

Initial Environmental Examination

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India: Tripura Urban and Tourism Development
Project – Road and Drain Improvement Works for
Cluster IA Towns of Tripura

Package No: R&SD-01/P-04

CURRENCY EQUIVALENTS

(as of 21 Mar 2023)

Currency Unit	–	Indian rupee (₹)
₹1.00	–	\$ 0.01
\$1.00	=	₹ 82.66

ABBREVIATIONS

ADB	–	Asian Development Bank
CPCB	–	Central Pollution Control Board
CTE	–	Consent to establish
CTO	–	Consent to operate
DBE	–	Design Basis Earthquake
DHQ	–	Districts headquarter
EAC	–	Expert appraisal committee
EARF	–	Environmental assessment and review framework
EHS	–	Environment, health and safety
EIA	–	Environmental impact assessment
EMP	–	Environmental management plan
EMS	–	Environmental management specialist
EPC	–	Engineering, Procurement & Construction
GoT	–	Government of Tripura
GRC	–	Grievance redress committee
GRM	–	Grievance redress mechanism
IEE	–	initial environmental examination
KMC	–	Khowai Municipal Council
MMC	–	Mohanpur Municipal Council
MoEFCC	–	Ministry of Environment, Forest, and Climate Change
NWQMP	–	National Water Quality Monitoring Programme
TSPCB	–	Tripura State Pollution Control Board
NOC	–	No objection certificate
OHS	–	Occupational health and safety
PGA	–	Peak Ground Acceleration
PIU	–	project implementation unit
PMSC	–	Project management & supervision consultant
PMU	–	Project management unit
RFA	–	Recorded Forest Area
RMC	–	Ranirbazar Municipal Council
ROW	–	Right of way
SDCC	–	Sustainable Development and Climate Change Department
SGC	–	Safeguards and gender cell
SPS	–	Safeguard Policy Statement
TOR	–	Terms of Reference
TUDA	–	Tripura Urban Planning and Development Authority
TUTDP	–	Tripura Urban and Tourism Development Project
WHO	–	World Health Organization
WTP	–	Water treatment plant

WEIGHTS AND MEASURES

dba	-	decibel
°C	-	degree Celsius
km	-	kilometer
lpcd	-	litre per capita per day
m	-	meter
mgbl	-	meter below ground level
mm	-	millimeter
MLD	-	million liters per day
km ²	-	square kilometer

NOTE

In this report, "\$" refers to United States dollars.

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CONTENTS

	Pages
EXECUTIVE SUMMARY	i
I. INTRODUCTION	1
A. Tripura Urban and Tourism Development Project (TUTDP)	1
B. Purpose of Initial Environmental Examination Report	1
C. Scope of IEE	2
D. Report Structure	2
II. DESCRIPTION OF THE PROJECT	2
A. Project Location	2
B. Existing Urban Road and Drain Situation	3
C. Proposed Project	5
D. Implementation Schedule	25
III. ANALYSIS OF ALTERNATIVES	56
IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK	57
A. ADB Policy	57
B. National Environmental Laws	60
V. DESCRIPTION OF THE ENVIRONMENT	65
A. Methodology Used for Baseline Study	65
B. Physical Resources	66
C. Subproject Site Environmental Features	87
VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES	128
A. Introduction	128
B. Design and Location Impacts	129
C. Construction Impacts	135
D. Operation and Maintenance Impact	148
E. Unanticipated Impacts during Construction and Operation	150
VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE	150
A. Overview	150
B. Public Consultation	150
C. Information Disclosure	152
VIII. GRIEVANCE REDRESS MECHANISM	153
IX. ENVIRONMENTAL MANAGEMENT PLAN	156
A. Environmental Management Plan	156
B. Implementation Arrangements	193
C. Capacity Building and Training	197
D. Monitoring and Reporting	198
E. Environmental Management Plan Implementation Cost	199
X. CONCLUSION AND RECOMMENDATIONS	203

FIGURES

Figure 1: Geographical Location of Subproject towns on State map of Tripura	3
Figure 2: Proposed Roads of Khowai Google Earth	26
Figure 3: Proposed plan and Profile of the Roads	27

Figure 4: Typical Cross - Section of Bituminous Pavement (With Catchpit)	30
Figure 5: Existing drain in Khowai Town	31
Figure 6: Proposed Drain in Khowai Town	32
Figure 7: Proposed storm water drainage work area of Khowai MC	33
Figure 8: Proposed alignment of drain in Lal Cherra1 Catchment	34
Figure 9: Proposed alignment of drain in Namapara Catchment	34
Figure 10: Proposed alignment of drain in Jeep Taxi stand Catchment	35
Figure 11: Proposed alignment of Drain in Main Drain 3 Catchment	35
Figure 12: Catchment area Delineation map of storm water Drainage	36
Figure 13: Typical cross section of Storm water drains for all towns	37
Figure 14: Proposed Road in Mohanpur on google Earth	39
Figure 15: Proposed plan and Profile of the Roads	40
Figure 16: Typical Cross - Section of Interlocking Concrete	44
Figure 17: Existing drain in Mohanpur Town	45
Figure 18: Proposed drain in Mohanpur Town	46
Figure 19: Catchment area Delineation Map of Strom Water Drain in Mohanpur	47
Figure 20: Proposed Road components at Ranibazar on Google map	48
Figure 21: Proposed plan and Profile of the Roads	49
Figure 22: Sample Typical Cross-section of the ICB pavement with drain	52
Figure 23: Existing Drain network in Ranirbazar Town.	53
Figure 24: Proposed Drain network in Ranirbazar Town	54
Figure 25: Total Catchment area Drainage Network Scheme- Ranirbazar	55
Figure 26: Month wise rainfall data in Year 2020	73
Figure 27: Month wise number of rainy days in year 2020	73
Figure 28: Watershed Map of Tripura watershed showing important rivers and Bangladesh International Boarder	74
Figure 29: Waterbody Map of Khowai MC	75
Figure 30: Waterbody Map of Mohanpur MC	76
Figure 31: Waterbody Map of Ranirbazar MC	77
Figure 32: Forest map of Khowai district	81
Figure 33: Forest map of West Tripura district (Ranirbazar and Mohanpur towns)	82
Figure 34: Key biodiversity area and Protected area within the 10 km area of Khowai town	83
Figure 35: Key biodiversity area and Protected area within the 10 km area of Mohanpur	83
Figure 36: Key biodiversity area and Protected area within the 10 km area of Ranirbazar	84
Figure 37: Land use map of Khowai town	84
Figure 38: Land use map of Mohanpur town	85
Figure 39: Land use map of Ranirbazar town	85
Figure 40: Grievance Redressal Mechanism (GRM)	155
Figure 41: Safeguards Implementation Arrangements	197

TABLES

Table 1: Summary of Urban Roads Infrastructure in Cluster IA towns	3
Table 2: Existing Situation of Storm Water Drainage Systems	4
Table 3: Proposed Road list – Khowai, Mohanpur and Ranirbazar	5
Table 4: Proposed Storm water Drainage stretch to be implemented at Khowai	9
Table 5: Main Proposed Storm water Drainage stretch to be implemented in Mohanpur	15
Table 6: List of Proposed Drain in Ranirbazar Municipal Town	22
Table 7: Relevant Rules and regulations National and International	60
Table 8: List of NOC Required for Safeguarding the Project	64
Table 9: Baseline- Physical Characteristic of project towns	66

Table 10: Khowai river water quality and treated & supplied water quality from Water Treatment Plant	78
Table 11: Analytical results of water samples collected from Haora River, Ranirbazar	78
Table 12: Groundwater quality results of project town	79
Table 13: Noise level data of Project towns during December 2020	80
Table 14: List of major industries in and around project towns	86
Table 15: Site Environmental Features – Khowai Road	88
Table 16: Site Environmental Features for Khowai Drain	91
Table 17: Site Environmental Features of Road – Mohanpur	96
Table 18: Site Environmental Features of Drain – Mohanpur	99
Table 19: Site Environmental Features of road – Ranirbazar	113
Table 20: Site Environmental Features for Ranirbazar Drain	115
Table 21: Sensitive Receptors in the Project Influence area – Mohanpur Road	121
Table 22: Sensitive Receptors in the Project Influence area – Ranirbazar	126
Table 23: Summary of utility with proximity to proposed project components	130
Table 24: Design Stage Environmental Impacts and Mitigation Measures	158
Table 25: Pre-Construction Stage Environmental Impacts and Mitigation Measures	161
Table 26: Construction Stage Environmental Impacts and Mitigation Measures	165
Table 27: Operation Stage Environmental Impacts and Mitigation Measures	186
Table 28: Construction Stage Environmental Monitoring Plan	189
Table 29: Operation Stage Environmental Monitoring Plan	191
Table 30: Outline Capacity Building Program on EMP Implementation	198
Table 31: Cost Estimates to Implement the Environmental Management Plan	200

APPENDICES

Appendix 1: REA Checklist	205
Appendix 2: National Ambient Air Quality Standards	229
Appendix 3: Ambient Noise Level Standards	231
Appendix 4: Vehicle Exhaust Emission Norms	232
Appendix 5: Labour Laws	233
Appendix 6: Strip Plan for Proposed Road and Drain	235
Appendix 7: Drinking Water Standards	257
Appendix 8: Stakeholder Consultations	258
Appendix 9: Sample Grievance Form	310
Appendix 10: Guidelines for Workers Camps	312
Appendix 11: Guidelines for Prevention and Control of COVID-19	314
Appendix 12: IBAT Assessment Checklists of Project Towns	317
Appendix 13: Guidelines for Safety During Monsoon/ Heavy Rainfall	348
Appendix 14: Sample Environmental Site Inspection Report	350

EXECUTIVE SUMMARY

Proposed Tripura Urban and Tourism Development Project (TUTDP) will improve the municipal infrastructure and public services and will lay the foundation for tourism development in the State of Tripura. Tripura is in the Northeast Region (NER) of India, covering an area of 10,490 square km, with a population of 4.1 million (estimated 2022), and Agartala as the state's capital. The project targets key urban local bodies (ULBs) along the main national highways in Tripura, major infrastructure components of which include water supply, stormwater drainage, communal or neighbourhood roads, and tourism development support.

The project is aligned with the following impact(s): clean and sustainable environment in ULBs achieved, and Tripura increasingly recognized in the India tourism industry as a new destination. The project will have the following outcome: Adequate, safe, and climate- and disaster-resilient, urban services (water, storm drainage, and municipal roads) provided and sustainable tourism improved in project areas. Project has four outputs: (i) Output 1: Municipal reforms and capacity of ULBs strengthened, (ii) Output 2: Urban infrastructure improved. The project will improve various public infrastructures, such as (i) water supply, (ii) stormwater drainage, and (iii) municipal roads, (iii) Output 3: Tourist destinations improved, and (iv) Output 4: Capacity of tourism corporation's operational services improved. Government of Tripura acting through Urban Development Department (UDD) will be the project executing agency. Tripura Urban Planning and Development Authority (TUDA) and Tripura Tourism Development Corporation Limited (TTDCL) will be the implementing agencies.

Under phase 1 of the project, 12 towns have been selected for improvement of water supply, roads and storm water drains, and tourism facilities. Improvement of roads and storm water drains in **Khowai, Mohanpur and Ranirbazar** towns (Package R&D/01) is one of the subprojects proposed under the TUTDP.

Khowai town - Subproject includes the following, (i) **Roads**: Rehabilitation of two roads, 960 m Jeep stands to Nivedita park via Nripen Chakraborty avenue and 600 m Vivekananda statue to Nripen Chakraborty Avenue via Swapnapuri by improving existing carriage way of 10 m wide, and footpath and side drains (1.5 m wide) on both sides; (ii) **Drains**: improvement/construction of road side/main drains of 5 km length and 0.6-1.6 m wide, 0.6-2.67 m deep, in ward no. 4, 11, part of ward no. 1, 2, 3, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15 and adjoining area of ward no 9, 12, 13, 14, 15. Roads will be constructed with bitumen, and in some places with interlocking cement concrete tiles. Drains will be of cement concrete and covered.

Mohanpur town- Subproject includes the following, (i) **Roads**: Rehabilitation of four roads, 1410 m Tulabagan 14 no. ward no-12 para Dharendra Sarkar house to Rishipara rubber bagan old quarter, 350m Agartala Simma road to Kathaltali Samsanghat, 300 m Dighalia road to Tertiary center and 375 m Simma road to Jibesh Das house all road will be 4 m wide and 10.75 m Construction of 3 cell R.C.C Box Culvert at Tulabagan 12 no. para & rishi para of 4.75 m width by improving / strengthening/widening existing carriage way of 3-4 m wide, and side drains (1,2 m wide) on single side with catchpit on other side; (ii) **Drains**: improvement/construction of road side/main drains of 7.38 km length and 0.4-1.1 m wide, 0.5-1.1 m deep, in ward no-01, ward no-02, ward no-03, ward no-04, ward no-06, ward no-07, ward no-08, ward no-09, ward no-10, ward no-11, ward no-12, ward no-13, ward no-14 and ward no-15 areas. Roads will be constructed with interlocking cement concrete paver block. Drains will be of cement concrete and covered.

Ranirbazar -Subproject includes the following, (i) **Roads:** Rehabilitation of two roads 165 m Gopal Road To Fish market of width 3 m and 280 m Ranirbazar market of Natmandir to late Dilip Debnath house of width 4.5 m by improving / strengthening/widening existing carriage way of 3 m wide to 4.5 m wide, and side drains (1.5 m wide) on single side with catchpit on other side; (ii) **Drains:** improvement/construction of road side drains of 5 km length and 0.4-1.2 m wide, 0.4-2.0 m deep, in Nalgaria (NH-8) to Assampara Treatment Plant both side, NH-8 Gopal Road to Ranirbazar Market, Ranirbazar Market Natmandir to Dilip Debnath house, Existing OHT to Natmandir, Natmandir to NH-8, Dhan Chowmuhani to Thana Road Tri Junction, and Ranirbazar Cattle Market to Ghora mara River areas. Roads will be constructed with interlocking cement concrete paver block. Drains will be of cement concrete and covered.

Screening and Categorization Assessment of Potential Impacts. This road and drains subproject is classified as environmental category B as per ADB's Safeguard Policy Statement (SPS), 2009, and accordingly this initial environmental examination (IEE) assesses the environmental impacts and provides mitigation and monitoring measures to ensure that there are no significant impacts as a result of the subproject. As per the Government of India environmental impact assessment (EIA) Notification, 2006, this subproject does not require EIA study or environmental clearance. In case works require shifting of utilities such as telephone and electricity lines, permission from respective agencies will be obtained.

Description of the Environment. The subproject towns Khowai, Mohanpur and Ranirbazar are in Tripura state in northeast India. It is third-smallest state, bordered by Assam and Mizoram to the east and by Bangladesh to the north, south and west. Agartala is the capital and the largest city in the state. The whole of northeast India, including Tripura, falls under seismic zone V and is highly vulnerable to earthquakes. Proposed roads and drains components are within urban areas of project towns. There are no forests or protected areas or archeologically or historically sensitive areas in or near project sites. Sites do not fall under any buffer or eco sensitive zone.

Khowai is the headquarter of Khowai district in western Tripura. Town is extended upto international border of Bangladesh in northwest direction. Located at 24° 3' 54" N and 91° 36' 18" E, it has mostly plain terrain, an average elevation of 23 m above mean sea level (MSL). Area of the town is 5.86 sq.km, divided into 15 municipal wards, and has a population of 18526 (2011 census). River Khowai passes through the town. Rainfall of Khowai subdivision varies from 2,058 mm to 3,141mm. Proposed roads and footpaths are from Jeep stand to Nivedita park via Nripen Chakraborty avenue and Vivekananda statue to Nripen Chakraborty Avenue via Swapnapuri, all works are proposed within the existing ROW of roads. Drain improvement works at Lal Cherra Catchment, Namapara Catchment, Jeep Taxi Stand Catchment and Main Drain Catchment, from Bishu Roy House to Lal Chhera via Kudipara, Vivekanand statue to Namapar via Khowai Hospital and Vivekananda Statue to Jeep Stand covering different stretches, along the roads. Nearest forest area is Atharamura Kalajhari reserve forest located within 16 km, nearest protected area is Rema Kalenga wildlife sanctuary, located within 5 km from the project area in Habiganj, Bangladesh.

The town **Mohanpur** is located in West Tripura district in western Tripura. Town is extended upto international border of Bangladesh in northwest direction. Located at 23° 57' 57" 26" N and 91° 22' 53" E., it is characterized by undulating hills, with the highest point in the area reaching an elevation of around 100 meters above sea level. The area of Municipal Council is 14.55 Sq km, divided into 15 wards and has a population of 16722 (2011 census). Sonai River is the flows through the town. Yearly rainfall as recorded nearby station, Jirania varies between 1500- and 2507-mm. Proposed roads in town with side drain are Tulabagan 14 no. ward no-12 para Dharendra Sarkar house to Rishipara rubber began old quarter, Agartala Simma road to Kathaltali

Samsanghat, Dighalia road to Tertiary center, Simma road to Jibesh Das house and Construction of 3 cell R.C.C Box Culvert at Tulabaghan 12 no. para & Rishi para, all works are proposed within the existing ROW of roads. Drainage works are planned in ward no-01, ward no-02, ward no- 03, ward no- 04, ward no-06, ward no-07, ward no-08, ward no -09, ward no- 10, ward no- 11, ward no- 12, ward no- 13, ward no- 14 and ward no- 15 of town. The nearest protect area is the “Sepahijala Wildlife Sanctuary” is located within 33 km aerial distance in Sepahijala district, Tripura and near forest area Tulakona R.F. is at 18 km aerial distance from the project town.

The **Ranirbazar** is located in west Tripura. Town is situated at 23.83°N latitude and 91.37°E Longitude. The town is characterized by undulating terrain with hills, and plains. The town is surrounded by hills on three sides, namely the Jampui Hills to the north, the Atharamura Range to the east, and the Longtharai Range to the south. The area of the town is 11.72 sq km, divided into 13 municipal wards, and has a population of 13104 (2011 census). River Haora is flowing in the western direction of town. Yearly rainfall as recorded nearby station varies between 1500 & 2507 mm. Proposed roads with side drain in town are Gopal Road To Fish market and Ranirbazar market of Natmandir to late Dilip Debnath house, all works are proposed within the existing ROW of roads and drain improvement are proposed at Nalgaria (NH-8) to Assampara Treatment Plant both side, NH-8 Gopal Road to Ranirbazar Market, Ranirbazar Market Natmandir to Dilip Debnath house, Existing OHT to Natmandir, Natmandir to NH-8, Dhan Chowmuhan to Thana Road Tri Junction, and Ranirbazar Cattle Market to Ghora mara River. Nearest protected area is “Sepahijala Wildlife Sanctuary, located 21 km from the town in Sepahijala district, Tripura.

Potential Environmental Impacts and Mitigation measures. Environmental impacts due to the project design or location are not significant as various measures are already included in site planning and preliminary design. All roads' works are planned within the right of way (ROW) of existing roads. Drain will be improved with the existing width and new drains will be within the right of ROW of existing roads. Necessary drains and cross drainage works are proposed to facilitate surface runoff and mitigate any negative impacts of road improvement. Potential impacts during construction are considered significant but temporary and are common impacts of construction in urban areas, and there are well developed methods to mitigate the same. The roads and roadside drainage will involve straightforward construction and is unlikely to cause significant adverse impact. Construction impacts arise mainly from dust and noise, silt generation, soil and water contamination from chemicals spills and leaks, hauling of construction material, waste, and equipment on local roads (traffic, dust, safety etc.), mining of construction material, occupational health, and safety (OHS) aspects. Road and drains work in roads congested with people, activities, and traffic may have impacts arising mainly from the disturbance of residents, businesses, and traffic due to construction work; safety risk to workers, public and nearby buildings due to deep trench excavations in the road; access impediment to houses and business, disposal of large quantities of construction waste etc.

In operation phase there may be requirement of repairs in road and drainage system, maintenance of drain- disposal of drainage sludge etc. Various provisions are already made in the design. It is unlikely that there will be any significant negative impacts.

Environmental Management Plan. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels, along with the delegation of responsibility to appropriate agency. Various design related measures are already included in the project design. During construction, the EMP includes mitigation measures such as (i) proper planning and scheduling of road and drains works to minimize public inconvenience; (ii) measures to avoid impacts on heritage building and chance find procedures (iii) barricading, dust suppression and noise control measures; (iv) traffic management measures

for works along the roads and for hauling activities; (v) occupational and community health and safety, labour welfare, (vi) provision of walkways and planks over trenches to ensure access will not be impeded; (vii) reuse of excavated materials to extent possible, (viii) spill and sediment control measures to avoid water and soil pollution, etc. EMP will guide the environmentally-sound construction of the subproject. EMP includes a monitoring program to measure the effectiveness of EMP implementation and includes observations on- and off-site, document checks, and interviews with workers and beneficiaries. A copy of the updated EMP/ site environmental management plan (SEMP) shall be always kept on-site during the construction period. The EMP will be included in bids and contracts, and implementation shall be binding on contractors.

Implementation Arrangements. Urban Development Department (UDD) of Government of Tripura (GOT) is the executing agency, and the implementing agencies are Tripura Urban Planning and Development Authority (TUDA, for urban component) and Tripura Tourism Development Corporation Limited (TTDCL, for tourism component). A project management unit (PMU) in Agartala and six project implementation units (PIUs, 3 urban and 3 tourism) will be established in Agartala, Udaipur and Kumarghat. Project management and supervision consultant (PMSC) will be engaged to assist PMU and the PIUs. At PMU, the project coordinator will be the nodal officer for environmental, social safeguards and gender and will be responsible for ensuring compliance with ADB's Safeguards Policy Statement (SPS), 2009. An environmental safeguards officer (ESO) will be engaged to support the project coordinator. Project Manager or Assistant Project Manager of PIU will be designated as safeguards focal in each PIU. PMSC team will include an Environmental Safeguards Specialist (ESS), and three support safeguards staff located in PIUs. Contractor will appoint an Environment, Health, and Safety (EHS) supervisor.

Consultation, Disclosure and Grievance Redress. The stakeholders were involved in developing the IEE through FGD and public consultation at project area level, after which views expressed were incorporated into the IEE and in the planning and development of the project. Focus Group Discussions (FGDs) and consultations have been conducted in three towns: Khowai - February, August 2022, November 2022 and March 2023 with 99 participants (36 male and 63 female). Mohanpur: March, August 2022, October 2022 and March 2023 with 106 participants (26 male and 80 female). Ranirbazar 93 participants (41 male and 52 female). All participants are expressed need for the project and willingness to take it up and stakeholders were very supportive for the project and promises to extend full cooperation during the construction phase as the activities are proposed to improve the road and drainage conditions and living standard.

Monitoring and Reporting. The PMU, PIU and consultants will be responsible for monitoring and reporting. During construction, results from internal monitoring by the contractor will be reflected in their monthly EMP implementation reports to the PIU. PIU, with the assistance of PMSC, will monitor the compliance of contractor, prepare a quarterly monitoring report and submit to PMU. The PMU will oversee the implementation and compliance and will submit semi-annual environmental monitoring reports (SEMR) to ADB. SEMRs will be disclosed on ADB and project websites.

Conclusions. The proposed project is unlikely to cause significant adverse impacts, and potential impacts are mainly due to construction and can be mitigated or minimized to acceptable levels through measures included in the EMP. The citizens of the Khowai, Mohanpur and Ranirbazar will be the major beneficiaries. The subproject is primarily designed to improve environmental quality and living conditions of these towns through provision of good road and drain. The benefits arising from this subproject include: (i) increased connectivity; (ii) reduced time of water stagnation time during monsoon time; (iii) better public health particularly reduction in waterborne and infectious diseases.

Based on the findings of the IEE, the classification of the project as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006). This IEE needs to be updated in case of any change in design and scope, reviewed, and approved by ADB, and disclosed further in ADB and project website.

I. INTRODUCTION

A. Tripura Urban and Tourism Development Project (TUTDP)

1. The project is aligned with the following impact(s): clean and sustainable environment in ULBs achieved, and Tripura increasingly recognized in the India tourism industry as a new destination.¹ The project will have the following outcome: Adequate, safe, and climate- and disaster-resilient, urban services (water, storm drainage, and municipal roads) provided and sustainable tourism improved in project areas.²

2. **Output 1: Municipal reforms and capacity of ULBs strengthened.** The project will strengthen (i) the capacity of technical staff in project management and operation and maintenance (O&M) of urban infrastructure; (ii) ULB own-source revenue generation, financial management and accounting reforms; (iii) advisory support for city-wide inclusive sanitation for ULBs that complements government financing scheme;³ (iv) integration of climate change- and disaster resilience in urban planning with universal design consideration, and gender equality and social inclusion (GESI) analysis and (v) support to developing building regulations and building byelaws for the state.

3. **Output 2: Urban infrastructure improved.** The project will improve various public infrastructures, such as (i) water supply, (ii) stormwater drainage, and (iii) municipal roads.

4. **Output 3: Tourist destinations improved.** The project will strengthen public infrastructure that is vital for ecotourism such as (i) tourism destination development with climate resiliency and green infrastructure retrofitting; (ii) museum development at the Neermahal Palace (iii) Improved tourist accommodation and family oriented-Adventure Park; and (iv) Tourism-related goods and equipment for selected tourism destinations.

5. **Output 4: Capacity of tourism development corporation's operational services improved.** Tripura tourism through TTDCL will (i) develop a 10-year business plan including marketing and coordination with the private sector (including exploring outsourcing and O&M of tourism facilities and assets for local business, small and medium enterprise opportunities for women), (ii) demonstrating community-based tourism development (iii) stakeholder tourism capacity and skill development program, (iv) marketing and tourism promotion activities.

6. Under phase 1 of project, 12 towns have been selected for improvement of water supply, roads and storm water drains. Improvement of roads and drains in **Khowai, Mohanpur and Ranirbazar** towns (Package R&D/01) is one of the subprojects proposed under the TUTDP.

B. Purpose of Initial Environmental Examination Report

7. As per ADB's Safeguards Policy Statement, 2009, ADB requires the consideration of environmental issues in all aspects of the Bank's operations. Using rapid environmental assessment (REA) checklist for 3 towns (Appendix 1), subproject is unlikely to cause significant adverse impacts, and classified as **Category B** and per ADB SPS requirements this IEE is

¹ Government of India, Ministry of Housing and Urban Affairs. 2015. Smart Cities Mission Guidelines. Delhi; Government of Tripura, Department of Tourism. 2020. Tourism Policy 2020–2025. Agartala.

² The design and monitoring framework is in Appendix 1.

³ ADB is working with Global Water and Sanitation Center under Bill and Melinda Gates Foundation to provide CWIS support preliminary study for 2 towns that would be potentially financed in the planned Phase 2.

conducted.

C. Scope of IEE

8. The subproject will be implemented under the Item Rate Contract modality. Thus, this IEE is based on the project design report. The IEE is conducted mainly based on field reconnaissance surveys and secondary sources of information. Stakeholder consultation was an integral part of the IEE. IEE will be updated during implementation if there are any changes in project scope, design or sites updates will supersede the earlier version.

D. Report Structure

9. This Report contains the following sections:

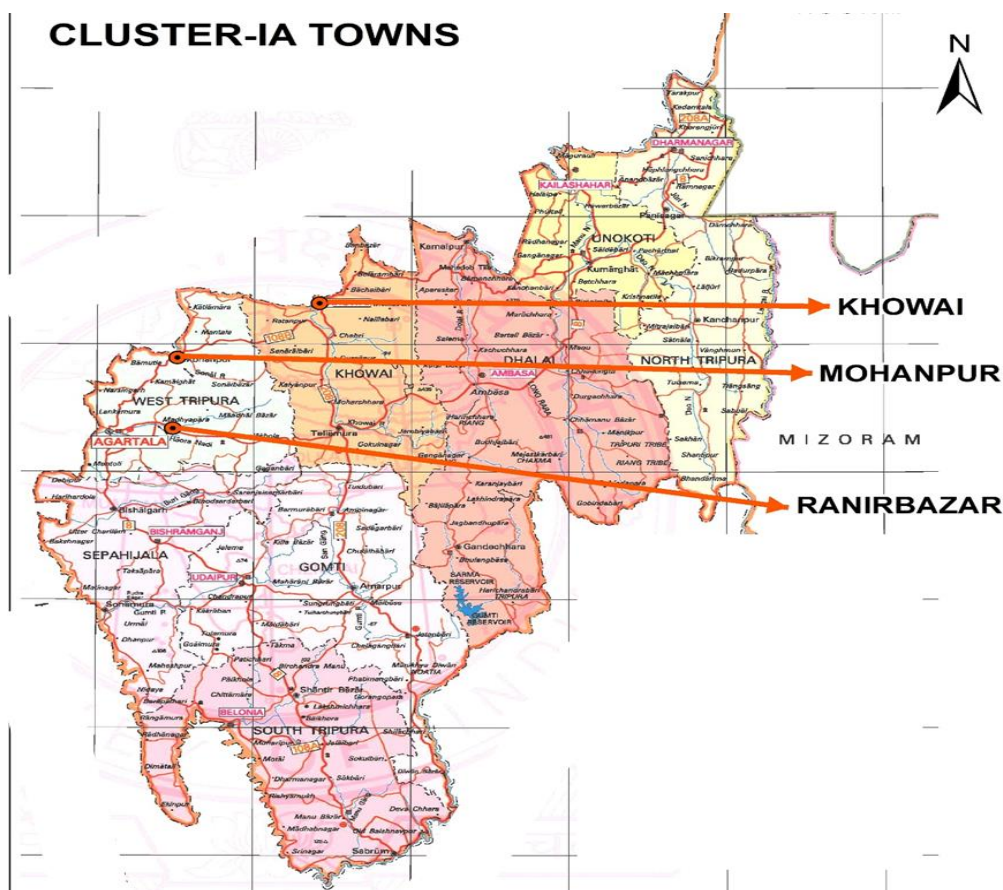
- (i) Executive summary;
- (ii) Introduction;
- (iii) Description of the project;
- (iv) Analysis of alternatives;
- (v) Policy, legal and administrative framework;
- (vi) Description of the environment;
- (vii) Anticipated environmental impacts and mitigation measures;
- (viii) Public consultation and information disclosure;
- (ix) Grievance redress mechanism;
- (x) Environmental management plan; and
- (xi) Conclusions and recommendations.

II. DESCRIPTION OF THE PROJECT

A. Project Location

10. Project towns Khowai, Mohanpur and Ranirbazar are located in Tripura state in northeast India. It is bordered by Assam and Mizoram to the east and by Bangladesh to the north, south and west. Agartala is the capital and the largest city in the state. **Khowai** is a town located at 24° 3' 54" N and 91° 36' 18" E and is about 55 km from Agartala. Town area is 5.86 sq. km divided into 15 wards. The population is 18526 (2011 census). **Mohanpur** is located at 23° 57' 57" 26" N and 91° 22' 53" E, 21 km from Agartala. Town area is 14.55 sq. km divided into 15 wards. The population is 16722 (2011 census). **Ranirbazar** town is situated at 23.83°N and 91.37°E, 10 km from Agartala. Ranirbazar town area is 11.72 sq. km divided into 13 wards. Population is 13104 (2011 census). **Figure 1** presents the location of subproject towns.

Figure 1: Geographical Location of Subproject towns on State map of Tripura



Source - <https://surveyofindia.gov.in>

B. Existing Urban Road and Drain Situation

1. Overview of Existing Road

11. In all three towns the condition of roads is mostly good with the pavement of bituminous & cement concrete. However, few roads are found to be damaged. ROW is varying from 4.0 to 15.0 m in Khowai, 6.0 to 12.0 m in Mohanpur and 5.0 to 7.0 m in Ranirbazar whereas carriageway width is varying from 3 m to 7 m in Khowai, 3 m to 6 m in Mohanpur and 4 m to 6 m in Ranirbazar. The summary of existing roads in three towns are presented in Table 1.

Table 1: Summary of Urban Roads Infrastructure in Cluster IA towns

Parameter	Khowai	Mohanpur	Ranirbazar
Total length of major roads	10.90 Km	23.0 Km	3.0Km
Total length of other roads	38.20 Km.	41.0 Km	43.85 Km
Details of right of way of roads	Varying from 4 to 15m	Varying from 6 to 12 m	Varying from 5 to 7 m
Average width of carriage way (including municipal road, NH/SH/MDR/ODR)	Varying from 3m to 7 m	Varying from 3.0 to 6 m	Varying from 4 to 6 m

Parameter	Khowai	Mohanpur	Ranirbazar
Details of road Pavement (Type and condition):	Both side earthen pavement about 0.9 m.	Bituminous macadam pavement roads & all roads are in good condition	Bituminous macadam pavement & All roads are in good condition
Total length of <i>Kuccha</i> Road	9.7 km	1.65 km	1.65 km
Total numbers of signalized intersections	Nil	2 nos.	2 nos.
Mode of public transportation available	Public transport like auto Rickshaw, E-Rickshaws, Rickshaw and Maruti car/Van.	Govt./private intercity bus service, private auto & Others private 4-Wheeler Vehicle	Govt./private intercity bus service, private auto & Others private 4-Wheeler Vehicle

2. Overview of the Existing Drainage System

12. The existing storm water drainage system in these town is piecemeal construction of open Drain as per local and temporary requirements without town level planning. Currently, rainwater during monsoon season flows toward the sides of the road which have lower elevation and then flows to nearby low-lying lands or ponds. These low laying land and ponds serve as rainwater conveyance, passageway, waterlogging areas during monsoon seasons and practically dry grassy ditches or fields during summer seasons. The town has mainly open drains. Summary of the existing drains are given below:

Table 2: Existing Situation of Storm Water Drainage Systems

Parameter	Khowai	Mohanpur	Ranirbazar
Total length of drains in the town:	45 km (mixed i.e., both side and one side of the road)	35 km (mixed i.e., both side and one side of the road)	37 km (mixed i.e., both side and one side of the road)
Coverage of existing drains with respect to road network:	75%	38.88 %	79.0%
Area coverage of storm water drainage network in the town	6.819 Sq.km	5.96 sq. km	2.0 sq. km (stormwater catchment area as per RMC record)
Length of existing natural and manmade major drains	Natural – 8.5 km Manmade – 14.70 km	Manmade: 30 km Natural: 5 km	Manmade: 15.5 km Natural: 21.5 km
Types of drains	i) <i>Brick</i> drains. ii) RCC drains. iii) Earthen drain	Masonry Drain, R.C.C. Drains, Feeder Drain & Normal Drain (Covered and Open)	i) <i>Brick</i> drains. ii) RCC drains. iii) Earthen drain
Maximum and minimum sizes of drains:	Minimum width: 1 m, Maximum width: 3 m	Minimum Size: 0.30 m X 0.30 m Maximum Size: 1.2 m X 1.5 m	Minimum Size: 0.30 m X 0.30 m Maximum Size: 1.2 m X 1.5 m
Location of disposal points of drains	The major drainage channel of the Khowai is Singhee Cherra, Lal Cherra and an unnamed main drain which is started	The major drainage channel of the Mohanpur is proposed to be	Haora river, Ghoramara chera, Mara khal

Parameter	Khowai	Mohanpur	Ranirbazar
	beyond Municipal boundary and aligned within municipal area via nearby house of Pramathes Sen, nearby Ganki Food Godown, Jeep Taxi Stand, Ram Thakur Ashram Road, Khowai Market, Kali Mandir Road, Khowai Bus Stand and ultimate outfall point to Khowai River.	discharged to Sonai River, Taranagar Cherra & Low-lying area through proposed /existing drainage network with two gravity outfall arrangement.	
Details of locations for chocking of drains due to solid waste:	Ward no 1, 2, 3(part), 9(part), 5, 6, 7(part), 10(part), 11(part), 13(part),14(part),15(part) Reasons: Narrow drains, low lying area and choking of drains.	In front of Mohanpur Motor Stand (major point of Mohanpur), Dalubari, TRTC Para, Santi Para	At different location around 50 points.
How many times a year flooding occurs	3-4 times	4- 5 times	4 -5 times
Final discharge	Khowai river	Sonai river	Haora River and Goramara River

13. At present there is no existing sewerage system and mostly three towns depend on septic tank arrangement. There are few drainage lines which are laid by ULB or by PWD.

C. Proposed Project

1. Road infrastructure

14. Most of the length of subproject road runs through plain terrain cutting across towns. The works are proposed within the existing ROW of existing roads. A 1.2 m wide footpath will be constructed on both sides of the road under which side drain will be accommodated. Vertical alignment has been designed to correct the existing road conditions in compliance to road standards. The town wise summary of the proposed roads is given in Error! Reference source not found..

Table 3: Proposed Road list – Khowai, Mohanpur and Ranirbazar

Sl. No.	Road from-to	Proposed works	Existing ROW (m)	Proposed ROW (m)- road width	Length (m)
Khowai					
1	Jeep stands to Nivedita park via Nripen Chakraborty avenue	1.2 m wide footpath on both sides with underground drains	10	10	960
2	Vivekananda statue to Nripen Chakraborty Avenue via Swapnapuri	(Bituminous pavement) Work: Strengthening with marginal widening 2 m of	10	10	600

Sl. No.	Road from-to	Proposed works	Existing ROW (m)	Proposed ROW (m)-road width	Length (m)
		road with new footpath and drain Present carriage way of 7 m			
	Total length of Road works proposed in Khowai				1560
Mohanpur					
1	Tulabagan 14 no. ward no-12 para Dhirendra Sarkar house to Rishipara rubber bagan old quarter	Construction of road with interlocking concrete paver blocks (ICB) pavement, replacing	4	4	1410
2	Agartala Simma road to Kathaltali Samsanghat	kuccha road and roadside drains one side and catchpits at	4	4	350
3	Dighalia road to Tartiary center	other side Work-	4	4	300
4	Panikata road to Kachimara*	construction of ICB road over	4	4	270
5	Simma road to Jibesh Das house	existing kuchha / semi kuchha road within the ROW. Present carriage way of 3-4 m	4	4	375
	Culvert				
6	Construction of 3 cell R.C.C Box Culvert at Tulabaghan 12 no. para & rishi para	RCC culvert minor bridge in place of present bamboo structured temporary bridge. Work: New RCC bridge construction over canal	4.75	4.75	10.75
	Total length of Road works proposed in Mohanpur			2435 m Road and 10.75 m culvert	
Ranirbazar					
1	Gopal Road To Fish market	Work: Road construction	3	3	165
2	Ranirbazar market of Natmandir to	with interlocking paver blocks along with road side	4.5	4.5	280

Sl. No.	Road from-to	Proposed works	Existing ROW (m)	Proposed ROW (m)-road width	Length (m)
	late Dilip Debnath house	drain on one side and catchpits on the other sides. Construction within ROW, no widening considered. At present <i>kuccha</i> road and partly bituminous road Present carriage way of 4-4.5 m			
Total length of Road works proposed in Ranirbazar					445

* Road already constructed through government fund

2. Proposed Cross Section Details for Road

15. The cross section of Bituminous pavement with drain for Khowai is shown in **Figure 4**. The typical Cross Section for the ICB pavement with drain is shown in **Figure 16** for Mohanpur and Error! Reference source not found.2 for Ranirbazar. Cement concrete paver blocks is proposed for a major part of the project road. The guidelines contained in IRC: SP: 63-2018 are applicable for Interlocking concrete paver block pavements.

16. For Interlocking paver block the thickness required is 580 mm as per IRC 63. To suit the site condition in individual town, it is proposed to have 3 types of road improvement work having 3 different types of thickness.

17. **Traffic:** In project area, people use to travel by Motorcycle, Bicycle, since the external load on pavement is less, assuming 10Msa for the design of Concrete block pavements; Guidelines for Interlocking concrete block pavements, for safe & smooth plying of vehicles as well as non-motorized traffic including pedestrians.

18. The present traffic data on each of these roads typically very few vehicles per day on most of the stretches. The traffic largely comprises motorcycles/two wheelers, tractors, light commercial vehicles, animal drawn carts and bicycles.

3. Proposed Drainage System

Khowai

19. Design of the stormwater drain within the subproject areas has been done considering contribution from ward 4, 11, part of Ward 1, 2, 3, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15 and adjoining area of ward no 9, 12, 13, 14, 15.

20. The entire sub-project area has been divided into four numbers of drainage catchment depending on the drainage outlet as mentioned below:

- (i) Lal Cherra 1 Catchment
- (ii) Namapara Catchment
- (iii) Jeep Taxi Stand Catchment
- (iv) Main Drain-3 Catchment

21. The type of drainage cross sections proposed in towns are as follows, drawings of these typical cross sections are given in **Figure 13**.

- (i) Type A - Typical Arrangement of Storm Water Drain Along Both Side of Road with Catch Pit (Drain Width Bellow 1.00 m)
- (ii) Type B - Typical Arrangement of Storm Water Drain Along Both Side of Road with Catch Pit (Drain Width Above 1.00 m)
- (iii) Type C - Typical Arrangement of Storm Water Drain Along Both Side of Road without Catch Pit and Drain Top Level Flashing. Finished Road Level (Drain Width Bellow 1.00 m)
- (iv) Type D - Typical Arrangement of Storm Water Drain Along Both Side of Road without Catch Pit and Drain Top Level Flashing. Finished Road Level (Drain Width Above 1.00 m)
- (v) Type E - Typical Arrangement of Storm Water Drain Along One Side of Road with Catch Pit connected from other side of road and Drain Top Level Flashing. Finished Road Level (Drain Width Bellow 1.00 m)
- (vi) Type F - Typical Arrangement of Storm Water Drain Along One Side of Road with Catch Pit connected from other side of road and Drain Top Level Flashing Finished Road Level (Drain Width Above 1.00 m)
- (vii) Type-G - Typical Arrangement of Storm Water Drain Along Both Side of Road with Out Catch Pit and Drain Top Slab Flashing with Finished Road Level With 1 M Height Earth Retaining Wall (Drain Width Below 1.00 M)
- (viii) Type-H - Typical Arrangement of Storm Water Drain Along Both Side of Road with Out Catch Pit and Drain Top Slab Flashing with Finished Road Level With 2 M Height Earth Retaining Wall (Drain Width Below 1.00 M) drawings of these typical cross sections are given in Figure 14.

22. Length of Storm water Drain along with proposed cross section to be implemented under the Khowai town is shown below.

Description	Catchments				Total
	Catchment-3 (Lal cherra_1) catchment	Catchment-9 (Namapara) catchment	Catchment-10 (Jeep taxi stand) catchment	Catchment-13 (Main drain_3) catchment	
RCC Box Drain (width 1000 mm & above) (m)	893.20	451.90	189.70		1534.80
RCC Box Drain (width below 1000 mm) (m)	380.20	2182.50	345.30	605.30	3513.30
Total Length (M)	1273.40	2634.4	535.00	605.30	5048.10

Table 4: Proposed Storm water Drainage stretch to be implemented at Khowai

Catchment	Part of Proposed drain	Outfall point		Length (M)	Existing drain condition	ROW		Section (mm x mm) [Varying] (width x depth) - RCC covered drain	Cross section type of RCC covered drain*
		Proposed Drain's-existing outfall	Final Outfall			Existing width	Proposed width		
Catchment-3 (Lal Cherra_1) Catchment	From House of Bishnu Roy to Embankment Road (Along the side of Lal Cherra)- D1	Lalcherra	Khowai River	192.20	Uncovered drain – <i>kuccha</i> and some part <i>pucca</i> /cemented. Soild waste disposed on the drain	1m	0.6m	(600 x 1050) to (600 x 1200)	Type-C
				188.00		1.5m	0.8m	(800 x 1000) to (800 x 1200)	Type-C
				495.70		2m	1m	(1000 x 1070) to (100 x 2025)	Type-D
				68.90		2.3m	1.1m	(1100 x 1970) to (1100 x 2250)	Type-D
				23.00		2m	1.2m	1150 x 2000	Type-D
				305.60		2.3m	1.1m	(1100 x 1970) to (1100 x 2250)	Type-D
	Total length			1273.0					
Catchment-9 (Namapara) Catchment	Vivekananda Statue to Cobler Chowmuhani Via Swapanpuri Atithi Nivas (LHS) – D2	Opposite Radhanagar Bus stand 24.070278N , 91.60228 E	Khowai River	332.20	Uncovered drain –	0.9m	0.8m	(800 x 600) to (800 x 975)	Type-A
	Vivekananda Statue to Cobler Chowmuhani Via Swapanpuri	Near Namapara Bridge opp. Nibedita Park	Khowai River	334.10		0.3m	0.8m	(800 x 800) to (800 x 1500)	Type-A

Catchment	Part of Proposed drain	Outfall point		Length (M)	Existing drain condition	ROW		Section (mm x mm) [Varying] (width x depth) - RCC covered drain	Cross section type of RCC covered drain*
		Proposed Drain's-existing outfall	Final Outfall			Existing width	Proposed width		
	Atithi Nivas (RHS)- D2	24.072164N , 91.601047E			<i>kuccha</i> and some part <i>pucca</i> / cemented. Soilid waste disposed on the drain				
	Backside of Swapanpuri Atithi Nivas- D3	Near Namapara Bridge opp. Nibedita Park 24.072164N , 91.601047E	Howa i River	121.90		2m	0.8m	(800 x 750) to (800 x 2270)	Type-C
	Vivekananda Statue to Namapara Chowmuhani - D4	Near Namapara Bridge opp. Nibedita Park 24.072164N , 91.601047E	Howa i River	350.90		0.7m	0.8m	(800 x 750) to (800 x 1450)	Type- A
	Namapara Chowmuhani to Cobler Chowmuhani (LHS)- D5	Near Namapara Bridge opp. Nibedita Park 24.072164N , 91.601047E	Howa i River	160.00		0.5m	0.8m	(800 x 600) to (800 x 1070)	Type-A
	Namapara Chowmuhani to Cobler Chowmuhani (RHS)- D5	Near Namapara Bridge opp. Nibedita Park 24.072164N , 91.601047E	Howa i River	211.20		0.6m	0.8m	(800 x 700) to (800 x 1510)	Type-A

Catchment	Part of Proposed drain	Outfall point		Lengt h (M)	Existing drain condition	ROW		Section (mm x mm) [Varying] (width x depth) - RCC covere d drain	Cross section type of RCC covere d drain*
		Proposed Drain's-existing outfall	Final Outfall			Existin g width	Propose d width		
	Cobler Chowmuhani to Namapara Bridge near Nivedita Park- D6	Near Namapara Bridge opp. Nibedita Park 24.072164N , 91.601047E	Khowa i River	32.4		1.8m	0.8m	(700 x 1540) to (700 x 2100)	Type-C
				122.60		1.8m	0.8m	(800 x 1700) to (800 x 2150)	Type-C
				15.00		2.2m	1.3m	(1250 x 2150) to (1250 x 2300)	Type-D
				300.00		1.9m	1.5m	(1500 x 2300) to (1500 x 2600)	Type-D
				136.80		2.5m	1.6m	(1600 x 2600) to (1600 x 2670)	Type-D
				Total length			606.8		
	Namapara Chowmuhani to Namapara Bridge near Nivedita Park (LHS)- D7	Near Namapara Bridge opp. Nibedita Park 24.072164N , 91.601047E	Khowa i River	256.60	Uncovere d drain – <i>kuccha</i> and some part <i>pucca</i> / cemented. Soilid waste disposed on the drain	0.5m	0.8m	(800 x 600) to (800 x 1350)	Type-A
	Namapara Chowmuhani to Namapara Bridge near Nivedita Park (RHS)- D7	Near Namapara Bridge opp. Nibedita Park 24.072164N , 91.601047E	Khowa i River	260.60		0.5m	0.8m	(800 x 600) to (800 x 1750)	Type-A

Catchment	Part of Proposed drain	Outfall point		Lengt h (M)	Existing drain condition	ROW		Section (mm x mm) [Varying] (width x depth) - RCC covere d drain	Cross section type of RCC covere d drain*	
		Proposed Drain's-existing outfall	Final Outfall			Existin g width	Propose d width			
CATCHMENT-10 (JEEP TAXI STAND) CATCHMENT	Vivekananda Statue to Jambura Road Junction (LHS) – D8	Near Jeep Taxi Stand 24.065812 N, 91.606981 E	Khowa i River	195.90		1.3m	0.8m	(800 x 650) to (800 x 1350)	Type-A	
	Jambura Road Junction to Jeep Taxi Stand (LHS)- D9	Near Jeep Taxi Stand 24.065812 N, 91.606981 E	Khowa i River	72.20		1.3m	1m	(1000 x 1400) to (1000 x 1760)	Type-B	
				64.20			1.1m	(1100 x 1760) to (1100 x 2590)	Type-B	
				11.70			1.2m	(1200 x 2590) to (1200 x 2320)	Type-B	
				24.50			1.4m	(1400 x 1350) to (1400 x 1400)	Type-B	
				Total length			172.6			
	Jambura Road Junction to Jeep Taxi Stand (RHS)- D9	Near Jeep Taxi Stand 24.065814 N, 91.607145E	Khowa i River	149.40		Uncovere d drain – <i>kuccha</i> and some part <i>pucca</i> / cemented. Soilid waste disposed on the drain	1.2m	0.8m	(800 x 1220) to (800 x 2390)	Type-A
				17.10				1.1m	(1100 x 1140) to (1100 x 1220)	Type-A
	Total length					166.5				
	Total length					166.5				

Catchment	Part of Proposed drain	Outfall point		Length (M)	Existing drain condition	ROW		Section (mm x mm) [Varying] (width x depth) - RCC covered drain	Cross section type of RCC covered drain*
		Proposed Drain's-existing outfall	Final Outfall			Existing width	Proposed width		
CATCHMENT-13 (MAIN DRAIN_3) CATCHMENT	Jambura Road Junction to Namapara Chowmuhani via Vivekananda Statue (LHS)- D10	Near Jeep Taxi Stand 24.065812 N, 91.606981 E	Khowai River	605.30	Uncovered drain – <i>kuccha</i> and some part <i>pucca</i> / cemented. Solid waste disposed on the drain	1m	0.8m	(800 x 710) to (800 x 1410)	Type-A
	Total			5048					

(* cross section type shown in **Figure 13**
Provision of catchpit as per design and drainage location)

Mohanpur

23. This subproject primarily focuses on the Drainage development works within 21 numbers of catchment. SWF generated from the sub project area is proposed to be discharged to Sonai River, Taranagar Cherra & Low-lying area. No outfall structure will be constructed under the package.

24. The main proposed storm water drains to be implemented within project area are as follows.

Table 5: Main Proposed Storm water Drainage stretch to be implemented in Mohanpur

Sl. no	Proposed Drain	Outfall point		Length in M	Existing Drain Condition	ROW		Section (MM*MM) [Varying] Width x Depth- RCC covered drain	Cross section type of RCC covered drain*
		Proposed Drain- existing outfall	Final outfall			Existing Width	Proposed Width		
1.	Construction of Cover Drain from Dilip Saha house to Joydeep Ghosh Shop under ward no-01, MMC- D1	Existing drain near Vishwakarma varieties	Sonai river via different cherra	94.4	Existing Uncovered Pucca cemented drain	0.4m	0.4m	(400 x 500)	Type-E
2.	Construction of Cover Drain from Jitindra Debnath land to Sarajit Acharjee land (Rabindra Palli) under ward no-02 MMC- D2	No fixed area. Section only 23.967079 N, 91.361690 E	Sonai river via different cherra	191.9	Existing Uncovered kaccha drain	1.4m	0.7m -0.8m	(700 x 900) to (800 x 950)	Type-C
3.	Construction of Cover Drain from Swapan Malakar land to Bakul Debnath House (Rabindra Palli) under ward no-02 MMC- D3	23.973117 N, 91.364983 E Nearby Xpressbees Mohanpur	Sonai river via different cherra	536.8	No drain existing and some part Kaccha drain	0.4m connecting drain	0.4m - 0.5m	(400 x 600) to (500 x 600)	Type-C
4.	Construction of Cover Drain from Simna Main Road to Sandhya Maisan house (Ghosh Para) under ward no -02 MMC- D4	Opposite Joyguru Motors TVS 23.968709 N, 91.365325 E	Sonai river via different cherra	97.93	No drain existing and some part Kaccha drain	0.4m connecting drain	0.4m	(400 x 500)	Type-E

Sl. no	Proposed Drain	Outfall point		Length in M	Existing Drain Condition	ROW		Section (MM*MM) [Varying] Width x Depth- RCC covered drain	Cross section type of RCC covered drain*
		Proposed Drain- existing outfall	Final outfall			Existing Width	Proposed Width		
5.	Construction of Cover Drain from Jagabandhu Debnath land to Chandan Bhattacharya house (Rabindra _Palli) under ward no- 02 MMC- D5	No fixed area. Section only 404 N, 91.361195 E	Sonai river via different cherra	404.6	No drain existing and some part Kaccha drain	connecting drain	0.4m	(400 x 500)	Type-E
6.	Construction of Cover Drain from Amal Gope to Haralal Bhowmik house under ward no- 03 MMC- D6	Chowmani near Srikrishna temple 23.962290 N, 91.360638 E	Sonai river via different cherra	152.9	No drain existing and some part Kaccha drain	0.6m	0.5m	(500 x 500) to (500 x 600)	Type-A
7.	Construction of Cover Drain from Goutam Shil house to BOC under ward no – 03, MMC- D7	Near bharat petroleum station 23.959657 N, 91.360416 E	Sonai river via different cherra	203.4	Existing Uncovered cemented drain	0.6m	0.5- 0.6m	(500 x 500) to (600 x 800)	Type-A and E
8.	Construction of Cover Drain from near the house of Subhash Deb (Pada) in front of Sudhan Das house (slab culvert) under ward no- 04, MMC- D8	Nearby sarkar study center 23.970505 N, 91.373618 E	Sonai river via different cherra	272.8	Existed cemented open drain, clogged with solid waste which needs to be cleared, and the other half of the drain is mud and earthen built.	0.6 m	0.8- .85 m	800 x 1100) to (850 x 1100)	Type-E
9.	Construction of Cover Drain from Dulal Modak	Cherra Nearby Dr. Subhajit Dutta's Clinic	Sonai river via different cherra	322.3	Existing cemented open drain which is clogged by solid	0.8m	0.5m	500 x 500) to (500 x 600)	Type-A

Sl. no	Proposed Drain	Outfall point		Length in M	Existing Drain Condition	ROW		Section (MM*MM) [Varying] Width x Depth- RCC covered drain	Cross section type of RCC covered drain*
		Proposed Drain- existing outfall	Final outfall			Existing Width	Proposed Width		
	shop to Shukhamay Deb land (Hospital Chowmuhan) under MMC.- D9	23.973131 N, 91.374514 E			waste, requires cleaning, and other half is mud and earthen drain, filled with vegetation.				
10.	Construction of Cover Drain from Simna Main Road to Ramkrishna Ashram (Vivekananda pally) under MMC.- D10	Near Karuna Villa 23.971214 N, 91.369272 E	Sonai river via different cherra	387	No existing drainage system present.	0.5m	0.4-0.5m	(400 x 500) to (500 x 600)	Type-C
11.	Construction of Cover Drain from Ratan Kanti Debnath house to Rabi Deb land (Jagatpur School Chowmuhan) under ward no-06, MC- D11	Nearby Subodh Ch. Deb Business center 23.971857 N, 91.394454 E	Sonai river via different cherra	389.7	A part of the proposed site has an existing kuccha drain mostly covered with vegetation, majorly herbs and climbers which requires clearance, and the other half does not possess any existing drain.	0.4m-0.5m connecting drain	0.5m	(500 x 600) to (500 x 700)	Type-C
12.	Construction of Cover Drain from Honda Show Room to Ranjit Debnath House under ward no-07, MMC- D12	Near Joy Govinda hotel and Restaurant 23.974665 N, 91.383761 E	Sonai river via different cherra	302	No existing drainage system present.	0.6m connecting drain	1.1m	(1100 x 1100) to (1100 x 1100)	Type-B

Sl. no	Proposed Drain	Outfall point		Length in M	Existing Drain Condition	ROW		Section (MM*MM) [Varying] Width x Depth- RCC covered drain	Cross section type of RCC covered drain*
		Proposed Drain- existing outfall	Final outfall			Existing Width	Proposed Width		
13.	Construction of Cover Drian from near the house of Kiran Deb to Jagatpur Community Hall under ward no-08, MMC- D13	Nearby Subodh Ch. Deb Business center 23.971801 N, 91.394433 E	Sonai river via different cherra	567.5	No existing drainage system at present	0.6m connecting drain	0.5-0.8 m	(500 x 600) to (800 x 1100)	Type-C
14.	Construction of R.C.C Cover Drain from Shanti Kr. Debnath to Bhajan Debnath land via Aila Ghat Bazar and near Amal Das house to Aila Ghat Bazar under ward no - 09, MMC- D14	Nearby Taranagar high School 23.958451 N, 91.389216 E	Sonai river via different cherra	669	A portion of the site has existing cemented drain, clogged with solid wastes and is not in use, while the other half does not have any existing drain.	1.4m	0.4m-0.6 m	(400 x 600) to (600 x 800)	Type-C
15.	Construction of Cover Drain from near the house of Subal Rakshi to Airan Chowmuhani slab culvert (Both Side) and slab culvert to near Bandan (one side only) under ward no-10, MMC- D15	Near DTDC Mohanpur SB Enterprise 23.969726 N, 91.372198 E	Sonai river via different cherra	797	Existing cemented open drains are present on both sides. Drains are clogged and full of vegetation mostly herbs and bushes.	0.8m	0.4-0.8 m	(400 x 500) to (800 x 1100)	Type-C

Sl. no	Proposed Drain	Outfall point		Length in M	Existing Drain Condition	ROW		Section (MM*MM) [Varying] Width x Depth- RCC covered drain	Cross section type of RCC covered drain*
		Proposed Drain- existing outfall	Final outfall			Existing Width	Proposed Width		
16.	Construction of Cover Drain from near BSNL Office to Airan Chowmuhan slab culvert, under ward no-10, MMC- D16	Near BSNL Office 23.968717 N, 91.370840 E	Sonai river via different cherra	138.4	No drainage system is present	0.7m	0.5m	(500 x 500)	Type-A
17.	Construction of Cover Drain from near the house of kajal Debnath to Bikash Biawas land under ward no- 11, MMC- D17	About 200 m before Bemola Rice Mill 23.961897 N, 91.380022 E	Sonai river via different cherra	464.1	Both side of the road has existing open cemented drainage system	0.7m	0.4- 0.8 m	(400 x 500) to (800 x 900)	Type-C
18.	Construction of Cover Drain from near the house of Bimal Biswas to PWD Mian Road under ward no- 11, MMC- D18	About 150m from the Serowali Maa temple in existing HUME Pipe culvert 23.959832 N, 91.377059 E	Sonai river via different cherra	214.2	A section of the proposed site has existing open cemented drain while the other section has a mud and earthen drain with lined up vegetation majorly herbs and shrubs, which requires clearance.	0.6m	0.4m	(400 x 500)	Type-C
19.	Construction of Cover Drain from Chanmohan Das house to Jaharlal Das house under ward no- 12, MMC- D19	Connecting to existing Cherra 23.946980 N, 91.359644 E	Sonai river via different cherra	313.1	No drainage system is existing at present in the proposed location	0.5m connecting drain	0.4m	(400 x 500)	Type-E

Sl. no	Proposed Drain	Outfall point		Length in M	Existing Drain Condition	ROW		Section (MM*MM) [Varying] Width x Depth- RCC covered drain	Cross section type of RCC covered drain*
		Proposed Drain- existing outfall	Final outfall			Existing Width	Proposed Width		
20.	Construction of Cover Drain from near Nimai Gope house to Krishna Mandir under ward no- 13, MMC- D20	Near Nimai gope house 23.959876 N, 91.363039 E	Sonai river via different cherra	404.3	No drainage system is existing at present in the proposed location Only few places have earthen furrow, filled with herbs.	0.4m connecting drain	0.4- 0.6m	(400 x 500) to (600 x 900)	Type-E
21	Construction of Cover Drain from Tulabagan School to Kishore Debnath house under ward no- 14, MMC- D21	Near Kishore Devnath house 23.947388 N, 91.367309 E	Sonai river via different cherra	153.95	No existing drainage system noted, however earthen furrow is lined near the proposed site.	0.4m connecting drain	0.4m	(400 x 500)	Type-E
22.	Construction of Cover Drain from near the Grocery Shop of Anil Paul to Ghosh Para slab culvert under ward no- 15, MMC- D22	Behind Rajesh Gope Grocery store 23.967875 N, 91.366570 E	Sonai river via different cherra	311.5	There is an existing open cemented drain present, which clogged with solid waste and growth of herbs and shrubs	0.8m	0.5m	(500 x 500) to (500 x 700)	Type-A
		Total		7388.78					

(* cross section type shown in Figure 13

Provision of catchpit as per design and drainage location)

Ranirbazar

25. The entire sub-project area has been divided into two numbers of drainage catchment depending on the drainage outlet as mentioned below:

- (i) RGM Hospital-Laxmi Cherra Catchment
- (ii) Mora Cherra Catchment

26. This subproject primarily focuses on the Drainage development works within the catchment areas. Part of SWF generated from the sub project area is proposed to be discharged to Ghoramara River through existing gravity outfall/ PS arrangement and part of SWF is designed to be conveyed to the Haora River.

The subproject area covers from parts of wards 1, 4, 8, 7, 9, 10,12 & 13. of RMC area. Total area coverage under this catchment is about 72.658 ha with a design population (2053) of about 14,177.

27. Length of Storm water Drain to be implemented under the Package at Ranirbazar shown below.

Description	Catchments			Total
	Catchment 1	Catchment 3	Catchment 4	
RCC Box Drain (1000 mm & above) (m)	657.20	149.10	0	806.30
RCC Box Drain (below 1000 mm) (m)	1309.80	1934.00	870.90	4114.70
Total in m	1967.00	2083.10	870.90	4921.00

28. The area is covered by roadside *pucca* drain. Most of the drains in the catchment area is observed in stagnant condition due to unorganized construction. Adequacy analysis of the existing system of lateral drain shall be done during the execution phase. Proposed stormwater drains are given in Table 6.

Table 6: List of Proposed Drain in Ranirbazar Municipal Town

Catchment	Part of Proposed drain	Outfall point		Length (M)	Existing drain condition	ROW		SECTION (mm x mm) [Varying] (width x depth)- RCC covered drain	Cross section type of RCC covered drain**
		Proposed Drain - existing outfall	Final Outfall			Existing Width	Proposed Width		
Catchment 1	Nalgaria (NH-8) to Assampara Treatment Plant (RHS)- D1	Near railway bridge over Haora river 23.824143 N, 91.372224 E	Haora River	126.7	Open cemented drain partly, kaccha drain partly, Sluggish drain due to clogging and primary uncovered	0.6m	0.4m	(400 x 400)	Type-C
				110.6		0.6m	0.6m	(600 x 500)	Type-C
				80.4		0.6m	0.8m	(800 x 800)	Type-C
				80.3		0.6m	0.9m	(900 x 800)	Type-C
				151.8		0.6m	1m	(1000 x 900)	Type-D
				310.6		0.6m	1.2m	(1200 x 1600) to (1200 x 1800)	Type-D
	Total Length			860.4					
	Nalgaria (NH-8) to Assampara Treatment Plant (LHS)- D8	Near Paschim Noagaon bridge over Haora river 23.822516 N, 91.377964 E	Haora River	175.5	Open cemented drain partly, kaccha drain partly, Sluggish drain due to clogging and primary uncovered	0.45m	0.4m	(400 x 400) to (400 x 600)	Type-C
				96.5		0.45m	0.5m	(500 x 500) to (500 x 700)	Type-C
				190.9		0.45m	0.6m	(600 x 600) to (600 x 1200)	Type-C
				96.7		0.45m	0.7m	(700 x 800) to (700 x 1500)	Type-C
				221.3		0.5m	0.8m	(800 x 800) to (800 x 1600)	Type-C
				130.9		0.5m	0.9m	(900 x 1200) to (900 x 1600)	Type-C
				80.8		0.5m	1m	(1000 x 900)	Type-D
				114		0.5m	1.2m	(1200 x 1400) to (1200 x 1800)	Type-D
	Total Length			1106.0					
		Total Length			1106.0				
	Catchment 2	Krishnakali to Ranirbazar Public Health Centre*			701.6	Already constructed			
Catchment 3	NH-8 Gopal Road to		Haora River	318.1	Roadside kaccha drains	0.5m	0.4m	(400 x 400) to (400 x 1200)	Type-C

Catchment	Part of Proposed drain	Outfall point		Length (M)	Existing drain condition	ROW		SECTION (mm x mm) [Varying] (width x depth)- RCC covered drain	Cross section type of RCC covered drain**
		Proposed Drain - existing outfall	Final Outfall			Existing Width	Proposed Width		
	Ranirbazar Market- D3	Near Gopal road to Haora river 23.836585 N, 91.363396 E		274.5	in certain areas, but these are poorly designed with inadequate gradients, and are frequently clogged with solid waste	0.5m	0.8m	(800 x 800) to (800 x 900)	Type-C
				149.1		0.5m	1.2m	(1200 x 1400)	Type-D
	Total Length			741.7					
	Ranirbazar Market Natmandir to Dilip Debnath house- D4	Near Trinath temple beside Haora river 23.834135 N, 91.364034 E	Haora River	67.3	Uncovered partly kaccha and partly covered cemented roadside drains, but these are poorly designed with inadequate gradients, and are frequently clogged with solid waste	0.45m	0.4m	(400 x 400)	Type-C
				80.2		0.45m	0.5m	(500 x 1100)	Type-C
				210.5		0.45m	0.6m	(600 x 600) to (600 x 1200)	Type-C
				70.6		0.45m	0.7m	(700 x 1200) to (700 x 1400)	Type-C
				118.6		0.45m	0.8m	(800 x 1200) to (800 x 1500)	Type-C
	Total length			547.2					
	Existing OHT to Natmandir- D6	Near Trinath temple beside Haora river 23.834135 N, 91.364034 E	Haora River	28	Existing drain partly covered and partly open on the left side of the road which is frequently clogged with solid waste	0.4m	0.4m	(400 x 600)	Type-C
				2.9		0.4m	0.5m	(500 x 1200)	Type-C
Total length			30.9						

Catchment	Part of Proposed drain	Outfall point		Length (M)	Existing drain condition	ROW		SECTION (mm x mm) [Varying] (width x depth)- RCC covered drain	Cross section type of RCC covered drain**	
		Proposed Drain - existing outfall	Final Outfall			Existing Width	Proposed Width			
	Natmandir to NH-8-D7	Near Gopal road to Haora river 23.836585 N, 91.363396 E	Haora River	296.7	Uncovered partly kaccha drain. The existing drains are not in good condition because of the drains are choked with silt, solid waste etc.	0.4m	0.4m	(400 x 400) to (400 x 1200)	Type-C	
				2.7		0.4m	0.8m	(800 x 2000)	Type-C	
	Total length			299.4						
	Dhan Chowmuhani to Thana Road Tri Junction D-9	Near Trinath temple beside haora river 23.834135 N, 91.364034 E	Haora River	294.1	Partly covered and partly open cemented and kaccha drain	0.6m	0.4m	(400 x 400) to (400 x 1100)	Type-C	
				108.5		0.6m	0.5m	(500 x 500) to (500 x 800)	Type-C	
				61.3		0.6m	0.6m	(600 x 1000)	Type-C	
	Total length			463.9						
	Catchment 4	Ranirbazar Cattle Market to Ghora mara River D5	Near Ghoramara bridge beside Perfect driving school 23.837934 N, 91.363692 E	Haora River	493.7	Partly covered and partly open cemented and kaccha drain	0.5m	0.4m	(400 x 400) to (400 x 1100)	Type-E
					134.5		0.5m	0.6m	(600 x 1200) to (600 x 1400)	Type-E
					242.7		0.5m	0.7m	(700 x 900) to (700 x 1900)	Type-E
Total length			870.9							
Total length				4921 m						

* Drain already constructed

(** cross section type shown in Figure 13

Provision of catchpit as per design and drainage location)

29. Following Figure 2 to 5 proposed roads in google map, proposed plan and profile of road and typical cross section of the road for Khowai, and Figure 6 to 13 showing the proposed and existing drain, proposed drain area, catchment area map and typical cross section of the drain. Figure 14 to 16 shows proposed roads in google map, proposed plan and profile of road and typical cross section of the road of the Mohanpur and Figure 17 to 19 shows the proposed and existing drain, catchment delineation area map of Mohanpur town. Figure 20 to 25 presents maps of existing and proposed road and drainage components, proposed road lay out plan and cross section, catchment delineation area of drain for Ranirbazar town.

D. Implementation Schedule

30. Implementation of Package of cluster IA as item rate contract. Project will be implemented in 36 months. Bids to be invited for the package in July/ August 2023, and construction work is likely to commenced in January 2024 and will be completed by January 2027.

