for mitigative measures on potential impacts of each activity/sub-activities for the works to be carried out under the RDSS Programme at ADB-funded district Bardhaman West of West Bengal that includes:

- Anticipate and avoid risks and impacts;
- Where total avoidance is not possible, minimize or reduce them to acceptable levels;
- Once risks and impacts have been minimized or reduced, mitigate;
- Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

1.3 BENEFITS OF INITIAL ENVIRONMENTAL EXAMINATION

Some of the benefits and positive outcomes that may result from this IEE include:

- **Environmental Risk Identification and Management**: The IEE systematically identifies potential environmental and social risks associated with the proposed programme. By recognizing these risks early in the planning stages, appropriate mitigation measures can be implemented, reducing the likelihood of adverse environmental and social impacts.
- **Compliance with Regulations**: The IEE ensures that all proposed activities within Bardhaman West district comply with relevant environmental & social regulations and standards.
- **Informed Decision-Making**: The IEE facilitates informed decision-making by providing stakeholders with a clear understanding of the potential environmental and social impacts of the programme. This transparency allows for better planning and allocation of resources, ensuring that development activities contribute positively to the district's socio-economic growth without compromising environmental sustainability.

1.4 LOCATION OF PROGRAMME AREA

Bardhaman West district, located in the western part of West Bengal, India, is characterized by its diverse geography and industrial significance. Positioned between 23.24° N and 87.84° E, the district is administratively divided into 8 blocks, each contributing to its socio-economic landscape (Figure 1.1).

The climate is tropical, featuring hot summers, a monsoon season from June to September, and cooler winter months. The district experiences an average annual rainfall of approximately 1400 mm, vital for sustaining agriculture. Bardhaman West's temperature variations and fertile soil make it conducive to diverse crops. The land use/land cover includes a mix of agricultural land, industrial zones, and urban settlements, reflecting its varied topography. Notable features include the industrial town of Durgapur, known for its steel plant and educational institutions, contributing significantly to the region's economic development. The Damodar River flows through the district, impacting its landscape and serving as a vital water resource. Bardhaman West district, with its blend of industry, agriculture, and cultural elements, stands as a key contributor to the dynamic fabric of West Bengal.

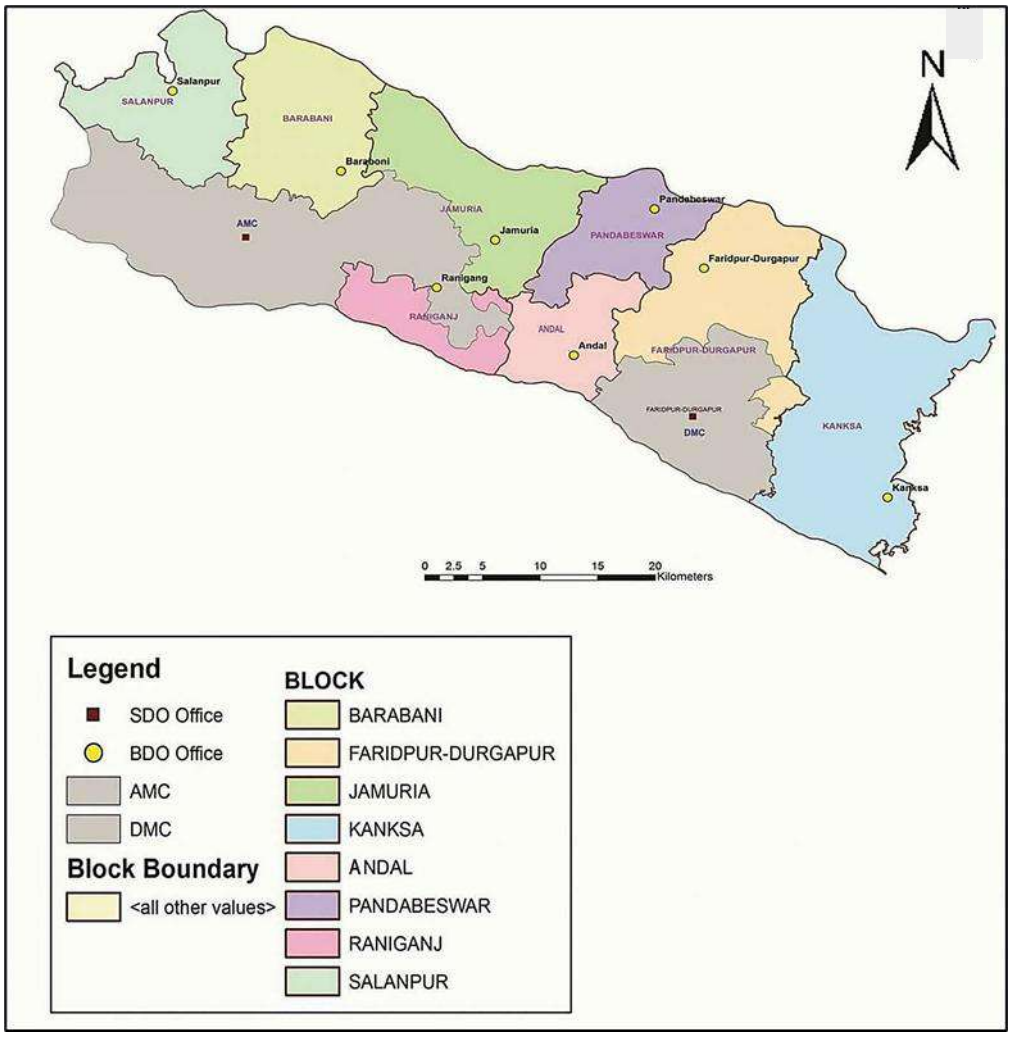


FIGURE 1.1: BLOCK MAP OF BARDHAMAN WEST DISTRICT

1.5 STRUCTURE OF THE IEE

The present IEE report includes the following chapters including this introductory chapter:

2.0 RDSS PROGRAMME DETAIL

To provide reliable and quality power at affordable prices and to meet the above objectives, the RDSS, with funding support from the Government of India and the Asian Development Bank (ADB) is being carried out by West Bengal State Electricity Distribution Company Limited (WBSEDCL), which includes the following components for the 7 ADB funded districts. The components are:

A. Conversion of Low-Tension Overhead (LTOH) network by Aerial Bunched (AB) Cable
B. Bifurcation of 11KV HT Feeder
C. Segregation of 11 KV HT Agricultural Feeder
D. Augmentation of Conductor size of 11KV Line (With ACSR DOG Conductor)
E. Installation of 11KV Capacitor Bank in 33/11KV SS
F. IT/OT Works

It may be pertinent to mention here that only components A, B and D are proposed to be undertaken in the Bardhaman West district with the financial assistance of ADB.

2.1 PROGRAMME DEVELOPMENT OBJECTIVES

The development objective of the proposed Programme is to improve the reliability and efficiency of electricity supply in works covered under in RDSS Programme at seven ADB-funded districts of West Bengal by strengthening the distribution systems to achieve the following goals:

(i) Reduction of Aggregate Technical and Commercial (AT & C) Losses.

(ii) Improve quality and reliability of power supply.

2.2 PROGRAMME OUTPUT

The prime output of works covered under the RDSS Programme at Bardhaman West district with the financial assistance of ADB is envisaged as follows:

Output 1: Power distribution network strengthened. The program will strengthen the rural power distribution network by converting Low-Tension Over Head (LTOH) lines to aerial bundled cables and segregation agriculture non-agriculture feeders and installing capacitor banks to reduce AT&C loss and improve the reliability of power supply for millions of customers in the Bardhaman West district.

Output 2: Institutional capacity enhanced to sustain the results. The program will support the institutional enhancement of WBSEDCL for overall RDSS program target achievement,

sustainable repairment and maintenance, increased renewable energy penetration, tariff rationalization, and enhanced financial management to sustain the results after RDSS completion in 2026.

Output 3: Occupational and community health and safety capacity enhanced. The program will support enhancements of occupational and community health and safety to minimize fatal accidents during the construction, operation, and maintenance of the power distribution system.

Output 4: Institutional capacities on Gender Equality and Social Inclusion (GESI) strengthened. The project will help strengthen WBSEDCL's institutional capacities on GESI.

2.3 COMPONENT-WISE DETAIL

The programme comprises the following components/sub-activities:

Component A: Conversion of LTOH Lines into Aerial Bunched Cable

To reduce LTOH line loss of the distribution network and enhance safety, it is contemplated to convert the LTOH lines into Aerial Bunched Cable in West Bengal. The conversion of the existing LTOH line by Aerial Bunched Cable will reduce the line loss in the existing LTOH network and enhance safety from electrocution and other electrical hazards.

Certainly, the work associated with the conversion of Low-Tension Overhead (LTOH) to AB (Aerial Bunched) is:

- This involves removing the existing LTOH line with new AB cables. It may require the erection of an additional number of intermediate poles.

Component B: Feeder Bifurcation (11KV HT)

In alignment with the initiative to enhance the efficiency and reliability of the electricity distribution network, Component B focuses on feeder bifurcation for existing 11 KV HT feeders which aims to address load distribution imbalances and capacity constraints by dividing the existing feeders into smaller segments. By analyzing feeder load profiles and capacity limitations, this project aims to optimize the distribution network's performance. Feeder bifurcation will facilitate better voltage regulation, mitigate power quality issues, and improve overall service reliability. Through this intervention, areas with varying load characteristics and demand patterns can be efficiently managed, ensuring equitable distribution of electricity resources. Furthermore, feeder bifurcation contributes to reducing technical losses by creating separate 11 KV feeders, thereby improving the network's efficiency and performance. This proactive approach not only enhances the operational efficiency of the distribution system but also contributes to meeting the evolving electricity needs of the communities served.

The erection work associated with feeder bifurcation (11 kV HT) includes:

- Depending on the capacity and load requirements of the bifurcated feeders, expansions of the existing substations control room may be necessary.

- UG Cabling for National Highway/Road & Railway crossing.

- The work involves the installation of new switchgear in the control rooms of the substations. The control room within the boundary of the sub-stations may be extended in some places for installation of switchgear. One switchgear is required for one 11 KV circuit segregation.

- Existing structures such as poles may be erected to accommodate the new feeder configurations, cables, and equipment.

Component D: Augmentation of Conductor size of 11KV Line (With ACSR DOG Conductor)

The augmentation of the conductor size of the 11KV lines, specifically utilizing ACSR DOG conductors, in alignment with the conversion of LTOH lines into Aerial Bunched Cable in selected districts of West Bengal. This augmentation initiative is designed to further optimize the efficiency and performance of the distribution network. By upgrading the conductor size to ACSR DOG, the project aims to reduce transmission losses, enhance voltage regulation, and improve the overall reliability of the electricity supply. This enhancement ensures a more robust and resilient distribution infrastructure, capable of meeting the evolving energy demands of the region. The deployment of ACSR DOG conductors aligns with the project's objectives of enhancing safety and minimizing technical losses, thereby facilitating a more sustainable and efficient electricity distribution system for the benefit of consumers and stakeholders alike.

Here are some points on the work associated with the augmentation of conductor size of 11 kV lines with ACSR DOG conductor:

- Augmenting the conductor size involves replacing existing conductors with ACSR DOG conductors on the 11 kV lines. This includes removing old conductors, installing new ones, and ensuring proper connections and insulation.

- The work involves the erection of Poles and structures on the poles for replacement of existing conductors.

- For road crossing and railway crossings, an extension of 11 KV Underground Cables is required through a machine-controlled micro-tunneling process.

- Works should include safety measures such as signage, fencing, and barriers to protect workers, the public, and the infrastructure during construction and operation.

- Once the civil works are completed, testing and commissioning of the upgraded conductor lines are essential to ensure functionality, reliability, and safety.

The detailed components (A to C) of the Bardhaman West district are presented in Table 2.1.

TABLE 2.1: DETAIL OF COMPONENT A TO C UNDER RDSS PROGRAMME – BARDHAMAN WEST DISTRICT

Package Name: Bardhaman West **Package No.: 26** **Division Name: DURGAPUR, ASANSOL** **TKC Name: Universal MEP Projects & Engineering Services Limited**											
Component -A (Conversion of LTOH to LT AB Cable)		Component -B (11 KV Feeder Bifurcation)				Component -C (11 KV Feeder Segregation)					
LT ABC Length 3CX70 Sq mm (CKM)	New Pole 8 MTR (Nos.)	HT OH Line (ACSR 50 Sq mm Conductor) (CKM)	HT OH Line (HT AB Cable 3CX95 Sq mm) (CKM)	11 KV UG CABLE 3CX185 Sq mm (CKM)	11 KV UG 3CX 185 Railway / Highway Crossing. (CKM)	HT OH Line (ACSR 50 Sq mm Conductor) (CKM)	HT OH Line (HT AB Cable 3CX95 Sq mm) (CKM)	11 KV UG CABLE 3CX185 Sq mm (CKM)	11 KV UG 3CX 185 Railway / Highway Crossing. (CKM)	Distribution Transformer Substations (Nos.)	New LT Line 3CX50 Sqmm(LT ABC) (CKM)
1200	**8400**	**25.28**	**0.00**	**5.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

The detail of the seven selected feeders for bifurcation in Bardhaman West district is presented in Table 2.2.

TABLE 2.2: DETAIL OF THE SELECTED 11 KV HT FEEDER FOR BIFURCATION – BARDHAMAN WEST DISTRICT

Name of 11 KV Feeder	Name of Emanating 33/11 KV S/Stn	Block of Emanating 33/11 KV S/Stn	Length as per Latest Survey (CKM)
Amritnagar	Raniganj	Asansole	2.88
Searsole	Mangalpur	Asansole	1.575
Damagoria	Dendua	Asansole	3.768
Nachan-I	Bhiringi	Durgapur	3.12
Gobindapur	Pandabeswar	Durgapur	5.083
Haripur	Nilkantha	Durgapur	1.2
Sukumarnagar	Coke Oven	Durgapur	1.342

The detail of the Augmentation of 11kv OH Line by DOG conductors (Component D) in the Bardhaman West district is presented in Table 2.3.

TABLE 2.3: BRIEF DETAIL OF THE AUGMENTATION OF DOG CONDUCTORS – BARDHAMAN WEST DISTRICT

Sl. No.	Region Name	Division	Name of Source 33/11kv Sub Station	Name of Existing 11kv Feeder	Present Size in Sq.mm	Length of the Feeder to be augmented (in Ckm)
1	Paschim Burdwan	Asansol	Neamatpur	Kendua Bazar	ACSR 30/50 SQMM	7
2			Neamatpur	Dhemomain	ACSR 30/50 SQMM	4
3			Neamatpur	Barakar-1	ACSR 30/50 SQMM	10
4			Neamatpur	Barakar-II	ACSR 30/50 SQMM	6
5			Neamatpur	Belrui	ACSR 30/50 SQMM	8
6			Neamatpur	Kulti	ACSR 30/50 SQMM	6
7			Neamatpur	Sitarampur	ACSR 30/50 SQMM	6
8			Raniganj	Mahalaxmi	ACSR 30/50 SQMM	12
9			Raniganj	457	ACSR 30/50 SQMM	13
10			Raniganj	Girjapara	ACSR 30/50 SQMM	13

11			Raniganj	2 No	ACSR 30/50 SQMM	13
12			Bogra	Chanda	ACSR 30/50 SQMM	3
13			Bogra	Kuardihi	ACSR 30/50 SQMM	2
14			Mangalpur	Ballavpur	ACSR 30/50 SQMM	14
15			Mangalpur	Ronai	ACSR 30/50 SQMM	7
16			Mangalpur	Searsole	ACSR 30/50 SQMM	16
17			Bakidanga	Nigha	ACSR 30/50 SQMM	2
					Total	142

2.4 PROCESS DETAIL

2.4.1 Conversion of LTOH Bare Conductor to LTAB Cable

The following steps would be followed during the conversion of LTOH bare conductor to LTAB Cable:

i. GPS Survey of route of existing LTOH line including identification of environmental and social impact likely to be caused during conversion of LTOH to LT ABC.

ii. Selection of location avoiding any environmental and social issues and excavation of soil for making pole pit & installation of intermediate 8M PCC Pole within existing ROW to limit the sag of the cable to maintain safe vertical clearance following the IE Rules.

iii. The excavation work and implantation of PCC poles shall be carried out manually or by engaging mechanical drilling machines.

iv. Proper earthling of the new poles.

v. Removal of the existing structure carrying the bare conductor.

vi. Installation of pre-fabricated fittings like pole clamp, suspension clamp, dead end clamp, etc. and pre-fabricated stay sets with GI wire to hold the pole tension at bending points and end poles, for stringing of LT AB cable.

vii. Stringing of LT AB Cable using cable pullers (guiding ropes and pulleys).

viii. The existing service connections will be re-connected through the setting up of pre casted Junction Box at the pole top.

ix. The connection between AB cable and the Junction Box will be through the cable with one end connected with crimping tools to connect AB Cable and the other end shall be joined with Bus Bar of the Junction Box Bus Bar through lugs. Junction Boxes have lids to close and proper earthling arrangement of Junction Boxes shall be maintained through messenger wire of the AB cable which are grounded through earth spikes in distinct intervals.

x. After completion of work further route survey of the work will be carried out with GPS for actual measurement by the department technical officer. The checking of quality of work will be done by the PMA and departmental staff during the work.

2.4.2 Bifurcation of Existing 11kv HT Feeders

The following steps would be followed during the segregation/bifurcation of 11 kV HT Feeders:

i. GPS Survey of route of the proposed HTOH line including identification of environmental and social impact likely to be caused during segregation/bifurcation of 11 kV HT Feeders.

ii. Selection of location avoiding any environmental and social issues & Excavation of soil for making pole pit & installation 9M PCC Pole for single pole, double pole, four pole structures, etc.

iii. Proper earthling of the new poles.

iv. Installation of pre-fabricated fittings like pole clamp, “V” Bracket, etc.

v. Installation of 11KV insulators or HT AB Cable accessories for support and safety of the HTOH line.

vi. Stringing of HT AB Cable using cable pullers (guiding ropes and pulleys).

vii. Stringing of HT OH bare conductor using ACSR 50sqmm. /RABBIT conductor.

viii. Laying of HTUG cable using Micro-tunneling method through PE80-PN6 HDPE Pipes during Railway Track or Highway Crossing.

ix. Installation of 11KV Isolator structure using pre-fabricated iron fittings and isolator.

x. Installation of 12KV Vacuum Circuit Breaker (VCB) inside the control room of the existing 33/11KV substation.

xi. Extension of the control room with other allied activities before installation of VCB.

xii. Distribution Transformers are to be commissioned where necessary according to the IE rule guidelines.

xiii. Structure with Double 8-meter PCC pole, Four 8 meter PCC Poles shall be mounted excavating the earth pit manually or mechanically according to the shape and size of the transformer which depends on the ratings of the transformer.

2.4.3 Augmentation of Conductor size of 11kv OH Line

Construction steps

i. Pit marking and digging: Identify and mark the locations for pole placement, then excavate pits accordingly.

ii. Erection of supports and concreting: Install the support structures (poles) and ensure they are securely anchored by concreting them into place.

iii. Providing of guys to support: Install support guys at key locations to reinforce the stability of poles and mitigate strain from external forces.

iv. Mounting cross-arms, pin and insulators, and pin binding: Attach cross-arms, insulators, and pins to the poles, ensuring proper alignment and secure fastening.

v. Paying and stringing of the conductor: Uncoil and string the conductor along the support structures, ensuring it is properly tensioned and aligned.

vi. Sagging and tensioning of conductors: Adjust the sag and tension of the conductors according to approved standards to ensure proper alignment and functionality.

vii. Crossings: Manage crossings with other infrastructure such as roads, railways, and rivers, ensuring proper clearance and safety measures are in place.

viii. Guarding: Implement measures to protect the power line from external hazards, such as wildlife interference or unauthorized access.

ix. Earthing: Ground metallic supports and other components to prevent electrical hazards and ensure operational safety.

x. Testing and commissioning: Conduct thorough testing to verify the integrity and functionality of the constructed power line before commissioning it for operational use.

Erection of DP structure for Angle Location

i. Identification of Angle Locations: Angle locations refer to points along the power line where there are deviations of more than 10 degrees from the straight alignment. These deviations can occur due to various factors such as changes in terrain, the curvature of the land, or the need to navigate around obstacles.

ii. Need for Double Pole Structure: In situations where the deviation angle exceeds the threshold, a Double Pole (DP) structure is erected instead of a single pole. This is necessary to ensure stability and proper support for the power line as it negotiates the angle.

iii. Pit Digging along the Bisected Angle: Once the angle locations are identified, pits are dug along the bisection of the deviation angle. This means that the pits are positioned in such a way that they align with the midpoint of the angle, ensuring balanced support for the DP structure.

iv. Erection of DP Structure: With the pits prepared, the DP structure is erected at the angle location. This typically involves installing two poles close to each other, with their orientation adjusted to accommodate the angle of deviation.

v. Horizontal/Cross Bracing: To reinforce the stability of the DP structure, horizontal or cross bracings are fitted between the poles. These braces help distribute the load evenly and prevent tilting or displacement of the poles under strain.

vi. Temporary Guys for Stability: During the erection process, temporary guys made of Manila rope are used to hold the poles in a vertical position. These temporary supports provide additional stability until the DP structure is fully secured in place.

vii. Grouting and Securing: Once the DP structure is erected, the poles are securely grouted into the pits to ensure they remain stable and upright. Grouting involves filling the pits with concrete or another suitable material to anchor the poles firmly in the ground.

viii. Additional Support as Needed: Depending on the specific characteristics of the angle location and the angle of deviation, additional supports or bracing may be installed to reinforce the DP structure further. This ensures that the power line remains secure and reliable, even when navigating sharp angles or deviations in the terrain.

Clipping

i. Selection of Fasteners: Suitable fasteners, such as bolts, clamps, or clips, are selected based on the design requirements and the type of support structures used in the power line construction.

ii. Formation of Jumpers: Jumpers, which are sections of conductors forming parabolic shapes, may be formed at section and angle towers to ensure maximum clearance requirements. These jumpers help distribute the tension evenly along the conductor and prevent excessive stress concentrations.

iii. Securing Fasteners: Fasteners are securely installed in all fittings and accessories to ensure they remain in position even under tension or external forces. Proper techniques are employed to open and secure security clips or clamps, ensuring they provide a reliable connection between the conductor and the support structure.

iv. Prevention of Contact: Special attention is given to ensuring that fasteners do not cause any damage or contact between adjacent conductors or other components of the power line. Insulation materials or spacers may be used to maintain proper clearance and prevent short circuits or electrical faults.

3.0 METHODOLOGY

The district-specific IEE has been largely structured as per SPS, 2009 and ADB's Environmental Assessment Guidelines (2003). The IEE reports, including EMPs and monitoring plans, cover the most environmentally sensitive components in the districts as well as specific sub-activities under the RDSS Programme. The methodology of Initial Environmental Examination for Bardhaman West district is as follows:

3.1 CORRIDOR OF IMPACT

The proposed activities under RDSS Programme in the Bardhaman West district are likely to be confined within the existing RoW as well as substation, however, some additional RoW may be required in case of segregation/bifurcation of 11kv HT Feeder.

3.2 FIELD VISITS, PRIMARY AND SECONDARY DATA COLLECTION

Selected sample pole locations (i.e., existing and proposed) were visited along with concerned PIU officials for environmental screening and identification of associated environmental and social issues. Feeder-specific strip map was prepared for all the selected feeders during the field visit to capture the information related to the requirement of tree trimming (within 3 m), utility and community structures located (within 3 m) along the proposed route alignment, surface water bodies (within 30 m), and ecological sensitivities. Secondary information about the environmental and social issues, protected areas and forest areas was collected from various government and non-governmental / research institutions to assess the baseline environment and social setting within the programme locations i.e. the Bardhaman West district. For the Initial Environmental Examination, component-wise questionnaires have been developed and the same is presented in Appendix 3.1.

Gathering of Data and Information

The process begins with the collection of relevant data and information necessary for the Initial Environmental Examination. This includes obtaining digitized maps, such as the Vidyut Manchitra (LT distribution network), as well as environmental and social data related to the programme area. The objective is to gather comprehensive information that will be used to assess potential impacts during the conversion of LTOH lines to AB cabling.

Overlay of Vidyut Manchitra on Google Earth Pro and ArcGIS Software Along with Forest Maps

In the next step, the Vidyut Manchitra is overlaid on platforms like Google Earth Pro and ArcGIS software. Additionally, forest maps from the Government of West Bengal are incorporated into the analysis. This spatial overlay helps in visualizing the LT distribution network about the geographical and environmental features of the programme area, enabling a better understanding of the potential environmental impacts.

Identification of Environmental Sensitive Receptors

The examination continues with the identification of environmentally sensitive receptors, such as reserve forests, protected forests, Key Biodiversity Areas (KBAs), Important Bird Areas (IBAs), natural habitats, and ASI (Archaeological Survey of India) or state-protected monuments. The identification of these sensitive areas is crucial for determining where special considerations and protective measures are needed during the programme.

Earmarking Buffer Areas Around Environmental Sensitive Receptors/Monuments

Once the sensitive receptors are identified, buffer areas ranging from 100 to 300 meters are earmarked around these locations. These buffer zones serve as protective areas to minimize the potential impacts of the programme activities on these environmentally and culturally significant sites, ensuring that they remain undisturbed.

Identification of Existing Trees within the RoW of Existing LTOH Line

The next step involves identifying existing trees within the Right of Way (RoW) of the current LTOH line. The goal is to minimize the programme's impact by avoiding or mitigating potential harm to these trees during the conversion to AB cabling. This step is essential for preserving local vegetation and maintaining ecological balance.

Identification of Water Bodies within 30 m on Both Sides of the LTOH Line

Water bodies, such as rivers, ponds, and lakes, located within 30 meters on both sides of the existing LTOH line are also identified. This identification helps in planning programme activities to avoid or minimise any negative impacts on these water resources, thereby protecting aquatic ecosystems and ensuring water quality.

Identification of Road/Railway crossing

The process includes identifying national and state highways as well as railway crossings that intersect with the route alignment of the selected feeders for bifurcation and segregation works. This identification is crucial to secure necessary permissions from the competent authorities before the commencement of any work. Obtaining these approvals ensures compliance with regulatory requirements and facilitates smooth programme execution.

3.3 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A Consultation Framework has been prepared to ensure the involvement of stakeholders at each stage of programme planning and implementation. The information disclosure would provide citizen-centric information on the policies and the details of sub-activities along with the implementation process of development of distribution infrastructure for the loss reduction works covered under the RDSS Programme at seven ADB-funded districts of West Bengal.

FIGURE 3.1: ORIENTATION WORKSHOP ON IDENTIFICATION OF E&S ISSUES FOR UNDERTAKING IEE

FIGURE 3.2: DISCUSSION WITH WBSEDCL EXECUTIVES AND OTHER STAKEHOLDERS FOR FINALIZATION OF MODALITIES ON IEE

3.4 DATA ANALYSIS, IMPACT IDENTIFICATION AND MITIGATION MEASURE

Information collected was analyzed and impact was identified using expert's assessment and following established practices.

Assessment of Environmental & Social Settings and Identification of Likely Environmental & Social Issues

Finally, the environmental and social settings of the programme area are assessed, focusing on identifying potential environmental and social issues such as tree trimming/cutting, debris flow to nearby waterbodies or rivers, road/railway crossing, encroachments, the presence of mobile vendors, and the possible loss of livelihoods. This assessment is crucial for addressing any adverse environmental and social impacts that the programme might have on the flora, fauna and local communities ensuring that the needs and concerns are considered and mitigated during programme planning and execution. Mitigative measures are proposed for each sub-activity specific to the feeders. EMP is prepared considering mitigative measures and the institutional framework of WBSEDCL.

4.0 BASELINE ENVIRONMENTAL & SOCIAL STATUS

The existing environmental & social baseline of programme area has been assessed to screen the potential environmental & social risks and impacts of various components of the proposed programme. A compendium of biophysical and social sensitivity in programme area has been compiled based on secondary data and spot verification during the field visit to provide an understanding of the scale and magnitude of sensitivity/vulnerability of the physical, ecological and social environment. A brief detail of the environmental and social baseline of the Bardhaman West district is presented in subsequent sections.

4.1 ENVIRONMENTAL BASELINE

4.1.1 Geology

The Bardhaman West district, situated in the Indian state of West Bengal, is a transitional zone between the Chotanagpur Plateau, which constitutes a portion of the peninsular shield in the west, and the Ganga-Brahamaputra alluvial plain in the north and east. Archaean granite gneisses and migmatites of the Chotanagpur Gneissic Complex are exposed in a narrow east-west belt fringing the north-western part and constitute the oldest basement rocks. Over these, in a faulted, subsided semi-graben type structural trough, deposited the thick-bedded sedimentary sequence of Gondwana Super Group comprising sandstone, shale, and siltstone with prolific commercial coal seams. All these rocks are cut across by several high angles, transverse, and gravity faults. Mostly the Lower Gondwana sequence is developed in this district, comprising the Talchir, Barakar, Barren Measure, Raniganj and Panchet Formations. The Gondwana sequence rocks are exposed in the western part of the district area. In parts of the central and the broad, oval area of eastern part, laterite cover with red soil and Quaternary sequence of riverine sediments grouped under Sijua, Panskura, and Diara formations are exposed.

The Bardhaman west district contains more than one-third lands of the district and is a delta which is formed from sediments of recent origin. The Bardhaman West district is traversed by several rivers, mainly the Damodar and Ajay River, a distributary of the Ganges. These rivers have played a significant role in shaping the landscape through erosion, transportation, and deposition of sediments. One notable geological feature in the district is the presence of minerals. The main workable deposits of coal in India are found in the Gondwana Formation and the Damodar Valley located on the Gondwana Formation has exceptionally rich coal deposits. In recent years, anthropogenic activities such as urbanization, industrialization, and agriculture have exerted significant pressure on the geological landscape of the district. The extraction of groundwater for irrigation and industrial purposes has led to subsidence in some areas, while deforestation and improper land management practices have increased the risk of soil erosion and landslides.

Geological surveys, mapping, and monitoring of groundwater resources are essential tools for informed decision-making and mitigating geological hazards. Overall, the geology of the Bardhaman West district reflects a complex interplay of geological processes and human activities, shaping the landscape and influencing the lives of its inhabitants. The Geological map (Figure 4.1) is retrieved from the Geological Survey of India.

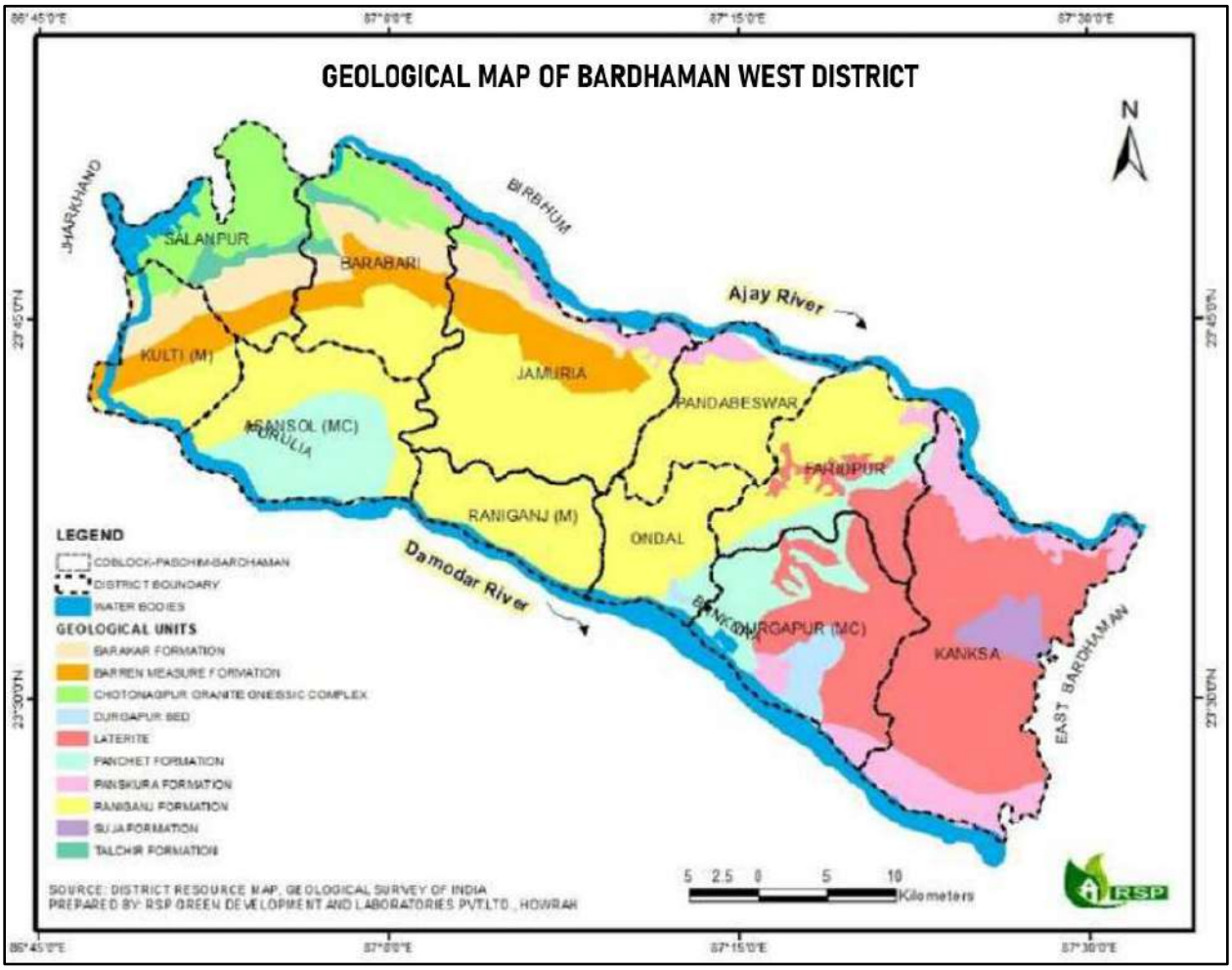


FIGURE 4.1: GEOLOGY OF BARDHAMAN WEST DISTRICT

4.1.2 Geomorphology

The geomorphology of the Bardhaman West district (Figure 4.2) in West Bengal, India, is characterized by a diverse range of landforms shaped by various geological processes, including river erosion and deposition, tectonic activities, and anthropogenic influences. Here are some notable geomorphological features of the district:

i. Physiographic Zones: The geomorphology of the Bardhaman west district consists of three major physiographic zones namely floodplain, pediplain with scattered rocks & upper mature deltaic plain. Flood plain is formed due to successive floods and deposition of inter-bedded layers of sand and clay which gradually raise the tract above flood level. The riverine area has developed through alluviation and has decreased from east to west.

ii. Alluvial Plains: The eastern part of the Bardhaman West district gradually transitions into the alluvial plains of the Ganges, characterized by flat and fertile lands. The plains are characterized by lower-lying floodplains areas near rivers, broad, with natural levees formed along the riverbanks due to repeated deposition during floods.

iii. River Channels and Floodplains: The Damodar, Ajay, and Barakar rivers have carved out extensive floodplains and meandering channels across the district. These riverine landforms are subject to frequent flooding during the monsoon season, which replenishes soil fertility but also poses challenges for infrastructure and agriculture.

iv. Old River Channels (Khals): The district is dotted with remnants of old river channels locally known as "khals". These abandoned channels bear witness to the historical shifts in river courses and serve as important waterways for transportation and irrigation.

v. Lateritic Soil and Landforms: The Bardhaman West district also features lateritic soils, where weathering of rocks has occurred. These soils are typically found on the uplands and are less fertile compared to the alluvial soils in the plains, with iron-rich crusts, creating hard and resistant surfaces that influence local drainage patterns and vegetation.

vi. Chotanagpur Plateau Extension: The western part of West Bardhaman falls within the eastern fringes of the Chotanagpur Plateau, which is characterized by rugged terrain, hills, and plateau regions. This area is composed of ancient Precambrian rocks, primarily granite and gneiss, contributing to its hilly and undulating landscape.

vii. Tectonic Characteristics: The western part of the district, being part of the Chota Nagpur Plateau's extension, has been subject to tectonic uplift, which is responsible for the hilly terrain and the presence of older rock formations at the surface.

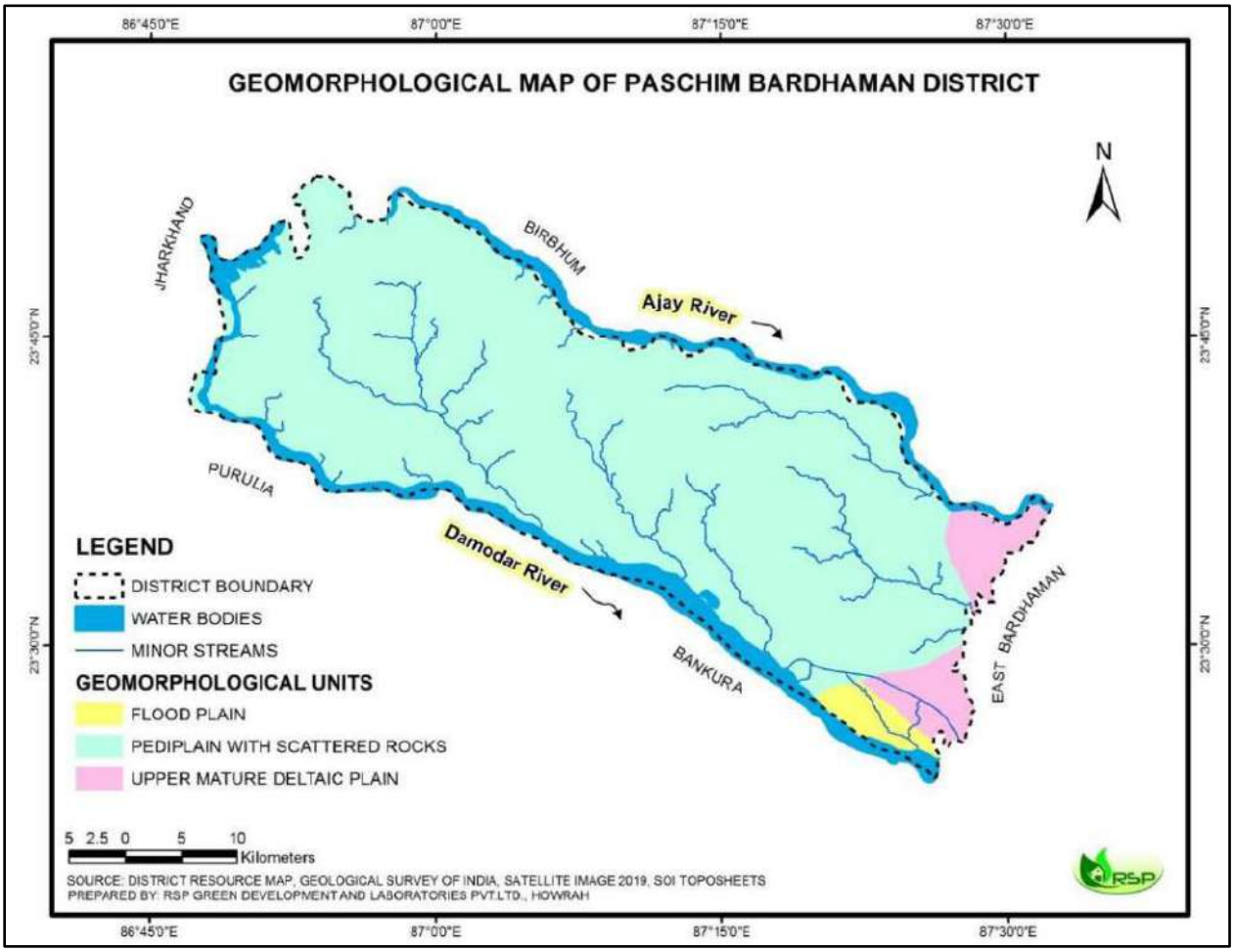


FIGURE 4.2: GEOMORPHOLOGY OF BARDHAMAN WEST DISTRICT

4.1.3 Hydrology

In Bardhaman West District, the area forms a mix of plateau regions, river valleys, and alluvial plains. The region's water resources are shaped by several rivers, primarily Damodar, Ajay, and Barakar, along with numerous small streams, ponds, and groundwater reserves. The district is rich in natural drainage lines. Individual aquifers in older alluvium are of limited thickness and discontinuous has poor yield water prospects. The main rivers flowing in this district are Damodar and Ajay. Main River Bhagirathi or Hooghly receives the river Damodar and Ajay that drains out all the water of the district. The river Damodar receives Nunia and Singaran; while the river Ajay receives water from Kunur, Banka and Khari Rivers. The common hydrological regime is defined by the tropical monsoon climate with alternating dry and wet seasons. The river Damodar flows in a straight pattern from west to east on entering the Paschim Bardhaman district. The Ajay River originates on a small hill about 300 metre high, southwest of Deoghar in Jharkhand. It then flows

through Jharkhand and enters West Bengal. The overall drainage pattern of Bardhaman west district is presented in Figure 4.3.