Maps Showing existing and proposed components in KhowaiTown

Figure 2: Proposed Roads of Khowai Google Earth

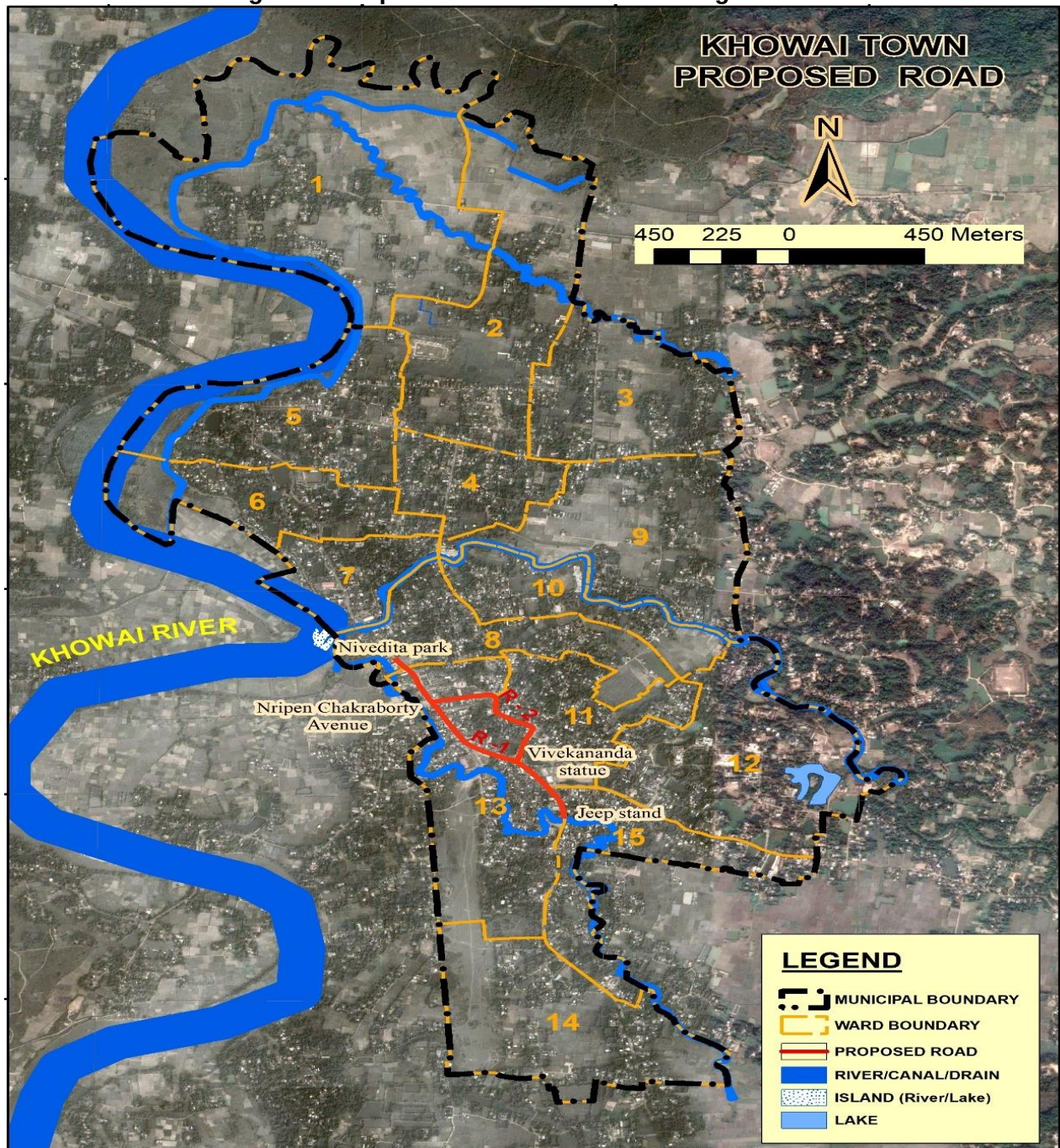
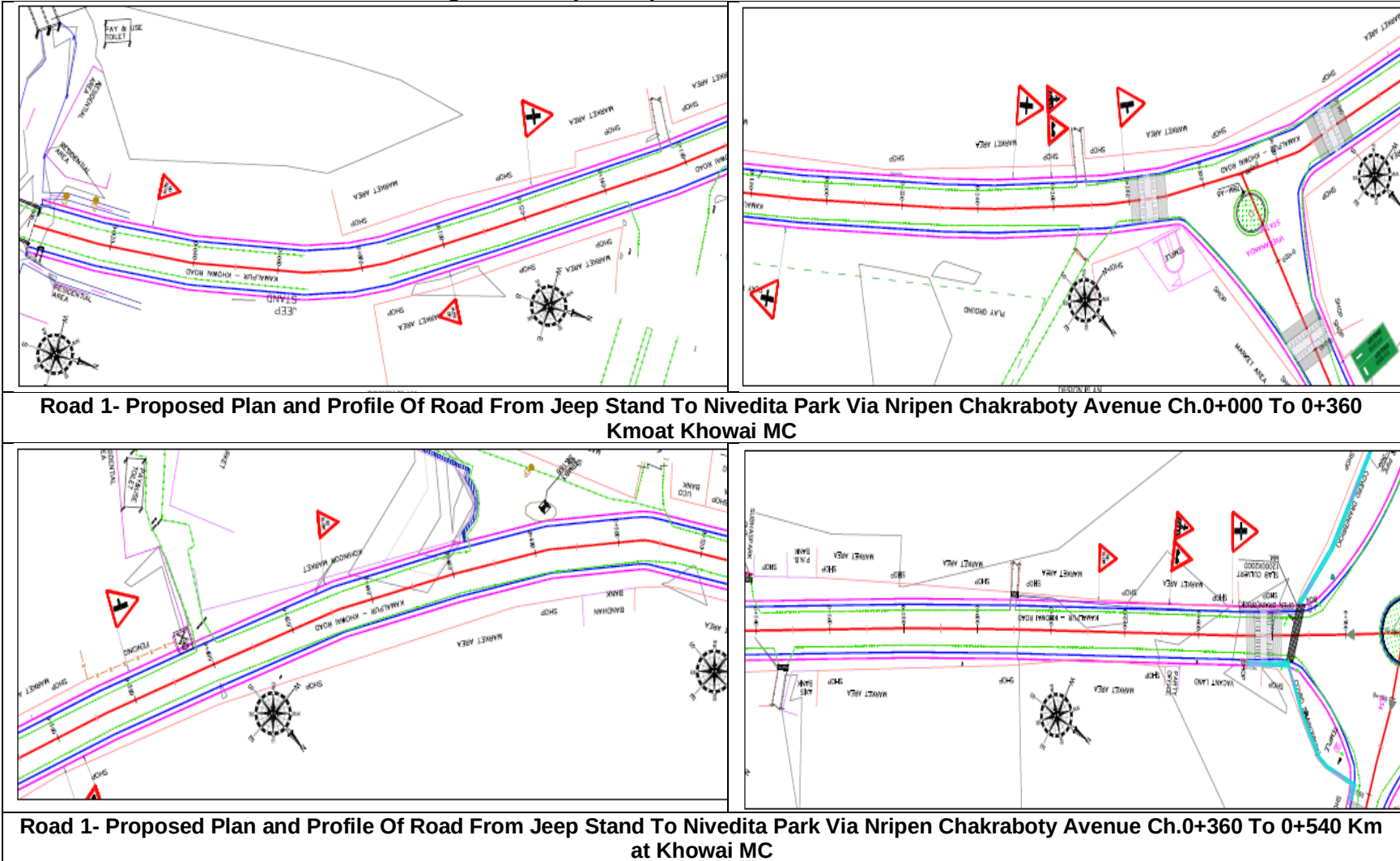
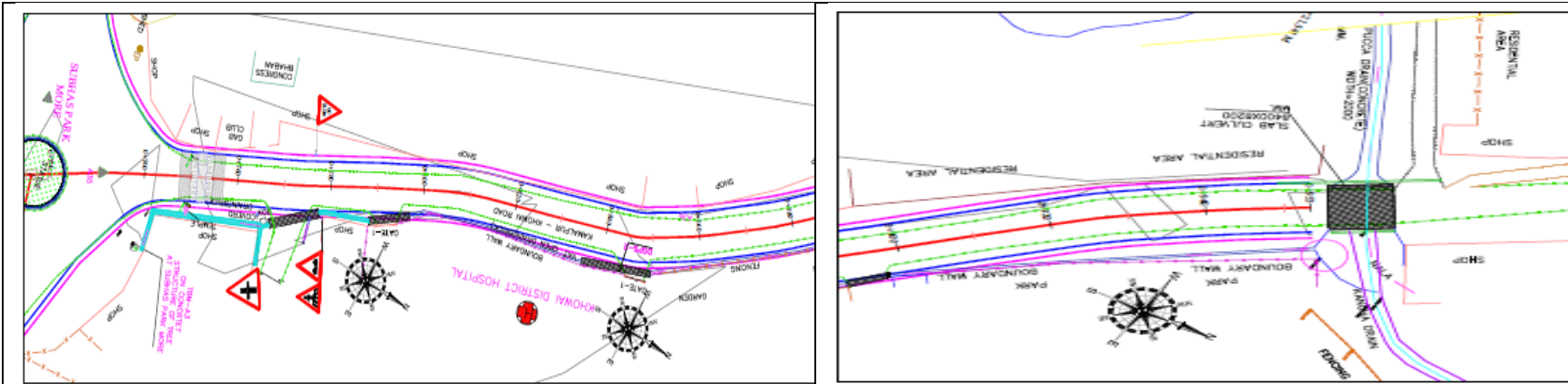
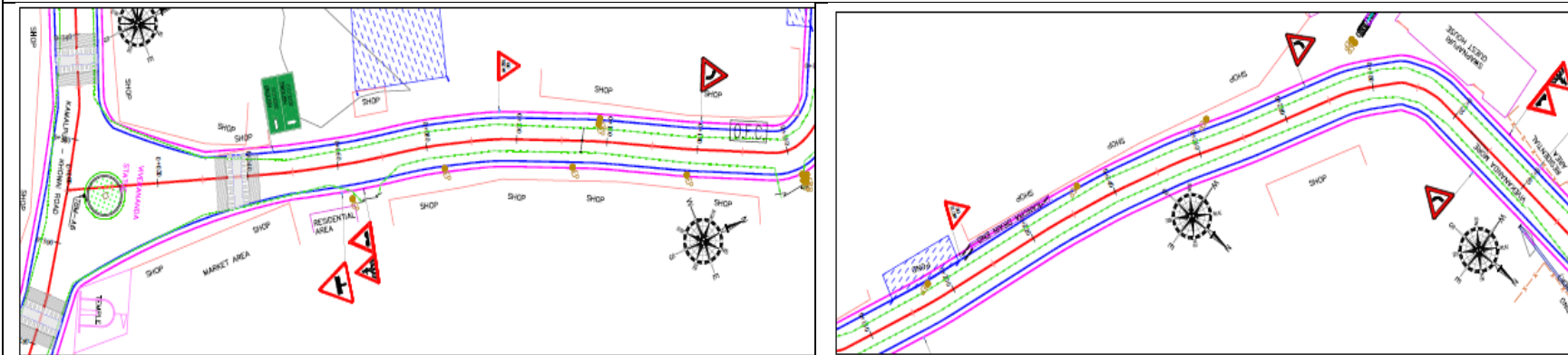


Figure 3: Proposed plan and Profile of the Roads

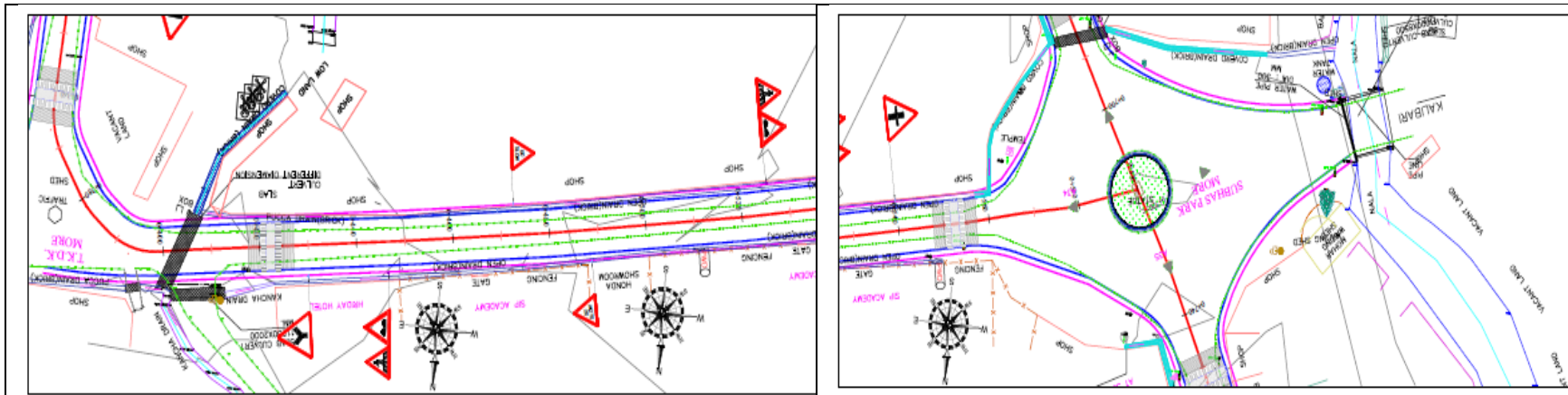




Road 1- Proposed Plan and Profile of Road From Jeep Stand To Nivedita Park Via Nripen Chakraboty Avenue Ch. 0+540 To 0+900 Km at Khowai MC



Road 2- Proposed Plan and Profile Of Road From Vivekananda Statue To Nripen Chakraborty Avenue Up To Khowai Agartala Swapanpuri Ch.0+000 To 0+360 At Khowai Mc



Road 2- Proposed Plan And Profile Of Road From Vivekananda Statue To Nripen Chakraborty Avenue Up To Khowai Agartala Swapanpuri Ch. 0+360 To 0+540 At Khowai Mc

Figure 4: Typical Cross - Section of Bituminous Pavement (With Catchpit)

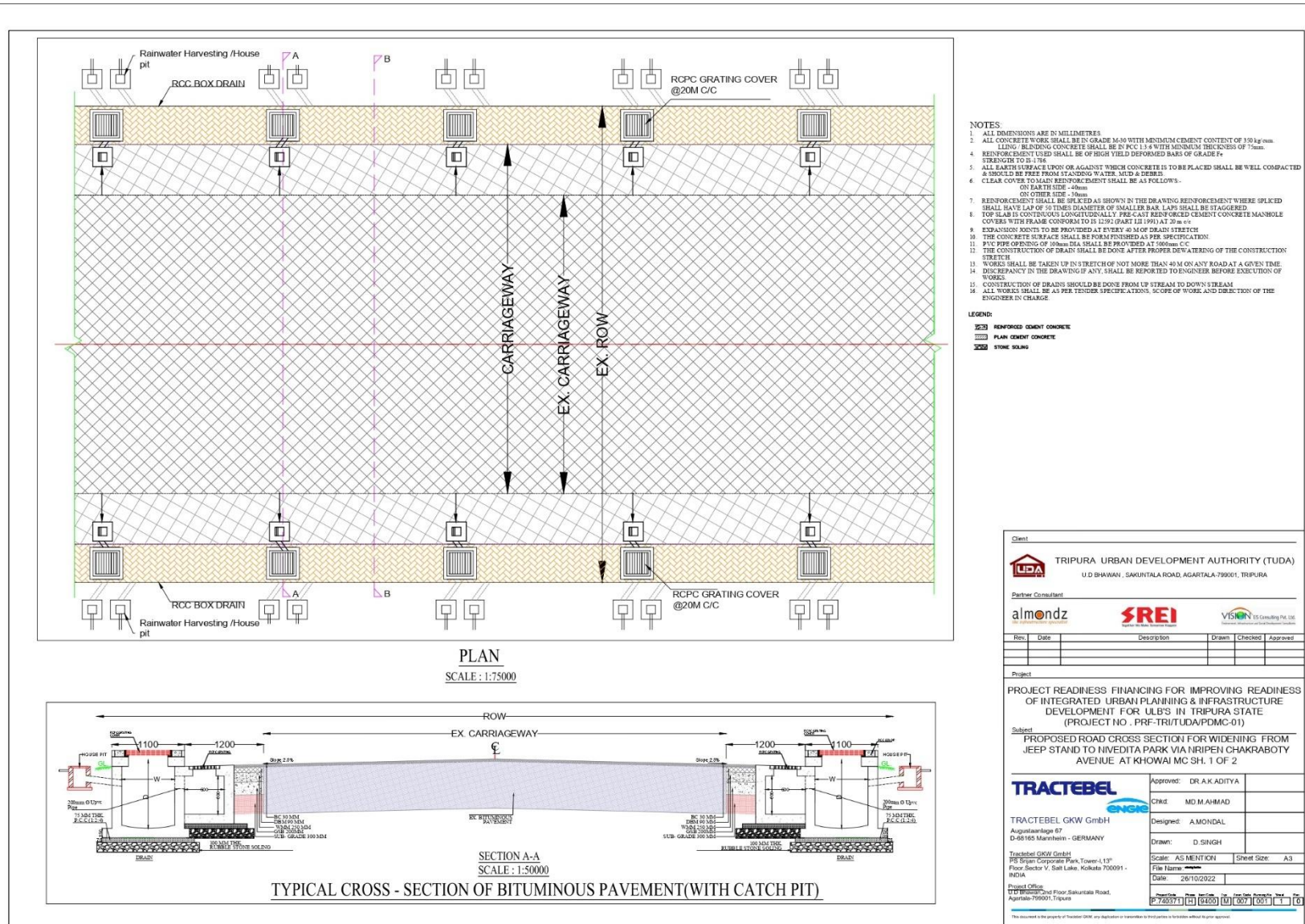


Figure 5: Existing drain in Khowai Town

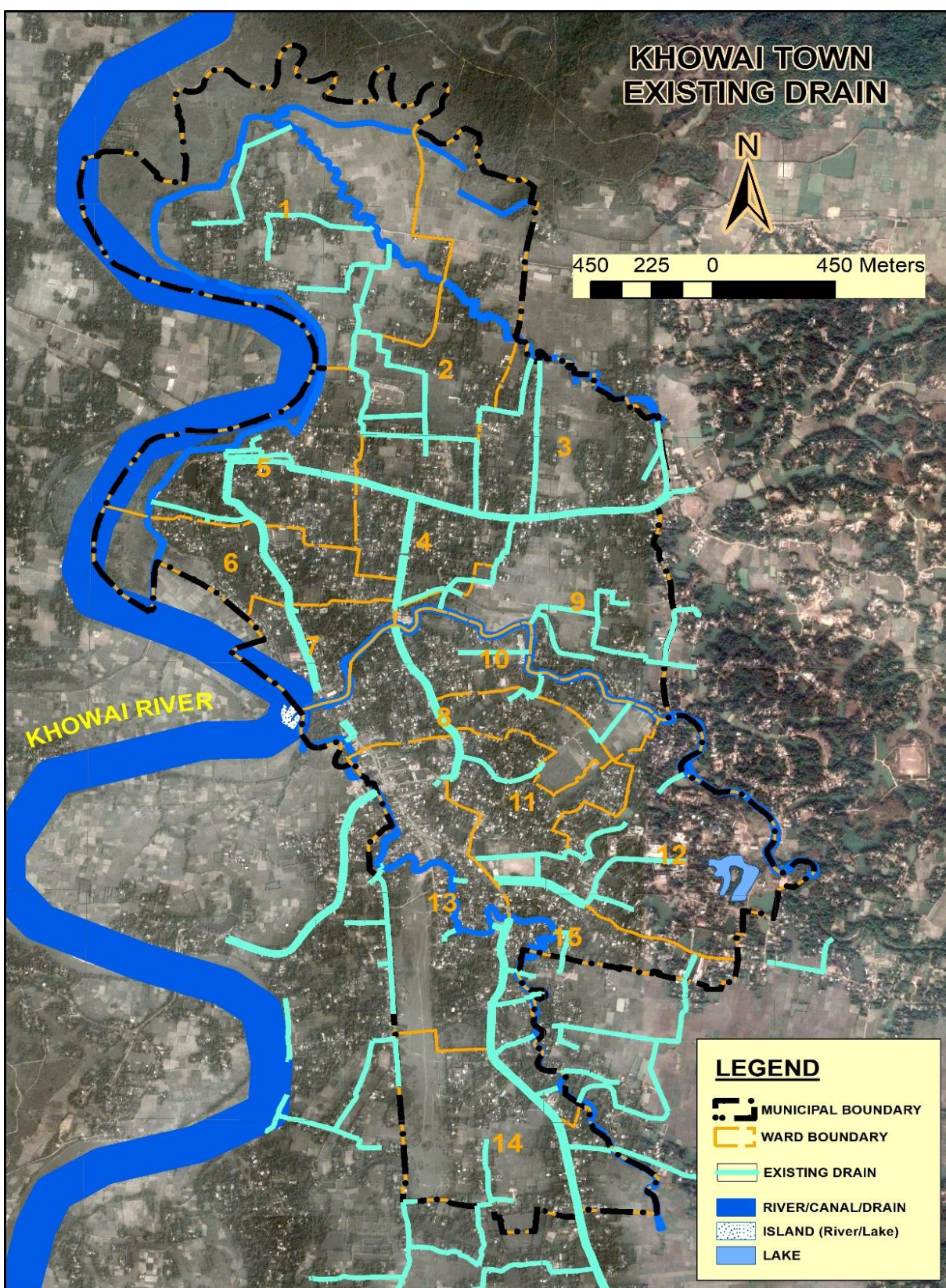


Figure 6: Proposed Drain in Khowai Town

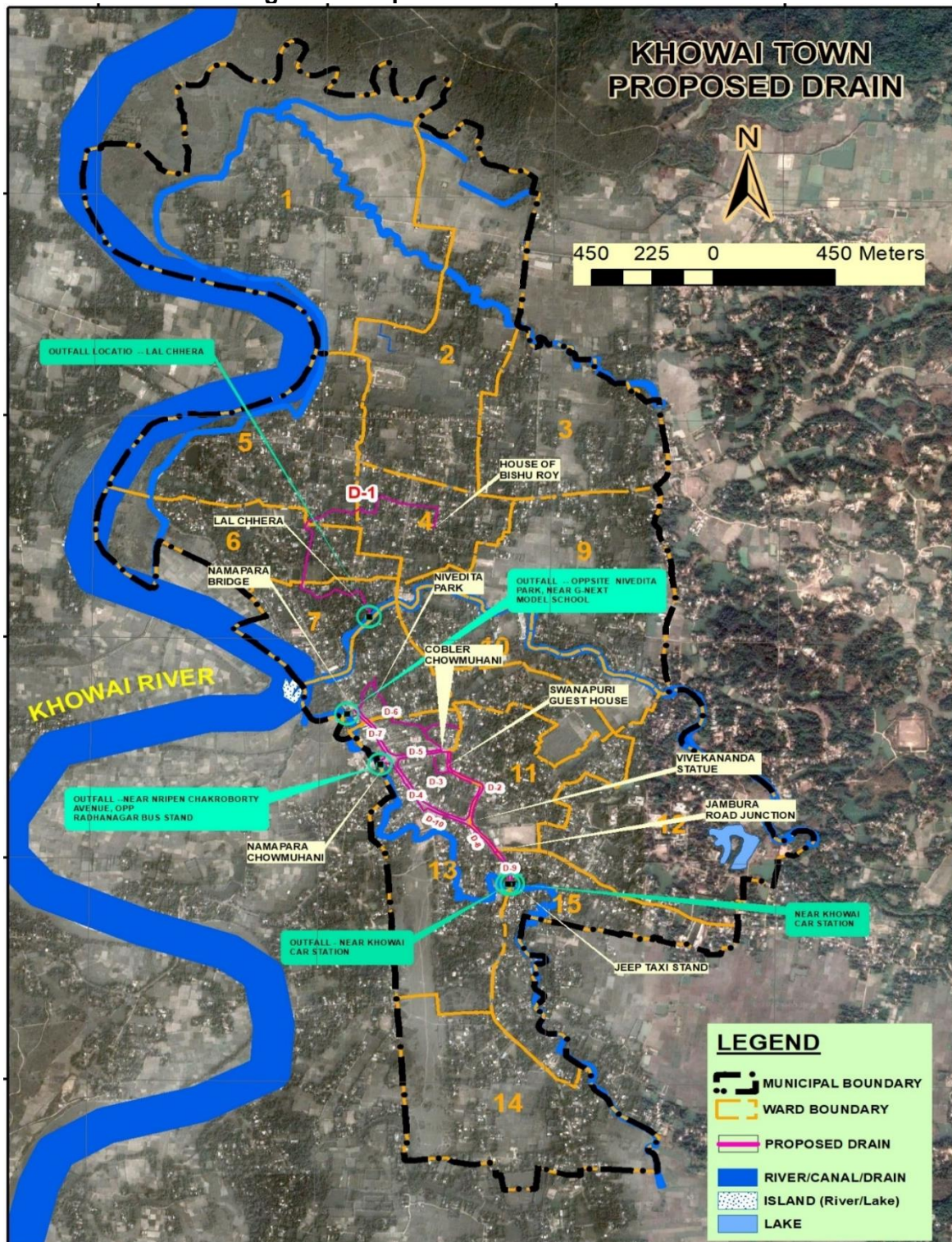


Figure 7: Proposed storm water drainage work area of Khowai MC

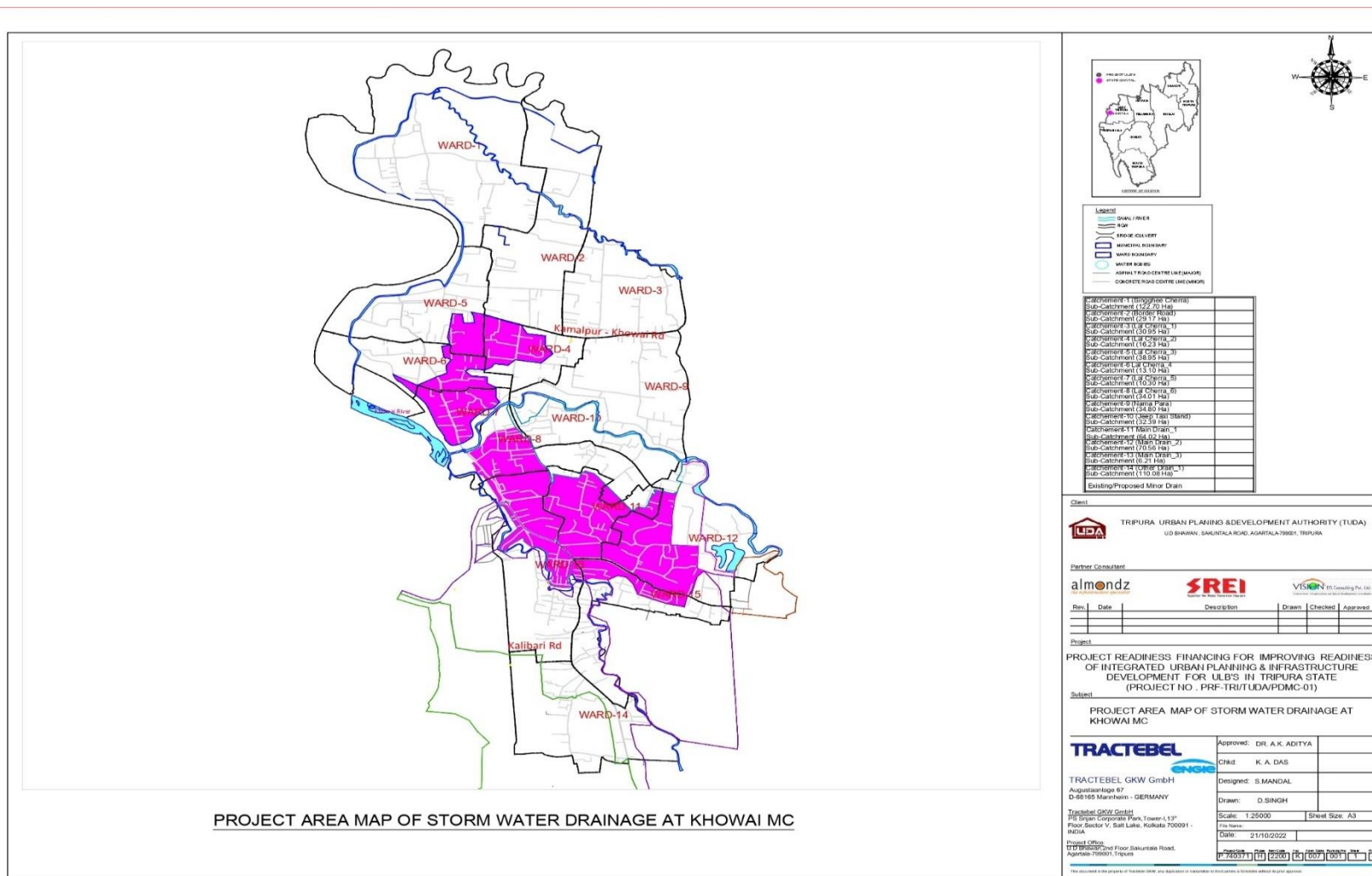


Figure 8: Proposed alignment of drain in Lal Cherra1 Catchment

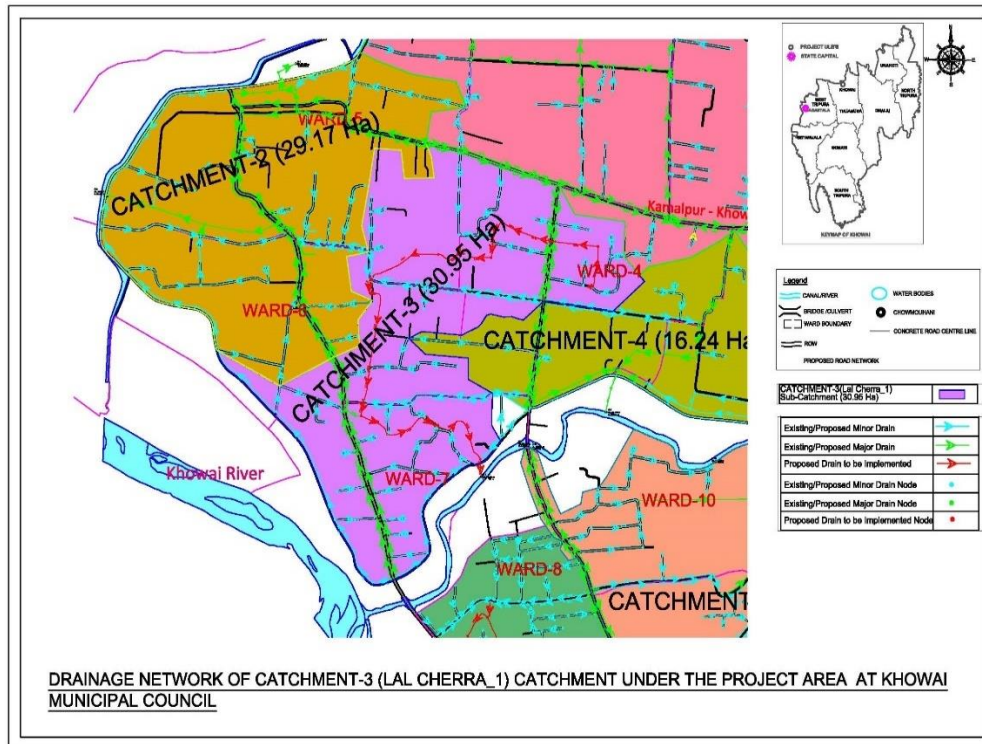


Figure 9: Proposed alignment of drain in Namapara Catchment

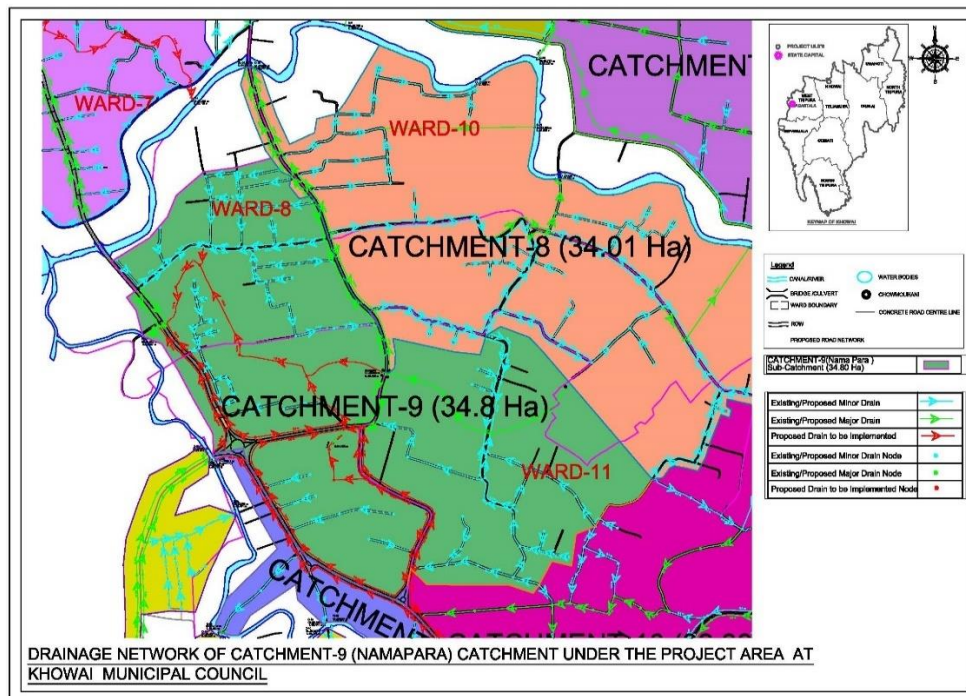


Figure 10: Proposed alignment of drain in Jeep Taxi stand Catchment

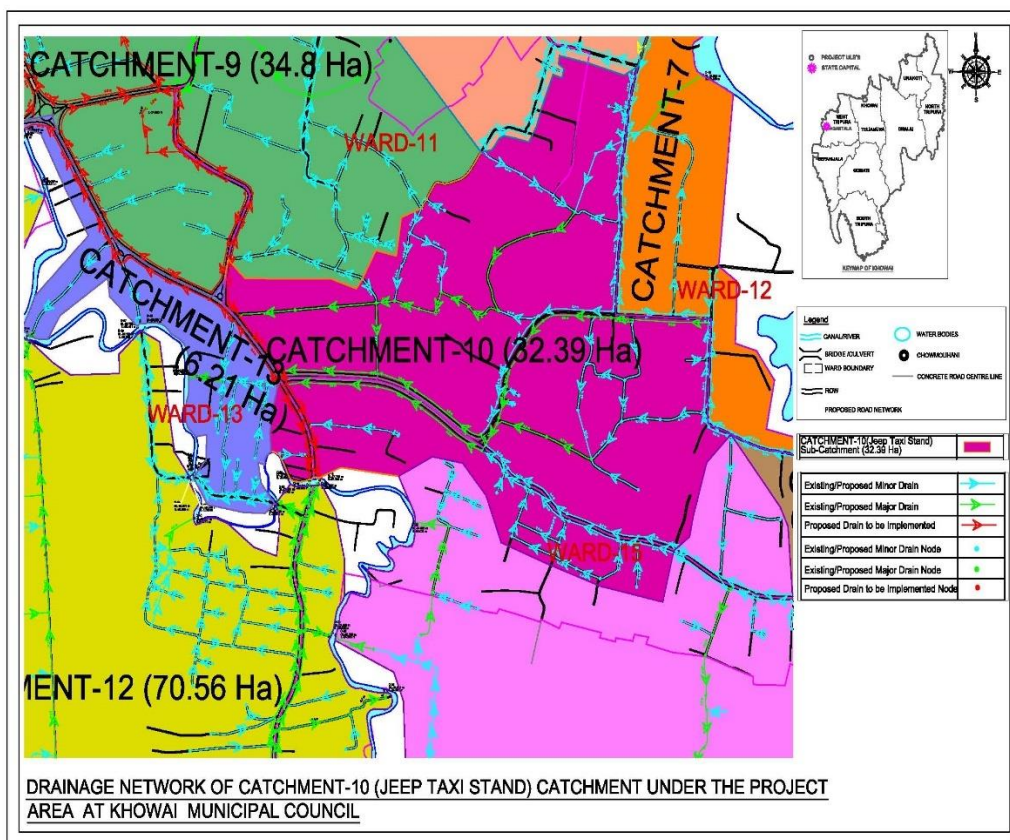


Figure 11: Proposed alignment of Drain in Main Drain 3 Catchment

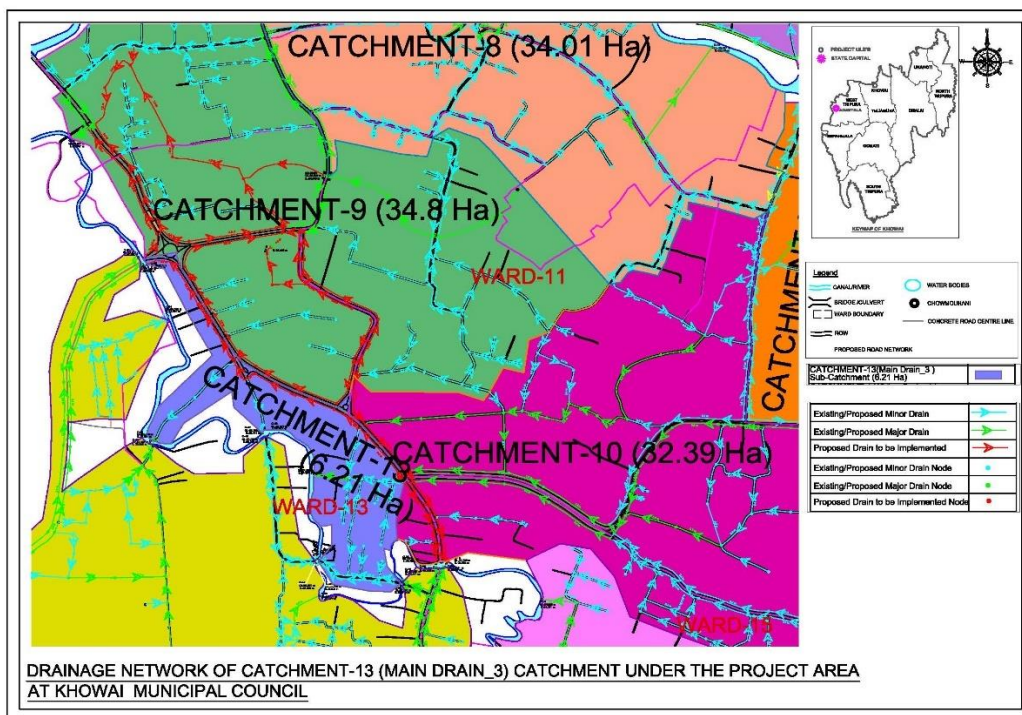


Figure 12: Catchment area Delineation map of storm water Drainage

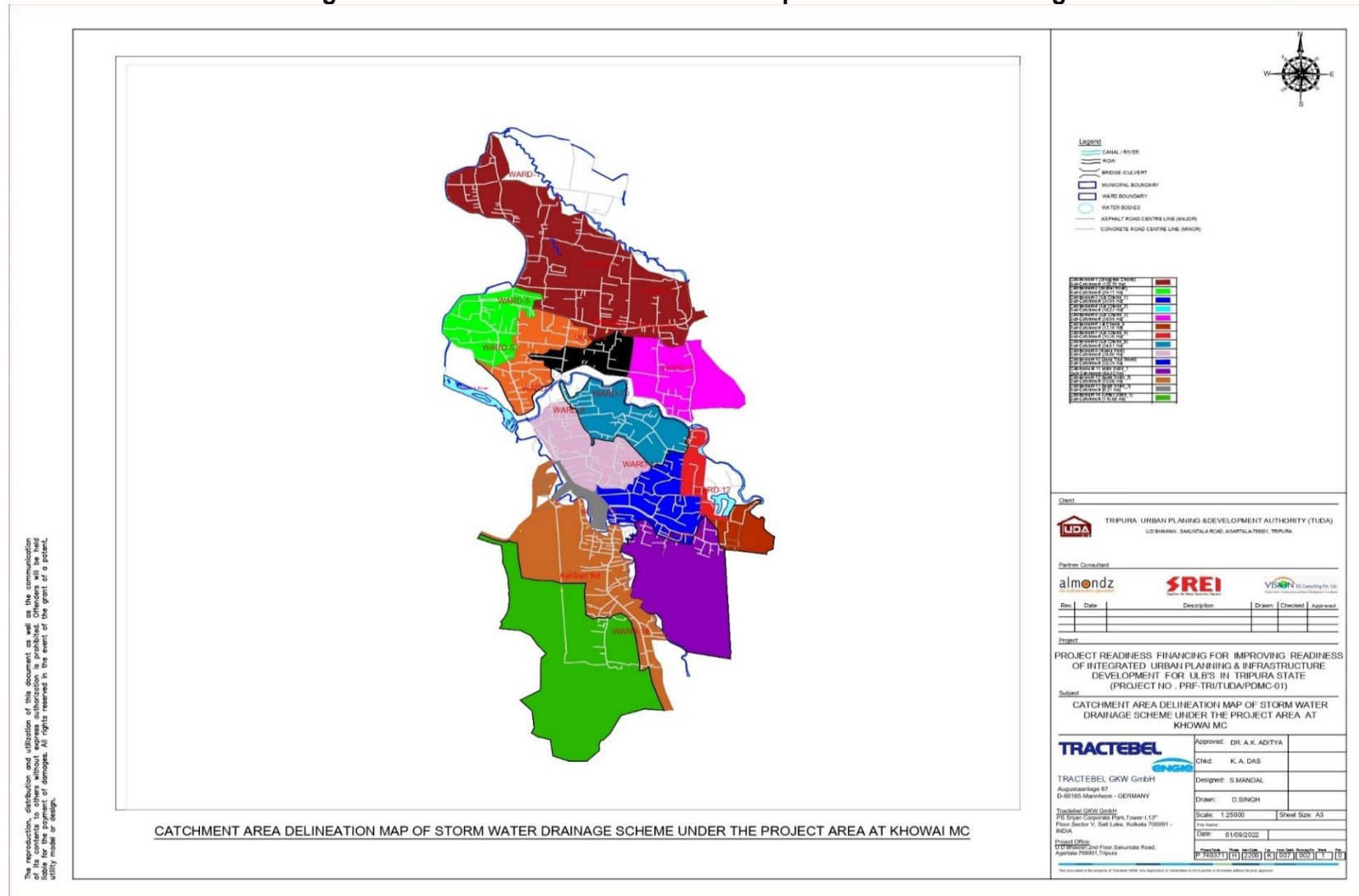
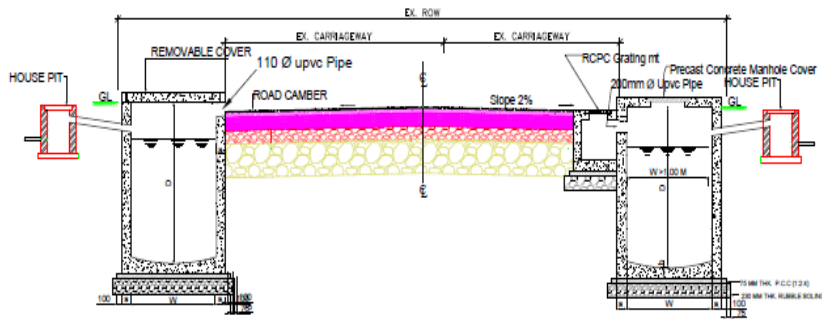


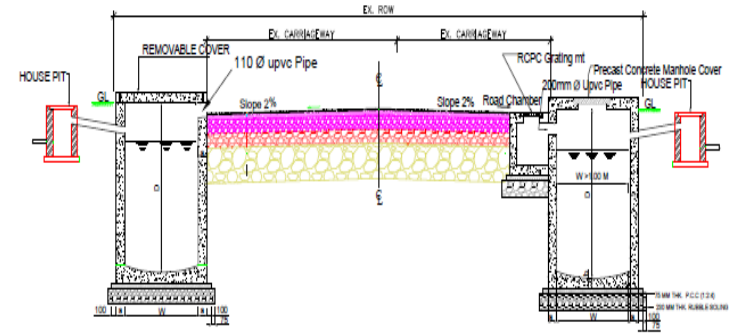
Figure 13: Typical cross section of Storm water drains for all towns



TYPICAL CROSS OF STORM WATER DRAIN (TYPE-A)

SCALE-1:60

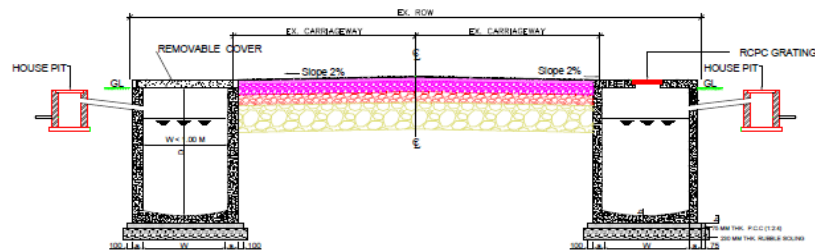
Typical Arrangement of Storm Water Drain Along Both Side of Road with Catch Pit (Drain Width Bellow 1.00 m) - Type A



TYPICAL CROSS OF STORM WATER DRAIN (TYPE-B)

SCALE-1:60

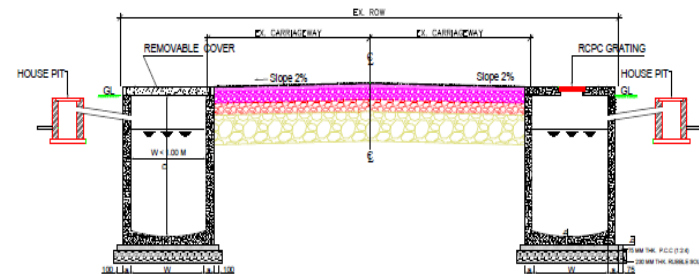
Typical Arrangement of Storm Water Drain Along Both Side of Road with Catch Pit (Drain Width Above 1.00 m) - Type B



TYPICAL CROSS OF STORM WATER DRAIN (TYPE-C)

SCALE-1:60

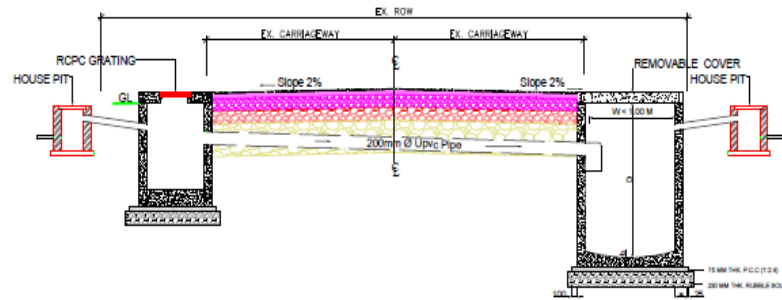
Typical Arrangement of Storm Water Drain Along Both Side of Road without Catch Pit and Drain Top Level Flashing. Finished Road Level (Drain Width Bellow 1.00 m) - Type C



TYPICAL CROSS OF STORM WATER DRAIN (TYPE-D)

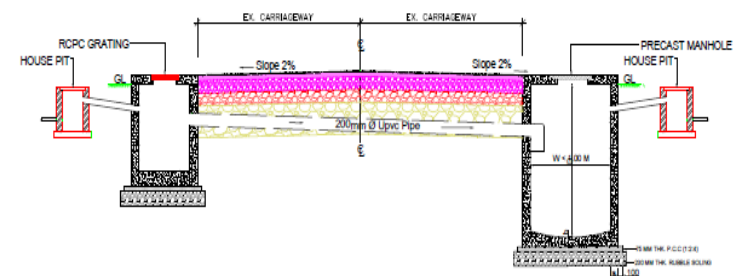
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Typical Arrangement of Storm Water Drain Along Both Side of Road without Catch Pit and Drain Top Level Flashing. Finished Road Level (Drain Width Above 1.00 m) - Type D



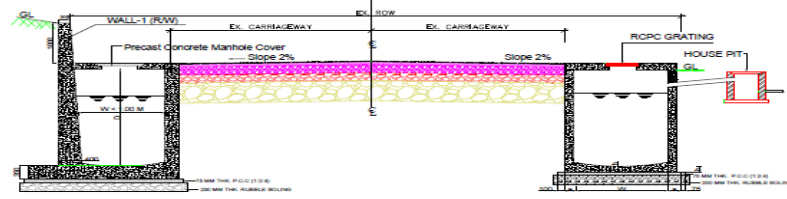
TYPICAL CROSS OF STORM WATER DRAIN (TYPE-E)
SCALE: 1:60

Typical Arrangement of Storm Water Drain Along One Side of Road with Catch Pit connected from other side of road and Drain Top Level Flashing. Finished Road Level (Drain Width Below 1.00 m) - Type E



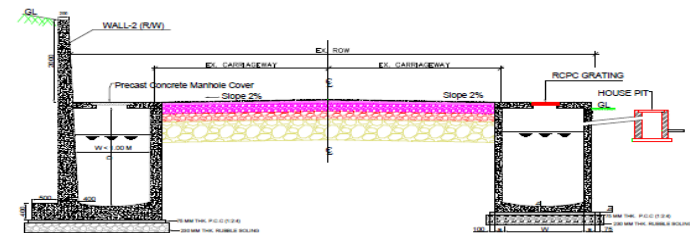
TYPICAL CROSS OF STORM WATER DRAIN (TYPE-F)
SCALE: 1:60

Typical Arrangement of Storm Water Drain Along One Side of Road with Catch Pit connected from other side of road and Drain Top Level Flashing Finished Road Level (Drain Width Above 1.00 m) - Type F



TYPICAL CROSS OF STORM WATER DRAIN (TYPE-G)
SCALE: 1:60

Typical Arrangement of Storm Water Drain Along Both Side of Road with Out Catch Pit and Drain Top Slab Flashing with Finished Road Level With 1 M Height Earth Retaining Wall (Drain Width Below 1.00 M) -Type-G



TYPICAL CROSS OF STORM WATER DRAIN (TYPE-H)
SCALE: 1:60

Typical Arrangement of Storm Water Drain Along Both Side of Road with Out Catch Pit and Drain Top Slab Flashing with Finished Road Level With 2 M Height Earth Retaining Wall (Drain Width Below 1.00 M) -Type-H

Maps Showing existing and proposed components in Mohanpur Town

Figure 14: Proposed Road in Mohanpur on google Earth

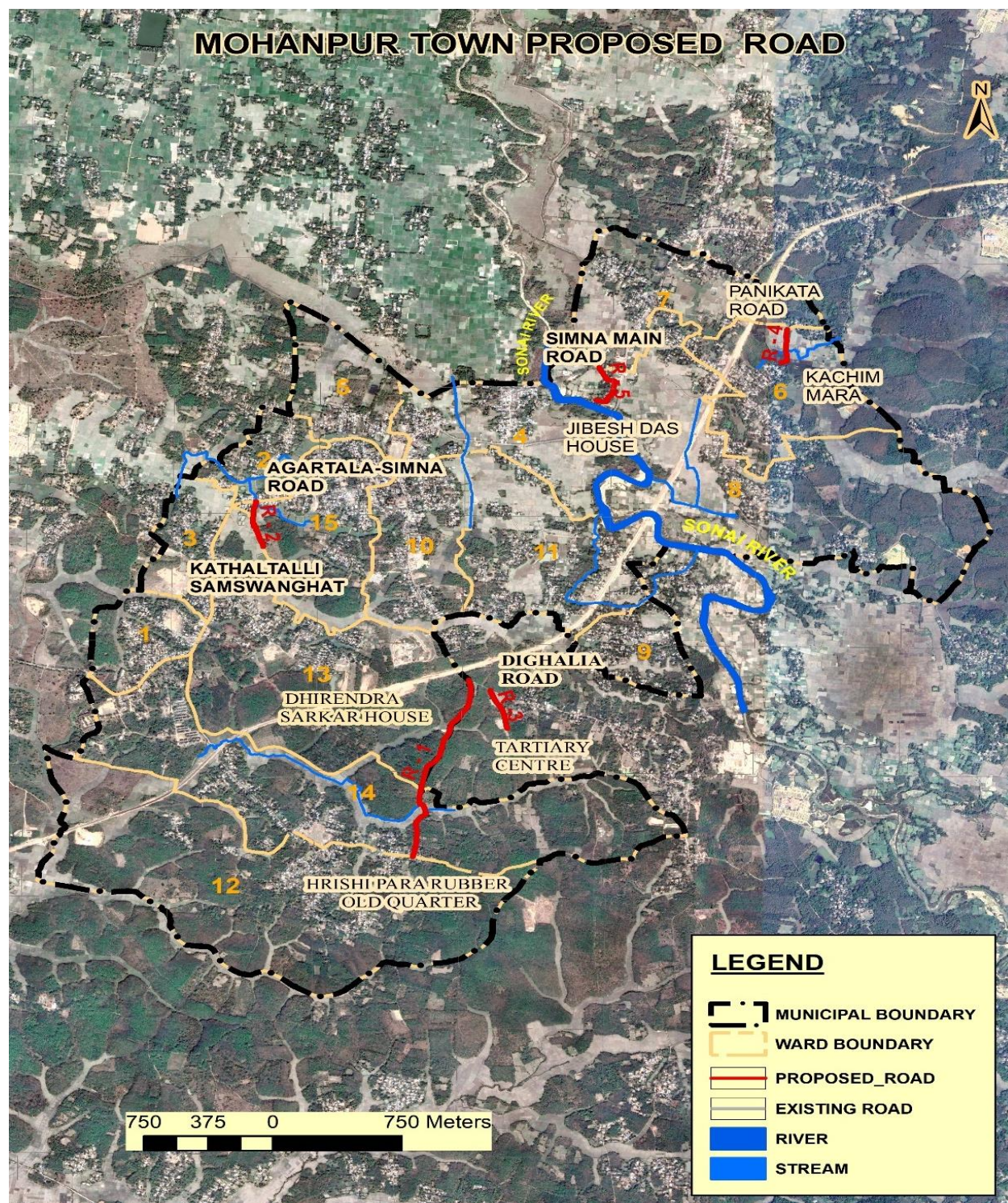
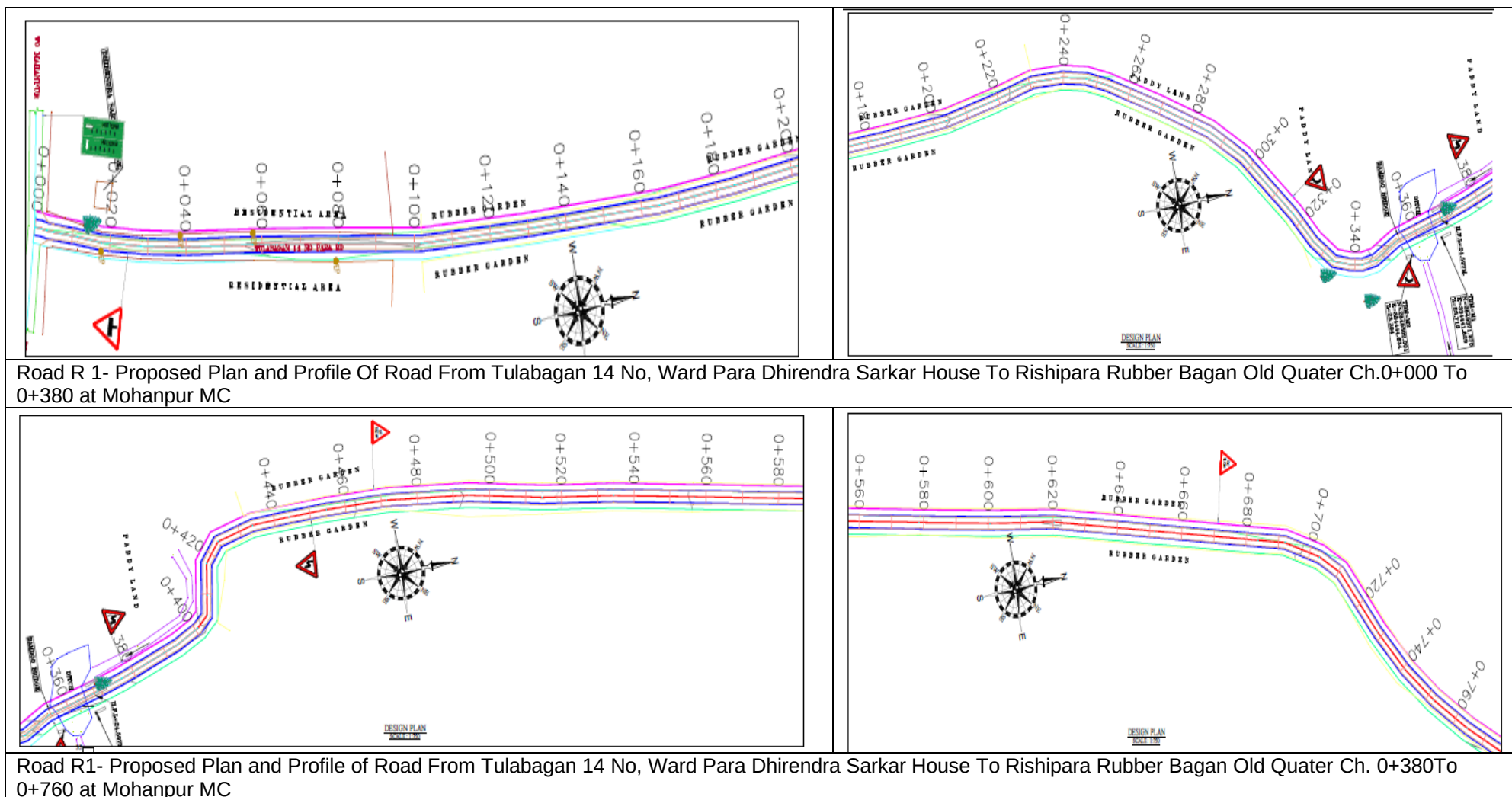
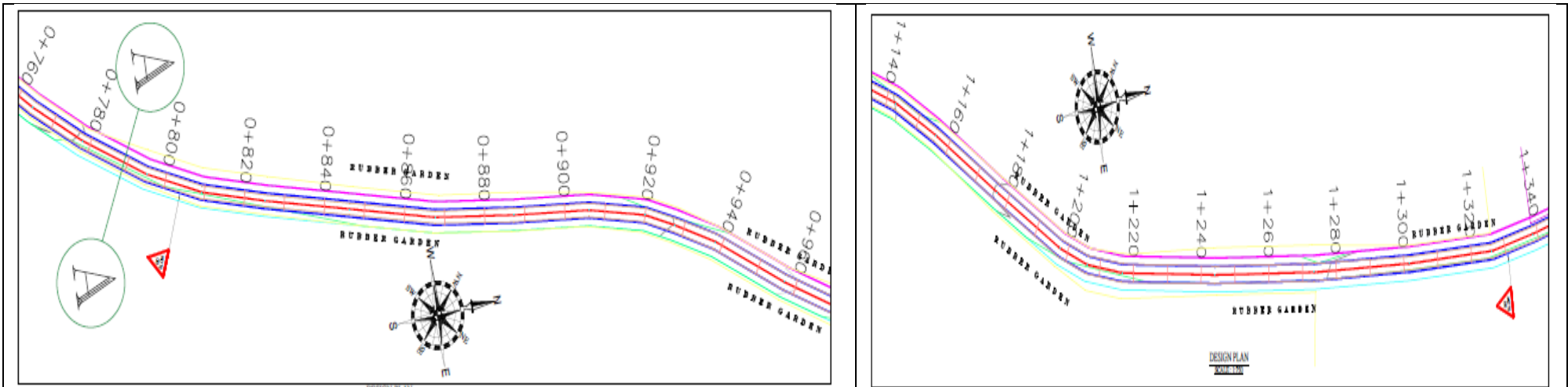
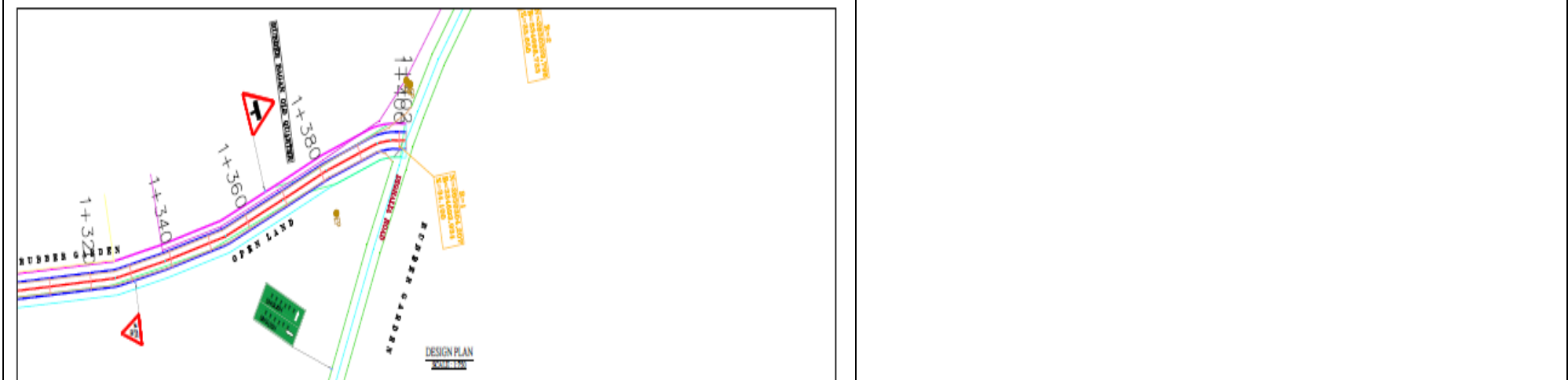


Figure 15: Proposed plan and Profile of the Roads

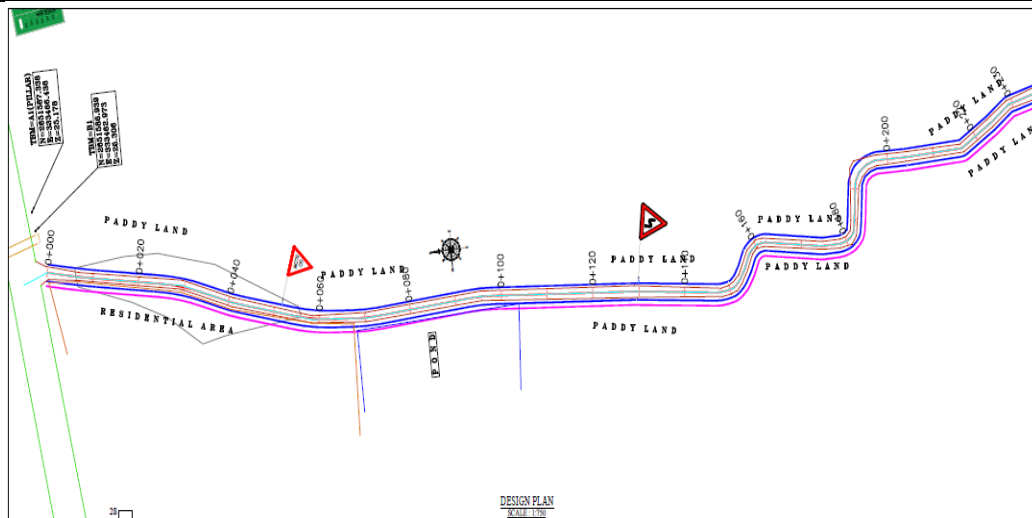




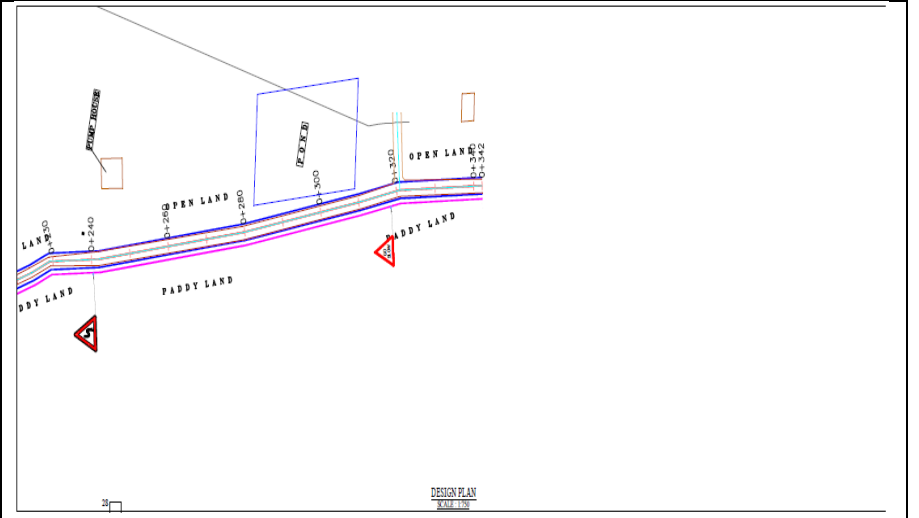
Road R 1- Proposed Plan and Profile Of Road From Tulabagan 14 No, Ward Para Dharendra Sarkar House To Rishipara Rubber Bagan Old Quater Ch. 0+760 To 1+340 at Mohanpur MC



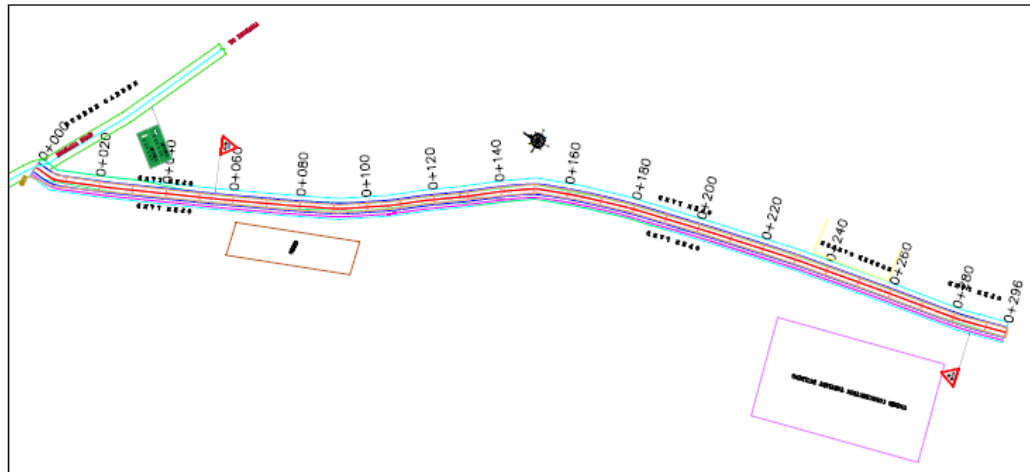
Road R1- Proposed Plan and Profile Of Road From Tulabagan 14 No, Ward Para Dharendra Sarkar House To Rishipara Rubber Bagan Old Quater Ch. 1+340 to 1+420 at Mohanpur MC



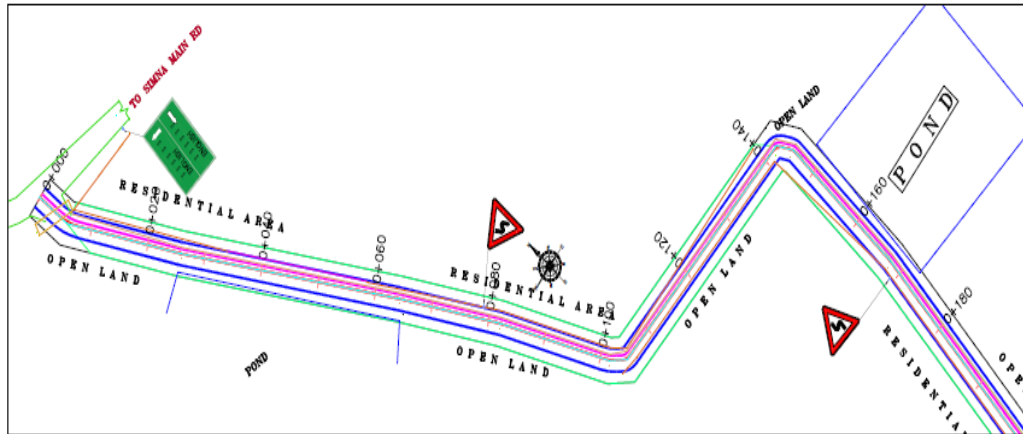
Road R 2- Agartala Simma Road To Kathaltali Samsanghat Ch.0+000 To 0+230



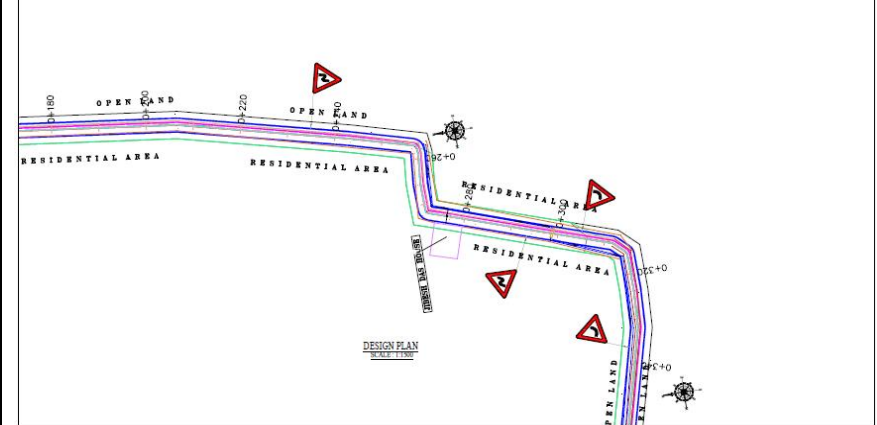
Road R 2- Agartala Simma Road To Kathaltali Samsanghat Ch.0+230 To 0+342



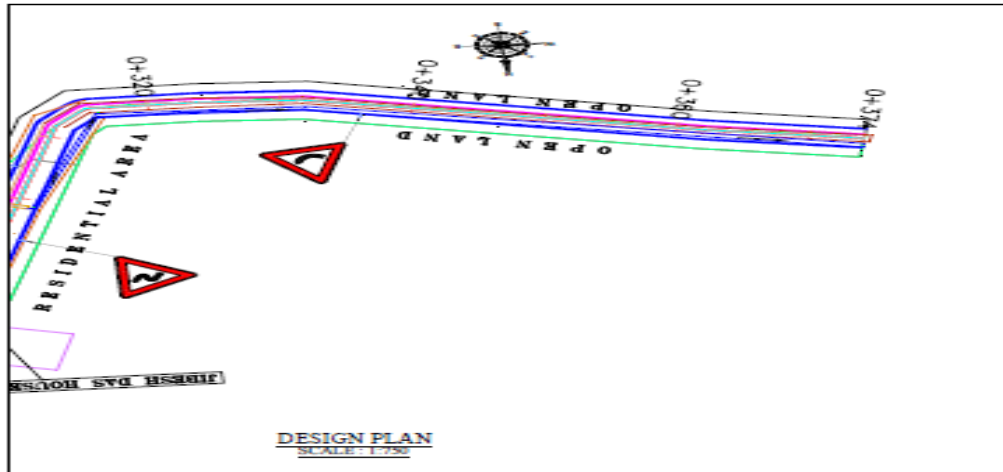
Road R 3- Dighalia road to Tertiary center Ch.0+000 To 0+300



Road R 5- Simma Road to Jibes Das House CH.0+000 TO 0+180



Road R 5- Simma Road to Jibes Das House CH. 0+180 TO 0+340



Road R 5- Simma Road to Jibes Das House CH. 0+340 to 0+374

Figure 16: Typical Cross - Section of Interlocking Concrete Paver Block Pavement- Mohanpur

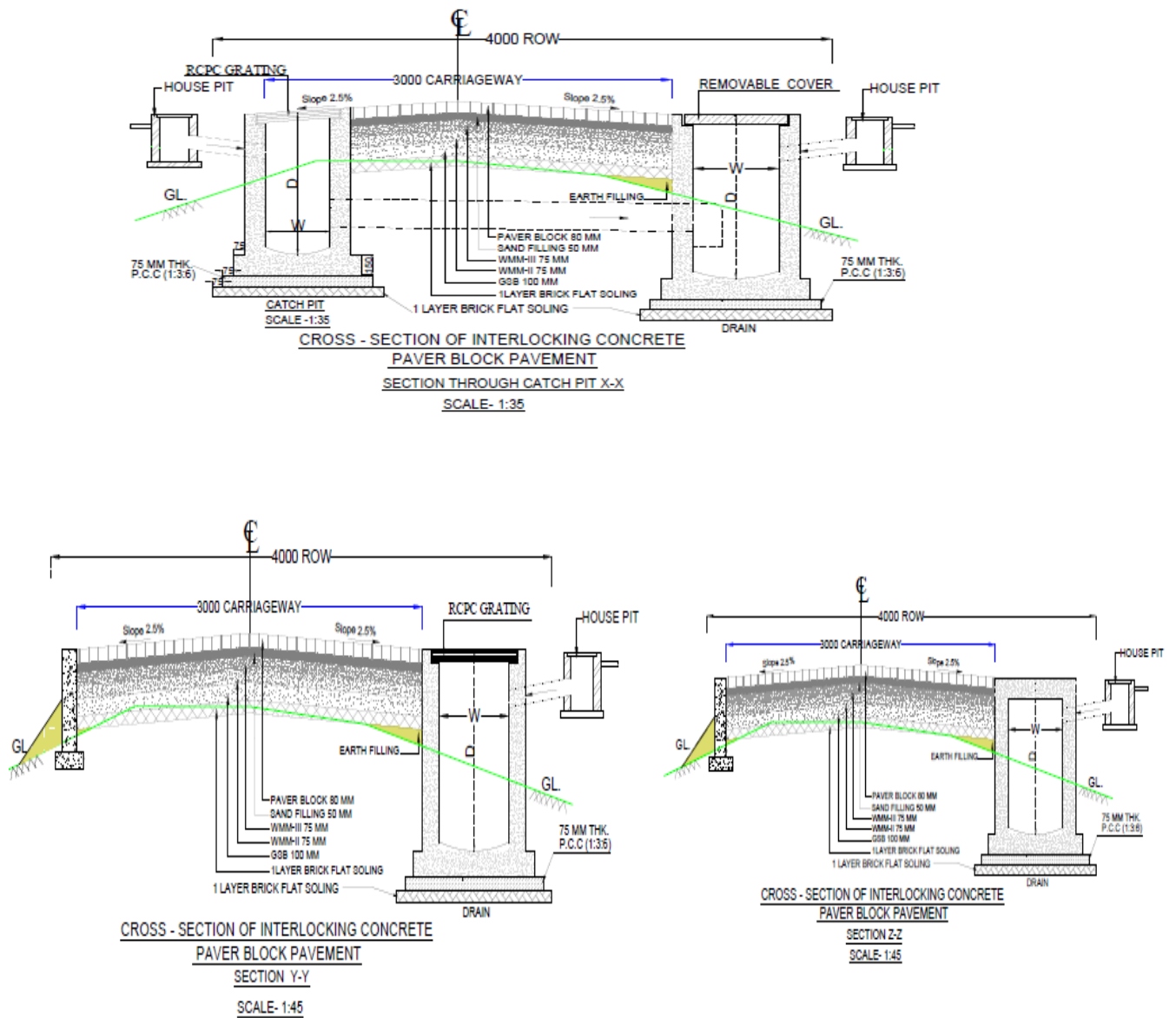


Figure 17: Existing drain in Mohanpur Town

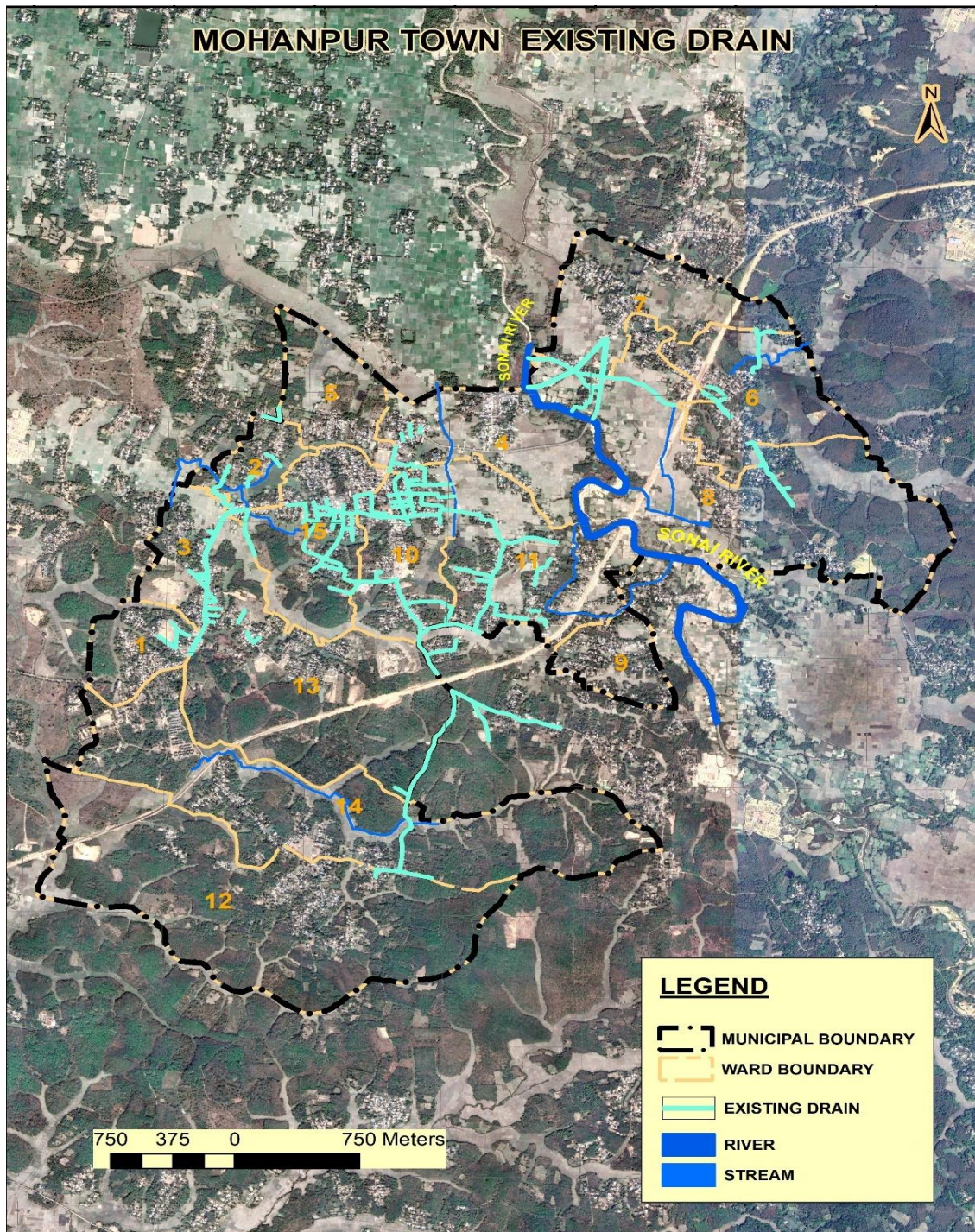


Figure 18: Proposed drain in Mohanpur Town

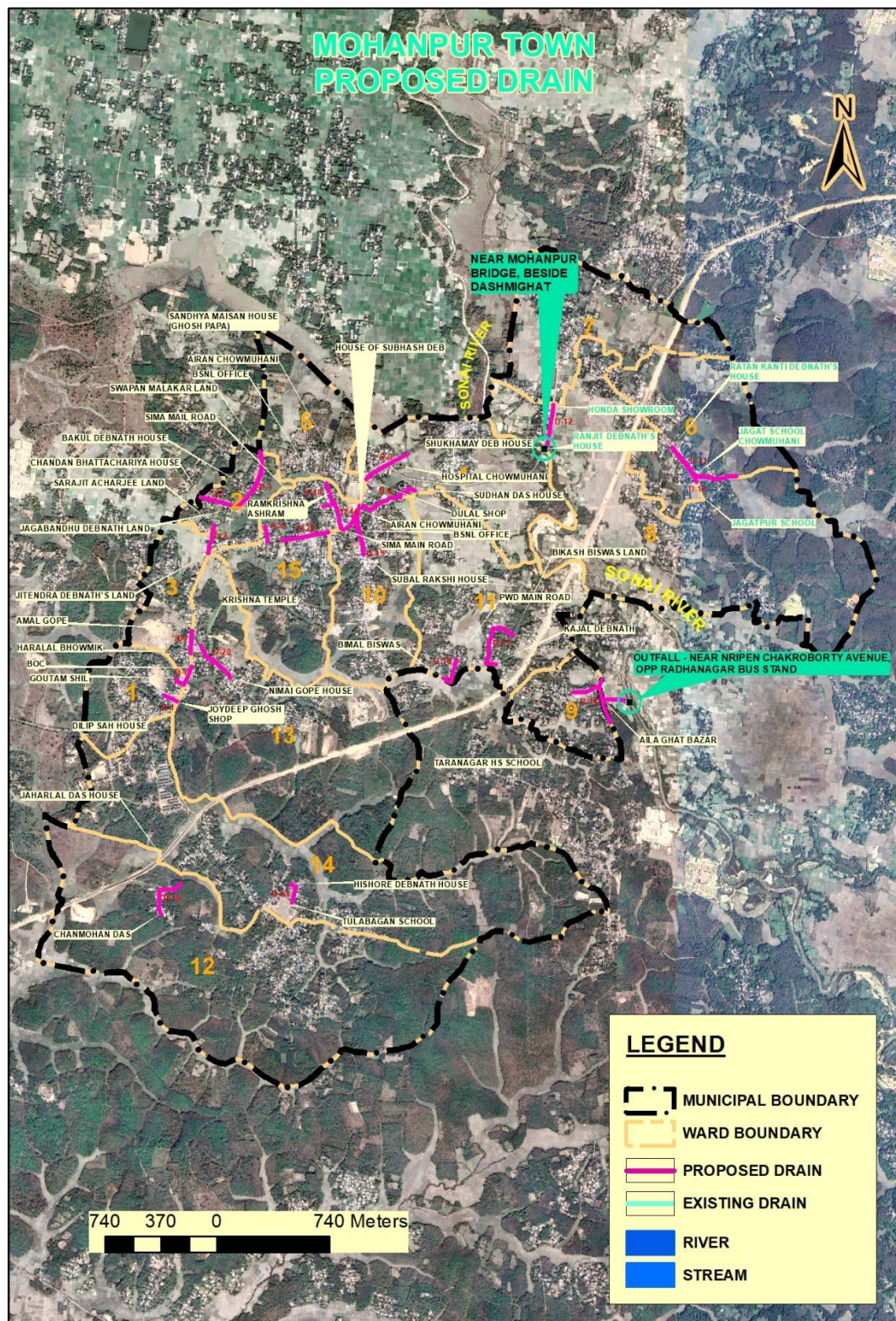
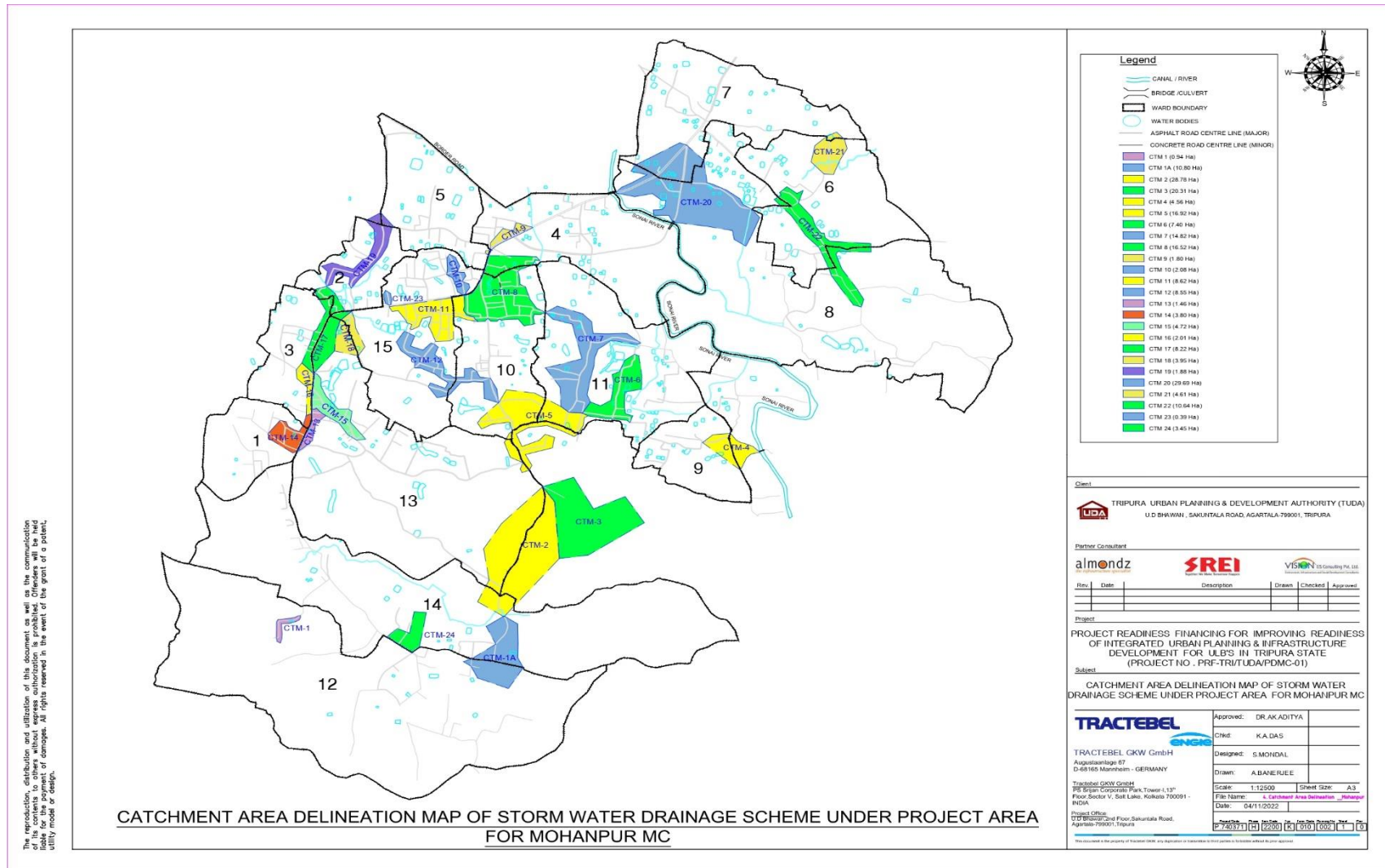


Figure 19: Catchment area Delineation Map of Storm Water Drain in Mohanpur



Maps Showing existing and proposed components in Ranirbazar Town

Figure 20: Proposed Road components at Ranibazar on Google map

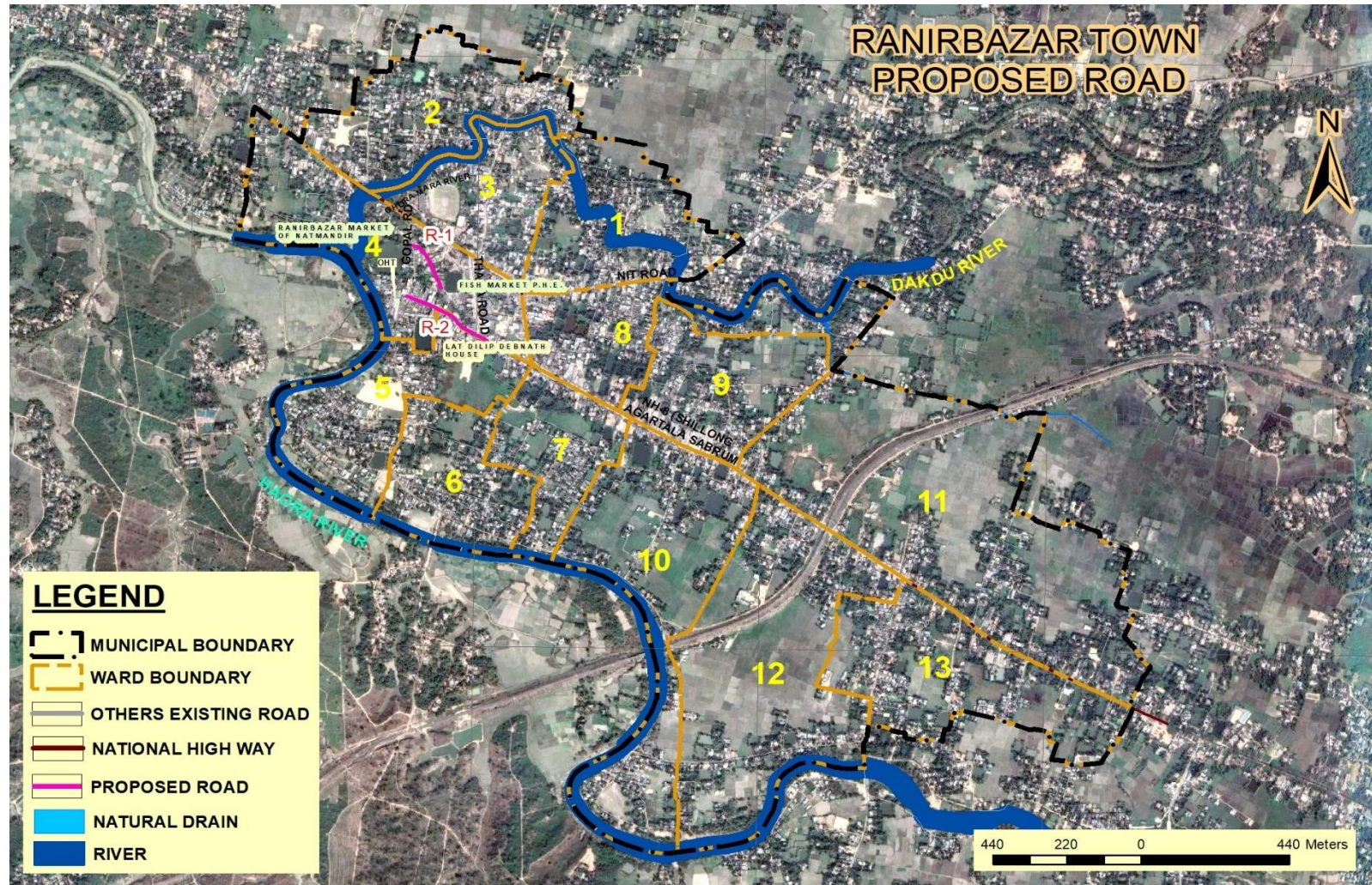
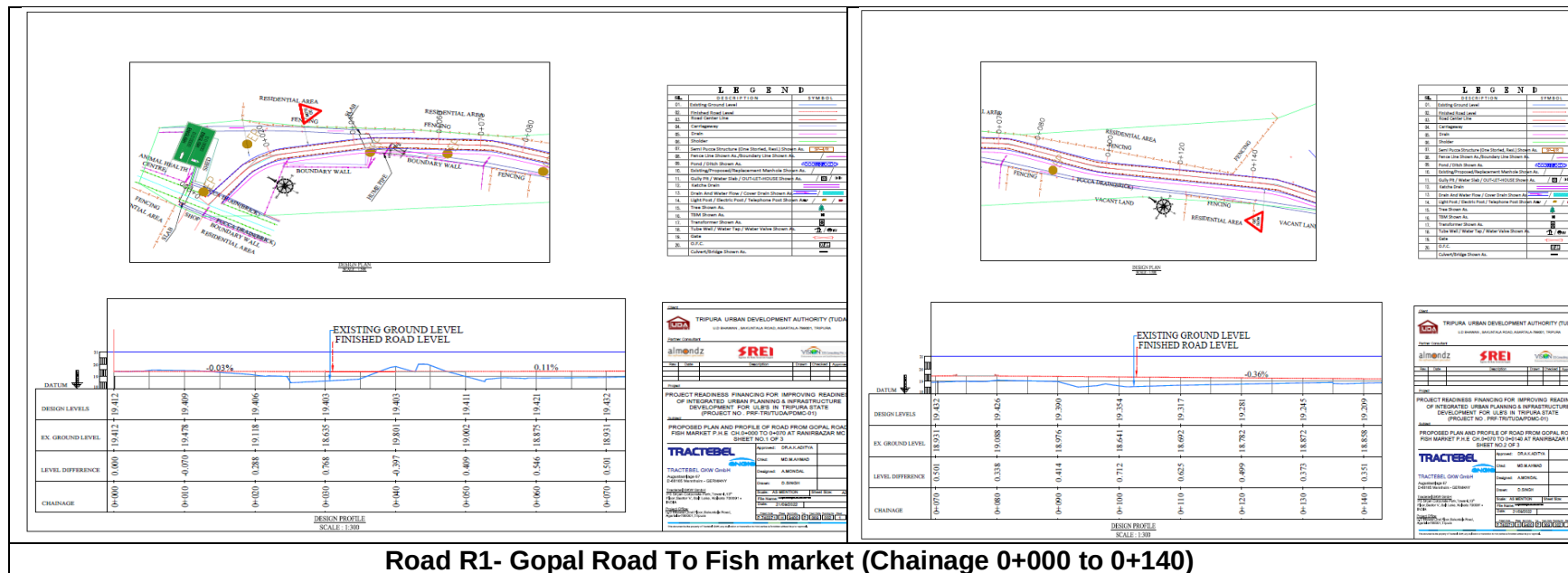
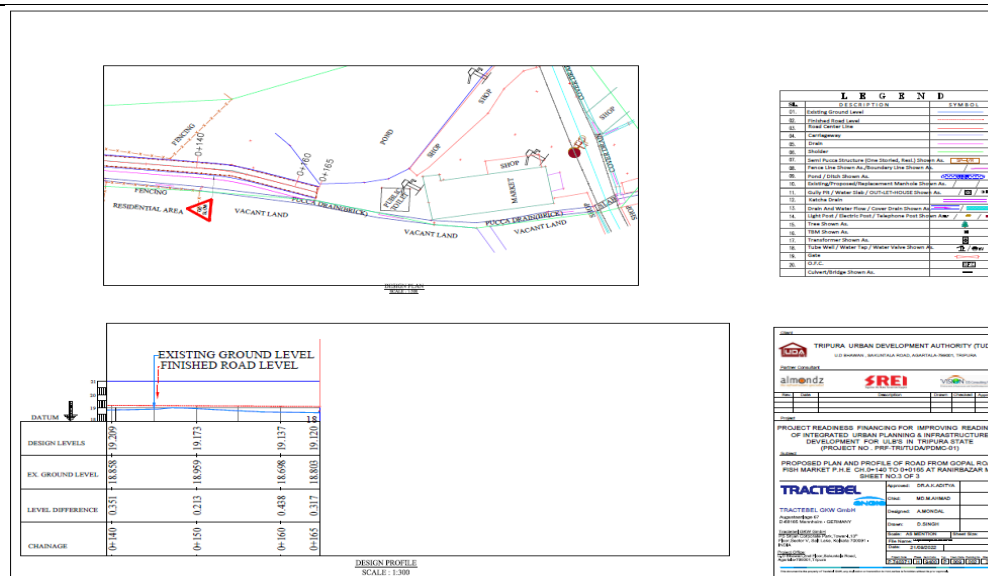
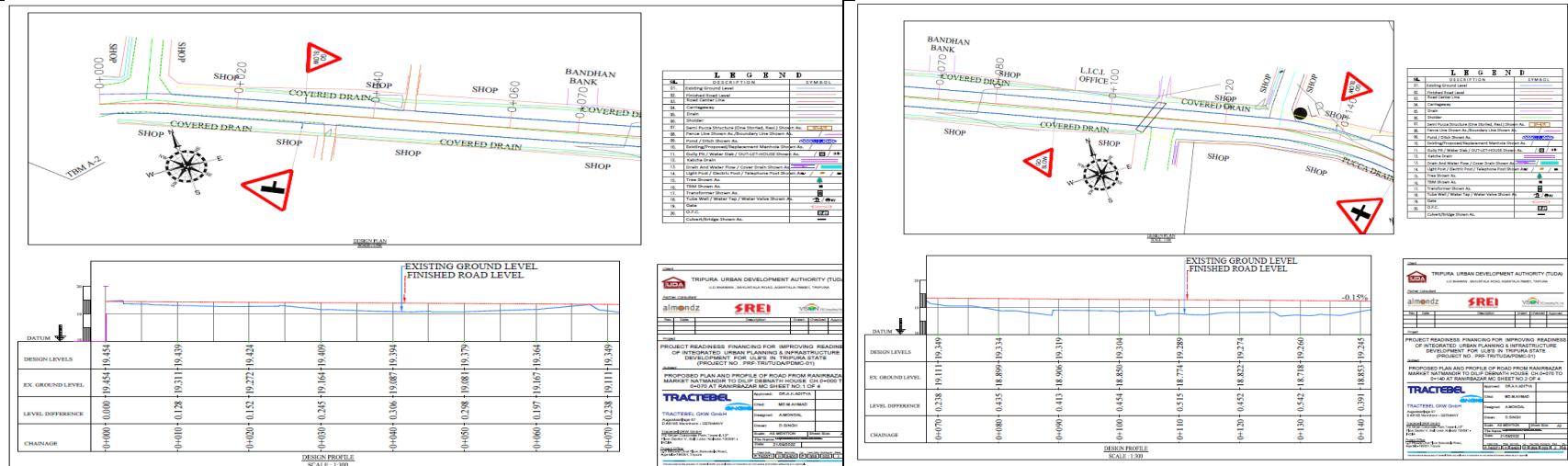


Figure 21: Proposed plan and Profile of the Roads





Road R1- Gopal Road To Fish market (Chainage 0+140 to 0+165)



Road R2- Ranirbazar market of Natmandir to late Dilip Debnath house (Chainage 0+000 to 0+140)

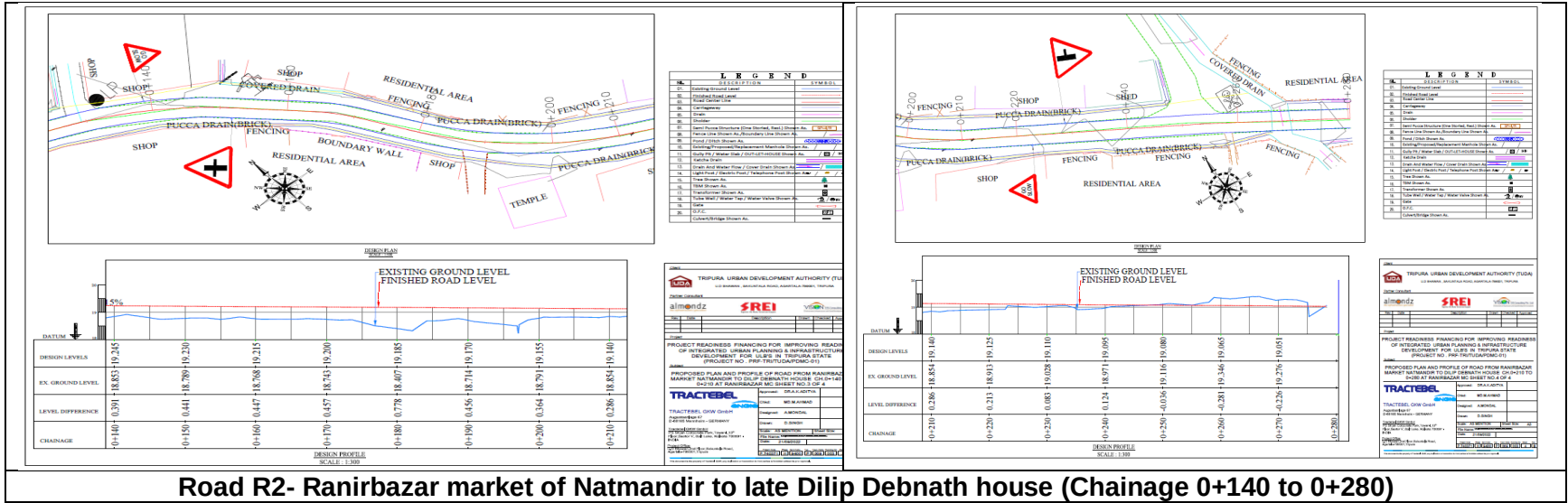


Figure 22: Sample Typical Cross-section of the ICB pavement with drain

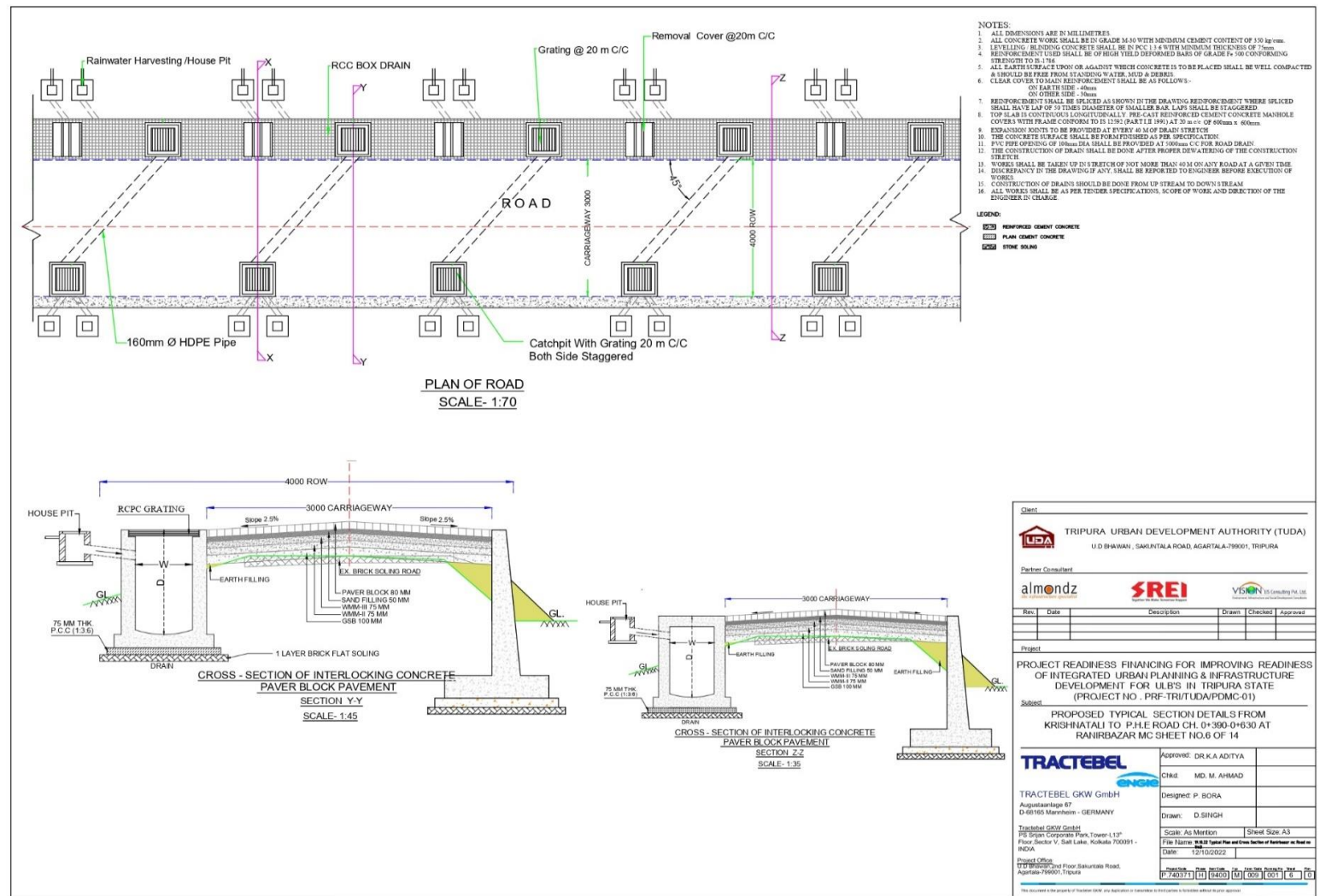


Figure 23: Existing Drain network in Ranirbazar Town.

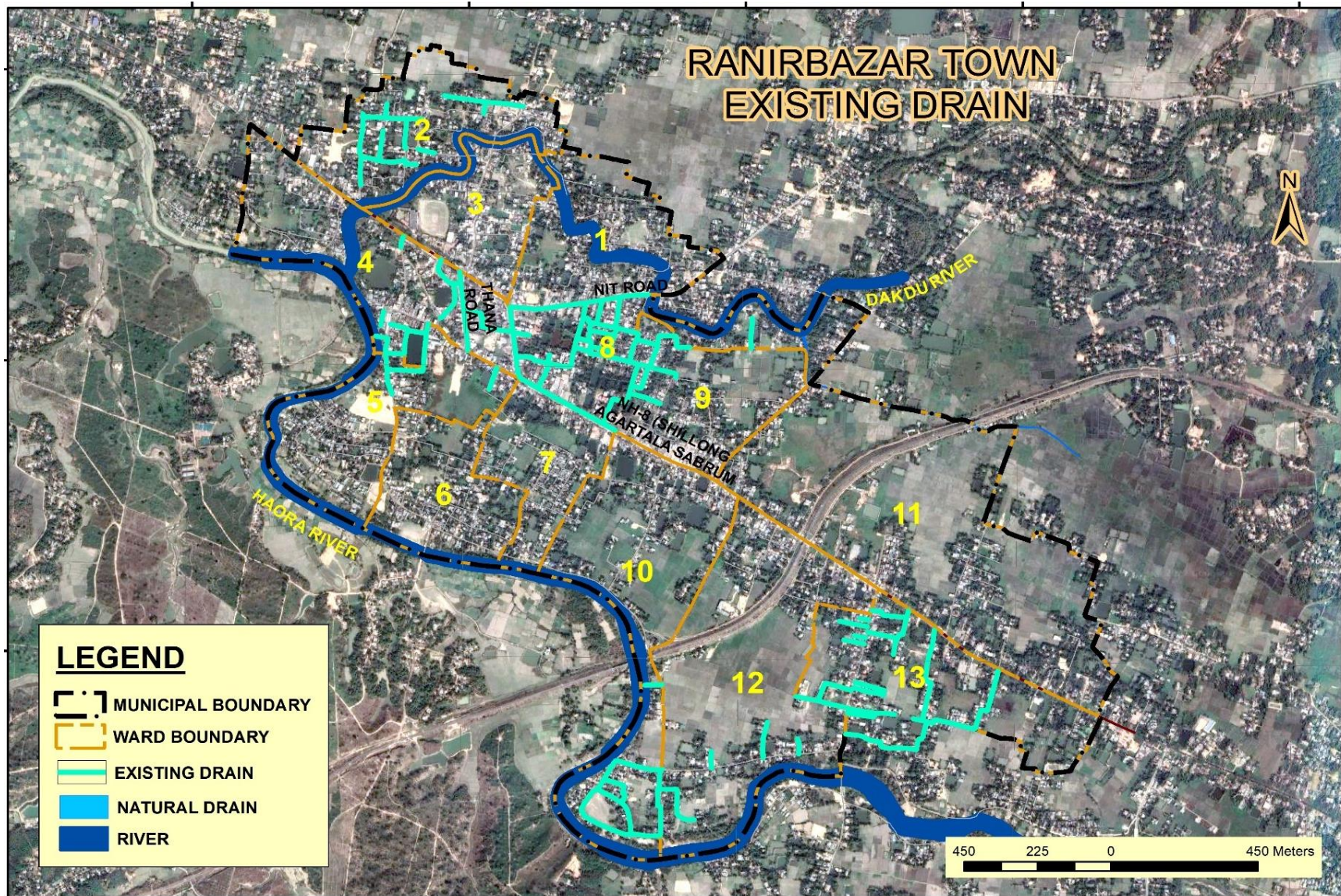


Figure 24: Proposed Drain network in Ranirbazar Town

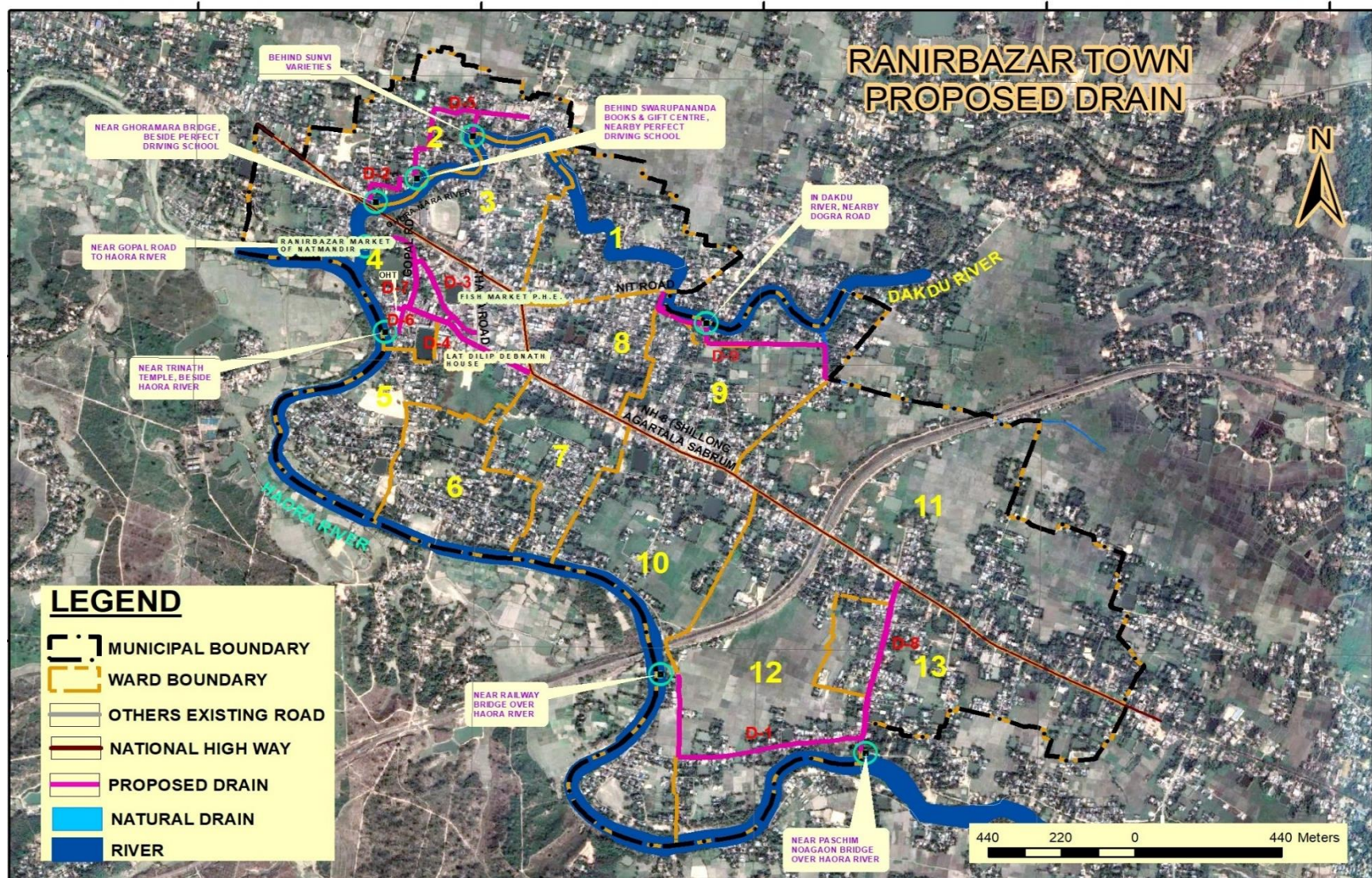
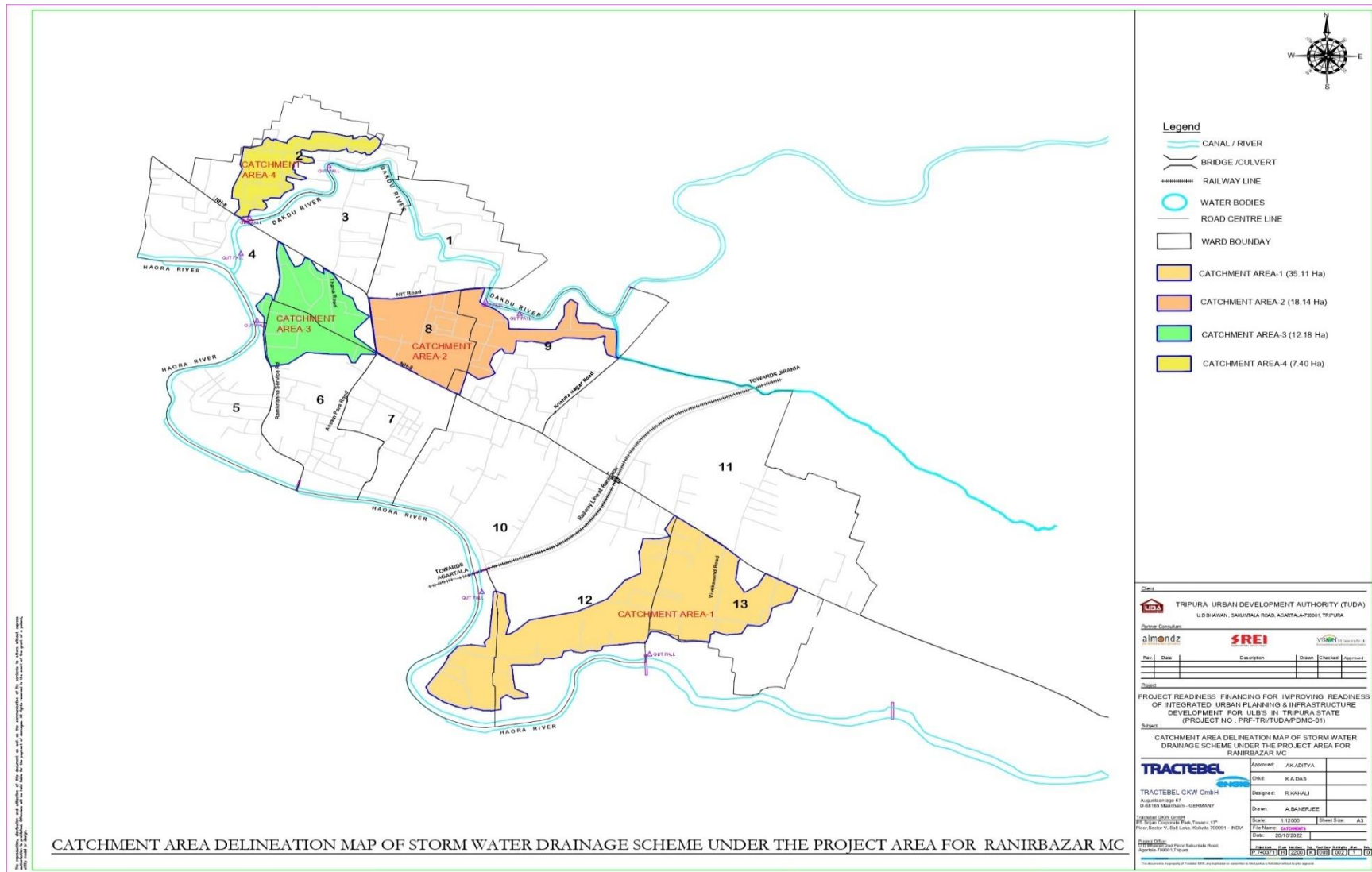


Figure 25: Total Catchment area Drainage Network Scheme- Ranirbazar



III. ANALYSIS OF ALTERNATIVES

31. In this project construction proposals are confined to the existing alignment of the unpaved tracks. The majority of these are foot/pathways traditionally used by the villagers and transformed into the present form of unpaved tracks/roads through minor construction works taken up by the communities, local bodies and State Government over the decades. There is no other option instead of the construction of the selected road. So, only 'With project' and 'without project' consider for the alternative analysis.

32. Practically in all the subproject components of road and drain in government land and only existing ROWs are considered and therefore displacement of any community will not arise. In the screening exercise, areas of concern - congested marketplace on the sides of the road, existence of sensitive area, extent of physical displacement if any, etc. was studied. The findings have been used as inputs for engineering design within the technical requirements and cost effectiveness. A Comparative analysis of "with project" and "without project" scenario is given in Table below.

Sl. no	Parameter	‘With-Project’ Scenario	‘Without-Project’ Scenario
For stormwater Drain			
1.	Water logging/flooding – extent and duration	Substantially reduced the water logging in the Khowai, Mohanpur and Ranirbazar town area.	No construction of storm water drains. This will result in periodic flooding in urbanized area shall results in property damages. Stagnation of water shall result in health-related problems including spread of vector borne diseases such as Dengue and Malaria.
2.	Maintenance of drainage system	Organised and better maintenance and therefore efficient operation of the created system	Without proper drainage system, maintenance of drainage system is not possible
3	Public health	Clean surroundings eliminating bad odour and mosquito breeding from open drains	Mosquito menace due to presence of open drains with low flow velocity
4	Roads	With the construction of cover stormwater drain roads will become wide	No effect. Roads are remained as it is.
5	Risks	Wide roads mean safe transport and pedestrian movement	No change (narrow roads) will continue to pose transport hazards and risk of accident to pedestrians
	Recommendation	Present level of drain service will improve after implementation of the project. No permanent impact on environmental parameters is envisaged in case of “with project” scenario, only short-term negative impact and long-term positive impact may result. Hence “With Project” scenario is much preferable than “Without Project” scenario.	
For Road Works			
1.	Road Quality	These urban roads improvement will promoting access to health, education facilities and as an avenue to increased economic opportunities, leading to increased agricultural income and productive employment opportunities.	Present roads are the unpaved tracks which is not motorable, without this project these roads are remains the same.

Sl. no	Parameter	‘With-Project’ Scenario	‘Without-Project’ Scenario
2.	Drainage	Drainage will be improved due to further development of culverts / bridges with adequate hydraulics.	These issues remain unaddressed without the project
3.	Environmental Quality	Existing roads are earthen road/ brick road. Improvement of road with ICB pavement will reduce the dust pollution. Providing better level of service in terms of improved riding quality and smooth traffic flow which reduce the vehicular pollution.	Without project scenario, the project roads remain the same. Unpaved road will increase the dust pollution and vehicular pollution also.
4	Road Side Amenities	Appropriate road side amenities to be provided at various locations along the corridor.	Not adequate.
	Recommendation	“With” project scenario with positive/beneficial impacts will vastly improve the environment and enhance economic development of the region compared to the “Without” project scenario, which will further deteriorate the present environmental setup and quality of life.	

IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

33. ADB requires the consideration of environmental issues in all aspects of ADB’s operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

34. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

- (i) **Category A.** Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
- (ii) **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- (iii) **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
- (iv) **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

35. **Environmental Management Plan.** An environmental management plan (EMP), which addresses the potential impacts and risks identified by the environmental assessment, has been prepared. The level of detail and complexity of the EMP and the priority of the identified

measures and actions are commensurate with the project's impact and risks.

36. **Environmental Audit of Existing Facilities.** ADB SPS, 2009 requires an environmental audit, if a subproject involves facilities and/or business activities that already exist or are under construction, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues.

37. **Public Disclosure.** ADB posts the safeguard documents on its website as well as disclose relevant information in accessible manner in local communities:

- (i) for environmental category A projects, draft EIA report at least 120 days before Board consideration;
- (ii) final or updated EIA and/or IEE upon receipt; and
- (iii) environmental monitoring reports submitted by the implementing agency during project implementation upon receipt.

38. **Consultation and Participation.** ADB SPS require borrower to conduct meaningful consultation⁴ with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

39. **Grievance Redress Mechanism.** ADB SPS requires borrowers to establish a mechanism to receive and facilitate resolution of affected people's concerns, complaints, and grievances about the subproject's performance. The grievance redress mechanism shall be scaled to the risks and adverse impacts of the subproject.

40. **Monitoring and Reporting.** The borrower shall monitor, measure, and document the implementation progress of the EMP. If necessary, the borrower shall identify the necessary corrective actions, and reflect them in a corrective action plan. The Borrower shall prepare and submit to ADB semi-annual environmental monitoring reports that describe progress with implementation of the EMP and compliance issues and corrective actions, if any. For subprojects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis until ADB issues a project completion report.

41. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during subproject implementation, ADB SPS requires the borrower to update the environmental assessment and EMP or prepare a new environmental assessment and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts.

⁴ As per ADB SPS, 2009, meaningful consultation means a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues

42. **Occupational Health and Safety.** ADB SPS requires the borrower⁵ to ensure that workers⁶ are provided with a safe and healthy working environment, taking into account risks inherent to the sector and specific classes of hazards in the subproject work areas, including physical, chemical, biological, and radiological hazards. Borrower shall take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work, including: (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) providing appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place.

43. **Community Health and Safety.** ADB SPS requires the borrower to identify and assess risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the subproject, and shall establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.

44. **Physical Cultural Resources.** The borrower is responsible for siting and designing the subproject to avoid significant damage to physical cultural resources. ADB SPS requires that such resources likely to be affected by the subproject are identified, and qualified and experienced experts assess the subproject's potential impacts on these resources using field-based surveys as an integral part of the environmental assessment process. When the proposed location of a subproject component is in areas where physical cultural resources are expected to be found as determined during the environmental assessment process, chance finds procedures included in the EMP.

45. **ADB SPS International Best Practice Requirements.** ADB SPS, 2009 requires that, during the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices that are consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety (EHS) Guidelines. (IFC's General EHS Guidelines⁷ and Sector Specific [Water and Sanitation] Guidelines⁸). These standards contain performance levels and measures that are normally acceptable and applicable to projects. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

⁵ In case where responsibility is delegated to subproject contractors during construction phase, borrower shall ensure that the responsibilities on occupational health and safety are included in the contract documents

⁶ Including nonemployee workers engaged by the borrower/client through contractors or other intermediaries to work on project sites or perform work directly related to the project's core functions.

⁷<https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES>

⁸<https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES>

B. National Environmental Laws

46. **Environmental Assessment.** The Government of India EIA Notification of 2006 replacing the EIA Notification of 1994, sets out the requirement for Environmental Assessment in India. This states that Environmental Clearance is required for specified activities / projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts. None of the components of subproject proposed for this Package falls under the ambit of the EIA Notification 2006, and therefore EIA Study or environmental clearance is not required for the subproject.

47. **Applicable Environmental Regulations.** Besides EIA Notification 2006, there are various other acts, rules, policies, and regulations currently in force in India that deal with environmental issues that could apply to infrastructure development. The specific regulatory compliance requirements of the subproject are shown in Table 7.

Table 7: Relevant Rules and regulations National and International

Sr. No.	Law	Description	Applicability in the project
1.	EIA Notification	The EIA Notification of 2006 set out the requirement for environmental assessment in India. Environmental Clearance is required for certain defined activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence.	No project Road and Drain components attract provisions of EIA notification 2006 and its amendment till date. Sand mining for construction works (if required), requires environment clearance under EIA act. (list of already approved sand mines in Tripura is available on TSPCB website ⁹) PIU/PMU has to ensure that contractor is procuring mining material from approved mines only or get EC for new mines.
2.	Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments (1987)	Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Pollution Control Boards and for conferring on and assigning to CPCB/SPCBs powers and functions relating to water pollution control. Such projects have to obtain Consent to Establish (CTE) under Section 25 of the Act from Tripura State Pollution Control Board (TSPCB) before starting implementation and Consent to Operate (CTO) before commissioning.	No project Road and Drain components attract provisions of Water Act and not requiring CTE and CTO from TSPCB.

⁹ <https://tspcb.tripura.gov.in/sand-mining-ec/>

Sr. No.	Law	Description	Applicability in the project
3.	Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	This Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. The Act also establishes ambient air quality standards.	Following will require CTE and CTO from TSPCB: Establishment of DG sets more than 1 MVA. Batching Plant, and Hot mix plants, if any If ready mix concrete and hot mix bitumen is procured from third party, contractor must ensure that the plants, from where material is being purchased is having valid CTE & CTO and copy should be collected from third party and submitted in PIU
4.	Environment (Protection) Act, 1986 and CPCB Environmental Standards. (National Ambient Air Quality Standards 2009 and amendments)	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards.	Ensure applicable standards for ambient air quality. Ensure Emission Limits standards for New DG Sets Ensure stack height standards Requirement for DG Sets. Appendix 2 provides applicable standards for ambient air quality. Appendix 4 provides vehicular emission norms
5.	Noise Pollution (Regulation and Control) Rules, 2000 amended up to 2010.	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones.	Ensure applicable noise standards and noise limits for DG sets. Appendix 3 provides applicable noise standards
6.	Central Motor Vehicle Act Central Motor Vehicle Rules and (Amendment) Rules (1988 and amendment thereafter)	Objective of this Act is to check vehicular air and noise pollution. Vehicles to be used for construction and other purposes need to meet the standards and certificates prescribed as per the Rules, 1989 to control noise, pollution, etc.	Ensure vehicle exhaust emission standards.
7.	Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010 Tripura Ancient Monuments and Archaeological Sites and Remains Act 1997	The Act designates areas within 100 meters (m) of the "protected monument/area" as "prohibited area" and beyond that up to 200 m as "regulated area" respectively. No "construction" is permitted in the "prohibited area" and any construction activity in the "regulated area" requires prior permission of the Archaeological Survey of India (ASI).	No ASI Monuments falls under impact area of any of the component of this package and no clearance from ASI is required.
8.	The Sexual Harassment of Women at workplace (Prevention, Prohibition and Redressal) Act, 2013	Whereas sexual harassment results in violation of the fundamental rights of a woman to equality under article 14 and 15 of the Constitution of India and her right to life and to live with dignity under article 21 of the Constitution and right to practice any profession or to carry on any occupation, trade or business which includes a right to safe environment free from sexual harassment	Applicable

Sr. No.	Law	Description	Applicability in the project
9.	Labor Laws upto 2019	The contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The contractor shall base the employment relationship upon equal opportunity and fair treatment and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline. The contractor shall provide equal wages and benefits to men and women for work of equal value or type.	Applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works. Appendix 5 provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.
10	Biodiversity Act of 2002	The Biodiversity Act 2002 primarily addresses access to genetic resources and associated knowledge by foreign individuals, institutions or companies, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people.	Not applicable
11	Wildlife Protection Act, 1972 amendment 1991	This overarching Act provides protection to wild animals, birds, plants and matters connected with habitat protection, processes to declare protected areas, regulation of wildlife trade, constitution of state and national board for wildlife, zoo authority, tiger conservation authority, penalty clauses and other important regulations.	None of the components of the subproject are located within the protected Area. Therefore, this act is not applicable.
12	The Indian Forest Act, 1927; Forest (Conservation) Act, 1980, amended 1988; Forest (Conservation) Rules, 1981 amended 1992 and 2003; and Guidelines for Diversion of Forest Lands for Non-Forest Purpose under the Forest (Conservation) Act, 1980	The Forest (Conservation) Act prevents the use of forest land for non-forest uses without the clearance from Ministry of Environment, Forests and Climate change (MoEFCC), Govt. of India For tree felling NOC will be required	Not applicable; none of the components of the subproject are in forest.
13	Wetlands (Conservation and Management) Rules, 2010 & 2017	The Rules specify activities which are harmful and prohibited in the wetlands such as industrialization, construction, dumping of untreated waste and effluents, and reclamation. The Central Government may permit any of the prohibited activities on the recommendation of Central Wetlands Regulatory Authority.	No sub project components will be planned nearby the designated wetland

Sr. No.	Law	Description	Applicability in the project
14	Solid Waste Management Rules 2016	Rules to manage municipal solid waste generated; provides rules for segregation, storage, collection, processing, and disposal Responsibility of Solid Waste Generator: Segregate and store the waste generated in three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes in suitable bins and handover segregated wastes to authorized waste pickers or waste collectors as per the direction or notification by the local authorities from time to time.	Solid waste to be generated at proposed facilities shall be managed and disposed in accordance with the MSWM Rules Contractor to follow all the rules during construction works.
15	Construction and Demolition Waste Management Rules, 2016	Rules to manage construction and to waste resulting from construction, remodeling, repair, and demolition of any civil structure. Rules define "construction waste" as waste comprising of building materials, debris resulting from construction, re-modeling, repair, and demolition of any civil structure.	Construction and demolition waste generated from the project construction shall be managed and disposed as per the rules
16	Hazardous Waste Rules 2016	The occupier of Hazardous waste shall be responsible for safe and environmentally sound management of hazardous and other wastes. As described in rules, including (a) prevention; (b) minimization; (c) reuse, (d) recycling; (e) recovery including co-processing; (f) safe and legal disposal.	Contractor to comply all the requirements of this Act during construction works.
17	The Child Labour (Prohibition and Regulation) Amendment Act, 2016	No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act's Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule. Child can help his family or family enterprise, which is other than any hazardous occupations or processes set forth in the Schedule, after his school hours or during vacations	No children between the age of 14 to 18 years will be engaged in hazardous working conditions.
18	Notification from Ministry of Jal Shakti (Department of Water Resources, River Development and Ganga Rejuvenation), central ground water authority on 20 th September 2020. Guidelines to regulate and control groundwater extraction in the country	No Objection Certificates for ground water extraction to industries or infrastructure projects or Mining Projects etc.- All new/existing industries, industries seeking expansion, infrastructure projects and mining projects abstracting ground water, unless specifically exempted, will be required to seek No Objection Certificate from Central Ground Water Authority or, the concerned State/ UT Ground Water Authority as the case may be.	In case of use of ground water for construction activity and for domestic use (labour camp) NOC will be taken from Central Ground Water Authority
International treaties			

Sr. No.	Law	Description	Applicability in the project
19	Ramsar Convention, 1971	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. India is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory countries to include wetland conservation in their national land use plans.	No Ramsar protected area near proposed project towns
20	Wetlands (Conservation and Management) Rules, 2017	The Rules specify activities which are harmful and prohibited in the wetlands such as industrialization, construction, dumping of untreated waste and effluents, and reclamation. The Central Government may permit any of the prohibited activities on the recommendation of Central Wetlands Regulatory Authority.	Not applicable as subprojects components of different sectors are not located within any designated wetland area.
21	Montreal Protocol 1992	India is a signatory of this convention which aims for reduction in the consumption and production of ozone-depleting substances (ODS), while recognizing differences in a nation's responsibilities. Ozone depleting substances are divided in two groups Chlorofluorocarbons (CFCs) and Hydro chlorofluorocarbons (HCFCs).	Not applicable in this project as no ODS are involved in construction works.
22	Basel Convention on Trans-boundary Movement of Hazardous Wastes, 1989	India is a signatory of this convention which aims to reduce trans-boundary movement and creation of hazardous wastes.	Contractor to follow the provisions of Hazardous Waste Rules 2016 for storage, handling, transport and disposal of hazardous waste emerged during construction works.
23	Convention on Migratory Species of Wild Animals (CMS), 1979 (Bonn convention)	CMS, also known as Bonn convention was adopted in 1979 and entered into force on 1 November 1983, which recognizes that states must be the protectors of migratory species that live within or pass through their national jurisdictions, and aims to conserve terrestrial, marine and avian migratory species throughout their ranges. CMS Parties strive towards strictly protecting these species, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them.	Not applicable to this project as no migratory species of wild animals are reported in the project areas.

Table 8: List of NOC Required for Safeguarding the Project

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
1.	Land for project activity	Allotment and approval for specific land use	ULB
2.	Road cutting for drain construction	Permission from ULB and PWD (where applicable)	PIU
3.	Establishment of	Allotment and approval for specific	Contractor

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
	construction camps	land use from ULB	
4.	NOC for disposal of excess Earth	Construction & Demolition Waste Management Rules, 2016	Contractor
5.	Tree Cutting	State forest department/Revenue as per requirement	PIU
6.	Hot mix plants, Crushers, Batching plants and DG Set	Consent to establish and consent to operate under Air Act, 1981 from TSPCB	Contractor
7.	Storage, handling, and transport of hazardous materials	Hazardous Wastes (Management and Handling) Rules, 2016 Manufacturing, Storage, and Import of Hazardous Chemicals Rules, 1989 from TSPCB	Contractor
8.	New Sand mining, quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor/ Third Party
9.	Use of vehicles and equipment	Pollution under control certificate (PUC) form RTO/ Pollution Control Board	Contractor
10.	Temporary traffic diversion measures	Temporary traffic diversion measure including use of alternate road from District traffic police	Contractor
11.	Use of highway ROW for construction area/ crossing	National Highway Authority of India	PIU

48. PMU will be overall responsible for supervision in getting all clearances and provide details to ADB through semi-annual monitoring report. PMU will ensure availability of all necessary regulatory clearances and approvals are obtained prior to commencement of works. Respective PIUs, with support of project consultants and contractors, are responsible for obtaining the clearances/permits and ensuring conditions/specifications/provisions are incorporated in the subproject design, costs, and implementation. The PIUs shall report to PMU the status of compliance to clearances/permits as part of the regular progress reporting.

V. DESCRIPTION OF THE ENVIRONMENT

A. Methodology Used for Baseline Study

49. **Data Collection and Stakeholder Consultations.** Data for this report has been primarily collected through comprehensive literature survey, discussion with stakeholder agencies, and field visits to the proposed subproject sites.

50. The literature survey broadly covered the following:

- (i) Project details, reports, maps, and other documents prepared by the Govt. of Tripura
- (ii) Discussions with technical experts of the project team, municipal and Nagar Panchayat authorities, relevant government agencies like Tripura State Pollution Control Board (TSPCB) etc.
- (iii) Secondary data from previous project reports and published articles, and
- (iv) Literature on land use, soil, geology, hydrology, climate, socioeconomic profiles, and other planning documents collected from Government agencies and websites.

B. Physical Resources

51. **Tripura** is in the northeastern part of the subcontinent. It is bordered to the north, west, and south by Bangladesh, to the east by the state of Mizoram, and to the northeast by the state of Assam. It is among the smallest of India's states and is in an isolated hilly region of the country, with various indigenous peoples or tribes accounting for a significant portion of the population. The capital is Agartala, Baseline status of the 3 project towns is given below.

Table 9: Baseline- Physical Characteristic of project towns

Baseline Characteristic	Khowai	Mohanpur	Ranirbazar
Location- NE State Tripura	Khowai is a town, located at 24° 3' 54" N and 91° 36' 18", on the banks of Khowai river. The Khowai district is flanked by Bangladesh on the north, Amarpur and Gandacharra on the south, Kamalpur & Ambassa on the east and Mohanpur and Jirania Sub Division on the west.	Mohanpur Town is located at 23° 57' 57" 26" N and 91° 22' 53" E, 20 km north of Agartala. Mohanpur is surrounded by Hezamara Block towards East, Mandwai Block towards South, Agartala Block towards South, Padmabil Block towards East	Ranirbazar is situated at 23.83°N and 91.37°E in under West Tripura district, which is bounded by Bangladesh in the north and west and Khowai district in the east and by Sepahijala district in the south.
Area	The Khowai town covers an area of about 5.86 sq.km. The Khowai town is divided into 15 wards.	The total area of Mohanpur Municipal Council is 14.55 Sq km. The town is divided into 15 wards	The total area of Ranirbazar Municipal Council is 11.72 Sq Km. The town is divided into 13 wards
Connectivity	Khowai is connected to Agartala, Kamalpur and Kailasahar through State Road. Khowai is located about 54 km from Agartala. Nearest airport is at Agartala. Khowai is also linked through railway. Teliamura is the nearest railway station.	National Highway 208 (NH 208) passes through Mohanpur town, connecting it to the nearby cities of Agartala and Udaipur. Nearest railway station and airport is at Agartala, 27 km.	Ranirbazar is about 10 km away from Agartala. It is well connected by Road and Rail network. Ranirbazar is located on NH 208. Nearest railway station is at Jogendra Nagar and the major railway station is at Agartala. Nearest airport is Agartala Airport.
Topography	The town is situation on the bank of Khowai river, between river in east and Kailashahar range hills in the west. Terrain is comprising partly plain and partly undulating landing, sloping towards the river. The Khowai town is located at an average altitude of 23 meters above mean sea level.	The topography of Mohanpur is characterized by undulating hills, with the highest point in the area reaching an elevation of around 100 meters above sea level. Average altitude of Mohanpur is 36 meters above mean sea level. The topography of the town is mostly covered by undulating hilly land, although there are some plain lands here and there.	The topography of Ranirbazar is characterized by undulating terrain with hills, and plains. The town is surrounded by hills on three sides, namely the Jampui Hills to the north, the Atharamura Range to the east, and the Longtharai Range to the south. The town has highest elevation of 22 meter & lowest alleviation of 15 meters approx. The Haora River passes

Baseline Characteristic	Khowai	Mohanpur	Ranirbazar
			through the heart of Ranirbazar.
Soils	Soils of Khowai town are acidic in nature. Soil type of this area is red loam and sandy loam type. At few areas reddish yellow brown sandy soils is noted. Due to loamy characteristics of the soil texture, most of soils are well drained. Most of the part of Khowai town have deep soil depth.	Soil of Mohanpur town is predominantly clayey loam and sandy loam. The soil is rich in organic matter and has a slightly acidic pH. The major soil groups found in the area are red-yellow podzolic soil, alluvial soil, and lateritic soil.	Soil in Ranirbazar town is mainly composed of red laterite soil. This type of soil is common in areas with high rainfall and warm temperatures.
Seismicity	Entire north-eastern region of India extending to the Himalayan arc in the north and Burmese arc to the east is among the most seismically active regions of the world. The whole of Tripura State falls under seismic zone V and is highly vulnerable to earthquakes. Hilly areas are highly vulnerable to earthquake. Areas along the river in Khowai are flood prone. River causes floods during the monsoon. Hilly areas are landslide prone.		
Climatic conditions	The climate in Tripura displays characteristics that are typical of the hilly and mountainous region. Tripura records a low average temperature of 10 degree Celsius in the winter season which rises to a maximum average of 35 degree Celsius in the summer. The altitude of the state also influences the climatic conditions. January is the coldest while July is the hottest. Humidity is generally high throughout the year. In the summer season the relative humidity is varied from 50 percent to 74 percent whereas in the rainy season it is over 85 percent. Rainfall varies not only from place to places. Average annual rainfall of Tripura is 2200 mm, and generally increases from southwest part of the state to northeast. The northeastern part of the state gets maximum rainfall. Rainy season generally starts by about the end of May, but thundershowers usually occur from about April to the break of the monsoon. The rainy season continues up to September. The maximum rainfall is usually recorded during the month of June – July. The months of October and November constitute the post monsoon season. Highest rainfall is recorded in between month of May & July. Project towns has almost similar climatic conditions and rainfall. The Graphs below showing rainfall in project town. There is no weather station in Mohanpur and Ranirbazar. Jirania is adjacent town to Mohanpur & Ranirbazar and both towns have same weather conditions. The Figure 26 below shows month wise rainfall for Khowai and Jirania town. Figure 27 shows month wise rainy days.		

Baseline Characteristic	Khowai	Mohanpur	Ranirbazar
Surface water	The State of Tripura is well endowed with surface water resources. As many as ten major rivers are reported to generate an annual flow of 793 million m³ of water. All rivers are rain-fed and ephemeral in nature. All major rivers originate from hill ranges and show a typical drainage pattern called trellis, except a few instances of dendrite pattern. Rivers in the project towns are described below. Besides, there are numerous small ponds and water bodies within the towns. Khowai River. Khowai River passes along boundary of Khowai town. This is a trans-boundary river that originates in the eastern part of the Atharamura Hills of Tripura and enters Bangladesh at Balla in Habiganj District. Khowai River is second longest river of Tripura with a length of 166 km. Its total catchment area is 1,328km². Hoara River. The primary water source of West Tripura is Haora River. It is called Saidra in Kokborok by the indigenous tribes of the state. Apart from this there are many streams and cherras. Haora river originates from the Baramura range and its tributaries are Dowaigang, Ghoramara, Debda on the right and Charupanadi, Dhobatilachhera and Bangeswargangon the left bank. The length of the river is 53 kms, and it flows towards west and passes through major towns like Champaknagar, Jirania, Khumulwng, Khayerpur, Ranirbazar and last Agartala before it enters and empties into the Titas in Bangladesh.¹⁰ Haora River passes through Ranirbazar western boundary. Sonai River. The main water course of Mohanpur is Sonai River. Beside these there are many Cherras. After Haora (46 km), Sonai Gang (22.31 km) is the second longest river in West Tripura District which is affected by bank erosion hazard. The five sites namely, Chandpur, Barkanthalia, Ailaghat, Trishghar and Mohanpur Bazar have been identified as most vulnerable places to bank erosion. Figure 28 below shows the watershed map of Tripura and town wise water bodies maps are shown in Figure 29 to Figure 31. Water quality. As per the Annual report 2020-2021 of TSPCB, the Haora River water quality parameters of TDS, DO, BOD, Total Hardness, and Lead are within permissible limits. Surface and treated water quality status is shown in Table 12-13.		
Groundwater	The State of Tripura is occupied by the rocks ranging in age from Upper Tertiary to Quaternary. Mobile trough geosynclinal deposition of Barail group followed by flysch type of Surma & Tipam sediments, overlain by Dupitila formation, is noticed in the State. Most of the longitudinal synclinal valleys of the state are the basins of deposition of recent formation. Recent alluvium occurs along the streams and the flood plains of major rivers. Ground water occurs under unconfined condition in Dupitila, Recent & Tipam formations. Besides, it also occurs under confined to semi-confined conditions in Tipam formation at considerable depth. Recharge areas for the deeper aquifer lies in the adjacent anticlinal hills. Wherever a good thickness of impermeable clay beds underlie & overlie the saturated granular zones, auto flow artesian conditions have been found in the valleys, which are the discharge area. The artesian flowing conditions occur in patches both at shallow depth and at deeper depth. The auto discharge of the flowing wells in the State ranges from 100 to 6000 LPH, the maximum auto discharge from deep tube well to the extent of 54000 LPH has been found in Khowai valley near Khowai town, where the piezometric head rose up to 7 m above ground level. Ground water resources have been assessed block-wise for recharge worthy area. Total Annual Ground Water Recharge of the State has been assessed as 1.31bcm and Annual Extractable Ground Water Resource as 1.06 bcm. The Annual Ground Water Extraction		

¹⁰ District Survey Report 2018, West Tripura

Baseline Characteristic	Khowai	Mohanpur	Ranirbazar
	is 0.103 bcm and Stage of Ground Water Extraction is 9.7 %. All the 59 assessment units have been categorized as 'Safe'. As compared to 2020 assessment, there is no significant change in ground water recharge and ground water extraction in the State. Groundwater quality. Water Quality of groundwater in the project area of existing DTW is tested by DWS. It can be seen from table that the except iron content, all tested parameters are within the limit of Indian standard and WHO acceptable standards. Table 14 shown detailed results of Ground water quality analysis.		
Air quality	There are no data on ambient air quality of Project towns, which is not subject of monitoring by the Tripura State Pollution Control Board (TSPCB) because there are no major industries located in and around. Baseline air quality will be established at specific project locations before start of the construction, this is included in the EMP.		
Noise levels	TSPCB conducted noise level monitoring in the month of December 2020 is presented in Table 15. In Khowai at all the zones during both day and night noise level is within the standards. In Mohanpur during day time noise always above the National standard irrespective of zones. In day time noise level exceed WHO standard at residential & salient zones. During night time noise level at residential zone exceeds both the standards. In Ranirbazar the values of noise level noted in some of the areas are primarily owing to vehicular traffic and other anthropogenic activities. It has been observed during monitoring, that the noise level during day time at silent zone exceeded the prescribed National standard but below the WHO standard. But at nighttime noise level at silent zone always above both the standards		
Ecological resources	Tripura a small state of North-east of India having rich content of floral and faunal diversity. Total area of the state is 10,491.69 sq km in which forest area is 6294.29 sq km. Among the forest area percentage of Protected Areas (Pas) in Tripura is about 9.59%. There are 6(six) PAs throughout state which includes 4(four) Wildlife Sanctuary and 2(two) National Parks. There are no protected areas, wetlands, mangroves, or estuaries in or within the subproject towns. Figure 32 and Figure 33 shows Forest maps of Khowai and West Tripura districts. There is no forest area nearby Khowai, Mohanpur and Ranirbazar town. Nearest forest to Khowai is Atharamura Kalajhari reserve forest located 16 km, nearest protected area is Rema Kalenga wildlife sanctuary, located within 5 km from the town in in Habiganj, Bangladesh. The nearest protected area to Mohanpur is the "Sepahijala Wildlife Sanctuary" is located within 33 km aerial distance in Sepahijala district, Tripura and near forest area Tulakona R.F. is at 18 km aerial distance from the project town. Nearest forest area to Ranirbazar is Baramura¹¹ Eco Park, Teliamura at 21 km distance and protected area to Ranirbazar is "Sepahijala Wildlife Sanctuary, located 21 km from the town in Sepahijala district, Flora. Nearby the project sites of Ranirbazar trees are mainly Rubber Tree (<i>Hevea brasiliensis</i>), Ba rak (<i>Bambusa balcooa</i>), Bombash (<i>Bambusa spp.</i>), Betel nut (<i>Areca catechu</i>) and bamboo. Common species noted in and around Khowai and Mohanpur town, Teak (<i>Tectona grandis</i>), Sal (<i>Shorea robusta</i>), Gamar (<i>Gmelina arborea</i>), Chamal (<i>Artocarpus chaplasi</i>), Garjan (<i>Dipterocarpus turbinatus</i>), Koro (i) (<i>Albizia procera</i>), Sundi (<i>Michelia Montana</i>) and Rubber Tree (<i>Hevea brasiliensis</i>). Common Bamboo species recorded across all the subproject towns are Ba rak (<i>Bambusa balcooa</i>), Bari (<i>Bambusa polymorpha</i>), Mritinga (<i>Bambusa tulda</i>), Muli (<i>Melocanna baccifera</i>), Kai (<i>Bambusa nutans</i>), Paora (<i>Bambusa teres</i>), Rupai (<i>Dendrocalamus longispathus</i>), Dolu (<i>Neohuzeaua dullooa</i>), Makal (<i>Bambusa pallida</i>), Pecha (<i>Dendrocalamus hamiltonii</i>), Kailiyai (<i>Oxytenanthera nigrociliata</i>), Kanak kaich (<i>Bambusa offinis</i>), Lanthi bans (<i>Dendrocalamus strictus</i>), Tetua (<i>Bambusa spp.</i>), Ish (<i>Bambusa spp.</i>), Jai (<i>Bambusa</i>		

¹¹ International Journal of Current Research Vol. 7, Issue, 04, pp.15342-15349, April, 2015

Baseline Characteristic	Khowai	Mohanpur	Ranirbazar
	spp.), Bombash (<i>Bambusa</i> spp.), Sairil/Wadu bamboo (<i>Melocalamus compactiflorus</i>), Bosai (<i>bambusa</i> spp.). In project area common tree species are <i>Terminalia belerica</i>, <i>Artocarpus heterophyllus</i>, <i>Mangifera Indica</i>, <i>Azadirachta indica</i>, <i>Averrhoa carambola</i>, <i>Syzygium cumini</i>, <i>Leucaena leucocephala</i>, <i>Acacia nilotica</i>, <i>Lagerstroemia parviflora</i>, <i>Ficus religiosa</i>, <i>Zizyphus xylopara</i>, <i>Embllica officinalis</i>, <i>Tamarindus indica</i>, <i>Anogeissus pendula</i>, <i>Ficus glomerata</i>, <i>Caryota urens</i>, <i>Areca catechu</i> and commercial rubber plantation Fauna. The subproject locations are in and around urban areas, and lands converted long ago for urban and agricultural purposes. Therefore, existence of wild fauna is not reported. Only domestic animals such as pigs, dogs, cows, buffalos, cats, and goats are present in the subproject areas. Fauna in and around forest area are, Palm civet cat (<i>Paradoxurus hermaphroditus</i>), Jungle cat (<i>Felis chaus</i>), Barking Deer (<i>Muntiacus muntjac</i>), Common langur (<i>Presbytis entellus</i>), Rhesus Macaque (<i>Macaca mulata</i>), Phayre's leaf Monkey (<i>Trachypithecus phayer</i>), Spectacle Langur (<i>Tachypithecus obscurus phayrei</i>). There are 8 numbers of fish species are found in Khowai River, (<i>Anguilla bengalensis</i>, <i>Labeonandina</i>, <i>Hypophthalmichthysmolitrix</i>, <i>Chitalachitala</i>, <i>Ompokbimaculatus</i>, <i>Ompokpabda</i>, <i>Wallagoattu</i>, and <i>Ailiacoila</i>) and 12 in Haora River (<i>Lepidocephalus guntea</i>, <i>Rasbora daniconius</i>, <i>Amblypharyngodon mola</i>, <i>Puntius conchoni</i>, <i>Puntius chola</i>, <i>Puntius sophore</i>, <i>Acanthocobitis botia</i>, <i>Mystus vittatus</i>, <i>Exostoma berdmorei</i>, <i>Mastacembelus armatus</i>, <i>Colisa lalia</i>, <i>Channa punctatus</i>).		
IBAT screening	There is 1no. of protected area, Rema-Kalenga Wildlife Sanctuary and 1no. of key biodiversity area (KBA) Rema-Kalenga Wildlife Sanctuary in Bangladesh is within 5 km from the town and subproject components. There are 75 International Union for the Conservation of Nature (IUCN) Red List threatened species within 50 km area. Out of 75 IUCN red list (VU, CR and EN) species reported within 50km radius., 40 species are classified as vulnerable (VU), 10 species are classified as Critically Endangered (CR) and 25 species are Endangered (EN). Among CR and EN Birds are common which includes 23 species (VU-9, CR-6, EN-8), 19 reptile (VU-8, CR- 3, EN-8), 25 mammals (VU-15, CR- 1, EN-09). Key biodiversity area and Protected area within the 10 km area of Khowai town is shown in Figure 34	No protected area or KBA is within the 10 km area from project site. 2nos. of protected area and 4nos. of key biodiversity area within the buffer of 10 to 50km radius of the subproject components. 71 International Union for the Conservation of Nature (IUCN) Red List threatened species are within 50 km area from the project site Out of 71 IUCN Red List (Critically Endangered (CR), Endangered (EN) and Vulnerable (VU) species are reported within 50km radius. Out of these 35 IUCN Red listed species, 37 species are classified as Vulnerable, 11 species are classified as Critically Endangered (CR) and 23 species are Endangered (EN). Majorly Birds are common species which includes 20 species (VU-8, CR-6, EN-6), 15 Reptiles (VU-6, CR- 3, EN-	No protected area or KBA is within the 10 km area from project site. 2nos. of protected area and 5nos. of key biodiversity area within the buffer of 10 to 50km radius of the subproject components. 72 International Union for the Conservation of Nature (IUCN) Red List threatened species are within 50 km area from the project site Out of 72 IUCN red list (VU, CR and EN) species reported within 50km radius. Out of these 72 IUCN red list species, 38 species are classified as Vulnerable, 10 species are classified as Critically Endangered (CR) and 24 species are Endangered (EN).