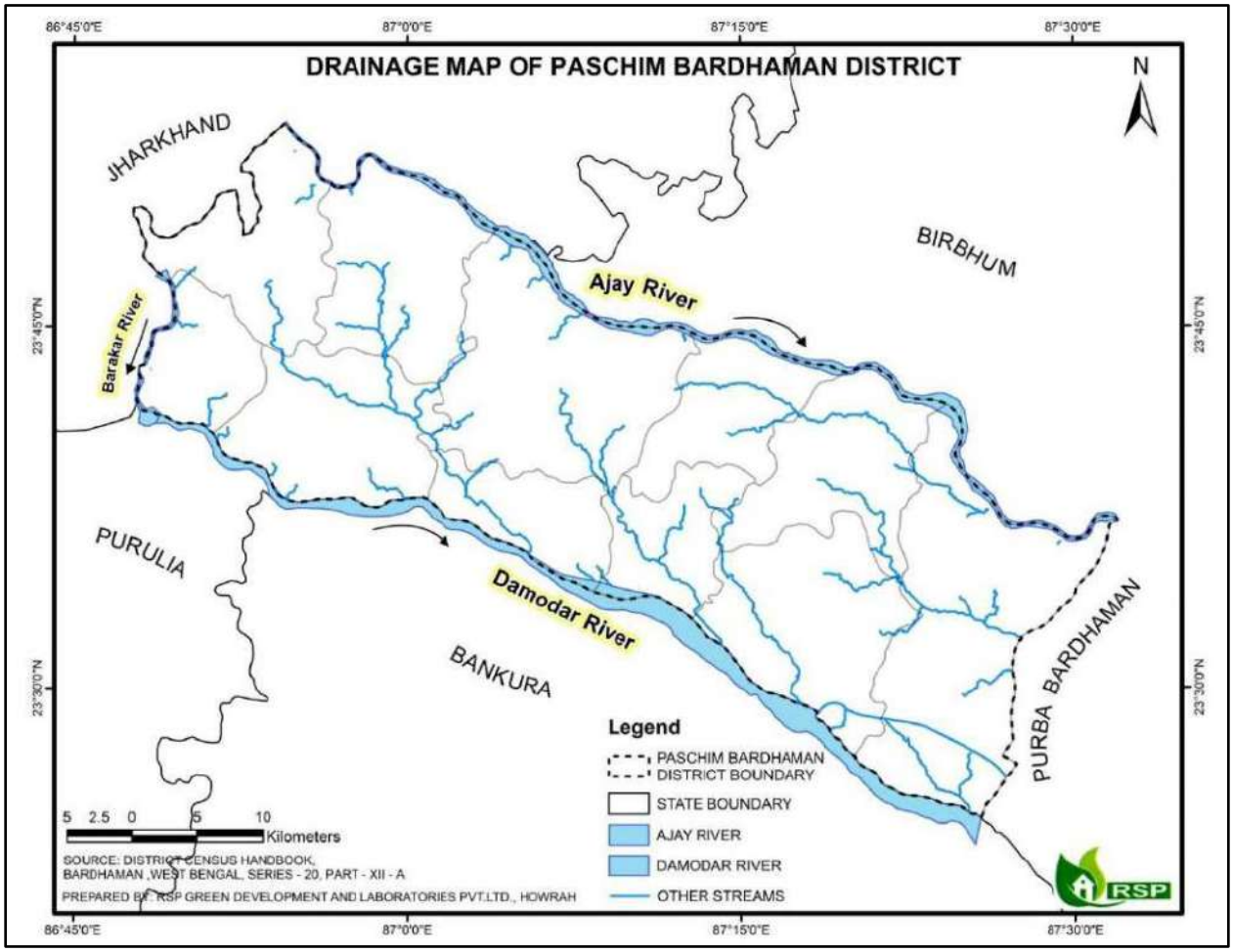


FIGURE 4.3: DRAINAGE MAP OF BARDHAMAN WEST DISTRICT

4.1.4 Soil

The soil in the district is mainly lateritic & alluvial soil. Gravelly loam soil covers near about 50% of the district's total geographical area. In addition to this fine loamy to coarse loamy and fine loamy to sandy loamy types of soils are abundant in the district. Parent Materials of the district of Bardhaman West encompasses the varieties primarily of Colluvium-Alluvium, Colluvium-Alluvium-Shale, Granite-Gneiss and Alluvium-Granite Gneiss along with Granite Gneiss-Sandstone in a very confined region at West with soil depth from deep to very deep. This soil is found between the rivers Ajoy and Damodar, part of the district, which is highly porous, poor in organic matter content and acidic. The soil map of Bardhaman West district is presented in Figure 4.4.

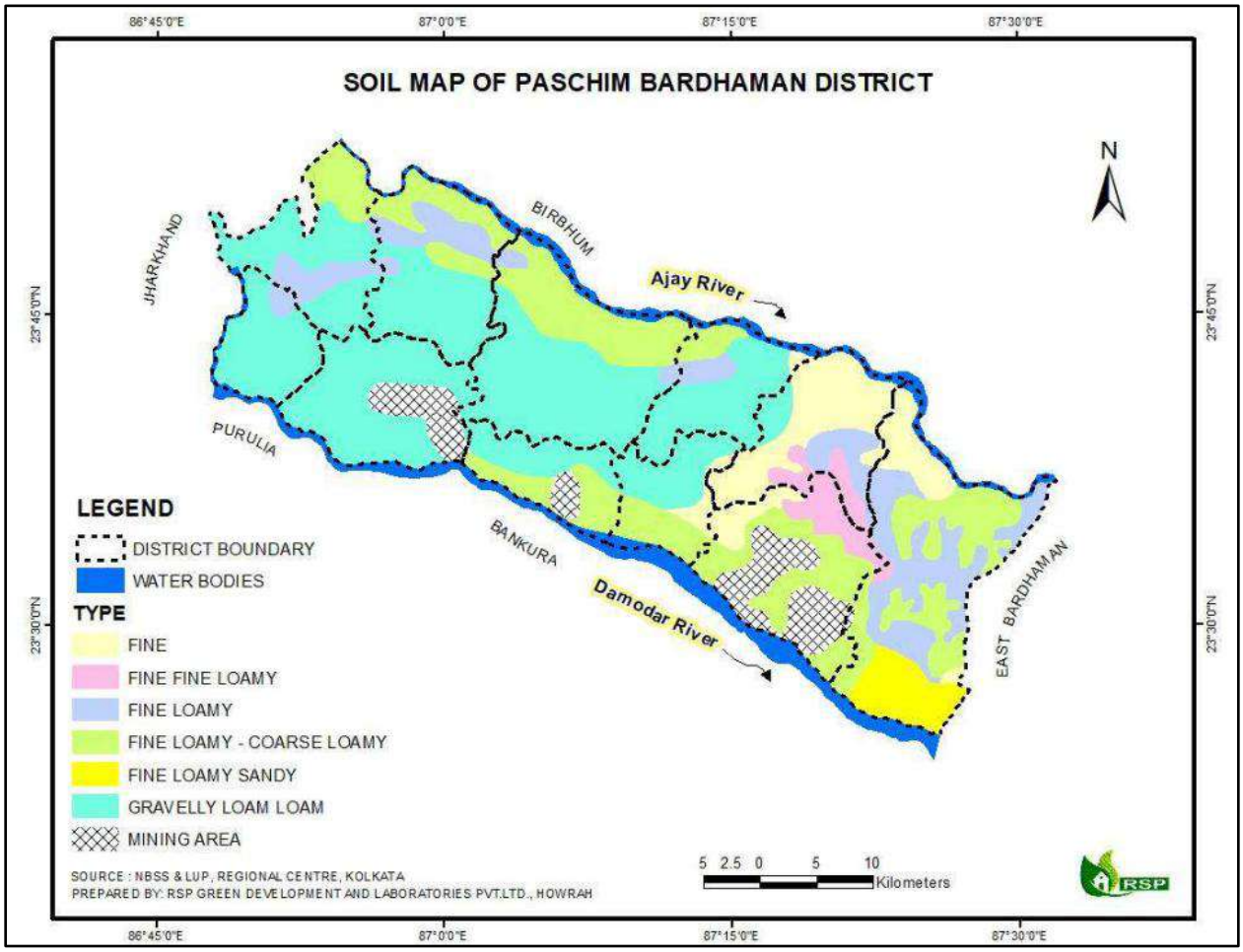


FIGURE 4.4: SOIL MAP OF BARDHAMAN WEST DISTRICT

4.1.5 Land Use & Land Cover

The land use/land cover (LULC) map of Bardhaman West has been presented in Figure 4.5. The LULC analysis (Table 4.1) reveals that the district's land use and land cover paint a diverse and dynamic picture, showcasing the district's versatility in balancing agriculture, industry, and natural elements. With approximately 64.94% of its total area designated as net area sown, Bardhaman remains a significant contributor to West Bengal's agricultural landscape. The allocation of 30.65% to non-agricultural use underscores the district's industrial and urban development, with notable centers like Durgapur playing a pivotal role in the region's economic growth. The presence of 3.02% forest area emphasizes a commitment to preserving natural ecosystems. Minimal portions are dedicated to barren and uncultivable land, cultivable wasteland, fallow lands, and miscellaneous tree groves, highlighting the district's efficient land use practices. The intricate land use/land cover pattern signifies Bardhaman's ability to harmonize

agricultural productivity, industrial growth, and environmental preservation, making it a key player in West Bengal's diverse landscape. The block-wise distribution of forest area in Bardhaman West district is presented in Figure 4.5.

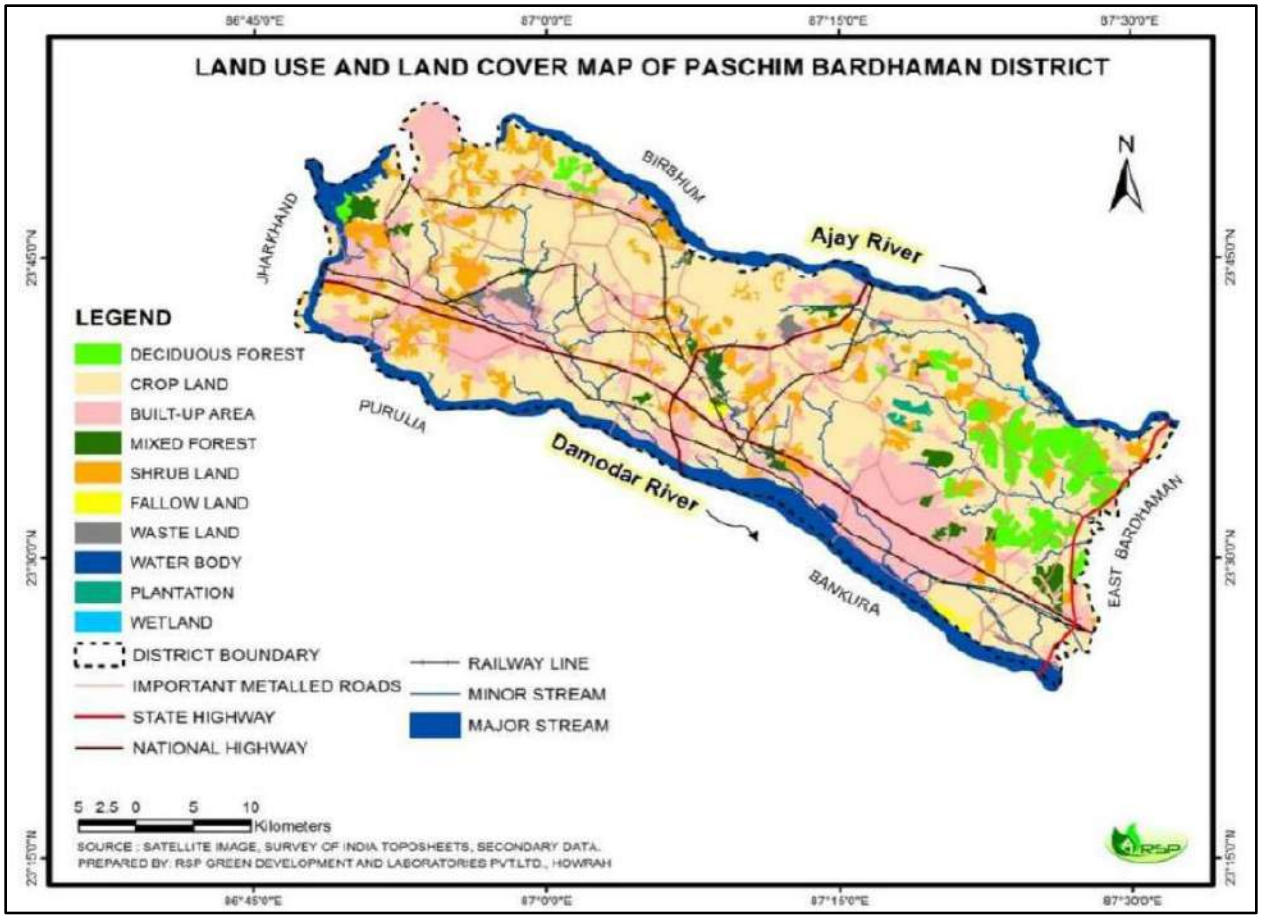


FIGURE 4.5: LAND USE LAND COVER MAP OF BARDHAMAN WEST DISTRICT

TABLE 4.1: LULC ANALYSIS OF BARDHAMAN WEST DISTRICT

Sl. No.	Land use pattern	Area In thousand hectares	% of total areas
1	**Reporting Area**	**698.76**	**100**
2	Forest Area	21.16	3.02
3	Area under Non-agricultural use	214.19	30.65
4	Barren & uncultivable land	0.44	0.06
5	Permanent pastures & other grazing land	0.06	0.008

6	Land under Misc. tree groves not included in Net area sown	0.98	0.14
7	Cultivable waste land	3.74	0.53
8	Fallow land other than Current fallow	1.09	0.15
9	Current fallow	3.31	0.47
10	Net area sown	453.79	64.94

4.1.6 Forest Cover

The Bardhaman West & Bardhaman East District has a geographical area of 7024 km² constitutes 7.91% of the State's area. The total forest cover in Bardhaman West & East District is 339.31 km^2 which is 4.83% of the district's total geographical area (Forest Survey of India, 2019). Most of the forests in the western part of the subdivision have been cleared but in the eastern part, some still exist in Kanksa and its adjoining Faridpur-Ukhra area. Out of the total recorded forest area, Very Dense Forests are 16.95%, moderately dense forests are 27.04%, and the remaining is open forests i.e. 55.99%. The percentage contribution of various types of forest cover is presented in Figure 4.6. The analysis reveals that in the Bardhaman District majority of the forest is open forest (55.99% of total forest cover).

Bardhaman West district in the Indian state of West Bengal is known for its diverse forest cover. The forest landscape in Bardhaman West is predominantly characterized by mixed moist deciduous forests, which typically consist of a variety of tree species such as Sal, teak, mahogany, and bamboo. These forests provide habitat to numerous species of flora and fauna, contributing to the region's biodiversity. However, due to various anthropogenic activities like deforestation, agricultural expansion, and urbanization, the forest cover in Bardhaman West district, like many other parts of India, may have faced degradation and fragmentation over the years. Efforts by the government and conservation organizations are essential to protect and restore these forests to maintain ecological balance and ensure the sustainability of natural resources in the region. The block-wise distribution of forest area in Bardhaman West district is presented in Figure 4.6.

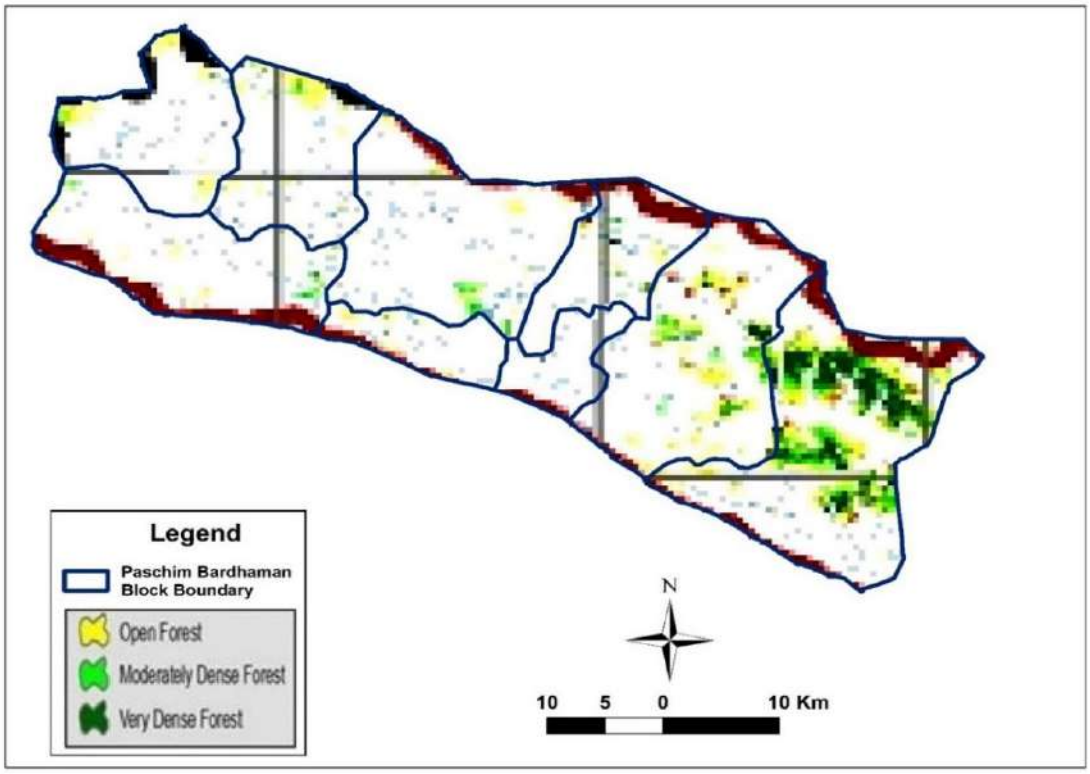


FIGURE 4.6: BLOCK-WISE DISTRIBUTION OF FOREST AREA - BARDHAMAN WEST DISTRICT

TABLE 4.2: STATUS OF FOREST COVER OF BARDHAMAN WEST DISTRICT

District	Geographical Area (sq. km)	Type of Forest Cover (sq. km)				% of Forest Cover
		Very Dense Forest	Moderately Dense Forest	Open Forest	Total Forest Cover	
Bardhaman West	7024	57.53	91.78	190	339.31	4.83

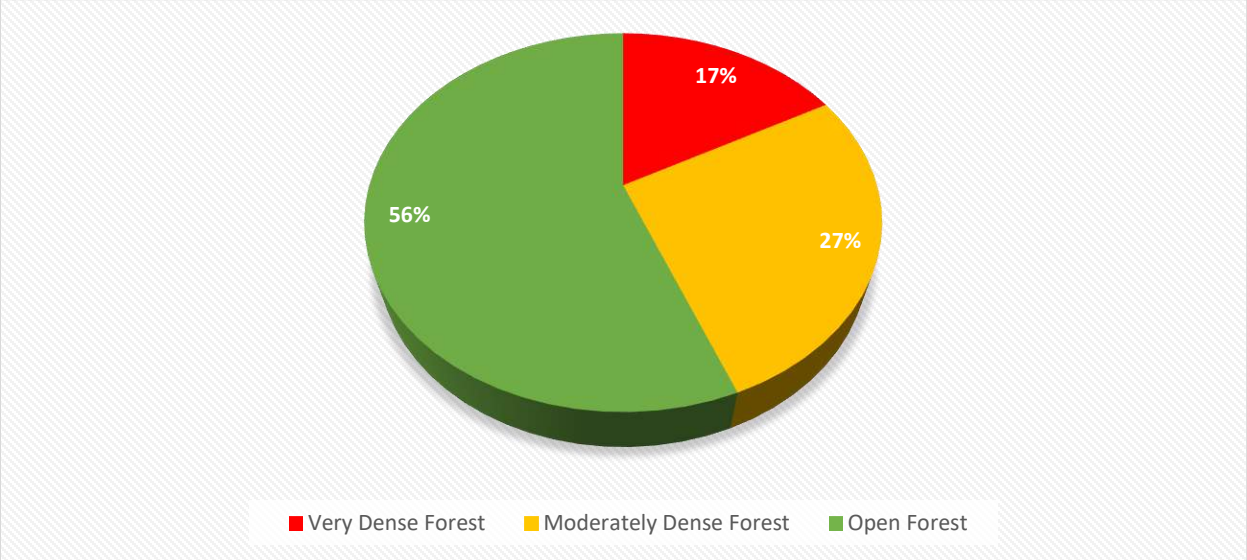


FIGURE 4.7: PERCENTAGE DISTRIBUTION OF TYPE OF FOREST COVER IN BARDHAMAN WEST DISTRICT

4.1.7 Flora and Fauna

FLORA

Bardhaman West district in West Bengal, India, boasts a rich and diverse flora due to its varied geographical features, including plains, wetlands, and forested areas. The district is known for its mixed moist deciduous forests, characterized by a variety of tree species. Common trees include sal (Shorea robusta), Bot (Ficus bengalensis), Asvattha (*Ficus religiosa*), Shireesh (*Albizia saman*), Arjun (Terminalia Arjuna), Krishnachuda (Caesalpinia pulcherrima), Mahua (*Madhuea latifolia*), Simul (*Salmalia malabarica*), Neem (*Azadirachta indica*), and various species of acacia. These forests also often contain bamboo thickets, providing habitat and sustenance for a diverse range of wildlife. Along the banks of rivers and its tributaries, a mix of vegetation adapted to the riverine ecosystem. The common plants in that area are lal-bharenda (*Jatropha gossypifolia*), Ban-okra (*Urena lobata*), Ulu (*Imperata arundinecea*), etc. Bardhaman west district is home to several wetlands and marshy areas, which support unique plant communitiesKeshe (*Saccharum spentaneum*), Bena (*Andropogon squarrosus*), Ganj or patasola (*Vallisneria spiralis*), Jhangi (Hydrilla verticillata.), Pond weed (*Potamogeten indicus*), Kesardam(*Jussiaea repens*), Kush (*Eragrostis cynosuroides*), common Jhangi (*Utricularia stellaris*), Pana (*Lemna pancicostata*), Water hyacinth (*Eichornia crassipes),* Hogla (*Typha angustata*), Padma (*Nelumbium speciosum*) etc thrive in these habitats, providing shelter and food for aquatic fauna. Much of the land in Bardhaman west district is used for agriculture. Common crops grown include rice, jute, sugarcane, potato, oilseeds and vegetables. The agricultural landscape also includes fruit orchards

Aam (Mangifera indica), Amlaki (Phyllanthus embica), Narikel (Cocos nucifera), Khejur (Phoenix dactylifera), Tal (Borassus flabellifer) trees. In urban areas like towns and cities, a mix of cultivated ornamental plants, street trees, and green spaces. Species such as coconut palms, mango trees, neem trees, dumur trees and various flowering plants i.e. Rajanigandha (Polyanthes tuberosa), Ghentu or Bhat (Clerodendron infortunatum), Gulancha (Tinospora cordifolia) are commonly planted for their aesthetic and environmental benefits. Preserving natural habitats, promoting afforestation, and adopting sustainable land-use practices can help maintain the ecological balance and ensure the continued existence of the region's plant diversity.

FAUNA

Bardhaman west district, located in the Indian state of West Bengal, supports a diverse range of fauna due to its varied habitats, including forests, wetlands, agricultural lands, and urban areas. The district is home to a rich avian diversity, with numerous species of resident and migratory birds. The common avifauna of the district are pea-fowl (*Pavo cristatus*), jungle-fowl (*Gallus sp*.), jungle crow (*Corvus macrorhynchos*), house crow (*Corvus splendens*), treepie (*Dendrocitta vagabunda*), common babbler (*Turdoides caudata*), gold-fronted chloropsis (*Chloropsis aurifrons*), red-vented bulbul (*Pycnonotus cafer*), red-whiskered bulbul (*Pycnonotus jocosus*), red spotted bluethroat (*Luscinia svecica*), brown-backed robin (*Erythropygia hartlaubi*), Shama (*Copsychus malabaricus*), Tickell's blue flycatcher (Cyornis tickelliae), paradise flycatcher (*Terpsiphone sp*.), wood shrike (*Tephrodornis pondicerianus*), black drongo (*Dicrurus macrocercus*), tailor bird (*Orthotomus sp*.), streaked fantail warbler (*Cisticola juncidis*), golden oriole (*Oriolus oriolus*), common mayna (*Acridotheres tristis*), pied mayna (*Gracupica contra*), white-backed munia (*Lonchura striata*), white-throated munia (*Euodice malabarica*), spitted munia (*Lonchura punctulata*), red munia (*Amandava amandava*), yellow-throated sparrow (*Petronia xanthocollis*), house sparrow (*Passer domesticus*), woodpecker (*Picidae sp*.), India cuckoo (*Cuculus micropterus*), pied crested cuckoo (*Clamator jacobinus*), koel (*Eudynamys sp*.), parakeet (*Melopsittacus undulatus*), nilkantha (*Coracias benghalensis*), bee-eater (*Meropidae sp.*), kingfisher (*Alcedines sp*.), hornbill (*Bucerotidae sp.*), hoopoe (*Upupidae sp*.), horned owl (*Bubo virginianus*), spotted owlet (*Athene brama*), jungle owlet (*Glaucidium radiatum*), griffon vulture (*Gyps fulvus*), long-billed vulture (*Gyps indicus*), scavenger vulture (*Neophron percnopterus*), lagger falcon (*Falco jugger*), small spotted eagle (*Clanga clanga*), brahminy kite (*Haliastur indus*), pariah kite (*Milvus migrans*), sparrow hawk (*Accipiter nisus*), various types of pigeon and dove, goose, duck, teal, lapwing, white necked stork and several varieties of egret and heron.. Bardhaman West district harbors several mammal species, although many are likely to be found in forested areas or rural landscapes. Some of the mammals found in the region include leopard (*Panthera pardus*), wolf (*Canis lupus*), hyaena (*Hyaena hyaena*), jackal (*Canis aureus*) and other smaller species, but hyaenas are not so common. Tigers (*Panthera tigris*), Wild pigs (*Sus scrofa*), monkeys (*Cercopithecidae sp*.), etc. Reptiles are also part of the fauna of Bardhaman West

district. This includes snakes like thepythons (*Pythonidae sp.),* several kinds of cobra (Serpentes sp.), the kraits (*Bungarus sp*.) and the deadly Russell's viper (*Daboia russelii*), Dhamna (*Ptyas mucosa*) and various species of harmless grass snakes (*Natrix natrix*). Additionally, various species of turtles, lizards, and crocodiles may inhabit the wetland areas and water bodies in the region. Amphibians such as frogs and toads are found in the district, inhabiting ponds, marshes, and other water bodies. The district supports a wide variety of invertebrate fauna, including insects, arachnids, mollusks, and others. This diverse group of organisms plays crucial roles in ecosystem functioning and includes butterflies, beetles, spiders, snails, and more. Efforts to conserve and protect the natural habitats of Bardhaman West district are essential for ensuring the survival of its diverse fauna. Conservation initiatives, habitat restoration, and sustainable development practices can help maintain the ecological balance and biodiversity of the region.

4.1.8 Climate

Bardhaman West has a tropical savanna climate. The annual mean temperature is 34.44C, although monthly mean temperatures range from 12°C to 37°C and maximum temperatures in Bardhaman West often exceed 38°C. Maximum rainfall occurs during the monsoon in July and the average annual total is above 153.23 mm. Moderate northwesterly to northeasterly winds prevail for most of the year with a high frequency of calms. Summer is dominated by strong southwesterly monsoon winds. Winters are comfortable with temperatures lying between 12°C to 22°C. The average wind speed in Bardhaman West is 1.3 m/s with a maximum wind speed of around 4.1 m/s.

Temperature

The cool weather commences in the later part of November and lasts until the middle of February. During these months the prevailing winds are from the north and north-east. This is followed by the hot and dry season which extends up to May. The weather becomes increasingly hot during the day, though the night remains fairly cool.

TABLE 4.3: MONTH-WISE TEMPERATURE DATA OF BARDHAMAN WEST DISTRICT

Parameter	Minimum	Maximum	Average
January	12.7	24.4	17.7
February	16.1	27.7	21.6
March	20.5	32.7	26.6
April	24.4	36.1	30
May	26.6	36.6	31.1

June	27.2	34.4	30.5
July	26.6	32.2	29.4
August	26.6	32.2	28.8
September	26.1	32.2	28.8
October	23.3	31.6	27.2
November	18.3	28.8	23.3
December	13.8	25	18.8

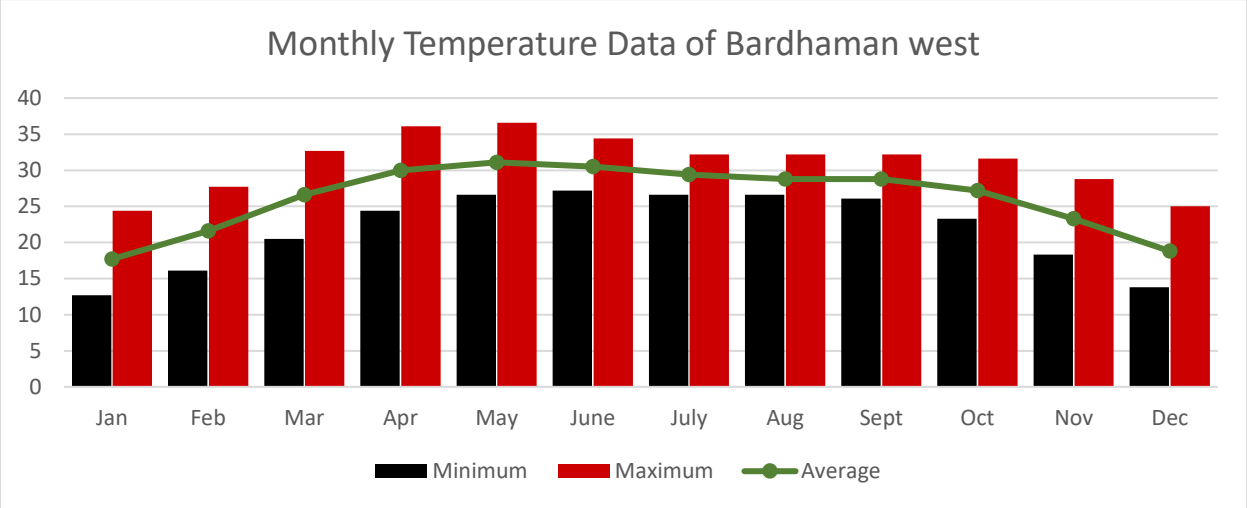


FIGURE 4.8: GRAPHICAL REPRESENTATION OF MONTHLY TEMPERATURE VARIATION IN BARDHAMAN WEST DISTRICT

Rainfall and Humidity

The intensity of rainfall due to depressions sometimes becomes very extensive and may cause enhanced soil erosion in the district. The average rainfall in Bardhaman West is 1186mm with a maximum wind speed of around 4 m/s. The average relative humidity remains around 55.09% and varies from 53% to 86%. The month with the lowest amount of relative humidity is March (53%).

TABLE 4.4: MONTH-WISE RAINFALL DATA (IN MM) OF BARDHAMAN WEST DISTRICT

YEAR	2017	2018	2019	2020	2021	Average
JAN	0.90	0.00	0.00	25.43	0.00	5.27

FEB	0.00	1.07	59.14	1.99	0.43	12.53
MAR	16.93	4.25	20.60	61.84	4.08	21.54
APR	30.83	129.76	56.69	56.53	18.05	58.37
MAY	135.70	69.84	137.06	252.18	210.40	161.04
JUN	208.07	123.42	76.97	300.40	254.43	192.66
JUL	413.73	276.26	208.40	133.06	304.03	267.10
AUG	211.36	162.51	232.50	272.41	214.17	218.59
SEPT	137.25	120.56	209.32	108.10	276.23	170.29
OCT	187.05	21.81	133.77	52.40	128.73	104.75
NOV	19.72	0.35	42.09	2.38	36.75	20.26
DEC	14.16	28.47	9.52	0.02	69.47	24.33
Total	1375.70	938.30	1186.06	1266.74	1516.77	1256.71

4.1.9 Air Quality

The air quality status of Bardhaman West districts is shown in Table 4.5 (A), 4.5 (B), 4.5 (C), 4.5 (D). In 2022 and 2023, the air quality in Bardhaman West district, West Bengal, showed significant concerns, particularly related to PM2.5 levels, which are a primary indicator of air pollution. Bardhaman West, like many other regions in India, experienced poor air quality with PM2.5 levels frequently exceeding safe limits. The air quality in this period was significantly impacted by factors such as vehicular emissions, industrial activities, and seasonal crop burning, which worsened during the winter months. The air is unhealthy for sensitive groups, and people who experience difficulty breathing or throat irritation should limit their time outside.

TABLE 4.5 (A): AMBIENT AIR QUALITY OF BARDHAMAN WEST FOR IMPLEMENTATION OF LOSS REDUCTION PROJECT UNDER RDSS

Months	NO2(µg/m³)			SO2(µg/m³)			PM10(µg/m³)			PM2.5 µg/m³		
	Min	Max	SD	Min	Max	SD	Min	Max	SD	Min	Max	SD
Station: Angadpur												
2022												
Jan	30	33	1.05	12	13	0.50	134	149	4.21	-	-	-
Feb	31	35	1.32	12	14	0.66	134	150	4.89	-	-	-

Mar	32	35	1.03	13	15	0.63	147	150	1.05	-	-	-
Apr	33	35	0.94	13	15	0.57	146	151	1.34	-	-	-
May	30	33	0.99	12	14	0.66	133	142	2.98	-	-	-
Jun	30	35	1.76	12	14	0.74	136	145	3.13	-	-	-
Jul	32	36	1.33	12	14	0.57	138	144	2.17	-	-	-
Aug	31	34	1.05	12	14	0.79	135	142	2.08	-	-	-
Sep	31	34	1.20	12	14	0.87	134	142	2.45	-	-	-
Oct	33	37	1.58	13	17	1.49	140	158	6.90	-	-	-
Nov	33	37	1.25	13	15	0.87	141	147	1.69	-	-	-
Dec	33	37	1.23	14	15	0.47	143	149	1.89	-	-	-
2023												
Jan	34	37	1.00	14	16	0.50	142	148	1.83	74	80	1.98
Feb	33	37	1.32	13	16	1.17	120	142	8.99	65	80	5.19
Mar	31	36	1.56	12	15	1.19	110	123	3.60	61	72	3.48
Apr	31	34	0.99	12	15	0.93	107	117	2.91	61	71	3.03
May	28	33	1.66	10	13	1.03	100	117	5.74	58	70	3.83
Jun	28	33	1.50	10	13	1.07	92	115	7.66	57	66	2.67
Jul	25	31	1.97	9	12	0.83	70	93	7.10	43	64	6.66
Aug	21	27	1.76	8	11	0.99	59	70	3.14	38	45	2.10
Sep	19	26	2.06	9	12	0.87	54	65	3.60	36	45	3.06
Oct	18	28	3.53	7	15	2.37	55	98	15.60	35	59	8.46
Nov	26	52	8.36	11	18	2.24	108	245	48.18	56	94	11.96
Dec	22	29	2.00	10	14	1.09	86	121	10.28	46	63	4.53
NAAQS*	**80.00**			**80.00**			**100.00**			**60.00**		

*National Ambient Air Quality Standard, Ministry of Environment, Forest & Climate Change, Government of India, 2009

TABLE 4.5 (B): AMBIENT AIR QUALITY OF BARDHAMAN WEST FOR IMPLEMENTATION OF LOSS REDUCTION PROJECT UNDER RDSS

Months	NO2(µg/m³)			SO2(µg/m³)			PM10(µg/m³)			PM2.5 µg/m³		
	Min	Max	SD	Min	Max	SD	Min	Max	SD	Min	Max	SD
Station: Asansol												
2022												
Jan	30	34	1.29	12	14	0.79	131	145	4.15	63	67	1.37
Feb	30	36	1.64	12	14	0.70	137	150	3.96	66	70	1.20
Mar	32	36	1.13	13	15	0.57	145	149	1.42	70	73	0.99
Apr	33	37	1.15	13	15	0.68	145	149	1.17	67	70	0.94
May	31	34	0.93	12	14	0.78	137	141	1.36	62	66	1.22
Jun	31	35	1.37	12	14	0.63	136	144	2.36	64	66	0.79

Jul	32	35	0.94	12	13	0.42	136	143	1.87	64	66	0.82
Aug	30	35	1.42	11	15	1.03	132	143	3.02	61	65	1.42
Sep	30	35	1.56	11	14	1.12	130	140	3.43	61	64	1.11
Oct	31	37	1.93	12	16	1.22	136	164	9.16	64	110	17.43
Nov	33	35	0.63	13	14	0.47	138	143	1.91	69	73	1.29
Dec	33	36	0.94	14	15	0.42	142	147	1.73	72	77	1.66
2023												
Jan	33	36	1.12	13	15	0.60	140	144	1.12	61	67	1.87
Feb	34	35	0.48	13	15	0.78	110	142	13.36	60	66	1.85
Mar	29	36	2.09	12	15	1.10	106	115	2.76	55	64	2.76
Apr	31	33	0.70	12	14	0.83	95	115	5.77	56	62	2.26
May	27	31	1.25	9	12	1.05	97	110	4.37	55	63	2.67
Jun	26	32	1.64	9	12	0.92	88	112	6.87	55	63	2.51
Jul	23	31	2.38	8	12	1.33	57	92	11.21	44	60	5.14
Aug	19	29	2.75	8	11	1.07	51	57	2.06	34	42	2.62
Sep	18	26	2.52	7	11	1.27	46	55	2.64	31	35	1.22
Oct	16	29	3.74	7	14	2.12	44	101	21.32	31	60	10.64
Nov	26	51	8.33	11	19	2.62	124	247	42.86	62	106	15.70
Dec	22	28	1.71	7	13	1.80	69	128	20.17	37	61	8.56
NAAQS*	**80.00**			**80.00**			**100.00**			**60.00**		

*National Ambient Air Quality Standard, Ministry of Environment, Forest & Climate Change, Government of India, 2009

TABLE 4.5 (C): AMBIENT AIR QUALITY OF BARDHAMAN WEST FOR IMPLEMENTATION OF LOSS REDUCTION PROJECT UNDER RDSS

Months	NO2(µg/m³)			SO2(µg/m³)			PM10(µg/m³)			PM2.5 µg/m³		
	Min	Max	SD	Min	Max	SD	Min	Max	SD	Min	Max	SD
Station: Benachiti												
2022												
Jan	29	33	1.31	11	14	0.82	132	148	4.45	-	-	-
Feb	30	35	1.64	12	14	0.71	135	149	4.47	-	-	-
Mar	32	35	1.26	13	14	0.50	146	152	1.83	-	-	-
Apr	32	35	1.15	13	15	0.57	145	149	1.37	-	-	-
May	30	34	1.11	12	14	0.83	131	142	3.18	-	-	-
Jun	30	35	1.47	11	14	0.83	132	142	3.33	-	-	-
Jul	32	35	1.29	12	14	0.82	135	147	3.97	-	-	-
Aug	31	35	1.13	12	15	0.87	132	142	2.75	-	-	-
Sep	31	35	1.48	12	15	0.87	132	141	3.06	-	-	-
Oct	32	39	1.98	12	17	1.58	138	165	8.61	-	-	-

Nov	34	36	0.82	13	15	0.57	141	145	1.26	-	-	-
Dec	33	36	0.79	14	16	0.67	142	146	1.37	-	-	-
2023												
Jan	34	37	0.86	13	16	0.87	145	148	0.97	71	78	2.20
Feb	33	36	0.99	13	16	0.87	108	145	15.40	69	78	2.93
Mar	30	36	1.62	13	17	1.30	109	117	2.33	61	71	2.82
Apr	31	35	1.49	13	16	0.99	104	117	4.36	58	67	3.08
May	29	35	1.79	10	15	1.70	99	115	5.31	59	74	4.69
Jun	28	33	1.56	9	14	1.42	95	116	6.54	56	72	4.86
Jul	24	31	1.97	10	12	0.63	70	92	7.45	51	60	2.48
Aug	21	26	1.55	9	12	0.94	61	71	2.62	39	47	2.62
Sep	21	26	1.41	9	12	1.05	59	65	2.11	40	47	1.98
Oct	20	31	3.52	9	13	1.32	54	100	16.77	34	57	7.66
Nov	26	49	7.27	11	19	2.55	106	219	40.16	54	97	14.52
Dec	24	29	1.64	8	14	1.80	72	118	13.57	43	57	4.04
NAAQS*	**80.00**			**80.00**			**100.00**			**60.00**		

*National Ambient Air Quality Standard, Ministry of Environment, Forest & Climate Change, Government of India, 2009.

TABLE 4.5 (D): AMBIENT AIR QUALITY OF BARDHAMAN WEST FOR IMPLEMENTATION OF LOSS REDUCTION PROJECT UNDER RDSS

Months	NO2(µg/m³)			SO2(µg/m³)			PM10(µg/m³)			PM2.5 µg/m³		
	Min	Max	SD	Min	Max	SD	Min	Max	SD	Min	Max	SD
Station: Bidhannagar												
2022												
Jan	27	32	1.41	11	14	1.15	116	129	4.06	60	71	3.06
Feb	27	33	2.17	12	17	1.69	120	126	2.12	60	74	5.10
Mar	25	32	1.89	2	14	3.27	93	119	7.95	63	76	3.59
Apr	29	33	1.40	11	17	1.52	113	134	5.85	62	73	3.28
May	27	31	1.22	11	14	0.93	113	130	5.57	63	74	3.43
Jun	28	32	1.50	13	18	1.55	107	127	6.00	63	76	4.35
Jul	19	30	3.13	3	6	0.92	50	70	5.54	32	48	4.57
Aug	16	27	3.69	2	7	1.41	43	67	7.18	26	43	5.43
Sep	16	27	3.91	2	5	1.39	39	67	8.50	22	40	5.43
Oct	23	31	3.06	3	11	3.12	48	83	10.52	34	51	5.38
Nov	27	40	3.73	10	21	4.67	94	151	18.00	42	92	13.68
Dec	25	33	2.86	7	19	4.44	73	131	17.72	37	71	12.25

2023												
Jan	27	33	1.65	11	16	1.73	102	126	7.52	62	73	3.42
Feb	27	32	1.56	10	13	1.00	95	109	5.02	59	73	4.61
Mar	27	33	1.76	6	11	1.47	84	105	5.31	56	72	4.87
Apr	28	35	2.03	8	12	1.09	88	110	6.44	57	72	4.68
May	31	38	2.40	10	14	1.42	95	120	7.58	62	76	4.63
Jun	22	30	2.63	3	10	1.91	66	95	10.39	46	63	4.86
Jul	19	30	3.13	3	6	0.92	50	70	5.54	32	48	4.57
Aug	16	27	3.69	2	7	1.41	43	67	7.18	26	43	5.43
Sep	16	27	3.91	2	5	1.39	39	67	8.50	22	40	5.43
Oct	23	31	3.06	3	11	3.12	48	83	10.52	34	51	5.38
Nov	27	40	3.73	10	21	4.67	94	151	18.00	42	92	13.68
Dec	25	33	2.86	7	19	4.44	73	131	17.72	37	71	12.25
NAAQS*	**80.00**			**80.00**			**100.00**			**60.00**		

*National Ambient Air Quality Standard, Ministry of Environment, Forest & Climate Change, Government of India, 2009

4.1.10 Ambient Noise

The ambient noise level of the majority of the project area showed a value ranging from 55 to 65 dB which is well within prescribed limits.

4.2 SOCIAL BASELINE

4.2.1 Demography

The block-wise demographic profile of Bardhaman West district has been presented in Table 4.6. The analysis reveals that the total number of households and population in the district is 925173 and 4003465 respectively (Figure 4.10A and 4.10B). The study further indicates that out of the total population, 51% are males and 49% are females. The social stratification of Bardhaman West district indicates that the SC population constitutes 29.4% of the total population whereas the ST population constitutes 5.5% of the total population of Bardhaman West district.

Population

The rural population of the Bardhaman West district is 4,003,465. The total male population of Bardhaman West district is nearly about 2033915 which is 50.80% of the total rural population, whereas, the female population is around 1969550, which is roughly 49.20% of the overall rural population of the Bardhaman West district.

TABLE 4.6: BLOCK-WISE DISTRIBUTION OF DEMOGRAPHIC PROFILE OF BARDHAMAN WEST DISTRICT

Sl. No.	Block	Total									
		Households	Population	Male	%	Female	%	SC	%	ST	%
1	Salanpur	35182	163057	83796	51.39	79261	48.61	39294	24.10	17084	10.48
2	Barabani	25900	127542	65912	51.68	61630	48.32	37542	29.44	18903	14.82
3	Jamuria	26102	123176	64578	52.43	58598	47.57	37793	30.68	10272	8.34
4	Raniganj	21653	106441	55835	52.46	50606	47.54	37491	35.22	9982	9.38
5	Ondal	39704	186915	98149	52.51	88766	47.49	52518	28.10	7628	4.08
6	Pandabeswar	34248	161891	84651	52.29	77240	47.71	49189	30.38	10821	6.68
7	Faridpur Durgapur	25591	115924	60478	52.17	55446	47.83	36641	31.61	8073	6.96
8	Kanksa	40438	178125	91350	51.28	86775	48.72	62329	34.99	18239	10.24

FIGURE 4.9 (A): BLOCK WISE DISTRIBUTION OF HOUSEHOLDS IN BARDHAMAN WEST DISTRICT

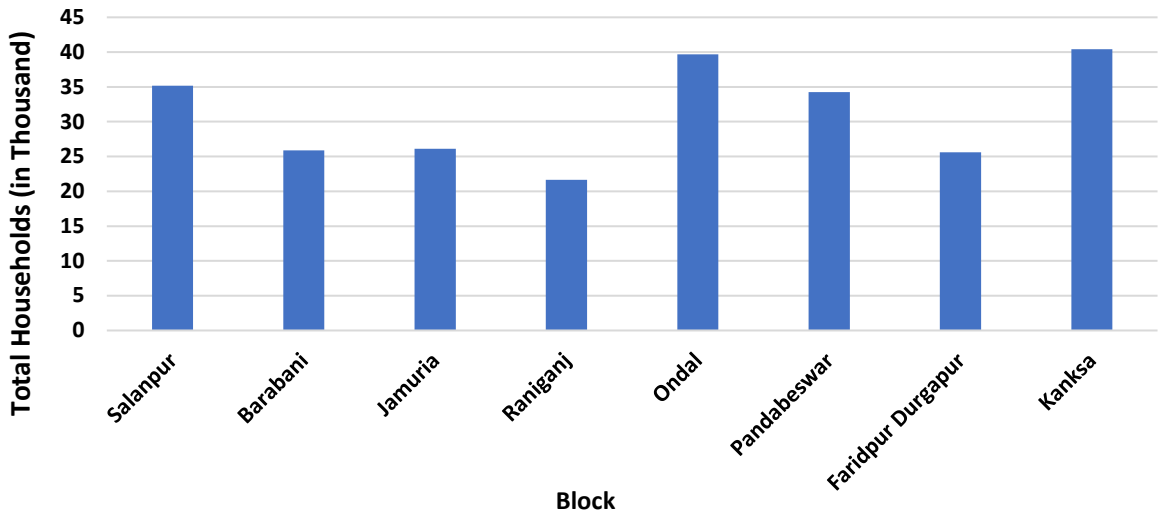


FIGURE 4.9 (B): BLOCK WISE DISTRIBUTION OF POPULATION IN BARDHAMAN WEST DISTRICT

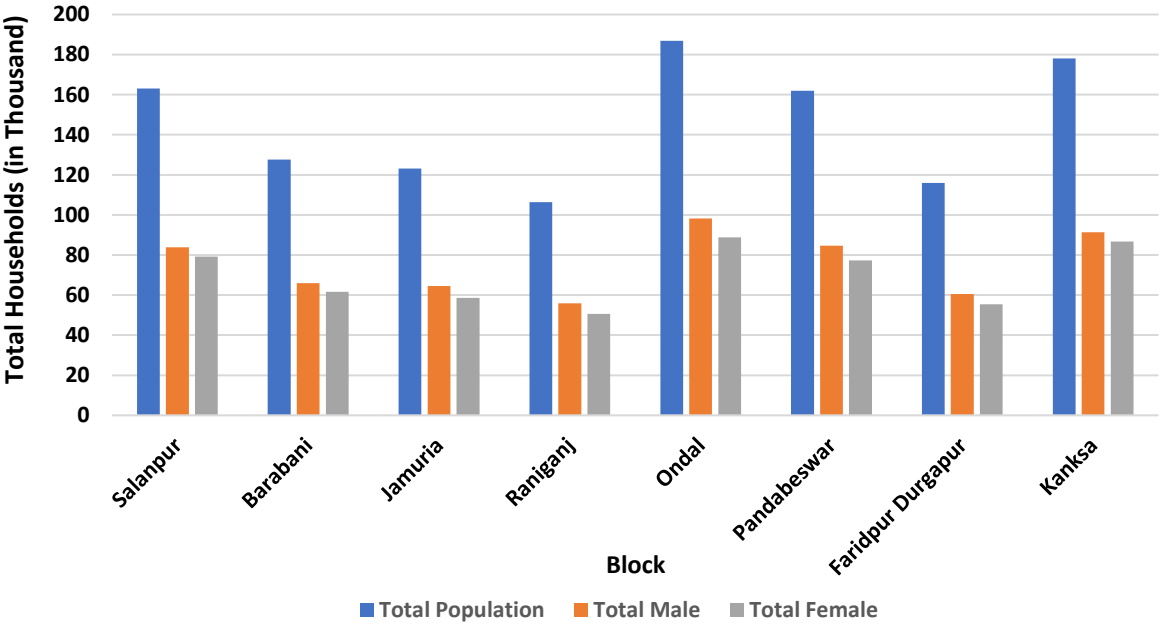


FIGURE 4.9 (C): BLOCK WISE DISTRIBUTION OF TOTAL POPULATION IN BARDHAMAN WEST DISTRICT

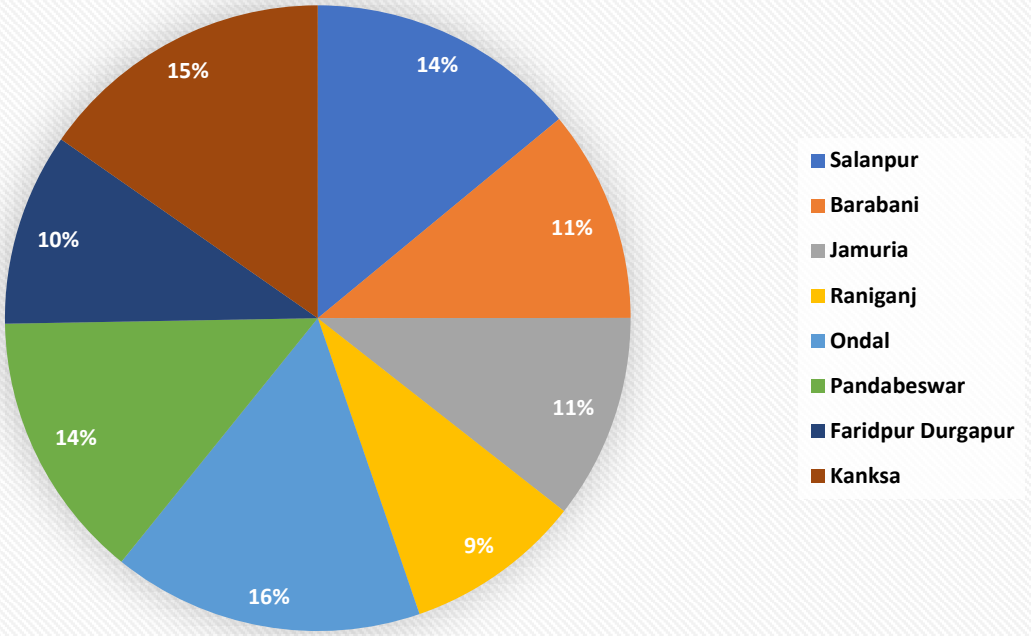


FIGURE 4.9 (D): GENDER WISE DISTRIBUTION OF POPULATION IN BARDHAMAN WEST DISTRICT

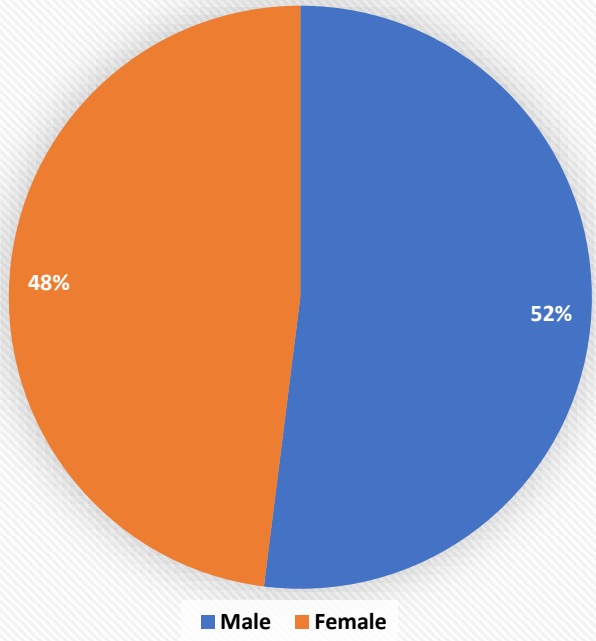


FIGURE 4.9 (E): SOCIAL STRATIFICATION IN BARDHAMAN WEST DISTRICT

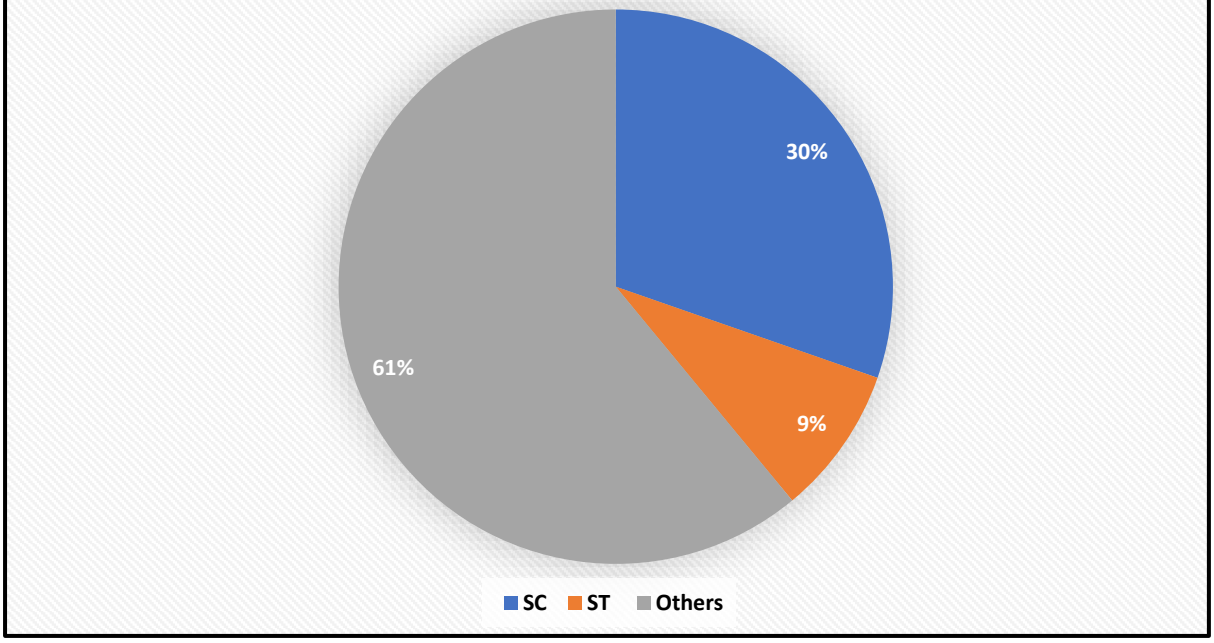


FIGURE 4.9 (F): BLOCK WISE DISTRIBUTION OF SC & ST IN BARDHAMAN WEST DISTRICT

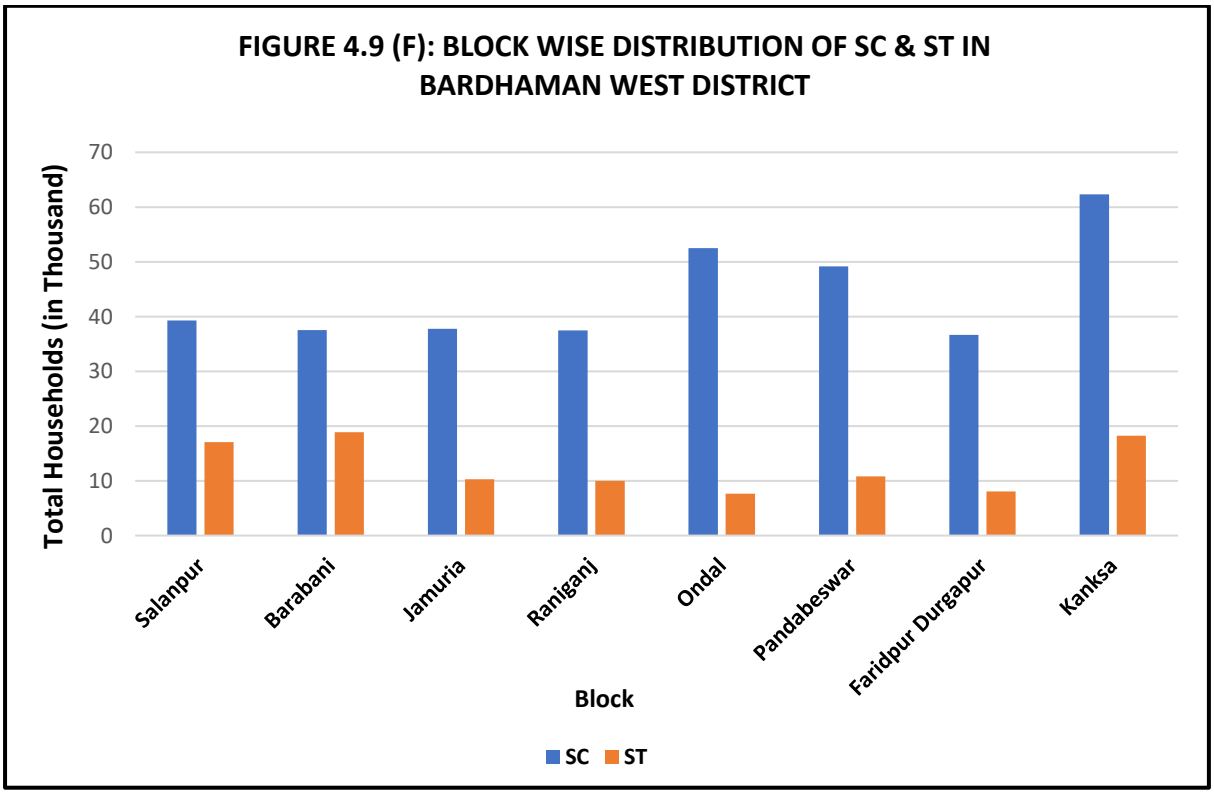
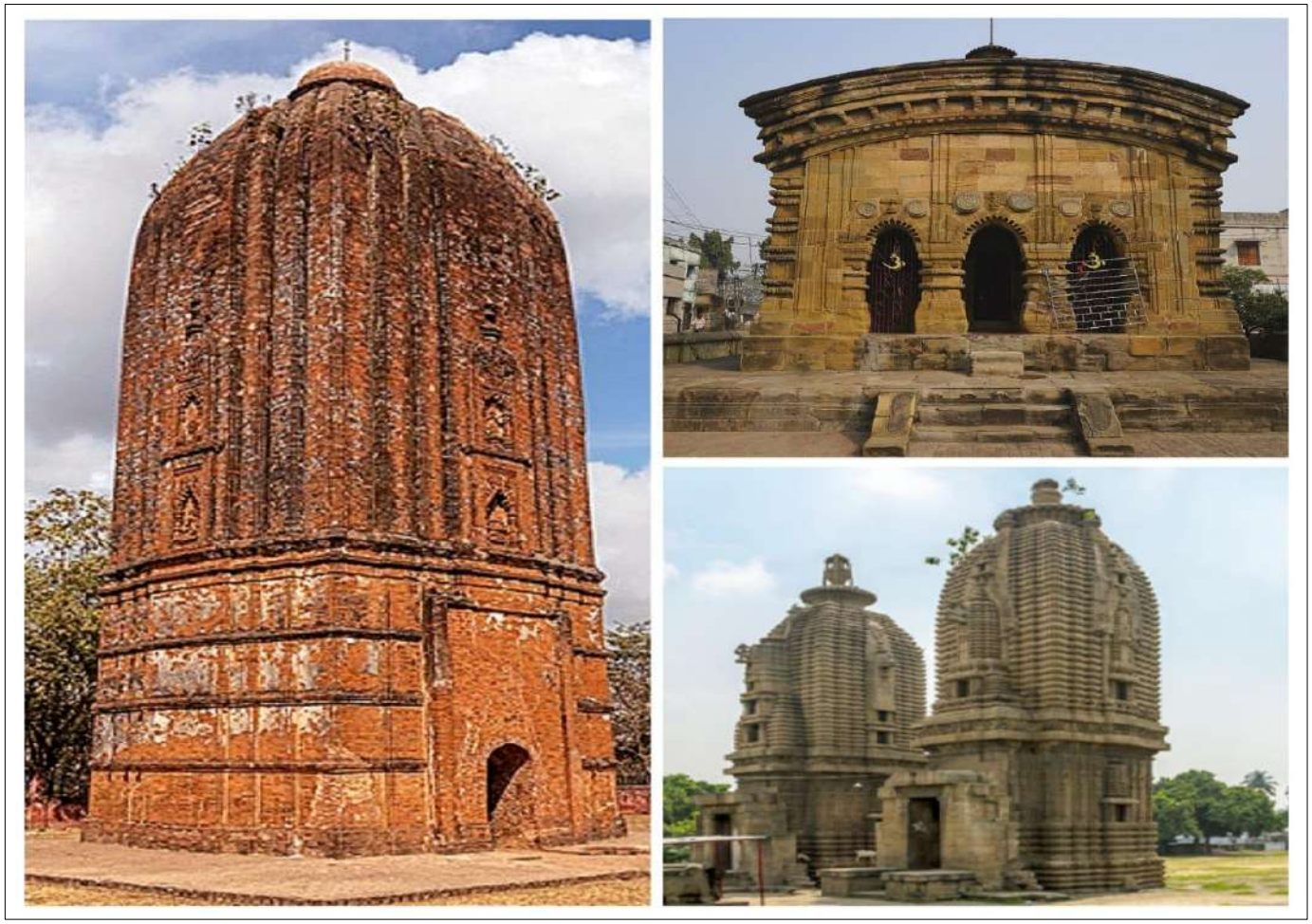


FIGURE 4.10: EXISTING CULTURAL RESOURCES OF BARDHAMAN WEST DISTRICT



5.0 INITIAL ENVIRONMENTAL EXAMINATION FOR CONVERSION OF LTOH TO AB CABLING

5.1 E&S SCREENING FOR CONVERSION OF LTOH TO AB CABLING

The Environmental and Social (E&S) screening for the conversion of Low Tension Overhead (LTOH) to Aerial Bundled (AB) cabling involves evaluating the potential environmental and social impacts associated with the programme. The IEE provides a comprehensive analysis that aids decision-makers in understanding the full scope of the project's potential impacts. Conversion of LTOH to AB cabling to reduce transmission losses, improve safety, and minimize maintenance issues. Proximity to protected areas, forests, water bodies, or ecologically sensitive zones and cultural resources (i.e. 100-300m buffer area) has been selected. Respective TKCs of WBSEDCL will run the works for subactivities under component-A (i.e. Conversion of LTOH to AB Cable) as guided in the screening process and take appropriate mitigation measures to reduce the RoW/COI effect wherever possible for the RDSS programme. The screening process also considers legal and regulatory compliance, identifying any environmental clearances or permits needed and ensuring adherence to social safeguard policies. This screening ensures that potential impacts are identified early and that appropriate mitigation measures are implemented.

For Bardhaman West district, the Initial Environmental Examination for Conversion of LTOH to AB Cabling has been taken to examine the existing distribution network falling within the buffer areas of environmentally sensitive receptors (Protected Forest, Reserve Forest, IBA, KBA, Wetland, etc.) and cultural resources (UNESCO World Heritage Sites, ASI Protected Monuments, State Protected Monuments, etc.) where it ensures that risks are recognized early, allowing for proactive management through mitigation measures.

Figure 5.1 presents the LTOH distribution network of the entire Bardhaman West district.

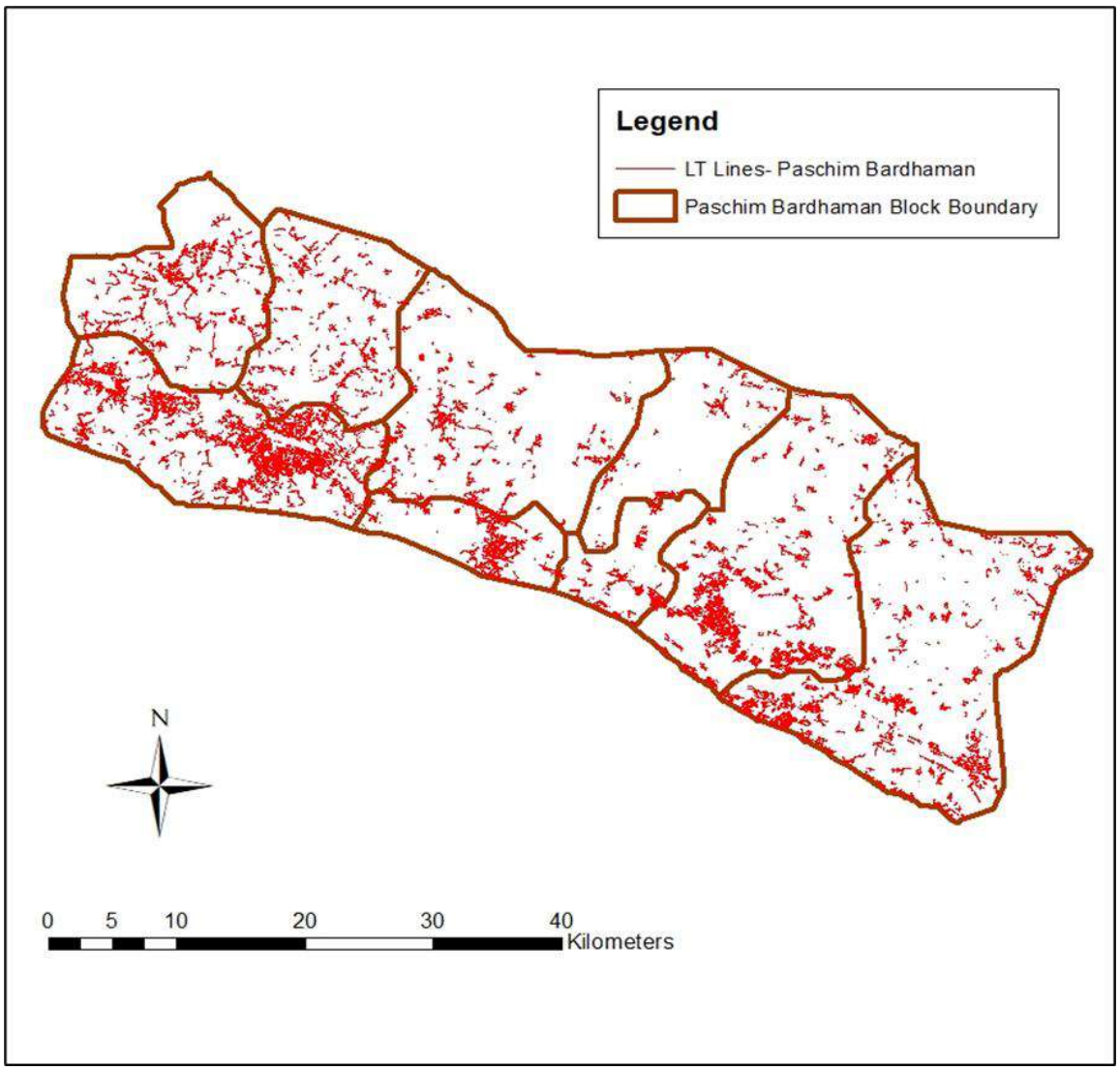


FIGURE 5.1: EXISTING LTOH DISTRIBUTION NETWORK OF BARDHAMAN WEST DISTRICT

5.2 BLOCK-WISE ENVIRONMENTAL & SOCIAL SCREENING OF BARDHAMAN WEST DISTRICT

During the Initial Environmental Examination (IEE) for conversion of the existing LTOH Line into AB Cable emphasis was given on the identification of the location of various environmental sensitive receptors viz reserve forest, protected forest, KBA/IBA, natural habitat, etc as well as ASI and State Protected Monuments to earmark buffer area (i.e. 100-300 m) around the identified environmental sensitive receptor/monument). The existing trees within the RoW/COI of the existing LTOH line are being identified to minimize the likely impact of proposed project activities, if any. The location of water bodies (i.e. river crossing, pond, water reservoir/lake, etc) within the 30 m on both sides of the existing LTOH line are also being identified to minimize the likely impact of proposed project activities, if any. The social setting along with likely social issues i.e. encroachment, mobile vendor, loss of livelihood, etc was also

considered during IEE. The initial environmental and social screening along the existing LTOH line of Bardhaman West district has been presented in Figure 5.2 to Figure 5.10.