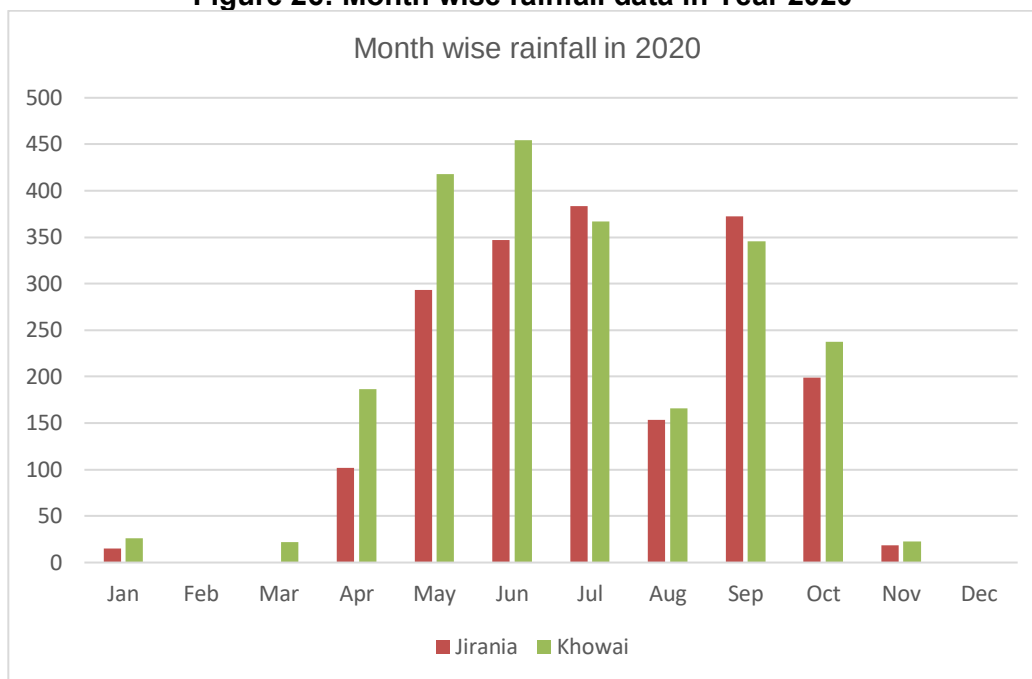
Baseline Characteristic	Khowai	Mohanpur	Ranirbazar
		6), 25 Mammals (VU- 15 CR- 1, EN-09). Key biodiversity area and Protected area within the 10 km area of Mohanpur town is shown in Figure 35	Mammals are common species which includes 25 species (VU-15, CR- 1, EN-09), 17 reptile (VU-07, CR- 03, EN-06), 20 birds (VU-08, CR- 05, EN-07)). Biodiversity Assessment Report (IBAT Analysis). Key biodiversity area and Protected area within the 10 km area of Ranirbazar town is shown in Figure 36 .

Economic development	Land use.				
	No	Land Use Category	Percentage		
			Khowai	Mohanpur	Ranirbazar
	1	Residential	35	64	40
	2	Commercial	1	0.98	10
	3	Industrial	0	21	22.32
	4	Public and Semi-Public	3	0.04	0.21
	5	Mixed Use	1	0.02	1.21
	6	Recreational	5	0.14	0.8
	7	Transportation and Communication	18	0.001	0.06
	8	Primary Activity	10	5	12
	9	Protective and Undevelopable Use Zone	21	10	13
	10	Others	6	5	0.4
	Total	100	100	100	
Source: GIS base Master plans of towns					
Industries. Industrial development project towns are very limited. Table 16 lists, industries near project towns). Town Map showing land use pattern are presented in Figure 37-39					

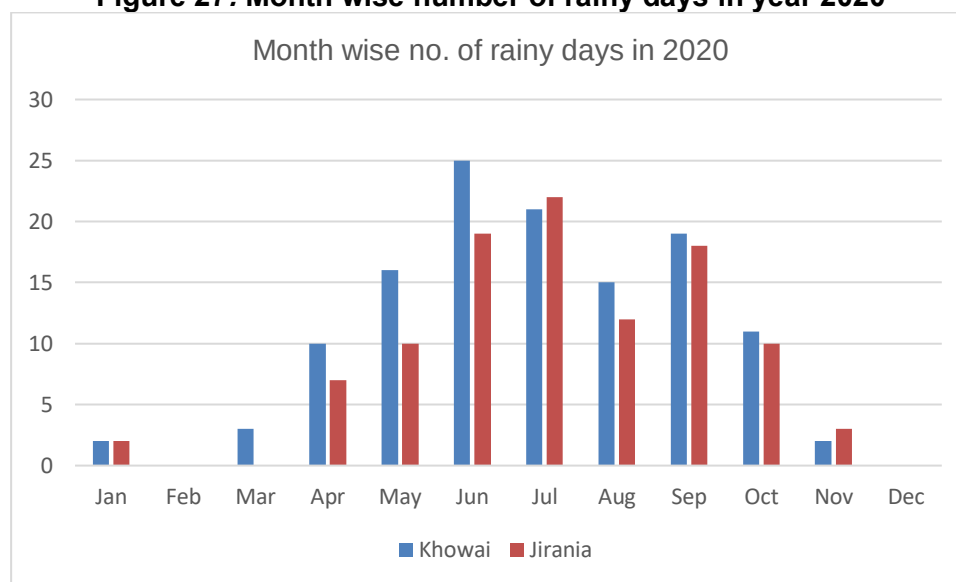
Demographic parameters	Parameter	Khowai	Mohanpur	Ranirbazar
	House holds	4681	-	3305
	Population	18526	16722	13104
	Male	9256	8484	6719
	Female	9229	8238	6385
	Children under the age of 0-6	1500	1922	1265
	No of Wards	15	15	13
	Schedule Caste (% of total Population)	11 %	30.8%	18.87%
	Schedule Tribe (% of total Population)	6.43 %	16.8%	0.24%
	Hinduism (% of total Population)	98.09%	96.41%	98.69%
	Islam (% of total	1.19%	0.47%	1.16%

Baseline Characteristic	Khowai	Mohanpur	Ranirbazar
	Population)		
	Others (Buddhism, Christianity, Sikhism and Jainism) (% of total Population)	Less than 1 %	Christianity (2.88%), Sikh (0.07%), Buddhist (0.03%), Jain (0.01%), Others (0.0), Not Stated (0.03%)
	Sex ratio (female per 1000 males)	993	1014
	Total literacy rate	97.39%	93.61 %
	Male literacy rate	98.3	96.50 %
	Female literacy rate	96.47	93.15 %.
History and tourism	Khowai. There is predominance of both the Kokborok and Bangla languages in Khowai. The main festivals of the town are Durga Puja, Kharchi, Garia Pooja, and Tring (Tripuri New Year). In Khowai the places of Interest are Baramura Eco Park, Chakmaghat Park at Teliamura, Banabithi Ecopark at Padmabil and Jangal Mahal.¹²	Mohanpur. Mohanpur has a historical background. The ancient capital of the princely State 'Swadhin Tripura' was at Rangamati (Udaipur, South Tripura) by the bank of the river Gomti and in 1760 A.D., it was shifted by the Maharaja Krishna Manikya to the site of old Agartala by the bank of river Haora and was named 'Haveli'. The Capital city of Agartala was founded in 1838 AD by Maharaja Krishna Kishore Manikya (1830-49 A.D.). In Mohanpur town every year one significant fair is organized, namely Brahmamakunda fair which is mainly religious in nature. Many pilgrims take part in the fair. This traditional Brahmakunda fair generally held during the auspicious occasion of "Ashokastami". The festival has a great significance as people from different parts of the state arrive here to attend the fair to offer "obeisance" to their ancestors.	Ranirbazar. Major tourism places near Ranirbazar are Mekhlipara (lush green forests and hills and Matarbari temple), Ranirbazar park and Haveli Museum.

¹² Official website of Khowai district

Figure 26: Month wise rainfall data in Year 2020

(Source: https://www.agri.tripura.gov.in/sites/default/files/Station_wise.pdf)

Figure 27: Month wise number of rainy days in year 2020

(Source: https://www.agri.tripura.gov.in/sites/default/files/Station_wise.pdf)

Figure 28: Watershed Map of Tripura watershed showing important rivers and Bangladesh International Boarder

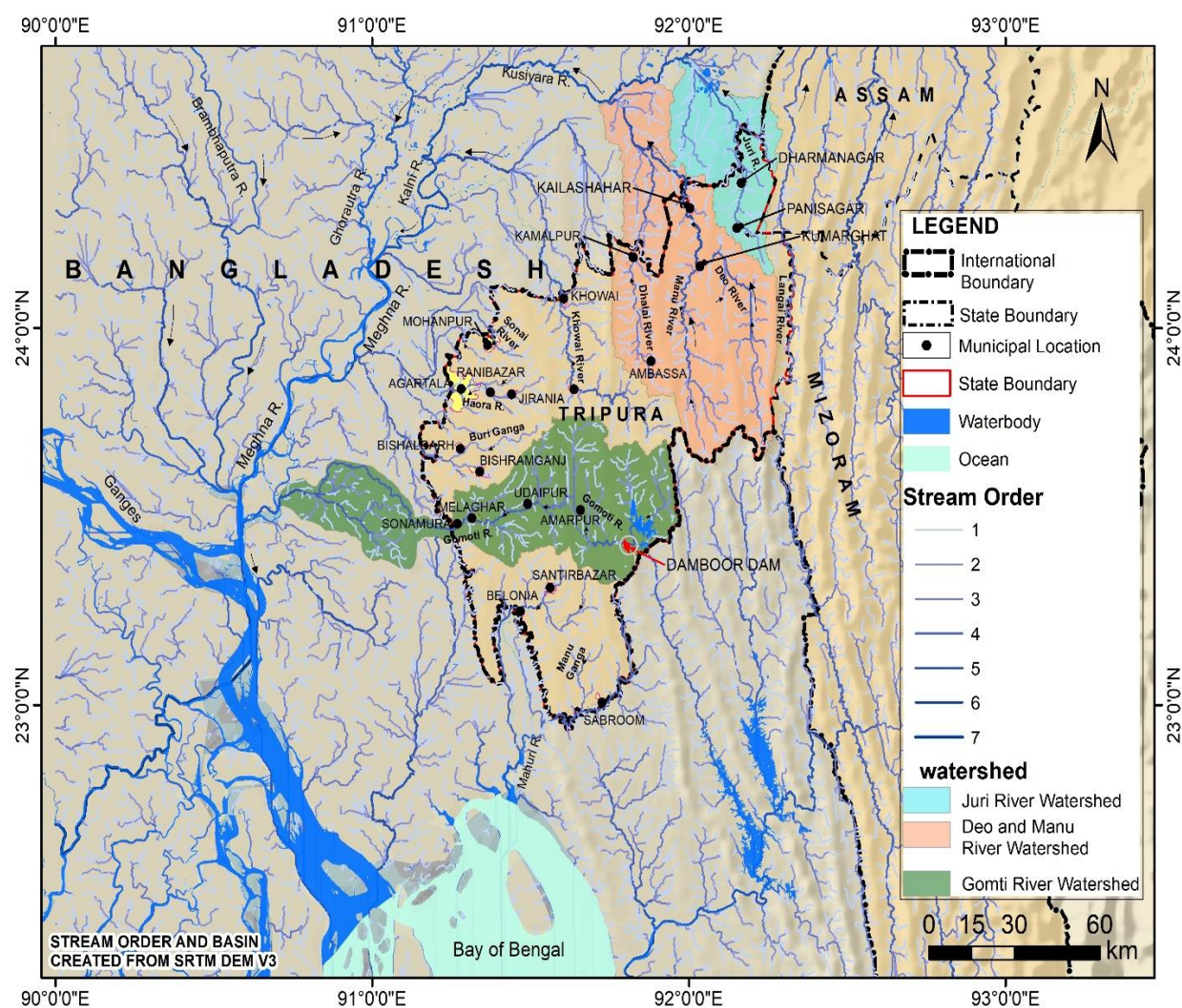


Figure 29: Waterbody Map of Khowai MC

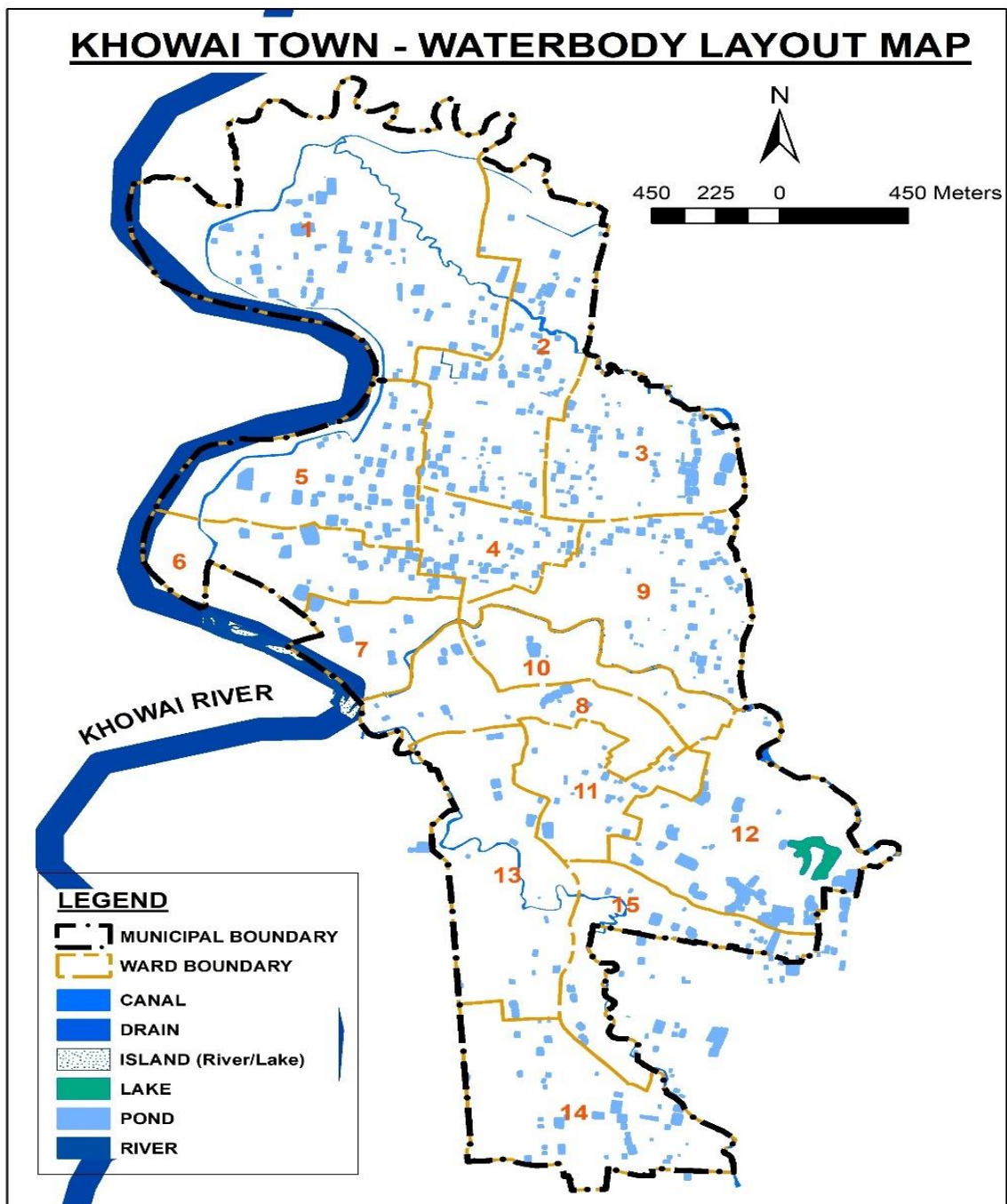


Figure 30: Waterbody Map of Mohanpur MC

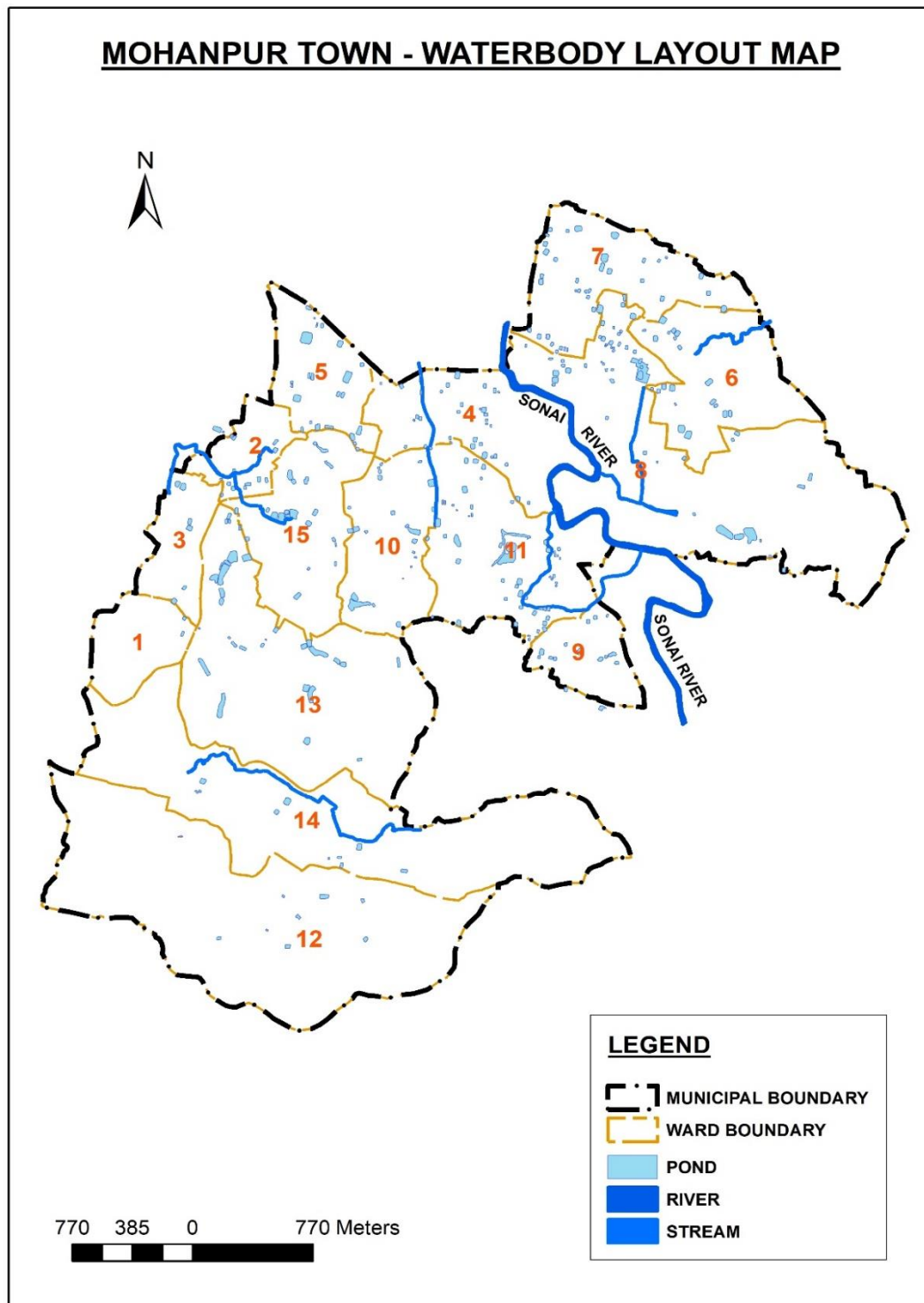


Figure 31: Waterbody Map of Ranirbazar MC

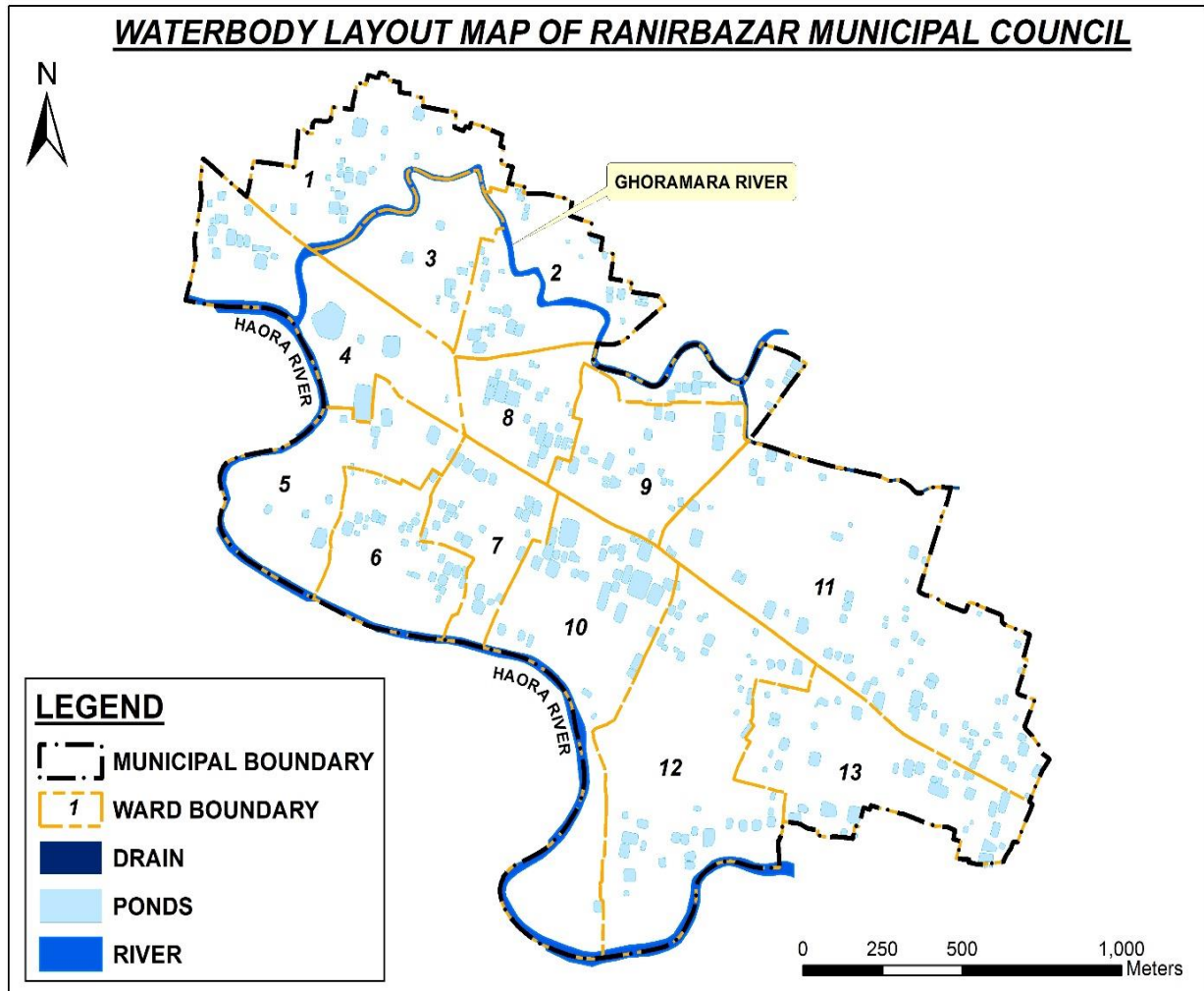


Table 10: Khowai river water quality and treated & supplied water quality from Water Treatment Plant

Sr No.	Date	Parameters of Raw Water		
		Physical Appearance	Turbidity (NTU)	pH
1	26.12.2022	Hazy	41.2	7.88
2	27.12.2022	Hazy	39.05	7.8
3	28.12.2022	Hazy	40.57	7.92
4	29.12.2022	Hazy	38.4	7.5
5	30.12.2022	Hazy	39	8.05
6	31.12.2022	Hazy	40.21	7.8
7	01.01.2023	Hazy	38.4	7.75
8	02.01.2023	Hazy	39.05	7.9
9	03.01.2023	Hazy	40.27	7.95
10	04.01.2023	Hazy	40.53	8.1
Average			39.668	7.5- 8.1
National Standards for Drinking Water^a				
CPCB Standard for Source^{**}			-	6-9

Source- DWS, Water Treatment Plant laboratory

^a Bureau of India Standard 10500: 2012.

^b Health-based guideline values.

^c Figures in parenthesis are maximum limits allowed in the absence of alternate source.

Table 11: Analytical results of water samples collected from Haora River, Ranirbazar

Sl.No.	Parameters	Average value	CPCB Standard for Source ^{**}	Indian Standard for Drinking Water [*]
1.	pH	7.45	6-9	6.5-8.5
2.	Turbidity (NTU)	61.50	-	1
3.	Total dissolved solids (mg/L)	95.33	-	500
4.	Dissolved oxygen (mg/L)	5.96	>4	-
5.	Bio-Chemical Oxygen Demand (mg/L)	2.25	<3	-
6.	Total Hardness (mg/L)	33.01	-	200
7.	Lead (mg/L)	0.018	0.1	0.01

Source: Annual Report 2020-2021, Tripura State Pollution Control Board, *IS 10500:2012 **IS 2296:1992

Table 12: Groundwater quality results of project town

DWT at	Physical Appearance	Turbidity (NTU)	pH	Total Alkalinity (mg/l)	Total Hardness as CaCO ₃ (mg/l)	Calcium as Ca. (mg/l)	Magnesium as Mg. (mg/l)	TDS (mg/l)	Chloride as Cl (mg/l)	Total Iron (mg/l)	Arsenic(mg/l)	Fluoride (mg/l)	Residual Chlorine (mg/l)	Nitrate (NO ₃) (mg/l)	Total coliform	Fecal Coliform
Khowai- 2022 Jan																
Paharmura	Clear	1.42	7	-	-	-	-	-	-	1.208	-	-	-	-	-	-
Sipaibour	Clear	0.84	7	-	-	-	-	-	-	0.728	-	-	-	-	-	-
Samatal Padmabil	Clear	1.2	6.8	-	-	-	-	-	-	0.618	-	-	-	-	-	-
Mohanpur- 2020 Dec																
Mohanpur	-	BDL	6.52	-	-	20	2.43	210.8	42.49	0.38	-	0.17	-	2.5	-	-
Indian drinking water standards Acceptable limit and (Permissible limit)	Clear	5	6.5-8.5	200 (600)	200 (600)	75 (200)	30 (100)	500 (2000)	250 (1000)	<0.3		1 (1.5)	0.2 (1.0)		0	0
WHO Guidelines for Drinking-Water Quality, 4 th Edition, 2011 ^b												1.5	5		0	0

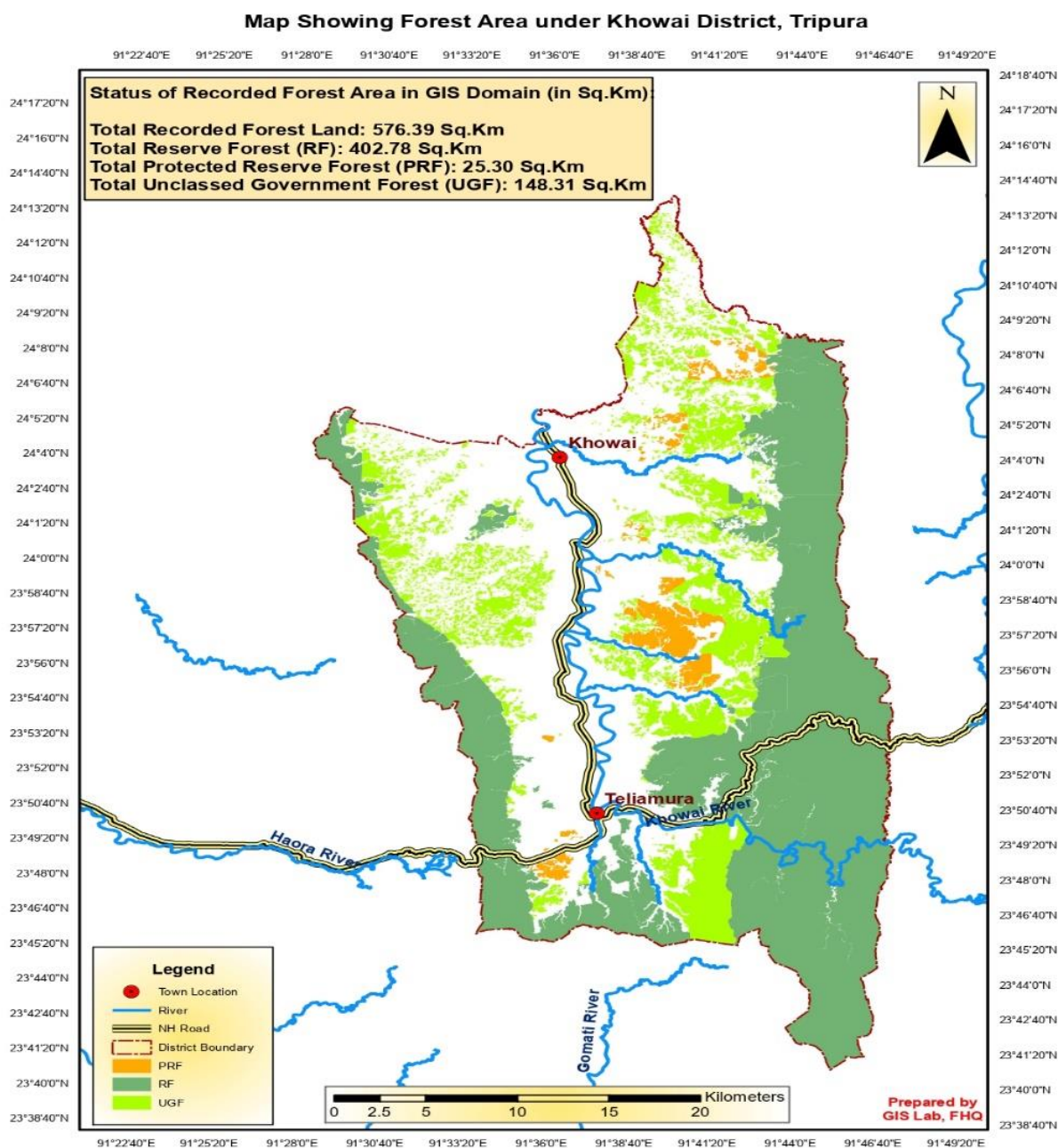
Source: DWS respective towns

Table 13: Noise level data of Project towns during December 2020

Type of area	Location	Day time Measured value in dBA			Day Time Standards		Night time Measured value in dBA			Nighttime Standards		Activities around monitoring locations
		Lmin	Lmax	Leq	Indian	WHO Guidelines	Lmin	Lmax	Leq	Indian.	WHO Guidelines	
Khowai												
Commercial	Khowai Motor Stand	59.28	61.64	60.67	65	70	36.9	39.16	38.24	55	55	-
	KhowaiMarket	59.6	61.54	60.73	65	70	36.72	38.48	37.67	55	55	-
	KalyanpurMarket	59.28	61.0	60.24	65	70	36.5	38.3	37.47	55	55	-
Residential	Durganagar	50.30	52.28	51.5	55	55	36.5	38.3	37.42	45	45	-
	Khowai Office lane area	51.02	52.62	51.97	55	55	36.76	38.78	37.85	45	45	-
Silent	Khowai District Hospital	48.74	50.82	49.95	50	55	36.66	37.92	37.41	40	40	-
Mohanpur												
Commercial	MohanpurBazar	60.28	68.92	65.59*	65	70	46.24	49.16	48.26	55	55	Vehicular movement, public noise.
	Manipuri Chowmuhani	61.56	66.4	-	65	70	38.82	40.72	40.0	55	55	
Residential	CollegeRoad	51.78	58.94	57.20*	55	55	45.2	47.84	47.05*	45	45	
Silent	MohanpurHospital	52.76	57.06	55.98*	50	55	38.7	40.88	40	40	40	Ambulance and Public movement public noise.
Ranirbazar												
Commercial	Jirania Bazar	56.92	60.66	58.88	65	70	51.28	52.62	52.22	55	70	-
Residential	Kalimura, Subash Nagar	50.78	53.92	52.74	55	70	45.4	47.58	47.78*	45	55	-
Industrial	Saha & Saha Industries (SSI Brick)	50.48	53.74	53.43	75	55	38.56	40.8	39.9	70	45	-
Silent	In front of Jirania Hospital	48.96	53.98	51.81*	50	55	45.84	49.2	47.7*	40	40	-

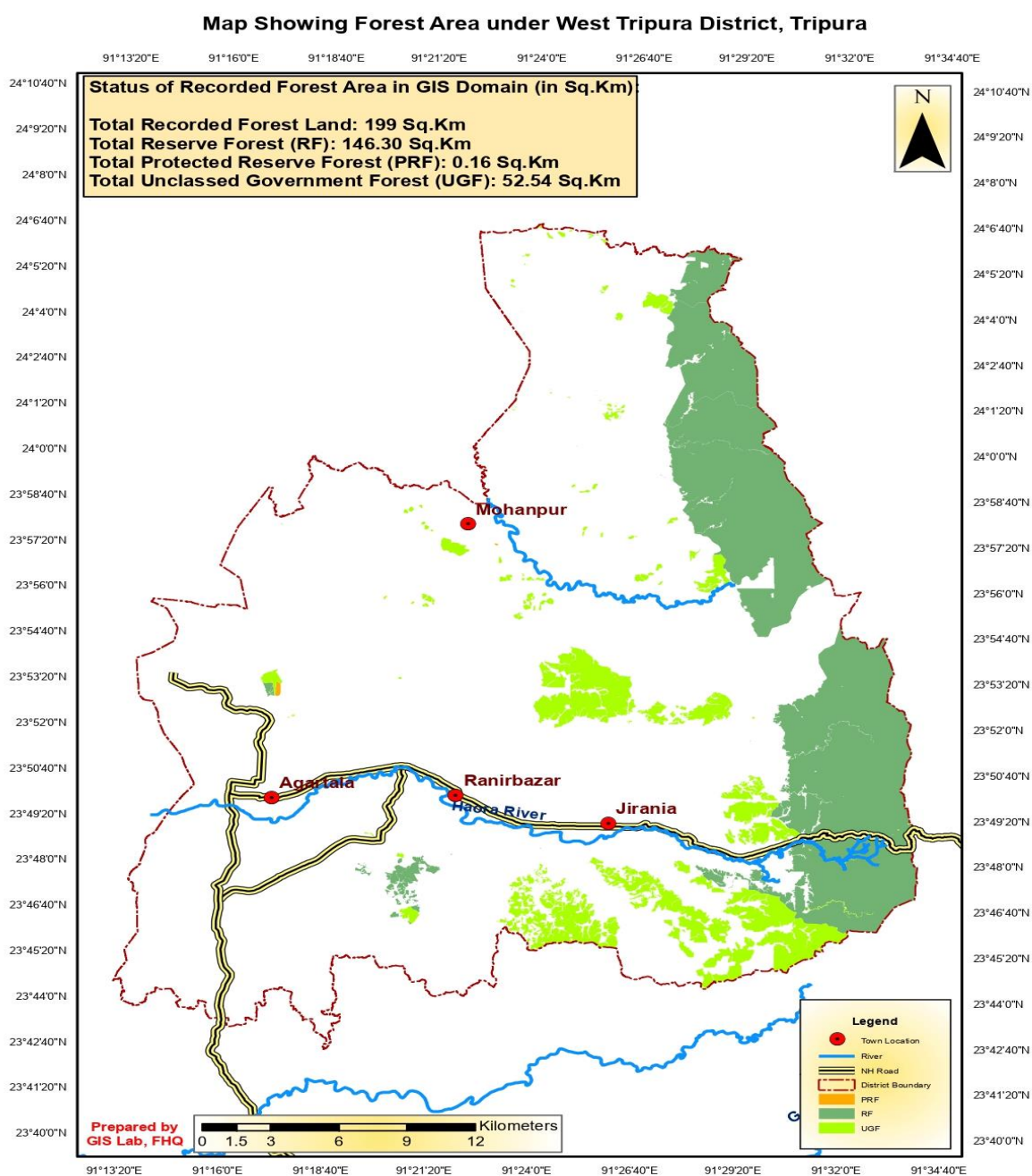
Source: TSPCB Report

Figure 32: Forest map of Khowai district



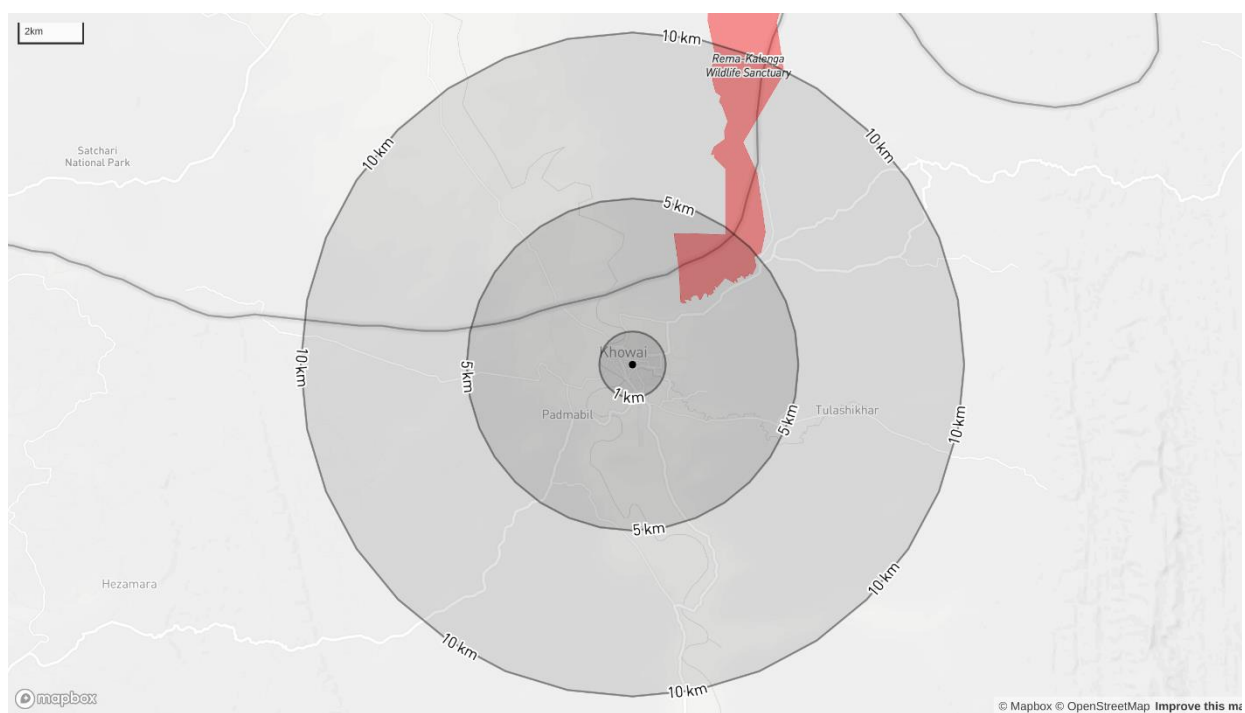
(Source: Forest Dept; Govt. of Tripura)

Figure 33: Forest map of West Tripura district (Ranirbazar and Mohanpur towns)



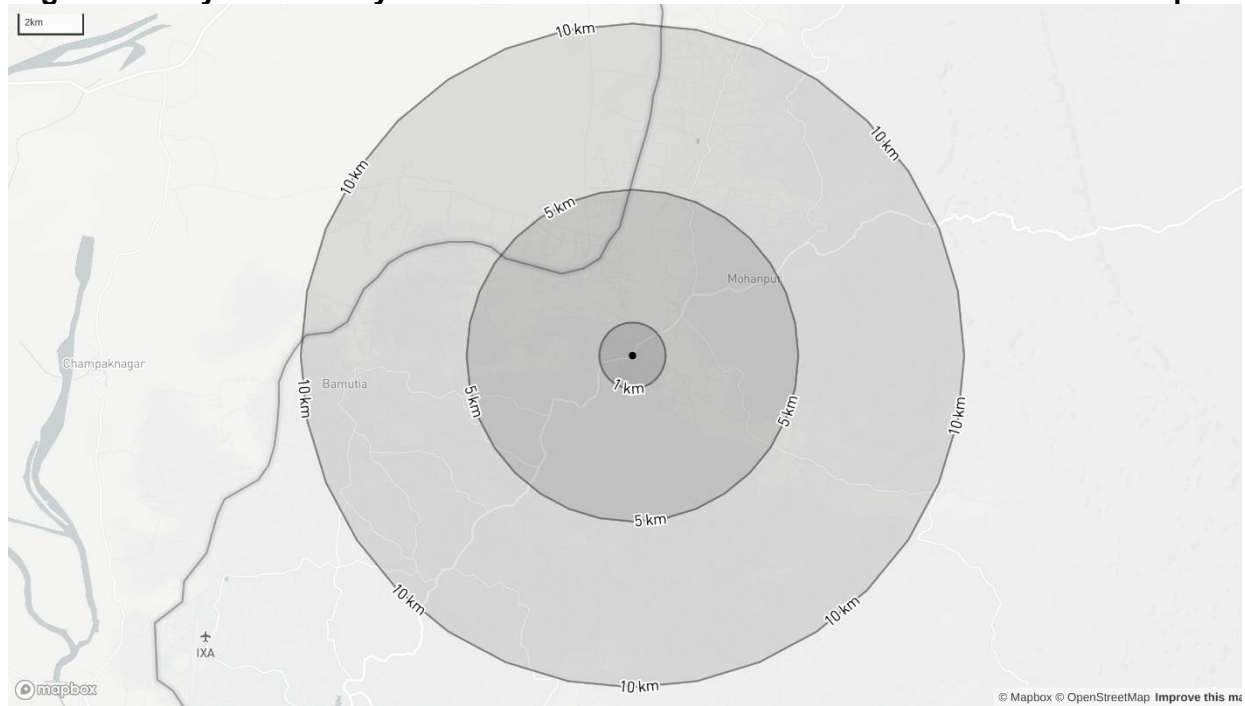
(Source: Forest Dept; Govt. of Tripura)

Figure 34: Key biodiversity area and Protected area within the 10 km area of Khowai town



(Source IBAT)

Figure 35: Key biodiversity area and Protected area within the 10 km area of Mohanpur



(Source IBAT)

Figure 38: Land use map of Mohanpur town

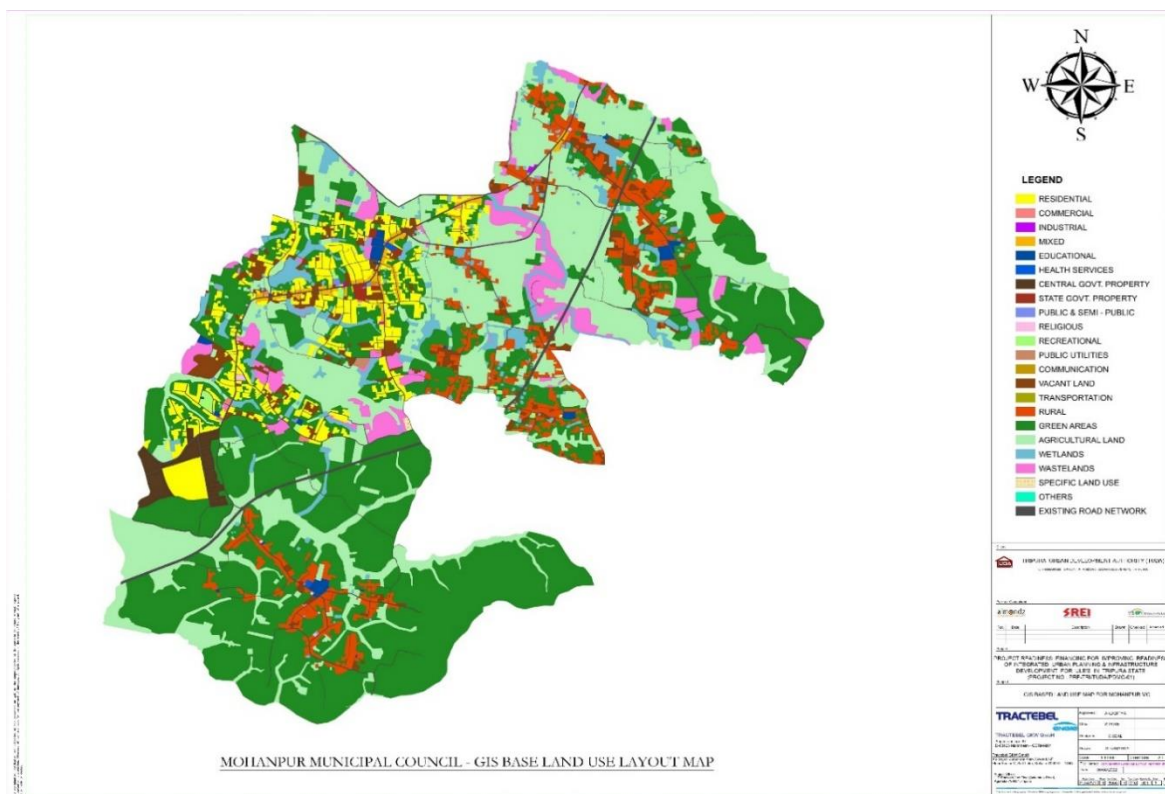


Figure 39: Land use map of Ranirbazar town

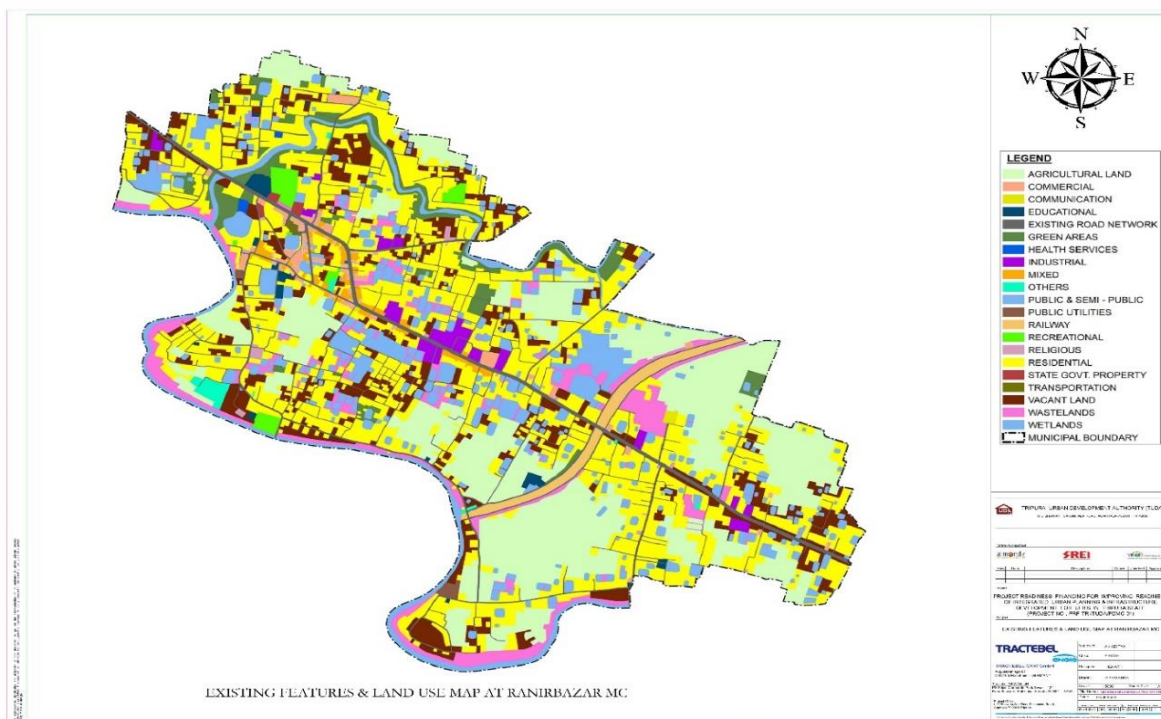


Table 14: List of major industries in and around project towns

Sl. No.	Major Industrial Estate	Types of Industry
Khowai		
1.	Tea Estate	Functioning -02 i) Kalyanpur Tea Estate, P.O. Baganabazar, Tripura ii) Khowai Tea Estate Post, Khowai, Tripura
2	Bamboo Cluster Incense Stick	Rolled Agarbatti /Bamboo stick
3.	Bamboo Cluster	Handicraft Items
4.	Cold Storage (Potato, Fruits & Vegetable)	Cold Storage of capacity 1000 MT
5.	Rubber Plantation	Rubber
6.	Natural Gas based thermal power plant	Bara Mura in Khowai district
Mohanpur		
1	Name of the Tea Estate, and Address (No factory)	i. Adarni Tea Estate, Lembucherra, west Tripura ii. Binodini Tea Estate, Chechoria, West Tripura iii. Brahmakunda T.E, Sundartilla, Agartala iv. Durgabari T.E, Tebaria, Agartala. v. Fatichera T.E, Fatichera, West Tripura vi. Gopal Nagar T.E, Taranagar, West Tripura vii. Harendranagar T.E, Harendranagar, Agartala viii. Haridaspur T.E ix. Kalacharra T.E, Kalacharra, West Tripura Meghibundh, Sidhai Mohanpur
2	Name of the Tea Factory	i. Harendragar Tea Estate ii. Central Tea Processing iii. Fatikcherra Tea Estate iv. Durgabari Tea Estate v. Narendrapur Cha Bagan x. Brahmakunda Tea Processing Factor
3	Bamboo Cluster Incense Stick	vi. Rolled Agarbatti
4	Bamboo Cluster	Bamboo Plantation (Mohanpur) vii. Bamboo Plantation (Hezamara)

Sl. No.	Major Industrial Estate	Types of Industry
	Khowai	
5	Bamboo Cluster	Furniture/ Handi craft (Bamutia) Furniture (Katlamara- Simna)
1.	Bamboo Cluster	Handicraft Items

(Source: ULB and Economic Review of Tripura 2019)

C. Subproject Site Environmental Features

52. Features of the selected subproject sites are presented in the following table.

Table 15: Site Environmental Features – Khowai Road

Sl no.	Road Name	Length of the road(m)	Environmental Features of the Site	Photograph
1	From Jeep Stand to Nivedita Park via Nripen Chakraborty avenue	960 m Existing RoW is 10 m. 1.2 m footpath is proposed	The proposed road section is a bitumen road located in Khowai Town. The topography of the project area is plain. The land use is completely commercial type. The existing condition of the road is good. There are a few existing infrastructure and services (roads, tele communication lines, power lines and various pipelines) within the vicinity of the subproject. There are no historical places in the project area; however, one temple exists near to existing carriageway but outside the impact zone. There is no waterbody near the proposed footpath. No tree cutting is required for construction of this road. There is some Arjun tree exist near the proposed road, which will not be removed for construction. There is a hospital at chainage 800 m which is adjacent to the road. There is no significant protected forest in and around project area, road is located within the urban area surrounded by commercial / residential areas	 Latitude: 24.067271 Longitude: 91.60642 Elevation: 23.74±3 m Accuracy: 15.3 m Time: 19-11-2022 15:10 Note: Khowai Road no 1 starting point 

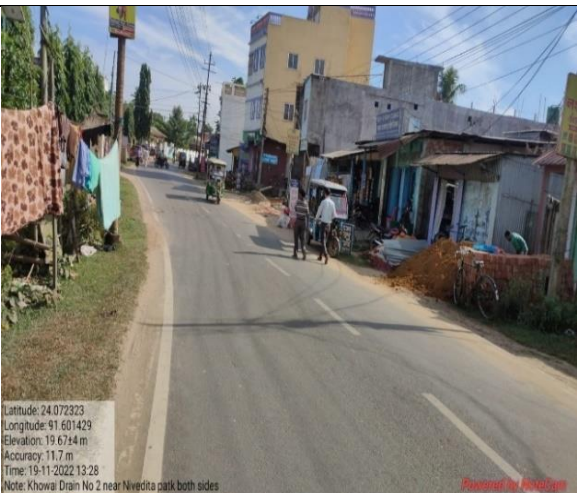
Sl no.	Road Name	Length of the road(m)	Environmental Features of the Site	Photograph
				 Latitude: 24.067842 Longitude: 91.605994 Elevation: 30.54±16 m Accuracy: 6.1 m Time: 19-11-2022 15:12 Note: Khowai Road no 1 starting point
2	From Vivekananda Statue to Nripen Chakraborty Avenue via Swapnapuri Hotel	600 m Existing ROW is 10 m. 2m widening of the Carriageway proposed and 1.2 m footpath is proposed Both side drain is considered. Foot path above the RCC drain.	The proposed road section is a bitumen road located in Khowai Town. The topography of the project area is plain. The land use is completely commercial type. The existing condition of the road is fair and motorable with average RoW width is 10 m. At some places along the project road, potholes are found. There is no tree along the project road. Also, there is no waterbody near the proposed road. Utility shifting (electric post) may be required. No tree cutting is required for construction of this road.	

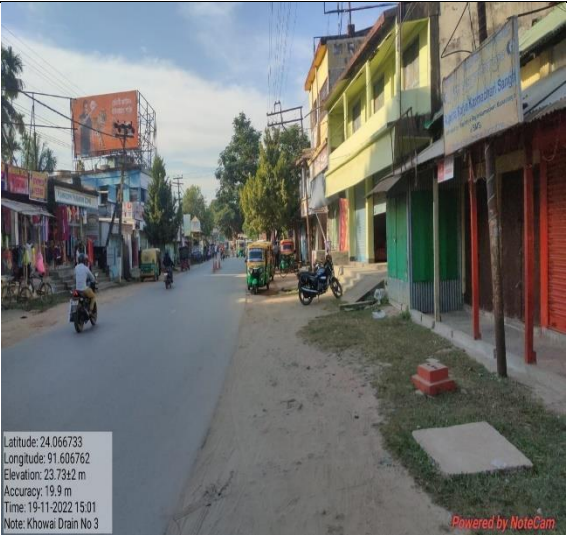
Sl no.	Road Name	Length of the road(m)	Environmental Features of the Site	Photograph
			There is no significant protected forest in and around project area, road is located within the urban area surrounded by commercial / residential areas. .	 Latitude: 24.070258 Longitude: 91.604697 Elevation: 29.25±3 m Accuracy: 3.8 m Time: 19-11-2022 15:23 Note: Khowai Road no 2 Powered by NoteCam

Table 16: Site Environmental Features for Khowai Drain

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
1	Storm water Drain from Bishu Roy House to Lal Chhera via Kudipara and Srinath Vidyaniketan Start- Lat- 24.079246°, Long- 91.604077° End- Lat- 24.075829°, Long- 91.601821°	The drain crosses the Durganagar-Cobler Chowmuhani Road, Dr. Bidhan Roy Sarani, KGG School, Thakurbari Mandir Road and some other roads. The drain is abutted by houses on both sides initially and passes through open ground at later sections. Lateral drains from the mentioned roads are connected with this existing drain. Width of proposed drain which is to be implemented under this project is varying from 600 mm to 1150 mm. The drain has been shifted to the left and right of the road for other drain connection. Utility shifting may be required during the construction activity. There is a school adjacent to the drain. No tree cutting is required for construction of this drain. There is no significant protected forest in and around project area, drain is located within the urban area surrounded by residential areas In maximum portion, there is an existing drain which is open drain and clogged by solid waste. Chainage wise proposed drainage land use is given in Appendix 6. There are 3 numbers of waterbody near the proposed drain, but outside the impact zone. Chainage wise details given in Appendix 6. Proposed drainage project indicates discharged to waste water at Lal Chhera drain.	  

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
			 Drain after Jibananada School
			 Drain near Srinath Vidyaniketan
			 Latitude: 24.076193 Longitude: 91.601797 Elevation: 28.27415 m Accuracy: 11.2 m Time: 19-11-2022 13:15 Note: Khowa Drain No. 1 end point Outfall at Lal cherra

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
2.	Vivekananda Statue to Namapara via Swapanpuri Atithi Nivas, Nivedita Park and Hospital Start- Lat- 24.065821°, Long- 91.607149° End-Lat- 24.072324°, Long- 91.601306°	The major drain of this area is existed from the backside of Swapanpuri Atithi Nivas to Namapara bridge near Nivedita park with a major connecting drain which is started from open land nearby Binapani Club. This major drain outfalls to a main drain which is started beyond Municipal boundary and aligned within municipal area via nearby house of Pramathes Sen, nearby Ganki Food Godown, Jeep Taxi Stand, Ram Thakur Ashram Road, Khowai Market, Kali Mandir Road, Khowai Bus Stand and ultimate outfall point to Khowai River. The land use along the proposed drain is partly residential and partly commercial. There was an existing drain which is clogged by the solid waste. There is a hospital adjacent to the proposed drain. Existing drain is mostly open drain. Proper measure should be taken during the construction. There is no waterbody near the proposed drain. Utility shifting will be required. Chainage wise details given in Appendix 6. Four trees, <i>Caryota urens</i>, <i>Artocarpus heterophyllus</i>, <i>Emblia officinalis</i> and <i>Tamarindus indica</i> species cutting may be required for construction of this drain. There is no significant protected forest in and around project area, drain is located within the urban area surrounded by commercial and residential areas	 Latitude: 24.072482 Longitude: 91.601356 Elevation: 19.454 m Accuracy: 3.8 m Time: 19-11-2022 13:24 Note: Khowai Drain No 2 near  Latitude: 24.072323 Longitude: 91.601429 Elevation: 19.674 m Accuracy: 11.7 m Time: 19-11-2022 13:28 Note: Khowai Drain No 2 near Nivedita park both sides  Outfall

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
3	Vivekananda Statue to Jeep Stand	This drain runs along main roads and internal roads. Proposed major drain from Vivekananda Statue to Jeep Taxi Stand shall be implemented under the stormwater drainage project. Proposed drain to be constructed by replacing the existing kutcha drain/ pukka drain by RCC covered drain which are aligned along the side of Road. The existing puck drain/ kutcha drain at following stretches which are shown in the drawing volume to minimize the waterlogging issue of ward no 11, 12, 13, and 15. There is no trees near the proposed drain. There is no environmentally sensitive location near the proposed drain. The land use along the road is commercial. Road is congested with traffic, pedestrians and squatters and vendors near the jeep stand area. This is the one of the busiest roads in the Khowai urban area. One tree, <i>Zizyphus xylopara</i> species cutting may be required for construction of this drain. There is no significant protected forest in and around project area, drain is located within the urban area surrounded by commercial and residential areas.	 Latitude: 24.066733 Longitude: 91.606762 Elevation: 23.73±2 m Accuracy: 19.9 m Time: 19-11-2022 15:01 Note: Khowai Drain No 3
Typical site picture under different stretch – sensitive receptors			
1.	Drain Near Srinath Vidyaniketon School	There is an existing drain adjacent to the school. Abutting land use is predominantly residential area. Lined side drains are proposed on LHS of the road in habitation to prevent waterlogging. During the construction period measure should be taken.	 Latitude: 24.077254 Longitude: 91.60028 Elevation: 5.96±5 m Accuracy: 26.5 m Time: 19-11-2022 12:27 Note: Khowai Drain No. 1 school

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
2	Drain in North Pabia Chora	There is an existing drain adjacent to the hospital boundary wall but the existing drain is clogged by solid waste. During the construction period measure should be taken. Abutting land use is predominantly commercial and sensitive area.	Latitude: 24.711813 Longitude: 91.601939 Elevation: 29.25±4 m Accuracy: 37.8 m Time: 19-11-2022 13:33 Note: Khowa Drain No 2 near hospital both sides Powered by NoteCam
3.	Drain near a religious tree in Jeep stand	There is a religious tree which may not be impacted during the construction, if required alignment can be shifted. Abutting land use is predominantly commercial area.	Latitude: 24.056306 Longitude: 91.607007 Elevation: 23.74±8 m Accuracy: 9.3 m Time: 19-11-2022 14:28 Note: Khowa Drain No 3 Powered by NoteCam

Table 17: Site Environmental Features of Road – Mohanpur

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
1.	Road 01 Tulabagan 14 no., Dhirendra Sarkar house to Rishipara rubber Garden old quarter (MMC, Ward no.12) Start- Lat- 23.944491°, Long- 91.372343° End Lat- 23.955984°, Long-91.375436°	Road is to be constructed on Tulabagan 14 no. Para, from Dhirendra Sarkar house to Rishipara rubber plantation old quarter, with a approx. length of 1410m, and ROW of 4 m. The road mainly passes through residential area leading to rubber plantation. Bamboo plantation is also noted beside the road. No impact is expected on existing rubber and bamboo plantation. No tree cutting may be required for construction of this road. There is no significant protected forest in and around project area, road is located outside the town surrounded by rubber plantation and residential at initial stretch The existing road is brick built with an existing ROW of 4 m and presently a section of the road is in a bad shape, its broken and in few places deep pits are formed, which causes serious problems during monsoon season. One tree cutting may be required for this project road. There is no waterbody near the project road. Shifting of few electric posts is required as per preliminary site visit. As per site visit, no sensitive receptor is present near the proposed site.	 Latitude: 23.944547 Longitude: 91.372362 Elevation: 4.86112 m Accuracy: 14.4 m Time: 26-12-2022 13:57 Note: MMC R  Latitude: 23.944575 Longitude: 91.372367 Elevation: 5.75412 m Accuracy: 27 m Time: 26-12-2022 13:57 Note: MMC R 

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
2.	Road 02 Agartala Simma Road to Kathaltali Samsanghat (MMC Ward no. 13) Start Lat- 23.967455°, Long- 91.363109° End Lat- 23.964538°, Long-91.363578°	Road is to be constructed on Kathaltali, from Agartala Simma Road to Kathaltali Samsanghat. The proposed length of the road is 350m and ROW is 4m. The existing road is very narrow bearing an approx. ROW of 4 meters on an average. It is an earthen road, with mostly agricultural fields on both sides. Existing earthen road is connecting a NH road. At the starting point road is passing through habitational area and remaining portion of the road passing through agricultural land. There is a pond within the impacted zone of the road. One tree cutting may be required for this project road. Few places have bushy shrubs and herbs which requires clearance. There is no significant protected forest in and around project area, road is located outside the town surrounded by agriculture and rural area. Shifting of few electric posts is required as per preliminary site visit. No sensitive receptors are present in close proximity of the proposed site.	 
3.	Road 03 Dighalia Road to Tertiary Centre (MMC, Ward no. 13) Start Lat- 23.955327°, Long- 91.376673° End Lat- 23.952860°, Long-91.377657°	Road is to be constructed on Dakshin Taranagar (Dighalia Road to Tertiary Centre). Existing road is a brick road. The proposed length of the road is 300m with an ROW is 4m. There is a waste segregation center at chainage 0+310 Km which is approx. 25m from the edge of the road. The existing road has a broad ROW of approx. 4m and is brick made. There is a rubber plantation area on the left side of the proposed road. No tree will require to cut for this proposed road. There is no	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		major waterbody near the proposed road. No utility shifting is required as per site visit. No sensitive receptors are present in proximity of the proposed site.	 Latitude: 23.9585 Longitude: 91.37795 Elevation: 47.586 m Accuracy: 15.0 m Time: 06-01-2023 12:39 Note: Road 3
4.	Road 05 Simma Road to Jibesh Das Road (MMC, Ward no. 08) Start Lat- 23.976398°, Long- 91.382622° End Lat- 23.974251°, Long-91.382470°	Road is to be constructed in ward no. 08 near Bypass, Mohanpur from Simma Road to Jibesh Das Road. The proposed length of the road is 375m with an ROW of 4m. The existing road is brick built with an ROW of average 3m. The land use of the area is mainly residential with agricultural lands nearby. A narrow brick road is present which leads to a section which is mud built. There is a pond with guard wall at chainage 0+150 km which is approximately 2m away from the edge of the road. There are 5 nos. tree, 2- <i>Magnifera Indica</i>, <i>Artocarpus heterophyllus</i>, <i>Areca catechu</i>, <i>Azadirachta indica</i> cutting may be required for construction of this road. There is no significant protected forest in and around project area, road is located outside the town surrounded by agriculture and rural area Few utilities shifting is required. There is no significant protected forest in and around project area, road is located outside the town surrounded by agriculture area	 Latitude: 23.975361 Longitude: 91.383571 Elevation: 19.5216 m Accuracy: 15.2 m Time: 26-12-2022 16:42 Note: MMC ROS tree

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
5	Construction of culvert on Tulabagan 14 no., ward no-12 Dhirendra sarkar house to Rishipara rubber Bagan old quarter	Construction of 3 cell RCC box culvert on the road- ROW – 4.75 m and length 10.74 m. At present there is temporary wooden bridge one seasonal drain. The drain is dry and filled with grasses during summers. No tree cutting may be required for construction of this culvert. There is no significant protected forest in and around project area, culvert is located outside the town surrounded by agriculture area	

Table 18: Site Environmental Features of Drain – Mohanpur

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
1.	Drain 01 (Construction of cover drain from Dilip Saha house to Joydeep Shop) MMC Ward no. 01 Start Lat- 23.958592°, Long- 91. 358974° End Lat- 23.958232°, Long- 91. 359811°	The drain is to be constructed at Bazar Tali, Chandpur, from Dilip Saha House to Joydeep Ghosh Shop. The approx. length of the proposed drain is only 94.4 m. Land use of the area is residential and partly commercial as its very near to the bazar. Existing open cemented drain is present for a section of the proposed site. Clearing of vegetation mostly herbs and climbers and cleaning solid wastes in existing drains is required for normal functioning of drains. As per preliminary site visit, no utility shifting is required. No sensitive receptor is present at proximity. No tree cutting may be required for construction of this drain. There is no significant protected forest in and around project area, drain is located within town surrounded by residential area.	 Latitude: 23.958515 Longitude: 91.358955 Elevation: 22.02±8 m Accuracy: 7.5 m Time: 26-12-2002 15:50 Note: MMC DOT  Latitude: 23.958617 Longitude: 91.358905 Elevation: 22.18±8 m Accuracy: 12.4 m Time: 26-12-2002 13:51 Note: MMC DOT

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
2.	Drain 02 (Construction of cover drain from Jitindra Debnath land to Sarajit Acharjee land, Rabindra Palli) MMC Ward no. 02 Start Lat- 23.967065°, Long- 91.361728° End Lat- 23.968720°, Long-91.362068°	The drain is to be constructed at Katal Tali, from Jitindra Debnath land to Srajit Acharjee land, Mohanpur. The length of the proposed drain is approx. 191.9m. The land use of the area is mostly open, agricultural with patches of habitations nearby, and the proposed drain is present between main road and open/ agricultural land. The existing drain seems as a narrow furrow, which is earthen with only signs of demarcation of agricultural runoff is present. No as such safety features of drain is observed for prevention of pollution. The preliminary site visit concludes on shifting of 1no. of electric pole. Waterbody about 3 m away from the drain. No sensitive receptor is present nearby. No tree cutting may be required for construction of this drain. There is no significant protected forest in and around project area, drain is located outside the town surrounded by agriculture area	 
3.	Drain 03 (Construction of cover drain from Swapan Malakar land to Bakul Debnath house, Rabindra palli) MMC Ward no.02 Start Lat- 23.973113°, Long- 91.365025° / End Lat- 23.970849°, Long-91.364568°	The drain is to be constructed at Rabindra Palli from Swapan Malakar land to Bakul Debnath House. The proposed length of the drain is 536.8 m. The Land use of the area is dominantly residential. The proposed site has lined houses with temporary guard walls made of either bamboo fencing or tin. There is no existing drainage system present, so no safety features of drain are observed. The preliminary site visit concludes on shifting of 1 no electric and one no. telephone pole is required. No tree felling will be required. Sensitive receptors present in close proximity of the proposed site are, one Anganwadi school, one Kali mandir, and one	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		preaching center. Those are not within impact zone. Clearance of herbs is required, for the proposed site.	
4.	Drain 04 (Construction of cover drain from Simna Main Road to Sandhya Maisan house, Ghosh para), MMC Ward no. 02 Start Lat- 23.967824°, Long- 91.365546° End Lat- 23.968694°, Long-91.365380°	The drain is to be constructed at Ghosh Para from Simna Main Road to Sandhya Maisan House. The approx. length of the drain is 98 m. The land use of the area is residential, with lined temporary guard wall made up of Tin. There is no existing drainage system present, so no safety features of drain are observed. No shifting of utility is required as per the preliminary site visit. No tree felling will be required. No sensitive receptors are present in proximity of the proposed site. Few spots contain herbs which needs clearance.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
5.	Drain 05 (Construction of cover drain from Jagabandhu Debnath land to Chandan Bhattacharya house, Rabindra Palli) MMC Ward no. 02 Start Lat- 23.970849°, Long- 91.364568° End Lat- 23.970395°, Long-91.361180°	The drain is to be constructed at Rabindra Palli, Mohanpur from Jagabandhu Debnath land to Chandan Bhattacharya House. The length of the proposed drain is approx. 404.6m. The Land use of the area is residential with temporary boundary walls in maximum houses. No existing drainage system is present; thus, no signs of pollution at source prevention is observed. No shifting of utility is required as per the preliminary site visit. No sensitive receptors are present in proximity of the proposed site. Clearance of herbs and bushes is required in this site. Felling of 3 trees of <i>Mangifera Indica</i> species, <i>Averrhoa carambola</i> and <i>Syzygium cumini</i> may be required. No as such specific environmental feature is observed.	 
6.	Drain 06 (Construction of cover drain from Amal Gope house to Haralal Bhowmik house) MMC Ward no. 03 Start Lat- 23.961081°, Long- 91.360659° End Lat- 23.962460°, Long-91.360716°	The drain is to be constructed at Sukanta Pally near Krishna Mandir, Mohanpur, from Amal Gope house to Haralal Bhowmik house. The length of the proposed drain is approx. 152.9m. No existing drainage system is present. The proposed site is just beside main road, with temporary dumping of construction materials. Habitations are present on one side. No shifting of utility is required as per the preliminary site visit. Sensitive receptor includes one Krishna Mandir, outside the impacted area. No tree cutting may be required for construction of this drain. There is no significant protected forest in and around project area, drain is located outside the town surrounded by agriculture area	 

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
7.	Drain 07 (Construction of cover drain from Goutam Shil house to BOC) MMC Ward no. 03 Start Lat- 23.960320°, Long- 91.360682° End Lat- 23.959572°, Long-91.359770°	The covered drain is to be constructed near Krishna Mandir from Goutam Shil house to BOC, Mohanpur. The length of the proposed drain is 203.4m. The proposed site has a section which has a cemented existing open drain. No tree cutting may be required for construction of this drain. There is no significant protected forest in and around project area, drain is located within the urban area surrounded by residential area No safety features of drain are observed for prevention of pollution. No as such requirement of shifting of utility, electric post. Krishna Mandir is present in close proximity of the proposed site. Clearance of herbs and shrubs which requires clearance in the proposed site.	 Latitude: 23.960320 Longitude: 91.360682 Elevation: 23.959572 m Accuracy: 20.5 m Time: 26-12-2022 16:08 Name: MMC DOB
8.	Drain 08 (Construction of cover drain from near the house of Subhas Deb (Pada) in front of Sudhan Das house Slab culvert.) MMC Ward no. 04 Start Lat- 23.969675°, Long- 91.371375° End Lat- 23.970946°, Long-91.375067°	A covered drain is to be constructed at Sudhai Mohanpur, near the house of Subhas Deb (Pada) to Infront of Sudhan Das house Slab culvert, with a length of 272.8m The land use of the area is residential. Half of the proposed site has an existing cemented open drain, clogged with solid waste which needs to be cleared, and the other half of the drain is mud and earthen built. No measures have been observed for prevention of pollution in the drains. Few utilities shifting is required as per preliminary site visit. One Kali Mandir is present near to the proposed site, outside the impacted zone Clearance of vegetation mostly shrubs is required.	 Latitude: 23.969675 Longitude: 91.371375 Elevation: 23.970946 m Accuracy: 16.3 m Time: 26-12-2022 16:08 Name: MMC DOB  Latitude: 23.970946 Longitude: 91.375067 Elevation: 23.969675 m Accuracy: 4.8 m Time: 26-12-2022 16:09 Name: MMC DOB

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		One Subabul tree cutting may be required for construction of this drain. There is no significant protected forest in and around project area, drain is located within the urabn area surrounded by residential area	
9.	Drain 09 Construction of cover drain from Dulal Modak Shop to Shukhamay Deb land), MMC Ward no. 05 Start Lat- 23.971569°, Long- 91.371911° End Lat- 23.973125°, Long-91.374562°	A RCC covered drain is to be constructed from school Chowmuhani to Hospital Chowmuhani, namely from Dulal Modak Shop to Shukhamay Deb land with a length of 322.3 m. The land use of the area is commercial, residential with lined shops and school and hospital nearby. Half of the proposed site has an existing cemented open drain which is clogged by solid waste, requires cleaning, and other half is mud and earthen drain, filled with vegetation. No measures have been taken to prevent pollution of drains. Few utilities shifting is required as per preliminary site visit. Few trees are present along the drain but felling will be not required. Clearance of vegetation mostly herbs is required, and the drains require proper removal and cleaning of solid waste to function normally. There is no significant protected forest in and around project area, drain is located within the town surrounded by residential area	 Latitude: 23.971661 Longitude: 91.371899 Elevation: 31.59411 m Accuracy: 12.6 m Time: 28-12-2022 16:14 Note: MMC D09  Latitude: 23.971688 Longitude: 91.371981 Elevation: 32.9929 m Accuracy: 8.3 m Time: 28-12-2022 16:13 Note: MMC D09

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
10.	Drain 10 (Construction of cover drain from Simna Main Road to Ramkrishna Ashram) MMC Ward no. 05 Start Lat- 23.968617°, Long- 91.370313° End Lat- 23.971286°, Long-91.369325°	The covered drain is to be constructed at Vivekananda Palli, from Simna Main Road to Ramkrishna Ashram with a length of 387m. No existing drainage system present. According to preliminary site visit, 2no. of electric posts present on the proposed site needs to be shifted. Sensitive receptors include 1no. of Ashram, outside impact zone. Clearing of vegetation mostly herbs is required in the proposed site, No tree felling will be required. There is no significant protected forest in and around project area, drain is located within the urban area surrounded by residential area covered with temporary boundary walls.	 
11.	Drain 11 (Construction of cover drain from Ratan Kanti Debnath house to Rabi Deb land), MMC Ward no. 06 Start Lat- 23.973690°, Long- 91.391755° End Lat- 23.971910°, Long-91.394331°	The drain is to be constructed at Jagatpur School Chowmuhan, from Ratan Kanti Debnath house to Rabi Deb land with a length of 389.7m The drain is located within urban area, the land use of the area is mostly residential with presence of a few habitations nearby. A part of the proposed site has an existing drain mostly covered with vegetation, majorly herbs and climbers which requires clearance, and the other half does not possess any existing drain. According to preliminary site visit, one utility shifting may be required. Felling of atleast 3 trees of species <i>Artocarpus heterophyllus</i>, <i>Acacia nilotica</i> and <i>Lagerstroemia parviflora</i> has been assessed. No sensitive receptors are present nearby proximity.	 