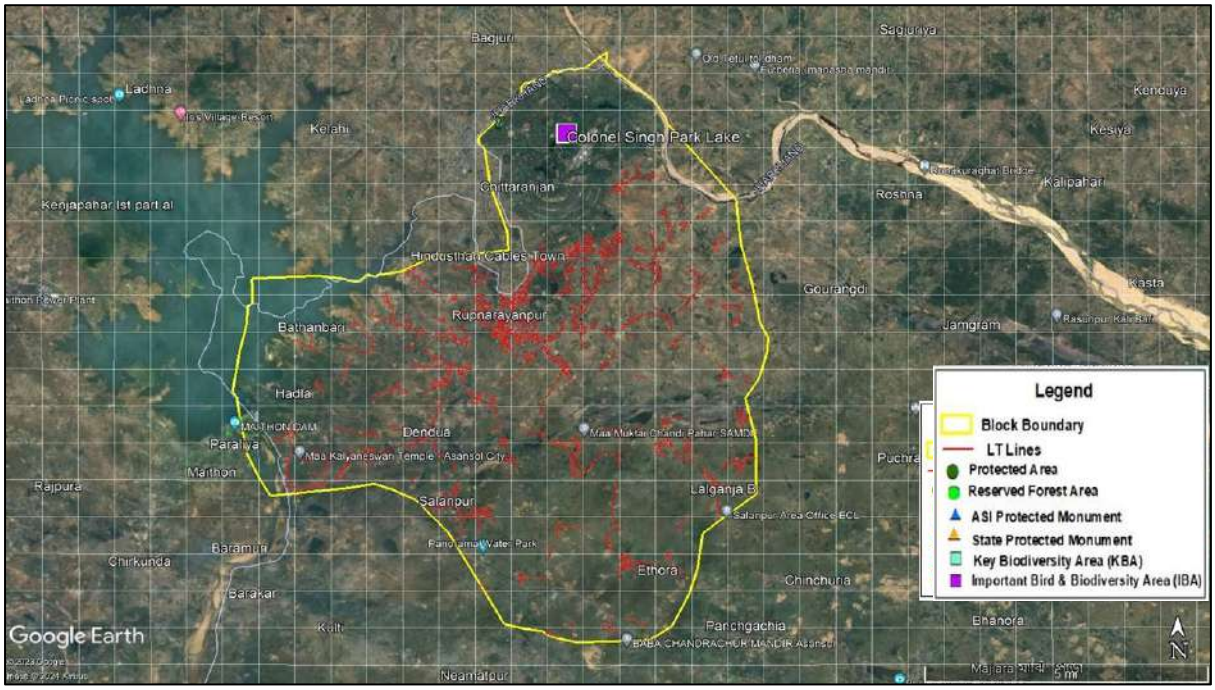


FIGURE 5.2: E&S SCREENING ALONG EXISTING LTOH LINE OF SALANPUR BLOCK UNDER BARDHAMAN WEST DISTRICT

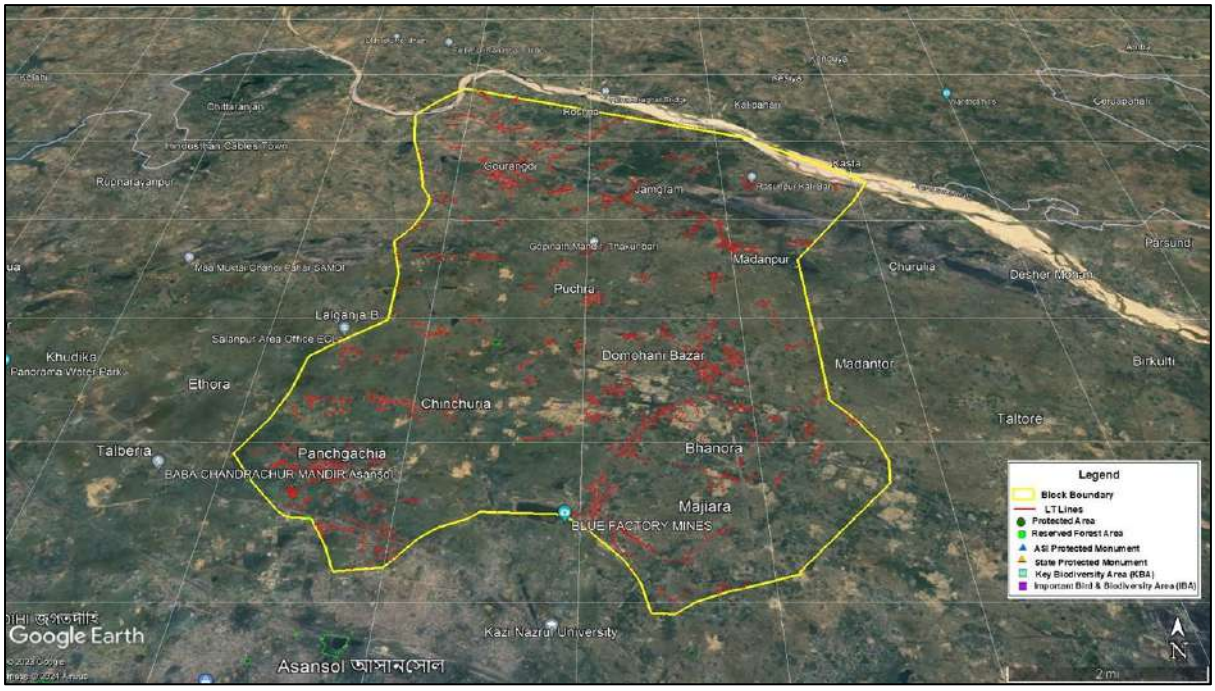


FIGURE 5.3: E&S SCREENING ALONG EXISTING LTOH LINE OF BARABANI BLOCK UNDER BARDHAMAN WEST DISTRICT

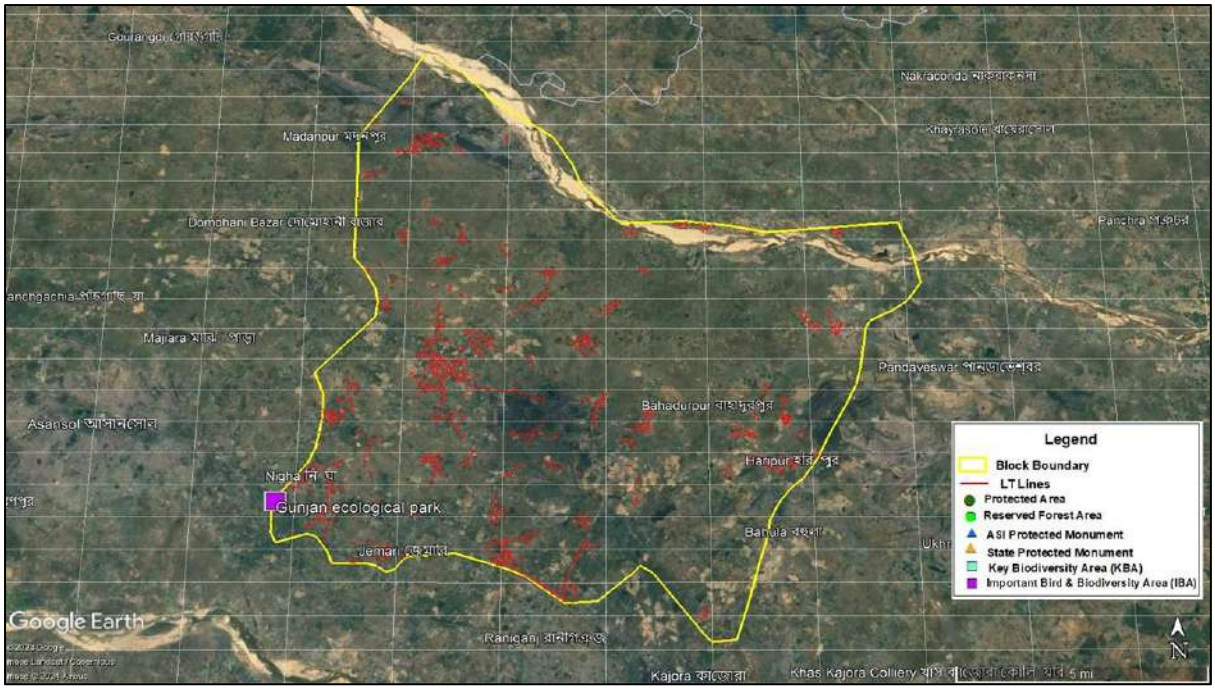


FIGURE 5.4: E&S SCREENING ALONG EXISTING LTOH LINE OF JAMURIA BLOCK UNDER BARDHAMAN WEST DISTRICT

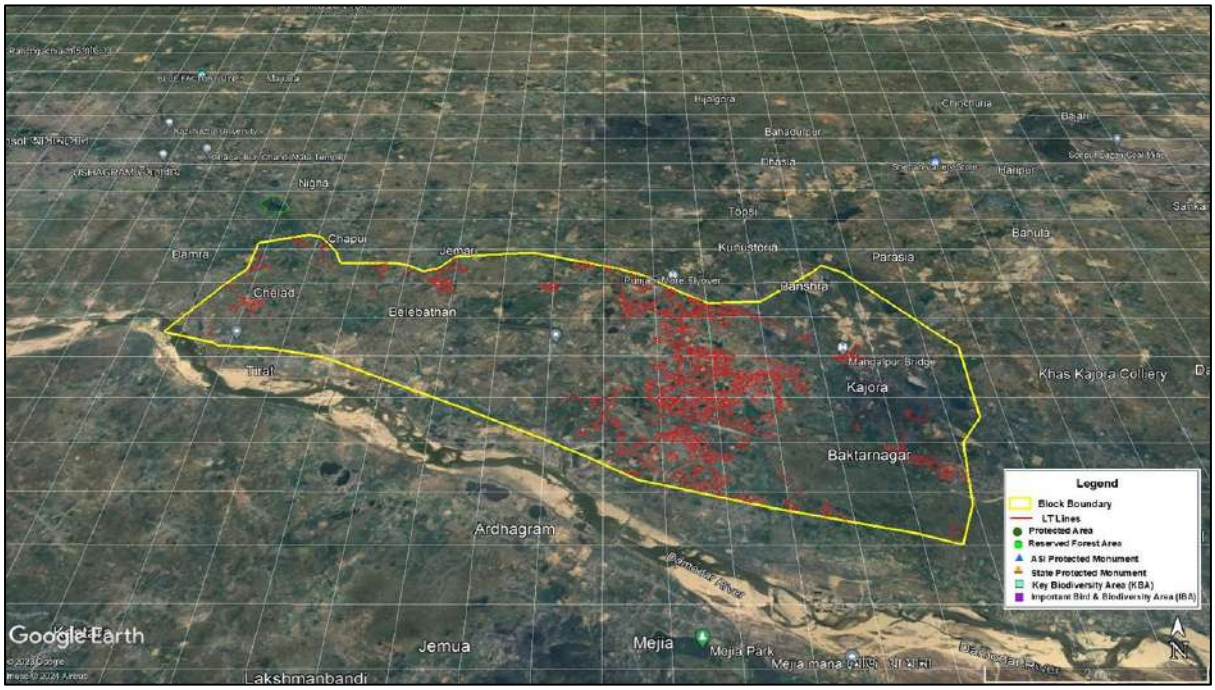


FIGURE 5.5: E&S SCREENING ALONG EXISTING LTOH LINE OF RANIGANJ BLOCK UNDER BARDHAMAN WEST DISTRICT

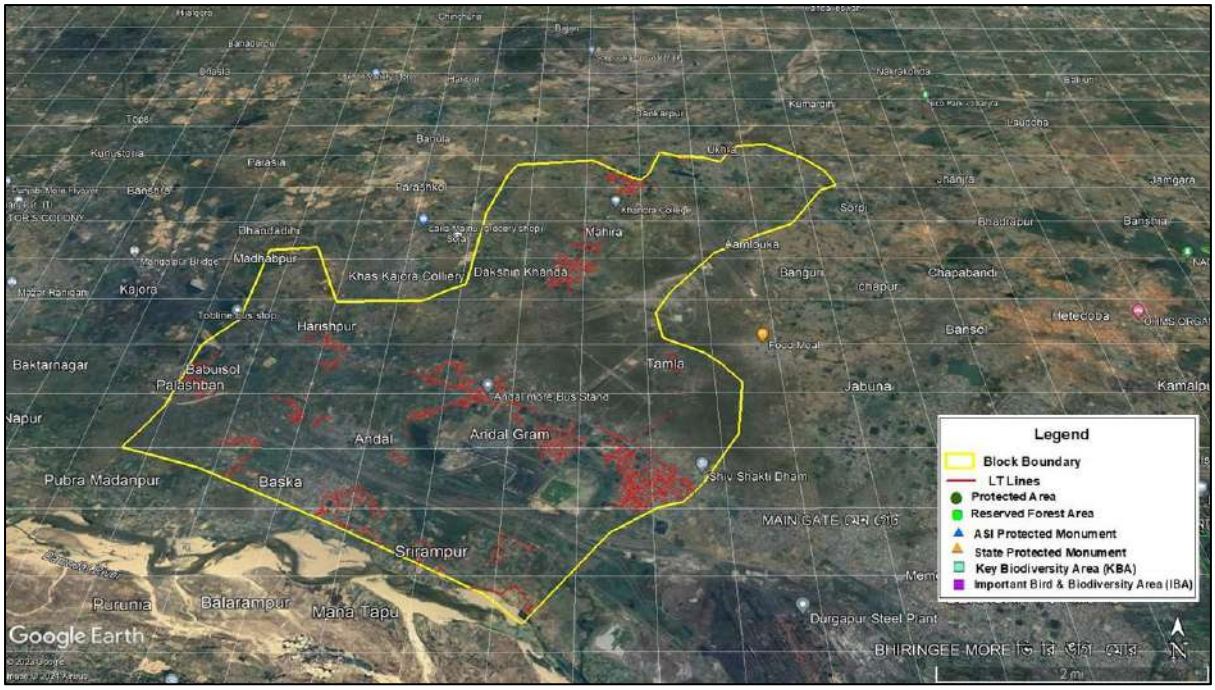


FIGURE 5.6: E&S SCREENING ALONG EXISTING LTOH LINE OF ONDAL BLOCK UNDER BARDHAMAN WEST DISTRICT

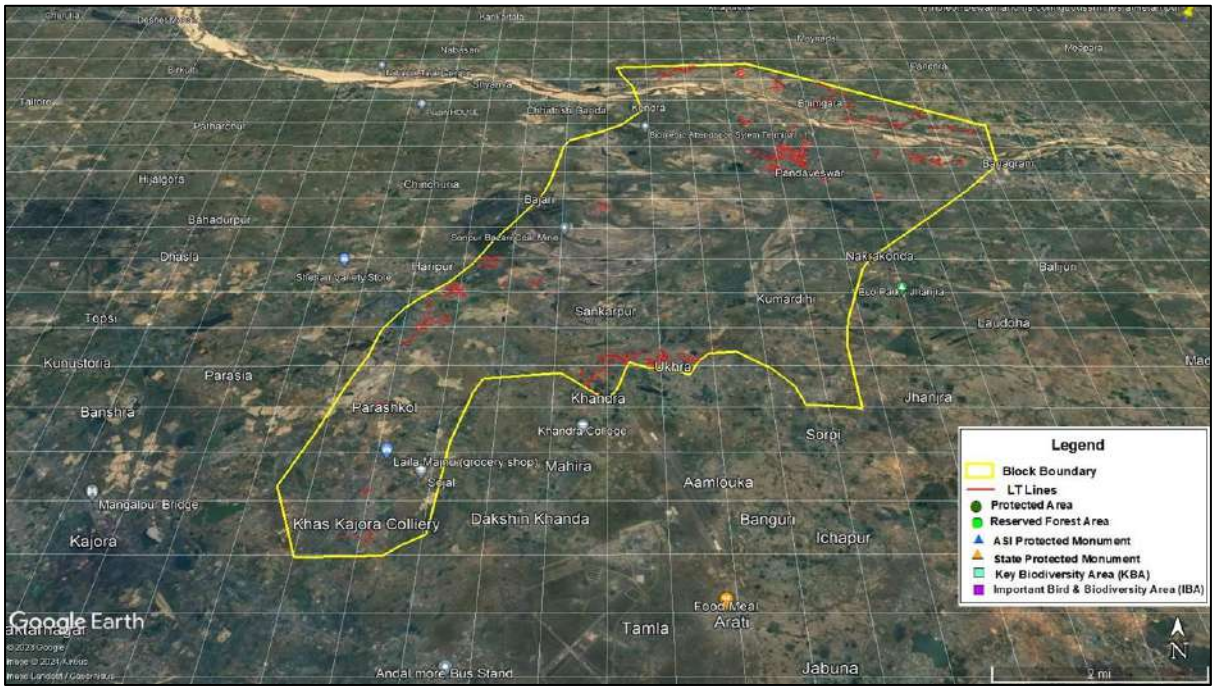


FIGURE 5.7: E&S SCREENING ALONG EXISTING LTOH LINE OF PANDABESWAR BLOCK UNDER BARDHAMAN WEST DISTRICT

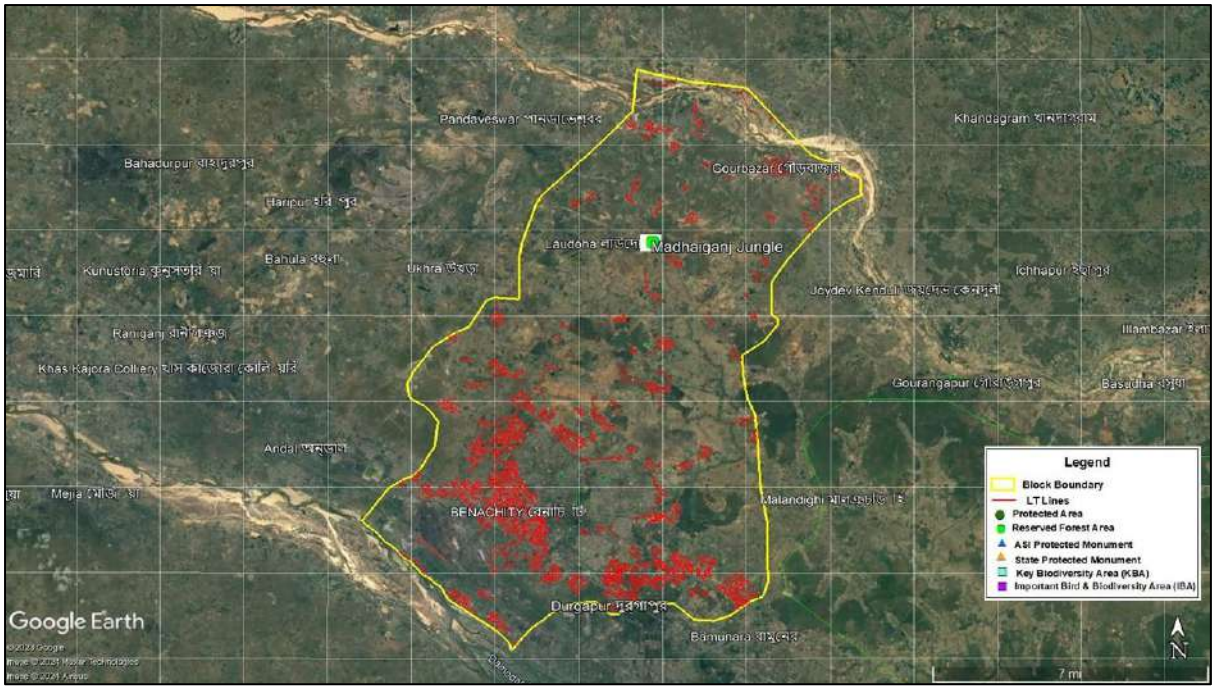


FIGURE 5.8: E&S SCREENING ALONG EXISTING LTOH LINE OF FARIDPUR-DURGAPUR BLOCK UNDER BARDHAMAN WEST DISTRICT

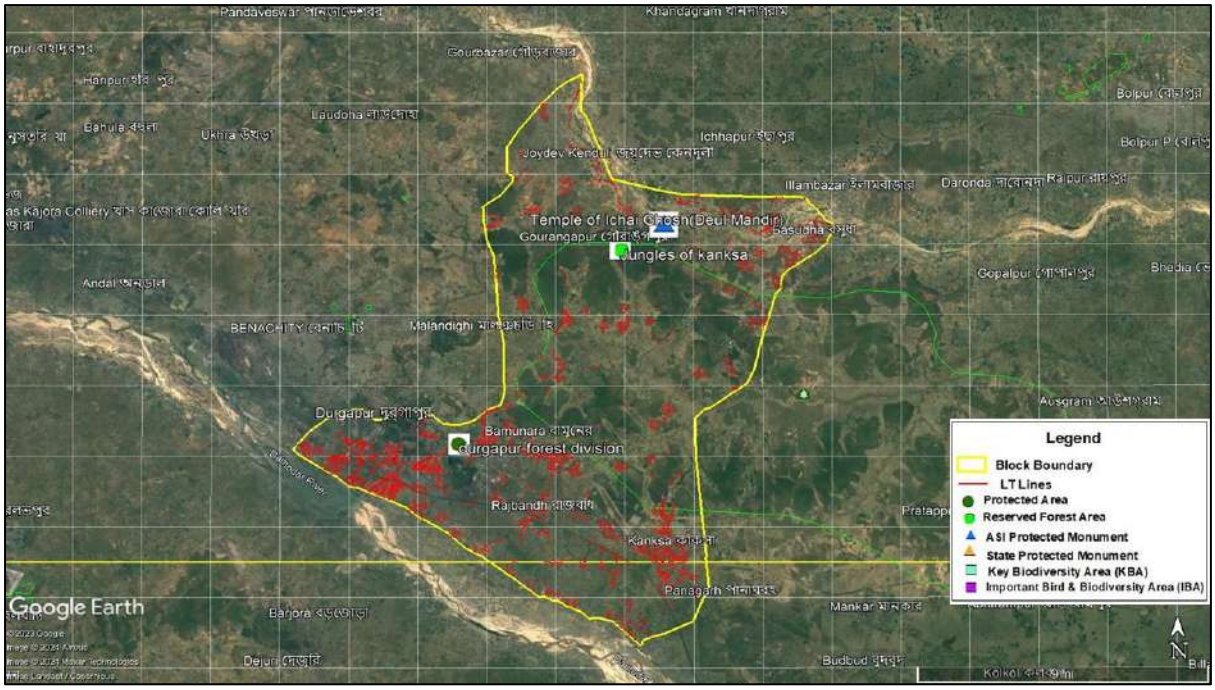


FIGURE 5.9: E&S SCREENING ALONG EXISTING LTOH LINE OF KANKSA BLOCK UNDER BARDHAMAN WEST DISTRICT

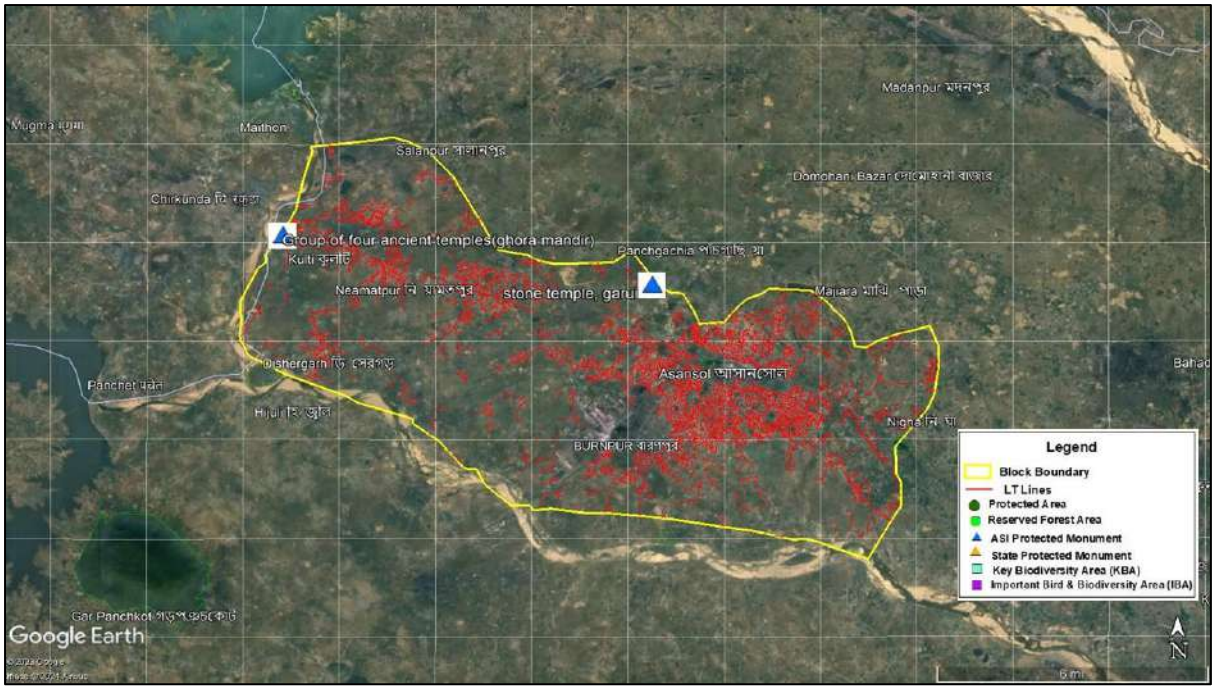


FIGURE 5.10: E&S SCREENING ALONG EXISTING LTOH LINE OF ASANSOL BLOCK UNDER BARDHAMAN WEST DISTRICT

5.3 ENVIRONMENTAL SENSITIVE RECEPTOR & CULTURAL RESOURCES

The block-wise distribution of various environmental receptors in Bardhaman West district is depicted in Figure 5.11. Table 5.1 presents the block-wise detail of the presence of environmentally sensitive receptors in the Bardhaman West district. During the Initial Environmental Examination (IEE), it was observed that there is a protected forest forest in Kanksa block. On the other hand, reserved forests are located in the blocks of Kanksa and Durgapur respectively and Important Bird & Biodiversity (IBA) areas are located in the blocks of Kanksa and Durgapur (as presented in Table 5.1).

The analysis further reveals that there are ASI protected monument in Asansol and Kanksa. block. Hence, from the analysis it can be concluded that no environmentally sensitive receptors are located in the blocks of Raniganj, Barabani, and Andal.

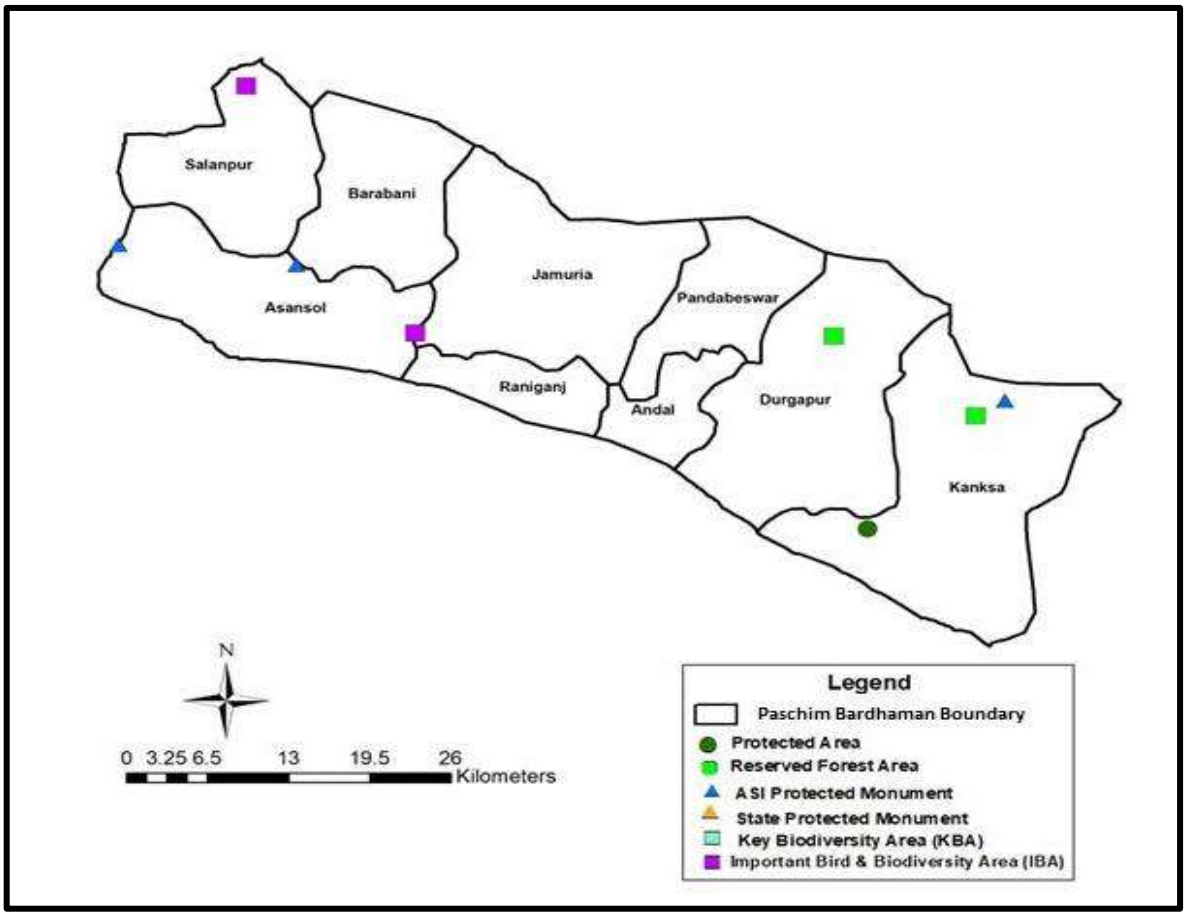


FIGURE 5.11: BLOCK-WISE DISTRIBUTION OF ENVIRONMENTAL SENSITIVE RECEPTORS UNDER BARDHAMAN WEST DISTRICT

TABLE 5.1: BLOCK-WISE SCREENING OF ENVIRONMENTAL SENSITIVE RECEPTORS IN BARDHAMAN WEST DISTRICT

Sl. No.	Subdivision	Block	Reserved Forest	Protected Forest	KBA	IBA	UNESCO World Heritage Site	ASI protected monuments	State protected monuments
1	Asansol	Raniganj	No	No	No	No	No	No	No
2		Jamuria	No	No	No	Yes	No	No	No
3		Barabani	No	No	No	No	No	No	No
4		Salanpur	No	No	No	Yes	No	No	No
5		Asansol	No	No	No	Yes	No	Yes	No
6	Durgapur	Durgapur-Faridpur	Yes	No	No	No	No	No	No
7		Andal	No	No	No	No	No	No	No
8		Kanksa	Yes	Yes	No	No	No	Yes	No

Table 5.2 presents the detail of the location and area of the various environmental sensitive receptors under the Bardhaman West district.

TABLE 5.2: LOCATION AND DETAIL OF ENVIRONMENTAL SENSITIVE RECEPTORS OF BARDHAMAN WEST DISTRICT

Sl. No.	Environmental Sensitive Receptors	Sub-division	Block	Name	Area	Co-ordinates	
						Latitude	Longitude
1	**Protected Area**	Durgapur	Kanksa	Durgapur Forest Division	0.10Ha	23°30'20.60"N	87°21'11.04"E
2	**Reserved forest**	Durgapur	Kanksa	Jungles of Kanksa	1,845Ha	23°35'49.54"N	87°25'51.79"E
			Durgapur	Madhaiganj Forest	77.4Ha	23°39'42.45"N	87°19'42.94"E
3	**Important Bird Area (IBA)**	Asansol	Asansol	Bhuta Buri Mandir	2.11Ha	23°37'51.12"N	86°55'37.47"E
			Jamuria	Gunjan Ecological Park	29.7Ha	23°39'51.23"N	87° 1'38.05"E
			Salanpur	Colonel Singh Park	62.9Ha	23°51'49.93"N	86°54'19.31"E
4	**Key Biodiversity Areas (KBA)**	-	-	-	-	-	-
5	**UNESCO World Heritage Sites**	-	-	-	-	-	-
6	**ASI Protected Monuments**	Asansol	Asansol	Group of Four Temple (Ghora Mandir)	0.01Ha	23°44'7.96"N	86°48'48.72"E
			Asansol	Stone temple, garui	0.03Ha	23°43'7.88"N	86°56'29.50"E
		Durgapur	Kanksa	Temple of Ichai Ghosh	0.10Ha	23°36'33.92"N	87°27'7.17"E
7	**State Protected Monuments**	-	-	-	-	-	-

The block-wise location of eco-sensitive receptors and cultural resources identified within the influence area of the existing LTOH distribution network along with identified buffer area (100-300 m) from the boundary of concerned eco-sensitive receptors and historical & cultural areas including ASI monuments and World Heritage Site is presented in Figure 5.12 to 5.29.

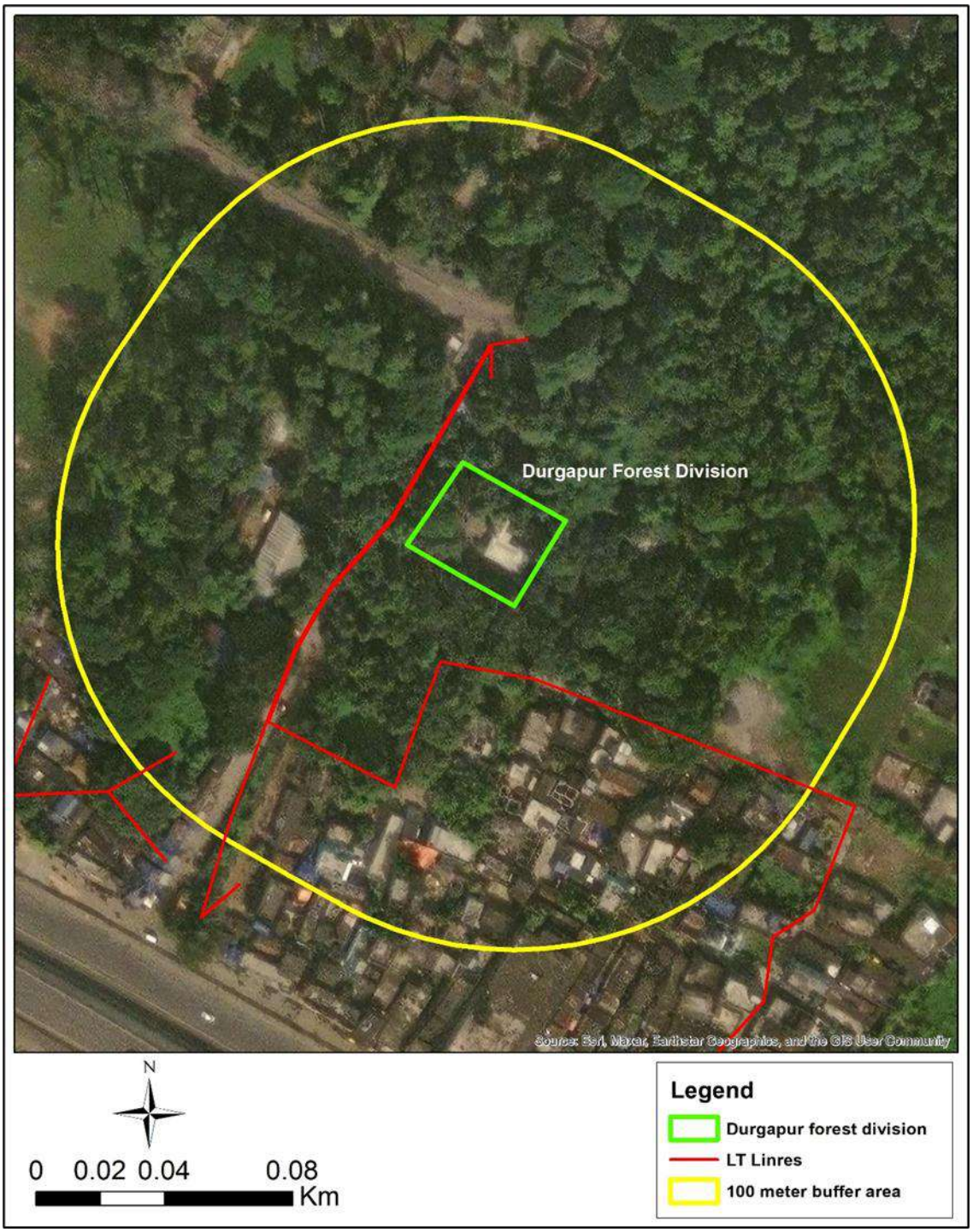


FIGURE 5.12: BUFFER ZONE ALONG THE ENVIRONMENTAL SENSITIVE RECEPTOR UNDER KANKSA BLOCK OF BARDHAMAN WEST DISTRICT

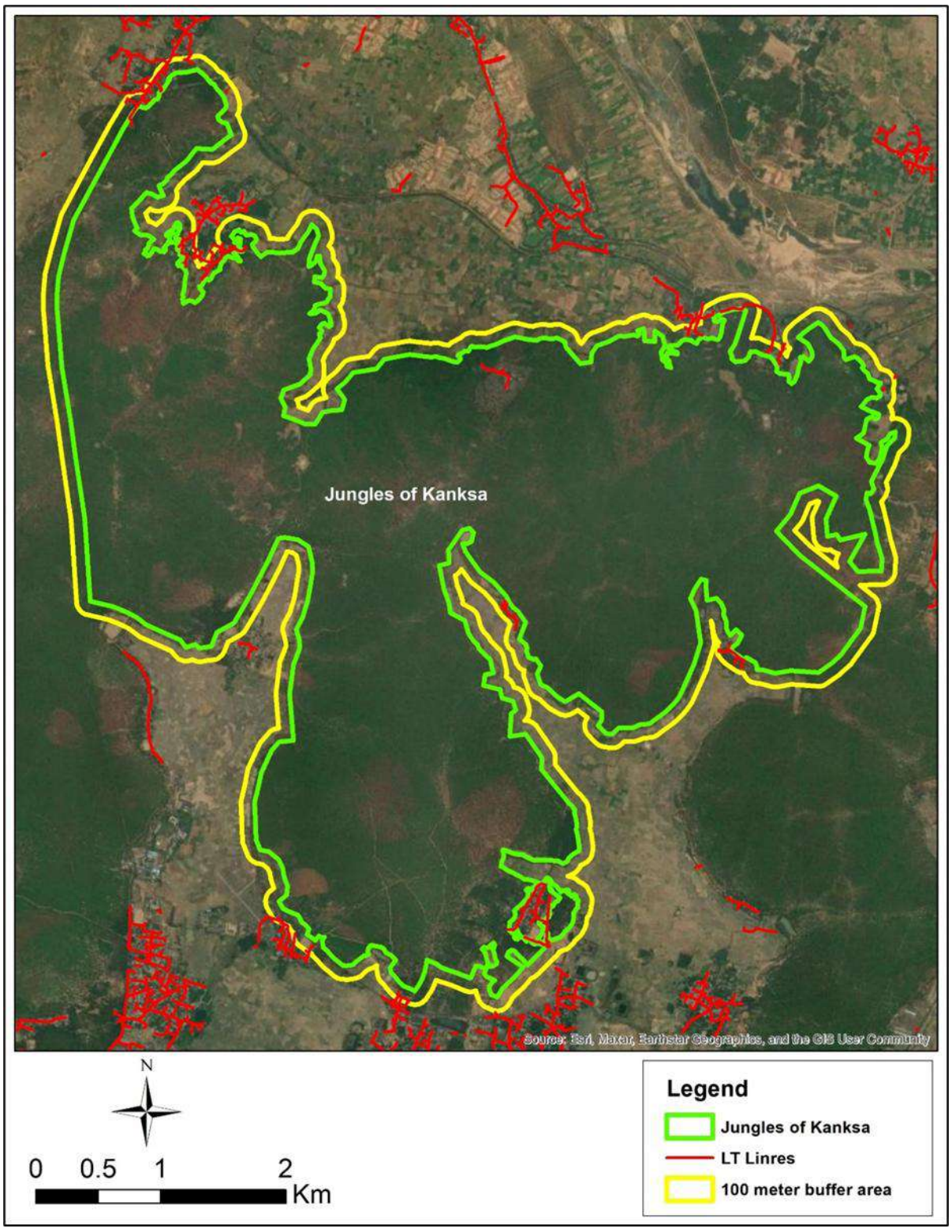


FIGURE 5.22: BUFFER ZONE ALONG THE ENVIRONMENTAL SENSITIVE RECEPTOR UNDER KANKSA BLOCK OF BARDHAMAN WEST DISTRICT

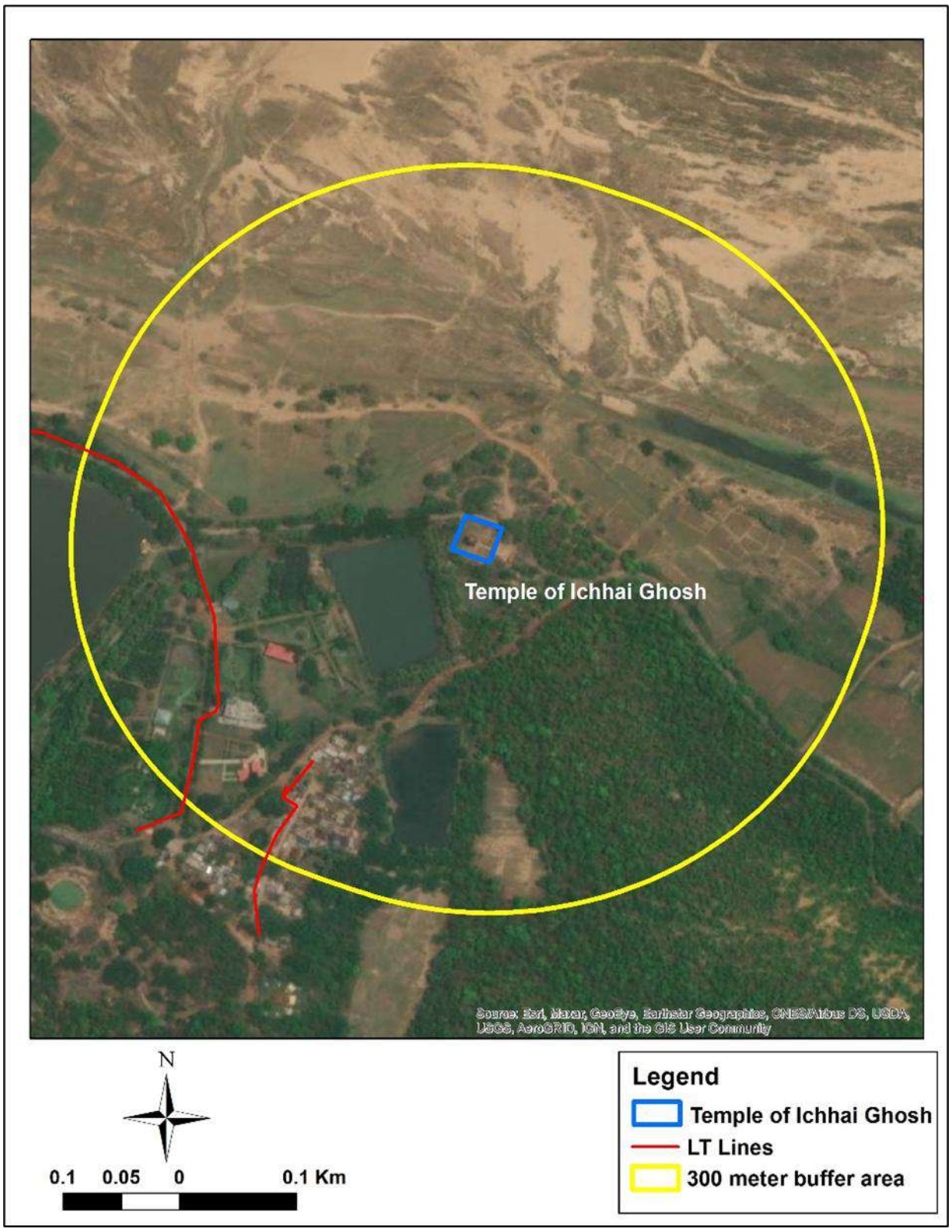


FIGURE 5.23: BUFFER ZONE ALONG THE CULTURAL RESOURCE UNDER KANKSA BLOCK OF BARDHAMAN WEST DISTRICT

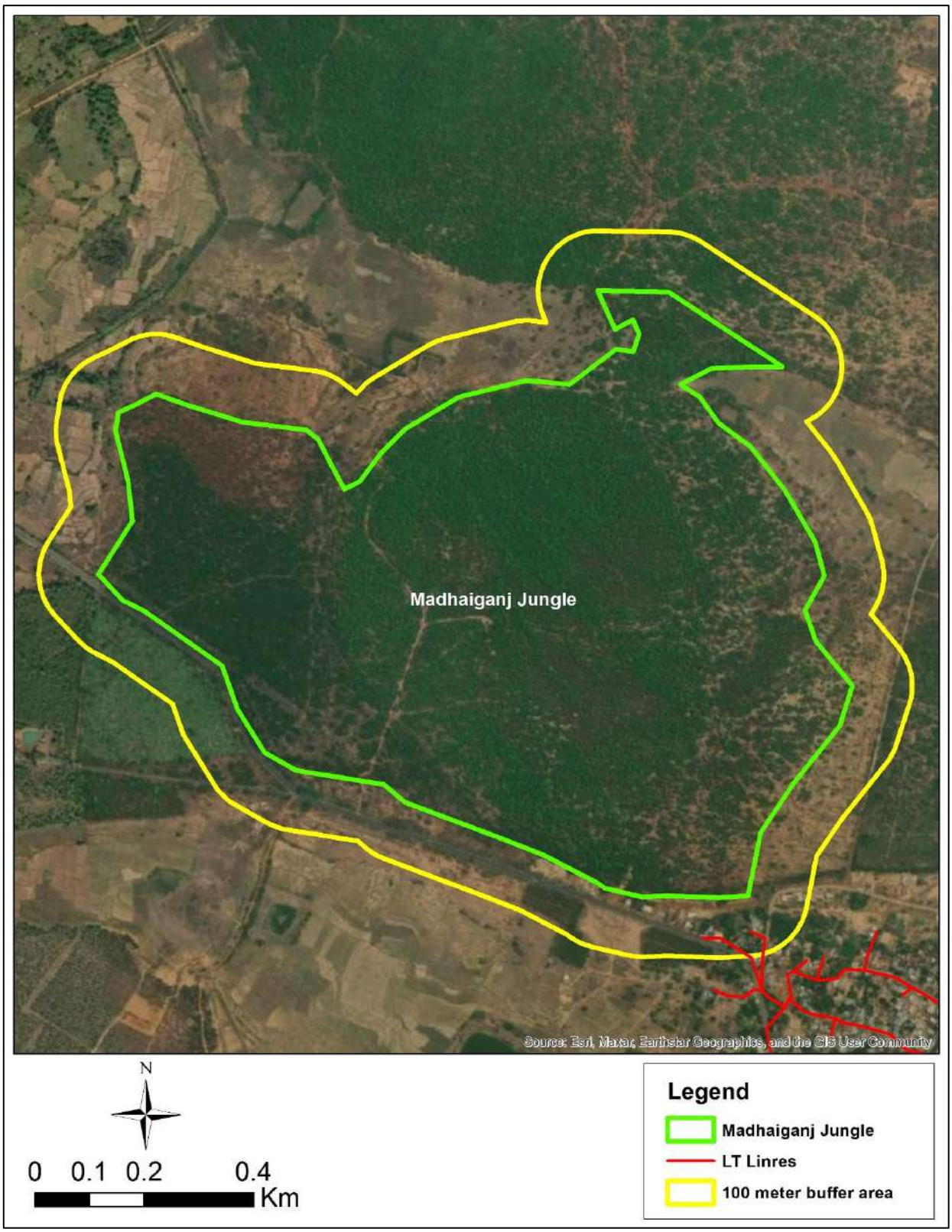


FIGURE 5.24: BUFFER ZONE ALONG THE ENVIRONMENTAL SENSITIVE RECEPTOR UNDER DURGAPUR BLOCK OF BARDHAMAN WEST DISTRICT

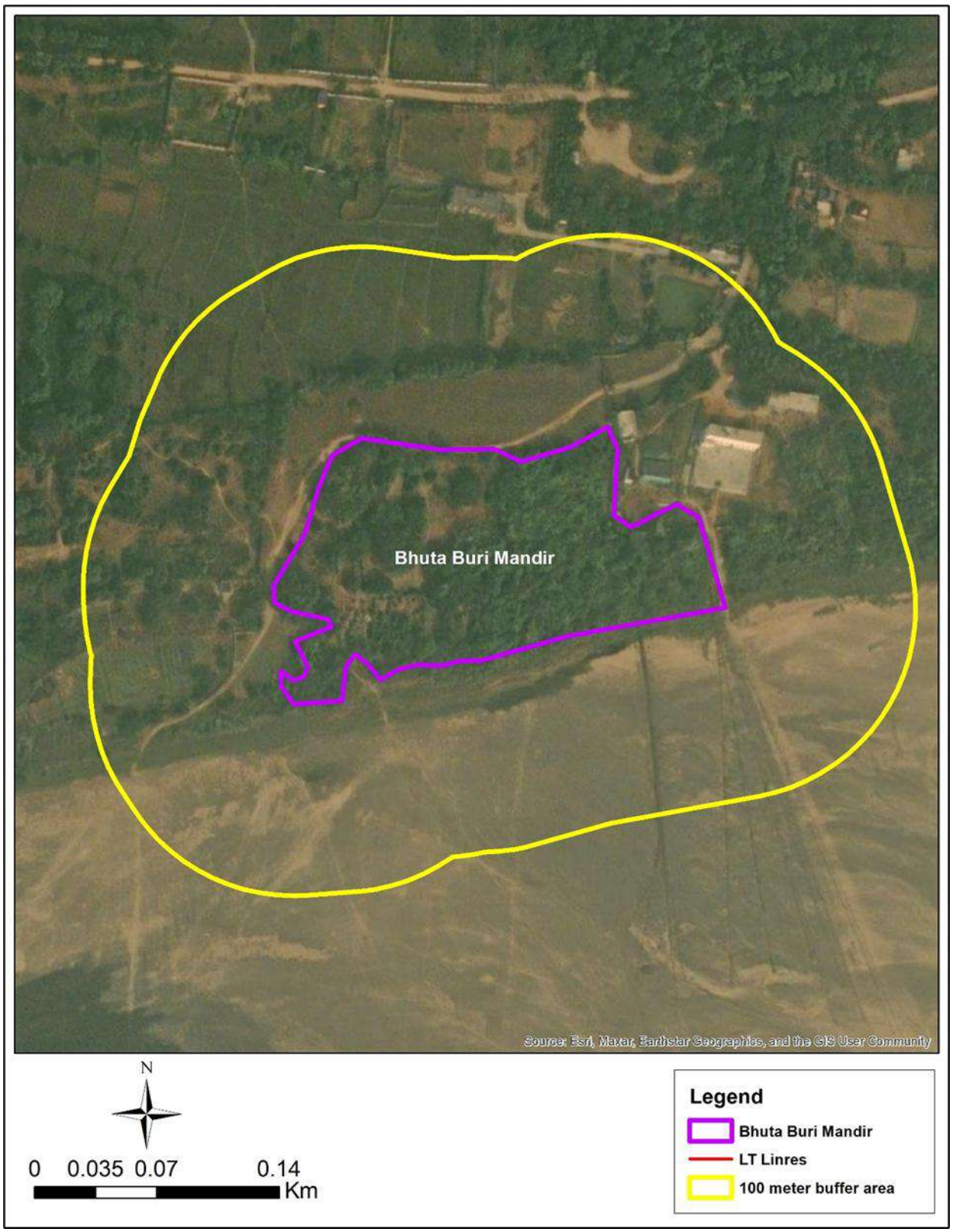


FIGURE 5.25: BUFFER ZONE ALONG THE CULTURAL RESOURCE UNDER HARIPAL BLOCK OF BARDHAMAN WEST DISTRICT

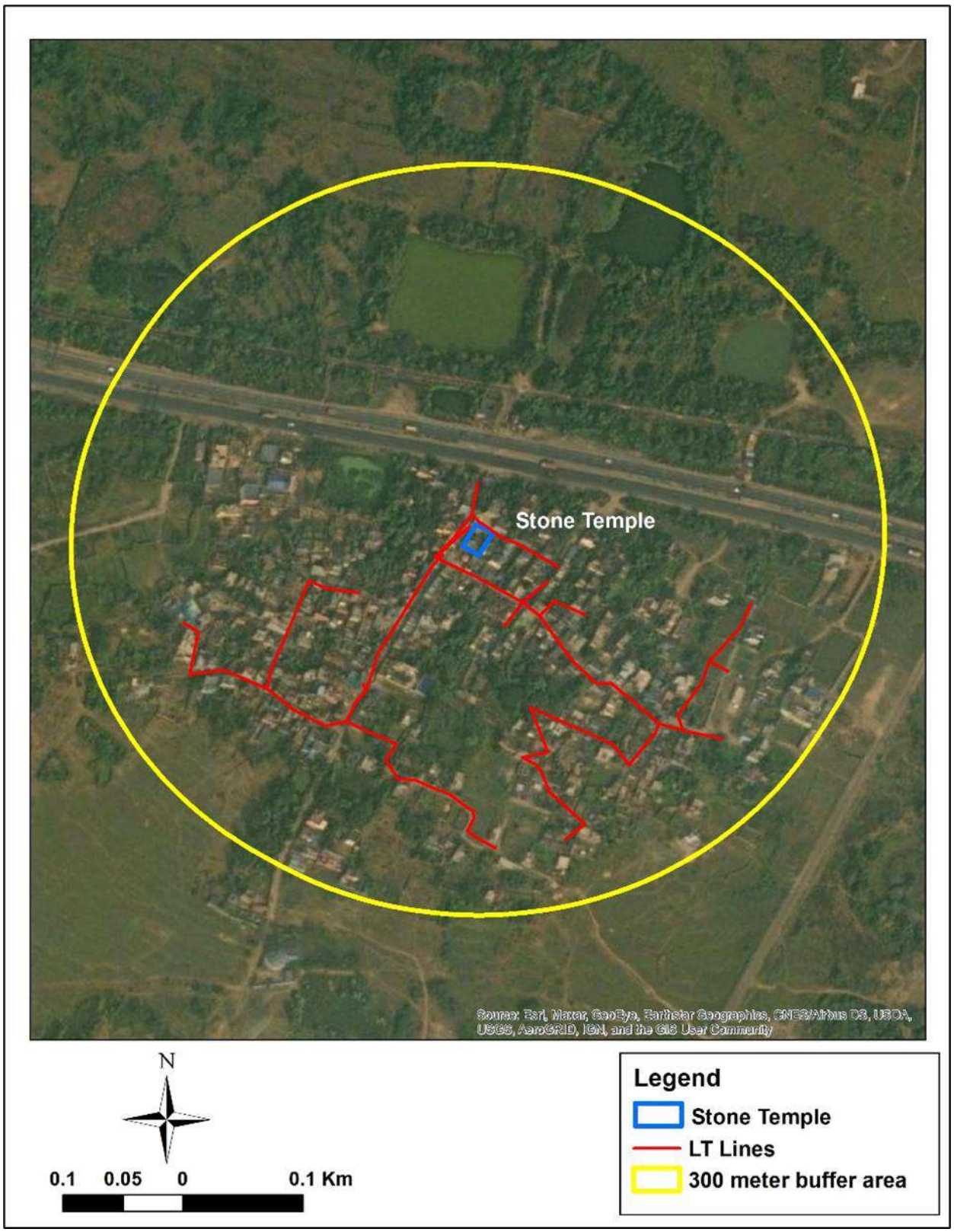


FIGURE 5.26: BUFFER ZONE ALONG THE CULTURAL RESOURCE UNDER ASANSOL BLOCK OF BARDHAMAN WEST DISTRICT

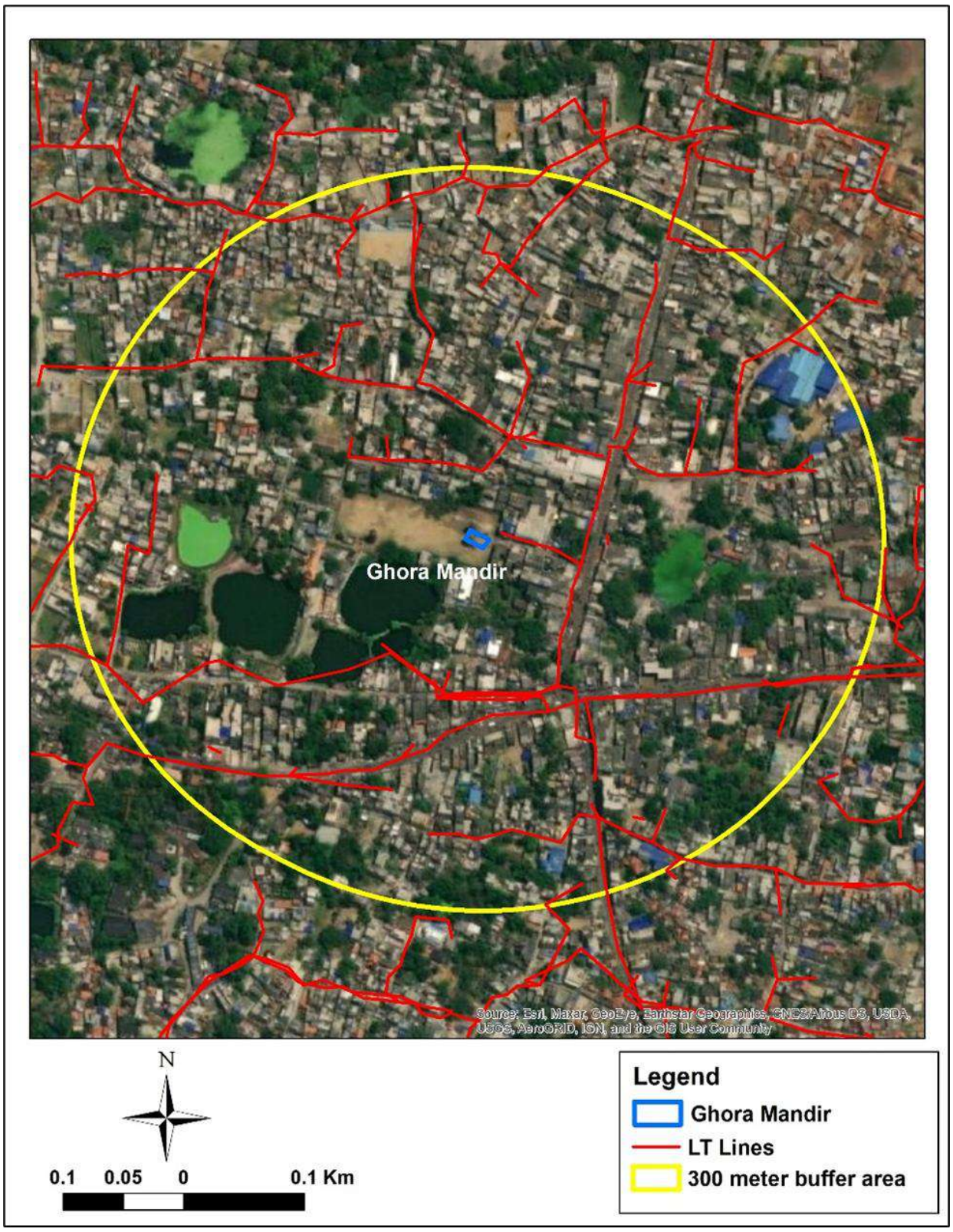


FIGURE 5.27: BUFFER ZONE ALONG THE CULTURAL RESOURCE UNDER ASANSOL BLOCK OF BARDHAMAN WEST DISTRICT

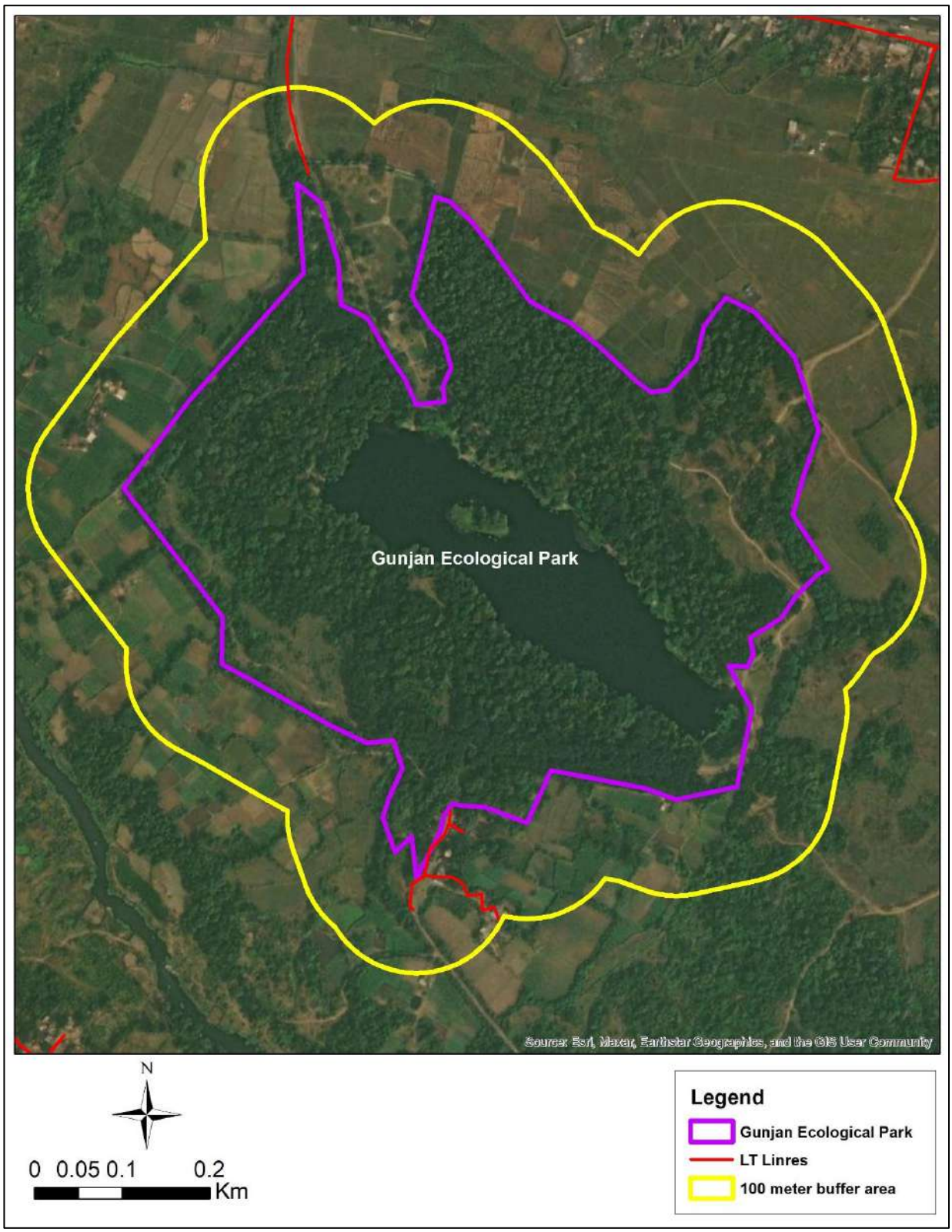


FIGURE 5.28: BUFFER ZONE ALONG THE ENVIRONMENTAL SENSITIVE RECEPTOR UNDER CHINSURA-MOGRA BLOCK OF BARDHAMAN WEST DISTRICT

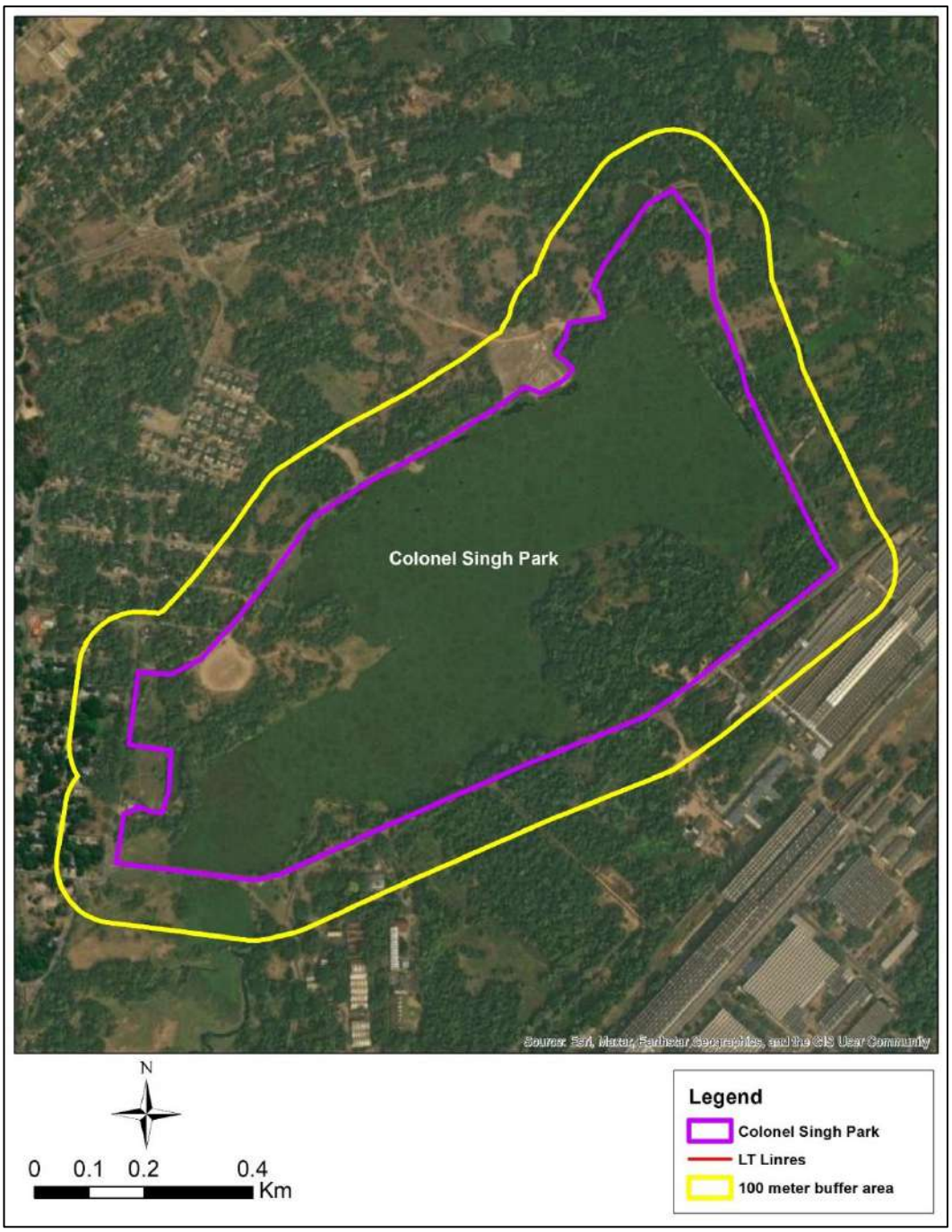


FIGURE 5.29: BUFFER ZONE ALONG THE ENVIRONMENTAL SENSITIVE RECEPTOR UNDER SALANPUR BLOCK OF BARDHAMAN WEST DISTRICT

Accordingly, it is suggested that conversion of the LTOH line into AB caballing in the Bardhaman West district can be initiated except at the location (i.e. Buffer area) of eco-sensitive receptors and cultural resources as indicated in Table 5.3. However, required public consultation and implementation of EMP need to be ensured at the time of conversion of the LTOH line into AB caballing.

TABLE 5.3: BLOCK WISE SUMMARY OF IEE OF BARDHAMAN WEST DISTRICT FOR CONVERSION OF LTOH INTO AB CABELLING

Sl. No.	Block	Eco-sensitive Receptors	Villages falling under buffer area of eco-sensitive receptors	Cultural Resources	Villages falling under buffer area of cultural resources	Remarks
1	2	3	4	5	6	7
1	Raniganj	No	-	No	-	Conversion of LTOH line into AB caballing can be initiated in the entire block
2	Jamuria	Yes	**i) Gunjan Ecological Park**: Jamuria, Asansol, Saora	No	-	Conversion of LTOH line into AB caballing can be initiated in the entire block except the buffer zone identified along the environmental sensitive receptor (column 4)
3	Barabani	No	-	No	-	Conversion of LTOH line into AB caballing can be initiated in the entire block
4	Salanpur	Yes	**i) Colonel Singh Park:** Chittaranjan	No	-	Conversion of LTOH line into AB caballing can be initiated in the entire block except the buffer zone identified along the environmental sensitive receptor (column 4)
5	Asansol	No	-	Yes	**i) Ghora Mandir:** Kulti **ii) Stone Temple:** Kulti	Conversion of LTOH line into AB caballing can be initiated in the entire block except the buffer zone identified along the environmental sensitive receptor (column 6)
6	Durgapur-Faridpur	Yes	**i)Madhaiganj forest:** Madhaiganj, Benebandhi, Jamgara, Balijuri**,** Srikrishnapur	No	-	Conversion of LTOH line into AB caballing can be initiated in the entire block except the buffer zone identified along the environmental sensitive receptor (column 4)

7	Andal	No	-	No	-	Conversion of LTOH line into AB caballing can be initiated in the entire block
8	Kanksa	Yes	**i) Durgapur Forest Division:** Durgapur, Bamunara **ii) Jungle of Kanska:** Sibpur, Bistupur, Jatgaria, Gourangapur, Garkilla Kherobari, Banagram, Saraswatiganja, Chua, Hariki**,** Malandighi, Rakshitpur, Kandarkona	Yes	**i) Temple of Ichai Ghosh:** Santoshpur, Gourangapur	Conversion of LTOH line into AB caballing can be initiated in the entire block except the buffer zone identified along the environmental sensitive receptor (Columns 4 and 6)

6.0 INITIAL ENVIRONMENTAL EXAMINATION FOR BIFURCATION OF 11KV HT FEEDERS

6.1 E&S SCREENING FOR BIFURCATION OF 11KV HT FEEDERS

The Environmental and Social (E&S) screening for the bifurcation of 11kV High Tension (HT) feeders involves assessing the potential environmental and social impacts associated with this electrical infrastructure programme. This process helps identify significant issues that need to be managed during the planning and implementation phases, ensuring that the programme is both environmentally responsible and socially equitable. Additionally, it emphasizes the importance of stakeholder engagement and monitoring to ensure the programme is carried out responsibly, with transparent reporting and adherence to health and safety protocols, ultimately contributing to the programme's success in improving power distribution while protecting the environment and communities. Respective TKCs of WBSEDCL will run the works for subactivities under component-B (i.e. Bifurcation of 11kv HT feeders) as guided in the screening process and take appropriate mitigation measures to reduce the RoW or COI effect wherever possible for the RDSS programme.

For Bardhaman West district, the Initial Environmental Examination for Bifurcation of 11kv HT feeders has been taken to examine the existing distribution network falling within the buffer areas of environmentally sensitive receptors (Protected Forest, Reserve Forest, IBA, KBA, Wetland, Waterbodies/River crossing, etc.) and cultural resources (UNESCO World Heritage Sites, ASI Protected Monuments, State Protected Monuments, Road/Railway crossing, etc.) where it ensures that risks are recognized early, allowing for proactive management through mitigation measures.

6.2 PROPOSED ROUTE ALIGNMENT OF THE SELECTED FEEDERS FOR BIFURCATION

Figures 6.1 to 6.7 present the proposed route alignment of selected 11 kV feeder bifurcation under Bardhaman West district.