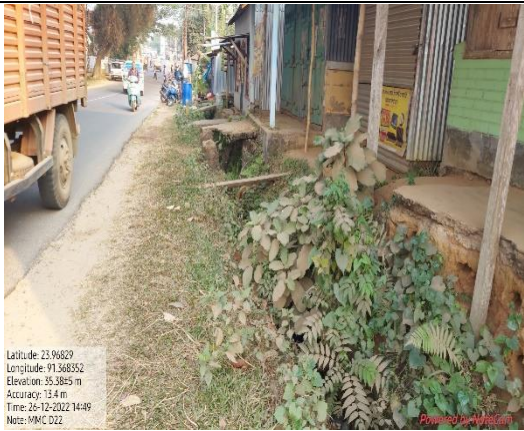
Sl. no	Project Component and location	Environmental Features of the Site	Photograph
12.	Drain 12 Construction of cover drain from Honda Show Room To Ranjit Debnath House), MMC Ward no. 07 Start Lat- 23.976160°, Long- 91.384010° End Lat- 23.973503°, Long-91.383453°	The drain is to be constructed near the bypass main road from Honda Show Room to Ranjit Debnath house with a length of 302m. No habitations are present as such nearby. No existing drainage system present. No utility shifting is required as per preliminary site visit. Mostly open area on the side, with few shops around. Mainly herbs, scrub present, which need clearance.	 Latitude: 23.976027 Longitude: 91.384011 Elevation: 31.617 m Accuracy: 8.5 m Time: 26-12-2022 16:28 Note: MMC D12
13.	Drain 13 (Construction of cover drain from near house of Kiran Deb to Jagatpur Community Hall), MMC Ward no. 08 Start Lat- 23.976160°, Long- 91.384010° End Lat- 23.973503°, Long-91.383453°	The covered drain is to be constructed near Jagatpur. Mohanpur, from near house of Kiran Deb to Jagatpur Community Hall, with a length of 567.5m The land use of the area is mostly open & commercial with presence of a few habitations nearby. No existing drainage system at present. One tree of <i>Ficus religiosa</i> may require to cut for construction of drain. As per preliminary site visit, utility shifting is not required. No sensitive receptors are present nearby. No as such specific environmental feature is observed.	 Latitude: 23.976027 Longitude: 91.384011 Elevation: 31.617 m Accuracy: 8.5 m Time: 26-12-2022 16:28 Note: MMC D13

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
14.	Drain 14 (Construction of cover drain from Shanti Kr. Debnath to Bhajan Debnath land via Aila Ghat Bazar and near Amal Das house to Aila Ghat Bazar), MMC Ward no. 09 Start Lat- 23.957265°, Long- 91.387951° End Lat- 23.958464°, Long-91.389178°	A covered drain is to be constructed near Aila ghat Bazar from Shanti Kr. Debnath to Bhajan Debnath land via Aila Ghat Bazar and near Amal Das house to Aila Ghat Bazar, with an approx. length of 669m. A portion of the project site has existing cemented drain, clogged with solid wastes and is not in use, while the other half does not have any existing drain. Utility shifting may not be required. Sensitive receptors include 1no. School, 2nos. of mandirs, one Shani Mandir and one Kali Mandir. Those are outside the impact zone. Clearing of herbs and shrubs is required. No tree cutting may be required for construction of this drain. There is no significant protected forest in and around project area, drain is located within the town surrounded by residential followed by agricultural area	 Latitude: 23.959335 Longitude: 91.3872 Elevation: 20.6718 m Accuracy: 15.8 m Time: 06-01-2023 13:14 Notes: D14  Latitude: 23.959305 Longitude: 91.387149 Elevation: 20.83412 m Accuracy: 9.2 m Time: 06-01-2023 13:17 Notes: D14
15.	Drain 15 (Construction of cover drain from near the house of Subal Rakshi to Airan Chowmuhani slab culvert (Bothside) and slab culvert to near Bandan (One side only), MMC Ward no. 10 Start Lat- 23.967987°, Long- 91.371653° End Lat- 23.970154°, Long-91.372780°	Covered Drains are to be constructed on both side of the road, at Airan Chowmuhani. from near the house of Subal Rakshi to Airan Chowmuhani slab culvert (Bothside) and slab culvert to near Bandan (One side only), with an approx. length of 797m. The land use of the area is mostly mixed commercial & residential. Bazar area, with busy roads and series of shops lined on both sides. Existing cemented open drains are present on both sides. Drains are clogged and full of vegetation mostly herbs and bushes. Shifting of one electric pole may be required. Presence of sensitive receptors in proximity is none. Clearance of vegetation and proper management is required	 Latitude: 23.970074 Longitude: 91.371852 Elevation: 37.59439 m Accuracy: 12.8 m Time: 26-12-2022 15:56 Notes: MMC D15

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		to revive the drains. One no. of tree (<i>Zizyphus xylopara</i>) felling may be required.	 Latitude: 23.9672 Longitude: 91.371824 Elevation: 37.58256 m Accuracy: 15.0 m Time: 26-12-2022 15:31 Note: MMC D16
16.	Drain 16 (Construction of cover drain from near BSNL office to Airan Chowmuhani slab culvert) MMC Ward no. 10 Start Lat- 23.968588°, Long- 91.370475° End Lat- 23.969507°, Long-91.371315°	The covered drain is to be constructed, from near BSNL office to Airan Chowmuhani slab culvert with a approx. length of 138.4m. The land use of the area is commercial, with mainly bazar area. Presence of series of shops, mostly fishes, meat and vegetable shops. No drainage system is present, dumping of raw wastes is seen here and there. Shifting of one electric post may be required. No tree felling will be required for construction of drain. No sensitive receptors are found nearby in close proximity.	 Latitude: 23.968967 Longitude: 91.371 Elevation: 37.58256 m Accuracy: 14.5 m Time: 26-12-2022 15:40 Note: MMC D16  Latitude: 23.969175 Longitude: 91.37112 Elevation: 37.58219 m Accuracy: 15.0 m Time: 26-12-2022 15:41 Note: MMC D16
17.	Drain 17 (Construction of cover drain from near the house of Kajal Debnath to Bikash Biswas land), MMC Ward no. 11 Start Lat- 23.960652°, Long- 91.380480° End Lat- 23.962392°, Long-91.381564°	The drain is to be constructed at Mahadev Para, Mohanpur, from near the house of Kajal Debnath to Bikash Biswas land. Approx. length of drain is 464 m. The land use of the area is residential. Both side of the road has existing cemented drainage system which is already in use, but no measures have been taken to prevent pollution. The outfall of the drain leads to a pond following it is a low agricultural land. Shifting of one Electrical post is required as per preliminary site visit. No tree felling will be required for construction of drain.	 Latitude: 23.960809 Longitude: 91.377801 Elevation: 38.7212 m Accuracy: 11.9 m Time: 06-01-2023 15:36 Note: D18

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		Sensitive receptors include one Anganwadi and one mandir located outside the impact zone. .	 Latitude: 23.960187 Longitude: 91.37577 Elevation: 33.3888 m Accuracy: 6.9 m Time: 06-01-2023 13:38 Note: D18
18.	Drain 18 (Construction of cover drain from near the house of Bimal Biswas to PWD Main Road), MMC, Ward no. 11 Start Lat- 23.960911°, Long- 91.377895° End Lat- 23.959802°, Long-91.377042°	The covered drain is to be constructed at Dhakaiya Pally, Mohanpur, from near the house of Bimal Biswas to PWD Main Road, with an approx. length of 214.2 m The land use of the area is mainly residential. A section of the proposed site has existing cemented drain while the other section has a mud and earthen drain with lined up vegetation majorly herbs and shrubs, which requires clearance. The drain also passes through a low-lying cultivation field leading to rubber plantation and finally merges with a stream. No measures have been observed to prevent pollution of drains. Shifting of one Electrical post is required as per preliminary site visit. No sensitive receptors are found near close proximity to the proposed site. No tree cutting will be required for construction of this drain.	 Latitude: 23.962949 Longitude: 91.380234 Altitude: 27.48812 m Accuracy: 8.4 m Time: 06-01-2023 14:22 Note: D19 Latitude: 91.379031 Elevation: 31.53412 m Accuracy: 2000.0 m Time: 06-01-2023 14:00 Note: D19

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
19.	Drain 19 (Construction of covered drain from Chanmohan Das House to Jaharlal Das House) MMC Ward No. 12 Start Lat- 23.945512°, Long- 91.358909° End Lat- 23.947335°, Long-91.360163°	The covered drain is to be constructed at Bibi Tilla, from Chanmohan Das House to Jaharlal Das House, with an approx. length of 313.1 m. The land use of the area is residential and open area No drainage system is existing at present in the proposed location. A section of the proposed site is bushy, full of herbs and shrubs, which requires clearance while the other section is lined with temporary boundary walls lined near the habitations. Shifting of one electric pole is required. Sensitive receptors include 2 nos. of temples, outside the impact zone. No tree cutting will be required for construction of this drain.	 Latitude: 23.945995 Longitude: 91.358906 Elevation: 35.54222 m Accuracy: 0.9 m Time: 26-12-2022 15:01 Note: MMC 019  Latitude: 23.94609 Longitude: 91.358906 Elevation: 19.216 m Accuracy: 1.7 m Time: 26-12-2022 15:17 Note: MMC 019
20.	Drain 20 (Construction of cover drain from near Nimai Gope house to Krishna Mandir) MMC Ward no. 13 Start Lat- 23.961576°, Long- 91.361309° End Lat- 23.959641°, Long-91.363225°	The drain is to be constructed at Bohemian Colony in Mohanpur, from near Nimai Gope house to Krishna Mandir with an approx. length of 404 m. The land use of the area is mainly residential, lined with temporary boundary walls. No drainage system is existing at present in the proposed location Only few places have earthen furrow, filled with herbs. Sensitive receptor includes 2no. of temples are present nearby, One Krishna Mandir and one Shani Mandir, outside the impact zone Few places require clearing of vegetation, mostly herbs and shrubs. No tree cutting will be required for construction of this drain.	 Latitude: 23.960791 Longitude: 91.362025 Elevation: 16.3812 m Accuracy: 18.4 m Time: 26-12-2022 14:16 Note: MMC 020  Latitude: 23.961211 Longitude: 91.361340 Elevation: 19.47512 m Accuracy: 12.1 m Time: 26-12-2022 14:18 Note: MMC 020 Krishna mandir

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
21.	Drain 21 (Construction of covered drain from Tulabagan School to Kishore Debnath House) MMC Ward No. 14 Start Lat- 23.946302°, Long- 91.367415° End Lat- 23.947400°, Long-91.367312°	The covered drain is to be constructed near Tulabagan School to Kishore Debnath House, with an approx. length of 153.95 m. The land use of the area is residential with presence of cropland mainly vegetables sporadically, lined to the proposed site. No existing drainage system noted, however earthen furrow is lined near the proposed site. Series of trees (20 nos.) mostly drumstick present lining the proposed site, outside the impact zone. Four tree (<i>Mangifera Indica</i>, <i>Areca catechu</i>, <i>Caryota urens</i>, and <i>Ficus glomerata</i>) cutting may be required for construction of this drain. Utility shifting of 2 no. Electric pole is required. An inactive well is present near the proposed site (Approx. within 2 meters). Sensitive receptor includes, Tulabagan School, which is approximately within 15m of the proposed site, outside the impact zone.	 Latitude: 23.946659 Longitude: 91.367407 Elevation: 10.1112 m Accuracy: 14.1 m Time: 26-12-2022 13:28 Note: MMC D21  Latitude: 23.946458 Longitude: 91.367188 Elevation: 25.4783 m Accuracy: 13.5 m Time: 26-12-2022 13:27 Note: MMC D21
22.	Drain 22 (Construction of cover drain from near the Grocery Shop of Anil Paul to Ghosh Para slab culvert), MMC Ward no. 15 Start Lat- 23.968398°, Long- 91.369496° End Lat- 23.967906°, Long-91.366483°	The drain is to be constructed at Sudhai Mohanpur opposite Mohanpur English Medium School, from near the Grocery Shop of Anil Paul to Ghosh Para slab culvert. Approx length of the drain is 311.5 m. The land use of the area is commercial, which is along the main road, lined with shops. There are few houses are also noted along the drain. There is an existing open cemented drain present, which clogged with solid waste and	 Latitude: 23.96829 Longitude: 91.368352 Elevation: 35.3855 m Accuracy: 13.4 m Time: 26-12-2022 14:49 Note: MMC D22

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		growth of herbs and shrubs, proper management and clearance of vegetation is required, for proper functioning of the drains. According to preliminary site visit, around 7 nos. utility shifting is required. Sensitive receptors are present in close proximity which includes, Mohanpur English Medium School and one Shani Mandir. Those are outside the impact zone. No tree cutting will be required for construction of this drain.	

Table 19: Site Environmental Features of road – Ranirbazar

SI no.	Road Name	Length of the road(m)	Starting and endpoint of the road	Environmental Features of the Site	Photograph
1	Gopal Road To Fish market	165 m with 3.0-3.5 m RoW	Starting point- Lat- 23.836284° Long- 91.364844° End Point Lat- 24.331897° Long- 92.000394°	Maximum portion of the existing road is foot/pathways traditionally used by the villagers. The existing road has very poor horizontal and vertical geometry. There is a waterbody near the end point of the proposed road. On the right side of the there is an open drain. Project road predominately traverses through plain terrain however small section passes through rolling terrain. The existing right-of-way of the project is 3.0-3.5 meter. Utility shifting is not required for this proposed road except shifting of one tap may be required. The alignment in this road passes through residential area. There is no environmentally sensitive area near the proposed subproject road. There are few numbers of coconut trees near the proposed which will not impacted due to the construction of road. No tree cutting will be required for construction of this road. There is no significant protected forest in and around project area, road is located within the town surrounded by residential area. Construction material dumped near the end point of the road. No environmentally sensitive areas in or near the proposed alignment.	 Latitude: 23.835975 Longitude: 91.365306 Elevation: 22.74±19 m Accuracy: 19.1 m Time: 08-12-2022 12:09 Note: Ranirbazar road 2 

SI no.	Road Name	Length of the road(m)	Starting and endpoint of the road	Environmental Features of the Site	Photograph
					
2.	Ranirbazar market of Natmandir to late Dilip Debnath house	280 m with 3.5 m RoW	Starting point- Lat- 23.833643° Long- 91.366988° End Point Lat- 23.834869° Long- 91.364688°	The existing bituminous surface is in good condition, presently. The existing road has good geometry and has available Right of Way of 3.0-3.5m. There is an open drain right side of the road. No tree cutting will be required for construction of this road. There is no significant protected forest in and around project area, road is located within the town surrounded by commercial and residential area. A Temple and a school along subproject road within 10 meters from the edge of the existing road has been identified. Utility shifting is required for the road. There is no waterbody near the proposed road. There are no trees near the proposed road. Demolition work may require to construct the proposed road. There is no significant protected forest in and around project area.	

Table 20: Site Environmental Features for Ranirbazar Drain

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
1.	Construction of RCC covered drains left/right side Nalgaria (NH-8) to Assampara Treatment Plant (NH-8 to Anganbari School)- Drain D1 <i>Start-Lat- 23.822426°, Long- 91.378150° / End-Lat- 23.819307°, Long- 91.372779°</i>	The subproject area covers from parts of wards 10,12 & 13. of RMC area. It is located near Assampara Treatment Plant. A total of 860m storm water drains with precast RCC covers will be constructed alongside the roads to facilitate smooth draining of storm water coming on the roads so that surface runoff generated during rainy season is properly collected, transported, and discharged to the nearest river. There are roadside drains in certain areas, but these are poorly designed with inadequate gradients, and are frequently clogged with solid waste and polluted by sewage. Drain passes mostly through residential areas. The drain will be developed within the available existing RoW. No new land will be acquired from private sources. There is an Anganwadi adjacent to the proposed drain, measure should be taken during the construction. There is a temple adjacent to drain, which will save through judicial design. Utility shifting like shifting of 4 electric post, one transformer may be required. There is no significant protected forest in and around project area. No tree cutting will be required for construction of this drain.	 Latitude: 23.824145 Longitude: 91.378442 Elevation: 9.52221 m Accuracy: 17.5 m Time: 08-12-2022 14:14 Note: Ranirbazar drain 7  Latitude: 23.824368 Longitude: 91.378553 Elevation: 28.8366 m Accuracy: 22.3 m Time: 08-12-2022 14:14 Note: Ranirbazar drain 7 

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
2	Construction of RCC covered drains left/right side from NH-8 Gopal Road to Ranirbazar Market , Drain D3 Start-Lat- 23.834150°, Long- 91.366723° End: Lat- 91.363423°, Long- 91.363423°	The proposed drain covers the portions of ward no 4. The length of the proposed drain is 741.7m. Width of the proposed drain ranges from 0.4 m to 1.2 m. The proposed drain mostly encroached in the commercial and residential areas. There is also no proper system for storm water drainage in this area. There are roadside drains in certain areas, but these are poorly designed with inadequate gradients, and are frequently clogged with solid waste. There are no trees near the proposed drain, but outside the impacted area. There is a big water body adjacent to the proposed drain. Measure should be taken during the construction period. 4 electric posts and one telephone post needs to be shifted. No environmentally sensitive areas in or near the proposed drain. No tree cutting will be required for construction of this drain.	 Latitude: 23.835593 Longitude: 91.365405 Elevation: 22.74±11 m Accuracy: 24.7 m Time: 08-12-2022 12:10 Note: Ranirbazar road 2
3	Construction of RCC covered drains left side/ right side of Ranirbazar Market Natmandir to Dilip Debnath house, Drain D4 Start-Lat- 23.834788°, Long- 91.364859° End-Lat- 23.833670°, Long- 91.366982°	Drain along the Natmandir to Dilip Debnath house. The existing carriageway of this road is 3m and the earthen shoulder with drain ranges from 0.5m to 0.7m wide on either side. The length of the proposed drain is 547 m. Land use along the road from Ranirbazar Market Natmandir to Dilip Debnath house is commercial and residential. The shops are using the footpath with temporary extensions. Two trees of species <i>Acacia nilotica</i> and <i>Artocarpus heterophyllus</i> cutting may be required for construction of this drain. There is a school and a temple within the 10m radius of proposed drain. There are roadside drains, but these are poorly designed with inadequate gradients, and are	 Latitude: 23.834507 Longitude: 91.365667 Elevation: 22.74±4 m Accuracy: 21.9 m Time: 08-12-2022 12:37 Note: Ranirbazar road 3 and drain 4 utility

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		frequently clogged with solid waste. Shifting of about 10 electric post and 1 transformer may be required. Topography of the area is mostly flat. There is no significant protected forest in and around project area.	
4	Construction of RCC covered drains left side/ right side of Ranirbazar Cattle Market to Ghora mara River, Drain D 5 Start-Lat- 23.840508° , Long- 91.367831° / End-Lat- 23.837938°, Long- 91.363714°	This proposed drain runs along Ranirbazar Cattle Market to Ghora mara River. RCC covered drain is proposed along one side of the road. The length of the proposed drain is 871 m. The width of the carriageway ranges from 3 m to 4.5 m and the earthen shoulder ranges from 0.5 m to 1 m on either side. There are few trees along the roadside which will be not affected. The road is within town congested by the residential property in few starches. The land use along the drainage area is residential. Shifting of about 10 electric post and 1 transformer may be required. No environmentally sensitive areas in or near the proposed alignment. There is no protected forest in and around project area. No tree cutting will be required for construction of this drain.	 Latitude: 23.840625 Longitude: 91.365316 Elevation: 23.85±8 m Accuracy: 7.8 m Time: 08-12-2022 14:46 Note: Ranirbazar road 5 Powered by NoteCam  Latitude: 23.840691 Longitude: 91.366287 Elevation: 12.8±14 m Accuracy: 7.8 m Time: 08-12-2022 14:45 Note: Ranirbazar road 5

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
			
5	Construction of RCC covered drains left side/ right side of existing OHT to Natmandir, Drain D 6 Start-Lat- 23.834088° , Long- 91.364395° End- Lat- 23.834806°, Long- 91.364550°	This proposed drain runs along the main road. The drain length is only 31 m. Drain is passing through commercial areas within town. The width of the carriageway is 4 m and there is an existing drain on the left side of the road which is frequently clogged with solid waste and polluted by sewage. There is a temple at the endpoint of the drain, but outside the impact zone. No environmentally sensitive areas in or near the proposed alignment. There is no significant protected forest in and around project area. No tree cutting will be required for construction of this drain.	
6	Construction of RCC covered drains left side/ right side of Natmandir to NH-8, Drain D 7 Start-Lat- 23.834814° , Long- 91.364523° End- Lat- 23.836198°, Long- 91.364874°	This drain runs from Natmandir to NH-8 and along the Road of 3.5 m carriageway with both side drain. Proposed length of the drain approx. 300 m. The existing drains are not in good condition because of the drains are choked with silt, solid waste etc. There is a school adjacent to the proposed drain, measure should be taken during the construction period. One telephone pole which may need to shift for the construction. The land use along the road is partly residential and partly commercial. There are no trees along the road.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		There is no significant protected forest in and around project area. No tree cutting will be required for construction of this drain.	
7	Construction of RCC covered drains left side/ right side of Nalgaria (NH-8) to Assampara Treatment Plant (From Anganwari School to existing outfall), Drain D 8 Start- Lat- 23.827012° , Long- 91.379228° End- Lat- 23.821992° , Long- 91.378330°	Storm water drains will be constructed within RoW of public roads under the government land. This drain runs from Anganwari to existing outfall and along the Road of 4 m carriageway with earthen shoulder 1 m wide on either side. The land use along the road is partly residential and the remaining part is mostly vacant agricultural field. There is an Anganwadi at the starting point of the drain. One number of temple is also located near the proposed drain. There are several betel nut trees along the road. Outfall is noted on nearby <i>nallaha</i> adjacent to agricultural land. There is no significant protected forest in and around project area. No tree cutting will be required for construction of this drain. However few numbers of utility (3 electric & 2 telephone posts) shifting may be require.	 Latitude: 23.821785 Longitude: 91.373337 Altitude: 21.71±10 m Accuracy: 6.4 m Time: 08-12-2022 14:08 Note: Ranibazar drain 7  Latitude: 23.822091 Longitude: 91.37278 Elevation: 23.81±11 m Accuracy: 13.7 m Time: 08-12-2022 13:57 Note: Ranibazar drain 7
8	Construction of RCC covered drains left side/ right side of Dhan Chowmuhani to Thana Road Tri Junction, Drain D 9 Start: Lat- 23.833003° , Long- 91.368277° End: Lat- 23.833670° , Long- 91.366982°	This proposed drain is the continuation of the drain no-4 within town. Abutting land use is predominantly residential area. This proposed drain runs along the main road. The existing carriageway of this road is 3m and the earthen shoulder with drain ranges from 0.5m to 1m wide on either side. Length of the proposed drain is about 464 m. There is an existing open drain of this area are choked up due to improper sections, slope etc. and improper maintenance. There are no trees near the proposed drain. There is no waterbody near the proposed drain. Shifting of few utilities	 Latitude: 23.833664 Longitude: 91.367093 Elevation: 26.74±6 m Accuracy: 19.7 m Time: 08-12-2022 13:24 Note: Ranibazar drain 9

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		may be required for construction of drain. No tree cutting will be required for construction of this drain. No environmentally sensitive areas in or near the proposed alignment. There is no significant protected forest in and around project area.	
Typical site picture under different stretch			
1.	Hand Pump near Drain 3	Existing water hand pump may require to shift for the drain construction.	
2	Hand Pump near Drain 5	Existing water hand pump is adjacent to the existing drain which may require to shift during the construction period.	
3.	Community property on Drain-3	Existing community property is adjacent to the existing drain which may require to shift.	

Table 21: Sensitive Receptors in the Project Influence area – Mohanpur Road

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
1.	Temple (Kalimandir)	Bibi Tilla	Within 2 meters	 Latitude: 23.946561 Longitude: 91.358642 Elevation: 55.54425 m Accuracy: 23.3 m Time: 26-12-2022 13:06 Note: MMC D19 Kali mandir
2.	Temple (Lokenath Mandir)	Bibi Tilla	Within 15 meters	 Latitude: 23.946976 Longitude: 91.358678 Elevation: 12.27810 m Accuracy: 9.3 m Time: 26-12-2022 13:19 Note: MMC D19 Kali mandir
3.	Temple (Kalimandir)	Ward no. 01	Within 15 meters	 Latitude: 23.958517 Longitude: 91.359312 Elevation: 55.87412 m Accuracy: 22.3 m Time: 26-12-2022 13:40 Note: MMC D01 Kali mandir
4.	Temple (Krishna Mandir)	Rabindra Palli	Within 10 meters	 Latitude: 23.96161 Longitude: 91.360599 Elevation: 43.3888 m Accuracy: 5.7 m Time: 26-12-2022 14:02 Note: MMC D03 Krishna mandir

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
5.	Temple (Sani Mandir)	Bohemian Colony	Within 1.5 meters	 Latitude: 23.90084 Longitude: 91.561976 Elevation: 8.57412 m Accuracy: 13.3 m Time: 26-12-2022 14:15 Note: MMC D20
6.	Temple (Kali Mandir)	Rabindra Palli	Within 10 meters	 Latitude: 23.970231 Longitude: 91.564035 Elevation: 33.93472 m Accuracy: 9.3 m Time: 26-12-2022 14:40 Note: MMC D03
7.	Temple (Sani Mandir)	Opposite Mohanpur English Medium School	Within 10 meters	 Latitude: 23.968307 Longitude: 91.568516 Elevation: 33.3842 m Accuracy: 9.8 m Time: 26-12-2022 14:50 Note: MMC D22 Sani mandir
8.	Temple (Ramkrishna Mandir)	Vivekananda Palli	Within 2 meters	 Latitude: 23.970229 Longitude: 91.569495 Elevation: 32.89455 m Accuracy: 10.2 m Time: 26-12-2022 15:35 Note: MMC D10

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
9.	Temple (Kali Mandir)	Sidhai Mohanpur	Within 1 meter	 Latitude: 23.970088 Longitude: 91.372648 Elevation: 31.9944 m Accuracy: 35.8 m Time: 26-02-2022 16:01 Note: NMC, D68 Powered by NoteCam
10	Temple (Krishna Mandir)	Mahadev Para	Within 5 meters	 Latitude: 23.940587 Longitude: 91.377594 Elevation: 36.2166 m Accuracy: 5.4 m Time: 06-01-2023 13:42 Note: D18 Powered by NoteCam
11	Temple (Krishna Mandir)	Dhakaiya Pally	Within 2 meters	 Latitude: 23.940742 Longitude: 91.379683 Elevation: 39.82412 m Accuracy: 8.4 m Time: 06-01-2023 13:55 Note: D19 Powered by NoteCam
12	Temple (Kalimandir)	Aila ghat Bazar	Within 5 meters	 Latitude: 23.939062 Longitude: 91.368405 Elevation: 29.22116 m Accuracy: 10.2 m Time: 06-01-2023 13:26 Note: D14 Powered by NoteCam

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
13	Temple (Krishna Mandir)	Aila ghat Bazar	Within 10 meters	 Latitude: 23.959369 Longitude: 91.387082 Elevation: 29.48m2 m Accuracy: 13.6 m Time: 06-01-2023 13:13 Note: D16
14	Temple (Lokenath Mandir)	Dhakaiya Pally	Within 5 meters	 Latitude: 23.961002 Longitude: 91.380035 Elevation: 57.18m2 m Accuracy: 15.6 m Time: 06-01-2023 13:57 Note: D17
15	Anganwadi school	Rabindra Palli	Within 2 meters	 Latitude: 23.970782 Longitude: 91.364416 Elevation: 21.3148 m Accuracy: 11.5 m Time: 06-12-2022 14:34 Note: MMC DG's anganwadi
16	Anganwadi school	Mahadev Para	Within 10 meters	 Latitude: 23.960302 Longitude: 91.377253 Elevation: 50.96m24 m Accuracy: 16.7 m Time: 06-01-2023 13:42 Note: D18

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
17.	School	Tula Bagan	Within 10 meters	 Latitude: 23.945112 Longitude: 91.56697 Elevation: 11.99124 m Accuracy: 11.5 m Time: 26-12-2022 13:34 Note: MMC D23 TULABAGAN SCHOOL
18	School	Taranagar	Within 20 meters	 Latitude: 23.93908 Longitude: 91.586209 Elevation: 22.1348 m Accuracy: 10.2 m Time: 06-01-2023 15:27 Note: D14 school
19	School		Within 10 meters	 Latitude: 23.96851 Longitude: 91.568167 Elevation: 33.9844 m Accuracy: 6.9 m Time: 26-12-2022 14:47 Note: MMC D22
20.	Preaching Centre	Gopalnagar	Within 2.5 meters	 Latitude: 23.971458 Longitude: 91.564792 Elevation: 30.2112 m Accuracy: 16.6 m Time: 26-12-2022 14:36 Note: MMC D25

Table 22: Sensitive Receptors in the Project Influence area – Ranirbazar

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
2.	Anganwari School	At the starting point of Drain 8 and end point of drain 1	Adjacent to the proposed drain.	 Latitude: 23.822558 Longitude: 91.976172 Elevation: 23.027 m Accuracy: 6.2 m Time: 08-12-2022 14:13 Note: Ranirbazar drain 7 Powered by NoteCam
3.	School	Near the starting point of drain no 7	Adjacent to the proposed drain.	 Latitude: 23.835356 Longitude: 91.964759 Elevation: 23.7433 m Accuracy: 20.9 m Time: 08-12-2022 13:00 Note: Ranirbazar drain 8 school Powered by NoteCam
4	School	Near the end point of drain 4	10 m from the proposed drain.	 Latitude: 23.834237 Longitude: 91.964076 Elevation: 22.7415 m Accuracy: 18.6 m Time: 08-12-2022 12:40 Note: Ranirbazar road 3 and drain 4 school Powered by NoteCam
5	Temple	Near the end point of drain 4	10 m from the proposed drain.	 Latitude: 23.83427 Longitude: 91.966112 Elevation: 22.7433 m Accuracy: 22.3 m Time: 08-12-2022 12:39 Note: Ranirbazar road 3 and drain 4 temple Powered by NoteCam

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
6	Temple	At the end point of Drain 6	Adjacent to the proposed drain.	 Latitude: 23.834807 Longitude: 91.364435 Elevation: 22.1423 m Accuracy: 21.6 m Time: 08-12-2022 13:16 Note: Ranibazar drain 6 temple
7	Temple	At the end point of Drain 9	Adjacent to the proposed drain.	 Latitude: 23.833064 Longitude: 91.366141 Elevation: 23.8422 m Accuracy: 25.6 m Time: 08-12-2022 13:40 Note: Ranibazar drain 9
8	Temple	Near the starting point of Drain 1	Within 5 m from the proposed drain.	 Latitude: 23.824368 Longitude: 91.376553 Elevation: 28.8319 m Accuracy: 22.3 m Time: 09-12-2022 14:14 Note: Ranibazar drain 7

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

53. Potential environmental impacts of the proposed infrastructure components are presented in this section. Mitigation measures to minimize/mitigate negative impacts, if any, are recommended along with the agency responsible for implementation. Monitoring actions to be conducted during the implementation phase is also recommended to reduce the impact.

54. Screening of potential environmental impacts are categorized into four categories considering subproject phases: location impacts and design impacts (pre-construction phase), construction phase impacts and operations and maintenance phase impacts.

- (i) **Location impacts** include impacts associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site.
- (ii) **Design impacts** include impacts arising from Investment Program design, including technology used, scale of operation/throughout, waste production, discharge specifications, pollution sources and ancillary services.
- (iii) **Pre-construction impacts** include impacts which are anticipated during construction works but planning is required for proposed mitigation measures before start of construction works such as taking consents from various departments, planning for construction and workers camps, deployment of safety officer, arrangement of required barricades and caution boards etc.
- (iv) **Construction impacts** include impacts caused by site clearing, earthworks, machinery, vehicles, and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.
- (v) **O&M impacts** include impacts arising from the operation and maintenance activities of the infrastructure facility. These include routine management of road and drain, and occupational health and safety issues.

55. Screening of environmental impacts has been based on the impact magnitude (negligible/moderate/severe - in the order of increasing degree) and impact duration (temporary/permanent).

56. This section of the IEE reviews possible project-related impacts, in order to identify issues requiring further attention and screen out issues of no relevance. ADB SPS (2009) require that impacts and risks will be analysed during pre-construction, construction, and operational stages in the context of the project's area of influence. The ADB Rapid Environmental Assessment Checklist (**Appendix 1**) has been used to screen the project for environmental impacts and to determine the scope of the IEE.

57. In the case of this project (i) most of the individual elements involve straightforward construction and operation, so impacts are mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the civil construction process, and are produced because that process is invasive, involving excavation and earth, material movements, disposal of drainage silt/sludge/garbage and (iii) being mostly located in an urban area, will not cause direct impact on biodiversity values. The project has been in properties held by the local government and access to the project location is through public rights-of-way and existing roads hence, land acquisition and encroachment on private property will not occur.

B. Design and Location Impacts

58. **Integration of EMP in bidding documents and contracts.** Lack of awareness by contractors on ADB SPS requirements may result in insufficient budget and non-implementation of EMP.

59. To ensure that EMP will be provided with sufficient budget and implemented:

- (i) Once the Contractor is selected, the PIU with support from PMSC will inform contractors on their responsibilities in EMP implementation, in compliance with ADB and government requirements, self-monitoring and reporting procedures.
- (ii) The PMU will incorporate the costs of implementing OHS and the EMP as well as specific provisions requiring contractors to comply with all other conditions required by ADB into the bidding and contract document.

60. **Updating of IEE.** The PMU shall update the IEE in case of change in design/ location during design verification prior to start of construction. and during construction, if needed and submit the same for review and clearance of ADB.

61. **Design of the Proposed Components.** The proposed design for the subproject includes construction of roads and drains. The subproject road involves construction of utility ducts and trenches for drainage lines, water supply lines, and electricity and telecommunication cables. The IRC: 98-1997, Guidelines on accommodation of utility services on roads in urban areas is followed. Various design features that will improve the existing condition of the roads are as follows:

- (i) Storm water drain is provided at the extreme edge of the right of way;
- (ii) Water supply lines carrying water at high pressure may cause damage to the road pavement, so they are provided on one side of the road;
- (iii) There is safe distance between water supply line and drainage line to avoid any intermixing in case of any leakage or pipe burst.
- (iv) Footpaths are provided cater the needs of elderly and persons with disability.
- (v) Electric cables are kept away from water supply lines to avoid short circuit;
- (vi) The cables are away from tree line to avoid possible entrapment of the cable by tree roots.

62. **Utilities.** Telephone lines and wires within the close proximity to proposed subproject locations may require to be shifted in few cases, exact number of utilities require shifting it will be confirmed after confirmatory survey by contractor. To mitigate the adverse impacts due to relocation of the utilities, contractor will (i) identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; (ii) provide prior notice (at least one week in advance) to affected areas and (iii) require construction contractors to prepare and implement a contingency plan to include actions to be done in case of unintentional interruption of services. Surveys along road and drains in different towns have been carried out. The following Table show the impacted utilities in 3 towns. A further confirmatory survey will be carried out by concerned contractor before finalization of list of utilities which required shifting. Chainage wise strip plan is attached as **Appendix 6.**

Table 23: Summary of utility with proximity to proposed project components

Sr No	Total Impacted/ Shifting Required in no.							Tree felling requirement*
	Electric post	Telephone post	Light post	Transformer	Tube well/ Tap	Optical Fiber Cable	Traffic Signal	
Khowai roads								
	2							
Khowai Drains								
	26	5	1	1	0	1	2	7
Mohanpur Roads								
	14	0	0	0	0			7
Mohanpur Drains								
	24	1	0	0	0	0	0	13
Ranirbazar Roads								
			1		2			
Ranirbazar drains								
	36	6	0	3	0	0	0	2
Total	102	12	2	4	2	1	2	29
*Local tree species commonly used for avenue plantation like <i>Terminalia belerica</i> , <i>Artocarpus heterophyllus</i> , <i>Mangifera Indica</i> , <i>Azadirachta indica</i> , <i>Averrhoa carambola</i> , <i>Syzygium cumini</i> , <i>Leucaena leucocephala</i> , <i>Acacia nilotica</i> , <i>Lagerstroemia parviflora</i> , <i>Ficus religiosa</i> , <i>Zizyphus xylopara</i> , <i>Emblica officinalis</i> , <i>Tamarindus indica</i> , <i>Anogeissus pendula</i> , <i>Ficus glomerata</i> , <i>Caryota urens</i> , <i>Areca catechu</i> and commercial rubber plantation may require cutting								

63. **Social and Cultural Resources – Chance Finds.** Any work involving ground disturbance can uncover and damage archaeological and historical remains. For this project, excavation will occur in project sites for construction of roads and drains. PIU and the contractor will follow chance find protocol to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved:

- (i) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work
- (ii) Stop work immediately to allow further investigation if any finds are suspected;
- (iii) Inform Archaeological Department if a find is suspected, and taking any
- (iv) action they require to ensure its removal or protection in situ.

64. **Works near common properties, physical cultural resources other religious, cultural and other sensitive places.** Damage to private and common properties (such as temples, religious trees, boundary walls, houses). Construction works may also disturb / inconvenience community and visitors. Measures are required to minimize the impact. Following measures shall be implemented: -

- (i) Prior to commencement of construction, consult with concerned religious authorities of these temples, nearby people and devotees and explain the work method and duration of proposed works, take their suggestions and comments in scheduling and conducting the works
- (ii) Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as pneumatic drills, dozers etc., within 50 m of these structures
- (iii) Put in place proper dust and noise control measures

- (iv) Adjacent to religious/social buildings, undertake excavation and construction work in such a way that no structural damage is caused to the structures
- (v) Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places
- (vi) Cutting of any religious trees may be avoided, if possible, change alignment to protect old and religious trees.
- (vii) Provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.
- (viii) Ensure proper traffic management planning to minimize the disruption to the normal traffic flow in the area and ensure the safety of the people.
- (ix) Clear the work site of unnecessary material, equipment and debris / surplus soil; do not stock material / soil at the sites
- (x) Conduct continuous consultations with the local people during the works

65. **Impacts on local surface drainage:** Project towns face problems of water logging after heavy rains across the towns, but mainly in the low-lying areas. Improvement of roads will raise the level and may act as barrier for free movement of surface runoff, leading to water logging. Surface improvement of roads will also increase the runoff volume. This may impact the overall drainage system, if road improvements are not combined with appropriate improvements in drainage system. Under this subproject, improvement of roads is being undertaken along with provision of side lateral drains, and cross drainage structures like culverts where required to collect and convey surface runoff. Therefore, no adverse impacts envisaged on the local drainage due to the proposed subproject. Subproject also includes construction / improvement of existing drains in various places to collect and convey runoff into nearby streams / *charras* / rivers to mitigate the problem of water logging.

66. **Water pollution due to discharge of wastewater into drains.** At present there is no sewerage system in the subproject towns, and households mainly depend on septic tanks for disposal of sewage, and sullage (from kitchen and bath) is discharged into open drains, local streams or on to vacant lands. In some cases, outflow of septic tanks is also connected to open drains. Improvement of drains under the subproject will facilitate the surface drains, however, at the same time, it will also collect and discharge the wastewater that is discharged into drains from the town areas into streams and rivers through outfalls. The discharge of untreated wastewater, especially during the dry season, will degrade the receiving water bodies, impacting both the uses and aquatic life. To mitigate this, the Government of Tripura, has proposed to develop an interception, diversion and treatment system under the AMRUT/ similar scheme. This subproject also included fecal sludge management system, under which septage from septic tanks will be collected, conveyed to a treatment facility for treatment and disposal.

67. The proposal under the AMRUT scheme include interception of major drains in the core town areas, and the collection and conveyance of the intercepted wastewater to sewage treatment plant (STP) for treatment and disposal or reuse. Fecal sludge management system includes mobile tankers for collection of septage from septic tanks, and conveyance to STP for treatment and disposal. This project is presently under tendering stage, and will be completed in about 2 – 3 years.

68. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas.** Priority is to locate these near the subproject location. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and result in destruction of property, vegetation and drinking water supply systems. Thickly populated

residential areas shall not be considered for setting up camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). Extreme care to be taken to prevent disposals near water bodies or in areas which are inconvenience the community.

69. **Site selection for equipment lay-down and storage area.** Improper selection will affect local environment and inconvenience to public. Possible mitigation measures are:

- (i) Choice of location for equipment lay-down and storage areas must consider distances to adjacent land uses, general onsite topography and water erosion potential of the soil. Impervious surfaces must be provided where necessary.
- (ii) Storage areas shall be secure to minimize the risk of crime. They shall also be safe from access by children or animals etc.
- (iii) Residents living adjacent to the construction site must be notified of the existence of the hazardous storage area.
- (iv) Equipment lay-down and storage areas must be designated, demarcated, and fenced if necessary.
- (v) Fire prevention facilities must be present at all storage facilities.
- (vi) Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage areas.
- (vii) These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.
- (viii) Fuel tanks must meet relevant specifications and be elevated so that leaks may be easily detected.
- (ix) Staff dealing with these materials or substances must be aware of their potential impacts and follow the appropriate safety measures.

70. **Site selection of sources of materials.** The material used for the construction of subproject components are mainly sand, coarse aggregate fine aggregate and gravel for construction works. Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.

71. The natural raw materials like sand, gravel and soil shall be procured/ sourced from the authorized mines listed by Tripura Government as specified in the website http://trpervis.nic.in/test/natural_resources.html.

72. Aggregates will be collected from Churaibari at North Tripura district, near Assam boarder. Sand will be collected from the local river Khowai, Haora and local approved vendors. The contractor will verify all sources for legal compliances and will obtain prior approval of PIU for sourcing materials from any source.

73. Water for construction purposes is available from Khowai River and Haora River, within and nearby the town. In the case of use of ground water, permission be obtained from the concerned authority.

74. **Mitigation Measures.** Contractor should procure these materials only from the quarries permitted/ licensed by Mines and Geology Department, Government of Tripura;

- (i) Contractor should, to the maximum extent possible, procure material from existing

- authorized quarries;
- (ii) The contractor shall try to procure/ source the material from the nearest possible authorized sources.
- (iii) It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of Department of Mines & Geology and local revenue administration
- (iv) Contractor should submit the details of sources and copies of approvals, permissions to Khowai MC, Mohanpur MC and Ranirbazar MC, and should start procurement only after the respective source is approved by Khowai MC, Mohanpur MC and Ranirbazar MC and PIU.
- (v) The transportation of raw material should be done in covered vehicles.

75. **Tree cutting.** The cutting of trees requires a tree cutting permit from the local forest department. All trees cut under a project must be compensated by compensatory afforestation as required by the State Forest Department. Road and drain wise tree felling requirement surveyed for 3 towns. Details chainage wise information is attached in **Appendix 6** under strip plan and summary is given in **Table 25**. About 29 trees of Local tree species commonly used for avenue plantation like *Terminalia belerica*, *Artocarpus heterophyllus*, *Mangifera Indica*, *Azadirachta indica*, *Averrhoa carambola*, *Syzygium cumini*, *Leucaena leucocephala*, *Acacia nilotica*, *Lagerstroemia parviflora*, *Ficus religiosa*, *Zizyphus xylopara*, *Emblica officinalis*, *Tamarindus indica*, *Anogeissus pendula*, *Ficus glomerata*, *Caryota urens*, *Areca catechu* and commercial rubber plantation likely to be felled for construction of road and rehabilitation of drain. List will be finalized after confirmatory survey by contractor. Girth wise tree species, which likely to be impacted is also shown in **Appendix 6**.

- (i) Minimize tree cutting as much as possible during joint verification with the contractor; where possible, amend the alignment of drains locally to avoid tree cutting.
- (ii) As per compensatory afforestation requirement, the tree plantation will be done five times of tree cutting (1:5 of tree cutting).
- (iii) No trees shall be removed for setting up construction facilities / ancillary sites.

76. **Maintaining Core Labor Standard.** The Contractor and PMU/PIU are responsible for ensuring that international CLS¹³ as reflected in national labor laws and regulations are adhered to. PIU is ultimately responsible for monitoring compliance with national labor laws and regulations, provided that these national laws are consistent with CLS. ADB will carry out due diligence – during loan review missions - to ensure that executing and implementing agencies and contractors comply with applicable (national) core labor standards and labor laws. PMU or PIU will ensure that bidding and contract documents include specific provisions requiring contractors to comply with all: (i) applicable labor laws and core labor standards on: (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity or caste; and (c) elimination of forced labor; and (ii) the requirement to disseminate information on sexually transmitted diseases including HIV/AIDS to employees and local communities surrounding the project sites. These will be monitored as part of the project's safeguards reporting requirements.

¹³ Core Labor Standards (CLSs) are a set of four internationally recognized basic rights and principles at work: (i) freedom of association and the right to collective bargaining; (ii) elimination of all forms of forced or compulsory labor; (iii) effective abolition of child labor; and (iv) elimination of discrimination in respect of employment and occupation.

77. **Debris and Silt disposal.** The provision has been made in cost estimate to use the roadway excavated materials as necessary for the construction of road, which are as follows:

- (i) For all types of soil, such as ordinary rock, hard rock and
- (ii) Excavation from drain and foundation of other structures.

78. As per above description, the Contractor will use the excavated roadside material for construction of road. The rest unsuitable material will be disposed suitably. The lead and lift have been considered in cost estimates. Proper disposal plan will be prepared by the Contractor to dispose the unsuitable material generated from road excavation.

79. **Drinking water quality.** Drinking water supply for workers will be likely sourced from Department of water supply (DWS) provided sources. Groundwater in project towns has high iron levels.

80. To avoid any health risks from the drinking water supply:

- (i) Contractor will ensure that drinking water supply in compliance with the Indian National drinking water quality standards
- (ii) The Contractor will undertake water quality testing via accredited laboratory to confirm quality in compliance with y standards. If the groundwater quality does not comply with the standards, the contractor will source potable water from an alternative source or provide a potable onsite treatment facility with own costs and after approval from PIU/PMU

81. **EMP Implementation Training.** If the contractors and construction supervision engineers are not aware about the requirements of this EMP, the project may not proceed and comply with ADB and GoI and GoT environmental policies.

82. The PMU, PIU and contractors will be required to undergo training on EMP implementation. Methodology of capacity and training activities are discussed in next sections. The capacity building program will be participatory to the extent possible to make it more effective, with learning by doing, role playing, group exercises, on-the job training, etc. Pre- and post-training assessment will be conducted to measure the effectiveness of the program.

83. **Preparation of H&S Plan for Pandemic like COVID- 19.** With the existing EHS guidelines contracture has to prepare a site specific EHS plan including COVID -19 guidelines based on following principles and it get approved from PMU before staring of construction, the Contractor shall abide by the most stringent procedure available.

- (i) Consistently practice social distancing.
- (ii) Cover coughs and sneezes.
- (iii) Maintain hand hygiene.
- (iv) Clean surfaces frequently.

84. **Community awareness on project activities and impacts.** Lack of community awareness on project activities may result in potential community health and safety concerns and complaints.

85. Before the start of project construction, a meaningful consultation with the affected communities will be conducted. This meaningful consultation will aim to engage community stakeholders, listen to their views, and try to come to a common understanding about the need for an improved drainage system and the sacrifices that need to be made to achieve it. To aid in the consultation process, it is important that the community should be made aware of the details

of project activities. Important information to be disseminated to the people are, among others, the following:

- (i) Overview and objectives of the proposed project;
- (ii) Preliminary and/or final detailed design of proposed project components;
- (iii) Potential environmental and social impacts (positive and negative) of the project, and the proposed mitigation measures for the perceived negative impacts; and
- (iv) Grievance redress mechanism and contact details of the project.

C. Construction Impacts

86. **Construction Planning.** Inadequate planning could lead to non-implementation of EMP during the construction phase and result in significant environmental impacts leading to non-compliance with ADB's environmental safeguard requirements.

87. To ensure that EMP will be implemented during the construction phase, the contractor should, prior to start of construction activities:

- (i) Designate an Environmental Health and Safety Officer (EHSO).
- (ii) Conduct training on the rationale for and implementation of the SEMP and EMP to enhance general understanding and clarify responsibilities regarding implementation, including monitoring and reporting, must also be provided to relevant staff of contractors (including EHS Officer)
- (iii) The Contractor will be required to submit to PMU, for review and approval, a SEMP including (a) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes, (b) specific mitigation measures following the approved EMP; (c) monitoring program as per EMP; and (d) budget for SEMP implementation. No works can commence prior to approval of SEMP. The SEMP shall include, but not limited to the following:
 - (a) Traffic management plan;
 - (b) Construction health and safety plan (including COVID-19 H&S guidance);
 - (c) Construction waste and debris management Plan

88. **Excavation, soil erosion and sediment mobilization.** Excavation during construction will generate loose soil which can be carried through surface run-off during rainfall.

89. The Contractor shall implement the measures at all times to control soil erosion that shall include, but not be limited to the followings:

- (i) The Contractor shall plan his works to minimize surface excavation works during the rainy season where practicable.
- (ii) Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms shall be developed by the Contractor.
- (iii) The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered.
- (iv) Channels, earth bunds, netting, tarpaulin and or sandbag barriers shall be used on site to manage surface water runoff and minimize erosion.
- (v) The overall slope of the works areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows.
- (vi) Monitor groundwater quality that could exist close to the working areas to ensure compliance.

90. **Sources of Materials.** Since the construction work is not heavy, a moderate amount of

sand and coarse aggregate will be required for this sub-project. Quarries inevitably cause few physical changes; as construction materials are excavated from the ground, leaving large cavities, or levelling hillsides, etc. The physical damage caused by quarries is controlled by allowing them to operate within specific limited areas only, so the damage is restricted in extent and not allowed to spread indiscriminately. Contractors should avoid new borrow pits/quarries as far as possible, if necessary, all the permissions, including conduct of environmental assessment, and environmental clearance as necessary shall be obtained prior to start of quarrying activity. The contractor should also make a concerted effort to re-use as much excavated material from this sub-project as possible. The construction contractor will be required to:

- (i) Obtain construction materials only from government approved quarries with prior approval of Cluster-PIU;
- (ii) Cluster-PIU to review, and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval;
- (iii) Contractor to submit to Cluster-PIU on a monthly basis documentation on material obtained from each source (quarry/ borrow pit);
- (iv) Avoid creation of new borrow areas, quarries etc., for the project; if unavoidable, contractor to obtain all clearances and permissions as required under law, including Environmental Clearance prior to approval by Cluster- PIU.

91. **Impact on Air Quality.** There will be two main sources of air emissions, i.e., mobile sources and fixed sources during construction phase. Mobile sources are mostly associated with vehicles involved in construction activities. On the other hand, air pollution from fixed sources is mainly from generator sets, bitumen/concrete mixing plants, other construction equipment (e.g., compressors) and excavation/ grading activities.

92. Dust and gaseous emissions will be generated by the construction machinery. Pollutants of primary concern include particulate matter. However, suspended dust particles are coarse and settle within a short distance of the construction area. Therefore, the impact will be direct but temporary, and will be restricted to areas in close vicinity of the construction activities only.

93. Construction work also involves breaking up, digging, transporting, and dumping large quantities of dry material. The particulate matter from these can cause health impacts, i.e., respiratory problems, irritation in eyes and reduction in visibility.

94. In the conduct of construction activities and the operation of equipment, contractors shall utilize all practical methods to control, prevent and otherwise minimize atmospheric emissions, specifically:

- (i) Take every precaution to reduce the levels of dust at construction sites
- (ii) Fit all heavy equipment and machinery with air pollution control devices that are operating correctly.
- (iii) Asphalt / bitumen, and concrete mixing plants should be operated within the permissible emission standards, and should be located away from settlements (up wind)
- (iv) Vehicles travelling to and from the construction site must adhere to speed limits to avoid producing excessive dust.
- (v) Reduce dust by spraying stockpiled soil, excavated materials, and spoils.
- (vi) Cover with tarpaulin vehicles transporting soil and sand.
- (vii) Cover stockpiled construction materials with tarpaulin or plastic sheets.
- (viii) Heavy equipment and transport vehicles shall move only in designated areas and roads.

- (ix) Water spraying to access roads, camp sites and work sites to reduce dust emissions.
- (x) Machines and vehicles must be regularly examined and maintained to comply with requirements of technical specifications.
- (xi) All vehicles, equipment, and machinery used for construction will be regularly maintained to ensure that pollution emission levels comply with the relevant standards. Copies of conformance will be submitted regularly to the PIU.
- (xii) Repair and maintain access roads, as necessary.
- (xiii) Monitor air quality according to the environmental monitoring plan.
- (xiv) clean wheels and undercarriage of vehicles prior to leaving construction site;
- (xv) prohibit burning firewood in work and labor camps (promote liquified petroleum gas for cooking purposes and electric heater for heating purposes);
- (xvi) use vehicles that have government-issued permits and registrations; and
- (xvii) prohibit open burning of solid waste.

95. **Noise and Vibration Levels.** Proposed roads and drain are in urban areas where there are houses, religious places, noise sensitive area (School, college, court and hospital) and businesses. The sensitive receptors are the general population in these areas. Increase in noise level may be caused by excavation, particularly breaking of cement concrete or bitumen roads for drain and road construction works, operation of construction equipment like asphalt, concrete mixers, and the transportation of equipment, materials, and people. Vibration generated from construction activity may have impact on nearby buildings. This impact is negative but short-term, and reversible by mitigation measures. The construction contractor will be required to:

- (i) Plan activities in consultation with Cluster-PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
- (ii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptor;
- (iii) Construction work shall be limited to day light hours (8 AM to 6 PM) for all the works located within the town
- (iv) Adapt low noise producing work methods, and provide additional noise control measures (such as temporary barriers / enclosures) near sensitive receptors (i.e. Khowai District Hospital).
- (v) Noise level not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s;
- (vi) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; and
- (vii) Consult local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.

96. **Surface water pollution.** Silt-laden run-off from stockpiled materials, solid wastes and domestic wastewater from the construction camp, and leaks from chemical storage areas and machineries may contaminate or result in water pollution if disposed or discharged to nearby receiving bodies of water. Untreated sewage from the worker camps, construction facilities etc., could enter surface water if not properly, treated and disposed. Periods of high rainfall could lead to the overflow of the septic tanks and overland flow. Raw sewage can potentially impact surface water quality by promoting the growth of algae and delivering pathogens may be harmful to human and ecological receptors. Solvents and vehicle maintenance fluid (oil, coolant) and diesel fuel may contaminate surface and groundwater if these are disposed of directly into the ground

or washed into the streams. Human waste from construction workers may also contaminate surface water and groundwater if there are no adequate sanitary facilities. The proposed works invariably include cleaning and desilting of drains. In the existing situation, drains are carrying wastewater, and indiscriminate disposal of solid waste into drains is also prevalent. The drains have been choked and water accumulated at many stretches of drain. The proposed works therefore include dewatering of drains by pumping out of accumulated wastewater, and desilting.

97. To mitigate these impacts, the contractor will be required to:

- (i) Disposal of drain sludge/silt in solid waste disposal sites with prior permission from municipality and/or TSPCB
- (ii) Provision of temporary sedimentation canal along construction areas, particularly alignments that are adjacent to receiving bodies of water or canals.
- (iii) Works of culvert construction shall be planned in lean or dry / lean flow season only
- (iv) establish safety procedures against flash floods and other hazards associated with working in or near water during the construction of culverts on rivers
- (v) The measures to address soil erosion at the proposed facilities will consist of measures as per design, or as directed by the construction supervision consultant/PIU to control soil erosion, sedimentation, and water pollution. All temporary sedimentation, pollution control works, and maintenance thereof will be deemed incidental to the earthwork or other items of work.
- (vi) All temporary discharge points shall be located, designed, and constructed in a manner that will minimize erosion in the receiving channels.
- (vii) Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer.
- (viii) Use surplus soil for beneficial purposes such as in any other construction activities, or to raise the level of low-lying areas.
- (ix) Avoid scheduling of excavation work during the monsoon season. Earthworks during dry season.
- (x) Confine construction area including the material storage (sand and aggregate) so that runoff will not enter the site.
- (xi) Ensure that drains are not blocked with excavated soil
- (xii) Stockyards, storage of fuel and lubricants at least 50 meters (m) away from watercourses.
- (xiii) Fuel and other petroleum products stored at storage areas away from water drainage and protected by impermeable lining and bunded 110%.
- (xiv) Daily control of machinery and vehicles for leakages
- (xv) No obstruction in flowing water.
- (xvi) For effluents from workplace, camps, and offices, provide treatment arrangements such as retention ponds and septic tanks which should be incorporated in the facility designs. A sewage management plan must be prepared by the contractor and agreed with the PMSC.
- (xvii) Monitor water quality according to the environmental monitoring plan.

98. For management and final disposal of solid wastes following mitigation, contractor will be required to apply the follow-up measures such as:

- (i) collection of recyclable solid wastes and supply to scrap vendors;
- (ii) ensure all the camp wastes and construction wastes are placed in the designated waste collection pits away from receiving water;
- (iii) establishment of separate bunded and lined areas with 110% volume for the

- storage of all the toxic material wastes, including batteries, oil filters, mobile, burnt oils, etc. at the construction site; and
- (iv) consultation with PIU on the proper disposal of all residual wastes.

99. **Groundwater Quality.** Another physical impact that is often associated with excavation is the effect on drainage and the local water table if groundwater and surface water collect in the voids. In the sub-project area, groundwater depth is shallow, there are few water bodies and ponds, and it also receives high rainfall during the monsoon. Conducting excavation works during non-monsoon season will certainly help, but due to high water table, water may collect in pits as they are excavated. The water collected in excavated pits will contain silt and disposal of this in drainage channels lead to silting. To avoid this the contractor needs to be implement the following measures:

- (i) Create a temporary drainage channel around the work area to arrest the entry of runoff from upper areas into the work area
- (ii) Pump out the water collected in the pits / excavations to a temporary sedimentation pond; dispose of only clarified water into drainage channels/streams after sedimentation in the temporary ponds
- (iii) Consider safety aspects related to pit collapse due to accumulation of water

100. It is necessary that arrangement for safe drinking water is made prior to start of work. Water will be supplied for consumption only after adequate analysis and requisite treatment. The workers may also be trained on the need for judicious use of freshwater resources. The contractors will use water in consideration to its value as a resource.. All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned.

101. **Generation of Construction Wastes.** Solid wastes to be generated from the construction activities are excess excavated earth (spoils) during road and side drain construction, drain silt/ sludge during cleaning operation, discarded construction materials, cement bags, wood, steel, oils, fuels, and other similar items. Domestic solid wastes may also be generated from the workers' camp. Improper waste management could cause odor and vermin problems, pollution and flow obstruction of nearby watercourses and could negatively impact the landscape. The following mitigation measures to minimize impacts from waste generation shall be implemented by the contractor:

- (i) Prepare and implement a Construction Waste Management Plan;
- (ii) As far as possible utilize the debris and excess soil in construction purpose,
- (iii) Avoid stockpiling any excess spoils at the site for long time. Excess excavated soils should be disposed at approved designated areas immediately;
- (iv) If disposal is required, the site shall be selected preferably from barren, infertile lands; site should be located away from residential areas, few water bodies and any other sensitive land uses;
- (v) Drainage silt/ sludge will be disposed at landfill site or open area away from habitation and after receiving NOC from TSPCB;
- (vi) Domestic solid wastes should be properly segregated in biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; create a compost pit at workers' camp sites for disposal of biodegradable waste; non-biodegradable / recyclable material shall be collected separately and sold in the local recycling material market;
- (vii) Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed of in disposal sites approved by TSPCB;
- (viii) Prohibit burning of construction and/or domestic waste;
- (ix) Ensure that wastes are not haphazardly thrown in and around the project site,

- (x) provide proper collection bins, and create awareness to use the dust bins;
Conduct site clearance and restoration to original condition after the completion of construction work; Cluster-PIU to ensure that site is properly restored prior to issuing of construction completion certificate.

102. Waste can be disposed at Singichhara dumping ground, which is 2.5 Km from Khowai town, Akhaora dumping ground which is about 19 km from Ranirbazar town and DC Nagar waste dumping ground is 2 km away from Mohanpur. In all the cases necessary prior permission shall be obtained from the concerned authority, and waste shall be disposed following construction waste management rules.

103. **Disturbance to terrestrial flora and fauna.** The subproject area is a built-up area, hence, the impacts to flora and fauna will be insignificant. For trees found at the site, the design will ensure that these trees will not be cut, or if tree cutting is necessary, mitigation measure should be strictly followed.

- (i) Conduct final confirmatory tree cutting and bird nest survey before start of construction.
- (ii) No trees will be removed without prior approval of concerned government agency/foresee department.
- (iii) Restrict vegetation removal to within ROW / actual work site.
- (iv) Tree cutting is avoided to maximum possible, transplant trees, where feasible
- (v) For any tree cut, conduct replacement planting at a ratio of 1(cut):5 (new planting)
- (vi) Before any tree cutting activity takes place, a thorough inspection of the tree must be conducted to check for any active bird nests. If an active nest is found, the tree cutting activity must be postponed until the young birds have flown off from their nests and are no longer dependent on them. This measure ensures that young birds are not harmed and that their habitats are protected.
- (vii) The contractor will not use or permit the use of wood as a fuel for the execution of any part of the works, including but not limited to the extent practicable shall ensure that fuels other than wood are used for cooking.
- (viii) Within RoWs, minimize land cover removals, and install protective physical barriers around trees.
- (ix) All ROW to be re-vegetated and landscaped after construction completed.
- (x) Prior to tree cutting, placard/s shall be installed in conspicuous places to inform the public that the tree cutting is authorized
- (xi) Protect giant trees and locally important trees (for religious reasons), if any is identified at the site during implementation
- (xii) Prohibit employers and workers from poaching animals and cutting of trees for firewood in the vicinity of the site

104. **Impacts on aquatic ecology.** Some of the subproject alignments are near or adjacent to ponds, canals and rivers. The construction of the subproject may affect these ponds and rivers due to siltation and chemical spills, and improper waste disposal, and therefore may impact the quality of the water and any thriving aquatic species.

105. To mitigate this impact, contractor will be required to:

- (i) Provide temporary protection at sections near the river/ponds to avoid sliding of soils;
- (ii) Store spoils away from the side of the river/pond;
- (iii) Implement proper storage/disposal of materials, chemicals, and waste
- (iv) Implement mitigation measures for excavation, soil erosion and sediment

mobilization, surface water pollution, and construction waste generation.

106. **Drainage Congestion.** Construction material getting into surface runoff or uncontrolled disposal may cause drainage congestion. The impact of these on hydrology is expected to be more pronounced during post monsoon period with rapid movement of rainwater through existing drainage structures, which if blocked by construction waste and debris may cause flooding or waterlogging in neighboring areas.

107. Wastes and construction debris will not be disposed in a manner that these would end up in drainage channels. The on-site storage of excessive quantities of unwanted spoil and aggregate materials should be avoided. Where storage is necessary, the Contractor shall ensure heaps and stockpiles are located at sites that they do not permit direct runoff into watercourses and are on land sloping at less than 1.5%. All heaps shall be of a size and stability that will ensure the risk of mass movement during period of heavy rainfall is minimized.

108. **Management Plan for Night works** (if required). Following requirements should be fulfilled for construction works at night hours-

- (i) Night works should be avoided at construction sites specially in residential areas and should be performed only when day works are not possible due to excessive traffic/public/pedestrian movement, site of cultural or religious importance, where there is huge crowd during day hours or any other unavoidable circumstances;
- (ii) Contractor should plan for night works only after directions from PMU/PIU/project consultants
- (iii) Contractor should submit plan for night works for approval from PIU;
- (iv) PIU should ensure that prior written information should be given to local authorities such as district administration, Police/traffic police, line agencies concerned, resident's welfare association/business association/vyapar of the affected areas and their consents/permissions should be taken prior to start of night works;
- (v) PIU/PMSC engineers should check and ensure that all the preparation as per management plan is done by contractor and contractor is having all the necessary equipment and materials for night works;
- (vi) Contractor is required to have following equipment/arrangements for night works;
- (vii) Contractors should have handheld noise level meter for measurement of noise during night hours;
- (viii) Contractors should have handheld lux meter for the measurement of illumination during night hours;
- (ix) Preferably electrical connections are available for running equipment otherwise sound proof/super silent Diesel Generator set should be available;
- (x) Sound level should not increase as per following-

Type of area of work	Maximum noise level dB(A)
Industrial	70
Commercial	55
Residential	45
Silence zone	40

- (xi) Illumination should be as follows-

Minimum illumination (lx)	Areas to be illuminated	Type of work activity
54	Illumination	General work area lighting, and

	throughout the work area	performance of visual tasks of large size, or medium contrast, or low require accuracy
108	Illumination of work area and areas adjacent to equipment	Performance of visual tasks of medium size, or low to medium contrast, or medium required accuracy
216	Illumination of task	Performance of visual tasks of small size, or low contrast or high required accuracy or fine finish

- (xii) As far as possible ready-mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site;
- (xiii) All the noise activity like hammering, cutting, crushing, running of heavy equipment should be done in day time and avoided in night time;
- (xiv) Workers engaged in night works should have adequate rest/sleep in day time before start of night works;
- (xv) Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night;
- (xvi) All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent/retro-reflective arrangements;
- (xvii) Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests;
- (xviii) Horns should not be permitted by equipment and vehicles;
- (xix) Workers should not shout and create noise;
- (xx) First aid and emergency vehicles should be available at site;
- (xxi) Emergency preparedness plan should be operative during night works;
- (xxii) Old persons and pregnant women and women having small kids should not work in night time;
- (xxiii) All the vehicles and equipment being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise;
- (xxiv) All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works;
- (xxv) PIU/PMSC site engineers and contractor's safety personnel should closely monitor the safety of works continuously and noise and illumination levels on hourly basis and maintain photographic and video graphic records as well as register the observations;
- (xxvi) Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement;
- (xxvii) After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians;
- (xxviii) Drivers and workers should be alert and responsive during night works;
- (xxix) All the wages to workers working in night hours should be as per the applicable labour acts;
- (xxx) Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours; and
- (xxxi) Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

109. **Accessibility.** Excavation along the roads for construction of drain, hauling of construction materials and operation of equipment on-site can cause traffic problems. Roads connecting sites are narrow and carry considerable local traffic, mainly comprise bicycles, 2 wheelers, mini trucks, auto rickshaws, buses etc., Hauling of construction material, equipment, construction waste, etc., to and from the work site may increase the road traffic on local roads, which are not in good condition. This will further inconvenience the local community and road users. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

110. Hauling (material, waste/debris, and equipment) activities

- (i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
- (ii) Schedule transport and hauling activities during non-peak hours;
- (iii) Locate entry and exit points in areas where there is low potential for traffic congestion;
- (iv) Drive vehicles in a considerate manner; and
- (v) Notify affected public by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

111. **Traffic diversion or road closure.** On the project road, utilities within the RoW at few locations that will have to be shifted / removed prior to construction. As works are conducted on or along the roads, traffic may experience delays when diverted around active construction areas, but will be more severely hampered at the locations where temporary road closures are necessary. In narrow, single lane roads, complete road closure may be needed to conduct the road works, whereas drain works may not require road closure. Diversion and road closure points will have proper signs indicating the nature of the problem envisaged. Contractor will ensure that information on the timing of construction works and notifications of road closure (if any) is provided through the local community heads. At certain locations on the road, particularly at bridge /culver sites, traffic will be temporarily diverted from the existing carriageway while construction is in progress and temporary traffic diversions will be managed within the RoW..

112. The following measures are to be included in the project and implemented:

- Start the work from downstream end of the drains
- Prepare and implement a traffic management plan
- Conduct work in small sections, say 100 m at a time; confine the drain in the section and stop all inlets in general, and into that section in particular
- Provide a bypass arrangement for the water coming from upstream by providing pumping arrangement so that the water coming from upstream side of the selected section are pumped through a pipe to the downstream
- Dewater the selected section; pump the accumulated water into the downstream;
- As far as possible allow the silt to dry before start of desilting work.
- Avoid manual desilting of drains as far as possible in the section where there is space to employ mechanical diggers or appropriate equipment and tools
- Provide proper tools and equipment for desilting (winches and buckets), and personal protection equipment (PPE) for workers (gloves, gum boots, face masks, etc.); additional oxygen tanks
- Provide onsite training to workers on safe handling of contaminated water and sludge, and
- Silt/soil generated from desilting shall be disposed municipal land fill site with prior

permission from respective municipal councils and in consultation with Tripura State Pollution Control Board

113. The drain construction works will also disturb some modern-day social and cultural resources, such as schools, hospitals, and temples. Repair and rehabilitation of Drain interrupt access to commercial establishments, residences and for pedestrians and vehicles. This will be achieved through several of the measures recommended above, including:

- Avoiding working at sensitive times,
- Limiting dust by removing waste soil quickly, bringing sand to site only when necessary, covering and watering stockpiles, and covering soil and sand when carried on trucks;
- Increasing the workforce in sensitive areas to complete the work quickly;
- Providing wooden bridges for pedestrians and metal sheets for vehicles to allow access across open trenches where required (including access to houses);

114. **Socio-Economic – Income.** Blocking of access to the business / livelihood activities, especially during drainage construction along the roads, may impact the income of households. The impacts will result from excavation and construction works, stockpiling, the operation of construction vehicles and equipment, and accidental damage to utilities (e.g., power supply poles, open drains, and water taps or hoses). The potential impacts include disturbance to economic activities, particularly to the businesses operating along the alignments of construction works. Contractor will be required to:

- Implement the traffic management plan in collaboration with local authorities;
- Where traffic congestion will likely occur, place traffic flagmen during working hours;
- Avoid full road closures by applying the construction method on section-wise and/or chainage-wise approach during excavation, concreting and/or curing periods;
- If full road closure is not possible, especially on very narrow roads, ensure that alternate routes are identified and that affected residents and establishments are informed prior to conducting the construction activities;
- Provide convenient access to pedestrians when works occur in front of residential, commercial, or institutional establishments. Examples are planks with handrails that should be provided to cross excavated areas.
- Provide appropriate compensation to qualified affected people or businesses per approved resettlement plan for the subproject;
- Manage stockpile;
- Manage pumped water from excavations either to drains or drums for later use;
- Relocate the affected power supply poles, and
- Advise the concerned authority during accidental damage to utilities.

115. **Socio-Economic – Employment.** Construction skilled and unskilled workers will be required during the 36 months construction stage. This can result in generation of temporary employment and increase in local revenue. The construction contractor will be required to employ local labor force as far as possible.

116. **Occupational Health and Safety.** Workers need to be mindful of the occupational hazards which can arise from working at excavation works. Potential impacts are negative and long-term but reversible by mitigation measures. The construction contractor will be required to:

- ✓ Comply with all national, state, and local labour laws (see **Appendix 5**);
- ✓ Implementation of international best practices on occupational health and safety such as those in Section 4.2 of World Bank EHS Guidelines on Construction and Decommissioning Activities
- ✓ Develop and implement site-specific occupational health and safety (OHS) Plan along with COVID-19 SOP which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment; (c) OHS Training¹⁴ including COVID 19 for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;
- ✓ Ensure availability of first aid box at work site;
- ✓ Ensure the workers follow COVID 19 SOP and implement accordingly;
- ✓ Provide medical insurance coverage for workers;
- ✓ Maintain Safe distance at work and use of Mask should be encouraged for safeguard from COVID-19
- ✓ Secure all installations from unauthorized intrusion and accident risks;
- ✓ Provide health and safety orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
- ✓ Make sure vaccination against COVID-19 is done for the labourers
- ✓ Ensured the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
- ✓ Ensured moving equipment is outfitted with audible back-up alarms;
- ✓ Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate;
- ✓ Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.
- ✓ Provide supplies of potable drinking water;
- ✓ Provide clean eating areas where workers are not exposed to hazardous or noxious substances

117. **Community Health and Safety.** Drainage and road construction works along the road, and hauling of equipment and vehicles have potential to create safety risks to the community. Hazards posed to the public, specifically in high-pedestrian areas may include traffic accidents and vehicle collision with pedestrians. Potential impact is negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

- ✓ Contractor's implementation of community health and safety plan following international best practices on community health and safety such as those in

¹⁴ Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

Section 4.3 of World Bank Environmental Health and Safety (EHS) Guidelines on Construction and Decommissioning Activities. As a minimum and whichever is applicable, the health and safety plan shall ensure the following:

- ✓ implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning;
- ✓ restricting access to the site, through a combination of institutional and administrative controls, with a focus on high-risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community;
- ✓ removing hazardous conditions on construction sites that cannot be controlled affectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials; and
- ✓ implement measure to prevent proliferation of vectors of diseases at work sites;
- ✓ Implement necessary structural safety and site safety measures to prevent collapse of trenches, and damage / structural failure / collapse of adjacent buildings, boundary walls and other structures; provide proper braces, struts, anchors as required in the trench and for protecting the adjoining structures; avoid placing of material, equipment, waste, close to the trench edges
- ✓ adequate space and lighting, temporary fences, reflectorized barriers and signage's at active work sites
- ✓ contractor's preparedness in emergency response;
- ✓ adequate dissemination of GRM and contractor's observance and implementation of GRM
- ✓ Restrict construction vehicle movements to defined access roads and demarcated working areas (unless in the event of an emergency);
- ✓ Enforce strict speed limit (20-30 kmph) for playing on unpaved roads, construction tracks;
- ✓ Night-time driving will be by exception only, as approved by the Cluster-PIU to minimize driving risk and disturbance to communities;
- ✓ Adopt standard and safe practices for micro tunneling, if required;
- ✓ Temporary traffic control (e.g. flagmen) and signs will be provided where necessary to improve safety and provide directions;
- ✓ All drivers will undergo safety and training; along with COVID-19 awareness
- ✓ Public access to all areas where construction works are on-going will be restricted through the use of barricading and security personnel;
- ✓ Warning signs, blinkers will be attached to the barricading to caution the public about the hazards associated with the works, and presence of excavation;
- ✓ Control dust pollution – implement dust control measures as suggested under air quality section;
- ✓ Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure;
- ✓ Provide road signs and flag persons to warn of on-going trenching activities.