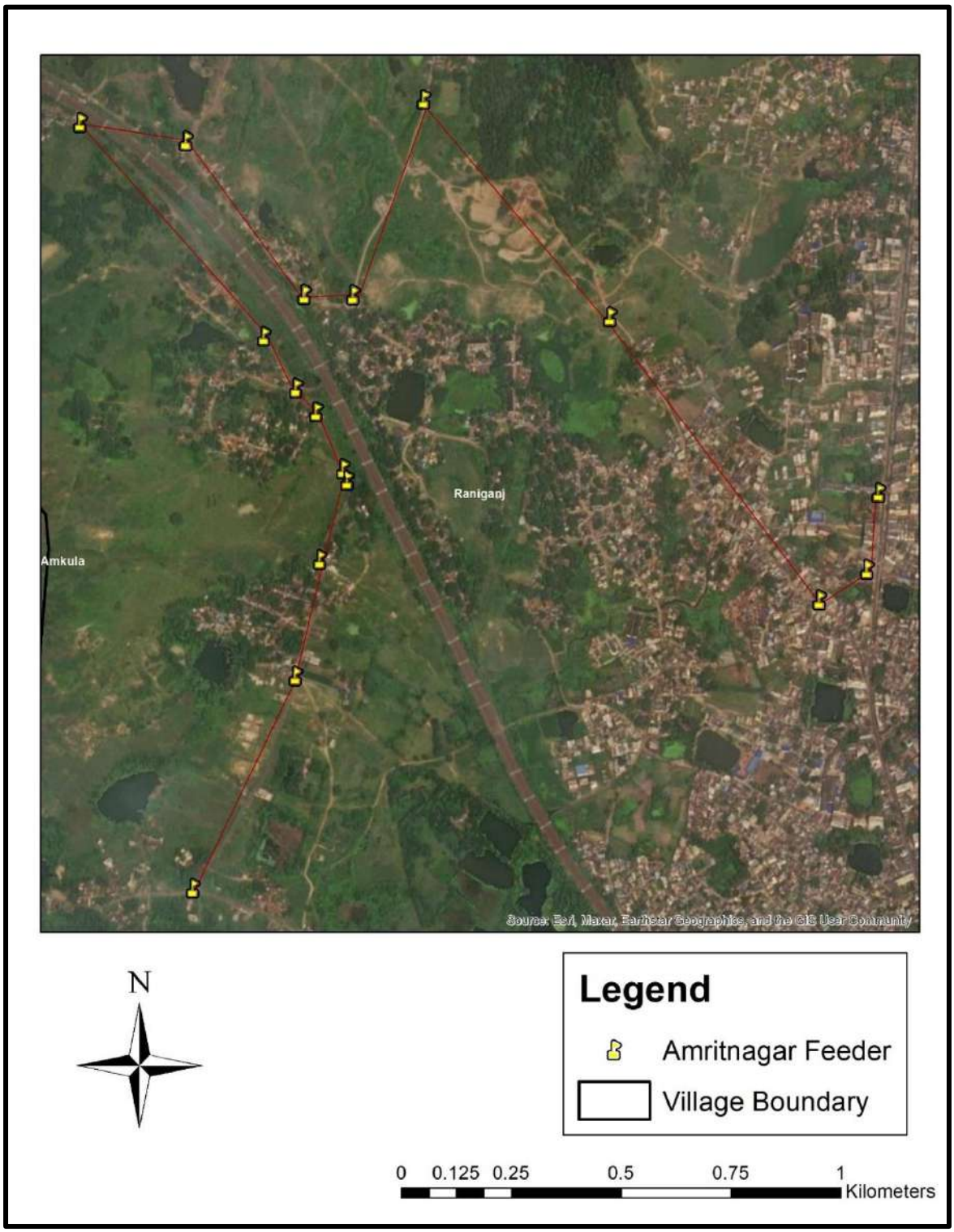


FIGURE 6.1: PROPOSED ROUTE ALIGNMENT FOR AMRITNAGAR FEEDER

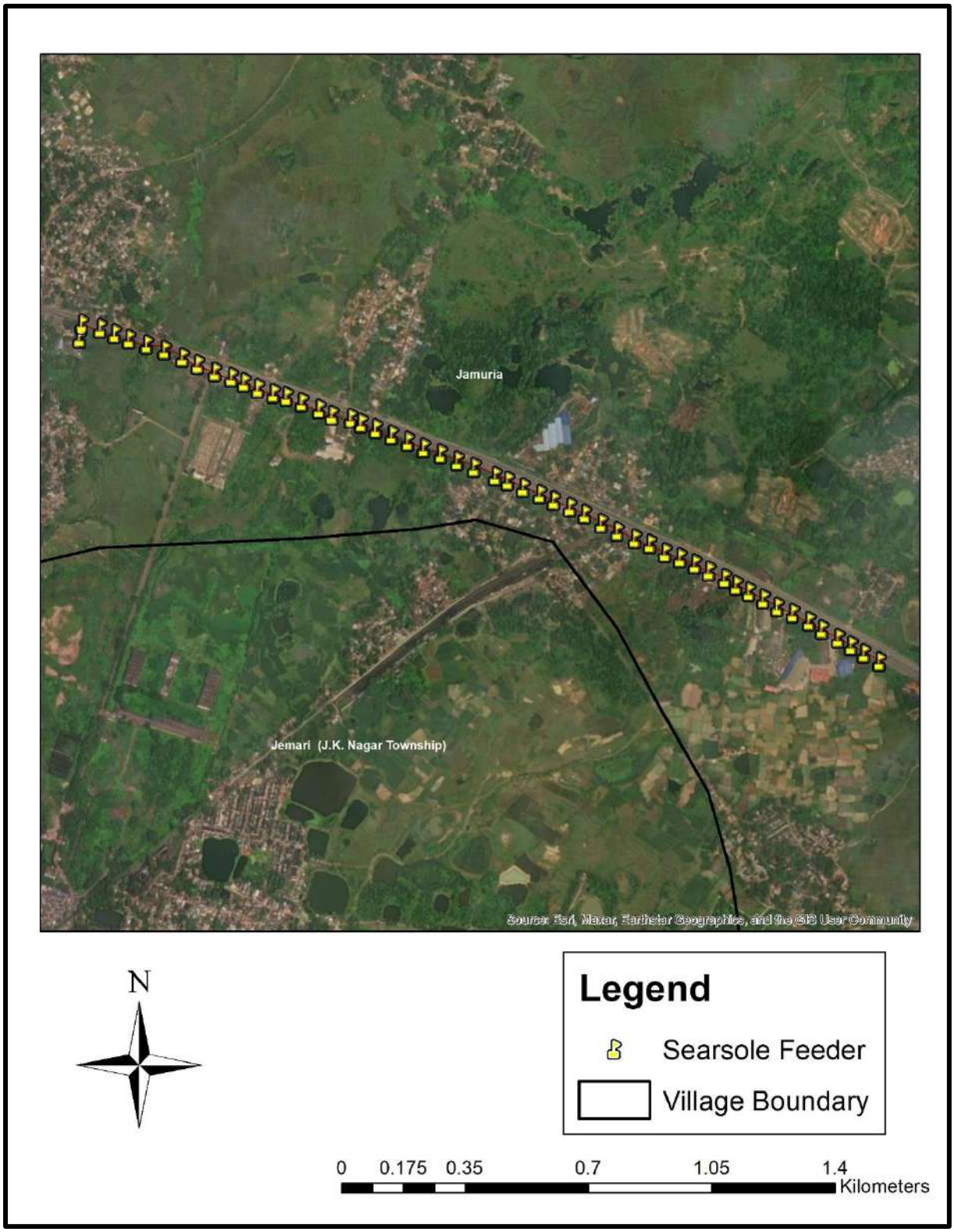


FIGURE 6.2: PROPOSED ROUTE ALIGNMENT FOR SEARSOLE FEEDER

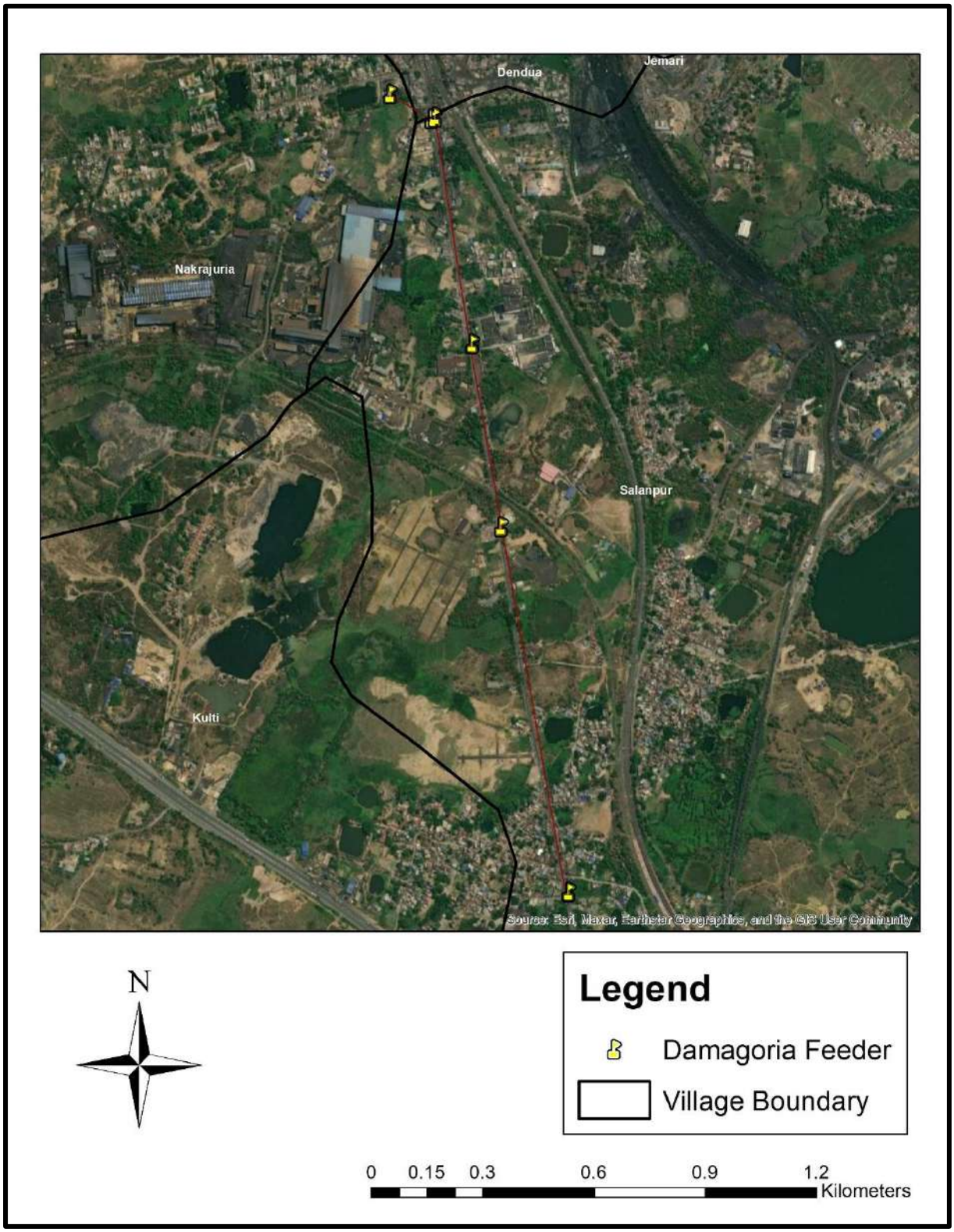


FIGURE 6.3: PROPOSED ROUTE ALIGNMENT FOR DAMAGORIA FEEDER

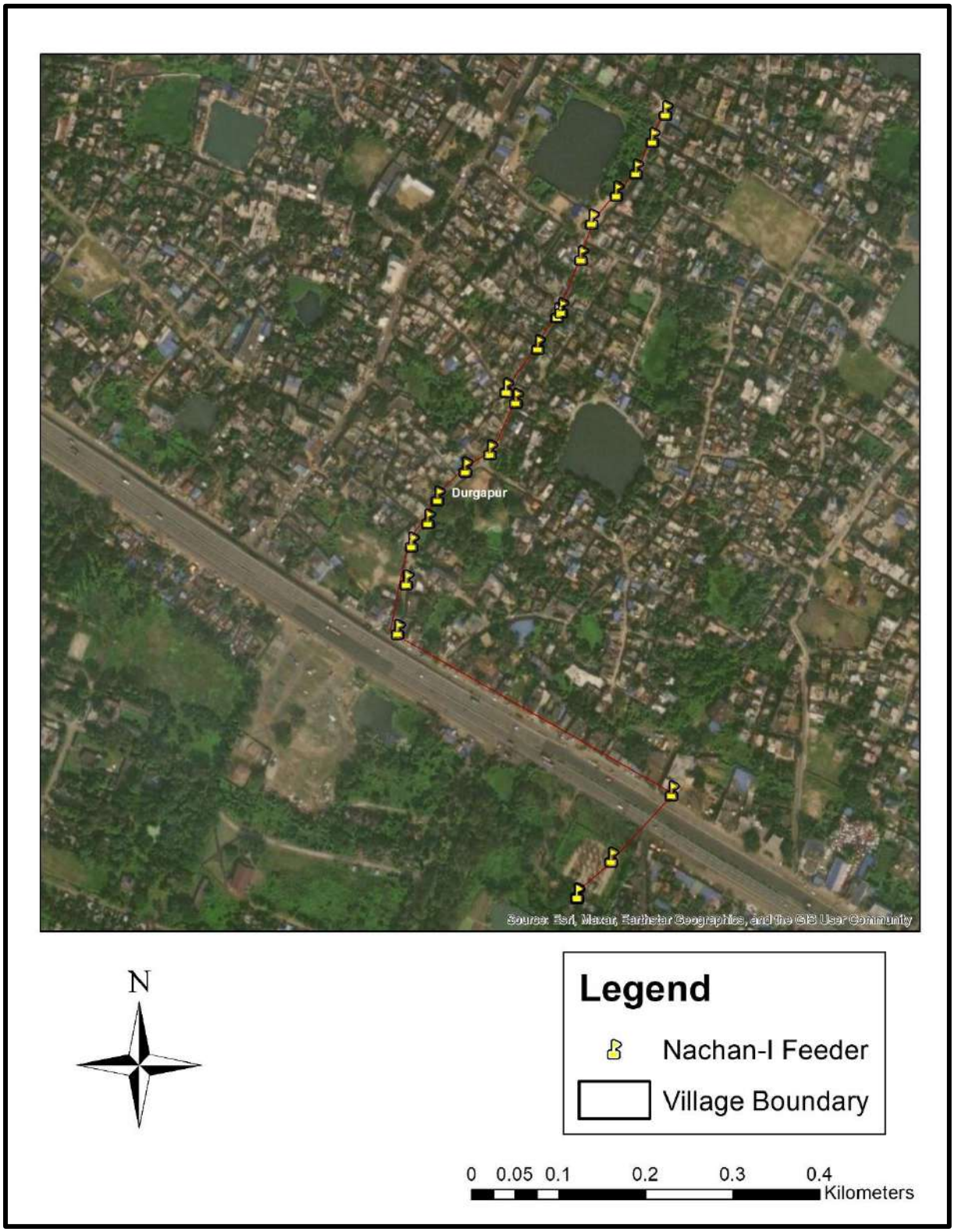


FIGURE 6.4: PROPOSED ROUTE ALIGNMENT FOR NACHAN-I FEEDER

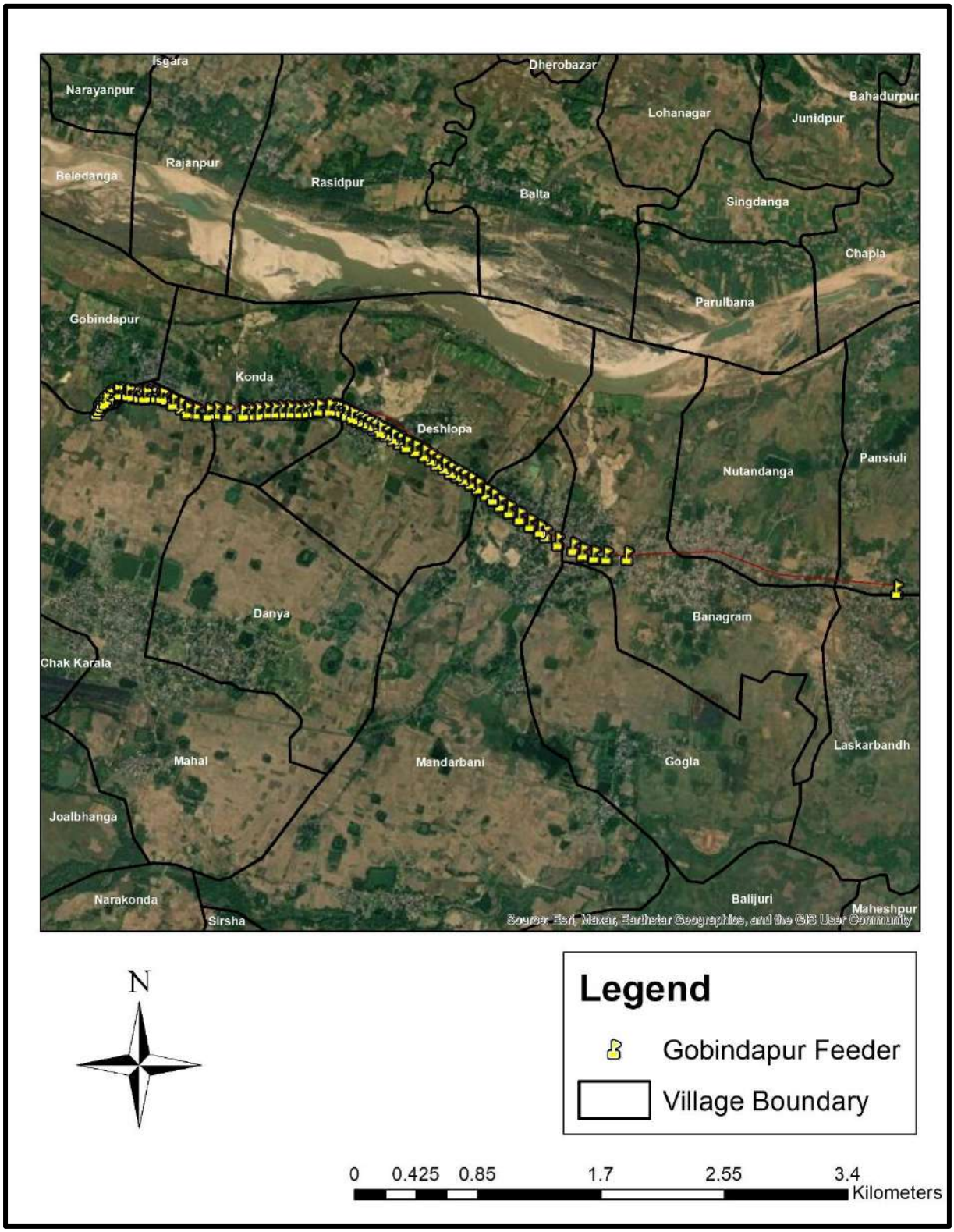


FIGURE 6.5: PROPOSED ROUTE ALIGNMENT FOR GOBINDAPUR FEEDER

FIGURE 6.6: PROPOSED ROUTE ALIGNMENT FOR HARIPUR FEEDER

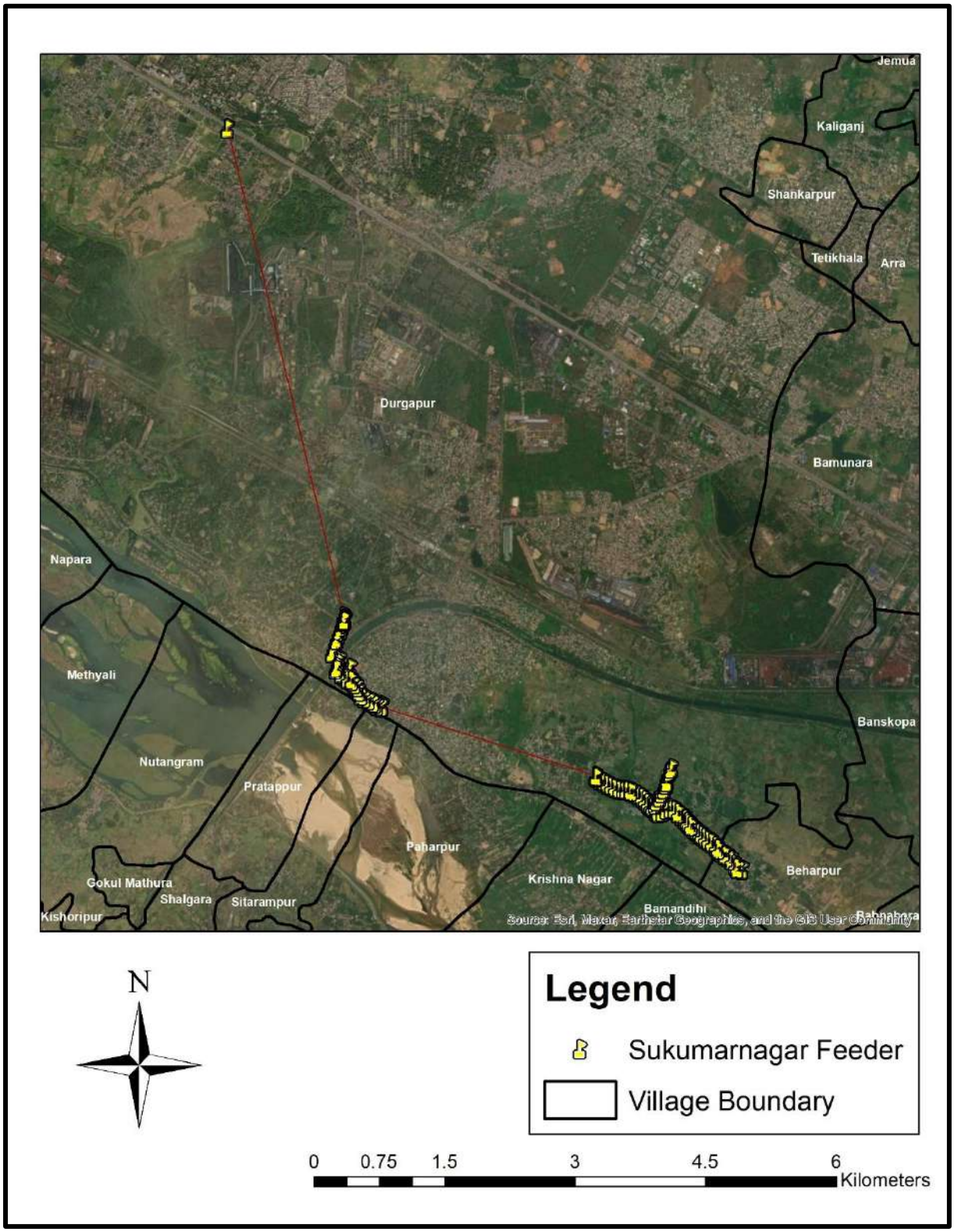


FIGURE 6.7: PROPOSED ROUTE ALIGNMENT FOR SUKUMARNAGAR FEEDER

6.3 ENVIRONMENTAL & SOCIAL SCREENING

The screening of environmental and social settings along the proposed route alignment of selected feeders for bifurcation of 11 kv HT feeders has been undertaken by overlaying Vidyut manchitra (i.e. digitized LT distribution network available with WBSEDCL) and GPS survey from the field side on Google Earth Pro and ArcGIS software along with forest maps of Government of West Bengal. During the Initial Environmental Examination (IEE) for bifurcation of 11 kv HT feeders' emphasis was given to the identification of the location of various environmentally sensitive receptors viz reserve forest, protected forest, KBA/IBA, natural habitat, waterbodies, etc as well as ASI and State Protected Monuments to earmark buffer area (i.e. 100-300m around the identified environmental sensitive receptor/monument).

The existing trees within the ROW/COI of the proposed route alignment of the selected feeder have been identified to minimize the likely impact of proposed programme activities, if any. The location of water bodies (i.e. river crossing, pond, water reservoir/lake, etc) within the 30 m on both sides of the feeder route alignment is also being identified to minimize the likely impact of the proposed programme activities, if any.

The social setting along with likely social issues i.e. encroachment, mobile vendor, loss of livelihood, etc. was also considered during IEE.

The initial environmental and social screening along the proposed route of the selected feeder (i.e. Amritnagar, Searsole, Damagoria, Nachan-I, Gobindapur, Haripur and Sukumarnagar) bifurcation of Bardhaman West district has been undertaken.

6.3.1 Environmental Sensitive Receptor & Cultural Resources

The feeder-wise detail of various environmental receptors & cultural resources falling within the influence zone is presented in Table 6.1. During the Initial Environmental Examination (IEE), it was observed that no significant environmental receptor viz. reserve forest, protected area, Key Biodiversity Area, or Important Bird Area falls within the influence zone of the selected 11 kV feeder's proposed route alignment. However, few waterbodies fall close to the proposed alignment of selected feeders.

The analysis further reveals that there is no ASI-protected monument as well as state-protected monument falls within the influence zone of the selected 11 kV HT feeder's proposed route alignment. However, at a certain stretch, it crosses state & national highways and railway crossing falls in the proposed alignment of selected feeders.

TABLE 6.1: FEEDER-WISE SCREENING OF ENVIRONMENTAL SENSITIVE RECEPTORS & CULTURAL RESOURCES IN PASCHIM BARDHAMAN DISTRICT

			Environmental Sensitive Receptors					Cultural Resources		
Sl. No.	Substation	Feeder	Reserved Forest	Protected Forest	KBA	IBA	Waterbodies/ River Crossing	ASI protected monuments	State protected monuments	Road/Railway crossing
1	Raniganj	Amritnagar	No	No	No	No	No	No	No	Yes
2	Mangalpur	Searsole	No	No	No	No	No	No	No	Yes
3	Dendua	Damagoria	No	No	No	No	Yes	No	No	Yes
4	Bhiringi	Nachan-I	No	No	No	No	Yes	No	No	Yes
5	Pandabeswar	Gobindapur	No	No	No	No	Yes	No	No	Yes
6	Nilkantha	Haripur	No	No	No	No	Yes	No	No	Yes
7	Coke Oven	Sukumarnagar	No	No	No	No	Yes	No	No	Yes

Table 6.2 presents the detailed location of waterbodies falling close to the proposed alignment of selected feeders (Figures 6.8-6.13). It also presents the location of the State & National Highway crossing (Figures 6.14-6.19) and Railway crossing (Figure 6.20).

TABLE 6.2: LOCATION OF WATERBODIES AND ROAD CROSSING UNDER THE INFLUENCE ZONE OF SELECTED 11 KV FEEDER BIFURCATION ROUTE ALIGNMENT OF BARDHAMAN WEST DISTRICT

Sl. No.	Environmental Sensitive Receptors	Sub-division	Feeder	GPS No. of Poles	Village	Distance/ Stretch	Co-ordinates	
							Latitude	Longitude
1	Waterbodies	Dendua	Damagoria	i) 17	Nakrajuria	29.05 m	23°46'50.57"N	86°52'4.76"E
		Bhiringi	Nachan-I	i) 8	Durgapur	20.40 m	23°33'11.68"N	87°16'25.80"E
				ii) 84	Durgapur	28.18 m	23°33'12.40"N	87°16'26.52"E
		Pandabeswar	Gobindapur	i) 177	Konda	18.94 m	23°42'53.60"N	87°18'17.39"E
				ii) 166	Konda	28.78 m	23°42'53.31"N	87°18'15.45"E
				iii) 175	Konda	18.62 m	23°42'52.71"N	87°18'0.37"E
				iv) 232	Gobindapur	19.35 m	23°42'56.63"N	87°17'34.71"E
				v) 228	Gobindapur	22.79 m	23°42'56.93"N	87°17'33.31"E
				vi) 230	Gobindapur	5.43 m	23°42'56.82"N	87°17'32.21"E
				vii) 120	Gobindapur	24.95 m	23°42'56.31"N	87°17'31.14"E
				viii) 242	Gobindapur	23.45 m	23°42'55.95"N	87°17'30.61"E
		Nilkantha	Haripur	i) 4	Ukhra	14.54 m	23°38'29.07"N	87°14'49.81"E
				ii) 101	Ukhra	21.88 m	23°38'28.49"N	87°14'48.91"E
				iii) 102	Ukhra	19.95 m	23°38'29.55"N	87°14'47.85"E
				iv) 5, 7, 106	Ukhra	6.53 m	23°38'30.06"N 23°38'30.33"N	87°14'46.62"E 87°14'45.47"E
				v) 10	Ukhra	4.89 m	23°38'39.15"N	87°14'35.69"E
		Coke Oven	Sukumarnagar	i) 96	Durgapur	70.13 m	23°29'2.20"N	87°18'33.52"E

				ii) 103-29	Durgapur	25.38 m	23°28'22.70"N 23°28'18.00"N	87°20'8.61"E 87°20'18.95"E
				iii) 109	Durgapur	15.56 m	23°28'10.18"N	87°20'39.22"E
				138	Beharpur	21.43 m	23°27'51.15"N	87°21'1.23"E
				136	Beharpur	12.03 m	23°27'50.86"N	87°21'3.21"E
				68	Durgapur	19.82 m	23°28'23.68"N	87°20'35.62"E
				69	Durgapur	14.26 m	23°28'24.22"N	87°20'35.98"E
				108	Durgapur	28.29 m	23°28'25.32"N	87°20'36.81"E
2	Road Crossing	Raniganj	Amritnagar	i) 64-65	Raniganj	167.99 m	23°37'1.16"N 23°36'56.04"N	87° 6'48.71"E 87° 6'47.88"E
				ii) 67	Raniganj	754.66 m	23°37'13.16"N	87° 6'29.02"E
				iii) 68	Raniganj	715.44 m	23°37'27.82"N	87° 6'15.28"E
				iv) 71	Raniganj	402.44 m	23°37'25.13"N	87° 5'57.78"E
				v) 76	Raniganj	135.52 m	23°37'2.99"N	87° 6'9.41"E
		Mangalpur	Searsole	i) 97-205	Jamuria	2275.54 m	23°39'15.68"N 23°39'44.07"N	87° 5'10.07"E 87° 3'56.91"E
		Dendua	Damagoria	i) 28-32	Salanpur	1935.03 m	23°46'48.55"N 23°45'46.78"N	86°52'8.32"E 86°52'20.21"E
				ii) 29	Salanpur	13.62 m	23°46'48.78"N	86°52'8.67"E
		Bhiringi	Nachan-I	i) 12, 74	Durgapur	340.85 m	23°32'56.65"N 23°32'51.15"N	87°16'17.68"E 87°16'27.79"E
				ii) 1	Durgapur	53.52 m	23°32'58.45"N	87°16'17.98"E
				iii) 2	Durgapur	29.05 m	23°33'0.54"N	87°16'18.78"E
				iv) 77	Durgapur	25.57 m	23°33'1.29"N	87°16'19.15"E
				v) 79	Durgapur	60.12 m	23°33'4.61"N	87°16'22.06"E
				vi) 6	Durgapur	56.31 m	23°33'6.46"N	87°16'22.88"E
				vii) 81	Durgapur	38.04 m	23°33'7.53"N	87°16'23.59"E

				viii) 82	Durgapur	7.01 m	23°33'7.70"N	87°16'23.74"E
				ix) 7	Durgapur	58.03 m	23°33'9.50"N	87°16'24.47"E
		Pandabeswar	Gobindapur	i) 9	Banagram	1742.86 m	23°42'23.40"N	87°19'26.07"E
				ii) 20	Banagram	73.74 m	23°42'23.61"N	87°19'18.81"E
				iii) 28	Mandarbani	43.85 m	23°42'28.97"N	87°19'6.72"E
				iv) 205	Konda	54.58 m	23°42'52.68"N	87°17'52.66"E
				v) 199	Mahal	47.57 m	23°42'54.10"N	87°17'46.66"E
		Nilkantha	Haripur	i) 2	Ukhra	20.06 m	23°38'28.46"N	87°14'49.83"E
				ii) 101	Ukhra	24.01 m	23°38'28.49"N	87°14'48.91"E
				iii) 13	Ukhra	10.78 m	23°38'41.94"N	87°14'36.87"E
		Coke Oven	Sukumarnagar	i) 18-20	Durgapur	2.69 m	23°32'3.36"N 23°32'3.28"N	87°17'51.77"E 87°17'51.78"E
				ii) 96-100	Durgapur	105.24 m	23°29'2.20"N 23°28'59.17"N	87°18'33.52"E 87°18'32.00"E
				iii) 99	Durgapur	39.57 m	23°28'59.91"N	87°18'32.50"E
				iv) 87	Durgapur	70.44 m	23°28'56.79"N	87°18'35.27"E
				v) 102	Durgapur	45.05 m	23°28'55.24"N	87°18'37.81"E
				vi) 81	Durgapur	45.36 m	23°28'54.14"N	87°18'38.87"E
				vii) 75	Durgapur	44.46 m	23°28'48.00"N	87°18'45.68"E
				viii) 74	Durgapur	27.04 m	23°28'47.52"N	87°18'46.45"E
				ix) 23	Durgapur	42.45 m	23°28'21.48"N	87°20'10.14"E
				x) 30	Durgapur	32.45 m	23°28'18.01"N	87°20'20.15"E
				xi) 105	Durgapur	45.17 m	23°28'17.59"N	87°20'21.65"E
				xii) 32	Durgapur	43.07 m	23°28'17.08"N	87°20'23.06"E
				xiii) 34	Durgapur	49.56 m	23°28'15.37"N	87°20'25.89"E

				xiv) 41	Durgapur	42.97 m	23°28'10.49"N	87°20'33.41"E
				xv) 109	Durgapur	51.06 m	23°28'10.18"N	87°20'39.22"E
				xvi) 120	Durgapur	43.87 m	23°28'7.02"N	87°20'42.77"E
				xvii) 121	Durgapur	27.78 m	23°28'5.65"N	87°20'43.99"E
				xviii) 123	Durgapur	41.70 m	23°28'0.89"N	87°20'50.45"E
				xix) 64	Durgapur	45.77 m	23°28'18.34"N	87°20'34.06"E
				xx) 68	Durgapur	51.36 m	23°28'23.68"N	87°20'35.62"E
				xxi) 108	Durgapur	39.91 m	23°28'25.32"N	87°20'36.81"E
3	Railway Crossing	Raniganj	Amritnagar	i) 72	Raniganj	19.13 m	23°37'26.34"N	87° 5'49.99"E

The feeder-wise location of eco-sensitive receptors and cultural resources identified within the influence area (i.e. COI/RoW) of the feeder bifurcation line along with the identified buffer area (100-300m) from the boundary of concerned eco-sensitive receptors and historical & cultural areas including ASI monuments and World Heritage Site if any are presented in Figure 6.8 to 6.20.

FIGURE 6.8: WATERBODY FALLING CLOSE TO ROW OF SELECTED FEEDER – DAMAGORIA

FIGURE 6.9: WATERBODY FALLING CLOSE TO ROW OF SELECTED FEEDER – NACHAN-I

FIGURE 6.10: WATERBODY FALLING CLOSE TO ROW OF SELECTED FEEDER – GOBINDAPUR

FIGURE 6.11: WATERBODY FALLING CLOSE TO ROW OF SELECTED FEEDER – HARIPUR

FIGURE 6.12: WATERBODY FALLING CLOSE TO ROW OF SELECTED FEEDER – SUKUMARNAGAR

FIGURE 6.13: CANAL CROSSING FALLING UNDER THE PROPOSED ALIGNMENT OF SELECTED FEEDER – SUKUMARNAGAR

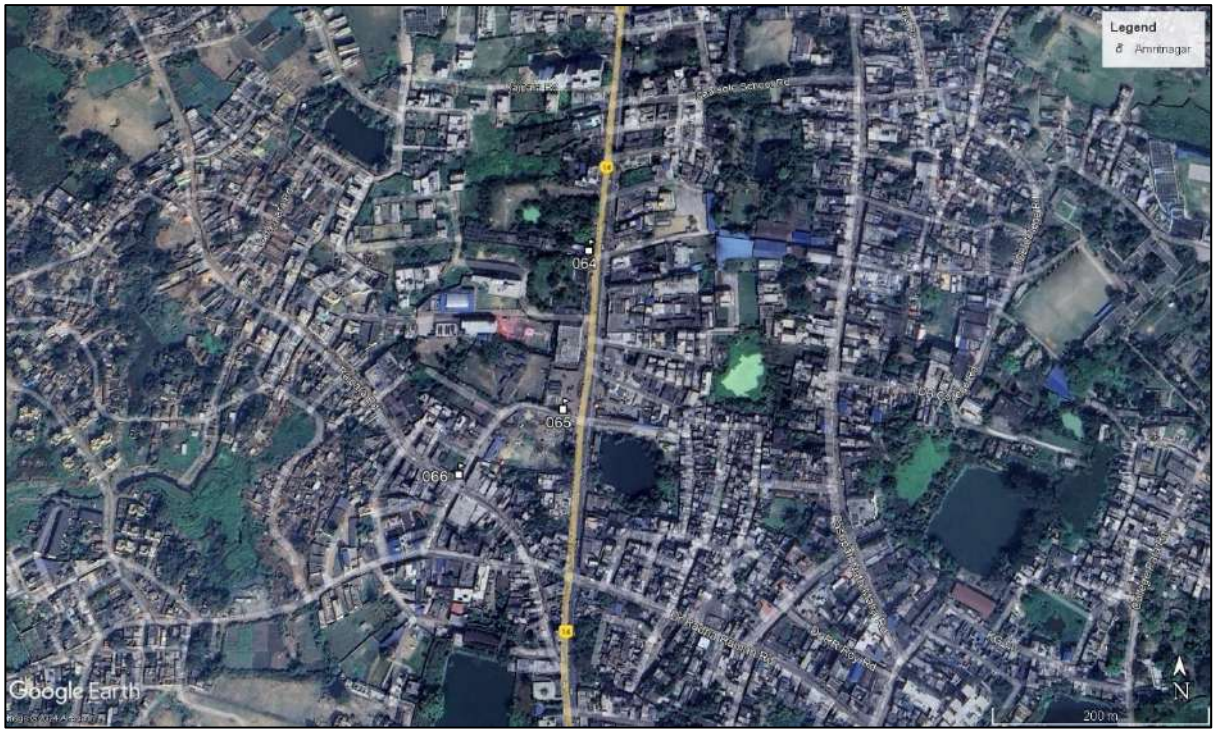


FIGURE 6.14: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (NH-14) – AMRITNAGAR

FIGURE 6.15: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (NH-19) – SEARSOLE

FIGURE 6.16: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (NH-419) – DAMAGORIA

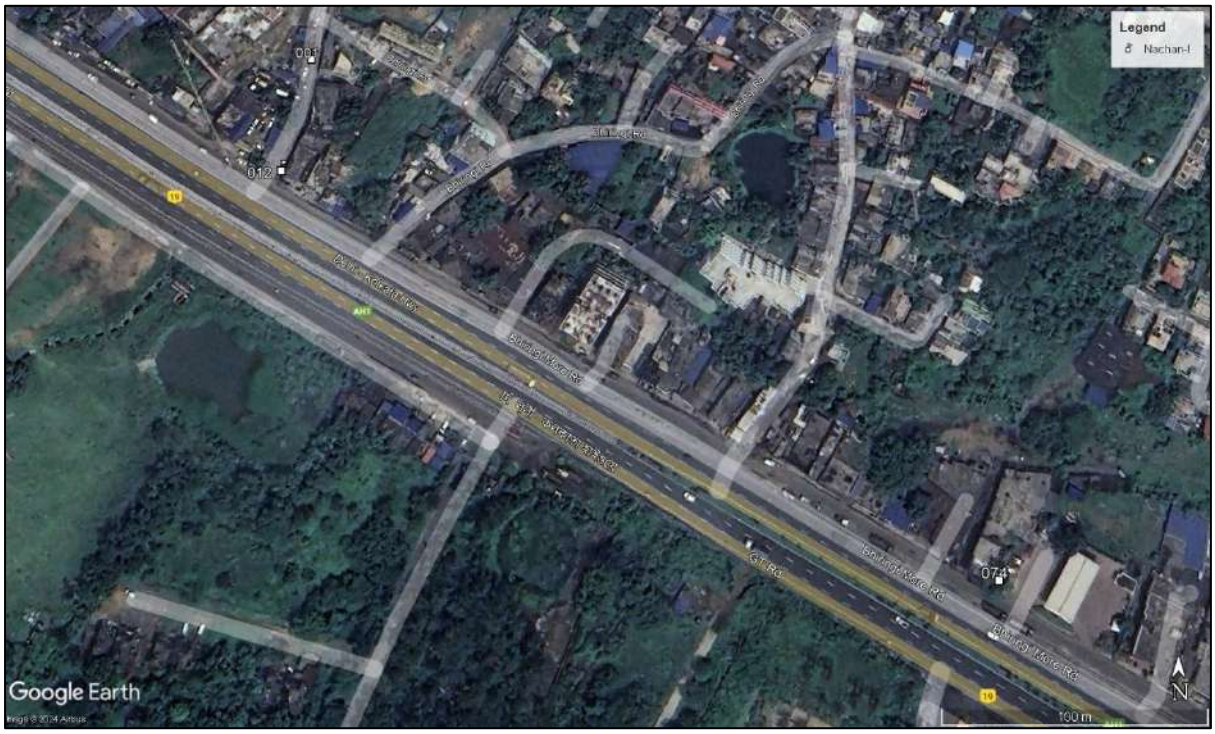


FIGURE 6.17: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (NH-19) – NACHAN-I

FIGURE 6.18: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (NH-19) – SUKUMARNAGAR

FIGURE 6.19: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG STATE HIGHWAY (SH-9) – SUKUMARNAGAR

FIGURE 6.20: RAILWAY CROSSING FALLING UNDER THE PROPOSED ALIGNMENT OF SELECTED FEEDER – AMRITNAGAR

7.0 INITIAL ENVIRONMENTAL EXAMINATION FOR AUGMENTATION OF CONDUCTOR SIZE OF 11KV LINE

7.1 E&S SCREENING FOR AUGMENTATION OF CONDUCTOR SIZE OF 11KV LINE

The Environmental and Social (E&S) screening for the augmentation of conductor size of 11kv line involves assessing the potential environmental and social impacts associated with this electrical infrastructure programme. This process helps identify significant issues that need to be managed during the planning and implementation phases, ensuring that the programme is both environmentally responsible and socially equitable. Additionally, it emphasizes the importance of stakeholder engagement and monitoring to ensure the programme is carried out responsibly, with transparent reporting and adherence to health and safety protocols, ultimately contributing to the programme's success in improving power distribution while protecting the environment and communities. Respective TKCs of WBSEDCL will run the works for sub-activities under component-D (i.e. Augmentation of Conductor size of 11KV Line) as guided in the screening process and take appropriate mitigation measures to reduce the RoW or COI effect wherever possible for the RDSS programme.

For Bardhaman West district, the Initial Environmental Examination for augmentation of conductor size of 11kv line has been taken to examine the existing distribution network falling within the buffer areas of environmentally sensitive receptors (Protected Forest, Reserve Forest, IBA, KBA, Wetland, Waterbodies/River crossing, etc.) and cultural resources (UNESCO World Heritage Sites, ASI Protected Monuments, State Protected Monuments, Road/Railway crossing, etc.) where it ensures that risks are recognized early, allowing for proactive management through mitigation measures.

7.2 ROUTE ALIGNMENT OF THE SELECTED FEEDERS FOR AUGMENTATION OF CONDUCTOR SIZE OF 11KV LINE

Figures 7.1 to 7.14 present the route alignment of selected feeders for Augmentation of Conductor size of 11KV Line under Bardhaman West district.

FIGURE 7.1: ROUTE ALIGNMENT OF 2NO. 11KV FEEDER

FIGURE 7.2: ROUTE ALIGNMENT OF BALLAVPUR 11KV FEEDER

FIGURE 7.3: ROUTE ALIGNMENT OF BARAKAR 11KV FEEDER

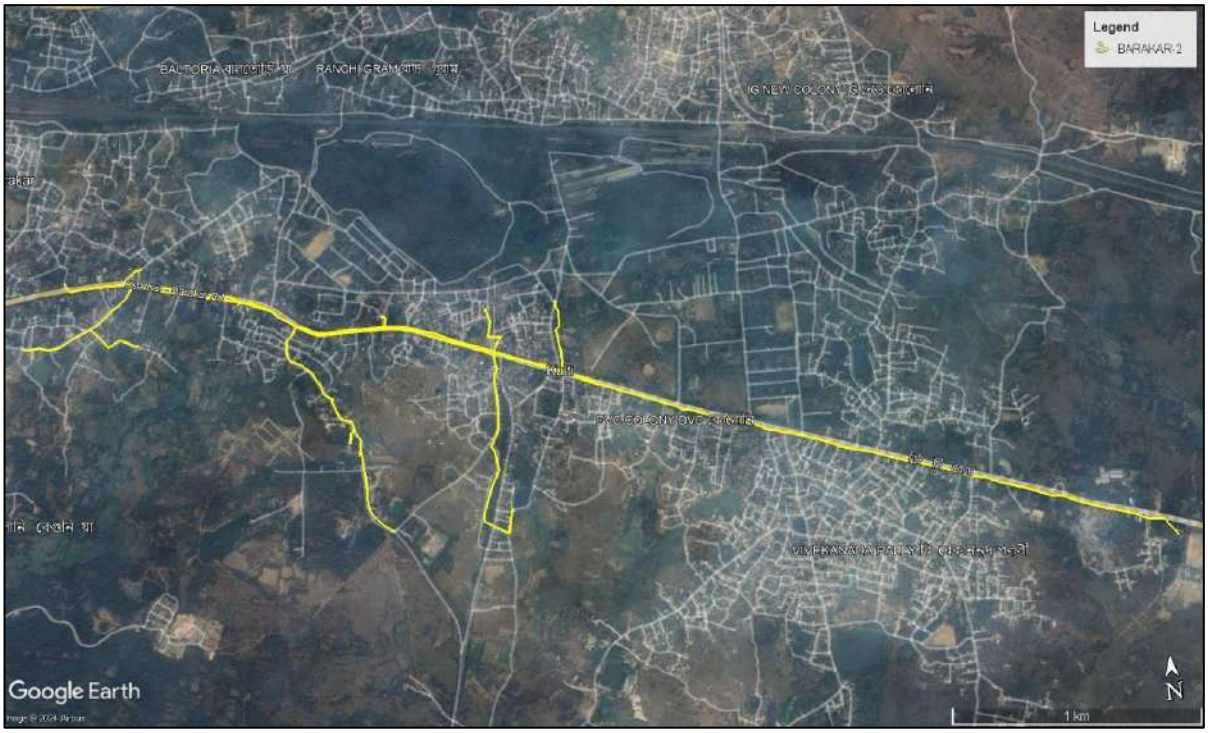


FIGURE 7.4: ROUTE ALIGNMENT OF BARAKAR II 11KV FEEDER

FIGURE 7.5: ROUTE ALIGNMENT OF BELRUI 11KV FEEDER

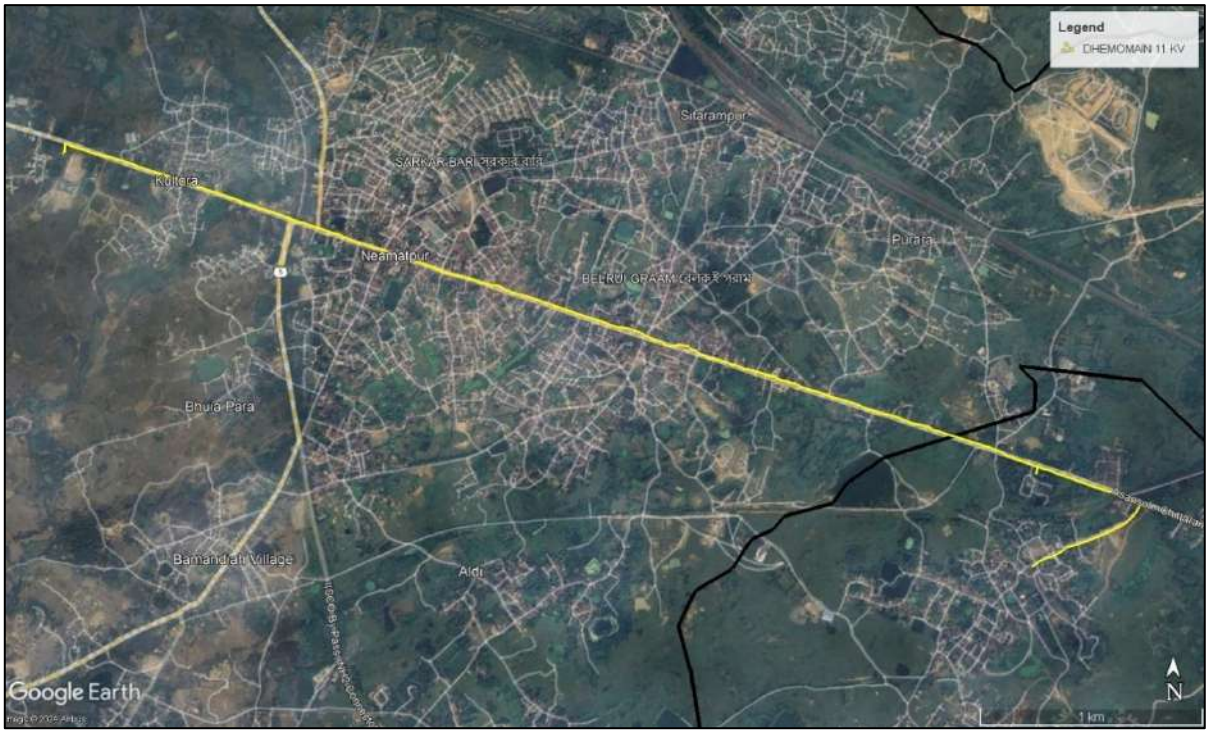


FIGURE 7.6: ROUTE ALIGNMENT OF DHEMOMAIN 11KV FEEDER

FIGURE 7.7: ROUTE ALIGNMENT OF GIRJAPARA 11KV FEEDER

FIGURE 7.8: ROUTE ALIGNMENT OF KENDUA BAZAR 11KV FEEDER

FIGURE 7.9: ROUTE ALIGNMENT OF KULTI 11KV FEEDER

FIGURE 7.10: ROUTE ALIGNMENT OF MAHALAXMI 11KV FEEDER

FIGURE 7.11: ROUTE ALIGNMENT OF NIGHA 11KV FEEDER

FIGURE 7.12: ROUTE ALIGNMENT OF RONAI 11KV FEEDER

FIGURE 7.13: ROUTE ALIGNMENT OF SEARSOLE 11KV FEEDER

FIGURE 7.14: ROUTE ALIGNMENT OF SITARAMPUR 11KV FEEDER

7.3 E&S SCREENING ALONG THE PROPOSED ROUTE ALIGNMENT OF SELECTED FEEDERS

The screening of environmental and social settings along the proposed route alignment of selected feeders for the Augmentation of Conductor size of 11KV Line (with ACSR DOG Conductor) has been undertaken by overlaying Vidyut manchitra (i.e. digitized LT distribution network available with WBSEDCL) and GPS survey from the field side on Google Earth Pro and ArcGIS software along with forest maps of Government of West Bengal. During the Initial Environmental Examination (IEE) for augmentation of conductor size of 11KV line (with ACSR DOG Conductor) emphasis was given to the identification of the location of various environmentally sensitive receptors viz reserve forest, protected forest, KBA/IBA, natural habitat, waterbodies, etc as well as ASI and State Protected Monuments to earmark buffer area (i.e. 100-300m around the identified environmental sensitive receptor/monument). The existing trees within the ROW/COI of the proposed route alignment of the selected feeder have been identified to minimize the likely impact of proposed programme activities, if any. The location of water bodies (i.e. river crossing, pond, water reservoir/lake, etc) within the 30 m on both sides of the feeder route alignment is also being identified to minimize the likely impact of the proposed programme activities, if any. The social setting and likely social issues, i.e., encroachment, mobile vendor, loss of livelihood, etc., were also considered during IEE.

The initial environmental and social screening along the proposed route of the selected feeder (i.e. Kendua bazar, Dhemomain, Barakar-1, Barakar-II, Belrui, Kulti, Sitarampur, Mahalaxmi, 457, Girjapara, 2 no, Chanda, Kuardihi, Ballavpur, Ronai, Searsole, Nigha) for augmentation of the conductor size of the 11KV line (with ACSR DOG Conductor) of Bardhaman West district has been undertaken.

Table 7.1 presents the detailed location of waterbodies, road crossings, river crossings, railway crossings and ESZ of forest areas falling close to the route alignment of selected feeders.

TABLE 7.1: LOCATION OF WATERBODIES AND ROAD CROSSING UNDER THE INFLUENCE ZONE OF AUGMENTATION OF CONDUCTOR SIZE IN 11KV LINE ROUTE ALIGNMENT OF BARDHAMAN WEST DISTRICT

Substation	Feeder	Length	Start Point		End Point		Remarks	Village Boundaries
			Latitude	Longitude	Latitude	Longitude		
Neamatpur	Kendua Bazar	7.12mtr	23°44'17.89"N	86°51'20.84"E			this part of conductor is located within 7.12mtr of waterbody	Kulti
		16.83mtr	23°44'14.68"N	86°51'20.32"E	23°44'14.09"N	86°51'20.45"E	this part of conductor is located along the rail crossing	Kulti
		11.94mtr	23°44'8.59"N	86°51'20.61"E			this part of conductor is located within 11.94mtr of waterbody	Kulti
		14.47mtr	23°43'57.16"N	86°51'14.70"E			this part of conductor is located within 14.47mtr of waterbody	Kulti
		1014.05mtr	23°43'30.97"N	86°51'14.97"E	23°43'20.44"N	86°51'48.85"E	this part of conductor is located along the NH2	Kulti
		7.98mtr	23°43'20.44"N	86°51'48.85"E	23°43'20.32"N	86°51'48.93"E	this part of conductor is crossing the NH2	Kulti
	Dhemomain	5371.82mtr	23°43'19.90"N	86°51'50.14"E	23°42'23.00"N	86°54'49.62"E	this part of conductor is located along the NH2	Kulti, Asansol
	Barakar-I	4653.75mtr	23°44'5.67"N	86°49'12.57"E	23°43'20.62"N	86°51'48.20"E	this part of conductor is located along the NH2	Kulti
		620.83mtr	23°44'29.98"N	86°48'57.53"E	23°44'10.06"N	86°48'52.81"E	this part of conductor is located along the SH5	Kulti
		9.32mtr	23°44'21.10"N	86°49'4.50"E			this part of conductor is located within 9.32 mtr of waterbody	Kulti
	Barakar-II	4653.75mtr	23°44'5.67"N	86°49'12.57"E	23°43'20.62"N	86°51'48.20"E	this part of conductor is located along the NH2	Kulti
		14.74mtr	23°43'58.01"N	86°49'20.08"E			this part of conductor is located within 14.74 mtr of waterbody	Kulti
		14.26mtr	23°43'41.62"N	86°50'14.09"E			this part of conductor is located within 14.26 mtr of waterbody	Kulti
		10.70mtr	23°43'30.48"N	86°50'15.03"E			this part of conductor is located within 10.70 mtr of waterbody	Kulti

	Belrui	4611.51mtr	23°43'20.03"N	86°51'51.11"E	23°42'31.21"N	86°54'25.61"E	this part of conductor is located along the NH2	Kulti, Asansol
		16.08mtr	23°42'49.39"N	86°52'34.57"E			this part of conductor is located within 16.08 mtr of waterbody	Kulti
		14.72mtr	23°42'40.83"N	86°53'24.97"E			this part of conductor is located within 14.72 mtr of waterbody	Kulti
		9.62mtr	23°42'33.05"N	86°53'38.79"E			this part of conductor is located within 9.62 mtr of waterbody	Kulti
		21.76mtr	23°42'41.07"N	86°53'59.80"E			this part of conductor is located within 21.76 mtr of waterbody	Kulti
		10.70mtr	23°43'7.25"N	86°53'51.93"E			this part of conductor is located within 10.70 mtr of waterbody	Kulti
		6.41mtr	23°43'1.53"N	86°54'10.05"E			this part of conductor is located within 6.41 mtr of waterbody	Kulti
		62.67mtr	23°43'18.25"N	86°53'58.97"E	23°43'20.03"N	86°54'0.25"E	this part of conductor is located along the rail crossing	Kulti
		3.89mtr	23°43'36.25"N	86°54'7.70"E			this part of conductor is located within 3.89 mtr of waterbody	Kulti
	Kulti	2464.62mtr	23°43'45.64"N	86°50'29.97"E	23°43'19.47"N	86°51'52.12"E	this part of conductor is located along the NH2	Kulti
		9.12mtr	23°43'25.47"N	86°50'56.17"E			this part of conductor is located within 9.12mtr of waterbody	Kulti
		29.08mtr	23°42'55.10"N	86°50'16.33"E			this part of conductor is located within 29.08mtr of waterbody	Kulti
		25.22mtr	23°42'39.82"N	86°50'9.63"E			this part of conductor is located within 25.22 mtr of waterbody	Kulti
		14.11mtr	23°42'30.19"N	86°50'12.19"E			this part of conductor is located within 14.11mtr of waterbody	Kulti
		27.66mtr	23°43'10.71"N	86°50'58.11"E	23°43'4.45"N	86°50'58.82"E	this part of conductor is located within 27.66mtr of waterbody	Kulti
		16.42mtr	23°43'12.31"N	86°51'19.35"E			this part of conductor is located within 16.42mtr of waterbody	Kulti
	Sitarampur	11.56mtr	23°43'6.08"N	86°52'34.89"E			this part of conductor is located within 11.56 mtr of waterbody	Kulti

		17.78mtr	23°43'14.19"N	86°53'2.60"E			this part of conductor is located within 17.78 mtr of waterbody	Kulti
		1638.18mtr	23°43'19.98"N	86°51'50.55"E	23°43'2.21"N	86°52'45.47"E	this part of conductor is located along the NH19	Kulti
		798.56mtr	23°43'6.26"N	86°52'33.61"E	23°43'31.59"N	86°52'31.92"E	this part of conductor is located along the SH5	Kulti
		9.44mtr	23°43'19.78"N	86°52'22.62"E			this part of conductor is located within 9.44mtr of waterbody	Kulti
		21.74mtr	23°43'14.13"N	86°53'2.55"E			this part of conductor is located within 21.74 mtr of waterbody	Kulti
Raniganj	Mahalaxmi Girjapara	1917.18mtr	23°38'4.57"N	87° 6'55.21"E	23°37'1.58"N	87° 6'48.93"E	this part of conductor is located along the SH14	Raniganj
		21.36mtr	23°37'58.17"N	87° 6'34.84"E			this part of conductor is located within 21.36 mtr of waterbody	Raniganj
		19.54mtr	23°38'0.94"N	87° 6'29.13"E			this part of conductor is located within 19.54 mtr of waterbody	Raniganj
		4.76mtr	23°38'1.97"N	87° 6'22.59"E			this part of conductor is located within 4.76 mtr of waterbody	Raniganj
		2503.97mtr	23°37'0.48"N	87° 6'49.16"E	23°35'45.25"N	87° 7'5.15"E	this part of conductor is located along the SH14	Raniganj
		8.28mtr	23°36'54.57"N	87° 6'49.09"E			this part of conductor is located within 8.28 mtr of waterbody	Raniganj
		16.12mtr	23°36'45.59"N	87° 6'46.54"E			this part of conductor is located within16.12 mtr of waterbody	Raniganj
		15.25mtr	23°36'31.76"N	87° 6'52.54"E			this part of conductor is located within15.12 mtr of waterbody	Raniganj
		7.35mtr	23°36'24.87"N	87° 6'44.20"E			this part of conductor is located within 7.35 mtr of waterbody	Raniganj
		8.16mtr	23°36'29.18"N	87° 6'42.79"E			this part of conductor is located within 8.16 mtr of waterbody	Raniganj
		31.22mtr	23°36'16.71"N	87° 6'55.27"E	23°36'15.67"N	87° 6'54.76"E	this part of conductor is located along the rail crossing	Raniganj
		20.70mtr	23°35'59.39"N	87° 7'2.54"E			this part of conductor is located within 20.70 mtr of waterbody	Raniganj

	2 no.	1323.25mtr	23°37'0.99"N	87° 6'48.95"E	23°36'19.02"N	87° 6'57.62"E	this part of conductor is located along the SH14	Raniganj
		26.46mtr	23°36'54.63"N	87° 6'48.81"E			this part of conductor is located within 26.46 mtr of waterbody	Raniganj
		16.07mtr	23°36'31.61"N	87° 6'52.71"E			this part of conductor is located within 16.07mtr of waterbody	Raniganj
		25.26mtr	23°36'6.52"N	87° 7'36.82"E			this part of conductor is located within 25.26mtr of waterbody	Raniganj
Mangalpur	Ballavpur	1135.58mtr	23°37'3.39"N	87° 8'42.88"E	23°36'36.72"N	87° 9'9.01"E	this part of conductor is located along the NH19	Raniganj, Baktarnagar
		12.87mtr	23°36'11.80"N	87° 8'42.82"E			this part of conductor is located within 12.87 mtr of waterbody	Baktarnagar
		19.88mtr	23°36'8.48"N	87° 9'1.48"E			this part of conductor is located within 19.88 mtr of waterbody	Baktarnagar
		20.95mtr	23°35'46.24"N	87° 8'51.40"E			this part of conductor is located within 20.95 mtr of waterbody	Baktarnagar
		14.76mtr	23°35'47.65"N	87° 8'58.07"E			this part of conductor is located within 14.76 mtr of waterbody	Baktarnagar
		10.76mtr	23°35'45.76"N	87° 8'56.93"E			this part of conductor is located within 10.76 mtr of waterbody	Baktarnagar
		18.86mtr	23°35'42.97"N	87° 8'35.59"E	23°35'42.47"N	87° 8'35.31"E	this part of conductor is located along the rail crossing	Baktarnagar
			23°35'42.29"N	87° 8'35.25"E	23°35'23.05"N	87° 7'27.72"E	this part of conductor is located along the agricultural land	Baktarnagar, Napur, Raniganj
		21.43mtr	23°35'13.04"N	87° 8'3.69"E			this part of conductor is located within 21.43 mtr of waterbody	Napur
		25.72mtr	23°35'18.49"N	87° 7'55.01"E			this part of conductor is located within 25.72 mtr of waterbody	Napur
		26.70mtr	23°35'26.70"N	87° 7'13.74"E			this part of conductor is located within 26.70mtr of waterbody	Raniganj
		9.38mtr	23°35'27.36"N	87° 7'7.27"E			this part of conductor is located within 9.38 mtr of waterbody	Raniganj
		964.38mtr	23°35'37.99"N	87° 7'5.82"E	23°35'29.34"N	87° 6'36.16"E	this part of conductor is located along the SH14	Raniganj

		10.05mtr	23°35'43.48"N	87° 7'5.56"E	23°35'43.48"N	87° 7'5.17"E	this part of conductor is located along the NH14 road crossing	Raniganj
		8.11mtr	23°35'34.81"N	87° 5'44.82"E			this part of conductor is located within 8.11 mtr of waterbody	Arddhagram
		1039.98mtr	23°35'9.30"N	87° 6'19.16"E	23°34'52.55"N	87° 6'50.47"E	this part of conductor is located along the Damodar river	Gopalpur, Shyamapur, Raghunathchak
			23°35'29.08"N	87° 5'48.07"E	23°35'14.11"N	87° 6'19.09"E	this part of conductor is located along the agricultural land	Arddhagram, Gopalpur, Narankuri
		39.05mtr	23°35'57.34"N	87° 6'30.73"E	23°35'58.07"N	87° 6'29.72"E	this part of conductor is located over the waterbody	Raniganj
		14.09mtr	23°36'8.20"N	87° 6'13.43"E			this part of conductor is located within 14.09 mtr of waterbody	Raniganj
		21.08mtr	23°36'7.55"N	87° 6'2.19"E			this part of conductor is located within 21.08 mtr of waterbody	Raniganj
	Ronai	16.81mtr	23°36'48.58"N	87° 7'47.43"E	23°36'46.76"N	87° 7'40.98"E	this part of conductor is located within 16.81 mtr of waterbody	Raniganj
		19.62mtr	23°36'42.09"N	87° 7'19.48"E			this part of conductor is located within 19.62 mtr of waterbody	Raniganj
		23.51mtr	23°36'41.11"N	87° 7'15.79"E			this part of conductor is located within 23.51 mtr of waterbody	Raniganj
Bakidanga	Nigha	31.55mtr	23°41'3.38"N	87° 0'10.60"E	23°41'4.10"N	87° 0'11.39"E	this part of conductor is located along the NH19 road crossing	Asansol
		410.61mtr	23°40'52.45"N	87° 0'26.76"E	23°40'36.81"N	87° 0'42.25"E	this part of conductor is located along the Nunia river (within 28mtr radius)	Asansol
		56.77mtr	23°40'29.94"N	87° 0'55.86"E	23°40'29.17"N	87° 0'57.19"E	this part of conductor is located with river crossing(Nunia river)	Asansol
		39.33mtr	23°40'20.44"N	87° 1'10.68"E	23°40'19.15"N	87° 1'10.55"E	this part of conductor is located along the NH19 road crossing	Jamuria
		687.63mtr	23°40'19.24"N	87° 1'10.59"E	23°40'14.71"N	87° 1'34.15"E	this part of conductor is located along the NH19	Jamuria
		61.83mtr	23°40'14.70"N	87° 1'34.14"E	23°40'15.64"N	87° 1'36.20"E	this part of conductor is located along the NH19 road crossing	Jamuria
		3.21mtr	23°40'17.85"N	87° 1'38.65"E			this part of conductor is located within 3.21 mtr of waterbody	Jamuria

Mangalpur	Searsole	1969.21mtr	23°38'5.04"N	87° 6'55.29"E	23°37'1.82"N	87° 6'49.01"E	this part of conductor is located along the NH14	Raniganj
		15.55mtr	23°37'49.63"N	87° 7'19.31"E			this part of conductor is located within 15.55 mtr of waterbody	Raniganj
		27.59mtr	23°37'58.25"N	87° 6'34.74"E			this part of conductor is located within 27.59 mtr of waterbody	Raniganj
		14.35mtr	23°38'0.68"N	87° 6'28.86"E			this part of conductor is located within 14.35 mtr of waterbody	Raniganj
		7.30mtr	23°38'8.78"N	87° 6'30.61"E	23°38'7.25"N	87° 6'42.57"E	this part of conductor is located within 7.30 mtr of waterbody	Raniganj
		58.29mtr	23°38'3.12"N	87° 6'23.67"E	23°38'1.96"N	87° 6'21.59"E	this part of conductor is located over the waterbody	Raniganj
		112.67mtr	23°38'17.82"N	87° 6'51.26"E	23°38'17.40"N	87° 6'55.25"E	this part of conductor is located along the NH19 road crossing	Raniganj
		392.98mtr	23°38'17.40"N	87° 6'55.25"E	23°38'23.90"N	87° 6'43.39"E	this part of conductor is located along the NH19	Raniganj
		40.39mtr	23°38'23.93"N	87° 6'43.37"E	23°38'22.77"N	87° 6'42.78"E	this part of conductor is located along the NH19 road crossing	Raniganj
		14.37mtr	23°37'57.51"N	87° 6'13.04"E	23°37'41.76"N	87° 6'11.61"E	this part of conductor is located within 14.37 mtr of waterbody	Raniganj
		26.79mtr	23°38'15.55"N	87° 5'16.05"E			this part of conductor is located within 26.79 mtr of waterbody	Raniganj
		16.55mtr	23°38'23.69"N	87° 5'29.73"E	23°38'18.26"N	87° 5'27.67"E	this part of conductor is located within 16.55 mtr of waterbody	Raniganj
		20.74mtr	23°38'47.51"N	87° 5'41.79"E	23°38'42.42"N	87° 5'38.52"E	this part of conductor is located within 20.74 mtr of waterbody	Raniganj
		1493.96mtr	23°39'0.97"N	87° 5'40.20"E	23°38'49.75"N	87° 5'59.34"E	this part of conductor is located along the NH19	Jamuria, Raniganj
		8.31mtr	23°39'3.74"N	87° 5'24.00"E			this part of conductor is located within 8.31mtr of waterbody	Jamuria
		19.09mtr	23°38'59.67"N	87° 5'30.20"E			this part of conductor is located within 19.09mtr of waterbody	Jamuria
		2.58mtr	23°39'8.15"N	87° 5'17.32"E			this part of conductor is located within 2.58mtr of waterbody	Jamuria

		1927.42mtr	23°39'15.29"N	87° 5'10.26"E	23°39'39.91"N	87° 4'9.71"E	this part of conductor is located along the NH19	Jamuria
		40.01mtr	23°39'30.72"N	87° 4'36.46"E	23°39'32.05"N	87° 4'36.19"E	this part of conductor is located along the NH19 road crossing	Jamuria
		24.94mtr	23°39'39.81"N	87° 4'13.06"E	23°39'39.19"N	87° 4'12.39"E	this part of conductor is located along the NH19 road crossing	Jamuria
		26.45mtr	23°39'47.85"N	87° 4'26.29"E			this part of conductor is located within 26.45mtr of waterbody	Jamuria
		10.80mtr	23°39'5.26"N	87° 3'49.45"E	23°39'6.42"N	87° 3'47.18"E	this part of conductor is located within 10.80 mtr of waterbody	Jemari (J.K. Nagar Township)
		2.33mtr	23°38'52.63"N	87° 3'55.50"E	23°38'47.96"N	87° 3'53.89"E	this part of conductor is located within 2.33 mtr of waterbody	Jemari (J.K. Nagar Township)
		15.22mtr	23°38'53.45"N	87° 3'57.21"E	23°38'52.49"N	87° 4'0.20"E	this part of conductor is located within 15.22 mtr of waterbody	Jemari (J.K. Nagar Township)
		15.09mtr	23°38'50.92"N	87° 4'4.67"E			this part of conductor is located within 15.09 mtr of waterbody	Jemari (J.K. Nagar Township)
		11.82mtr	23°38'37.37"N	87° 4'8.89"E	23°38'36.22"N	87° 4'11.62"E	this part of conductor is located within 11.82 mtr of waterbody	Jemari (J.K. Nagar Township), Belebathan
		4.17mtr	23°38'32.93"N	87° 3'57.64"E			this part of conductor is located within 4.17 mtr of waterbody	Jemari (J.K. Nagar Township), Belebathan

7.3.1 Environmental Sensitive Receptor & Cultural Resources

The feeder-wise location of eco-sensitive receptors and cultural resources identified within the influence area (i.e. COI/RoW) of the feeder for augmentation of conductor size of 11KV Line along with the identified buffer area (100-300m) from the boundary of concerned eco-sensitive receptors and historical & cultural areas including ASI monuments and World Heritage Site if any are presented in Figure 7.15 to 7.44.

FIGURE 7.15: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG STATE HIGHWAY(SH14)-2 NO. 11KV

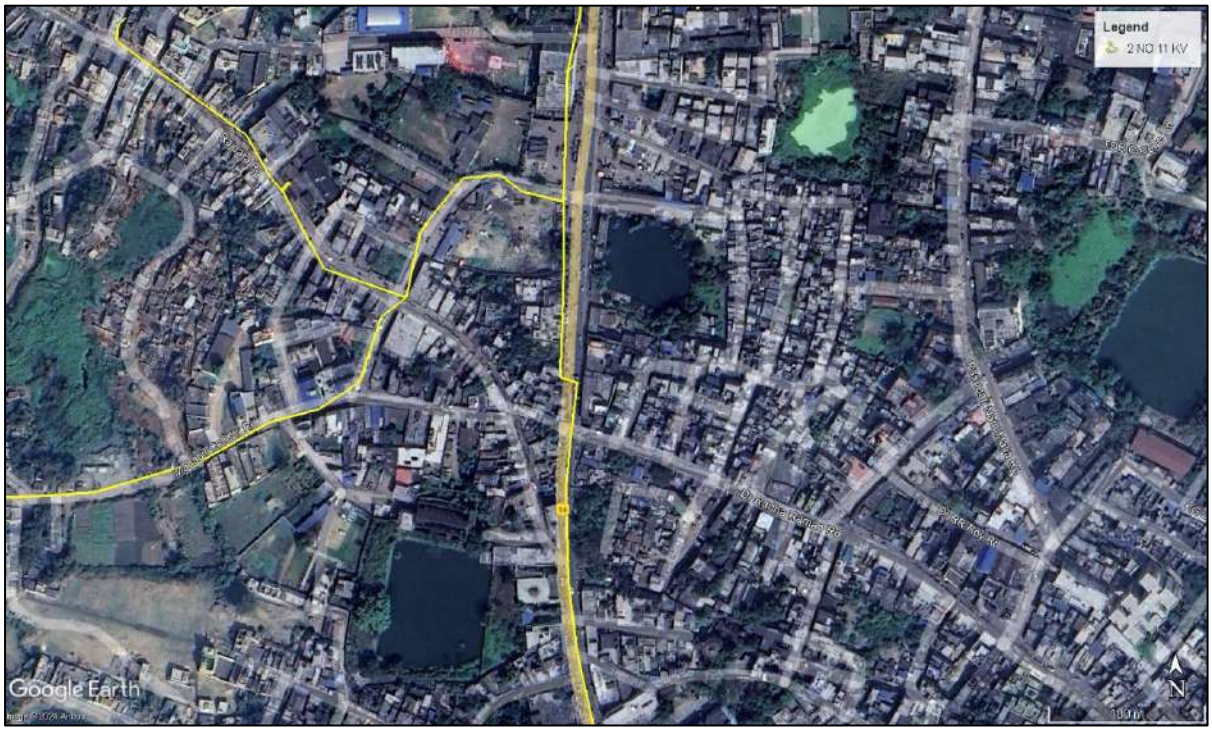


FIGURE 7.16: WATERBODY FALLING CLOSE TO ROW OF SELECTED FEEDER – 2NO.11 KV

FIGURE 7.17: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY(NH19)-BALLAVPUR 11KV

FIGURE 7.18: WATERBODIES FALLING CLOSE TO ROW OF SELECTED FEEDER- BALLAVPUR 11KV

FIGURE 7.19: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG STATE HIGHWAY(SH14)- BALLAVPUR 11KV

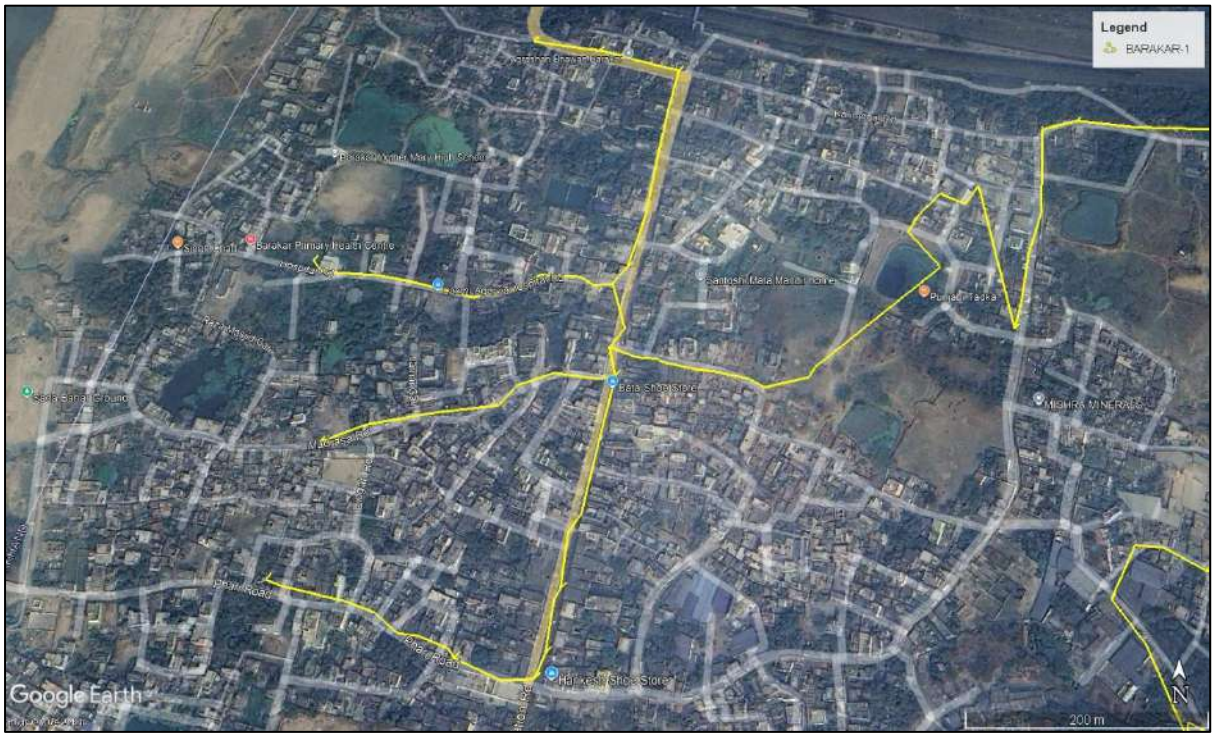


FIGURE 7.20: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG STATE HIGHWAY(SH5)- BARAKAR I 11KV

FIGURE 7.21: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY(NH2)- BARAKAR II 11KV

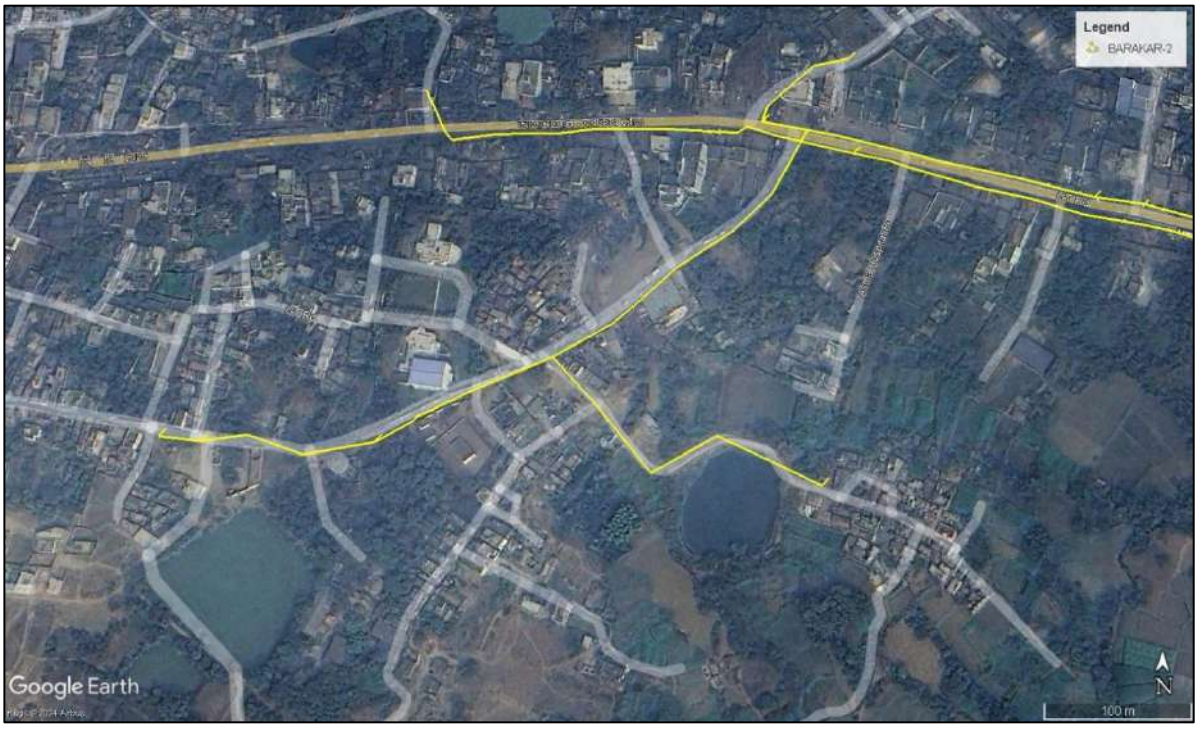


FIGURE 7.22: WATERBODIES FALLING CLOSE TO ROW OF SELECTED FEEDER- BARAKAR II 11KV

FIGURE 7.23: RAILWAY CROSSING FALLING CLOSE TO ROW OF SELECTED FEEDER - BELRUI 11 KV

FIGURE 7.24: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG STATE HIGHWAY(SH5)-BELRUI 11KV

FIGURE 7.25: WATERBODY FALLING CLOSE TO ROW OF SELECTED FEEDER – BELRUI 11 KV

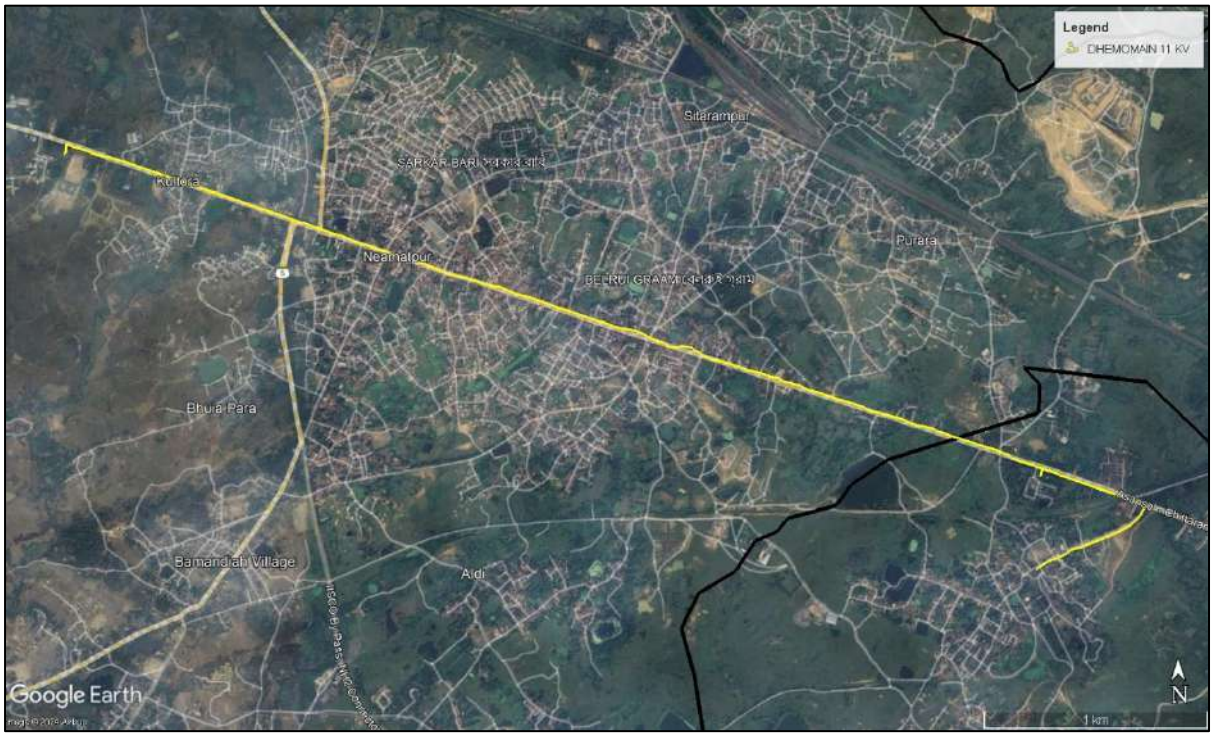


FIGURE 7.26: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY(NH2)-DHEMOMAIN 11KV

FIGURE 7.27: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG STATE HIGHWAY(SH14)-GIRJAPARA 11KV

FIGURE 7.28: RAILWAY CROSSING FALLING CLOSE TO ROW OF SELECTED FEEDER – GIRJAPARA 11 KV

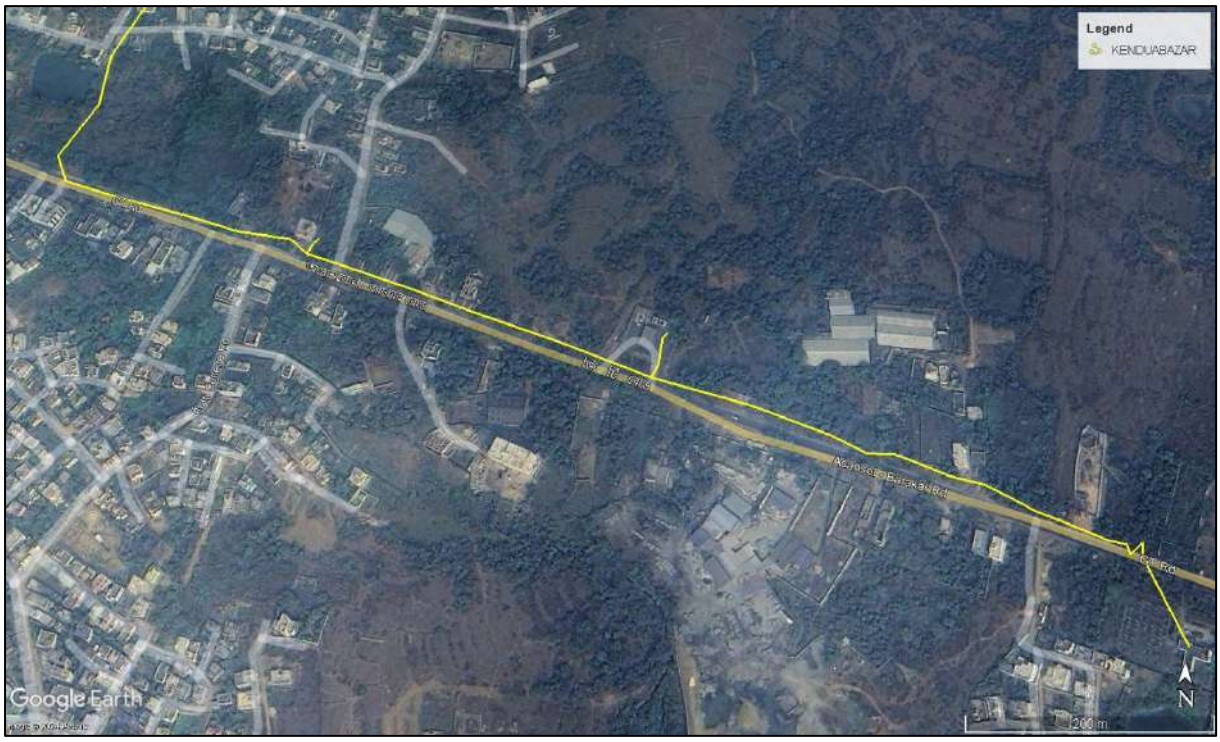


FIGURE 7.29: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY(NH2)-KENDUA BAZAR 11KV

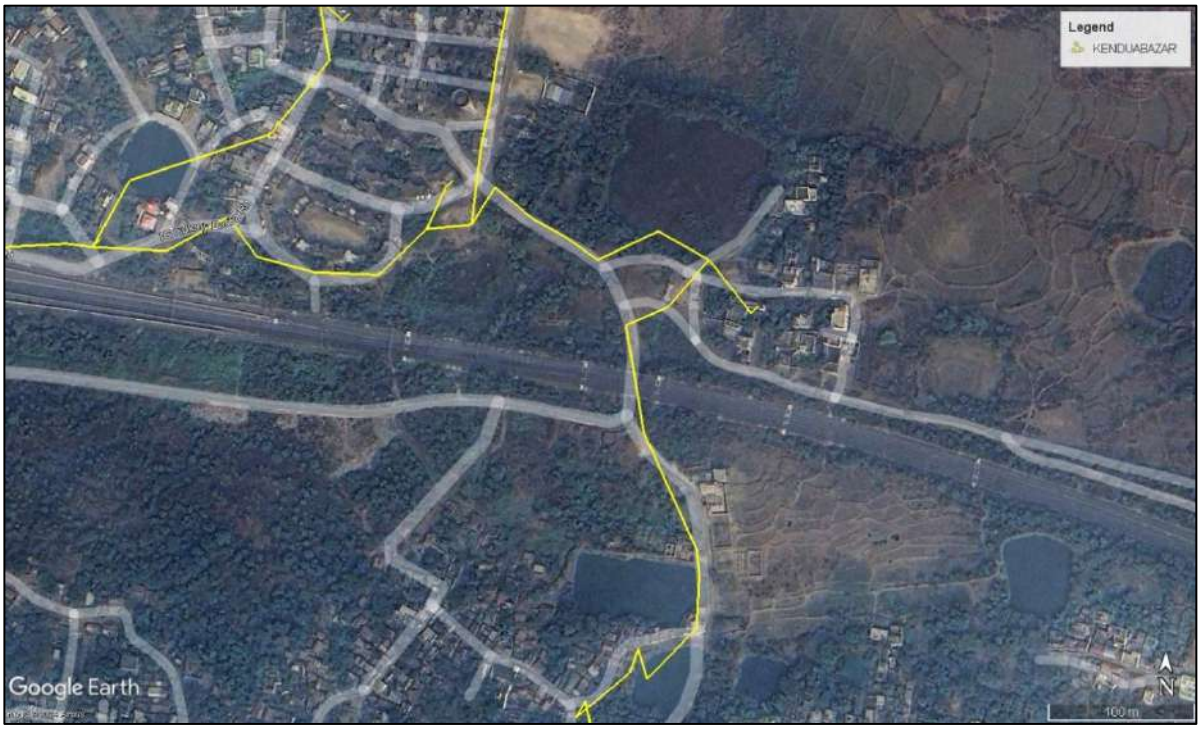


FIGURE 7.30: RAILWAY CROSSING FALLING CLOSE TO ROW OF SELECTED FEEDER – KENDUA BAZAR 11 KV

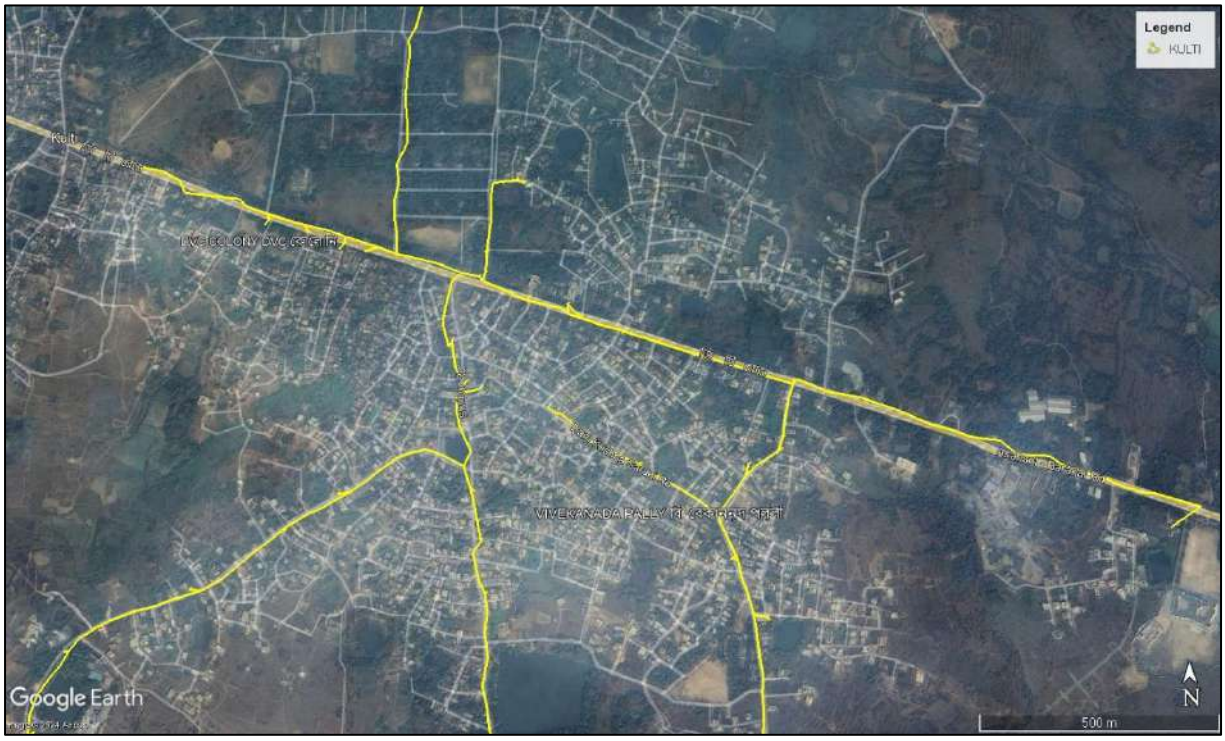


FIGURE 7.31: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (NH-2) – KULTI 11 KV

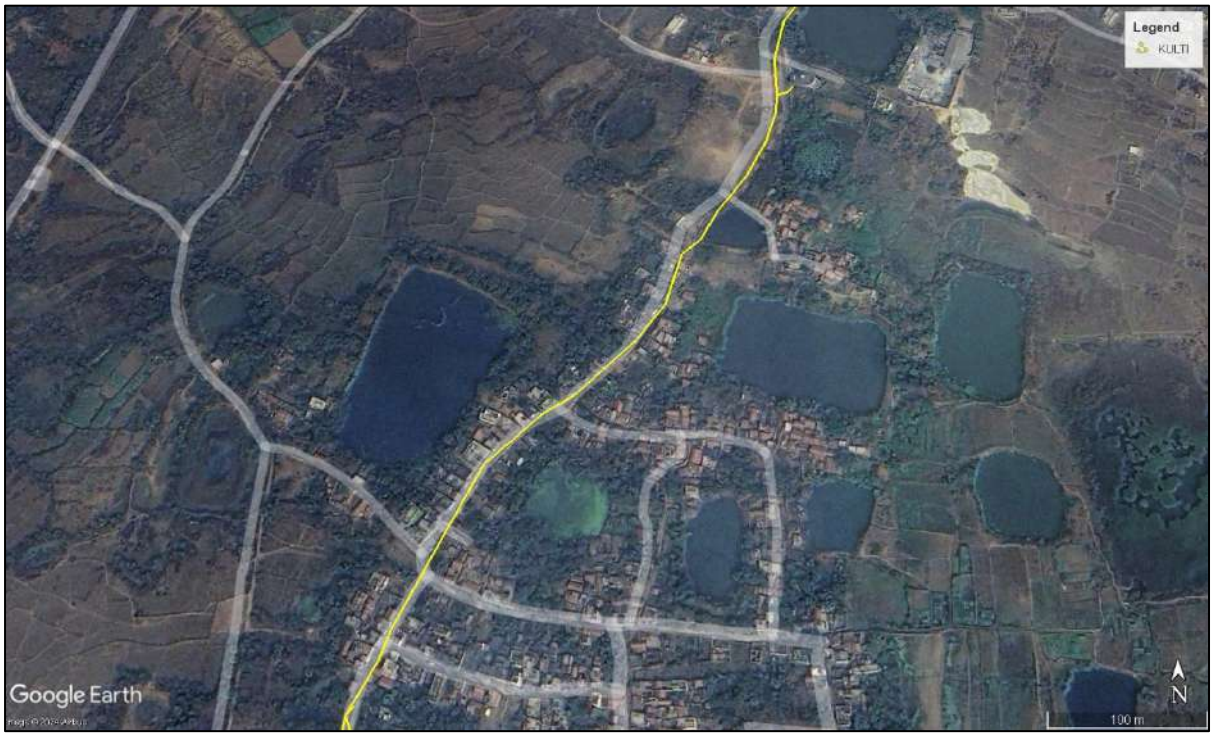


FIGURE 7.32: WATERBODIES FALLING CLOSE TO ROW OF SELECTED FEEDER – KULTI 11 KV

FIGURE 7.33: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG STATE HIGHWAY (SH 14) – MAHALAXMI 11 KV

FIGURE 7.34: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (AH1) – NIGHA 11 KV

FIGURE 7.35: WATERBODIES FALLING CLOSE TO ROW OF SELECTED FEEDER – NIGHA 11 KV

FIGURE 7.36: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG RIVER (NUNIA RIVER) – NIGHA 11 KV

FIGURE 7.37: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (NH19) – NIGHA 11 KV

FIGURE 7.38: WATERBODIES FALLING CLOSE TO ROW OF SELECTED FEEDER – RONAI 11 KV

FIGURE 7.39: WATERBODIES FALLING CLOSE TO ROW OF SELECTED FEEDER – SEARSOLE 11 KV

FIGURE 7.40: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (NH14) – SEARSOLE 11 KV

FIGURE 7.41: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG HIGHWAY CROSSING – SEARSOLE 11 KV

FIGURE 7.42: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG NATIONAL HIGHWAY (NH19) – SITARAMPUR 11 KV

FIGURE 7.43: PROPOSED ALIGNMENT OF SELECTED FEEDER ALONG STATE HIGHWAY (SH5) – SITARAMPUR 11 KV

FIGURE 7.44: WATERBODY FALLING CLOSE TO ROW OF SELECTED FEEDER – SITARAMPUR 11 KV

8.0 PUBLIC CONSULTATION & INFORMATION DISCLOSURE

Through the process of public consultation and disclosures, WBSEDCL would envisage the participation of stakeholders at each stage of programme planning and implementation. WBSEDCL would be responsible not only for ensuring the participation of the community in the consultation process but to making it effective to ensure the integration of the feedback received from stakeholders into the programme plans where it deems fit.