118. **Construction Camps.** Contractor will set up a construction camp – for temporary storage of construction material (cement, steel, fixtures, fuel, lubricants etc.), and stocking of surplus soil, and include separate living areas for migrant workers. The contractor is however encouraged to engage local workers as much as possible. Operation of work camps cause temporary air, noise and water pollution, and may become a source of conflicts, and unhealthy

environment if not operated properly. Potential impacts are negative but short-term and reversible by mitigation measures. The construction contractor is required to:

- (i) As far as possible locate the camp site away from residential areas (at least 50 m buffer shall be maintained)
- (ii) Avoid tree cutting for setting up camp facilities
- (iii) Ensure that a proper compound wall is provided, and erect a wind/dust screen around
- (iv) Camp site shall not be located near (50 m) water bodies, flood plains flood prone/low lying areas, or any ecologically, socially, archeologically sensitive areas
- (v) Construction camp must be safeguarded from COVID -19 including safe eating area, maintaining Hygiene inside camp, ensure physical distancing measures
- (vi) Separate the workers living areas and material storage areas clearly with a fencing and separate entry and exit
- (vii) Provide proper temporary accommodation with proper materials, adequate lighting and ventilation, appropriate facilities for winters and summers; ensure conditions of livability at work camps are maintained at the highest standards possible at all times;
- (viii) Consult Cluster-PIU before locating project offices, sheds;
- (ix) Minimize removal of vegetation and disallow cutting of trees
- (x) Ensure conditions of livability at work camps are always maintained at the highest standards possible; living quarters and construction camps shall be provided with standard materials (as far as possible to use portable ready to fit-in reusable cabins with proper ventilation); thatched huts, and facilities constructed with materials like GI sheets, tarpaulins, etc., shall not be allowed as accommodation for workers
- (xi) Camp shall be provided with proper drainage, there shall not be any water accumulation
- (xii) Ensure COVID vaccination is done for all the labours involved in the work
- (xiii) Provide drinking water, water for other uses, and sanitation facilities for employees
- (xiv) Prohibit employees from cutting of trees for firewood; contractor should be provided proper facilities including cooking fuel (oil or gas; fire wood not allowed)
- (xv) Train employees in the storage and handling of materials which can potentially cause soil contamination
- (xvi) Recover used oil and lubricants and reuse or remove from the site
- (xvii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; provide a compost pit for biodegradable waste, and non-biodegradable / recyclable waste shall be collected and sold in local market
- (xviii) Remove all wreckage, rubbish, or temporary structures which are no longer required
- (xix) At the completion of work, camp area shall be cleaned and restored to pre-project conditions, and submit report to Cluster-PIU; Cluster-PIU to review and approve camp clearance and closure of work site.

119. **Appendix 10** shows guideline for set up worker's camp.

120. **Social and Cultural Resources.** Significant negative social impacts in project are not anticipated. Site of social/cultural importance (schools, hospitals, and religious places) may be distributed by noise, dust, and impeded access. There are schools located close to the project

sites, and these may pose safety risks to school children, staff and visitors . This short-term impact, mitigated by the following mitigation measures.

- ✓ Avoiding working at sensitive times,
- ✓ Limiting dust by removing waste soil quickly, bringing sand to site only when necessary, covering and watering stockpiles, and covering soil and sand when carried on trucks;
- ✓ Using modern vehicles and machinery with standard adaptations to reduce noise and exhaust emissions, and ensuring they are maintained to manufacturers' specifications.
- ✓ Implement community health and safety measures recommended above; isolate work site from the school access road; provide proper barricading to prevent entry of children / public into work site; create awareness.

121. **Post-construction clean-up and reinstatement.** Construction debris, spoils, and excess construction materials may pose hazards to properties, community and environment if left unattended after construction.

122. The contractor will reinstate all working areas and access routes as work proceeds during construction. All plant, equipment, materials, temporary infrastructure, and vehicles will be removed at the earliest opportunity and the surface of the ground restored as near as practicable to its original condition. The following generic measures should be taken up:

- Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required;
- All excavated roads shall be reinstated to original condition;
- All disrupted utilities restored;
- All affected structures rehabilitated/compensated;
- The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up;
- All hardened surfaces within the construction camp area shall be ripped;
- All imported materials removed, and the area shall be top soiled and regressed using guidelines set out in the re-vegetation specification that forms part of this document;
- The contractor must arrange the cancellation of all temporary services;
- Request cluster-PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.

D. Operation and Maintenance Impact

123. **Roads.** In the operations and maintenance (O&M) phase, the roads will operate with routine maintenance, which should not affect the environment. Routine repairs will be very small in scale, to be conducted manually by small teams of workers with simple equipment (shovels, wheelbarrows, etc.) and works will be very short in duration thus will not cause significant physical impacts. Traffic may be interrupted temporarily but this work will be very small in scale, infrequent, and short in duration, so there will be no economic or other implications. The infrastructures will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only.

124. To maintain the safety of workers and road-users, such work should be coordinated with

the local police department so that adequate warning signs and traffic diversions can be set up when necessary. Debris need to be collected and disposed at a designated site such as the landfill. Community participation will be encouraged in ensuring drainage canals are clog-free through information and behavior change campaigns and incentives, if possible.

125. **Air pollution and noise level.** Improved roads may result in elevated noise level and air emissions from increased vehicular traffic over time. However, the extent of air pollution will depend upon i) the rate of vehicular emission and ii) the prevailing meteorological conditions. Air quality is likely to improve in the initial years after commissioning because of saving of fuel in the vehicular traffic riding on smooth and improved roads with much less interruption. locations.

126. **Community safety.** Improved roads may give way to faster vehicle speeds which could endanger people and households along the road alignments. Damage in roads may also cause accidents to motorists.

127. To mitigate these impacts, the PIU will be required to:

- (i) Conduct regular inspection of the roads to check for damages, and undertake rehabilitation measures for any damages found;
- (ii) Inspect and maintain the integrity of road barriers, especially at critical curves or locations that are prone to vehicular accidents;
- (iii) Inspect and maintain speed limiters such as humps installed on road sections near residential areas, schools, and religious establishments.
- (iv) Inspect and maintain all road signages, including appropriate warning signages at silent zones, and ensure that these are reflectorized and visible even during night time; and
- (v) Ensure pedestrian crossings are maintained.

128. The drains will not function without maintenance, as silt inevitably collects in areas of low flow over time. The project will therefore provide equipment for cleaning/desilting of drains, including buckets and winches to remove silt.

129. Rehabilitation major drain in Khowai, Mohanpur and Ranirbazar will improve the drainage system of this area, through quick discharge of rainwater from the localities.. Discharge of wastewater and improper disposal of solid waste from households and roadsides may clog the drains in the medium or longer term. This may result to accumulation of putrescible organic materials causing odor nuisance to the community and pollution to the receiving water bodies. This may also attract vectors of communicable diseases such as pests and rodents in the drainage system that could affect public health:

- (i) Prevent entry of wastewater into drains; this requires development of sewerage system (intercepting of wastewater) in the town. In the interim, an interception, diversion and treatment of drain water proposed under AMRUT scheme; PMU to ensure that this project is implemented as per the schedule so that wastewater that enter the drains is collected and treated prior to discharge into streams and river
- (ii) Ensure that sewage/septic tank outflow is not discharged into drains; implementation of the proposed sanitation and septage management system under AMRUT scheme will minimize this impact
- (iii) promotion and enforcement of good waste management practices at household level; and
- (iv) regular monitoring and cleaning, drains, and siltation or sedimentation chambers (or similar structures) at the outfalls, to prevent entry or accumulation of silt and solid

- wastes inside these drains.
- (v) Ensure regular cleaning and desilting of drains; project shall include provision of necessary maintenance equipment
- (vi) Prevent encroachment of drains

130. **Community hazards due to destroyed or removed drainage cover.** Damaged or removed drain cover exposes the drainage as hazard to people, animals and vehicles in the area, especially at night. PIU / ULB shall conduct regular inspection of the drainage alignments and ensure that all drainage covers are intact. In case of damage or loss of drainage cover, the municipality shall provide replacement of this cover to avoid occurrence of accidents.

131. Repair works could cause some temporary disruption of activities at sensitive locations such as schools, hospitals, religious places, etc., so the same precautions as employed during the construction period should be adopted. ULB will:

- Complete work in these areas quickly; and
- Consult municipal authorities, custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.

E. Unanticipated Impacts during Construction and Operation

132. In the event of unanticipated environmental impacts not considered as significant during implementation and not considered in the IEE and EMP, the PMU shall prepare a corresponding time-bound and budgeted corrective action plan acceptable to ADB, and ensure that these are implemented by the contractor/s and reported accordingly in environmental monitoring reports to ADB. If unanticipated environmental impacts deemed as significant become apparent during project implementation, the PMU will: (i) inform and seek ADB's advice; (ii) assess the significance of such unanticipated impacts; (iii) evaluate the options available to address them; and (iv) update the IEE including EMP. ADB will help the borrower mobilize the resources required to mitigate any adverse unanticipated impacts or damage.

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

133. The active participation of stakeholders in all stages of project preparation and implementation is essential for successful implementation of the project. It ensures that the subprojects are designed, constructed, and operated with utmost consideration to local needs, ensures community acceptance, and will bring maximum benefits to the people. Public consultation and information disclosure are a must as per the ADB policy.

B. Public Consultation

134. The public consultation and disclosure program are a continuous process throughout the project implementation, including project planning, design, and construction.

1. Consultation during Project Preparation

135. Institutional consultations were conducted with the project agencies, and Government Departments of Tripura, Tripura State Pollution Control Board, etc. The subproject proposal

is formulated in consultation with the local bodies in the project area to suit their requirements. The following methodologies have been used for carrying out public consultation:

- (i) Local communities, individuals affected and owners and employees of affected commercial establishments who are directly or indirectly affected were given priority while conducting public consultation.
- (ii) Walk-through and informal group consultations in the proposed subproject area.
- (iii) The local communities had been informed through public consultation about the project and its benefits.
- (iv) The environmental concerns and suggestions made by the participants were listed and discussed. The suggestions were incorporated in the EMP.

136. The main objectives of the consultation programs were to inform stakeholders on adverse environmental & social impacts, efforts to minimize and mitigate negative impacts while making people aware of the Road and Drainage project benefits. Different techniques of consultation with stakeholders were used during project preparation (interviews, official meeting, public meetings, etc.). A socio-economic household survey has been conducted in the project area, covering sample households, to understand the household characteristics, health status, and the infrastructure service levels, and the demand for infrastructure services. General public and the people residing along the project activity areas were also consulted during visits to the project sites. The stakeholders were involved in developing the IEE through focus group discussions (FGD) and public consultation at project area level, after which views expressed were incorporated into the IEE and in the planning and development of the project.

137. A workshop on Environment and Social safeguards has been arranged on 19th-20th December 2022 at Agartala for all the ULBs (main stakeholders) and project executing and implementation agencies. The primary intent of the orientation workshop was to enhance the knowledge base of the ULB officials, TUDA officials and officials of UDD on the mentioned disciplines (details in **Appendix 8**). Focus Group Discussions (FGD) have been carried out at different locations (wards) of the project area.

138. In **Khowai**, the Stakeholder Consultation has been carried out at 3 locations: with 40 nos. of participants. Among 40 participants, female no. covers 25%. FGD has also been carried out with 59 persons, out of which almost 90% are female. In **Mohanpur** Stakeholder Consultation has been carried out at 3 locations; with 32 nos. of participants (Female- 31%). In FGDs Total 74 persons participated in discussion, out of which almost 95% are female. In **Ranirbazar** Stakeholder consultation was attended by 29 stakeholders (14% female) FGDs was conducted along the project alignment in month on March and September 2022 with 64 participant (75% female).

139. All participants are expressed need for the project and willingness to take it up and stakeholders were very supporting of the project and promises to extend full cooperation during the construction phase as the activities are proposed to improve the road and drainage system and the living standards. Important issues or concerns that were raised by the stakeholders during consultations along with photographs and attendance sheets are provided in **Appendix 8**. Further a project-level consultation workshop will also be conducted in the project area.

- During consultation people were apprised about the road configuration and arrangements to be made during construction for safety of commuters, pedestrians, providing unhindered access to shops, measures to be taken for dust & noise pollution control.

- It was told by the residents that the condition of storm water drainage condition is not up to the mark; the low-lying areas generally get flooded during rainy season
- Residents expressed their views about the willingness to engage with the project and explore job opportunities.
- Aware of short-term impacts during the works such as dust generation, noise level, access problem, inconvenience for public and movement of vehicle. People demanded for the measures of dust suppression such as water sprinkler to control dust and noise during construction phase. Project team informed stakeholders of the proposed mitigation measures.
- It was also informed no road closures anticipated due to this work, and if needed during the construction phase, alternative access will be provided. Short term impact explained to local public and it assured that the measures will be included in the Environment Management Plan.
- All stakeholders were very supporting of the project, and promises to extend full cooperation during the construction phase as the activities are proposed to improve the road connectivity and drainage condition.
- As regards the storm water drainage project, it has been told by the residents that it will improve the roads and condition of low laying areas and improve the quality of river where the outfall will go.
- Stakeholders also indicated that a public notice on works, and awareness programs to be conducted
- The project team explained the proposed mitigation measures to mitigate / minimize such issues. Attention of stakeholders drawn to the EMP, and explained to them how the construction phase issues by avoided, minimized, or mitigated and managed.

2. Consultation during Implementation

140. Prior to start of construction, PIU in coordination with the local bodies will conduct information dissemination sessions at various places and solicit the help of the local community, leaders/ prominent for the project work. Focus group meetings will be conducted to discuss and plan construction work with local communities to reduce disturbance and other impacts and regarding the project grievance redress mechanism. A constant communication strategy will be established with the affected communities to redress the environmental issues likely to surface during construction phase. Consultation will continue during implementation and reported through environmental monitoring reports to ADB, semi-annually during construction and annually during operation until project completion.

C. Information Disclosure

141. Executive summary of the IEE will be translated in Bengali (local language) and will be made available at the offices of PMU, PIU, Nagar Panchayet and will be displayed on the notice boards. Hard copies of the IEE will be accessible to citizens to disclose the document and at the same time creating wider public awareness. Electronic version of the IEE in English and Executive Summary in Bengali will be placed in the official website of the TUDA (PIU), UDD (PMU) after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

142. Public information campaigns to explain the project details to a wider population is being conducted. Public disclosure meetings will be conducted at key project stages to inform the public of progress and future. Prior to start of construction, the cluster- PIU will issue Notification on the start date of implementation in local newspapers. A board showing the details of the

project will be displayed at the construction site for the information of general public.

143. Local communities will be continuously consulted regarding location of construction camps, access and hauling routes and other likely disturbances during construction. The road closure together with the proposed detours will be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.

VIII. GRIEVANCE REDRESS MECHANISM

144. A project will put in place a common GRM to receive, evaluate, and facilitate the resolution of social, environmental or any other project-related grievances. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. The public awareness campaign will generate awareness of the project and its grievance redress procedures. The campaign will ensure that the poor, vulnerable, and others know about the GRM.

145. The GRM will provide an accessible, inclusive, gender sensitive and culturally appropriate platform for receiving and facilitating the resolution of affected persons' grievances related to the project. The multi-tier GRM for the project is outlined below, each tier having time-bound schedules and with responsible persons identified to facilitate and address grievances at each stage. ULB-wide public awareness campaigns will ensure that awareness of grievance redress procedures is generated through the campaign. The project coordinator (urban and tourism), supported by independent consultants (social and environment), will be responsible for timely grievance redress on environmental and social safeguards issues.

146. Besides the project's grievance redress mechanism, the state also has a centralized public grievance redress monitoring system (CPGRMS) where the general public can file grievances through a dedicated web portal (grievance.tripura.gov.in). The general administrative (administrative reforms) department is the nodal agency, and an officer of the rank of joint secretary is responsible for its functioning. Each department of the state has nominated officers to receive the grievances. TUDA and DOT have nominated officers of the rank of Deputy Director as nodal officers, whose names and contact details are provided on its website. The affected persons can also lodge their complaints through this online portal.

147. **Information to the stakeholders about the GRM:** The stakeholders, including affected persons, will be informed about the GRM under the project and of the state through public consultations, disclosures, and distribution of public information booklets (PIB). In the case of illiterate DPs, the information will be provided verbally during meetings with them.

148. **Who can complain:** A complaint can be registered by stakeholders directly or indirectly affected by the project. A representative can register a complaint on behalf of the affected person or group, provided that the affected person or group identifies the representative and submits evidence of the authority to act on their behalf.

149. **What the Grievance/Complaint should contain:** Any comments, complaints, queries and suggestions pertaining to safeguard compliance - environment, involuntary resettlement, and indigenous people, design-related issues, compensation, service delivery or any other issues or concerns related to the project. The complaint must contain the complainant's name, date, address/contact details, location of the problem area, and the problem. A sample grievance registration form is provided in Appendix 10.

150. **Where and how to file a Complaint:** The complaint can be filed both online and offline. The people can submit their complaints at the contractor's site office or at PIU/PMU office. In addition, they can also have grievances/suggestions/queries submitted through phone or e-mails or the state grievance portal.

151. **Grievance redress /Problem solving through participatory Process:** The PMU and PIUs must make efforts to resolve the problems and conflicts amicably through a participatory process with the community and the ULBs. In case of immediate and urgent grievances in the complainant's perception, the contractor and supervision personnel from the PIU will provide the most easily accessible or first level of contact to resolve grievances quickly. Contact phone numbers and names of the concerned staff and contractors will be posted and displayed at all construction sites.

152. **Grievance Redressal Committee:** The GOT will establish the grievance redressal committees at the site, PIU and PMU levels to provide a mechanism to mediate conflict and disputes concerning compensation payments and cut down on lengthy litigation. The following will be the composition of the GRCs.

153. **Site-level GRC (1st level)** - The site-level GRC will comprise a Junior Engineer. PIU, a field engineer of PSMC, safeguard support staff of PSMC, and a representative from the affected community (as and when required). The contractor's site engineer and EHS cum social supervisor will jointly support in meetings, consultations, and site-level grievance resolution. The effort will be made to resolve issues on-site, in consultation with each other and within five days of receipt of a complaint/grievance.

154. **PIU-level GRC (2nd level)** - All grievances that cannot be redressed within five days at the field level will be brought to the notice of the PIU-level GRC established in each PIU. The PIU-level within two days of receipt of the complaint to determine the merit of each grievance brought to the committee. GRC at the PIU-level will be headed by Project Manager (executive/ assistant engineer)- focal for safeguards, and include the construction manager of PSMC, safeguards specialists of PSMC, and the Project Manager of the concerned contractor as members. The PIU-level GRC will also co-opt the representative of line departments (PWD, ULB) and a representative from the affected community, as and when required, including indigenous peoples communities or civil society organization working with indigenous peoples, as and when required.¹⁵

155. **PMU-Level GRC (3rd level)** - In case the grievances are not addressed at the PIU-level within 10 days of receipt, the same shall be brought to the notice of the PMU-level GRC. The PMU-level GRC will comprise of Project Director as chairman, a Co-Project Director as co-chairman, a Project Coordinator (Urban and Tourism) as member secretary, , environment safeguards officer of PMU and social, gender officer of PMU, women representatives from the line departments (ULB, PWD, Environment and Forests) and representative of affected community (including indigenous people community)¹⁶. The committee can co-opt any other

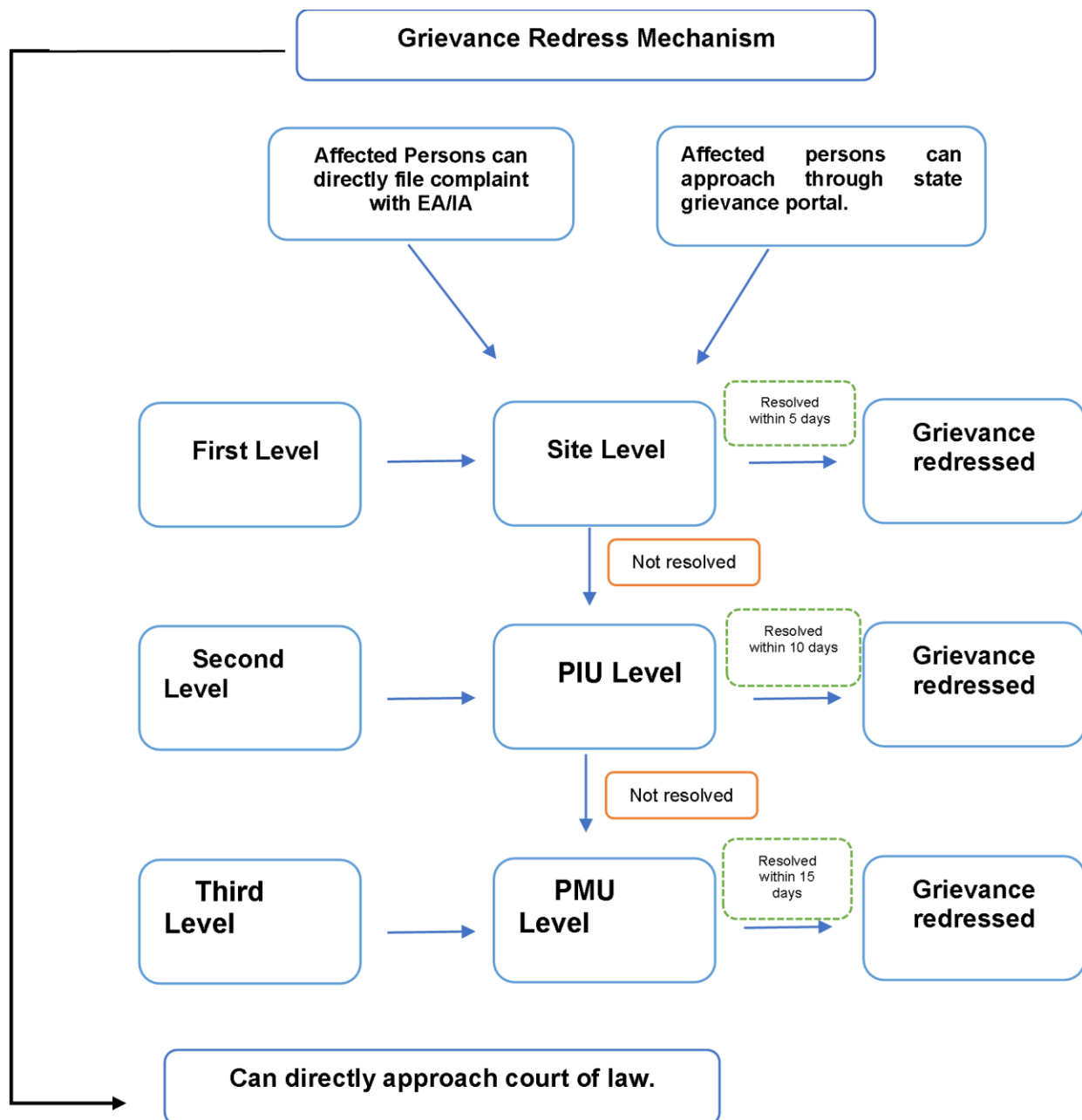
¹⁵ In case of any components with impact on indigenous people, GRC will have representative from affected indigenous people community or NGO working with indigenous people groups.

¹⁶ In case of any components with impact on indigenous people, GRC will have representative from affected indigenous people community, including at least one female indigenous person or NGO working with indigenous people groups.

member required for the resolution of the grievances. The GRC at the PMU-level will resolve the grievance within 15 days of receiving the complaint.

156. The complainant will be informed in writing about the resolution of their complaint or the decision of the grievance redress committees. The complainants are free to approach the court of law at any time of their own will at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

Figure 40: Grievance Redressal Mechanism (GRM)



157. **Documentation.** PMU, with the support of PIUs, will be responsible for the timely registration of grievances, related disclosure, and communication with the aggrieved party. PMU

will also ensure that all the details from submission to resolution are well recorded and documented.

158. **Record-keeping.** PIUs will keep records of grievances received, including contact details of the complainant, the date the complaint was received, the nature of the grievance, agreed corrective actions and the date these were affected and the final outcome. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMU and PIUs and reported in monitoring reports submitted to ADB on a semiannual basis.

159. **Periodic review and documentation of lessons learned.** The Project Coordinator, PMU, will periodically review the functioning of the GRM in each town and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

160. **Costs.** All costs related to the resolution of grievances (meetings, consultations, communication and reporting/ information dissemination as well as costs incurred by affected persons to attend GRC meetings, if any) will be borne by PMU.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

161. An environmental management plan (EMP) is being developed to provide mitigation measures to reduce all negative impacts to acceptable levels.

162. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between Project Management Unit (PMU), Project Implementation Unit (PIU) / TUDA, ULBs (Nagar Panchayat/ Municipal Council), Consultants and Contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (ii) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (iii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iv) detail specific actions deemed necessary to assist in mitigating the environmental impact of the sub project; and (v) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

163. The construction contractor will submit to Cluster - PIUs, for review and approval, a Site-Specific Environmental Management Plan (SEMP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEMP; and (iv) budget for SEMP implementation. The approved Site-Specific Environmental Management plans will be disclosed in the project website & website links will be provided in Semi- annual Environment Monitoring Report.

164. A copy of the EMP/approved SEMP will be always kept on site during the construction period. The approved EMP to be included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

165. For civil works, the construction contractor will be committed to (i) carry out all of the

mitigation and monitoring measures set forth in the approved SEMP; and (ii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer may prepare from time to time to monitor implementation of this IEE and SEMP. The contractor will allocate the budget for compliance with these SEMP measures, requirements, and actions.

166. The following tables show the potential environmental impacts, proposed mitigation measures and responsible agencies for implementation and monitoring.

Table 24: Design Stage Environmental Impacts and Mitigation Measures

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Design of the Proposed Components.	Lack of sufficient planning to assure long term sustainability of the improvements and ensure protection of the assets created	(i) Storm water drain is provided at the extreme edge of the right of way; (ii) Water supply lines carrying water at high pressure may cause damage to the road pavement, so they are provided on one side of the road; (iii) There is safe distance between water supply line and drainage line to avoid any intermixing in case of any leakage or pipe burst. (iv) Footpaths are provided cater the needs of elderly and persons with disability. (v) Electric cables are kept away from water supply lines to avoid short circuit; (vi) The cables are away from tree line to avoid possible entrapment of the cable by tree roots	Contractor / Cluster-PIUs/ PMSC	PMU	Project Costs
Integration of EMP in bidding documents and contracts	Lack of awareness by contractors on ADB SPS requirements may result in insufficient budget and non-implementation of EMP	(i) Once the Contractor is selected, the PIU with support from PMSC will inform contractors on their responsibilities in EMP implementation, in compliance with ADB and government requirements, self -monitoring and reporting procedures. (ii) The PMU will incorporate the costs of implementing OHS and the EMP as well as specific provisions requiring contractors to comply with all other conditions required by ADB into the bidding and contract document.	PMU, PMSC	PMU	Project Costs
Preparation of H&S Plan for Pandemic like COVID- 19.	COVID safety	(i) Consistently practice social distancing. (ii) Cover coughs and sneezes. (iii) Maintain hand hygiene. (iv) Clean surfaces frequently.	Contractor	PIU	Project costs
Seismic sensitivity	Damage to infrastructure and potential risks:	Designs of project component structures shall comply with relevant codes of design such as Bureau of Indian Standard (BIS) specifications for earthquake resistant	Contractor / Cluster-PIUs	PMU	

	project area in High earthquake risk zone (Zone V)	design (IS: 1893: Criteria for earthquake resistant design of structures).			
Physical Cultural resource	Encroachment/ damage to protected monuments and chance finds	(i) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work; (ii) Stop work immediately to allow further investigation if any finds are suspected; (iii) Inform local Archaeological Department / Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ; and prepare a chance find protocol	Contractor / cluster-PIUs	PMU	Project Costs
Site selection of sources of materials	Improper selection source of material	(i) Contractor should, to the maximum extent possible, procure material from existing authorized quarries; (ii) The contractor shall try to procure/ source the material from the nearest possible authorized sources. (iii) It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of Department of Mines & Geology and local revenue administration (iv) Contractor should submit the details of sources and copies of approvals, permissions to Khowai MC, Mohanpur MC and Ranirbazar MC, and should start procurement only after the respective source is approved by Khowai MC, Mohanpur MC and Ranirbazar MC, and PIU (v) The transportation of raw material should be done in covered vehicles.	Contractor / cluster-PIUs	PMU	Project Costs
Site selection for equipment lay-down and storage area	Improper selection will affect local environment and inconvenience to public.	(i) Choice of location for equipment lay-down and storage areas must consider distances to adjacent land uses, general onsite topography and water erosion potential of the soil. Impervious surfaces must be provided where necessary. (ii) Storage areas shall be secure to minimize the risk of crime. They shall also be safe from access by children or animals etc. (iii) Residents living adjacent to the construction site must be notified of the existence of the hazardous storage area. (iv) Equipment lay-down and storage areas must be designated, demarcated, and fenced if necessary.	Contractor / cluster-PIUs	PMU	Project Costs

		(v) Fire prevention facilities must be present at all storage facilities. (vi) Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals, and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage areas. (vii) These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources. (viii) Fuel tanks must meet relevant specifications and be elevated so that leaks may be easily detected. (ix) Staff dealing with these materials or substances must be aware of their potential impacts and follow the appropriate safety measures.			
Tree cutting	Cutting of trees	(i) Minimize tree cutting as much as possible during joint verification with the contractor; where possible, amend the alignment of drains locally to avoid tree cutting. (ii) As per compensatory afforestation requirement, the tree plantation will be done five times of tree cutting (1:5 of tree cutting). (iii) No trees shall be removed for setting up construction facilities / ancillary sites.	Contractor / cluster-PIUs	PMU	Project Costs
Drinking water quality	health risks from the drinking water supply	(i) Contractor will ensure that drinking water supply in compliance with the Indian National drinking water quality standards (ii) The Contractor will undertake water quality testing via accredited laboratory to confirm quality in compliance with y standards. If the groundwater quality does not comply with the standards, the contractor will source potable water from an alternative source or provide a potable onsite treatment facility with own costs and approval from PIU/PMU.	Contractor / cluster-PIUs		Project Costs

Table 25: Pre-Construction Stage Environmental Impacts and Mitigation Measures

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Compliance with environmental subproject selection criteria	Environmental impacts due to subproject	Compliance with environmental subproject selection criteria	Contractor in collaboration with Cluster-PIUs, and with approval of PMSC/ PIU	PMU	No costs required
Legal compliance	Environmental legal noncompliance may attract legal actions Failure to obtain necessary consents, permits, NOCs etc. can result to design revisions and/or stoppage of works	Obtain all consents, clearances (CTE/CTO from TSPCB), permits NOCs etc. before start of construction works Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction	PIU/Consultants in coordination of ULB	PMU	Cost of obtaining all consents, permits, clearance, NOCs etc. prior to start of civil works responsibility of PIU.
Environmental monitoring of baseline conditions of air, noise, water and soil	To establish base line environmental conditions	Environmental monitoring through NABL accredited laboratory	Construction contractor	(i) Report for NABL laboratory	Project Cost
Utilities	Telephone lines, electric poles and wires, water lines within proposed project area may be affected	(i) Operators of these utilities have been identified and included in the detailed design documents to prevent unnecessary disruption of services during construction phase; (ii) Utility shifting will be required before start of construction; (iii) Construction contractor will prepare and implement a contingency plan to include actions to be taken in case of unintentional interruption of services. (iv) Consult with and prior information to	Contractor in collaboration with Cluster-PIUs, and with approval of PMSC/ PIU	(ii)List of affected utilities (if any) and operators; (iii) Bid document to include requirement for a contingency plan for service interruptions	Project Cost

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		affected households and business (at least 1 week prior) on the intended utility shifting and likely disruptions in services			
Construction work camps, stockpile areas, storage areas, and disposal areas.	Conflicts with local community; disruption to traffic flow and sensitive receptors	(i) Construction camp to be set up in open area, slightly away from residential area (ii) Extreme care to be taken in selecting sites to avoid direct disposal waste/ excess earth near water body which may inconvenience the community. If required, for excess spoil disposal, (a) sites will be selected from barren, infertile lands. In case agricultural land selected, written consent will be taken from landowners; (b) debris disposal site will be selected 200 m away from surface water bodies; (c) no residential areas be located within 50 m downwind side of the site; and (d) site will be selected 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies.	Contractor to finalize locations in consultation and approval of Cluster-PIUs	List of selected sites for construction work camps, spot mix plants, stockpile areas, storage areas, and disposal areas. Written consent of landowner/s (not lessee/s)	Project Cost
Works near common properties, physical cultural resources other religious, cultural and other sensitive places	Disturbance of private and common properties (such as ramps, drainage, boundary walls, houses, soak well, lamp	• Prior to commencement of construction, consult with concerned religious authorities of these temples, nearby people and devotees and explain the work method and duration of proposed works, take their suggestions and comments in scheduling and conducting the works	PIU, PMSC	Survey data and site condition	Project Cost

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	post), and physical cultural resources	• Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as pneumatic drills, dozers etc., within 50 m of these structures • Put in place proper dust and noise control measures • Adjacent to religious/social buildings, undertake excavation and construction work in such a way that no structural damage is caused to the structures • Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrances/obstacles during such time to the religious places • Cutting of any religious trees may be avoided, if possible, change alignment to protect old and religious trees. • Provide proper signage, barricades etc. to protect public and devotees from dangers of construction works. • Ensure proper traffic management planning to minimize the disruption to the normal traffic flow in the area and ensure the safety of the people. • Clear the work site of unnecessary material, equipment, and debris / surplus soil; do not stock material / soil at the sites			

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		Conduct continuous consultations with the local people during the works			
Traffic Management	Impede traffic flow during construction	Prepare a traffic management plan during preconstruction phase.	Contractor to finalize traffic management plan in consultation with cluster PIUs	Ensure Traffic Management Plan is included in bidding documents.	Project Cost
Disposal sites of dredge and solid wastes	Cleaning of drains will generate large amounts of dredge material (i.e., silt) and solid waste which needs to be disposed in designated area away from sensitive receptors	Identify agreed sites with local officials to dispose of dredged materials	Contractor to finalize disposal plan in consultation with cluster PIUs	Cluster PIUs, and PMSC to ensure sites are agreed with local officials and in locations which are away from sensitive receptors.	Project Cost
EMP Implementation Training	proceed and comply with ADB, GoI and GoT environmental policies	The PMU, PIU and contractors will be required to undergo training on EMP implementation. Methodology of capacity and training activities are discussed in next sections. The capacity building program will be participatory to the extent possible to make it more effective, with learning by doing, role playing, group exercises, on-the job training, etc. Pre- and post-training assessment will be conducted to measure the effectiveness of the program.	PMSC	Training document	Project cost

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Community Awareness on Project Activities and Impacts	Lack of community awareness on project activities may result in potential community health and safety concerns and complaints.	- The community should be made aware of Overview and objectives of the proposed project; - Preliminary and/or final detailed design of proposed project components; - Potential environmental and social impacts (positive and negative) of the project, and the proposed mitigation measures for the perceived negative impacts; and - Grievance redress mechanism and contact details of the project	PIU, Contractor, PMSC	Awareness document, consultation document and record	Project cost

Table 26: Construction Stage Environmental Impacts and Mitigation Measures

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Planning	Inadequate planning could lead to non-implementation of EMP during the construction phase and result in significant environmental impacts leading to non-compliance with ADB's environmental safeguard requirements.	i. Designate an Environmental Health and Safety Officer (EHSO). ii. Conduct training on the rationale for and implementation of the SEMP and EMP to enhance general understanding and clarify responsibilities regarding implementation, including monitoring and reporting, must also be provided to relevant staff of contractors (including EHS Officer) iii. The Contractor will be required to submit to PMU, for review and approval, a SEMP including (a) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes, (b) specific mitigation measures following the approved EMP; (c) monitoring program as per EMP; and (d) budget for SEMP implementation. No works can commence prior to approval of SEMP. The SEMP shall include, but not limited to, the following:	Contractor in association with PIU	PMU	Project costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(a) Traffic management plan; (b) Construction health and safety plan (including COVID-19 H&S guidance); (c) Construction waste and debris management Plan			
Excavation, soil erosion and sediment mobilization	loose soil generated during excavation can be carried through surface run-off during a rainfall.	The Contractor shall always implement the measures to control soil erosion which shall include, but not be limited to the followings: i. The Contractor shall plan works to minimize surface excavation works during the rainy season where practicable. ii. Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms shall be developed by the Contractor. iii. The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. iv. Channels, earth bunds, netting, tarpaulin and or sandbag barriers shall be used on site to manage surface water runoff and minimize erosion. v. The overall slope of the works areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows. vi. Monitor groundwater quality that could exist close to the working areas to ensure compliance		PMSC and PIU	
Sources of Materials	Selection of material from government approved sources	✓ Obtain construction materials only from government approved quarries with prior approval of Cluster-PIU; ✓ Cluster-PIU to review, and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval;	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		✓ Contractor to submit to Cluster-PIU on a monthly basis documentation on material obtained from each source (quarry/ borrow pit); ✓ Avoid creation of new borrow areas, quarries etc., for the project; if unavoidable, contractor to obtain all clearances and permissions as required under law, including Environmental Clearance prior to approval by Cluster- PIU.			
Air Quality	Emissions from construction related vehicles, equipment, machinery, resulting to dusts and increase in concentration of vehicle related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons	(i) Take every precaution to reduce the levels of dust at construction sites (ii) Fit all heavy equipment and machinery with air pollution control devices that are operating correctly. (iii) Asphalt / bitumen, and concrete mixing plants should be operated within the permissible emission standards, and should be located away from settlements (up wind) (iv) Vehicles travelling to and from the construction site must adhere to speed limits to avoid producing excessive dust. (v) Reduce dust by spraying stockpiled soil, excavated materials, and spoils. (vi) over with tarpaulin vehicles transporting soil and sand. (vii) Cover stockpiled construction materials with tarpaulin or plastic sheets. (viii) Heavy equipment and transport vehicles shall move only in designated areas and roads. (ix) Water spraying to access roads, camp sites and work sites to reduce dust emissions. (x) Machines and vehicles must be regularly examined and maintained to comply with requirements of technical specifications. (xi) All vehicles, equipment, and machinery used for construction will be regularly maintained to ensure that pollution emission levels comply with the relevant standards. Copies of	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		conformance will be submitted regularly to the PIU. (xii) Repair and maintain access roads, as necessary. (xiii) Monitor air quality according to the environmental monitoring plan. (xiv) clean wheels and undercarriage of vehicles prior to leaving construction site; (xv) prohibit burning firewood in work and labor camps (promote liquified petroleum gas for cooking purposes and electric heater for heating purposes); (xvi) use vehicles that have government-issued permits and registrations; and (xvii) prohibit open burning of solid waste			
Noise and vibration	Increase in noise level due to earth-moving and excavation equipment, and transportation of equipment, materials, and people	- Plan activities in consultation with Cluster-PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; - Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptor - Construction work shall be limited to day light hours (8 AM to 6 PM) for all the works located within the town - Adapt low noise producing work methods, and provide additional noise control measures (such as temporary barriers / enclosures) near sensitive receptors (i.e. Khowai District Hospital). - Noise level not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s;	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		- Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; and - Consult local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals			
Surface water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during construction can contaminate nearby surface water quality. Ponding of water in the pits/ foundation excavations	(i) Disposal of drain sludge/silt in solid waste disposal sites with prior permission from municipality and/or TSPCB (ii) Provision of temporary sedimentation along construction areas, particularly alignments that are adjacent to receiving bodies of water or canals. (iii) Works of culvert construction shall be planned in lean or dry / lean flow season only (iv) establish safety procedures against flash floods and other hazards associated with working in or near water during the construction of culverts on rivers. (v) The measures to address soil erosion at the proposed facilities will consist of measures as per design, or as directed by the construction supervision consultant/PIU to control soil erosion, sedimentation, and water pollution. All temporary sedimentation, pollution control works, and maintenance thereof will be deemed incidental to the earthwork or other items of work. (vi) All temporary discharge points shall be located, designed and constructed in a manner that will minimize erosion in the receiving channels. (vii) Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer.	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(viii) Use surplus soil for beneficial purposes such as in any other construction activities, or to raise the level of low-lying areas. (ix) Avoid scheduling of excavation work during the monsoon season. Earthworks during dry season. (x) Confine construction area including the material storage (sand and aggregate) so that runoff will not enter the site. (xi) Ensure that drains are not blocked with excavated soil (xii) Stockyards, storage of fuel and lubricants at least 50 meters (m) away from watercourses. (xiii) Fuel and other petroleum products stored at storage areas away from water drainage and protected by impermeable lining and bunded 110%. (xiv) Daily control of machinery and vehicles for leakages (xv) No obstruction in flowing water. (xvi) For effluents from workplace, camps, and offices, provide treatment arrangements such as retention ponds and septic tanks which should be incorporated in the facility designs. A sewage management plan has to be prepared by the contractor and agreed with the PMSC. (xvii) Monitor water quality according to the environmental monitoring plan. (xviii) Provide uncontaminated water for dust suppression;			
Groundwater use and contamination	The water collected in excavated pits will contain silt and disposal of this in drainage channels lead to silting	(i) Create a temporary drainage channel around the work area to arrest the entry of runoff from upper areas into the work area (ii) Pump out the water collected in the pits / excavations to a temporary sedimentation pond; dispose of only clarified water into drainage channels/streams after sedimentation in the temporary ponds	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(iii) Consider safety aspects related to pit collapse due to accumulation of water			
Generation of Construction Wastes.	Solid wastes to be generated from the construction activities are excess excavated earth (spoils) during road and side drain construction, drain silt/ sludge during cleaning operation,	(i) Prepare and implement a Construction Waste Management Plan; (ii) As far as possible utilize the debris and excess soil in construction purpose, (iii) Avoid stockpiling any excess spoils at the site for long time. Excess excavated soils should be disposed at approved designated areas immediately; (iv) If disposal is required, the site shall be selected preferably from barren, infertile lands; site should be located away from residential areas, few water bodies and any other sensitive land uses; (v) Drainage silt/ sludge will be disposed at landfill site or open area away from habitation and after receiving NOC from TSPCB; (vi) Domestic solid wastes should be properly segregated in biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; create a compost pit at workers' camp sites for disposal of biodegradable waste; non-biodegradable / recyclable material shall be collected separately and sold in the local recycling material market; (vii) Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed of in disposal sites approved by TSPCB; (viii) Prohibit burning of construction and/or domestic waste; (ix) Ensure that wastes are not haphazardly thrown in and around the project site, provide proper collection bins, and create awareness to use the dust bins; (x) Conduct site clearance and restoration to original condition after the completion of	Construction Contractor and PMSC	PIU and ULB	

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		construction work; Cluster-PIU to ensure that site is properly restored prior to issuing of construction completion certificate.			
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	(i) Prepare a list of affected utilities and operators if any; and (ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of service	Construction Contractor and PMSC	PIU and ULB	Cost for implementation of mitigation measures responsibility of contractor.
Disturbance to terrestrial flora and fauna	Loss of vegetation and tree cover	(i) Conduct final confirmatory tree cutting and bird nest survey before start of construction. (ii) no trees will be removed without prior approval of concerned government agency/foresee department. (iii) Restrict vegetation removal to within ROW / actual work site. (iv) Tree cutting is avoided to maximum possible, transplant trees, where feasible (v) For any tree cut, conduct replacement planting at a ratio of 1(cut):5 (new planting) (vi) Before any tree cutting activity takes place, a thorough inspection of the tree must be conducted to check for any active bird nests. If an active nest is found, the tree cutting activity must be postponed until the young birds have flown off from their nests and are no longer dependent on them. This measure ensures that young birds are not harmed and that their habitats are protected. (vii) The contractor will not use or permit the use of wood as a fuel for the execution of any part of the works, including but not limited to the extent practicable shall ensure that fuels other than wood are used for cooking. (viii) Within RoWs, minimize land cover removals, and install protective physical barriers around trees.	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(ix) All ROW to be re-vegetated and landscaped after construction completed. (x) Prior to tree cutting, placard/s shall be installed in conspicuous places to inform the public that the tree cutting is authorized (xi) Protect giant trees and locally important trees (for religious reasons), if any is identified at the site during implementation (xii) Prohibit employees and workers from poaching animals and cutting of trees for firewood in the vicinity of the site			
Impacts on aquatic ecology	Alterations in aquatic ecology	(i) Provide temporary protection at sections near the river/ponds to avoid sliding of soils; (ii) Store spoils away from the side of the river/pond; (iii) Implement proper storage/disposal of materials, chemicals and waste (iv) Implement mitigation measures for excavation, soil erosion and sediment mobilization, surface water pollution, and construction waste generation.	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.
Management Plan for Night works (if required).	Disturbance to nearby establishment	(i) Night works should be avoided at construction sites specially in residential areas and should be performed only when day works are not possible due to excessive traffic/public/pedestrian movement, site of cultural or religious importance, where there is huge crowd during day hours or any other unavoidable circumstances; (ii) Contractor should plan for night works only after directions from PMU/PIU/project consultants (iii) Contractor should submit plan for night works for approval from PIU; (iv) PIU should ensure that prior written information should be given to local authorities such as district administration, Police/traffic police, line agencies concerned,	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds										
		resident's welfare association/business association/vyapar of the affected areas and their consents/permissions should be taken prior to start of night works; (v) PIU/PMSC engineers should check and ensure that all the preparation as per management plan is done by contractor and contractor is having all the necessary equipment and materials for night works; (vi) Contractor is required to have following equipment/arrangements for night works; (vii) Contractors should have handheld noise level meter for measurement of noise during night hours; (viii) Contractors should have handheld lux meter for the measurement of illumination during night hours; (ix) Preferably electrical connections are available for running equipment otherwise sound proof/super silent Diesel Generator set should be available; (x) Sound level should not increase as per following- <table> <tr> <th>Type of area of work</th> <th>Maximum noise level dB(A)</th> </tr> <tr> <td>Industrial</td> <td>70</td> </tr> <tr> <td>Commercial</td> <td>55</td> </tr> <tr> <td>Residential</td> <td>45</td> </tr> <tr> <td>Silence zone</td> <td>40</td> </tr> </table> (xi) As far as possible ready-mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site;	Type of area of work	Maximum noise level dB(A)	Industrial	70	Commercial	55	Residential	45	Silence zone	40			
Type of area of work	Maximum noise level dB(A)														
Industrial	70														
Commercial	55														
Residential	45														
Silence zone	40														

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(xii) All the noise activity like hammering, cutting, crushing, running of heavy equipment should be done in day time and avoided in night time; (xiii) Workers engaged in night works should have adequate rest/sleep in day time before start of night works; (xiv) Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night; (xv) All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent/retro-reflective arrangements; (xvi) Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests; (xvii) Horns should not be permitted by equipment and vehicles; (xviii) Workers should not shout and create noise; (xix) First aid and emergency vehicles should be available at site; (xx) Emergency preparedness plan should be operative during night works; (xxi) Old persons and pregnant women and women having small kids should not work in night time; (xxii) All the vehicles and equipment being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise; (xxiii) All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works;			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(xxiv) PIU/PMSC site engineers and contractor's safety personnel should closely monitor the safety of works continuously and noise and illumination levels on hourly basis and maintain photographic and video graphic records as well as register the observations; (xxv) Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement; (xxvi) After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians; (xxvii) Drivers and workers should be alert and responsive during night works; (xxviii) All the wages to workers working in night hours should be as per the applicable labour acts; (xxix) Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours; and (xxx) Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.			
Accessibility	Traffic problems and conflicts near project locations and haul road Impact on access to house and road user particularly during Construction of road and drain	i. Hauling (material, waste/debris, and equipment) activities ii. Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites; iii. Schedule transport and hauling activities during non-peak hours; iv. Locate entry and exit points in areas where there is low potential for traffic congestion; v. Drive vehicles in a considerate manner; and vi. Notify affected public by public information notices, providing sign boards informing	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		nature and duration of construction works and contact numbers for concerns/complaints.			
Traffic diversion or road closure	Traffic management and chances of accidents near construction site	i. Prepare and implement a traffic management plan ii. Start the work from downstream end of the drains iii. Conduct work in small sections, say 100 m at a time; confine the drain in the section and stop all inlets in general, and into that section in particular iv. Provide a bypass arrangement for the water coming for upstream by providing pumping arrangement so that the water coming from upstream side of the selected section are pumped through a pipe to the downstream v. Dewater the selected section; pump the accumulated water into the downstream; vi. As far as possible allow the silt to dry before start of desilting work. vii. Avoid manual desilting of drains as far as possible in the section where there is space to employ mechanical diggers or appropriate equipment and tools viii. Provide proper tools and equipment for desilting (winches and buckets), and personal protection equipment (PPE) for workers (gloves, gum boots, face masks, etc.); additional oxygen tanks for emergency use ix. Provide onsite training to workers on safe handling of contaminated water and sludge, and x. Silt/soil generated from desilting shall be disposed municipal land fill site with prior permission from respective municipal	Construction contractor and PMSC	PIU and ULB	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		councils and in consultation with Tripura State Pollution Control Board			
Socio-Economic - Employment	Generation of temporary employment and increase in local revenue	(i) Employ local labor force as far as possible; and (ii) Comply with labor laws (See Appendix 5 of this IEE)	Construction Contractor	PMSC and PIU	Contractor costs
Impact on socio-Income	Disturbance to economic activities may result from excavation works, stockpiling, the operation of construction vehicles and equipment, and accidental damage to utilities (e.g., power supply poles, open drains, and water taps or hoses)	- Implement the traffic management plan in collaboration with local authorities; - Where traffic congestion will likely occur, place traffic flagmen during working hours; - Avoid full road closures by applying the construction method on section-wise and/or chainage-wise approach during excavation, concreting and/or curing periods; - If full road closure is not possible, especially on very narrow roads, ensure that alternate routes are identified and that affected residents and establishments are informed prior to conducting the construction activities; - Provide convenient access to pedestrians when works occur in front of residential, commercial, or institutional establishments. Examples are planks with handrails that should be provided to cross excavated areas. - Provide appropriate compensation to qualified affected people or businesses per approved resettlement plan for the subproject; - Manage stockpile; - Manage pumped water from excavations either to drains or drums for later use; - Relocate the affected power supply poles, and - Advise the concerned authority during accidental damage to utilities	Construction Contractor	PMSC and PIU	Contractor costs
Occupational Health and Safety	Occupational hazards which can arise	(i) All national, state and local core labor laws to be complied with (see Appendix 5 of this IEE). Labour license and Workmen Compensation	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	during work, safe from COVID 19	policy to be obtained by contractor before start of construction (ii) Implementation of international best practices on occupational health and safety such as those in Section 4.2 of World Bank EHS Guidelines on Construction and Decommissioning Activities (iii) Develop and implement site-specific occupational health and Site-specific occupational health and safety (OHS) Plan and Supplementary H & S plan for COVID 19 to be developed and implemented which included measures such as: (a) excluding public from the site; (b) maintaining social distancing for protection from COVID 19 infection; (c) ensuring all workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose mask, face mask and ear plugs; (d) OHS Training and COVID 19 awareness H & S training for all site personnel; (e) complete COVID 19 vaccinations for workers, (f) documented procedures to be followed for all site activities including follow of SOP for COVID 19 to be developed for the project and H & S plan; and (g) documentation of work-related accidents; (iv) Availability of First aid box/ facility throughout the project period; (v) Medical insurance and tie-up with local hospitals to be provided for workers; (vi) All installations will be secured from unauthorized intrusion and accident risks; (vii) Potable drinking water to be provided for the workers;			measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(viii) Clean eating areas to be provided where workers are not exposed to hazardous or noxious substances; (ix) To provide health and safety orientation training including COVID 19 risk and mitigation to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; (x) Visibility of workers to be ensured through the use of high visibility vests when working in or walking through heavy equipment operating areas; (xi) Moving equipment will be outfitted with audible back-up alarms; (xii) Sign boards will be provided for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage is in accordance with international standards and are well known to, and easily understood by workers, visitors, and the general public as appropriate; (xiii) Workers will be disallowed exposure to noise level greater than 85 dB (A) for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. Standard Operating Procedure (SOP) for the project and Supplementary H & S plan for COVID 19 will be prepared which cover, (xiv) General instruction to follow to prevent the spread of COVID-19 in construction workplace (Refer to Error! Reference source not found.1) (xv) Worksite prevention practice at work site, office, during meeting, travelling, etc. (xvi) Precaution to be taken at workmen habitat/ camp			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(xvii) Use of PPEs: face mask – hand gloves, maintaining social distancing, disinfection, requirement of awareness covered under the H & S plan.			
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation and road, drain construction work	(i) Contractor's implementation of community health and safety plan following international best practices on community health and safety such as those in Section 4.3 of World Bank Environmental Health and Safety (EHS) Guidelines on Construction and Decommissioning Activities. As a minimum and whichever is applicable, the health and safety plan shall ensure the following: (ii) implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning; (iii) restricting access to the site, through a combination of institutional and administrative controls, with a focus on high-risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community; (iv) removing hazardous conditions on construction sites that cannot be controlled affectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials; (v) implement measure to prevent proliferation of vectors of diseases at work sites; (vi) Implement necessary structural safety and site safety measures to prevent collapse of trenches, and damage / structural failure / collapse of adjacent buildings, boundary walls and other structures; provide proper braces, struts, anchors as required in the trench and for	Construction Contractor	PMSC and PIU	Cost for Implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		protecting the adjoining structures; avoid placing of material, equipment, waste, close to the trench edges (vii) adequate space and lighting, temporary fences, reflectorized barriers and signage's at active work sites (viii) contractor's preparedness in emergency response; (ix) adequate dissemination of GRM and contractor's observance and implementation of GRM (x) Restrict construction vehicle movements to defined access roads and demarcated working areas (unless in the event of an emergency); (xi) Enforce strict speed limit (20-30 kmph) for playing on unpaved roads, construction tracks; (xii) Night-time driving will be by exception only, as approved by the Cluster-PIU to minimize driving risk and disturbance to communities; (xiii) Adopt standard and safe practices for micro tunneling, if required; (xiv) Temporary traffic control (e.g. flagmen) and signs will be provided where necessary to improve safety and provide directions; (xv) All drivers will undergo safety and training; along with COVID-19 awareness (xvi) Public access to all areas where construction works are on-going will be restricted through the use of barricading and security personnel; (xvii) Warning signs, blinkers will be attached to the barricading to caution the public about the hazards associated with the works, and presence of excavation; (xviii) Control dust pollution – implement dust control measures as suggested under air quality section; (xix) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		potentially serious accidents caused by equipment malfunction or premature failure; (xx) Provide road signs and flag persons to warn of on-going trenching activities.			
Work Camps and worksites	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants. Unsanitary and poor living conditions for workers	(i) As far as possible locate the camp site away from residential areas (at least 50 m buffer shall be maintained) (ii) Avoid tree cutting for setting up camp facilities (iii) Ensured that a proper compound wall is provided, and erect a wind/dust screen around (iv) Camp site shall not be located near (50 m) water bodies, flood plains flood prone/low lying areas, or any ecologically, socially, archeologically sensitive areas (v) Construction camp must be safeguarded from COVID -19 including safe eating area, maintaining Hygiene inside camp, ensure physical distancing measures (vi) Separate the workers living areas and material storage areas clearly with a fencing and separate entry and exit (vii) Provide proper temporary accommodation with proper materials, adequate lighting and ventilation, appropriate facilities for winters and summers; ensure conditions of livability at work camps are maintained at the highest standards possible at all times; (viii) Consult Cluster-PIU before locating project offices, sheds; (ix) Minimize removal of vegetation and disallow cutting of trees (x) Ensure conditions of livability at work camps are always maintained at the highest standards possible; living quarters and construction camps shall be provided with standard materials (as far as possible to use portable ready to fit-in reusable cabins with proper ventilation); thatched huts, and	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		facilities constructed with materials like GI sheets, tarpaulins, etc., shall not be allowed as accommodation for workers (xi) Camp shall be provided with proper drainage, there shall not be any water accumulation (xii) Ensure COVID vaccination is done for all the labours involved in the work (xiii) Provide drinking water, water for other uses, and sanitation facilities for employees (xiv) Prohibit employees from cutting of trees for firewood; contractor should be provided proper facilities including cooking fuel (oil or gas; fire wood not allowed) (xv) Train employees in the storage and handling of materials which can potentially cause soil contamination (xvi) Recover used oil and lubricants and reuse or remove from the site (xvii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; provide a compost pit for biodegradable waste, and non-biodegradable / recyclable waste shall be collected and sold in local market (xviii) Remove all wreckage, rubbish, or temporary structures which are no longer required (xix) At the completion of work, camp area shall be cleaned and restored to pre-project conditions, and submit report to Cluster-PIU; Cluster-PIU to review and approve camp clearance and closure of work site.			
Chance Finds	There are no protected properties in the subproject sites. However, in	In case of chance finds, works must be stopped immediately, informed to PIU and until such time chance finds are cleared by experts	Construction Contractor	PMSC and PIU	Contractor cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Social and Cultural Resources	case of chance finds, contractors will be required to follow a protocol as defined in the mitigation measures.	- Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as pneumatic drills, dozers etc., within 100 m of ASI monuments) - Put in place proper dust and noise control measures - Adjacent to religious/social/historical buildings, undertake excavation and construction work in such a way that no structural damage is caused to the structures - Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrances/obstacles during such time to the religious places - Provide proper signage, barricades etc. to protect public and devotees from dangers of construction works. - Ensure proper traffic management planning to minimize the disruption to the normal traffic flow in the area and ensure the safety of the people. - Clear the work site of unnecessary material, equipment and debris / surplus soil; do not stock material / soil at the sites - Conduct continuous consultations with the local people during the works - Implement additional safety features for working near the schools; isolate work site from the school access road; provide proper barricading to prevent entry of children / public into work site; create awareness among school children and staff on construction safety	Construction Contractor	PMSC and PIU	Contractor cost
Submission of EMP implementation report	Unsatisfactory compliance to EMP	(i) Appointment of Environment, Health and Safety (EHS) Social Supervisor to ensure EMP implementation	Construction Contractor and Cluster PIU	PMSC and PMU	Contractor cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(ii) Timely submission of monitoring reports including pictures			
Post- construction clean-up	Damage due to debris, spoils, excess construction materials	(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) after completion of work; (ii) All excavated roads shall be reinstated to original condition. (iii) All disrupted utilities will be restored (iv) All affected structures will be rehabilitated/ compensated (v) The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. (vi) The contractor must arrange the cancellation of all temporary services. (vii) Request Cluster-PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.	Construction Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Table 27: Operation Stage Environmental Impacts and Mitigation Measures

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Drainage Maintenance	Entry of wastewater, blocking/choking of drains due to accumulation of silt, and solid waste could damage the health and environment	(i) Prevent entry of wastewater into drains; this requires development of sewerage system (intercepting of wastewater) in the town. In the interim, an interception, diversion and treatment of drain water proposed under AMRUT/other govt. scheme; PMU to ensure that this project is implemented as per the schedule so that wastewater that enter the drains is collected and treated prior to discharge into streams and river (ii) Ensure that sewage/septic tank outflow is not discharged into drains; implementation of the proposed sanitation and septage management	Operation Contractor	ULB	Operating costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		system under AMRUT/ other govt. scheme will minimize this impact (iii) promotion and enforcement of good waste management practices at household level; (iv) regular monitoring and cleaning of the drains, and siltation or sedimentation chambers (or similar structures) at the outfalls, to prevent entry or accumulation of silt and solid wastes inside these drains. (v) Ensure regular cleaning and desilting of drains; project shall include provision of necessary maintenance equipment (vi) Prevent encroachment of drains			
Community hazards due to destroyed or removed drainage cover	Repair works could cause some temporary disruption of activities at sensitive locations such as schools, hospitals, religious places, etc.,	Repair works could cause some temporary disruption of activities at sensitive locations such as schools, hospitals, religious places, etc., so the same precautions as employed during the construction period should be adopted. ULB will: • Complete work in these areas quickly; and • Consult municipal authorities, custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.	Operation Contractor	ULB	Operating costs
Routine Maintenance of road	Traffic may be interrupted temporarily but this work will be very small in scale, infrequent, and short in duration, so there will be no economic or other implications. The infrastructures will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as	(i) To maintain the safety of workers and road-users, such work should be coordinated with the local police department so that adequate warning signs and traffic diversions can be set up when necessary. (ii) Debris need to be collected and disposed at a designated site such as the landfill. (iii) Continue to encourage community participation in ensuring drainage canals are clog-free through information and behavior change campaigns and incentives, if possible.	PIU, Operation Contractor	ULB	Operating costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	the work will be infrequent, affecting small areas only.				
Community safety.	Improved roads may give way to faster vehicle speeds which could endanger people and households along the road alignments. Damage in roads may also cause accidents to motorists.	(i) Conduct regular inspection of the roads to check for damages, and undertake rehabilitation measures for any damages found; (ii) Inspect and maintain the integrity of road barriers, especially at critical curves or locations that are prone to vehicular accidents; (iii) Inspect and maintain speed limiters such as humps installed on road sections near residential areas, schools, and religious establishments. (iv) Inspect and maintain all road signages, including appropriate warning signages at silent zones, and ensure that these are reflectorized and visible even during night time; and (v) Ensure pedestrian crossings are maintained..	Operation Contractor	ULB	Operating costs

Table 28: Construction Stage Environmental Monitoring Plan

Monitoring field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
Construction disturbances, nuisances, public and worker safety,	All work sites	Implementation of dust control, noise control, traffic management, and safety measures. Sample site inspection checklist attached as Appendix 14.	Weekly during construction	Supervising staff and safeguards specialists	PMSC and PIU	No costs required
Tree cutting	Along the proposed drain and road network	Tree cutting permit taken, Tree cutting done	Continuous	Supervising staff, EHS officer and safeguards specialists	PIU and ULB	Contractor
Shifting of utility structure	Along the proposed drain and road network	Inform to concerned service providers and shifting done	Continuous	Supervising staff, EHS officer and safeguards specialists	PIU and ULB	Contractor
Construction, Labour Camp, storage yard Management	Construction, Labour Camp, storage yard sites	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	PIU and ULB	contractor
Solid waste management	Construction, Labour Camp, storage yard Management	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	PMSC, PIU and ULB	contractor
Construction and demolition waste management	All construction site	As per SEMP and applicable rules and regulations	Monthly	EHS officer, Environment Specialist of consultant	PMSC, PIU and ULB	contractor

Monitoring field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
Consent to establish of batching plants, crusher, hot mix plant. DG sets etc. (if required)	Batching plants, crusher, hot mix plants etc.	Copies of Consents	Periodically	EHS officer, Environment Specialist of consultant	PMSC and PIU	No cost required for monitoring cost for obtaining CTE/CTO from PMU and for others from Contractor
Ambient air quality	Khowai 4 locations, (3 location on proposed drain and 1 in proposed road) Mohanpur 4 locations, (3 locations on propose drain and 1 location on proposed road) Ranirbazar 4 locations, (2 locations on propose drain and 2 location on proposed road)	PM ₁₀ , PM _{2.5} NO ₂ , SO ₂ , CO	(i) Once before start of construction. (ii) Yearly 3 times (for seasons: pre-monsoon, post-monsoon and winter) during construction (2.5-years period considered)	Construction Contractor	PMSC and PIU	Cost for implementation of monitoring measures responsibility of contractor
Ambient noise level	Khowai 4 locations, (3 location on proposed drain and 1 in proposed road) Mohanpur 4 locations, (3 locations on propose drain and 1 location on proposed road) Ranirbazar 4 locations, (2	Day time and nighttime noise levels	(i) Once before start of construction. (ii) Yearly 3 times (for seasons: pre-monsoon, post-monsoon and winter) during construction (2.5 -years period considered)	Construction Contractor	PMSC and PIU	Cost for implementation of monitoring measures responsibility of contractor

Monitoring field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
	locations on propose drain and 2 location on proposed road)					
Surface water quality	Two no. for each town if required (suspected water body contamination)	pH, TDS, Oil and grease, Cl, F, NO ₃ , TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity	(i) Once before start of construction (ii) Yearly 3 times (for seasons: pre-monsoon, post-monsoon and winter) during construction (2.5-years period considered)	Construction Contractor	PMSC and PIU	Cost for implementation of monitoring measures responsibility of contractor
COVID-19 Health Monitoring	At all operating sites	Known symptoms of COVID-19 e.g., fever, cough, etc.	Daily	Construction Contractor	PMSC and PIU	Cost for implementation of monitoring measures responsibility of contractor (Lumpsum)

Table 29: Operation Stage Environmental Monitoring Plan

Monitoring Field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
Monitoring of quality of water on discharge point of the drain	Outfall of the drain sampling in all zones	pH, Nitrite, Nitrate, Turbidity BOD, COD, Hardness, residual chlorine, Total Alkalinity	Quarterly once	Contractor / ULB	ULB	O&M costs

Monitoring Field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
Air quality Monitoring on proposed road	On sensitive locations	PM ₁₀ , PM _{2.5} NO ₂ , SO ₂ , CO	Two times in a year	Contractor / ULB	ULB	O&M costs

B. Implementation Arrangements

167. Urban Development Department (UDD) of Government of Tripura (GOT) is the executing agency, and the implementing agencies are Tripura Urban Planning and Development Authority (TUDA, for urban component) and Tripura Tourism Development Corporation Limited (TTDCL, for tourism component). A Project Management Unit (PMU) will be established with the secretary, UDD as the project director and secretary, Department of Tourism (DOT), GOT, as co-project director. The PMU will also include two additional project directors (one each for urban and tourism), a project coordinator, and an additional project coordinator. Six project implementation units (PIUs) will be established to cover urban and tourism components separately and will be located at Agartala, Udaipur and Kumarghat. Project Management & Supervision Consultant (PMSC) will be engaged to assist PMU and the PIUs for implementation of the project.

168. At PMU level, the project coordinator at PMU will be the nodal officer for environmental, social safeguards and gender and will be responsible for ensuring compliance with ADB's Safeguards Policy Statement (SPS), 2009, during the project implementation, including the monitoring and reporting. PMU will engage a qualified and experienced consultant, designated as environmental safeguards officer (ESO), to support project coordinator in environmental safeguards tasks. Project manager or assistant project manager of PIU will be designated as safeguards focal in each PIU. PMSC team will include an Environmental Safeguards Specialist (ESS), and three support safeguards staff, located in PIUs and will provide all necessary support and expert guidance to PMU and PIUs. Contractor will appoint an Environment, Health and Safety (EHS).

169. **Project Management Unit (PMU).** The PMU will be responsible for planning, management, coordination, supervision and progress monitoring. The PMU has the responsibility of fulfilling environmental requirements of the government and ensuring effective implementation of the environmental management provisions in the IEEs, EMPs and civil works contracts. The following are the key environmental safeguard tasks and responsibilities of the ESO at the PMU:

- (i) ensure project compliance with the statutory environmental requirements, ADB SPS 2009, and loan covenants
- (ii) ensure that draft IEEs prepared based on preliminary designs are updated to reflect the final subproject detailed designs, and are approved by ADB and disclosed prior to bid invitation (for works contracts) and commencement of works (for design-build contract)
- (iii) ensure that IEEs including EMPs are included in bidding documents and contracts
- (iv) Ensure that baseline monitoring as suggested in the EMPs are conducted and base values established prior to commencement of works
- (v) Ensure that detailed environmental audit conducted for existing facilities and corrective actions are included in project for implementation
- (vi) coordinate with design engineers to avoid potential environmental impacts
- (vii) ensure that SEMP are submitted by contractor and cleared by PIU prior to commencement of works
- (viii) ensure that construction works are not commenced until all applicable government clearances, permits (including those required by construction contractor) are obtained;
- (ix) Oversee and ensure that contractors and their subcontractors comply with labor laws and rules

- (x) ensure that the IEEs including EMPs are updated in case of any change project scope, design or location during implementation
- (xi) confirm compliance with all measures and requirements set forth in the IEEs, the EMPs and any corrective or preventive actions set forth in safeguard monitoring reports;
- (xii) finalize environmental sections quarterly progress reports, and environmental monitoring reports for submission to ADB
- (xiii) ensure availability of budget for safeguards activities
- (xiv) ensure adequate awareness campaigns, information disclosure among affected communities and timely disclosure of final IEEs/EMPs and SEMRs, including corrective action plans, if any, in project website and in a form accessible to the public;
- (xv) assist in setting up of grievance redress mechanism (GRM), identifying grievance redressal committee (GRC) members and developing capacity of GRC members, PIUs, consultants, and contractors in addressing environmental safeguards-related issues/concerns/complaints;
- (xvi) ensure any grievances brought about through the GRM are redressed in a timely manner;
- (xvii) organize periodic capacity building and training programs on safeguards for PMU, PIUs and contractors.

170. Project Implementation Units. The PIUs will be responsible for the day-to-day activities of project implementation in the field and will have direct supervision of all contractors. PIUs will oversee and monitor the day-to-day progress and implementation including environmental safeguards. The following are the key environmental safeguard tasks and responsibilities of the Safeguard Officer at the PIU with the PMSC's support environmental staff:

- (i) Promptly report to PMU on any changes in project design / location / scope during the design verification and implementation phase and coordinate with PMSC to update IEEs and EMPs
- (ii) Liaise with local offices of regulatory agencies and ensure that clearances /approvals are obtained timely;
- (iii) Take necessary action for obtaining right-of-way prior to start of works;
- (iv) Review and approve contractor SEMP's;
- (v) Oversee implementation of SEMP's by contractors
- (vi) Ensure that contractors and their subcontractors comply with labor legislations and standards; ensure that workers are accommodated, paid and treated according to the requirements
- (vii) ensure strict implementation of occupational health and safety requirements
- (viii) Review monthly reports from contractors on EMP implementation, and support PMU in preparing quarterly reports and SEMRs
- (ix) Ensure continuous public consultation and awareness;
- (x) Coordinate grievance redress process and ensure timely actions by all parties; and
- (xi) Support all other environmental safeguards-related activities and tasks of the PMU as may be needed.
- (xii) recommend issuance of construction work completion certification to the contractor upon verification of satisfactory post-construction clean-up.

171. Project Management and Supervision Consultant. The PMU and PIUs will be supported by PMSC's Environmental specialist and three support environmental staff. Key tasks

of will include, but not limited to, the following:

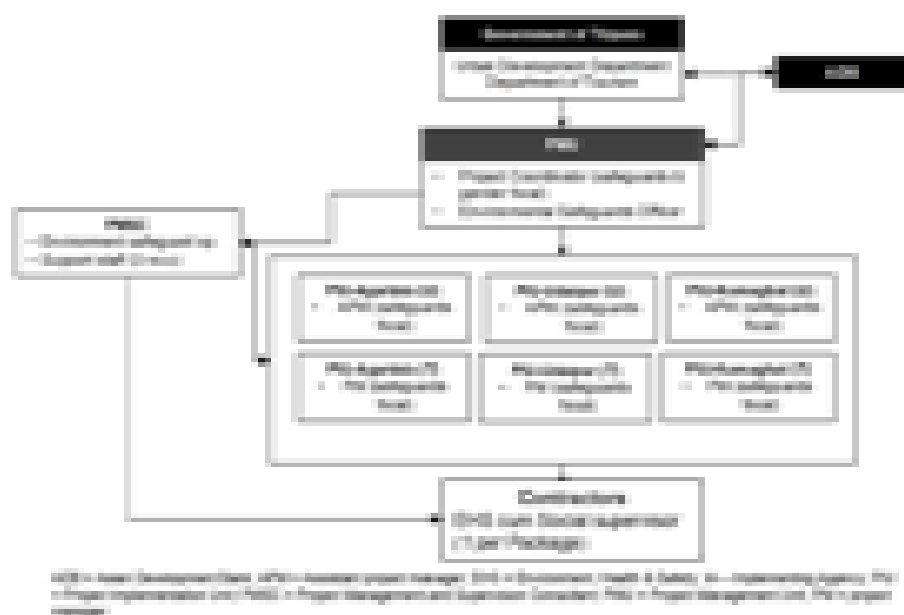
- (i) Assist in preparing, updating, reviewing, implementing, monitoring, and reporting of all tasks related to environmental safeguards as required
- (ii) Monitoring of EMP implementation, regulatory compliance, grievance redress, reporting etc.,
- (iii) Provide all necessary support and expert guidance to ESO and SO in managing environmental safeguards tasks
- (iv) Work closely with design teams to include environmental considerations in subproject location, design and technical specifications
- (v) Update IEEs and EMPs as needed to reflect detailed designs, changes in design verification and/or implementation phase of subprojects
- (vi) Assist in public consultations, feedback and reporting
- (vii) Ensure that the relevant provisions of EMPs, including costs of implementing the EMPs, are fully included in bid and contract documents, particularly in the bill of quantities and cost line items;
- (viii) Identify statutory clearances / permissions / approvals required and assist in obtaining them;
- (ix) Assist in including standards/conditions of regulatory clearances and consents, if any, in the project design;
- (x) Conduct training, capacity building activities for PMU, PIU and contractors
- (xi) Ensure compliance with ADB's disclosure requirements as per the SPS;
- (xii) Assist PMU/PIUs in reviewing and approving contractor SEMP, and other associated plans
- (xiii) Carry out site verification, and monitor the EMP implementation and ensure compliance by the contractors and subcontractors;
- (xiv) Ensure that contractors and their subcontractors comply with labor legislations; ensure that workers are paid and treated according to the labor legislations
- (xv) Identify any non-compliances or unanticipated impacts and recommend corrective actions
- (xvi) Prepare environmental safeguards section in quarterly reports
- (xvii) prepare semiannual environmental monitoring reports
- (xviii) Assist in operating GRM effectively
- (xix) Advise contractor on appropriate actions on grievances, ensure timely resolution and proper documentation; and
- (xx) Support all other environmental safeguards-related activities and tasks of the PMU and PIUs as may be needed.