8.1 MECHANISM FOR PUBLIC CONSULTATION & INFORMATION DISCLOSURE

Public consultation is a critical component of the Revamped Sector Distribution Scheme (RDSS) programme, aligned with the Asian Development Bank (ADB) Safeguard Policy Statement (2009), which emphasizes the importance of stakeholder engagement and public participation in development programmes to ensure environmental and social considerations are effectively addressed. The objectives of public consultation include discussing construction issues such as the conversion of Low-Tension Overhead (LTOH) lines to Aerial Bundled (AB) cable, addressing potential installation challenges, and highlighting benefits like improved safety and reliability. Additionally, it involves evaluating the segregation and bifurcation of 11 KV feeders, along with the augmentation of 33/11 KV substations and the installation of capacitor banks in substations. This consultation aims to explore benefits such as reduced load on individual feeders, enhanced fault isolation, improved power quality, and increased system efficiency. Furthermore, the implementation of IT/OT-enabled works will be addressed, focusing on the integration of advanced technologies to optimize operations and management. Potential issues, including the impact on existing infrastructure and communities, will also be carefully considered.

By engaging with the public, the RDSS programme aims to gather valuable insights, address concerns, and incorporate feedback to ensure the successful and sustainable implementation of the scheme. Public consultations provide a platform for transparency, accountability, and community involvement, which are essential for the programme's long-term success and acceptance.

8.1.1 Public Consultation for LTOH to AB Cable Conversion

During the public consultation in Bardhaman West district, several critical issues and benefits associated with the use of bare conductor cables and the conversion to Aerial Bunched (AB) cables were discussed in detail. The attendees included officials from the West Bengal State Electricity Distribution Company Limited (WBSEDCL), members of the Panchayat Samity, residents, officials from the Indian Institute of Social Welfare and Business Management (IISWBM) and representatives from the Asian Development Bank (Table 8.1).

TABLE 8.1: PUBLIC CONSULTATION FOR INITIATION OF LTOH TO ABC CONVERSION IN BARDHAMAN WEST DISTRICT, FEBRUARY & MARCH 2024

Sl. No.	Location		Date of PC	No. of Persons		
	Location of PC	Block		Male	Female	Total
1	Taldanga	Baraboni	20/02/24	6	5	11
2	Sonai Badyakar Para	Kanksha	12/02/24	22	27	49
3	Rupnarayanpur	Salanpur	17/02/24	21	8	29
4	Dakshin Khanda Moiri	Andal	19/02/24	11	2	12
5	Nochan Ukra	Durgapur-Fardipur	19/02/24	9	2	11
6	Gobindopur	Padaveswar	20/02/24	6	0	6
7	Shri Danga	Jamuria	17/02/24	33	12	45

In Baraboni block at Taldanga, 54.5% of the attendees were male and 45.5% were female. At Sonai Badyakar Para in Kanksha block, the consultation saw a higher female turnout with 55.1% female and 44.9% male participants. In Salanpur block at Rupnarayanpur, 72.4% of attendees were male and 27.6% were female. The consultation at Dakshin Khanda Moiri in Andal block had 91.7% male and 8.3% female participation. In Durgapur-Fardipur block at Nochan Ukra, 81.8% of the attendees were male and 18.2% were female. At Gobindopur in Padaveswar block, all participants were male, making up 100% of the attendance. Lastly, in Jamuria block at Shri Danga, 73.3% of attendees were male and 26.7% were female. These percentages reflect varied gender participation across different blocks of Bardhaman West district, with some blocks showing a more balanced gender representation, particularly in Kanksha, where female participation was notably high.

The following issues were discussed during the public consultation for the conversion of LTOH to AB cable:

- The heightened risk of electrocution for both humans and animals, especially in densely populated areas where exposed bare conductor cables are a threat.

- Bare conductor cables are often damaged by extreme weather conditions such as storms and lightning, causing power interruptions and posing severe safety risks.

- Compared to insulated cables, bare conductor cables require more frequent maintenance and replacements, resulting in substantial costs and time investments.

- The heightened risk of fires caused by sparks from bare cables was identified as a major concern, posing serious risks to nearby structures, vegetation, and wildlife, compounding the environmental and safety risks.

The following suggestions were made for conversion of LTOH to AB cable during the public consultation:

- WBSEDCL recommended the installation of Aerial Bundled Cables (AB Cables) to significantly reduce the risk of electrocution for both humans and animals, as these cables are insulated and safer in densely populated areas.

- WBSEDCL suggested that AB cables, being insulated, are less susceptible to damage from extreme weather conditions such as storms and lightning, thereby reducing the frequency of power interruptions and enhancing overall safety.

- To address maintenance concerns, WBSEDCL highlighted that AB cables require less frequent maintenance and replacements compared to bare conductor cables, which would lead to lower long-term costs and less disruption.

- WBSEDCL assured the public that AB cables, being insulated, significantly reduce the risk of fires caused by sparks. This measure was proposed to protect nearby structures, vegetation, and wildlife, thus minimizing environmental and safety risks.

- WBSEDCL emphasized that the conversion to AB cables would enhance overall safety for the community, providing a more reliable and secure power distribution system that reduces risks associated with bare conductor cables.

The following benefits of for conversion of LTOH to AB cable were highlighted during the public consultation:

- AB cables are equipped with insulation, significantly diminishing the likelihood of electrical mishaps, thus enhancing safety for individuals and property, particularly crucial in densely populated areas.

- AB cables offer heightened reliability and resilience against adverse weather conditions, ensuring an uninterrupted power supply even during storms and lightning.

- The improved durability of AB cables translates to decreased maintenance needs, leading to substantial cost savings and enhanced operational efficiency for the power distribution network.

- The adoption of AB cables eliminates the unattractive appearance associated with bare conductor cables, resulting in a more aesthetically pleasing urban environment and reducing the risk of urban blight.

The prime environmental and social issues raised by the local people include the selection of location for the erection of poles, damage likely to be caused to physical infrastructure by erection of pole as well as stringing of electric lines, loss of livelihood, impact on trees, crops and waterbodies, etc. These major issues raised by the local people were addressed by the WBSEDCL authority as well as other Government/Public representative to ensure minimum hardship to local people while construction activities as well as operation and maintenance phase of proposed programme intervention.

FIGURE 8.1: PUBLIC CONSULTATION FOR INITIATION OF WORK FOR LTOH CONVERSION TO ABC UNDER THE RDSS PROGRAMME AT BARDHAMAN WEST DISTRICT

8.1.2 Public Consultation for Bifurcation of 11kv Feeder

During the public consultation on the bifurcation of 11KV feeders, several key issues and benefits were thoroughly discussed. Community members and stakeholders, including representatives from ADB, WBSEDCL officials, local panchayat members, and residents, engaged in meaningful dialogue about the technical and operational improvements these measures would bring. Bifurcation was praised for improving load management, reducing technical losses, and ensuring a more stable and efficient power supply. The strategy was seen as vital for optimizing the distribution network, enhancing operational efficiency, and providing a more consistent and reliable power supply to consumers, ultimately contributing to a more resilient and sustainable energy system in the Bardhaman West district.

BIFURCATION OF 11KV FEEDERS

The following issues were discussed during the public consultation for the bifurcation of 11Kv feeder:

- The bifurcation process may require extended power outages, which could disrupt daily life and business activities. Residents also expressed concerns about the duration and frequency of these outages.

- Bifurcation involves construction work, including digging, installation of new poles, and stringing of lines, leading to noise pollution and disturbance in the community.

- The physical work required for bifurcation can lead to accidental damage likely to be caused to physical infrastructure, impact on trees, crops and water bodies, etc. Residents are worried about how such damage will be prevented or compensated.

The following suggestions were made for the segregation of 11Kv feeder during the public consultation:

- WBSEDCL officials have suggested scheduling power outages during non-peak hours and providing advance notice to the public. This approach would help minimize disruptions to daily life and business activities, allowing residents and businesses to plan accordingly.

- To address concerns about noise and construction disturbances, WBSEDCL has suggested using noise-reducing equipment and implementing construction work in phases. Additionally, they will set specific working hours to limit noise and disturbance during early mornings or late evenings.

- WBSEDCL officials assure residents that measures will be in place to protect private property during the bifurcation process. They might also outline a clear compensation or repair plan in case of any accidental property damage.

The following benefits of bifurcation of 11Kv feeder were highlighted during the public consultation:

- Bifurcation facilitates better load balancing and more accurate demand forecasting, enabling distribution companies to distribute loads more evenly across the network and reduce system stress.

- This process allows for targeted investments in critical areas, deferring the need for expensive upgrades and optimizing the existing infrastructure.

- Bifurcation supports better compliance with regulatory standards by allowing for more detailed reporting and documentation of performance metrics.

- These improvements result in better asset utilization, operational efficiency, and customer service, fostering a more sustainable and resilient power distribution system.

FIGURE 8.2: PUBLIC CONSULTATION FOR INITIATION OF WORK FOR 11KV FEEDER BIFURCATION UNDER THE RDSS PROGRAMME AT BARDHAMAN WEST DISTRICT

9.0 ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan (EMP) is an integral part of IEE which contains mitigative measures and a plan for assessment and management protocol to address identified/potential environmental & social risks/impacts during programme implementation and the O&M stage. The EMP is prepared to facilitate the effective implementation of recommended mitigation measures with defined roles and responsibility for implementation and monitoring, regulatory compliance requirements, and stages of implementation with location, time frame and costs. The mitigation measures are proposed to eliminate or minimise the identified impact associated with design, construction and operation stages of the project, to an acceptable level by adopting the most feasible options.

The EMP is prepared as per the SPS 2009 of ADB. The identified impacts are insignificant and are related to clearing operations of RoW, traffic diversions, setting and operation of construction camps, transportation of materials, air & noise pollution due to construction activities and operation of construction equipment, tree trimming/cutting, damage of utilities and physical community structure. Appropriate mitigation measures are identified for all major construction and operation activities under RDSS Programme in Bardhaman West district with the financial assistance of ADB.

The EMP covers information on the management and/or mitigation measures that will be taken into consideration to address impacts during pre-construction, construction and post-construction phases of the programme as presented in Table 9.1.

The EMP applies to all sub-activities under the Programme, including mitigation measures and monitoring requirements presented in the matrix form. This EMP Matrix will form part of the contract document with General Environment, Health & Safety (EHS) Conditions of Contract (CoC) forall contractors. The EMP specifies the mitigation and management measures which the PIU will undertake to demonstrate how the project will mobilize organizational capacity and resources to implement these measures.

TABLE 9.1: ENVIRONMENTAL MANAGEMENT PLAN MATRIX

Programme Activity	Potential Environmental Impact	Mitigation Action	Parameters to be Monitored	Standards/ Measurement/ Frequency	Institutional Responsibility	Implementation Schedule
PLANNING & DESIGN / PRE-CONSTRUCTION PHASE						
A Physical Resources						
Interference with drainage patterns/Irrigation channels	Temporary flooding hazards/loss of agricultural production	Pole-by-pole survey (network survey) of all existing bare conductor lines that will be replaced with AB Cabling.	Survey data and routemaps	Review of surveydata/line route maps - Once	Contractor subject to review by WBSEDCL / PMA (Programme Management Agency)	Survey and design
Interference with national roads and railway lines	Traffic congestion. Possible damage to road/railway infrastructure causing public inconvenience	Use of underground cabling for national road/railway crossings using the Horizontal Directional Drilling (HDD) method as per Technical Specifications. Obtain necessary permits/clearances/ approvals from road/railway authorities. Follow guidelines issued by the authorities for detailed design.	Permits/clearances/ approvals from road/railway authorities and their guidelines.	Technical Specifications andguidelines issued by road and railway authorities - Once	Contractor subject to review by WBSEDCL / PMA.	Survey and design / pre-construction
B Environment Resources						
Location of poles and other facilities	Impact to the existing environment	Based on network survey data and line route maps, if new LT/HT lines are passing through forest areas, natural flowpaths, important ecological habitats or close proximity to water bodies obtain approvals/permits from concerned authorities or propose alternate routes avoiding these areas in case of new LT/HT lines for ADB funded programme activities in seven districts applicability of works to be taken up in sensitive areas	Survey data and routemaps Conditions of permits/approvals and clearances	Review of survey data / line route maps by WBSEDCL/ PMA – Once	Contractor subject to review by WBSEDCL / PMA	Survey and design

		needs to be determined based on eligibility criteria mentioned in the ESMF.				
	Impact to the existing environment	Obtain necessary permits, approvals and clearances from concerned Authorities such as local authorities, forest dept. etc. once the line routes are finalized as above. (if required)	Conditions of permits/approvals and clearances	Consultation with authorities. Reviewof survey data / lineroute maps by WBSEDCL/ PMA – Once	Contractor subject to review by WBSEDCL / PMA	Survey and design
	Impact on water bodies/land/ residences	If pole by pole survey indicates location of poles and distribution transformers inside or in proximity to water bodies propose alternate pole locations or re-routing of lines. Also consider crossing of water bodies through special arrangements (long span lines). If illegal encroachments are noted within right of way (RoW) of the existing lines that disturb proposed conductor replacements with necessary clearances, consult WBSEDCL to remove such obstacles through appropriate actions or re-route lines as necessary. If new LT/ HT lines are passing through private lands consider shifting lines to boundary locations or obtain permission from owners to continue the line in the same manner.	Survey data and routemaps	Review of survey data / line route maps by WBSEDCL/ PMA – Once	Contractor subject to review by WBSEDCL / PMA	Survey and design
	Noise generation exposure to noise, Nuisance to neighbouring properties	Maintain specified clearances (designs) for distribution lines to houses and buildings. Supply of distribution transformers with specified maximum noise levels as per specifications	Proximity of lines / distribution transformersto buildings. Noise level measurement of distribution transformers	Statutory clearances as per IE rules / Transformer noise level as per NEMA Publication No. TR-	Contractor subject to review / testing by WBSEDCL /PMA	Survey and design / supply of equipment

			as per type testing	1 - Once		
	Impact on water bodies / land/ residences	Line routes and facilities shall be planned to avoid resettlements (no resettlements permitted for this programme). Avoid location of poles inside or close proximity to waterbodies and if necessary crossing of water bodies through special arrangements (long span lines). Avoid location of facilities inside private lands (unless permission is obtained from owners in exceptional cases).	Survey data and routemaps	Consultation with local authorities and landowners / Review of survey data / line route maps by WBSEDCL/ PMA – Once	Contractorsubject to review by WBSDCL /PMA	Survey and design
Impact on visual aesthetics / loss of original landscape beauty	Impact to the existing environment	New lines and distribution poles to be sited to minimize visual impacts and the amount of visual clutter as far as possible given the nature of the programme. Consult individual households where a new pole location is directly in front of private property prior to finalizing detaileddesign.	Survey data and routemaps Compliance with national laws and regulations	Consultation with local authorities and landowners / Review of survey data / line route maps by WBSEDCL/ PMA – Once	Contractorsubject to review by WBSDCL /PMA	Survey and design
Impact on construction waste, Healthand safety	Pollution risk andgeneration of construction wastes	Prepare pollution prevention plan (PPP) and construction waste management plan (CWMP) for solid and hazardous waste management (if any) in accordance with national regulations and the IFC's General EHS Guidelines (2007). For all construction works undertake risk assessment and prepare H&S plan in accordance with the IFC EHS General Guidelines on OHS for approval by DISCOM, considering occupational and community H&S and including adherence to electrical safety standards and emergency preparedness and response plan with communication	Compliance with national laws and regulations	Consultation with local authorities / Review of survey data / line route maps by WBSEDCL/ PMA – Once	Contractorsubject to review by WBSDCL /PMA	Survey and design

		systems and protocols to report an emergency situation.				
C Ecological Resources						
Encroachment into sensitive ecological areas	Loss of sensitive ecological values/ damage to endangered species	Based on network survey if new LT/HT lines encroach into ecologically sensitive areas obtain necessary approvals from concerned authorities or re-route lines as necessary for ADB funded programme activities in seven districts applicability of works to be taken up in sensitive areas needs to be determined based on eligibility criteria mentioned in the ESMF.	Floral and faunalhabitats loss	Enumeration of flora and fauna atsite-Once	Contractor subject to review by WBSEDCL / PMA	Survey and design
Cutting and Trimming of Trees	Loss of trees along the Right ofWay (RoW)	Minimize tree cutting and trimming requirements for any new line routes proposed. ecological walkover to identify any nesting or roosting areas on the trees by a qualified and experienced ecologist prior to trimming/ topping / cutting to determine the suitable time period for conducting tree trimming/ cutting/ topping/ line de-stringing and stringing etc. Only after the ecologist certifies that no impacts on ecology is anticipated , the tasks in such section can be done. Apart from this prior permission from the forest department will be mandatory.	Tree-loss	Tree cutting statistics providedby the Contractor-Once	Contractor subject to review by DISCOMS / PMA	Survey and design
D Human Environment						
Involuntary resettlement or land acquisition	Loss of habitatsand structures	Avoid loss of habitats and structures during construction as no resettlement plan is permitted	Survey data and lineroute maps	-	Contractor withthe approval of WBSEDCL	Pre-construction phase
Encroachmentinto farmland	Loss of agricultural productivity	If power lines cross directly throughprivate farmland; shift such lines towards boundaries.	Survey data and line route maps	Appropriate compensation -	Contractor withthe approval of	Pre-construction phase

		Farmers to be compensated for any permanent loss of cash crop trees thatneed to be trimmed or removed.		Once	WBSEDCL	
Proximity of lines to housesand buildings	Safety risks to residents	Maintain vertical and horizontal statutory clearances for power lines to buildings as per technical specifications. If necessary re-route the proposed lines.	Survey data and line route maps	Technical Specifications, IErules, CEA guidelines Review of survey data and line route maps - Once	Contractor subject to review by WBSEDCL /PMA	Survey anddesign
Power line construction planning	Safety risks to people due to excessive sags / breakage of conductors / collapse of lines	Prepare sag-tension charts for stringing of AB cables at different ambient temperatures to control maximum sag and maximum tension at different ambient temperatures. Ensure stays / struts are placed atrequired locations to support poles to ensure stability of lines.	Technical specifications and construction designs	Technical specifications, CEAguidelines Review of line design by WBSEDCL / PMA - Once	Contractor subject to review by WBSEDCL /PMA	Detailed design
Construction of power lines and facilities at heritage sites	Loss of aestheticvalue	As far as possible power lines and facilities shall be constructed not harmingaesthetics of archaeological, historical, cultural, and religious heritage sites. Typically, lines and distribution transformers shall be located away from such sites. Where necessary ABC or underground cables shall be used insteadof bare conductor lines. Distribution transformers if required inside the site may be installed within enclosures or buildings. Consultations with heritage site authorities shall be carried out to plan and design facilities in compliance with their requirements.	Survey data and lineroute maps	Detailed designs –Once	Contractor subject to review by WBSEDCL / PMA	Survey and design

Interference with other utilities and traffic due to design and layout of Programme equipment	Safety risks to WBSEDCL	Obtain necessary clearances consistent with the requirements of Government of India and Government of West Bengalfrom other utilities that could be affected by the Programme (electric, water, sewerage, telecommunications, road, rail etc.) Contractor to prepare for DISCOM approval traffic management plan in consultation with relevant local authoritiesto ensure proper execution of traffic controls including where temporary blockage of one lane of the road during installation is required for health and safety purposes that highly visible guides,advance warning signs or flag personsare in place to direct pedestrian and vehicular traffic.	Survey data and line route maps	100% of clearances obtained before commencement of works. Traffic management plan approved before commencement of works. No unresolved grievances from local community Compliance with national laws and regulations	Contractor subject to review by WBSEDCL / PMA Review and approval oftraffic management plan Assist with review and approval of traffic management plan	Survey anddesign
Location of workers camp and materials storage areas could adverselyaffect residential areas and sensitive receptors (schools, hospitals/clinics)		If required, laydown and storage areas, temporary worker camps, etc. to belocated at least 25m from waterbodies,50m from springs and groundwater wells,and 50m from sensitive receptors (houses, schools, clinics, temples, etc.) however noisy and dusty activities such as concrete batching, hot mix, construction workers overnight accommodation etc. to be located at least 200m away from any sensitive receptors. Local communities to be consulted when selecting sites for programme facilities prior to finalization.	Related facilities located sufficient distance from nearestreceptors No unresolved grievances from localcommunity Compliance with national laws and regulations	Part of detailed design and pre-construction phase	Contractor subject to review by WBSEDCL /PMA	Pre-Construction phase
CONSTRUCTION PHASE						
A Physical Resources						
Erection of new poles and stays	Soil erosion	Implement measures to preventpossibility of soil erosion due to surface run off. Measures include immediate backfilling	Soil erosion	Visual inspection of site – Once per each site upon completion of work	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase

		and compaction / stabilisation of excavated soils from pole pits and disposal of surplus soil as per approved procedure.				
	Water contamination	Measures shall be taken to prevent water quality degradation in downstream water bodies from construction sites. Construction work should be carefully designed to prevent obstruction or destruction to natural drainage. Surplus soil / materials / waste and debris during construction shall be disposed as approved and shall not be left where it may be carried by water to downstream flood plains, dams, lagoons or other water bodies. Immediate backfilling and compaction / stabilisation of soil during construction.	Water contamination	Visual inspection of site – Once per each site upon completion of work	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase
Road andrailway crossings	Public inconvenience due to accidental damage / disturbance to road and railway infrastructure.	Follow instructions / guidelines issues by the road and railway authorities and conditions of approvals / permits. Use HDD method for laying of underground cables as per technical specifications. Use of well trained and experienced machinery operators to reduce accidental damage. Maintain required clearances as per guidelines. Notify road and railway authorities immediately if any accidental damage occurs and pay applicable fees / costs for carrying out necessary repairs.	Accidental damages to road and railway infrastructure	Guidelines issued by road and railway authorities. Visual inspections - Once	Contractor subject to monitoring by WBSEDCL / PMA Payment of fees / costs forany repairs for accidental damages shallbe Contractors responsibility.	Construction Phase
B Environment Resources						
AB Cable replacements for existing lines passing through environmentally	Impact to the existing environment	Lines passing through environmentally sensitive areas such as forest areas, protected areas, heritage sites etc shall be identified based on network survey. Necessary permits / approvals shall be	Construction work in environmentally sensitive areas	Conditions of permits / approvals and clearances Site Inspections – As required	Contractor subject to monitoring by WBSEDCL / PMA	Construction Phase

sensitive areas		obtained from concerned authorities to carry out proposed work. Work shall be carried out strictly in accordance with the conditions / parameters of the permits issued by the relevant authorities.				
Line construction work	Noise and vibrations	Selection of construction techniques and machinery to minimize noise and vibrations. Associated construction works in residential areas shall be limited to daytime only.	Noise pollution duringconstruction. Public Complaints	GoI and IFC Noise control regulations Site Inspections - Quarterly	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase
Provision offacilities for construction workers	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation (soak pits/septic tanks), water supply and waste disposal facilities. Workforce is not allowed to harvest wood, therefore the Contractor to ensure LPG gas cylinders are provided to labor camps.	Amenities for Workforce.	Presence of proper sanitation, water supply and waste disposal facilities - Visual inspection (Continuous)	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase
Pole and distribution transformer erection, underground cabling and substation control room extensions	Noise and vibrations	Selection of construction techniques and machinery to minimize noise and vibrations. Associated construction works shall be limited to daytime only.	Noise pollution duringconstruction. Public Complaints	GoI and IFC Noise control regulations - Quarterly	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase
Undergroundcabling and substation control room extensions	Impairment of ambient air quality	Spraying of water to dust-generatingareas; Covering excavated soil/dump during off-work with tarpaulin; Provide temporary enclosure of dust-generatingconstruction area/activities; Trucks transporting construction materials that generate dust will be covered;	Construction techniquesand dust control measures	GoI and IFC Air Quality regulations - Quarterly	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase
Substation control room extensions anddistribution transformer erections	Hazardous waste	Ensure transformer oil supplied is PCB free as per technical specifications. Ensure safe handling and disposal of hazardous waste including transformer oiland asbestos in accordance with applicable	Hazardous waste disposal	Hazardous Waste (Management andHandling Rules,) 1989 -	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase

		regulations and procedures. For appropriate reuse or disposal with allwaste transfer records retained.		Continuous		
C Ecological Resources						
Trimming /cutting of trees	Loss of vegetation anddeforestation	Trees / bushes that can survive cutting shall only be pruned. Line routes shall be planned or re-routed so that no plant species of conservation status are cut. If necessary line Construction works will not be scheduled following harvest time to minimize damage to cash crops, Contractor is permitted to clear vegetation subject to consultation with crops owners. Felled trees and other cleared or pruned vegetation shall be disposed in accordance with applicable procedures.	Species of conservationstatus retained as approved by statutory authorities. Disposal of cleared vegetation as approvedby the statutory authorities	Presence of target species in Right of Way (RoW) following vegetation clearance. Site Inspections – Twice during pre-construction and upon completion	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase
Conduct of constructionworkers	Loss of vegetation anddeforestation	Construction workers prohibited from harvesting wood in the programme area during their employment. Contractor to provide LPG gas cylinder / cooker for labour camps.	Illegal wood/vegetation harvesting - number ofincidents reported	Complaints by localpeople or other evidence of illegal harvesting – Once	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase
	Effect on fauna	Prevent work force from disturbing the flora, fauna including hunting of domestic animals, wildlife and fishing in water bodies. Awareness programme for workers regarding conservation of flora, fauna including ground vegetation to all workers.	Habitat loss	Complaints by localpeople or other evidence of illegal hunting / fishing - Once	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase
Site clearance for undergroundcabling and substation control room extensions	Loss of vegetation	Marking of vegetation to be removed prior to clearance, and strict control on clearance area as per approved site area requirements. .	Vegetation marking andclearance control (area in m^2)	Clearance strictly limited to target vegetation-Once	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase

D Human Environment						
All construction works interfering withpublic areas and facilities	Nuisance to the general public	Notify general public in the locality of the proposed construction activity, scheduled commencement and completion period and contact details for information and complaints. Safe access to property and roads should be maintained and alternative routes and access provided where there are temporary diversions or blockages.	Notifications	Site inspections - Once	Contractor subject to monitoring by WBSEDCL / PMA	Construction phase
Electricity supply interruptions forline constructionworks	Inconvenience to electricity consumers and negative impacts on social, agricultural and commercial activities.	Pre-plan line construction works so that supply interruption durations required for AB cable replacements are minimized. Follow stipulated WBSEDCL procedurefor obtaining shutdown approval to carry out work on existing feeders. Make arrangements to inform affected consumers in advance. Make arrangements for immediate restoration of supply upon completion.	Supply interruption hours for constructionactivity	DISCOM procedurefor providing shutdown approval. Supply Interruptionhours - As Required	Contractor and WBSEDCL	Construction phase
Power line and distribution transformer construction, underground cabling and substation control room extensions	Possible safety risks to general public and construction workers	Implement safety measures to minimize safety risks to general public and workers as per approved Safety Plan **Safety of general public:** measures shall include demarcation of high-risk construction activity areas such as pole pits and trenches, display of warning signs/beacons/notices, traffic rearrangements/diversions, conducting safety audits and other measures as per approved safety plan. Ensure necessary safety clearancesto houses/buildings are maintained. **Safety of workers:** measures shall include provision of PPE for all workers,	Violations of safety regulations, accidents,safety audit reports, public complaints	Approved Safety Plan, Technical Specifications, CEAsafety regulations - Continuous	Contractor / safety officer subject to monitoring by WBSEDCL / PMA	Construction Phase

		use of proper equipment, documentation and training on safe working practices, regular safety audits, work permit process, temporary earthing, temporary stays for line stringing, follow sag tension charts for stringing of lines, establish occupational health and safety management system as per Contract provisions, employment of a safety officer and other measures as per approved safety plan and technical specifications.				
Construction of power lines and facilities at or vicinity of heritage sites	Disturbance to activities at heritage sites / Loss of aesthetic value	Schedule and carry out construction work in consultation with heritage site authorities to minimize disturbances to regular activities at site. Comply with the conditions and parameters of permits / approvals provided.	Work Schedules and implementation activity	Requirements as per permits / approvals / detailed designs - Once	Contractor subject to monitoring by WBSEDCL / PMA	Construction Phase
Temporary use of land	Disturbance / Losses to neighbouring land uses/ values	Access to sites for workers and machinery shall be through roads / public land. If access through private land required in exceptional cases prior permission from land owners shall be obtained. No damage shall be done to public / private properties during temporary use. If private lands are used for temporary storage of materials, labour camps, pre-construction works etc. it should be done in agreement with the land owners and upon payment of rentals as required. Material / debris shall not be stored along roads, near water bodies or in public lands in a manner that disturb intended usage of such facilities. Temporarily used land shall be reinstated to original condition following completion of construction works	Site arrangements	Site Inspections - Once.	Contractor subject to monitoring by WBSEDCL / PMA	Construction Phase

Chance finds of cultural resources and property/archaeological features	Loss/theft of precious archaeological item uncovered during excavation	In case of chance find of physical cultural resources and property/archaeological features damage to such property shallbe prevented, concerned authorities shall be notified and ensure safety of such property until handover to concerned authorities.	Chance find information	Gol's Treasure andTrove Act. – As required	Contractor subject to monitoring by WBSEDCL / PMA	Construction Phase
Transportationand storage ofmaterials	Nuisance to the general public	Transport loading and unloading of construction materials should not cause nuisance to the people by way of noise, vibration and dust. Avoid storage of construction materials beside the road, around water bodies, residential or public sensitive locations. Construction materials should be stored in covered areas to ensure protection from dust, emissions and such materials should be bundled in environment friendly and nuisance free manner.	Site arrangements	Site Inspections - Quarterly	Contractor subject to monitoring by WBSEDCL / PMA	Construction Phase
Soil erosion during auguring/excavation of pole foundation.		Minimize removal of existing vegetation and topsoil to that which is absolutely necessary. Infertile and rocky material will where possible be reused as fill material, if it needs to be taken off site it will be disposed by licensed waste managementoperator at designated disposal area suitable for accepting inert wastes. Excavation will be limited to within the agreed corridor of impact, ideally road reserve. (no resettlements permitted for this programme) Use of auguring to limit the area to be	Works in accordancewith EMP measures and approved CEMPprovisions Compliance with national laws and regulations	Site Inspections - Quarterly	Contractor subject to monitoring by WBSEDCL / PMA	Construction Phase

		disturbed for installation pole foundation. Undertake installation of poles during the dry season to minimize exposed areas subject to erosion by surface waterrunoff.				
Occupationalhealth and safety	Impact of Workers Health &Safety	Require workers to confirm they have seen and understood the requirements of the Occupational Health and Safety (OHS) plan before proceeding with the work.	Works in accordancewith EMP measures and approved H&S Plans	Compliance with national laws and regulations - Once	Contractor subject to monitoring by WBSEDCL / PMA	Construction Phase
Community health and safety such as toppling of concrete poles,	Impact on Community Health & Safety	Install visual and written warning signage's to the public to include the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution.	Works in accordancewith EMP measures and H&S Plans	Compliance with national laws and regulations - Continuous	Contractor subject to monitoring by WBSEDCL /PMA	Construction Phase
traffic and accidents, emergency spillof materials, and access of villagers to dangerous working areas.		Provision for ensuring security of the cable to avoid vandalism. For pole mounted transformers a suitable anti- climbing deterrent, to be used together with suitable warning signs. Fence and sign immediate working area to prevent public access duringconstruction works. Do not leave hazardous conditions (e.g. unlit open excavations without means of escape) overnight unless no access by public can be ensured Prevent standing water as it may become a breeding habitat for mosquitoes etc. During construction works providesignage detailing site and office contacts in case of grievance. Before handover all poles to be confirmed to have adequate foundation that they will remain vertical during operation, and that				

		all the feeder lines are correctly tensioned. Wherever possible, the contractor should not discriminate and should proactively encourage the employment of suitably skilled women on the programme.				
CapacityBuilding	Impacts to consumers due to construction procedures.	Provision of information and training (if required) on the requirements regarding construction of works.	Equipment O&M manuals, Specifications and training (if applicable)	Documentation andTraining provided – Once	Training arrangement by Contractor subject to monitoring by WBSEDCL / PMA	Construction Phase
POST CONSTRUCTION PHASE						
After completion of all activities, the entire installations will be handed over to the Distribution (O&M) wing for commercial operations. The Distribution (O&M) wing has its own set up and some other corporate set up to look after the all the issues related with environmentand operation and maintenance during the declared defect liability period. Bidder is responsible for designing appropriately to facilitate their implementation as per technical parameters specified in the biddingdocuments. But Bidder has the role of rectification of commissioned programme if any defect is intimated by the Distribution (O&M) wing, within the defect liability period.						

10.0 CONCLUSION & RECOMMENDATION

The Initial Environmental Examination (IEE) undertaken for initiation of LTOH line conversion into AB caballing (Component A) indicates that no environmentally sensitive receptors are located in the blocks of Raniganj, Barabani, and Andal. This indicates that the work of conversion of existing LTOH network into AB Cabling can be initiated in the blocks mentioned which are free of any environmentally sensitive receptors. However, in other blocks where environmental sensitive areas have been identified along with buffer areas (100-300 m) from the boundary of concerned environmental sensitive receptors/monuments, the work may be undertaken after the detailed environmental and social impact assessment and taking required consent/NOC from concerned authorities.

IEE for initiation of LTOH line conversion into AB caballing (Component A) indicates that the proposed work would be undertaken within existing RoW and no significant excavation and other activities are involved except the installation of additional poles as per the requirement avoiding environmental and social issues along the existing LTOH line, therefore, no significant impact is likely to be caused. Accordingly, it is suggested that conversion of LTOH line into AB caballing in the Bardhaman West district can be initiated except at the location (i.e. Buffer area) of eco-sensitive receptors and cultural resources as indicated in Chapter 5. However, required public consultation and implementation of EMP need to be ensured at the time of conversion of LTOH line into AB caballing.

The Initial Environmental Examination (IEE) undertaken for initiation of bifurcation of 11 kV feeders along the proposed route alignment indicates that no environmental sensitive receptors viz. reserve forest, protected area, Key Biodiversity Area, or Important Bird Area fall within the influence zone of the selected 11 kV feeder. However, few waterbodies fall close to the proposed alignment of selected feeders. The screening further reveals that there is no ASI-protected monument as well as state-protected monument falls within the influence zone of the selected 11 kV feeder's proposed route alignment. However, at a certain stretch, it crosses state & national highways and also railway line falls in the proposed alignment of selected feeders. As the proposed work would be primarily undertaken along the existing Road Network and no significant excavation and other activities are involved except the erection of poles avoiding environmental and social issues along the proposed route alignment for bifurcation of 11 kV feeders, therefore, no significant impact is likely to be caused. It may be pertinent to mention here that the required permission is to be undertaken for crossing SH-9, NH-19, NH-419, NH-14 and also for Railway Crossing under Amritnagar feeder. However, required public consultation and implementation of EMP need to be ensured at the time of undertaking construction activities for the bifurcation of 11 kV feeders.

Accordingly, it is suggested that the activities for bifurcation of selected 11 kV feeders (i.e. 7 feeders namely Amritnagar, Searsole, Damagoria, Nachan-I, Gobindapur, Haripur and

Sukumarnagar) under the Bardhaman West district can be initiated.

The Initial Environmental Examination (IEE) undertaken for initiation of augmentation of conductor size of 11KV Line along the selected feeder indicates that one Reserve Forest and one Important bird area fall within the influence zone. However, few waterbodies fall close to the proposed alignment of selected feeders. The screening further reveals that there is no ASI-protected monument as well as state-protected monument falls within the influence zone of the selected 11 kV feeder's route alignment. However, at a certain stretch, it crosses state & national highways also the railway line falls in the route alignment of selected feeders. As the proposed work would be primarily undertaken along the existing 11 KV Network and no significant excavation and other activities are involved in avoiding environmental and social issues along the route alignment for augmentation of conductor size of 11KV Line, therefore, no significant impact is likely to be caused. It may be pertinent to mention here that the required permission is to be undertaken for crossing SH-5, AH1, NH19, NH-2, other state highways and also for Railway crossing Kendua Bazar 11 KV feeder Girjapara 11 KV Feeder and Belrui 11 KV Feeder. However, required public consultation and implementation of EMP need to be ensured at the time of undertaking construction activities for the augmentation of conductor size of 11KV Line in selected feeders.

Accordingly, it is suggested that the activities for augmentation of conductor size of 11KV Line in selected feeders (i.e. Kendua bazar, Dhemomain, Barakar-1, Barakar II, Belrui, Kulti, Sitarampur, Mahalaxmi, 457, Girjapara, 2 no, Chanda, Kuardihi, Ballavpur, Ronai, Searsole, Nigha) under the Bardhaman West district can be initiated.

The findings of the environmental and social screening of selected feeders indicate that impacts are mostly similar and sub-activities are unlikely to cause any significant environmental or social impacts. Most of the impacts are likely to occur during the construction stage, are temporary, and can be mitigated with minor to negligible residual impacts. The implementation of prescribed mitigation measures will minimize/avoid the adverse impacts. Moreover, the impacts shall be monitored continually by implementing and updating the Environmental Management Plan and Environmental Monitoring Plan.

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