172. **Contractor.** The approved draft IEEs and EMPs are to be included in bidding and contract documents. The PMU and PIUs will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable laws and regulations relating to environment, health and safety; (ii) reinstate pathways, other local infrastructure, and agricultural land to at least to their pre-project condition upon the completion of construction; (iii) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation, international treaties for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; (c) no discrimination in respect of employment and occupation; (d) allow freedom of association and effectively recognize the right to collective bargaining, and (e) elimination of forced labor; and (iv) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites. The contractor will be required to appoint a full time Environment, Health and Safety (EHS) cum social supervisor on-

site to implement the EMP. EHS cum social supervisor will assist contractor in the following:

- (i) Prepare SEMP and submit to PMU/PIU for approval prior to start of construction
- (ii) Comply with the measures forth in the IEEs, the EMPs, and SEMRs
- (iii) Ensure implementation of SEMP and report to PIU/PMC on any new or unanticipated impacts
- (iv) Ensure that necessary pre-construction and construction permits are obtained
- (v) Ensure to adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and
- (vi) Conduct orientation, daily briefing sessions, toolbox talks, to workers on environment, health and safety;
- (vii) provide appropriate worker facilities at the workplace and labor camps as per the requirements and contractual provisions;
- (viii) Carry out site inspections on a regular basis and prepare site-inspection checklists/reports;
- (ix) Record EHS incidents and undertake remedial actions;
- (x) Conduct environmental monitoring (air, noise, etc.) as per the monitoring plan
- (xi) Prepare monthly EMP monitoring reports and submit to PIU
- (xii) Comply with labor legislations, and ensure that subcontractors also implement labor legislations requirements, through cascading of requirements to subcontractors—HR policy, labor management requirements, any worksite specific grievance redress mechanism.
- (xiii) Work closely with PIU and PMC to ensure communities are aware of project related impacts, mitigation measures, and GRM;
- (xiv) Receive, record, and redress grievances in an effective and timely manner;
- (xv) Provide the PIU/ PMU with a written notice of any unanticipated environmental, impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP;
- (xvi) Reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction;
- (xvii) Site clearance and restoration after the completion of works

173. Safeguards implementation arrangement is shown in **Figure 41**.

Figure 41: Safeguards Implementation Arrangements

C. Capacity Building and Training

174. Safeguard focal of PIU will be trained by Environmental Safeguard Specialist by PMSC on safeguards issues related to the project, EMP, SEMP and GRM. The SEMP, IPPF and GESI action plan will provide indicative capacity building program which included modules on: (i) introduction and sensitization to ADB SPS on environmental, involuntary resettlement and indigenous people policies and requirements; (ii) project related requirements as provided in the EMP, SEMP, IPPF and GESI action plan, (iii) review, updating and preparation of the IEEs, SEMPs, RPs, DDRs and IPPs (as required) upon the completion of project detailed design; (iv) improved coordination within nodal departments; (v) monitoring and reporting system; and (vi) project GRM.

175. The estimated cost is ₹3,00,000 (excluding trainings of contractors which is a part of EMP implementation cost during construction) to be covered by the project's capacity building program. The detailed cost and specific modules are being customized for the available skill set after assessing the capabilities of the target participants and the requirements of the project by the Environment Safeguard specialist (ESS) of PMSC.

Table 30: Outline Capacity Building Program on EMP Implementation

Description	Target Participants and Venue	Estimate (Rs)	Est and Source of Funds
1. Introduction and Sensitization to Environmental Issues (1 day) - ADB Safeguards Policy Statement - Government of India and Tripura state applicable safeguard laws, regulations and policies including but not limited to core labor standards, OHS, etc. - Incorporation of EMP into the project design and contracts - Monitoring, reporting and corrective action planning	All staff and consultants involved in the project At PIU-PMU (combined program for all subprojects in one cluster)	150,000	Included in the overall program cost
2. EMP implementation (1/2 day) - EMP mitigation and monitoring measures - Roles and responsibilities - Public relations, - Consultations - Grievance redress - Monitoring and corrective action planning - Reporting and disclosure - Construction site standard operating procedures (SOP) Health & safety, specifically health risk from COVID 19. -- Chance find (archeological) protocol -Traffic management plan Waste management plan - Site clean-up and restoration	All Cluster-PIU staff, contractor staff and consultant involved in the subproject At PIU- cluster- PIUs	150,000 (Lump sum)	Included in subproject cost estimates
3. Contractors Orientation to Workers (1/2 day) - Environment, health and safety in project construction -Health impact and protection from COVID 19	Once before start of work, and thereafter regular briefing every month once. Daily briefing / tool box talk on safety prior to start of work All workers (including unskilled laborers)	100,000	Contractor's cost

D. Monitoring and Reporting

176. Immediately after mobilization and prior to commencement of the works, the contractor is to submit a compliance report to cluster-PIU that all identified pre-construction mitigation measures as detailed in the EMP will be undertaken. Contractor should confirm that the staff for EMP implementation (EHS cum social supervisor/officer) is mobilized. Cluster-PIU is required to review, and approve the report and permit commencement of works.

177. During construction, results from internal monitoring by the contractor is to be reflected in their monthly EMP/SEMP implementation reports to the Cluster-PIU/PIU. PMSC is required to review and advise contractors for corrective actions if necessary. The quarterly report summarizing compliance and corrective measures taken is to be prepared by PMSC team at PIU and to be submitted to PMU. During operation, the contractor is required to conduct management and monitoring actions as per the operation stage EMP and submit to PIU a quarterly report on EMP implementation and compliance.

178. Based on monthly and quarterly reports and measurements, PMU/PIU (assisted by PMSC) is required to submit semi-annual environmental monitoring report (SEMR). Once concurrence from the ADB is received the report will be disclosed on TUDA/PMU websites.

179. ADB will review project performance against the TUTDP commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising social and environmental safeguards will be integrated into the project performance management system.

180. ADB's monitoring and supervision activities will be carried out on an on-going basis until a Project Completion Report (PCR) is issued. ADB issues a PCR within 1-2 years after the project is physically completed and in operation.

E. Environmental Management Plan Implementation Cost

181. Most of the mitigation measures require the contractors to adopt good site practices, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. The costs which are specific to EMP implementation and are not covered elsewhere in the projects are given below. **Table 31** indicates cost estimate to implement EMP.

Table 31: Cost Estimates to Implement the Environmental Management Plan

Sr. No.	Particulars	Stages	Unit	Total No.			Rate INR	Cost INR	Costs Covered By
				Khowai	Mohanpur	Ranirbazar			
A.	Implementation staff								
1	Environment, Health, and Safety cum social Supervisor	Construction	Per month (Effective work period for the town)	30 months	30 months	30 months	70,000.00	6,300,000.00	contractor
	Subtotal (A)							6,300,000.00	
B.	Mitigation Measures								
1	Consent for establishments and consent for operation from TSPCB	Pre construction – not applicable	-	-	-	-	-	-	
2	Provision for tree cutting and compensatory plantation measures (1: 5 ratio replantation) Includes plantation along the road (depends on availability of land)	Construction	Per tree	100	180	50	1,000	330,000.00	contractor
3	Traffic management at work sites (Pavement Markings, Channelizing Devices, Arrow	Construction	Lump sum	To be done	To be done	To be done	80,000.00 LS	240,000.00	contractor

Sr. No.	Particulars	Stages	Unit	Total No.			Rate INR	Cost INR	Costs Covered By
				Khowai	Mohanpur	Ranirbazar			
	Panels and Warning Lights)								
4	Provision for COVID-19 preventive measures e.g., mask, sanitizer, etc.	Construction	Lump sum	To be done	To be done	To be done	50,000.00 LS	150,000.00	Contract
	Subtotal (B)							720,000.00	
C.	Monitoring Measures								
1	Air quality monitoring	Construction	per sample	32	32	32	10,000.00	960,000.00	Contract
2	Noise levels monitoring	Construction	Per sample	32	32	32	1500.00	144,000.00	Contract
3	Surface water monitoring	Construction	Per sample	15	15	15	8,000.00	360,000.00	Contract
5	COVID-19 health monitoring at operating sites	Construction	Per thermal gun	5	5	5	5000.00	75,000.00	Contract
	Subtotal (C)							1,539,000.00	
D.	Capacity Building								
1	Introduction and Sensitization to Environmental Issues	Pre-construction	Lump sum	1,50,000	1,50,000	1,50,000	Lumpsum	4,50,000.00	PIU
2	EMP implementation	Pre-construction	Lump sum	1,50,000	1,50,000	1,50,000	Lumpsum	4,50,000.00	PIU
3	Contractors Orientation to Workers on EMP implementation	Prior to dispatch to worksite	Lump sum	1,00,000	1,00,000	1,00,000	Lumpsum	3,00,000.00	Contract
	Subtotal (D)							1,200,000.00	
E	Civil Works								

Sr. No.	Particulars	Stages	Unit	Total No.			Rate INR	Cost INR	Costs Covered By
				Khowai	Mohanpur	Ranirbazar			
1	Water Sprinkling for dust suppression	Construction	KL	2500	2500	2500	120	900,000.00	Civil works contract under Contractor
	Subtotal (E)							900,000.00	
F	Barricading								
1	Providing and fixing Barricading using 40 mm dia. M.S. pipe vertical and horizontal posts	Construction	m	Already included in Civil cost					Civil works contract under Contractor
2	Providing and fixing using 40 mm dia. M.S. pipe ("B" class) as vertical post and PVC tape	Construction	m	Already included in Civil cost					Civil works contract under Contractor
G	Grievance Redressal Mechanism			350000	350000	350000	Lumpsum	1,050,000.00	
	Total (A+B+C+D+E+F+G)						INR	11,709,000.00	
Contractor Cost							INR	10,809,000.00	
PIU Cost							INR	900,000.00	
Total							INR	11,709,000.00	

X. CONCLUSION AND RECOMMENDATIONS

182. The process described in this document has assessed the environmental impacts of all elements of the proposed road and drain subproject for Cluster IA towns. All potential impacts are identified in relation to pre-construction, construction, and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the project design or location were not significant.

183. Road and drainage system rehabilitation will be carried out within existing right of ways or roads and drains. Works are located in urban areas, and there are no notable sensitive environmental features except few local religious places, sensitive receptors like health institutes and educational institutes along the project roads. There are no environmentally, or historically or archeologically sensitive or protected areas within or adjoining the project sites. Nearest protected area to Khowai town is at 5 km, located in Bangladesh.

184. Road improvements are combined with necessary improvements drainage facilities along the roads, and therefore no adverse impacts due to rehabilitation / construction of roads envisaged. Provision of side lateral drains, and cross drainage structures like culverts where required to collect and convey surface runoff is already included in the proposed roads. Subproject also includes construction / improvement of existing drains in various places to collect and convey runoff into nearby streams / *charras* / rivers to mitigate the problem of water logging. In the existing condition, wastewater, mainly sullage (grey water) from the houses is being discharged into open drains. It is necessary that the proposed septage management and interception, diversion and treatment project under AMRUT/ other govt. scheme is implemented as per the schedule to prevent discharge of wastewater into natural drains, especially during dry season.

185. The public participation processes undertaken during project design ensured stakeholders are engaged during the preparation of the IEE. The planned information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during project implementation.

186. The project's grievance redress mechanism will provide the citizens with a platform for redress their grievances, and describes the informal and formal channels, time frame, and mechanisms for resolving complaints about environmental performance.

187. The EMP will assist the project agencies and contractor in mitigating the environmental impacts, and guide them in the environmentally sound execution of the proposed project.

188. A copy of the EMP/approved SEMP shall be always kept on-site during the construction period. The EMP shall be made binding on all contractors operating on the site, and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document shall constitute a failure in compliance.

189. The project will benefit the general public by improving roads and drains and will contribute to improved community livability in the project towns of Khowai, Mohanpur and Ranirbazar. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigating measures and environmentally sound engineering and construction practices.

190. **Conclusion.** Therefore, as per ADB SPS, the project is classified as environmental category B and does not require further environmental impact assessment. However, to conform to government guidelines. In case of any change in scope, design and location IEE report will be updated and to be approved by ADB before final disclosure.

191. **Recommendations.** The following are recommendations applicable to the subproject to ensure no significant impacts:

- (i) Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design;
- (ii) Include this IEE in bid and contract documents;
- (iii) Update/revise this IEE in case of change in scope, alignment, or location;
- (iv) Conduct safeguards induction to the contractor upon award of contract;
- (v) Ensure that the construction and demolition waste generated from demolition is existing structure to be reused and disposed as per guidelines stipulated in Construction and Demolition Waste Management Rules 2016
- (vi) Ensure proper disposal of drainage silt after receiving of NOC from Pollution Control Board;
- (vii) Ensure contractor appointed qualified environment, health, and safety (EHS) officers prior to start of works;
- (viii) Timely disclosure of information and establishment of GRM;
- (ix) Involvement of contractors, including subcontractors, in first level GRM;
- (x) Strictly supervise EMP implementation;
- (xi) Continuous consultations with stakeholders;
- (xii) Documentation and reporting on a regular basis as indicated in the IEE.
- (xiii) Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation

Appendix 1: REA Checklist

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST- KHOWAI

Road & Highways Khowai

Country/Project Title: India/ Tripura Urban & Tourism Development Project

Sector: Urban development – Road

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		✓	No historical/cultural/ monuments/ areas exist in or close vicinity of the subproject components. Hence no such impacts are anticipated.
Protected Area		✓	No as such protected area nearby the proposed roads considered for improvement
Wetland		✓	None
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Proposed roads are not within buffer zone of any protected area
Special area for protecting biodiversity		✓	None of the subproject component sites are adjacent to or within any special area for protecting biodiversity
B. Potential Environmental Impacts Will the Project cause...			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		✓	Work will be done within existing ROW. No encroachment on historical/cultural areas has been identified. No major disfiguration of landscape is envisaged as the roads pass through generally flat terrains.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		✓	Not applicable – no protected areas nearby the roads
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?	✓		Inclusion of drainage works with roads in critical areas will help reduce flooding risks in these sections.
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	✓		There may be siltation of natural streams/drains located in the vicinity of project sites during construction and operation and mitigation measures have been proposed in the EMP Poor camp management may lead to runoff of silt and other wastes from workers' camps. This possible impact has been identified and mitigation measures have been included in the EMPs.

Screening Questions	Yes	No	Remarks
Increased local air pollution due to rock crushing, earth cutting and filling works, and chemicals from asphalt processing?	✓		Dust generation from earthworks and fumes from equipment and construction vehicles would be unavoidable. Measures to minimize local air pollution problems have been proposed in the EMP. Due to the nature of construction works, it is anticipated that air pollution will be increased during construction phase. Local regulations will also apply. Other mitigation measures needed will be covered in the EMP.
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓		As a standard, workers will be provided with PPE to minimize exposure to risks and associated harmful occupational health effects Although, the scale of construction works is relatively small for brick/ mud road, occupational health, and safety (OHS) risks have still been taken into consideration and mitigation measures have been proposed in the EMP.
Noise and vibration due to blasting and other civil works?	✓		Although, the use of blasting is not proposed under the project, noise and vibration will be generated from construction works. Measures for minimizing this nuisance have been identified in the EMP
Dislocation or involuntary resettlement of people?		✓	Minimal impact is anticipated since improvement work will be accommodated within available ROW. Temporary impact may be during construction work.
Dislocation and compulsory resettlement of people living in right-of-way?		✓	ROW encroachment in the project is very uncommon although some commercial structures (e.g. kiosks, stores) will have to be relocated temporarily. These have been covered in the resettlement plans (RPs).
Disproportionate impacts on the poor, women and children, Indigenous Peoples, or other vulnerable groups?		✓	Currently, no specific vulnerable groups have been identified in the project areas
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		✓	ROW encroachment in the project state is very uncommon although some commercial Impacts to air quality will be highly localized and temporary during construction activity. Regular water sprinkling is a standard measure that will be employed to reduce the dust.
Hazardous driving conditions where construction interferes with pre-existing roads?	✓		With strict occupational health and safety requirements, restrictions on construction timing and mitigation measures against dust and other forms of pollution, serious concerns on respiratory problems and stress are not expected Contractors are required to prepare traffic management plans to avoid hazards and risks
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?	✓		As a standard practice, these issues have been covered in the provisions for sanitation, health care and solid and liquid waste management in the contract documents.
Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		✓	Minimal risk is anticipated. Regular monitoring of drains and other potential breeding grounds for mosquitoes and proper waste management in camps will be implemented

Screening Questions	Yes	No	Remarks
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?	✓		The preparation of traffic management plans and road safety provisions are included in the EMPs.
Increased noise and air pollution resulting from traffic volume?	✓		Noise barriers at sensitive receptors and community place will be provided to minimize impacts. Additional plantation along the road has been planned (depends on space availability) and improved road conditions will improve the air quality in the areas during operation.
increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?		✓	Major impacts are expected from accidental spillage which is not very likely. The project includes roads safety measures to ensure that the risks are minimized.
Social conflicts if workers from other regions or countries are hired?		✓	As a standard requirement, most of the workers will be locals. No such conflict is anticipated
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Workers will be mostly locals. Workers from remote places will be provided with adequate boarding facilities.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		Road construction involves the use of fuel, lubricants and bitumen which poses risk during transport and storage. Appropriate mitigation measures are covered in the EMPs.
Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.	✓		Adequate measures have been adopted to mitigate such risks The project includes road safety measures to ensure that the risks are minimized during operation.

A Checklist for Preliminary Climate Risk Screening

Screening Questions	Score	Remarks ¹⁷
Location and Design of project	1	Some project location may experience increased flooding during high rain season. However, no project components are sited in flood plains and road specifications have been designed taking into account increased risk of water logging.
Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	0	Proposed investments will not be passing through riverine areas
Would the project design (e.g., the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak		

¹⁷ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Screening Questions		Score	Remarks ¹⁷
	river flow, reliable water level, peak wind speed etc)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	Work involved improvement of small stretch of the road. Not much impact anticipated.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	1	Increased flooding due to predicted increased precipitation will likely increase the cost of maintenance of the roads to maintain an acceptable level of service.
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	Increase in temperature may cause rutting but not projected to be at a scale that can affect achieving the project objective of providing safe and efficient transport. Likely road blockages may occur during extreme weather events.

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): **Medium Risk**

Other Comments: None

Rapid Environmental Assessment Checklist**Storm Water Drain- Khowai****Country/Project Title:** India/ Tripura Urban & Tourism Development Project**Sector:** Sewerage & Drainage

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area...			
Densely populated?		✓	Khowai is not densely populated. The subproject area comprises different part of the town, Project locations supports open area, residential and commercial areas.
Heavy with development activities?		✓	The area comprises of residential structures, commercial establishments, and open area. The developmental activities such as construction works are ongoing at an average pace.
Adjacent to or within any environmentally sensitive areas?		✓	Drainage work will be carried out within Khowai town. There is no forest area nearby.
Cultural heritage site		✓	Drainage components are not located nearby the ASI protected area
Protected Area		✓	No as such protected area nearby the proposed drainage locations
Wetland		✓	None
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Drainage location not within buffer zone of any protected area
Special area for protecting biodiversity		✓	None of the subproject component sites are adjacent to or within any special area for protecting biodiversity
Bay		✓	Not Applicable
B. Potential Environmental Impacts Will the Project cause...			
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	No historical/cultural/ monuments/ areas exist in or close vicinity of the subproject components. Hence no such impacts are anticipated.
Interference with other utilities and blocking of access to buildings; nuisance to neighbouring areas due to noise, smell, and influx of insects, rodents, etc.?	✓		No significant impact is anticipated. However, during construction there will be minor impacts due to noise, and dust of construction activities. The interference with access to buildings and commercial establishments is anticipated during construction phase. This shall be temporary in nature and shall be restricted to the duration of construction activities at a particular site. No problems of smell, influx of insects, rodents, etc. are anticipated due to implementation of sub project. The works will be mainly restricted within the existing storm water drains.

Screening Questions	Yes	No	Remarks
Dislocation or involuntary resettlement of people?		✓	Scope of the sub-project will entail no involuntary resettlement impacts and no physical dislocation of people is anticipated. Temporary impact may be during construction phase. This deals under RP/ due diligence report
Disproportionate impacts on the poor, women and children, Indigenous Peoples, or other vulnerable groups?		✓	No such impact is anticipated.
Impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?		✓	Not applicable as sub project pertains to rehabilitation of existing storm water drains and outfalls.
Overflows and flooding of neighbouring properties with raw sewage?		✓	No such impact is anticipated. The proposed subproject will reduce the water logging and flooding in the drainage zones
Environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?		✓	Not Applicable
Noise and vibration due to blasting and other civil works?	✓		Noise due to operation of machines during civil works is anticipated. This shall be temporary in nature and shall be restricted to the duration of construction activities at a particular site. No blasting activity shall be involved
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	✓		During execution stage, workers may face occupational health and safety related issues if personal protection measures are not used properly. No such impact is anticipated in operation stage.
Discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?		✓	Not applicable as the subproject involves rehabilitation of existing storm water drains
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?		✓	Not applicable. Pumping and treatment plants are not involved.
Road blocking and temporary flooding due to land excavation during the rainy season?	✓		Temporary road blocking during construction of culverts shall be there for which proper traffic management and diversion arrangements shall be implemented. Due care shall be taken to carry out the works during dry periods to avoid any incidence of temporary flooding in the areas
Noise and dust from construction activities?	✓		Minor noise and dust from construction activities is anticipated which shall be temporary in nature coinciding only with the duration of construction activities.

Screening Questions	Yes	No	Remarks
Traffic disturbances due to construction material transport and wastes?		✓	The transportation of construction material and wastes shall be site specific and restricted to daily requirements which is not expected to result into traffic disturbances. However, traffic diversion plan, if required, will be prepared by contractor in consultation with Engineer to avoid traffic disturbances.
Temporary silt runoff due to construction?	✓		Temporary silt run off may be there during rainy season. Majority of the works shall be carried out during dry periods to avoid such impacts. To avoid silt flow in drains, during construction, silt fencing arrangements will be provided at the banks of drains.
Hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?		✓	Not Applicable
Deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?		✓	Not anticipated as the proposed subproject envisages rehabilitation of existing storm water drains. The major drains running the core area of the town are identified for interception and diversion to the proposed STP site. These components are proposed to be funded under AMRUT/ Similar scheme of GOI
Contamination of surface and ground waters due to sludge disposal on land?		✓	No as such impact anticipated
Health and safety hazards to workers from toxic gases and hazardous materials which may be contained in confined areas, sewage flow and exposure to pathogens in untreated sewage and unsterilized sludge?		✓	Not anticipated as there will be construction and rehabilitation of existing open drains. However, the workers shall be provided with personal protective equipment like gum boots, gloves and masks, etc. while working within the drains to avoid any occupational health hazards.
Large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		✓	No as such impact anticipated
Social conflicts between construction workers from other areas and community workers?		✓	No such conflicts are anticipated. Preference will be given to local laborers and migratory labour shall be employed in unavoidable circumstances only.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		✓	No as such impact anticipated
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	No such impact is anticipated in case of the proposed drainage work

A Checklist for Preliminary Climate Risk Screening

Screening Questions		Score	Remarks ¹⁸
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Extreme weather, specifically high rain intensity may result flooding of the drain. Outfall area of drain should be cleaned for final discharge of storm water to River
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	1	Maintenance of the drain will be affected under extreme climatic condition.
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low-risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): **Medium Risk**

Other Comments: None

¹⁸ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST- MOHANPUR**Road - Mohanpur****Country/Project Title: India/ Tripura Urban & Tourism Development Project****Sector: Urban development – Road**

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		✓	No historical/cultural/ monuments/ areas exist in or close vicinity of the subproject components. Hence no such impacts are anticipated.
Protected Area		✓	Sepahijala wildlife sanctuary located about 33.19 km (aerial distance) from Mohanpur town. No as such protected area nearby the proposed roads considered for improvement
Wetland		✓	None
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Proposed roads are not within buffer zone of protected area
Special area for protecting biodiversity		✓	Sepahijala wildlife sanctuary located about 33.19 km (aerial distance) from Mohanpur town. None of the subproject component sites are adjacent to or within any special area for protecting biodiversity
B. Potential Environmental Impacts Will the Project cause...			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		✓	Work will be done within existing ROW. No encroachment on historical/cultural areas has been identified. No major disfiguration of landscape is envisaged as the roads pass through generally flat terrains.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		✓	Not applicable – no protected areas nearby the roads. Mostly village type <i>kancha</i> road.
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?	✓		Inclusion of drainage works with roads in critical areas will help reduce flooding risks in these sections.
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	✓		There may be siltation of natural streams/drains located in the vicinity of project sites during construction and operation and mitigation measures have been proposed in the EMP Poor camp management may lead to runoff of silt and other wastes from workers' camps. This possible impact has been identified and mitigation measures have been included in the EMPs.

Screening Questions	Yes	No	Remarks
Increased local air pollution due to rock crushing, earth cutting and filling works, and chemicals from asphalt processing?	✓		Dust generation from earthworks and fumes from equipment and construction vehicles would be unavoidable. Measures to minimize local air pollution problems have been proposed in the EMP. Due to the nature of construction works, it is anticipated that air pollution will be increased during construction phase. Local regulations will also apply. Other mitigation measures needed will be covered in the EMP.
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓		As a standard, workers will be provided with PPE to minimize exposure to risks and associated harmful occupational health effects Although, the scale of construction works is relatively small for brick/ mud road, occupational health and safety (OHS) risks have still been taken into consideration and mitigation measures have been proposed in the EMP.
Noise and vibration due to blasting and other civil works?	✓		Although, the use of blasting is not proposed under the project, noise and vibration will be generated from construction works. Measures for minimizing this nuisance have been identified in the EMP
Dislocation or involuntary resettlement of people?		✓	Minimal impact is anticipated since improvement work will mostly be accommodated within available ROW. Temporary impact may be during construction work.
Dislocation and compulsory resettlement of people living in right-of-way?		✓	ROW encroachment in the project state is very uncommon. No resettlement is expected – mostly village type road
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	Currently, no specific vulnerable groups have been identified in the project areas
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		✓	ROW encroachment in the project state is very uncommon Regular water sprinkling is a standard measure that will be employed to reduce the dust.
Hazardous driving conditions where construction interferes with pre-existing roads?	✓		With strict occupational health and safety requirements, restrictions on construction timing and mitigation measures against dust and other forms of pollution, serious concerns on respiratory problems and stress are not expected Contractors are required to prepare traffic management plans (if required) to avoid hazards and risks
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?	✓		As a standard practice, these issues have been covered in the provisions for sanitation, health care and solid and liquid waste management in the contract documents.
Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		✓	Minimal risk is anticipated. Regular monitoring of drains and other potential breeding grounds for mosquitoes and proper waste management in camps will be implemented

Screening Questions	Yes	No	Remarks
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?	✓		The preparation of traffic management plans (as per requirement) and road safety provisions are included in the EMPs.
Increased noise and air pollution resulting from traffic volume?	✓		Noise barriers at sensitive receptors and community place will be provided to minimize impacts. Additional plantation along the road has been planned (depends on space availability) and improved road conditions will improve the air quality in the areas during operation.
increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?		✓	Major impacts are expected from accidental spillage which is not very likely. The project includes roads safety measures to ensure that the risks are minimized.
Social conflicts if workers from other regions or countries are hired?		✓	As a standard requirement, most of the workers will be locals. No such conflict is anticipated
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Workers will be mostly locals. Workers from remote places will be provided with adequate boarding facilities.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		Road construction involves the use of fuel, lubricants which poses risk during transport and storage. Appropriate mitigation measures are covered in the EMPs.
Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.	✓		Adequate measures have been adopted to mitigate such risks The project includes road safety measures to ensure that the risks are minimized during operation.

A Checklist for Preliminary Climate Risk Screening

Screening Questions	Score	Remarks ¹⁹
Location and Design of project	1	Some project location may experience increased flooding during high rain season. However, no project components are sited in flood plains and road specifications have been designed taking into account increased risk of water logging.
Would the project design (e.g. the clearance for bridges) need to	0	Proposed investments will not be passing through riverine areas

¹⁹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Screening Questions		Score	Remarks ¹⁹
	consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	Work involved improvement of small stretch of the road. Not much impact anticipated.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	1	Increased flooding due to predicted increased precipitation will likely increase the cost of maintenance of the roads to maintain an acceptable level of service.
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	Increase in temperature may cause rutting but not projected to be at a scale that can affect achieving the project objective of providing safe and efficient transport. Likely road blockages may occur during extreme weather events.

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low-risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): **Medium Risk**

Other Comments: None

Rapid Environmental Assessment Checklist**Storm Water Drain- Mohanpur****Country/Project Title:** India/ Tripura Urban & Tourism Development Project**Sector:** Sewerage & Drainage

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area...			
Densely populated?		✓	Mohanpur is not densely populated. The subproject area comprises different part of the town, Project locations supports open area, residential and commercial areas.
Heavy with development activities?		✓	The area comprises of residential structures, commercial establishments, and open area. The developmental activities such as construction works are ongoing at an average pace.
Adjacent to or within any environmentally sensitive areas?		✓	Drainage work will be carried out within Mohanpur town. There is no forest area nearby.
Cultural heritage site		✓	Drainage components are not located nearby the ASI protected area. Gunavati Group of Temples is situated 49.15 KM (aerial distance) away from the Mohanpur. Chaturdasa Devata, ASI protected area is located about 48.87 km (aerial distance) from Mohanpur.
Protected Area		✓	No as such protected area nearby the proposed drainage locations. Sepahijala wildlife sanctuary located about 33.19 km (aerial distance) from Mohanpur town.
Wetland		✓	None
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Drainage location not within buffer zone of any protected area
Special area for protecting biodiversity		✓	None of the subproject component sites are adjacent to or within any special area for protecting biodiversity
Bay		✓	Not Applicable
B. Potential Environmental Impacts Will the Project cause...			
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	No historical/cultural/ monuments/ areas exist in or close vicinity of the subproject components. Hence no such impacts are anticipated.

Screening Questions	Yes	No	Remarks
Interference with other utilities and blocking of access to buildings; nuisance to neighbouring areas due to noise, smell, and influx of insects, rodents, etc.?	✓		No significant impact is anticipated. However, during construction there will be minor impacts due to noise, and dust of construction activities. The interference with access to buildings and commercial establishments is anticipated during construction phase. This shall be temporary in nature and shall be restricted to the duration of construction activities at a particular site. No problems of smell, influx of insects, rodents, etc. are anticipated due to implementation of sub project. The works will be mainly restricted within the existing storm water drains.
Dislocation or involuntary resettlement of people?		✓	Scope of the sub-project will entail no involuntary resettlement impacts and no physical dislocation of people is anticipated. Temporary impact may be during construction phase. This deals under RP/ due diligence report
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	No such impact is anticipated.
Impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?		✓	Not applicable as sub project pertains to rehabilitation of existing storm water drains and outfalls.
Overflows and flooding of neighbouring properties with raw sewage?		✓	No such impact is anticipated. The proposed subproject will reduce the water logging and flooding in the drainage zones
Environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?		✓	Not Applicable
Noise and vibration due to blasting and other civil works?	✓		Noise due to operation of machines during civil works is anticipated. This shall be temporary in nature and shall be restricted to the duration of construction activities at a particular site. No blasting activity shall be involved
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	✓		During execution stage, workers may face occupational health and safety related issues if personal protection measures are not used properly. No such impact is anticipated in operation stage.
Discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?		✓	Not applicable as the subproject involves rehabilitation of existing storm water drains
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?		✓	Not applicable. Pumping and treatment plants are not involved.

Screening Questions	Yes	No	Remarks
Road blocking and temporary flooding due to land excavation during the rainy season?	✓		Temporary road blocking during construction of culverts shall be there for which proper traffic management and diversion arrangements shall be implemented. Due care shall be taken to carry out the works during dry periods to avoid any incidence of temporary flooding in the areas
Noise and dust from construction activities?	✓		Minor noise and dust from construction activities is anticipated which shall be temporary in nature coinciding only with the duration of construction activities.
Traffic disturbances due to construction material transport and wastes?		✓	The transportation of construction material and wastes shall be site specific and restricted to daily requirements which is not expected to result into traffic disturbances. However, traffic diversion plan, if required, will be prepared by contractor in consultation with Engineer to avoid traffic disturbances.
Temporary silt runoff due to construction?	✓		Temporary silt run off may be there during rainy season. Majority of the works shall be carried out during dry periods to avoid such impacts. To avoid silt flow in drains, during construction, silt fencing arrangements will be provided at the banks of drains.
Hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?		✓	Not Applicable
Deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?		✓	Not anticipated as the proposed subproject envisages rehabilitation of existing storm water drains. The major drains running the core area of the town are identified for interception and diversion to the proposed STP site. These components are proposed to be funded under AMRUT/ Similar scheme of GOI
Contamination of surface and ground waters due to sludge disposal on land?		✓	No as such impact anticipated
Health and safety hazards to workers from toxic gases and hazardous materials which may be contained in confined areas, sewage flow and exposure to pathogens in untreated sewage and unsterilized sludge?		✓	Not anticipated as there will be construction and rehabilitation of existing open drains. However, the workers shall be provided with personal protective equipment like gum boots, gloves, and masks, etc. while working within the drains to avoid any occupational health hazards.
Large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		✓	No as such impact anticipated
Social conflicts between construction workers from other areas and community workers?		✓	No such conflicts are anticipated. Preference will be given to local laborers and migratory labour shall be employed in unavoidable circumstances only.

Screening Questions	Yes	No	Remarks
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		✓	No as such impact anticipated
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	No such impact is anticipated in case of the proposed drainage work

A Checklist for Preliminary Climate Risk Screening

Screening Questions		Score	Remarks ²⁰
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Extreme weather, specifically high rain intensity may result flooding of the drain. Outfall area of drain should be cleaned for final discharge of storm water to River
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	1	Maintenance of the drain will be affected under extreme climatic condition.
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): **Medium Risk**

Other Comments: None

²⁰ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST- RANIRBAZAR**Road- Ranirbazar****Country/Project Title: India/ Tripura Urban & Tourism Development Project****Sector: Urban development – Road**

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		✓	No historical/cultural/ monuments/ areas exist in or close vicinity of the subproject components. Hence no such impacts are anticipated.
Protected Area		✓	Sepahijala wildlife sanctuary located about 21.02 km (aerial distance) from Ranirbazar town. No as such protected area nearby the proposed roads considered for improvement
Wetland		✓	None
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Proposed roads are not within buffer zone of any protected area
Special area for protecting biodiversity		✓	Sepahijala wildlife sanctuary located about 21.02 km (aerial distance) from Ranirbazar town. None of the subproject component sites are adjacent to or within any special area for protecting biodiversity
B. Potential Environmental Impacts Will the Project cause...			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		✓	Work will be done within existing ROW. No encroachment on historical/ cultural areas has been identified. No major disfiguration of landscape is envisaged as the roads pass through generally flat terrains.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		✓	Not applicable – no protected areas nearby the roads
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?	✓		Inclusion of drainage works with roads in critical areas will help reduce flooding risks in these sections.
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	✓		There may be siltation of natural streams/drains located in the vicinity of project sites during construction and operation and mitigation measures have been proposed in the EMP Poor camp management may lead to runoff of silt and other wastes from workers' camps. This possible impact has been identified and mitigation measures have been included in the EMPs.

Screening Questions	Yes	No	Remarks
Increased local air pollution due to rock crushing, earth cutting and filling works, and chemicals from asphalt processing?	✓		Dust generation from earthworks and fumes from equipment and construction vehicles would be unavoidable. Measures to minimize local air pollution problems have been proposed in the EMP. Due to the nature of construction works, it is anticipated that air pollution will be increased during construction phase. Local regulations will also apply. Other mitigation measures needed will be covered in the EMP.
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓		As a standard, workers will be provided with PPE to minimize exposure to risks and associated harmful occupational health effects Although, the scale of construction works is relatively small for brick/ mud road, occupational health and safety (OHS) risks have still been taken into consideration and mitigation measures have been proposed in the EMP.
Noise and vibration due to blasting and other civil works?	✓		Although, the use of blasting is not proposed under the project, noise and vibration will be generated from construction works. Measures for minimizing this nuisance have been identified in the EMP
Dislocation or involuntary resettlement of people?		✓	Minimal impact is anticipated since improvement work will mostly be accommodated within available ROW. Temporary impact may be during construction work.
Dislocation and compulsory resettlement of people living in right-of-way?		✓	ROW encroachment in the project state is very uncommon although some commercial structures (e.g. kiosks, stores) will have to be relocated temporarily. These have been covered in the resettlement plans (RPs).
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	Currently, no specific vulnerable groups have been identified in the project areas
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		✓	ROW encroachment in the project state is very uncommon although some commercial Impacts to air quality will be highly localized and temporary during construction activity. Regular water sprinkling is a standard measure that will be employed to reduce the dust.
Hazardous driving conditions where construction interferes with pre-existing roads?	✓		With strict occupational health and safety requirements, restrictions on construction timing and mitigation measures against dust and other forms of pollution, serious concerns on respiratory problems and stress are not expected Contractors are required to prepare traffic management plans to avoid hazards and risks
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?	✓		As a standard practice, these issues have been covered in the provisions for sanitation, health care and solid and liquid waste management in the contract documents.

Screening Questions	Yes	No	Remarks
Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		✓	Minimal risk is anticipated. Regular monitoring of drains and other potential breeding grounds for mosquitoes and proper waste management in camps will be implemented
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?	✓		The preparation of traffic management plans and road safety provisions are included in the EMPs.
Increased noise and air pollution resulting from traffic volume?	✓		Noise barriers at sensitive receptors and community place will be provided to minimize impacts. Additional plantation along the road has been planned (depends on space availability) and improved road conditions will improve the air quality in the areas during operation.
increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?		✓	Major impacts are expected from accidental spillage which is not very likely. The project includes roads safety measures to ensure that the risks are minimized.
Social conflicts if workers from other regions or countries are hired?		✓	As a standard requirement, most of the workers will be locals. No such conflict is anticipated
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Workers will be mostly locals. Workers from remote places will be provided with adequate boarding facilities.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		Road construction involves the use of fuel, lubricants and bitumen which poses risk during transport and storage. Appropriate mitigation measures are covered in the EMPs.
Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.	✓		Adequate measures have been adopted to mitigate such risks The project includes road safety measures to ensure that the risks are minimized during operation.

A Checklist for Preliminary Climate Risk Screening

Screening Questions	Score	Remarks ²¹
Location and Design of project Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Project location may experience increased flooding during high rain season. However, no project components are sited in flood plains and road specifications have been designed taking into account

²¹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Screening Questions		Score	Remarks ²¹
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	increased risk of water logging. Proposed investments will not be passing through riverine areas
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	Work involved improvement of small stretch of the road. Not much impact anticipated.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	1	Increased flooding due to predicted increased precipitation will likely increase the cost of maintenance of the roads to maintain an acceptable level of service.
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	Increase in temperature may cause rutting but not projected to be at a scale that can affect achieving the project objective of providing safe and efficient transport. Likely road blockages may occur during extreme weather events.

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): **Medium Risk**

Other Comments: None

Rapid Environmental Assessment Checklist**Storm Water Drain- Ranirbazar****Country/Project Title:** India/ Tripura Urban & Tourism Development Project**Sector:** Sewerage & Drainage

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area...			
Densely populated?		✓	Ranirbazar is not densely populated. The subproject area comprises different part of the town, Project locations supports open area, residential and commercial areas.
Heavy with development activities?		✓	The area comprises of residential structures, commercial establishments, and open area. The developmental activities such as construction works are ongoing at an average pace.
Adjacent to or within any environmentally sensitive areas?		✓	Drainage work will be carried out within Ranirbazar town. There is no forest area nearby.
Cultural heritage site		✓	Drainage components are not located nearby the ASI protected area. Gunavati Group of Temples is situated 35.7 KM (aerial distance) away from the Ranirbazar . Chaturdasa Devata, ASI protected area is located about 34.5 km (aerial distance) from Ranirbazar.
Protected Area		✓	No as such protected area nearby the proposed drainage locations. Sepahijala wildlife sanctuary located about 21.02 km (aerial distance) from Ranirbazar town.
Wetland		✓	None
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Drainage location not within buffer zone of any protected area
Special area for protecting biodiversity		✓	None of the subproject component sites are adjacent to or within any special area for protecting biodiversity
Bay		✓	Not Applicable
B. Potential Environmental Impacts Will the Project cause...			
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	No historical/cultural/ monuments/ areas exist in or close vicinity of the subproject components. Hence no such impacts are anticipated.
Interference with other utilities and blocking of access to buildings; nuisance to neighbouring areas due to noise, smell, and influx of insects, rodents, etc.?	✓		No significant impact is anticipated. However, during construction there will be minor impacts due to noise, and dust of construction activities. The interference with access to buildings and commercial establishments is anticipated during construction phase. This shall be temporary in nature and shall be restricted to the duration of construction activities at a particular site. No problems of smell, influx of insects, rodents, etc. are anticipated due to implementation of sub project. The works will be mainly restricted within the existing storm water drains.

Screening Questions	Yes	No	Remarks
Dislocation or involuntary resettlement of people?		✓	Scope of the sub-project will entail no involuntary resettlement impacts and no physical dislocation of people is anticipated. Temporary impact may be during construction phase. This deals under RP/ due diligence report
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	No such impact is anticipated.
Impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?		✓	Not applicable as sub project pertains to rehabilitation of existing storm water drains and outfalls.
Overflows and flooding of neighbouring properties with raw sewage?		✓	No such impact is anticipated. The proposed subproject will reduce the water logging and flooding in the drainage zones
Environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?		✓	Not Applicable
Noise and vibration due to blasting and other civil works?	✓		Noise due to operation of machines during civil works is anticipated. This shall be temporary in nature and shall be restricted to the duration of construction activities at a particular site. No blasting activity shall be involved
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	✓		During execution stage, workers may face occupational health and safety related issues if personal protection measures are not used properly. No such impact is anticipated in operation stage.
Discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?		✓	Not applicable as the subproject involves rehabilitation of existing storm water drains
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?		✓	Not applicable. Pumping and treatment plants are not involved.
Road blocking and temporary flooding due to land excavation during the rainy season?	✓		Temporary road blocking during construction of culverts shall be there for which proper traffic management and diversion arrangements shall be implemented. Due care shall be taken to carry out the works during dry periods to avoid any incidence of temporary flooding in the areas
Noise and dust from construction activities?	✓		Minor noise and dust from construction activities is anticipated which shall be temporary in nature coinciding only with the duration of construction activities.
Traffic disturbances due to construction material transport and wastes?		✓	The transportation of construction material and wastes shall be site specific and restricted to daily requirements which is not expected to result into traffic disturbances. However, traffic diversion plan, if required, will be prepared by contractor in consultation with Engineer to avoid traffic disturbances.
Temporary silt runoff due to construction?	✓		Temporary silt run off may be there during rainy season. Majority of the works shall be carried out during dry periods to avoid such impacts. To avoid silt flow in drains, during construction, silt fencing arrangements will be provided at the banks of drains.

Screening Questions	Yes	No	Remarks
Hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?		✓	Not Applicable
Deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?		✓	Not anticipated as the proposed subproject envisages rehabilitation of existing storm water drains. The major drains running the core area of the town are identified for interception and diversion to the proposed STP site. These components are proposed to be funded under AMRUT/ Similar scheme of GOI
Contamination of surface and ground waters due to sludge disposal on land?		✓	No as such impact anticipated
Health and safety hazards to workers from toxic gases and hazardous materials which maybe contained in confined areas, sewage flow and exposure to pathogens in untreated sewage and unsterilized sludge?		✓	Not anticipated as there will be construction and rehabilitation of existing open drains. However, the workers shall be provided with personal protective equipment like gum boots, gloves and masks, etc. while working within the drains to avoid any occupational health hazards.
Large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		✓	No as such impact anticipated
Social conflicts between construction workers from other areas and community workers?		✓	No such conflicts are anticipated. Preference will be given to local laborers and migratory labour shall be employed in unavoidable circumstances only.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		✓	No as such impact anticipated
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	No such impact is anticipated in case of the proposed drainage work

A Checklist for Preliminary Climate Risk Screening

Screening Questions		Score	Remarks ²²
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Extreme weather, specifically high rain intensity may result flooding of the drain. Outfall area of drain should be cleaned for final discharge of storm water to River
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed	0	

²² If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

	etc)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	1	Maintenance of the drain will be affected under extreme climatic condition.
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low-risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): **Medium Risk**

Other Comments: None

Appendix 2: National Ambient Air Quality Standards

Parameter	Location ^a	India Ambient Air Quality Standard ($\mu\text{g}/\text{m}^3$) ^b	WHO Air Quality Guidelines ($\mu\text{g}/\text{m}^3$)			Applicable Per ADB SPS ^e ($\mu\text{g}/\text{m}^3$)
			Global Update ^c 2005	Second Edition 2000 ^d	Air Pollution Guideline 2021	
PM ₁₀	Industrial Residential, Rural and Other Areas	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-	15 (Annual) 45 (24-hr)	20 (Annual) 50 (24-hr)
	Sensitive Area	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-		20 (Annual) 50 (24-hr)
PM ₂₅	Industrial Residential, Rural and Other Areas	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)	-	05 (Annual) 15 (24-hr)	10 (Annual) 25 (24-hr)
	Sensitive Area	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)			10 (Annual) 25 (24-hr)
SO ₂	Industrial Residential, Rural and Other Areas	50 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-	40 (24-hr) 500 (10-min)	50 (Annual) 20 (24-hr) 500 (10-min)
	Sensitive Area	20 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-		20 (Annual) 20 (24-hr) 500 (10-min)
NO ₂	Industrial Residential, Rural and Other Areas	40 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-	10 (Annual) 25 (24-hr) 200 (1-hr)	40 (Annual) 80 (24-hr) 200 (1-hr)
	Sensitive Area	30 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-		30 (Annual) 80 (24-hr) 200 (1-hr)
CO	Industrial Residential, Rural and Other Areas	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	4 mg/ m ³ (24-hr) 10 mg/ m ³ (8-hr)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
	Sensitive Area	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	35 mg/ m ³ (1-hr) 100 mg/ m ³ (15-minute)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
Ozone (O ₃)	Industrial Residential, Rural and Other Areas	100 (8-hr) 180 (1-hr)	100 (8-hr)		60 (peak season) 100 (8-hr)	100 (8-hr) 180 (1-hr)
	Sensitive Area	100 (8-hr) 180 (1-hr)	100 (8-hr)			100 (8-hr) 180 (1-hr)
Lead (Pb)	Industrial, Residential, Rural and Other Areas	0.5 (Annual) 1.0 (24-hr)		0.5 (Annual)		0.5 (Annual) 1.0 (24-hr)

Parameter	Location ^a	India Ambient Air Quality Standard ($\mu\text{g}/\text{m}^3$) ^b	WHO Air Quality Guidelines ($\mu\text{g}/\text{m}^3$)			Applicable Per ADB SPS ^e ($\mu\text{g}/\text{m}^3$)
			Global Update ^c 2005	Second Edition 2000 ^d	Air Pollution Guideline 2021	
	Sensitive Area	0.5 (Annual) 1.0 (24-hr)		0.5 (Annual)		0.5 (Annual) 1.0 (24-hr)
Ammonia (NH_3)	Industrial Residential, Rural and Other Areas	100 (Annual) 400 (24-hr)				100 (Annual) 400 (24-hr)
	Sensitive Area	100 (Annual) 400 (24-hr)				100 (Annual) 400 (24-hr)
Benzene (C_6H_6)	Industrial Residential, Rural and Other Areas	5 (Annual)				5 (Annual)
	Sensitive Area	5 (Annual)				5 (Annual)
Benzo(a)pyrene (BaP) particulate phase only	Industrial Residential, Rural and Other Areas	0.001 (Annual)				0.001 (Annual)
	Sensitive Area	0.001 (Annual)				0.001 (Annual)
Arsenic (As)	Industrial Residential, Rural and Other Areas	0.006 (Annual)				0.006 (Annual)
	Sensitive Area	0.006 (Annual)				0.006 (Annual)
Nickel (Ni)	Industrial Residential, Rural and Other Areas	0.02 (Annual)				0.02 (Annual)
	Sensitive Area	0.02 (Annual)				0.02 (Annual)

^a Sensitive area refers to such areas notified by the India Central Government.

^b Notification by Ministry of Environment and Forests, Government of India Environment (Protection) Seventh Amendment Rules, 2009

^c WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. Global update 2005. WHO 2006

^d Air Quality Guidelines for Europe Second Edition. WHO 2000

^e As per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS

Appendix 3: Ambient Noise Level Standards

Receptor/ Source	India National Noise Level Standards (dBA) ^a		WHO Guidelines Value For Noise Levels Measured Out of Doors ^b (One Hour LA _q in dBA)		Applicable Per ADB SPS (dBA) ^c	
	Day	Night	07:00 – 22:00	22:00 – 07:00	Day time	Night time
Industrial area	75	70	70	70	70	70
Commercial area	65	55	70	70	65	55
Residential Area	55	45	55	45	55	45
Silent Zone	50	40	55	45	50	40

Note-

^a Noise Pollution (Regulation and Control) Rules, 2002 as amended up to 2010.

^b Guidelines for Community Noise. WHO. 1999

^c Per ADB SPS, the government shall achieve whichever of the ambient quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

Appendix 4: Vehicle Exhaust Emission Norms

1. Passenger Cars

Norms	CO(g/km)	HC+ NOx(g/km)
1991 Norms	14.3-27.1	2.0(Only HC)
1996 Norms	8.68-12.40	3.00-4.36
1998 Norms	4.34-6.20	1.50-2.18
India stage 2000 norms	2.72	0.97
Bharat stage-II	2.2	0.5
Bharat Stage-III	2.3	0.35 (combined)
Bharat Stage-IV	1.0	0.18 combined)

2. Heavy Diesel Vehicles

Norms	CO(g/kmhr)	HC (g/kmhr)	NOx (g/kmhr)	PM(g/kmhr)
1991 Norms	14	3.5	18	-
1996 Norms	11.2	2.4	14.4	-
India stage 2000 norms	4.5	1.1	8.0	0.36
Bharat stage-II	4.0	1.1	7.0	0.15
Bharat Stage-III	2.1	1.6	5.0	0.10
Bharat Stage-IV	1.5	0.96	3.5	0.02

Source: Central Pollution Control Board

CO = Carbon Monoxide; g/kmhr = grams per kilometer-hour; HC = Hydrocarbons; NOx = oxides of nitrogen; PM = Particulates Matter

Appendix 5: Labour Laws

SALIENT FEATURES OF MAJOR LABOR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN CONSTRUCTION OF CIVIL WORKS

- (i) Workmen Compensation Act, 1923 - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.
- (ii) Payment of Gratuity Act, 1972 - Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death at the rate of 15 days' wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.
- (iii) Employees' PF and Miscellaneous Provisions Act, 1952 - The Act provides for monthly contributions by the employer plus workers @10 % or 8.33 %. The benefits payable under the Act are: (a) Pension or family pension on retirement or death as the case may be; (b) deposit linked insurance on the death in harness of the worker; (c) payment of PF accumulation on retirement/death etc.
- (iv) Maternity Benefit Act, 1951 - The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.
- (v) Contract Labour (Regulation and Abolition) Act, 1970 - The Act provides for certain welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor.
- (vi) Minimum Wages Act, 1948 - The employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employment.
- (vii) Payment of Wages Act, 1936 - It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.
- (viii) Equal Remuneration Act, 1979 - The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.
- (ix) Payment of Bonus Act, 1965 - The Act is applicable to all establishments employing 20 or more workmen. The Act provides for payments of annual bonus subject to a minimum of 8.33 % of wages and maximum of 20 % of wages to employees drawing Rs. 3,500/- per month or less. The bonus to be paid to employees getting Rs. 2,500/- per month or above up to Rs.3,500/- per month shall be worked out by taking wages as Rs.2,500/- per month only. The Act does not apply to certain establishments. The newly set up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of the Act.
- (x) Industrial Disputes Act, 1947 - The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what

are the requirements for laying off or retrenching the employees or closing down the establishment.

(xi) Industrial Employment (Standing Orders) Act, 1946 - It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the employer on matters provided in the Act and get the same certified by the designated Authority.

(xii) Trade Unions Act, 1926 - The Act lays down the procedure for registration of trade unions of workmen and employees. The trade unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(xiii) Child Labor (Prohibition and Regulation) Act, 1986 - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labor is prohibited in Building and Construction Industry.

(xiv) Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act, 1979 - The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.

(xv) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996 - All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay Cess at rate not exceeding 2% of the cost of construction as may be notified by the Government. The employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

Appendix 6: Strip Plan for Proposed Road and Drain

Strip Plan of Cluster IA towns for Road and Drain

Khowai-Road

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
Road 1- Jeep stand to Nivedita park via Nripen Chakraborty avenue					
1	0-100m	-	-	Commercial	Commercial
2	100m-200m	-	-	Commercial	Commercial
3	200m-300m	-	-	Commercial	Commercial. Temple 4m outside ROW at 300m chainage- Not impacted
4	300m-400m	Transformer 3m outside ROW at 400m chainage	-	Commercial	Commercial
5	400m-500m	-	-	Commercial	Commercial
6	500m-600m	-	-	Commercial	Commercial
7	600m-700m	-	-	Commercial	Commercial
				Culvert at 690m chainage across proposed road	
8	700m-800m	-	-	Commercial	Commercial. Temple 3m outside ROW at 750m chainage. Khowai District Hospital outside ROW at 790m chainage- Not impacted
				Culvert at 765m chainage across proposed road	
9	800m-900m	-	-	Commercial	Commercial
10	900m-960m	-	-	Commercial	Commercial
Road-2: Vivekananda statue to Nripen Chakraborty Avenue via Swapnapuri					
1	0-100m	-	-	Commercial. Water body 8m outside ROW at 80m chainage	Commercial and partly residential. Temple 4m outside ROW at 0m chainage- Not impacted
2	100m-200m	1 electric post 0.3 m outside ROW at 120m chainage and 1 electric post 0.2 m outside ROW at 195 m chainage	-	Commercial. Water body 1.5m outside ROW at 190m chainage	Commercial
3	200m-300m	-	-	Commercial	Commercial.
4	300m-400m	-	-	Commercial and partly Residential.	Commercial
5	400m-500m	-	-	Commercial Culvert at 405m chainage	Commercial
6	500m- 600m	-	-	Commercial	Commercial.

Khowai-Drain

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
Drain LAL CHERRA_1 Catchment area					
Drain Bishu Roy House to Lal Chhera via Kudipara and Srinath Vidyaniketan					
1	0-100m	1 Electric Post 0.3m outside Proposed Drain at 7m chainage	-	Residential	Residential
2	100m-200m	-	-	Residential	Residential
3	200m-300m	-		Culvert at 180m chainage	
3	200m-300m	-		Residential	Residential
4	300m-400m		1 Electric Post 0.5m outside Proposed Drain at 305m chainage	Residential <i>and Water body 0.5 m outside ROW at 305m chainage</i>	Residential and <i>Water body 0.5 m outside ROW at 320m chainage</i>
5	400m-500m	-	-	Open and partly Residential	Open
6	500m-600m	-	-	Residential	Open
7	600m-700m	-	-	Residential	Residential
8	700m-800m	-	-	Culvert at 675m chainage	
8	700m-800m	-	-	Residential	Open
9	800m-900m	-	-	Residential	Partly Residential and <i>Water body 30m away</i>
10	900m-1000m	-	-	Culvert at 890m chainage	
10	900m-1000m	-	-	Residential and partly Open	Residential
11	1000m-1100m	-	-	Residential and partly Open	Residential and partly Open
12	1100m-1200m	-	-	Residential	Bamboo garden
13	1200m-1273m			Culvert at 1195m chainage	
13	1200m-1273m			Residential	Residential
Drain – Nimapara catchment area					
Vivekananda Statue to Cobbler Chowmuhani Via Swapanpuri Atithi Nivas (LHS)					
1	0-100m	1 Electric Post 0.2m outside Proposed Drain at 90m chainage	-	Commercial	Road
2	100m-200m	-	-	Commercial	Road
3	200m-300m	1 Electric Post 0.4m outside Proposed Drain at 220m chainage	1 Electric Post 0.4m outside Proposed Drain at 205m chainage	Commercial and partly Residential	Road
4	300m-332m	-	Tree 0.4m outside drain at 300m chainage	Commercial.	Road

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
Vivekananda Statue to Cobbler Chowmuhani Via Swapanpuri Atithi Nivas (RHS)					
1	0-100m	1 Electric Post 0.5m outside Proposed Drain at 80m chainage	1 Electric Post 0.4m outside Proposed Drain at 70m chainage	Road	Commercial and partly residential. Temple outside Drain at 0 chainage
2	100m-200m	-	1 Electric Post inside Proposed Drain at 160m chainage	Road	Commercial
3	200m-300m	-	-	Road	Commercial
4	300m-334m	-	-	Road	Commercial
Backside of Swapanpuri Atithi Nivas					
1	0-100m	-	1 Electric Post inside Proposed Drain at 8m chainage	Residential and partly vegetation	Commercial
2	100m-122m	-	-	Commercial	Commercial
Vivekananda Statue to Namapara Chowmuhani					
1	0-100m	-	Tree 0.4m outside drain at 15m chainage and Tree 0.15m outside drain at 95m chainage	Road	Commercial.
2	100m-200m	1 Electric Post 0.1m outside Proposed Drain at 150m chainage	1 Telephone Post inside Proposed Drain at 140m chainage and 1 Electric Post 0.1m outside Proposed Drain at 180m chainage	Road	Commercial
3	200m-300m	-	-	Road	Commercial
4	300m-351m	-	2 Trees inside proposed drain at 320m chainage	Road	Commercial.
Namapara Chowmuhani to Cobbler Chowmuhani (LHS)					
1	0-100m	1 Electric Post 0.3m outside Proposed Drain at 25m chainage	1 Telephone Post inside Proposed Drain at 25 m chainage	Commercial	Road

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
2	100m-160m	1 Electric Post 0.3m outside Proposed Drain at 180m chainage	-	Commercial	Road
Namapara Chowmuhani to Cobbler Chowmuhani (RHS)					
1	0-100m	1 Electric Post inside Proposed Drain at 20m chainage	Tree 2m outside drain at 10m chainage	Road	Commercial.
2	100m-200m	-	-	Road	Commercial
				Culvert at 200m chainage	
3	200m-211m	-	1 Electric Post 0.3m outside Proposed Drain at 180m chainage	Road	Open
Cobbler Chowmuhani to Namapara Bridge near Nivedita Park					
1	0-100m	1 Electric Post inside Proposed Drain at 20 chainage	-	Road	Vegetation (Bushes and Shrubs)
2	100m-200m	-	-	Indian Oil	Vegetation (Bushes and Shrubs)
3	200m-300m	-	-	Open	Residential. Water body 3m outside proposed Drain at 360m chainage.
4	300m-400m	-	-	Residential	Open
5	400m-500m	-	-	Residential. Water body 3m outside proposed Drain at 500m chainage.	Open
6	500m-600m	-	-	Residential	Open
7	600m-607m	-	-	Residential	Open
Namapara Chowmuhani to Namapara Bridge near Nivedita Park (LHS)					
1	0-100m	Traffic signal Post inside Proposed Drain at 50 m chainage	Tree 2m outside drain at 5m chainage	Commercial.	Road
2	100m-200m	Telephone Post 0.1m outside Proposed Drain at 135m chainage and	1 Electric Post inside Proposed Drain at 160 chainage	Commercial	Road

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
		Telephone Post 0.4m outside Proposed Drain at 140m chainage			
3	200m-256m	-	1 Electric Post inside Proposed Drain at 220 chainage	Residential	Road
Namapara Chowmuhani to Namapara Bridge near Nivedita Park (RHS)					
1	0-100m	Traffic signal Post inside Proposed Drain at 50 chainage	Tree 3m outside drain at 20m chainage	Road. Temple 0.5m outside proposed drain at 20m chainage.	Commercial.
				Shop encroaches at 15m chainage. Culvert at 50m chainage	
2	100m-200m	-	1 Electric Post inside Proposed Drain at 160 chainage	Road	Commercial. District Hospital Khowai outside proposed Drain at 100m chainage.
3	200m-261m	Tree 0.3m outside drain at 205m chainage	Optical fiber cable 0.2m outside Proposed Drain at 210m chainage and Transformer 0.5m outside Proposed Drain at 210m chainage	Road	Commercial and Park
Main Drain 3- Jambura Road Junction to Namapara Chowmuhani via Vivekananda Statue (LHS)					
1	0-100m	1 Telephone Post 0.3m outside Proposed Drain at 80m chainage and 1 Telephone Post inside Proposed Drain at 50m chainage	1 Electric Post inside Proposed Drain at 50m chainage	Commercial.	Road
2	100m-200m	1 Electric Post inside Proposed Drain at 160m chainage and 1 Electric Post inside Proposed Drain	1 Electric Post 0.3 m outside Proposed Drain at 140m chainage	Commercial	Road

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
		at 180m chainage			
3	200m-300m	1 Transformer inside Proposed Drain at 220m chainage	-	Commercial	Road
4	300m-400m	-	1 Electric Post inside Proposed Drain at 360m chainage	Commercial	Road
5	400m-500m	-	1 Electric Post 0.4 m outside Proposed Drain at 495m chainage	Commercial	Road
6	500m-600m	-	-	Commercial Covered drain at 560m chainage	Road
7	600m-605m	-	-	Commercial	Road
Jeep Taxi stand drain Vivekananda Statue to Jambura Road Junction (LHS)					
	Vivekananda Statue to Jambura Road Junction (LHS)				
1	0-100m	Tree 0.3m outside drain at 40m chainage	-	Commercial.	Road Temple at 0 Chainage outside the proposed drain
2	100m-196m	-	-	Commercial	Road
	Jambura Road Junction to Jeep Taxi Stand (LHS)				
1	0-100m	-	-	Commercial	Road
2	100m-173m	-	-	Commercial	Road
	Jambura Road Junction to Jeep Taxi Stand (RHS)				
1	0-100m	-	-	Road	Commercial
2	100m-167m	-	-	Road	Commercial

Mohanpur- Road

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
Road no 1- Tulabagan 14 no. ward no-12 para Dharendra Sarkar house to Rishipara Rubber bagan old quarter					
1	0-100m	1 electric post 0.5m outside ROW at 40m chainage and 1 electric post 0.5m outside ROW at 60m chainage	1 electric post 0.3m outside ROW at 15m chainage Tree 1m outside proposed Road at 20m chainage	Residential.	Residential
2	100m-200m	-	-	Rubber Plantation	Rubber Plantation
3	200m-300m	-	-	Rubber Plantation	Rubber Plantation
4	300m-400m	Tree 0.4m outside ROW at 370m chainage	Tree 3m outside proposed Road at 330m chainage	Agricultural.	Agricultural.
5	400m-500m	-	-	Rubber Plantation	Rubber Plantation
6	500m-600m	-	-	Rubber Plantation	Rubber Plantation
7	600m-700m	-	-	Rubber Plantation	Rubber Plantation
8	700m-800m	-	-	Rubber Plantation	Rubber Plantation
9	800m-900m	-	-	Rubber Plantation	Rubber Plantation
10	900m-1000m	-	-	Rubber Plantation	Rubber Plantation
11	1000m-1100m	-	-	Rubber Plantation	Rubber Plantation
12	1100m-1200m	-	-	Rubber Plantation	Rubber Plantation
13	1200m-1300m	-	-	Rubber Plantation	Rubber Plantation
14	1300m-1400m	-	-	Rubber Plantation	Open
15	1400m-1410m	-	-	Open	Open
Road no-2 : Agartala Simma road to Kathaltali Samsanghat					
1	0-100m	1 electric post inside ROW at 45m chainage	1 electric post inside ROW at 75m chainage	Agricultural	Residential. Water body 0.5m outside ROW at 75m chainage
2	100m-200m	-	1 electric post inside ROW at 115m chainage, 1 electric post inside ROW at 160m chainage Tree inside proposed Road at 180m chainage	Agricultural	Agricultural.

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
3	200m-300m	-	1 electric post inside ROW at 210m chainage	Agricultural. Water body 1.5m outside ROW at 300m chainage	Agricultural
4	300m-350m	-	1 electric post 0.3m outside ROW at 305 m chainage	Agricultural.	Open
Road no-3: Dighalia road to Tertiary center					
1	0-100m	-	-	Open	Open
2	100m-200m	-	-	Open	Open
3	200m-300m	-	-	Rubber Garden	Building under construction
Road no 4: Simma road to Jibesh Das house					
1	0-100m	-	1 Electric post 0.4m outside ROW at 25m chainage and 1 Electric post 0.4m outside ROW at 25m chainage	Residential.	Open. Water body 1.5m outside ROW at 30m chainage.
				Culvert at 5m chainage	
2	100m-200m	Tree inside proposed Road at 140m chainage	Tree inside proposed Road at 170m chainage and 1 Electric post inside ROW at 180m chainage	Open. Water body 2m outside ROW at 150m chainage	Open and partly Residential
3	200m-300m	1 Electric post 0.4m outside ROW at 260m chainage	1 Electric post 0.3m outside ROW at 270m chainage	Residential	Residential
4	300m-375m	1 Tree inside ROW at 305m chainage and 1 Tree inside ROW at 340m chainage	1 Tree inside ROW at 320m chainage	Open	Open

Mohanpur- Drain

Sl. No.	Chainage	Utilities adjacent (Less than 0.5m) to/inside Proposed Drain		Nearby Land Use	
		LHS	RHS	LHS	RHS
Drain-1: From Dilip Saha house to Joydeep Ghosh Shop under ward no-01, MMC					
1	0-94m	-	-	Road	Residential
Drain-2: From Jitindra Debnath land to Sarajit Acharjee land (Rabindra Palli) under ward no-02 MMC					
1	0-100m	-	1 Electric Post 0.5m outside Drain at 45m chainage	Open	Open. Water Body 3m outside Drain at 65m chainage
2	100m-192m	-	-	Open	Open
Drain-3: From Swapan Malakar land to Bakul Debnath House (Rabindra Palli) under ward no- 02 MMC					

Sl. No.	Chainage	Utilities adjacent (Less than 0.5m) to/inside Proposed Drain				Nearby Land Use	
		LHS		RHS		LHS	RHS
Sl. No.	Chainage	Utilities adjacent(Less than 0.5m) to/inside ROW				Nearby Land Use	
		Left Side Drain		Right Side Drain			
		LHS	RHS	LHS	LHS	RHS	LHS
1	0-100m	-	-	-	-	Residential	Road
2	100m-200m	-	-	-	-	Residential	Road
3	200m-268m	-	-	-	1 Telephone Post 0.2m outside Drain at 226m chainage. 1 Electric Post 0.5m outside Drain at 266m chainage	Residential	Road
Drain 4- From Simna Main Road to Sandhya Maisan house (Ghosh Para) under ward no -02 MMC							
1	0-97m	-	-	-	-	Residential	Residential
Drain-5- From Jagabandhu Debnath land to Chandan Bhattacharya house (Rabindra _Palli) under ward no- 02 MMC							
1	0-100m	Tree 1m outside proposed drain at 45m chainage.		2 Trees 0.4m outside proposed drain at 5m chainage.		Residential.	Residential.
2	100m-200m	-		-		Open	Open
3	200m-300m	-		-		Open	Open
4	300m-400m			-		Residential	Residential
5	400m-406m	Trees 0.4m outside proposed drain at 400m chainage		-		Residential	Residential
Drain-6: From Amal Gope to Haralal Bhowmik house under ward no- 03 MMC							
1	0-100m	-		-		Residential	Road
2	100m-153m	-		-		Residential	Road
Drain-7: From Goutam Shil house to BOC under ward no – 03, MMC							
1	0-100m	-		-		Road	Residential Culvert at 85m chainage
2	100m-200m	-		-		Open	Road
3	200m-203m	-		-		Open	Road

Sl. No.	Chainage	Utilities adjacent (Less than 0.5m) to/inside Proposed Drain		Nearby Land Use	
		LHS	RHS	LHS	RHS
Drain-8: From near the house of Subhash Deb (Pada) in front of Sudhan Das house (slab culvert) under ward no- 04, MMC					
1	0-100m	1 Electric post inside Drain at 10m chainage	1 Tree inside Drain at 20m chainage. 1 Electric post 0.2m outside Drain at 30m chainage	Road	Residential Culvert at 85m chainage
2	100m-200m	-	-	Residential	Road.
3	200m-273m	-	-	Residential	Road
Drain-9: From Dulal Modak shop to Shukhamay Deb land (Hospital Chowmuhan) under MMC					
1	0-100m	-	-	Commercial	Road
2	100m-200m	1 Electric post 0.3m outside Drain at 110m chainage. 1 Electric post 0.4m outside Drain at 125m chainage. 1 Electric post 0.5m outside Drain at 150m chainage	-	Commercial	Road
3	200m-300m	-	Tree 4m outside proposed drain at 225m chainage. Tree 4m outside proposed drain at 230m chainage.	Residential	Road.
4	300m-322m	-	-	Residential	Road
Drain-10- From Simna Main Road to Ramkrishna Ashram (Vivekananda Pili) under MMC					
1	0-100m	1 Electric post 0.3m outside Drain at 5m chainage	1 Electric post inside Drain at 70m chainage	Road	Residential
2	100m-200m	-	-	Road	Residential
3	200m-300m	-	-	Road	Residential
4	300m-320m	-	-	Road	Residential
5	0(185m)-67m			Residential	Residential
Drain-11: From Ratan Kanti Debnath house to Rabi Deb land (Jagatpur School Chowmuhan) under ward no-06, MC					
1	0-100m	-	-	Residential	Road
2	100m-200m	-	-	Residential	Road.
3	200m-300m	1 Tree inside drain at 270m chainage. 1	-	Residential.	Road.

Sl. No.	Chainage	Utilities adjacent (Less than 0.5m) to/inside Proposed Drain		Nearby Land Use	
		LHS	RHS	LHS	RHS
		Tree inside drain at 280m chainage			
4	300m-390m	Tree 0.5m outside proposed drain at 350m chainage	1 Electric post 0.4m outside ROW at 340m chainage	Residential.	Road
Drain-12: From Honda Show Room to Ranjit Debnath House under ward no-07, MMC					
1	0-100m	-	-	Road	Commercial
2	100m-200m	-	-	Road	Open
3	200m-300m	-	-	Road	Open and partly commercial
4	300m-302m	-	-	Road	Open
Drain-13: From near the house of Kiran Deb to Jagatpur Community Hall under ward no-08, MMC					
1	0-100m	-	-	Road	Residential
2	100m-200m	-	-	Road	Residential
3	200m-300m	-	Trees 0.5m outside proposed drain at 255m and 260m chainage	Road	Open.
4	300m-400m	-	-	Road	Commercial
5	400m-500m	-	-	Road	Residential
6	500m-568m	-	-	Open	Open
Drain-14: From Shanti Kr. Debnath to Bhajan Debnath land via Aila Ghat Bazar and near Amal Das house to Aila Ghat Bazar under ward no -09, MMC					
1	0-100m	-	-	Road	Agricultural
2	100m-200m	-	-	Road	Agricultural.
3	200m-298m (Junctions at 255m and 195m chainages)	-	-	Road.	Agricultural.
4	0(255m)-100m	-	-	Road	Residential
5	100m-178m	-	-	Road	Residential
6	0(195m)-100m	-	-	Agricultural	Kacha Road
7	100m-107m	-	-	Agricultural	Kacha Road
Drain 15: From near the house of Subal Rakshi to Airan Chowmuhani slab culvert (Both Side) and slab culvert to near Bandan (one side only) under ward no- 10, MMC					

Sl. No.	Chainage	Utilities adjacent (Less than 0.5m) to/inside Proposed Drain				Nearby Land Use	
		LHS		RHS		LHS	RHS
Sl. No.	Chainage	Utilities adjacent (Less than 0.5m) to/inside Drain				Nearby Land Use	
		Left Side Drain		Right Side Drain			
		LHS	RHS	LHS	RHS	LHS	RHS
1	0-100m	-	-	1 Electric Post 0.3m outside proposed drain at 90m chainage.	-	Open and Residential	Open and Residential
2	100m-200m	-	-			Residential	Residential
3	200m-280m (Both side drain ends)	-				Market	Market
Sl. No.	Chainage	Utilities adjacent(Less than 0.5m) to/inside Drain				Nearby Land Use	
		LHS		RHS		LHS	RHS
4	0m-100m	1 Tree inside proposed drain at 30m chainage				Market and Residential	Road
5	100m-200m	-				Residential	Road
6	200m-237m	-				Residential	Road
Drain-16: From near BSNL Office to Airan Chowmuhan slab culvert, under ward no- 10, MMC							
1	0-100m	-		1 Electric Post 0.2m outside proposed drain at 95m chainage		Road	Commercial
2	100m-138m	-		-		Road	Commercial
Drain-17: From near the house of kajal Debnath to Bikash Biawas land under ward no- 11, MMC							
1	0-100m	-		1 Electric Post 0.2m outside proposed drain at 15m chainage		Open	Road
2	100m-200m	-		-		Residential	Road
3	200m-300m					Residential	Road
4	300m-400m					Residential and partly Open	Residential and partly Open
5	400m-464m					Open	Open
Drain-18: From near the house of Bimal Biswas to PWD Mian Road under ward no- 11, MMC							
1	0-100m	-				Residential	Road

Sl. No.	Chainage	Utilities adjacent (Less than 0.5m) to/inside Proposed Drain		Nearby Land Use	
		LHS	RHS	LHS	RHS
2	100m-200m	-	1 Electric Post 0.5m outside proposed drain at 190m chainage	Residential	Road
3	200m-214m			Open	Open
Drain-19: From Chanmohan Das house to Jaharlal Das house under ward no- 12, MMC					
1	0-100m	-	-	Road	Residential
2	100m-200m	-	1 Electric Post 0.3m outside proposed drain at 150m chainage	Road	Residential
3	200m-300m	-	-	Open	Road
4	300m-313m	-	-	Open	Road
Drain-20: From near Nimai Gope house to Krishna Mandir under ward no- 13, MMC					
1	0-100m	1 Tree 3m outside proposed drain at 45m chainage. 1 Tree 3m outside proposed drain at 50m chainage.	-	Residential.	Road
2	100m-200m	-	-	Residential	Road
3	200m-300m	-	-	Residential	Road
4	300m-400m	-	-	Residential	Road
5	400m-404m	-	-	Residential	Road
Drain-21: From Tulabagan School to Kishore Debnath house under ward no- 14, MMC					
1	0-100m	Tree 0.4m outside proposed Drain at 10m chainage. 3 Trees 0.5-1m outside proposed drain at 10m-20m chainage. 1 Electric Post inside proposed Drain at 35m chainage.	-	Road.	Residential
2	100m-154m	1 Electric Post inside proposed Drain	-	Road	Residential

Sl. No.	Chainage	Utilities adjacent (Less than 0.5m) to/inside Proposed Drain		Nearby Land Use	
		LHS	RHS	LHS	RHS
		at 125m chainage.			
Drain-22: From near the Grocery Shop of Anil Paul to Ghosh Para slab culvert under ward no- 15, MMC					
1	0-100m	1 Electric Post 0.3m outside proposed Drain at 70m chainage	-	Commercial	Road
2	100m-200m	1 Electric Post inside proposed Drain at 120m chainage. 1 Electric Post inside proposed Drain at 130m chainage. 1 Electric Post inside proposed Drain at 160m chainage. 1 Electric Post inside proposed Drain at 195m chainage.	--	Commercial	Road
3	200m-300m	1 Electric Post 0.2m outside proposed Drain at 225m chainage. 1 Electric Post 0.3m outside proposed Drain at 260m chainage	-	Residential	Road
4	300m-312m	-	-	Residential	Road

Ranirbazar- Road

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
Road no-01: Gopal Road to Fish market					
1	0-100m	-	1 tube well 0.5m outside ROW at 50m chainage	Residential	Residential

2	100m-165m	Water Body 8m outside ROW at 165m chainage	-	Open	Open
Road no-02: Ranirbazar market of Nathmandir to late Dilip Debnath house					
1	0-100m	-	-	Commercial and partly Residential	Commercial and partly Residential
2	100m-200m	1 Light Post 0.3m outside ROW at 140m chainage. 1 tube well 0.5m outside ROW at 155m chainage	-	Commercial	Commercial
3	200m-280m	-	-	Commercial	Commercial

Ranirbazar- Drain

Ram Bazar Drain					
Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)	
		LHS	RHS	LHS	RHS
Drain-1: Nalgaria (NH-8) to Assampara Treatment Plant (RHS)					
1	0-100m	-	1 Electric Post 0.3m outside proposed ROW at 45m chainage.	Open	Road
2	100m-200m	-		Residential	Road Temple 5m outside proposed drain at 130m chainage
3	200m-300m	1 Transformer 0.2m outside proposed ROW at 210m chainage. 1 Electric Post inside proposed ROW at 255m chainage.		Residential	Road Water body 8m outside proposed drain at 205m chainage
4	300m-400m	1 Tree 2 m outside proposed drain at 270m chainage.	-	Residential	Road
5	400m-500m	-	-	Residential	Residential
6	500m-600m	-	-	Residential	Residential and partly vacant
7	600m-700m	1 Electric Post 0.5m outside proposed ROW at 690m chainage.	-	Residential	Residential
8	700m-800m	-	1 Electric Post inside proposed ROW at 780m chainage.	Residential	Residential
9	800m-860m	-	-	Open	Open
Road 8- Nalgaria (NH-8) to Assampara Treatment Plant (LHS)					
		Left Side Drain	Right Side Drain		

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone				Nearby Land Use (Religious places & water bodies)	
		LHS		RHS		LHS	RHS
		LHS	RHS	LHS	RHS		
1	0-100m	1 Electric Post inside proposed drain at 60m chainage	1 Tree 3m outside proposed drain at 0m chainage.	-	-	Commercial	Commercial
2	100m-200m	-	-		1 Telephone Post 0.3m outside and 1 Electric Post 0.4m outside proposed drain at 120m chainage.	Residential	Residential
3	200m-300m	-	-	-	-	Residential	Residential
4	300m-400m	-	-	-	-	Residential	Residential
5	400m-500m	-	-	-	-	Residential	Residential
6	500m-553m	-	-	-	-	Residential	Residential
Drain-3: NH-8 Gopal Road to Ranirbazar Market							
1	0-100m	-		-		Residential and Open. Temple outside Drain at 95m chainage	Road
2	0m-87m	-		1 Electric Post 0.5m outside proposed Drain at 5m chainage.		Market and Vacant	Road
		Left Side Drain		Right Side Drain			
		LHS	RHS	LHS	RHS		
3	0-100m	-	-	-	-	Open and Residential	Open and Residential
4	100m-200m	-	-	-	-	Market and Residential	Open and Residential
5	200m-215m	-	-	1 Electric Post 0.2m outside proposed Drain at 200m chainage	-	Residential	Animal Health Center
6	0-100m	1 Telephone Post 0.5m outside		-		Open and Residential	-

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone		Nearby Land Use (Religious places & water bodies)			
		LHS	RHS	LHS	RHS		
		proposed Drain at 5m chainage					
7	100-155m	-	-	Open	-		
Drain-4: Ranirbazar Market Natmandir to Dilip Debnath house							
		Left Side Drain		Right Side Drain			
		LHS	RHS	LHS	RHS		
1	0-100m	-	-	2 Trees 0.2m outside proposed drain at 0m chainage .	1 Electric Post 0.15m outside proposed Drain at 0m chainage. 1 Electric Post 0.1m outside proposed Drain at 25m chainage 3 Electric Post inside proposed Drain at 45m, 70m and 80m chainages	Commercial	Residential
2	100m-200m	1 Electric Post 0.2m outside proposed Drain at 125m chainage	-	1 Electric Post inside proposed Drain at 160m chainage	1 Electric Post 0.2m outside proposed Drain at 105m chainage	Residential	Residential. Temple outside Proposed drain at 195m chainage
3	200m-275m	1 Transformer 0.5m outside proposed Drain at 250m chainage	-	1 Electric Post 0.2m outside proposed Drain at 220m chainage	1 Electric Post 0.3m outside proposed Drain at 250m chainage.	Residential	Residential
Drain-6: Existing OHT to Natmandir							
1	0-31m	-		1 Tree 2.5m outside proposed drain at 0m		Commercial. Temple outside proposed drain at 31m chainage.	Residential.
Drain 7- Natmandir to NH-8							
		Left Side Drain		Right Side Drain			
		LHS	RHS	LHS	RHS		

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone				Nearby Land Use (Religious places & water bodies)	
		LHS		RHS		LHS	RHS
1	0-100m	1 Telephone Post 0.4m outside proposed drain at 60m chainage	-	1 Electric Post 0.3m outside proposed drain at 65m chainage. 1 Telephone Post 0.3m outside proposed drain at 80m chainage	1 Electric Post 0.5m outside proposed drain at 35m chainage. 1 Telephone Post inside proposed drain at 75m chainage	Market and Residential. Temple outside proposed drain at 0m chainage.	Market and Residential
2	100m-148m	-	-	-	1 Electric Post 0.3m outside proposed drain at 110m chainage.	Market and Residential	Market and Residential
Drain-9: Dhan Chowmuhan to Thana Road Tri Junction							
		Left Side Drain		Right Side Drain			
		LHS	RHS	LHS	RHS		
1	0-100m	3 Electric Post inside proposed drain at 30m, 50m and 75m chainage. 1 Electric Post 0.4m outside proposed drain at 40m chainage	-	-	-	Market	Market
2	100m-200m	-	-	-	1 Transformer 1.5m outside proposed drain at 150m chainage	Market and Residential	Market and Residential

Sl. No.	Chainage	Utilities, trees adjacent (Less than 0.5m) to/inside ROW- impact zone				Nearby Land Use (Religious places & water bodies)	
		LHS		RHS		LHS	RHS
3	200m-232m	-	-	-	-	Market and Residential	Market and Residential
<i>Drain 5- Ranirbazar Cattle Market to Ghora mara River</i>							
1	0-100m	1 Electric Post 0.3m outside proposed ROW at 60m chainage		1 Electric Post inside proposed ROW at 90m chainage		Residential	Road
2	100m-200m	-		1 Electric Post 0.4m outside proposed ROW at 190m chainage 1 Tree 2m outside proposed drain at 180m chainage.		Residential	Road.
3	200m-300m	-		-		Residential	Road
4	300m-400m	2 Electric Post inside proposed ROW at 345m and 390m chainage		1 Electric Post 0.4m outside proposed ROW at 2305m chainage.		Residential	Road
5	400m-500m			1 Electric Post 0.4m outside proposed ROW at 480m chainage		Residential	Road
6	500m-600m			1 Electric Post inside proposed ROW at 550m chainage 1 Tree 2m outside proposed drain at 550m chainage.		Residential.	Road
7	600m-700m			1 Electric Post 0.3m outside proposed ROW at 615m chainage		Road	Residential
8	700m-800m	1 Electric Post 0.3m outside proposed ROW at 750m chainage		1 Transformer inside proposed ROW at 775m chainage		Residential	Road

Tree felling estimation – Cluster IA package Roads – Khowai, Mohanpur and Ranirbazar

ULB	Mohanpur : Roads					
Road no. 1: -Tulabagan 14 no. ward no -12 para Dhirendra Sarkar house to Rishipara Rubber bagan old quarter						
SI No	Chainage	Tree Species Local/ English Name	Scientific Name	Girth Size (in m)	IUCN Status	
1	300m-400m	Imli	Terminalia belerica	0.9	NA	
Road no-2: Agartala Simma road to Kathaltali Samsanghat						
2	100m-200m	Kanthal	Artocarpus heterophyllus	0.8	NA	
Road no. 4: - Simma road to Jibesh Das house						
3	100 m – 200 m	Mango	Magnifera Indica	0.5	NA	
4		Kanthal	Artocarpus heterophyllus	0.75	NA	
5		300 m – 375 m	Supari/ Betel nut	Areca catechu	0.3	NA
6			Mango	Magnifera Indica	1.3	
7	Neem		Azadirachta indica	0.7	NA	
ULB	Ranirbazar : Roads					
	NIL					
ULB	Khowai : Roads					
	NIL					

Tree felling estimation – Cluster IA package Drains – Khowai, Mohanpur and Ranirbazar

ULB	Mohanpur : Drains				
Drain no. 5: -From Jagabandhu Debnath land to Chandan Bhattacharya house (Rabindra Palli) under ward no. – 02 MMC					
SI No	Chainage	Tree Species Local/ English Name	Scientific Name	Girth size (in m)	IUCN Status
1	0 - 100 m	Mango	Mangifera Indica	1.3	NA
2		Kamranga	Averrhoa carambola	0.45	NA
3	400 m – 405 m	Jamun	Syzygium cumini	0.6	NA
Drain no. 8: - From near the house of subhash deb (Pada) in front of Sudhan Das house (slab Culvert) under ward Nno – 04, MMC					
4	0 – 100 m	Subabul	Leucaena leucocephala	0.7	NA
Drain no. 11: - From Ratan Kanti Debnath to Rabi Deb land (Jagatpur school Chowmuhan) under ward no-06, MC					
5	200 m – 300 m	Kanthal	Artocarpus heterophyllus	0.8	NA
6		Babul	Acacia nilotica	0.4	NA
7	300m- 400m	Ledi	Lagerstroemia parviflora	0.7	NA
Drain no. 13: - from near the house of Kiran Deb to Jagatpur Community hall under ward no – 08, MMC					
8	200 m – 300 m	Pipal	Ficus religiosa	0.8	NA
Drain no. 15: - From near the house of Subal Rakshi to Airan chowmuhan slab culvert (Both side) and slab culvert to near Bandan (one side only) under ward no – 10, MMC					
9	200 m – 300 m	Ghot	Zizyphus xylopara	0.6	NA
Drain no. 21: - From tulabafan School to Kishore Debnath house under ward no- 14, MMC					
10	0 – 100 m	Mango	Mangifera Indica	0.8	NA
11		Supari/ Betal nut	Areca catechu	0.4	NA
12		Tad	Caryota urens	0.45	NA
13		Dumur	Ficus glomerata	0.6	NA
ULB	Ranirbazar: - Drains				
Drain no. 4: - Ranirbazar Market Natmandir to Dilip Debnath house					
14	0 – 100 m	Babul	Acacia nilotica	0.35	NA
15		Kanthal	Artocarpus heterophyllus	0.58	NA
ULB	Khowai : Drains				
Drain: Nimapara Catchment Area					
Vivekananda Statue to Cobler Chowmuhan via Swapanpuri Atithi Niwas (LHS)					
16	300 – 332 m	Neem	Azadirachta indica	0.7	NA
Vivekananda Statue to Namapara Chowmuhan					
17	0 – 100 m	Tad	Caryota urens	0.7	NA
18		Kanthal	Artocarpus heterophyllus	0.8	NA
19	300 – 351 m	Amla	Emblica officinalis	0.45	NA
20		Tamarind	Tamarindus indica	1.7	NA

Namapara Chowmuhani to Namapara Bridge near Nivedita Park (RHS)					
21	200-250 m	Kardhai	<i>Anogeissus pendula</i>	0.8	NA
Jeep Taxi stand drain Vivekananda Statue to Jambura Road Junction (LHS)					
Vivekananda Statue to jambura Road Junction (LHS)					
22	0 – 100 m	Ghot	<i>Zizyphus xylopara</i>	0.45	NA

Appendix 7: Drinking Water Standards

Group	National Standards for Drinking Water ^a			WHO Guidelines for Drinking-Water Quality, 4 th Edition, 2011 ^b	Applicable Per ADB SPS ^{c, d}
	Parameter	Unit	Max. Concentration Limits ^d		
Physical	Turbidity	NTU	1 (5)	-	1 (5)
	pH		6.5 – 8.5	none	6.5 – 8.5
	Color	Hazen units	5 (15)	none	5 (15)
	Taste and Odor		Agreeable	-	Agreeable
	TDS	mg/l	500 (2,000)	-	500 (2,000)
	Iron	mg/l	0.3	-	0.3
	Manganese	mg/l	0.1 (0.3)	-	0.1 (0.3)
	Arsenic	mg/l	0.01 (0.05)	0.01	0.01
	Cadmium	mg/l	0.003	0.003	0.003
	Chromium	mg/l	0.05	0.05	0.05
	Cyanide	mg/l	0.05	none	0.05
	Fluoride	mg/l	1 (1.5)	1.5	1 (1.5)
	Lead	mg/l	0.01	0.01	0.01
	Ammonia	mg/l	0.5	none established	0.5
Chemical	Chloride	mg/l	250 (1,000)	none established	250 (1,000)
	Sulphate	mg/l	200 (400)	none	200 (400)
	Nitrate	mg/l	45	50	45
	Copper	mg/l	0.05 (1.5)	2	0.05 (1.5)
	Total Hardness	mg/l	200 (600)	-	200 (600)
	Calcium	mg/l	75 (200)	-	75 (200)
	Zinc	mg/l	5 (15)	none established	5 (15)
	Mercury	mg/l	0.001	0.006	0.001
	Aluminum	mg/l	0.1 (0.3)	none established	0.1 (0.3)
	Residual Chlorine	mg/l	0.2 (1.0)	5	0.2
Micro Germs	E-coli	MPN/100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample
	Total Coliform	MPN/100ml			

Note-

^a Bureau of India Standard 10500: 2012. Value within bracket indicated values permissible limits in absence of alternative source

^b Health-based guideline values.

^c Per ADB SPS, the government shall achieve whichever of the standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

^d Figures in parenthesis are maximum limits allowed in the absence of alternate source.

Appendix 8: Stakeholder Consultations

Summary of Consultation with Stakeholders- Khowai

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
19th November 2022	Near Swpnapuri Hotel	04 M=04 F=00	Consultation with Local people	- Briefing on project objectives probable implementation procedures - Potential positive and negative impacts due to project implementation - Relevant information of the upcoming project and benefits of the project. - Information on perceived benefits from the proposed subproject including reduction in water logging in rainy seasons. - Availability of labour during construction time	- The local people of the ULB expressed need for the project water supply, drainage and road and willingness to take it up; - Operation and maintenance of the facilities developed under the project and community participation - People in general were very enthusiastic about the benefits of the subproject in terms of water logging and also an improvement in the environmental quality. - People had concern on loss of livelihood - Socio-economic conditions likely impacted due to proposed drain improvement - Local Skilled worker are easily available in this area.
19th November 2022	At Durganagar Kalibari	05 M=02 F=03	Community members	- Briefing on project objectives probable implementation procedures - Relevant information of the upcoming road and drain project and benefits of the project. - Information on the benefits of the subproject in terms of economic and environmental enhancement - People in general were very enthusiastic about the benefits of the subproject in terms of water logging and	- People are fed up with water logging, frequent traffic jams and wanted that the subproject may be executed on a fast track so that this problem is eliminated. - Generally, all the people consulted were well aware about the proposed subproject. - Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. The proposed subproject road will provide better road connectivity to the nearby facilities.

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
				also an improvement in the environmental quality.	
23 rd March 2023	Khowai Municipal Council	19 M =18, F=1	ULB official – Khowai	- Briefing on project objectives probable implementation procedures - Discussion about requirement of the project and willingness of residents to pay for improved services of Storm water drainage, Benefits of road and storm water drainage.	- Residents expressed their views about the willingness to engage with the project and explore job opportunities. - As regards the storm water drainage and road project, it has been told by the residents that it will improve the roads and condition of low laying areas. - It was told by the residents that the condition of storm water drainage condition is not up to the mark; the low-lying areas generally get flooded during rainy season - Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle.
23 rd March 2023	Khowai Municipal Council	12 M=6 F=6	Community members	- Detailed discussion about current level of service of Water supply and condition of storm water drainage in the town/ Present Road condition and storm water management problem quantity and quality - Tentative Project implementation period and possible inconveniences during the construction period shared during consultation with community present from the locality	- Few people have told that they are aware of the proposed subproject, - All the residents expressed their concerned about the poor drainage condition and road connectivity. - Residents expressed their views about the willingness to engage with the project and explore job opportunities



Public Consultation Near Swpnapuri



Public Consultation at Durganagar Kalibari



Consultation at ULB office- ADB team



Community consultation at ULB

Consultation coverage in Newspaper

ADB representatives visits Khowai Municipal Council area

• By Tripuranewsline • 24 Mar 2023

A team of representatives comprising 12 members including the officials of Tripura Urban Development Authority under the leadership of Kalishankar Ghosh of Asian Development Bank paid a visit to Khowai Municipal Council area yesterday for implementation of different developmental works in the area.

Chairperson of Khowai Municipal Council Debashish Nath Sharma and CEO of the Municipal Council Hemanta Dhar were present during their visit.

The team of representatives visited deep tube well nearby Purnima School, deep tube well water source located at Office Tilla, site nearby Subhash Park Jeep Stand, road nearby Subhash Park Vivekananda Statue, drainage nearby District Hospital and the site nearby Dasarath Deb Memorial College.

After their visit, Chairperson of Khowai Municipal Council Debashish Nath Sharma informed that to provide clean drinking water in the Municipal Council area a ground water treatment plant will be set up in first phase at the cost of 15 crore 60 lakh rupees, total 1.5 km road from CNG station to Layapara, Nripen Chakraborty Avenue via Swapanpuri Guest House will be constructed, 1 km 700 m long cover drain will be constructed in the municipal area including footpath and urban beautification. This will cost total 15 crore rupees.

খোয়াই পুর
এলাকা
পরিদর্শনে
এশিয়ান
ডেভেলপমেন্ট
ব্যাঙ্কের
প্রতিনিধি

প্রেস রিলিজ, খোয়াই, ২২ মার্চ।।
খোয়াই পুর এলাকায় বিভিন্ন
উন্নয়নমূলক কাজ বাস্তবায়নের
লক্ষ্যে আজ এশিয়ান
ডেভেলপমেন্ট ব্যাঙ্কের প্রতিনিধি
কালিশঙ্কর ঘোষের নেতৃত্বে ও
ত্রিপুরা আরবান ডেভেলপমেন্ট
অথরিটির আধিকারিকগণ সহ
মোট ১২ সদস্যের এক
প্রতিনিধিদল খোয়াই পুর এলাকা
পরিদর্শনে আসেন।
পরিদর্শনকালে উপস্থিত ছিলেন
খোয়াই পুর পরিষদের
চেয়ারপার্সন দেবশিশ নাথ শর্মা,
পুর পরিষদের উপমুখ্যনির্বাহী
আধিকারিক হেমন্ত ধর প্রমুখ।
পরিদর্শনকালে প্রতিনিধি দলটি
পুর এলাকার পূর্ণিমা স্কুল সংলগ্ন
ডি পি টি উ বওয়েল,
অফিসটিলাহিত ডিপ টিউবওয়েল
জলের উৎস, সুভাষপার্ক জীপ
স্ট্যান্ড সংলগ্ন স্থান, সুভাষ পার্ক
বিবেকানন্দ স্টাচু সংলগ্ন রাস্তা,
জেলা হাসপাতাল সংলগ্ন নালা,
দশরথদেব মেমোরিয়াল কলেজ
সংলগ্ন স্থান সরেজমিনে পরিদর্শন
করেন। পরিদর্শন শেষে পুর
পরিষদের চেয়ারপার্সন দেবশিশ
নাথ শর্মা জানান, পুর এলাকায়
পরিষ্কৃত পানীয় জল প্রদান করার
লক্ষ্যে প্রথম পর্যায় ১৫ কোটি ৬০
লক্ষ টাকা ব্যয়ে গ্রাউন্ড ওয়াটার
ট্রিটমেন্ট প্ল্যান্ট, সিএনজি স্টেশন
থেকে লায়াপাড়া, নুপেন চক্রবর্তী
এভিনিউ জায়গা স্বপনপুরী গেট
হাউস মোট ১.৫ কিলোমিটার
রাস্তা নির্মাণ, ফুটপাথ ও শহর
সৌন্দর্যায়ণ সহ পুর এলাকায় ১
কিমি ৭০০ মিটার কভার ড্রেন
নির্মাণ করা হবে। এতে বার হবে
মোট ১৫ কোটি টাকা।

List of Participants in Consultation Meeting Swapnopuri Hotel

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF
INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL
BODIES IN TRIPURA

Name of the Town: - Khowai . Ward No: 13

Place: - Swapnopuri Date: - 19/11/22

Sl. No.	Name (CAPITAL LETTER)	Contact NO.	Signature
①	Banfulba Debbarma	9862724299	[Signature]
2	Dayamoy Debbarma	9866422175	[Signature]
3	Jayanta Tarafder	9436919693	[Signature]
4	Mangeshree Debbarma	9366745478	[Signature]

List of Participants in Consultation Meeting at Durganagar Kalibari

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF
INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL
BODIES IN TRIPURA

Name of the Town: - Khowai . Ward No: 4

Place: - Durganagar Kalibari Date: - 19/11/22

Sl. No.	Name (CAPITAL LETTER)	Contact NO.	Signature
1.	Bela Routh	9862 093077	Bela Routh
2.	Dipali Paul	9633135865	Dipali Paul
3	Ankan Routh	9612698339	Ankan Routh.
4	Mahitosh Dhar	9436711987	Mahitosh Dhar
5	Dipali Roy	9436375578	Dipali Roy

:

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF
INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN
LOCAL BODIES IN TRIPURA

Name of the Town: - Khowai

Ward No: - 07

Place: - Khowai ULB Office

Date: - 22-03-2023

Sl. No.	Name (CAPITAL LETTER)	Male / Female	Contact NO.	Signature
①	Debasish Nath	Male	9436126382	
②	Mamsha Telang	Female	9426808906	
③	Hemanta Kumar	Male	9077128928	
④	En Rajib Debbarma JE KMC.	Male	8416048223	
⑤	En. Saugad Chakraborty SBM EXPERT, KMC	Male	8951326373	
⑥	Soujit Bhattacharya	Male	7005221987	
⑦	Vipin Negi	M	9690057783	
⑧	Sourav Seal	M	7980272820	
⑨	Snehasis Palit	M	9932313841	
⑩	P. S. Bhattacharya	M	8794243534	
⑪	Sujoy Chakraborty	M	9862246728	
⑫	DR. ARDHENDU MITRA	M	9830415953	
⑬	KALYAN ASIS DAS	M	9836328867	
⑭	P. S. Ghosh	M	9837317118	
⑮	Pratim Singh	M	9560967524	
⑯	Pranab Kumar	M	9436134168	

Place- Khowai Municipal Council Office, Dated- 22-03-2023

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: -

Ward No: -

Place: -

Date: -

[illegible]

Place- Khowai Municipal Council Office, Dated- 22-03-2023

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF
INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN
LOCAL BODIES IN TRIPURA

Name of the Town: - Khowai

Ward No: -

Place: - Khowai ULBO Office

Date: - 22-3-2023

Sl. No.	Name (CAPITAL LETTER)	Male / Female	Contact NO.	Signature
①	Mamtha Telang	F	9425600906	Mamtha
②	K.S. Githoth	M	9831317118	
③	Gaurind Singh Rathore	M	9560967524	
④	Ratna Rani Kar	F.	8014747135	
⑤	Mousumi Majumdar	F.	9436919348	
⑥	Sinnu Deb Paul	F	9436796389	
⑦	Sanehita Baidya	F	9436514044	
⑧	Suibani Paul	F.	6033066926	
⑨	Jayanta Chakraborty	M	8761805667	
⑩	Sourav Seal	M	7980272820	
11	P. S. Bhowmik	M	8794243534	
12	Kalyan Biswas	M	9836328867	

Place- Khowai Municipal Council Office, Dated- 22-03-2023

Summary Outcome of Consultations- Focus group discussion – Khaowai

Sl. No	Date	Type of consultation	Location	Total No. of Participants	No. of Male Participants	No. of Female Participants
1	24.02.2022	Focus Group Discussion	Ward No- 05	16	01	15
2			Ward No- 10	10	00	10
3	25.02.2022		Ward No-01	15	00	15
4			Ward No-13	10	01	09
5	05.08.2022		Barobil	08	04	04
Total				59	06	53

Summary Outcome

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
1.	24.02.2022 Ward No- 05	16	Discussed about present drainage condition. They were explained about the proposed works and its advantages. They were also informed about the temporary inconveniences during the construction period, contractors' cooperation.	- It was told by the residents that the condition of storm water drainage condition is not up to the mark; - The willingness of the people for the proposed projects was appreciated. - Due provisions have been made in the implementation of the Environmental Management Plan & Safeguard Policy; the sufferings of local people will be reduced to a large extent during project implementation phase
2.	24.02.2022 Ward No- 10	10	Explained about the details of project benefits proposed under the subproject. Discussion about requirement of the project and willingness of residents to pay for improved services of Sewerage and Storm water drainage	- As regards the storm water drainage and sewer project, it has been told by the residents that it will improve the roads and condition of low laying areas and improve the quality of river where the outfall will go. - Residents expressed their views about the willingness to engage with the project and explore job opportunities
3.	25.02.2022 Ward No- 01	15	Details of proposed Scope of Work of the subproject and area to be covered under the subproject discussed with the residents. Environment & Health impacts of proposed project	- Few people have told that they are aware of the proposed subproject. - They shared the details of the water logging issues, mainly during the rainy season. - All the residents expressed their concern about the poor drainage conditions
4.	25.02.2022 Ward No-13	10	Existing drainage facility in this area. Discussion on Present condition of & requirement of Storm Water drainage in the targeted ward of the subproject. Water logging and drainage problem if any.	- It was found that all the residents present in the consultation have shown their willingness to participate in project. And increased awareness about the direct benefits along with latent benefits of the project were discussed in detail. - They expressed their positive participation during the project construction period. - Appreciated the drainage part of the

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
5.	05.08.2022 Barobil,	8	Present Status of the rural road and drain. Environment & Health impacts of proposed project. Possibility of Local disturbances due to Project Construction Work Water logging and drainage problem.	project and voiced it as relevant. - Few people have told that they are aware of the proposed subproject - They are well versed about the advantages of the project and improvement in health and environment. - Ready to cooperate during the construction period.

Photographs of Key Informants Interview and Focus Group discussion



Ward No-05, Dated-24-02-2022



Ward No- 10, Dated- 24-02-2022



Ward No- 01, Dated- 25-02-2022



Ward No- 13, Dated- 25-02-2022



Barobil, Dated- 05-08-2022

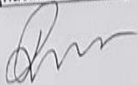
Attendance Sheet of Focus Group Discussion (FGD)

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura.

Name of the ULB / G.P. :- Khowai Ward Nos. :- 5

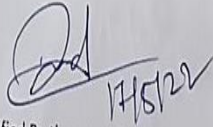
Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
	সিমা দেব	5	9612984482	F	সিমা দেব	
	Mamita Deb Barma (Kahar)	5	9612048186	F		
	Mousumi Acharjee (C)	5	9436479839	F	Mousumi Acharjee (C)	
	Shupra debnath	5	9436351131	F	Shupra debnath	
	Mina Des Banik	5	8729890986	F	Mina Des Banik	
	সীমা দেব	5				
	সীমা দেব (গোবর্ধন)	5	9436734432	F	সীমা দেব (গোবর্ধন)	
	সীমা দেব (গোবর্ধন)	5	8778354323	F	সীমা দেব (গোবর্ধন)	
	সীমা দেব	5	6033236835	F	সীমা দেব	
	Sima Deb	5	9402333599	F	Sima Deb	
	Swapna Datta	5	6033027065	F	S Datta	
	Soma Shil (Ghosh)	5	7630036515	F	Soma Shil (Ghosh)	
✓	Nigati Rani Das	5			Nigati Rani Das	
	Kalyani Bhattacharyee	5	9436319845	F	Kalyani Bhattacharyee	
		5	9436798699	F		
		5		F		
	Ruma Ghosh	5	6033062770	F	Ruma Ghosh	
	Chanda Bhattacharyee	5	9131042806	M	Chanda Bhattacharyee	
	সীমা দেব	5		F	সীমা দেব	

Signature of the respective Surveyor



Swapna Datta

Smt. Swapna Datta
Member
Khowai Municipal Council
Khowai Tripura.



Verified By the respective ULB staff

Name: - **Rajib Debbarma**
Junior Engineer
Designation: - Municipal Council
Khowai, Tripura.
Signature with Seal: -

realme Shot on realme C35

Ward No-05 (24-02-2022)

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Khowai

Ward Nos. :- 01

[illegible]

Signature of the respective Surveyor

[Signature]

Verified By the respective ULB staff

Verified By the respective
Name: - Rajib Debbarmia
Junior Engineer
Designation: - Municipal Council
Khowai, Tripura.

Signature with Seal: -

realme Shot on realme C35

Ward No- 01 (25-02-2022)

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF
INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL
BODIES IN TRIPURA

Name of the Town: - Khowai

Ward No:

Place: - Barobil

Date: - 05/08/22

[illegible]

Barobil, (05-08-2022)

Summary of Consultation with Stakeholders- Mohanpur

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
29 th October 2022	Tulabagan 10 no. Para -Ward no. 14	6 M=6 F=0	Community members	- Briefing on project objectives probable implementation procedures - Potential positive and negative impacts due to project implementation - Relevant information of the upcoming project and benefits of the project. - Information on perceived benefits from the proposed subproject including reduction in water logging in rainy seasons. - Availability of labour during construction time	- People are fed up with water logging, frequent traffic jams and wanted that the subproject may be executed on a fast track so that this problem is eliminated. - Generally, all the people consulted were well aware about the proposed subproject. - Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle.
22 nd March 2023	Mohanpur Municipal Council office	11 M=10, F=1	Stakeholder consultation	- Relevant information of the upcoming project and benefits of the project. - Potential positive and negative impacts due to project implementation - Relevant information of the upcoming project and benefits of the project.	- The proposed sub-project has been identified for improving the road and drainage system within existing Right of Way (RoW). - As regards the storm water drainage and road project, it has been told by the residents that it will improve the roads and condition of low laying areas.
22 nd March 2023	Tulabagan	15 M=6, F=9	Community members	- Briefing on project objectives probable implementation procedures - Discussion about requirement of the project and Tentative Project implementation period - Quality of water – high iron content	- Residents expressed their views about the willingness to engage with the project and explore job opportunities. - Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle.



Stakeholder Consultation at Tulabagan 10 no. Para



Stakeholder consultation at Mohanpur MC



Community consultation at Tulabagan

Attendance Sheet

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF
INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN
LOCAL BODIES IN TRIPURA

Name of the Town: - Mohanpur

Ward No: -

Place: - Mohanpur ULB Office

Date: - 22-3-2023

Sl. No.	Name (CAPITAL LETTER)	Male / Female	Contact NO.	Signature
①	SATIKANTA Chandraiah	M	9366603021	
②	Gaurind Singh Rathore	M	9560967524	
③	K.S. Gaitonde	M	9831317118	
④	Ardhendu Mitr	M	9830415953	
⑤	P.S. Bhattacharya	M	8794243534	
⑥	Sudhansu Paul	M	993231384	
⑦	Kalyan ASIS Das	M	9836328867	
⑧	Manmohan Telang	F	9425600906	
⑨	Soumar Seal	M	7980272820	
⑩	Sujoy Chakraborty	M	9862246728	
⑪	Pradip P. Saha	m	8707001669	
⑫				
⑬				

Place- Mohanpur Municipal Council Office, Dated- 22-03-2023

**LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF
INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN
LOCAL BODIES IN TRIPURA**

Name of the Town: - Mohanpur

Ward No: -

Place: - Tulabagan

Date: - 22-03-2023

Sl. No.	Name (CAPITAL LETTER)	Male / Female	Contact NO.	Signature
①	Gaurish Singh Rathor	M	9560967124	Gaurish
②	Mamsha Telang	F	9425800906	Mamsha
③	Arshendu Mibz	M	9830415952	Ar
④	K.S. G. A. S. S. S.	M	9831317778	K
⑤	Kundun Bisul	F	9936925347	K
⑥	Kangal Deb	m	9862904110	
⑦	সিদ্ধান্ত মিত্র	m	9366992349	সিদ্ধান্ত মিত্র
⑧	Ratna Das	F	9366322486	Ratna Das
⑨	Maloti Bisswas	F		Maloti
⑩	মল্লিকার্দেব	F	9077678546	মল্লিকার্দেব
⑪	pampi Deb	F	9615171916	pampi Deb
⑫	বন মল্লিকার্দেব	F		বন
⑬	Pradina Deb	F	9862076832	Pradina Deb
⑭	Soma Sarkar	F	9856555434	সোম সর্কার
⑮	সত্যনাথ সর্কার			সত্যনাথ সর্কার

Place- Tulabagan, Dated- 22-03-2023

Summary of Focus Group discussion

Summary of Focus Group discussion						
Sl. No	Date	Type of consultation	Location	Total No. of Participants	No. of Male Participants	No. of Female Participants
1	09.03.2022	Focus Group Discussion	Ward No- 06,10,13	20	00	20
2			Ward No- 06,08,10,11	20	00	20
3			Ward No-10,11,16	11	00	11
4			Ward No- 03,06,10,11,13,15	19	00	19
5	05-08-2022		Karaimura, Tulabagan	04	04	00
Total				74	4	70

Summary Outcome

Sl No.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
1.	09.03.2022 Ward No- 06,10,13	20	Explained about the details of project benefits proposed under the subproject. Discussion about requirement of the project and willingness of residents to pay for improved services of Sewerage and Storm water drainage	- As regards the storm water drainage and sewer project, it has been told by the residents that it will improve the roads and condition of low laying areas and improve the quality of river where the outfall will go. - Residents expressed their views about the willingness to engage with the project and explore job opportunities
2.	09.03.2022 Ward No- 06,08,10,11	20	Explained about the details of project benefits proposed under the subproject. Discussion about requirement of the project and willingness of residents to pay for improved services of Sewerage and Storm water drainage	- Participants informed about few low lying areas where water logging takes place during monsoon season. - People are happy because of the connectivity road improvement - People were in full support of the project and were ready to donate their land for the same, if required.
3.	09.03.2022 Ward No- 10,11,16	11	Existing drainage facility in this area. Discussion on Present condition of & requirement of Storm Water drainage in the targeted ward of the subproject Water logging and drainage problem if any.	- It was found that all the residents present in the consultation have shown their willingness to participate in project. And increased awareness about the direct benefits along with latent benefits of the project were discussed in detail. - They expressed their positive participation during the project construction period. - Appreciated the drainage

SI No.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
				part of the project and voiced it as relevant.
4.	09.03.2022 Ward No-03,06,10,11,13,15	19	Discussed about present drainage condition. They were explained about the proposed works and its advantages. They were also informed about the temporary inconveniences during the construction period, contractors' cooperation.	• It was told by the residents that the condition of storm water drainage condition is not up to the mark; • The willingness of the people for the proposed projects was appreciated. • Due provisions have been made in the implementation of the Environmental Management Plan & Safeguard Policy; the sufferings of local people will be reduced to a large extent during project implementation phase
5.	05-08-2022 Karaimura, Tulabagan	04	Explained about the details of project benefits proposed under the subproject. Discussion about requirement of the project and willingness of residents to pay for improved services of Sewerage and Storm water drainage	• As regards the storm water drainage and sewer project, it has been told by the residents that it will improve the roads and condition of low laying areas and improve the quality of river where the outfall will go. • Residents expressed their views about the willingness to engage with the project and explore job opportunities

Photographs of Key Informants Interview and Focus Group discussion



Ward No-06,10,23, Dated-09-03-2022



Ward No- 06,08,10,11, Dated- 09-03-2022



Ward No- 10,11,16, Dated- 09-03-2022



**Karaimura, Tulabagan,project site,
Dated- 25-02-2022**

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura.

Name of the ULB / G.P. :- Moham Puri

Ward Nos. :- 6, 10, 13

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Parbati Nag	13	6909388068	F	Parbati Nag	
2	Champa Ghosh	13	6009907123	F	Champa Ghosh	
3	Malati Nag	13	8415053732	F	Malati Nag	
4	Samipa Ghosh	13	8257905348	F	Samipa Ghosh	
5	Api Rani Deb Nath	13	8798113369	F	Api Rani Deb Nath	
6	Padma Rani Subradhan	10	9615280078	F	Padma Rani Subradhan	
7	Laxmi Rani Subradhan	10		F	Laxmi Rani Subradhan	
8	Usha Sarkar	10		F	Usha Sarkar	
9	Anita Das Debnath	11	7005947829	F	Anita Das Debnath	
10	Ananya Debnath	11	6009890311	F	Ananya Debnath	
11	Dipika Debnath	6	9366154995	F	Dipika Debnath	
12	Sumiti Nath Sarkar	6	9862929939	F	Sumiti Nath Sarkar	
13	Mina Chakraborty	6	9862800884	F	Mina Chakraborty	
14	Rupa Debnath	2	9366286528	F	Rupa Debnath	
15	Soma Subradhan	6	8794183192	F	Soma Subradhan	
16	Mamta Debnath	6	9366386050	F	Mamta Debnath	
17	Mamata Debnath	6	8974172488	F	Mamata Debnath	
18	Swarna Debnath	6		F	Swarna Debnath	
19	Lipika Subradhan	6	9862713597	F	Lipika Subradhan	
20						

Signature of the respective Surveyor

[Signature]

Verified By the respective ULB staff

Name :-

Sajal Debnath (TCS)
Dy. Chief Executive Officer
Moham Puri Municipal Council
Moham Puri, West Tripura

Signature with Seal

Ward No- 06,10,13 (09-03-2022)

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura.

Name of the ULB / G.P. :- Mohampon

Ward Nos. :- 6,8,10,11

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1.	Pinki Debnath.	6	9366941816		Pinki Debnath	
2.	Ruma Debnath.	11	9436182940		Ruma Debnath.	
3.	Sima Das. / Deb	6	9862901599		Sima Das (Deb)	
4.	Rakhi Debnath.	11	9362960695		Rakhi Debnath	
5.	Swarna Debnath.	11	8131952888		Swarna Debnath	
6.	Anuma Biswas (Deb)	6	7088312235.		Anuma Biswas (Deb)	
7.	Mandira Debnath.	11				
8.	Gita Pal	10				
9.	Rita Rani Pal	10	8731856088			
10.	Anchana Pal	10				
11.	Abhina Debnath.	8	9862630874			
12.	Dipa Deb (Ghosh)	8				
13.	Anita Rani Gope	11	6009033036			
14.	Mamata Sutradhar	11				
15.	Kakita Debnath.	11	883705410			
16.	Nani Deb Nath / Sarker	11	8794333296		Nani Sarker (Debnath)	
17.	Anita Debnath.	11	8414914644		Anita Debnath	
18.	Bina Sutradhar	6	8132828805		Bina Sutradhar	
19.	Maya Sutradhar	6	8414905201		Maya Sutradhar	
20.						

Signature of the respective Surveyor

[Signature]

Verified By the respective ULB staff

Name :-

[Signature]
 Name :- Sejal Debnath (TCS)
 Designation :- Dy. Chief Executive Officer
Mohampon Municipal Council
Mohampon West Tripura
 Signature with Seal

Ward No- 06,08,10,11 (09-03-2022)

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura.

Name of the ULB / G.P. :- Mohampur

Ward Nos. :- 3, 6, 10, 11, 13, 15

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Ujjwala Sankar	15	9856229239	F	Ujjwala Sankar	
2	Kalpna Das	15		F	Kalpna Das	
3	Sikha Sankar	15		F	Sikha Sankar	
4	Gita Sankar	15		F	Gita Sankar	
5	Anita Sankar	15		F	Anita Sankar	
6	Anima Sankar			F	Anima Sankar	
7	Sabitri Sankar	13	9615072579	F	Sabitri Sankar	
8	Urka Sankar	11		F	Urka Sankar	
9	Sabita Biswas	11		F	Sabita Biswas	
10	Anjana Biswas	11		F	Anjana Biswas	
11	Uma Acharjee	3	8787647940	F	Uma Acharjee	
12	Chandria Paul	10	9600993305	F	Chandria Paul	
13	Parthana Deb Nath	6	7005716419	F	Parthana Deb Nath	
14	Anjali Deb Nath	15	8974524992	F	Anjali Deb Nath	
15	Aruna Das (Sankar)	15	8794392853	F	Aruna Das (Sankar)	
16	Gita Rani Paul	10	9856755571	F	Gita Rani Paul	
17	Laxmi Das	13	7005314672	F	Laxmi Das	
18	Pinki Deb Nath	6	9366418905	F	Pinki Deb Nath	
19	Arundha Sankar	15		F		

Signature of the respective Surveyor

Verified By the respective ULB staff

Name :-

Sajal Debnath (TCS)

Designation: Chief Executive Officer

Mohampur Municipal Council

Signature with Seal of Mohampur Municipal Council

Ward No- 03,06,10,11,13,15 (09-03-2022)

Summary of Consultation with Stakeholders- Ranirbazar

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
19 th September 2022	Krishna Tali-Ward no. 07	5 M=5 F=0	Community members	- Briefing on project objectives probable implementation procedures - Present condition of road and drain - Potential positive and negative impacts due to project implementation - Relevant information of the upcoming project and benefits of the project. - No adverse impacts on structures, livelihoods anticipated. - People are willing to cooperate by all means to implement the project successfully	- Participants informed about few low-lying areas where water logging takes place during monsoon season. The villagers requested for provision of adequate cross drainage structures at these locations. - Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. - Waste water discharge in low lying area.
19 th September 2022	Ranirbazar Dhan Chowmoni Ward no. 05	5 M=4 F=1	Community members	- Briefing on project objectives probable implementation procedures - Relevant information of the upcoming project and benefits of the project. - Present road and drainage condition of this area. - Potential positive and negative impacts due to project implementation - Area to be covered under this project	- It was told by the residents that the condition of storm water drainage condition is not up to the mark; the low-lying areas generally get flooded during rainy season. - Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. - No adverse impacts on structures, livelihoods anticipated.
17 th March 2023	Ranirbazar Municipal Council Office	19 M=16 F=3	Stakeholder consultation	- Briefing on project objectives probable implementation procedures - Explained about the details of project benefits proposed under the subproject - Potential positive and negative impacts due to project implementation	Residents expressed their views about the willingness to engage with the project and explore job opportunities. Mostly people are willing to take the house service connections (Road and drain) and enjoy benefits of the subproject.

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
					• No impacts on structures, livelihoods anticipated- assurance given • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle.



Stakeholder Consultation at Krishna Tali



**Stakeholder Consultation at
Ranirbazar Dhan Chowmoni**



Stakeholder consultation at ULB



Public consultation Krishnatalli

List of Participants in Consultation Meeting at Ranirbazar Dhan Chowmoni

**LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF
INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL
BODIES IN TRIPURA**

Name of the Town: - Ravinbazar

Ward No: 5

Place: - Roribetan Bhurchowani

Date: -

[illegible]

**LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF
INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL
BODIES IN TRIPURA**

Name of the Town: - Ranirbazar

Ward No: 03

Place: - Ranirbazar ULB Office

Date: - 17/03/23

Sl. No.	Name (CAPITAL LETTER)	Contact NO.	Signature
1.	Goutam Leijender	8787898095	
2.	Saroj Kumar Bora	9830439554	
3.	Ex. Swapan Chatterjee	7005278180	
4.	DR. ARDHENDU MITRA	9830415953	
5.	Sudanshu Sengupta	9774896239	
6.	Mamsha Telang	942560906	
7.	Gowind Singh Rathore	9560967524	
8.	Sachin Paul	9932313841	
9.	Kalyan A. S. Das	983632889	
10.	Jayanta Chakraborty	8761808667	
11.	Vipin Negi	9690057783	
12.	Susmita Bera	8121049733	
13.	Sujoy Chakraborty	9862246728	
14.	Ampita Sarkar	7005012215	
15.	Rancho P. Sengupta	8707006667	
16.	Sourav Seal	7980272820	
17.	Pradip K. Das (EE)	8258066142	
18.	Samir M. Das (J.O.)	9436188274	
19.	K. S. GHOSH	9831317118	

Place- Ranirbazar Municipal Council Office, Dated- 17-03-2023

Summary of Focus Group discussion held at Ranirbazar

Focus-group discussions with affected persons and other stakeholders were conducted to learn their views and concerns. General public and the people residing along the project activity areas were also consulted during visits to the project sites.

Summary Outcome of Consultations

Sl. No	Date	Type of consultation	Location	Total No. of Participants	No. of Male Participants	No. of Female Participants
1	17.03.2022	Focus Group Discussion	Ward No- 1,2,3,4,5,6,9,10,11,13	17	00	17
2			Ward No- 3,4,6,7,9,10,12	11	00	11
3			Ward No- 6,12,7,8	09	00	09
4			Ward No- 3,5,6,7,10,11	11	00	11
5	19.09.2022		Mohepur	06	06	00
Total				64	16	48

Photographs of Key Informants Interview and Focus Group discussion



FGD at Ranirbajar



Maheshpur, Dated- 19.09.2022

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Ranir Bazar

Ward Nos. :- 1,3,2,5,6,9,4,10,11,13

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Bari Dhar (Pall)	6	9366746288		Bari Dhar (Pall)	
2	Pina Loh Datta	6	9077380790		Pina Loh Datta	
3	Panna Majumder Chowdhury	13	8837308995		Panna Majumder Chowdhury	
4	RAKH / Shil	6	8974265459		RAKH / Shil	
5	Kalpana Debnath (Dns)	11	8730852891		Kalpana Debnath (Dns)	
6	Sartada Surbadhan	10	9362240295		Sartada Surbadhan	
7	Jharna Chakraborty (Sharma)	2	8494585328		Jharna Chakraborty (Sharma)	
8	Sukh Rishi Paul	5	8787480820		Sukh Rishi Paul	
9	Gita Rishi Paul	5	9080885399		Gita Rishi Paul	
10	Maya Rami Debnath	5	9485325787		Maya Rami Debnath	
11	Gita Rami Ghosh (Dey)	3	7308673370		Gita Rami Ghosh (Dey)	
12	Gita Baishab	1	7005897860		Gita Baishab	
13	Ruma Rami Saha	9	7630847193		Ruma Rami Saha	
14	Sabita Das	10	7630846263		Sabita Das	
15	Mani Shiv (Debnath)	13	8862229792		Mani Shiv (Debnath)	
16	Silika Deb	11	6009670059		Silika Deb	
15	Rishi WBS	10	9366798160		Rishi WBS	
16	Kabita Saha	21	6009213957		Kabita Saha	
	Rinkusana	4	6009213957		Rinkusana	

Signature of the respective Surveyor

[Signature]

Verified By the respective ULB staff

Name:-

Designation:-

Signature with Seal:-

[Signature]
Er. Manuj Debbarna
 Jr. Engineer (Civil)
 Ranirbazar Municipal Council
 West Tripura.

Ward No- 1,2,3,4,5,6,9,10,11,13

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura.

Name of the ULB / G.P. :- Rani Bazari **Ward No. :- 6/12/7/8**

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
	Sandhya Majumdar	10	9909072124			
	Ratnima Deb Nath	8	9486555497			
	Anchana Bhownik(Nath)	7	8131055706			
	Kavika Dini(Chowdhury)	7	9612636260			
	Anima DATTA(SAHU)	6	9366825290		Anima DATTA(SAHU)	
	সমি স্মিতা(হিস)	6	8730856041		সমি স্মিতা(হিস)	
	Shikha Deb Nath	12	8794375027		Shikha Deb Nath	
	Jayanti Debnath	12	8914988820		Jayanti Debnath	
	স্বপ্না সিং(দাস)	6	9863483796		স্বপ্না সিং(দাস)	

Signature of the respective Surveyor

Verified By the respective ULB staff
Name:-
Designation:-
Signature with Seal
Er. Manoj Debbarna
Jr. Engineer (Civil)
Sainirbaraz Municipal Council
West Tripura.

Ward No- 6,12,7,8

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the ULB: - Ranibazar

Ward No:

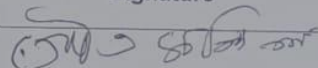
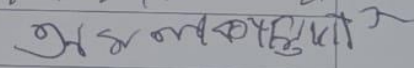
Place: - Moheshpur

Date: - 19/09/22

Today on dated a public consultation was held at ward No The consultation was carried out with the community people regarding proposed septage Treatment plan and existing situation. Community people shared their views on existing situation and proposed projects.

Key Points of the Consultation:

1. Awareness activities were conducted to people of about adverse impacts of open defecation through the consultation.
2. Common practice for sanitation and availability of septic tanks
3. Sharing the information on sanitation status in and its impact
4. Benefits of the proposed FSSTP

Sl. No.	Name (CAPITAL LETTER)	Contact No.	Signature
1	Giontom Shill	-	
2	Haripada Sharma	7640544699	- Haripada Sharma
3	Anil Debnath	-	.
4	Kartik Das	6909679303	Kartik Das
5	Tapas Barik	8979047337	Tapas Barik
6	Arnal Kanti Das	8799368613	

Moheshpur, Dated- 19-09-2022

INTERACTIVE WORKSHOP – ENVIRONMENT , SOCIAL SAFEGUARD- PART OF PRF Tripura Urban and Tourism Development Project (TUDDP)

Report of Orientation Workshop on ADB Safeguards Policy- Finance – Procurement – Institutional Arrangements for the Officials of Tripura Urban Planning and Development Authority (TUDA) & Project ULBs

Introduction

Government of Tripura initiated the Project Readiness Financing (PRF) of Integrated Urban Planning & Infrastructure Development for Urban Local Bodies in 20 towns¹ of the State under the loan no. 6037-IND assisted by the Asian Development Bank (ADB). The aim of the project is to plan, develop, implement and manage project activities and infrastructure assets for sustainable development and economic growth of the state as a whole. The project has two components viz URBAN and TOURISM. Urban infrastructure is looked after by TUDA whereas the Tourism part is under the TTDCL. The Urban Infrastructure Development subprojects are spread over 5 major components like Water supply, Storm water drainage, Septage management, Roads and Urban Amenities.

To achieve the project objectives efficiently, capacity building of the engineering and other non-engineering stakeholders is an inevitable part of the project. In the initial stage of preparation of DPR, Bid document and prior to the floating of tenders, DPR preparation and floating of tender documents, the technical and non-technical stakeholders, who are supposed to be directly or indirectly involved the Subprojects at all level needs to be oriented on the project prerequisites like, Safeguards Policy and measures to be followed, Financial modalities of externally aided projects, Procurement, Institutional arrangement structure etc. so as to enable project executing staffs to have a better understanding in discharge their roles and duties in a better way for assured quality services.

In this regard, a two days' workshop was organized with the joint effort of TUDA and PDMC where officials from all twenty project towns, TUDA and UDD have participated. The primary intent of the orientation workshop was to enhance the knowledge base of the ULB officials, TUDA officials and officials of UDD on the mentioned five disciplines, namely, a) Social safeguard, GRM and Gender, b) Environmental safeguards c) Financial modalities of externally aided projects, d) Procurement procedures, and e) Institutional arrangements.

Objective of the workshop

The specific objective of the workshop is to raise awareness on risks/issues, implications and arrangements of this project across various disciplines and creating a pathway to establish safeguard framework/plan and application of tools customizing to local conditions.

- ❖ The participants from ULBs and TUDA have a better understanding of the prerequisite parameters of an externally aided project
- ❖ Participants will be able to learn the process of continuous monitoring of the prerequisite parameters of safeguards, procurement process, contract management, financial implications, and institutional arrangements
- ❖ Avoid adverse impacts resulting from the project on environment and affected people, where ever possible
- ❖ Minimizing, mitigate and / or compensate for adverse project impacts on the environment and persons affected if efforts to avoid adverse impacts if not possible
- ❖ Helping borrowers / clients to strengthen the safeguard systems and build the capacity to manage social and environmental risks

- ❖ Reflect on their own supervision approach in a comprehensive perspective
- ❖ Exchange experiences or new ideas for guidance and suggestions to be used in the project
- ❖ Other objectives for the Orientation Workshop are to make the organization for creating a Field of Preparation.

Location and period of the workshop

The mentioned workshop was a residential workshop and was organized at Gitanjali Guest House, Bholagiri, Agartala. The workshop was organized for two days 19th and 20th December 2022

Total number of participants

The total number of participants were approximately 52 for the two days orientation workshop, comprising of 2 officials each from 20 ULBs and officials from TUDA/UDD.

Methodology of the workshop

The proposed orientation workshop has been conducted mostly in an interactive communication mode. The methodology followed during the orientation workshop are as under:

- ❖ Lecture
- ❖ Presentation
- ❖ Group discussions
- ❖ Subject related learning games etc.

Training Team & Organizing Team

The members of the organizing team comprised of Subject Experts and other support staffs of TUDA – PDMC including Social Safeguard Expert, Environmental Expert, Institutional Expert, Procurement and Finance Expert.

Outcome

The outcome of the two days “Orientation Workshop” related to the understanding of the participants. The outcomes are as under:

- Participants understood the different policies, procedures of Social & Environmental Safeguards
- Importance of social and environmental safeguards,
- Why gender in projects and basics of gender,
- Participants could also have an idea of the modalities of Institutional setups within the project
- Municipal Administration System
- Overview of urban scenario in Tripura
- Participants have learned Project accounting system under ADB and disbursement modalities
- Participants were made aware of the various Stages of procurement
- Types of procurement
- Methods of procurement under ADB project

Session Details – Day One

Session 1: Opening Session

The opening session is intended to welcome the participants and the trainer and the participants to get to know each other. The opening session was addressed by Dr. Tamal Majumder (TCS), Director, UDD, in which he welcomed all the participants and explained the importance of orientation workshop and the specific subjects as well. The opening session was followed by an address regarding the importance and prerequisites in ADB funded projects by Dr. A.K. Aditya, Team Leader, PDMC. After the opening session, participants were addressed and educated regarding ADB Protocols and Guidelines by Mr. M. K. Gop. The

session also provided a brief overview of the whole designed workshop schedule - the back ground, objectives, content and schedule of the course and highlights about the training methodology. The session was conducted in an interactive in nature.

manner and was more oriented towards learning from each other. The course handouts and reading materials are disseminated.

Session 2: Development Induced Social Issues, Social Safeguards & Impacts

The second session was intended to create an understanding of social impacts in implementation of urban infrastructure and development projects in urban areas and their positive and negative implications. It also aimed planners, implementors and decision makers to understand how and when to diagnose the social issues in the process of planning and designing infrastructure projects. The session was designed to assist the participants in distinguishing between “project benefitted people” and “project affected people” through discussions based on identified possible social issues due to urban infrastructure projects based on their experience. During the session, presentations were made deriving from national experience to supplement the learning efforts. It was discussed that development induced social issues will be inevitable unless appropriate social safeguards are not included into infrastructure development plans. This session was the foundation to understand the concept of social safeguards, grievance redressal mechanism and gender related issues and mainstreaming. The said session was so designed that a high level of active participation of the participants was observed although the session. The topics discussed under the session are as under:

- Understanding of Social Safeguard and its principles
- ADB’s Safeguard Policy, 2009 & Scope of application
- Safeguard requirements 2 and safeguard requirements 3
- Policy Objectives & Scope of Policy application
- Understanding Involuntary Resettlement
- Eligible displaced persons & types of displacements
- Basic IR Principles
- Negotiated Land Acquisition
- Categorization of Projects
- IR Impacts, types and categorization of the same
- Who are Indigenous People (IP)
- Safeguards Compliance Flowchart
- IR impacts – what to consider?
- Grievance Redressal Mechanism (GRM / GRC) Structure & ADB’s Accountability Mechanism
- Project stages for preparation of safeguard documents
- Case sharing for best practices of safeguard application in the field
- Consequences of not following safeguard norms on time
- Preparation of DDR and RP
- Process of land donation or negotiated land purchase
- Checklist for social safeguard and gender while visiting sites
- Gender – meaning, understanding and key concepts
- Considering gender in project designing and implementation
- Gender equality and equity
- Common perception regarding gender

Session 3: Environmental Safeguards and its applications

During the session in the respective subject matter, Environmental Safeguard Team– PDMC made an effort to make the participants understand that Environment Safeguards aims at minimizing environmental impacts while executing the project activities in the field. Process of doing the same was discussed through

implementation of Environmental Management Plan (EMP) proper awareness, and taking required mitigative measures. It was also shared with the participants that contractor has to continually comply with EMP strictly, proper solid waste/ waste water management, use of personal protective equipment's (PPE), continued supply of potable drinking water and First aid kits to workers/staffs and proper Health and Safety Plan (OHSP).

The report summarizes how ADB is structured and how it operates. ADB aims to improve environmental conditions of the rural and urban poor to enhance their chances for a better quality of life. We do this by working with governments and the private sector to fund land and water management systems; better resource management systems; cleaner energy production; expanded water supply, sanitation, and waste management services; and much more.

ADB's current strategies emphasize infrastructure investments with new approaches to focus on sustainability of their economic development. The impact of poor environmental quality and degraded resources on individuals, families, and communities poses a threat to the poor and increases the strain on those living on the margins of poverty. Most of the poor live in rural areas where they are highly dependent on ecosystems for their needs. Yet unsustainable exploitation and conversion is severely straining the forests, coastal systems, and lands from which they make their livings. And the very poorest tend to depend on the most marginal of areas, often contributing to resource degradation just to survive. As rural ecosystems become degraded, they lose their life-supporting functions—which sustain not only rural communities but urban populations. All queries of the respective ULBs were satisfactorily resolved regarding environmental concerns.

Topics discussed under Environment Safeguards are:

- Safeguard Requirement (ADB's Safeguard Policy Statement 2009)
- Importance of Safeguards (Prevent and mitigate harm to people and environment)
- Environmental Safeguards Policy Principles and requirements-ADB
- Major Rules and regulations for compliance
- Environmental Safeguard-Schedule and time frame of activities
- Details of Environmental Management plan (EMP)
- Activities during pre-construction phase (Statutory clearance, consent, NOC, Utility Shifting, selection of location, stockpile areas, disposal areas, material etc.)
- Environment safeguard requirement before start of project implementation
- Environment safeguard requirement during project implementation
- Project Implementation Phase EMP-site Environment Compliance
- Environmental Safeguard -Reporting

Session 4: Institutional Setups in Urban Scenario and Municipal Administration

This Session was focused on the urban scenario related to ULBs. Tripura urban sector has been facing crucial challenges like all other northeastern Indian cities. Geographical location and limited connectivity with India's main land are some permanent challenges. But those challenges can convert as value addition by improvement of governance efficiency. Natural resources, historical and tourist attractions are investment values for the urban sector. Those can be optimally utilized by attracting new urban investments and building new urban infrastructure. A few issues and challenges are mentioned below.

- Urban investments and improvement in the Physical Infrastructure of Cities.
- Reform linked investment strategy.
- Creating a self-sustainable service delivery mechanism and augmenting resources.
- Implementation of urban reforms addressing the causes and problems of the cities in the implementation of the reforms and suggest measures.

In addition to it the key objectives of creating Tripura Municipal Services were also discussed during the said session. In context of the same, the present scenario of ULBs, its staffing, institutional setting at ULBs, urban governance and administrative framework and the way forward was also a part of session.

Opening session

The opening session is starting with greeting of the guest of honour: -

- 1) Dr. Tamal Majumdar, Director of Urban Development,
- 2) Mr. Mihir Kanti Gop , Cheif planner TUDA & Project Coordinator PMU, TUDA , ADB project ,
- 3) Dr. Anup Kumar Aditya, Team Leader, PDMC.

After that the Expert of PDMC and the participants of the ULBs to get to know each other. The introduction will cover the background, work related to infrastructure development of the participants. In the of the workshop Dr. Tamal Majumder (Director of UDD) give his valuable inaugural speech related to ADB project followed Mr. Mihir Kanti Gop , Cheif planner TUDA & Project Coordinator PMU, TUDA , ADB project & Dr. Anup Kumar Aditya ,Team Leader , PDMC.

Orientation workshop session

Training/ Learning Objectives	Session Mode	Duration	Resource Person
Day One- 19.12.2022			
Registration for the Workshop cum training		Mins	
Welcome address to the participants and introductory session		Mins	Dr. Tamal Majumder (TCS), Director, UDD
Orientation on ADB Guidelines and Protocol	• Lecture • Discussion • Power Point presentation through Projector	Mins	Mr. M.K. Gop, Chief Planner, TUDA
Social Safeguards ➤ Orientation on the basic Safeguard Principles ➤ Project Categorizations ➤ Social Safeguard Reports and documentations ➤ Social Safeguard Requirements for project implementation ➤ Difference of DDR with RP/ IPP & SSMR ➤ Good practices of safeguard ➤ Consequence of bad safeguard practices	• Lecture • Discussion • Power Point presentation through Projector	120 Mins	Jayanta Chakraborty, Safeguard Expert, PDMC
➤ Uses & Importance of GRM & GRCs at various levels. ➤ Gender Equality & Social Inclusion	• Lecture • Discussion • Power Point presentation through Projector	60 Mins	Jayanta Chakraborty, Safeguard Expert, PDMC
Environmental Safeguards ➤ Orientation on the basic Safeguard Principles ➤ Project Categorizations ➤ Environmental Safeguard Reports and documentations	• Lecture • Discussion • Power Point presentation through Projector	120 Mins	Shendu Mitra, Environment Safeguard Expert, PDMC

➤ Environmental Safeguard Requirements for project implementation ➤ Different types of reports – IEE, SEMP & SEMR ➤ Good practices of safeguard ➤ Consequence of bad safeguard practices			
Feedback from participants		30 Mins.	All participants
Day Two- 20.12.2023			
Topic: ➤ Municipal Administration and overview of urban scenario in Tripura ➤ ULB governance/administration in Tripura and the role of urban staff in urban development and infrastructure ➤ Discussion follows with participants to share their existing scenario in respective ULBs. ➤ Discussion constitution/statutory obligations with reference to 74th CAA and Tripura Municipal Act, ➤ ULB as organisation, powers and functions of ULB and role of various functionaries ➤ Urban governance reforms – way forward	• Lecture • Discussion • Power Point presentation through Projector	2 Hours	Institutional Expert, PDMC
Finance: ➤ Modalities of project fund disbursement ➤ Project Accounting System	• Lecture • Discussion • Power Point presentation through Projector	2 Hours	Finance Expert, PDMC
➤ Procurement & its principles ➤ Various stages of procurement ➤ Types of procurement ➤ Procurement Methods ➤ Procurement Checklist ➤ Basics of contract management	• Lecture • Discussion • Power Point presentation through Projector	2 Hours	Procurement Expert, PDMC
Feedback from participants		15 Mins	All participants
Valedictory Session		5 Mins.	Official from TUDA

Closing session

After complete all the session by the experts of PDMC, Certificates are distribute to all them participants per procuration Mr. Mihir Kanti Gop , Chief planner TUDA & Project Coordinator PMU, TUDA , ADB project & Dr. Anup Kumar Aditya ,Team Leader , PDMC. And close up the workshop with vote of thanks by means of Mr. Mihir Kanti Gop , Chief planner TUDA & Project Coordinator PMU, TUDA , ADB project.





Attendance Sheet

ORIENTATION WORKSHOP ON SAFEGUARDS, FINANCE, PROCUREMENT & INSTITUTIONAL
ARRANGEMENTS - 2022

PDMC (TUDA)

Venue - Geetanjali State Guest House.

DATE- 19.12.2022

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
1	Ratish Ch. Bisharwar	Jr. Ex, Bishalpur M.C.	M	8974093128	Bisharwar
2	Subha Droni	Nect DMC	m	9362122801	Subha
3	Fatekh Hossain	C.O., BMC	m	7005693783	Fatekh
4	Prinayit Bhattacharya	Deputy Comm. Bulani M.C.	M	9485067001	Prinayit
5	En. Depankar Sharma	J.E., Ambikapur M.C.	M	7005353201	Depankar
6	En. Ananta Debnara	J.E., Chaitanya R.D. Block	F	9974579116	Ananta
7	Somali Paul	LDC, Chaitanya R.D. Block	F	9383133641	Somali
8	Bishal Deb	Account Section	M	8787352526	Bishal
9	En. Subrata Chandra	J.E., Mohanpur M.C.	M	9436484762	Subrata
10	En. Abhijit Debnath	J.E., Jindania N.P.	M	7005639026	Abhijit
11	Biswajit Das	Asstt. Manager (Finance), J.E.	M	7005248629	Biswajit
12	En. Ananta Debnara	Junior Engineer, Ambikapur M.C.	M	9436505127	Ananta

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
13	Abhijit Dasgupta	Accounts Secy, Ambikapur M.C.	M	8014477123	Abhijit
14	En. Swapan Chandra	J.E., Raipur M.C.	M	7005278180	Swapan
15	En. Shubhjit Paul	Technical Section, R.M.C.	M	6009576328	Shubhjit
16	En. Gulab Ch. Ghosh	J.E., Kamarpur M.C.	M	9436584433	Gulab
17	Parimal Chandra	Accountant Below-MC	M	9802610248	Parimal
18	En. Kamalesh	J.E. Below M.C.	M	7627966564	Kamalesh
19	Gopendra Biswas	Deputy Comm., Teliamura Municipal Council	M	9436488944	Gopendra
20	En. Bijay Kumar Das	J.E., Teliamura Municipal.	M	7005553306	Bijay
21	En. Pratikam Saha	J.E., Melaghar Municipal.	M	9774119382	Pratikam
22	En. Pranjit Kumar	J.E., Sonamug Nager, Melaghar	M	8837210671	Pranjit
23	En. Chandra	Asstt. Comm., Sonamug Nager	M	9612472435	Chandra
24	Keshavram Saha	Accounts Incharge, SNP	(M)	9436517198	Keshavram
25	Ruma Pal Deb	Acctt. - ro - charge, SNP	(F)	9485062654	Ruma
26	Subrata Deb	J.E., Kailashpur M.C.	(M)	8415861186	Subrata
27	Prinay Bhushan Paul	J.E., Kumbhari M.C.	M	8837233816	Prinay
28	Prabulla Kumar	Asstt. Comm., Acctt. & Kgt M.C.	(M)	9402355912	Prabulla
29	Raj Kumar Debnara	LDC, Cam. Cam.	(M)	8787761715	Raj
30	Ananta Das	J.E. (U.M.C.)	(M)	8259093314	Ananta

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
31	Tapan Sarkar	AW UMC	Male	7629041426	[Signature]
32	Saikat Roy	Actt. Khowai MC	Male	9436514027	[Signature]
33	Subhojit Das	Actt. DMC	Male	9862122801	[Signature]
34	Prasenjit Deb	Office Assistant (TUDA)	Male	8837341214	[Signature]
35	Mumoni Das	J.E., TUDA	Female	7005220074	[Signature]
36	Sujoy Chakraborty	Social Safeguard (Suby)	Male	9862246728	[Signature]
37	Rita Mandal	Environment Safeguard (Expert)	Female	9851741939	[Signature]
38	Pradeep Sanyal	Social Safeguard	Male	8707001669	[Signature]
39	Jayanta Chakraborty	Social Safeguard & Gender Expert	M	8761805667	[Signature]
40	Atanu Chakraborty	Office Assistant, PDMC	M	8787832479	[Signature]
41	Susmita Dasgupta	Socio-Economic Surveyor (TUDA)	F	8132049723	[Signature]
*42	Rupak Deb	CMU (TULM), Panisagar NP	M	8118937105	[Signature]
*43	Prasanta Das	SBM Expert Panisagar NP	M	8131971297	[Signature]

ORIENTATION WORKSHOP ON SAFEGUARDS, FINANCE, PROCUREMENT & INSTITUTIONAL ARRANGEMENTS - 2022

**PDMC (TUDA)
Venue - Geetanjali State Guest House.**

DATE- 20/12/2022

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
1	Prasenjit Chatterjee ✓	Accountant, Amara MC	M.	9485067039	[Signature]
2	Rupak Deb ✓	CMU (TULM) Panisagar NP	M	8118937105	[Signature]
3	Prasanta Das ✓	SBM Expert	M	8131971297	[Signature]
4	Amrita D/Baner ✓	J.E., Charidam Block	F	297457116	[Signature]
5	Somali Paul ✓	LDC, Charidam Block	F	9883133641	[Signature]
6	Uridul Dey ✓	SA, Sabmor Nagar Panchayat	M	9612004652	[Signature]
7	Bishal Deb ✓	Account Section	M	8787352526	[Signature]
8	Dr. Subrata Chatterjee ✓	J.E., Mohanpur MC	M	9438189762	[Signature]
9	Dr. Prasenjit Das ✓	J.E., Amara NP	M	9436505127	[Signature]
10	Dr. Swapan Chakraborty ✓	J.E. Rourkela NP	M	7005278180	[Signature]
11	Dr. Shubajit Paul ✓	Technical Section, RMC	M	6009576328	[Signature]
12	Dr. Bimal Ch. Ghosh ✓	J.E., Karmalpur NP	M.	9436582423	[Signature]

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
13	Parimal Chandra Mondal ✓	Acctt. Belowe M.C.	M	9862610248	
14	Abhijit Dasgupta ✓	Account Sec Anugpur M.P.	M	8014437123	
15	Deji Banerjee ✓	□/R	M	7005583206	
16	Gopendra Biswas ✓	Accountant/Tellama M.C.	M	8837068546	
17	Abhijit Debnath ✓	Junior Engineer JNP	M	7005639006	
18	Srinajit Das ✓	Asstt. Manager/Finance	M	7005243629	
19	Farrukh Hossain ✓	CO, Bishalgadh M.C.	M	7005693783	
20	Subhojit Das ✓	Acctt. UMC	M	9862122801	
21	Tapan Sarkar ✓	Acctt. UMC	M	7627041426	
22	Byom Chakrabarty ✓	Cashier SMC	M	9612472425	
23	Rajkumar Debbarma ✓	Melaghar M.C. Cashier	(M)	8787761715	
24	Amanjit Das ✓	J.E. UMC	(M)	8259093314	
25	Subrata Deb ✓	JE, Kankasahar M.C.	(M)	815861186	
26	Bijoy Kumar Barui ✓	JE, Kunkul M.C.	(M)	8837235816	
27	Bafulla Kumar Deb ✓	Envier, I/C Acctt. sec KSC M.C.	(M)	9402355912	
28	Ruma Pal Deb ✓	Acctt. in-charge HCLSC	(F)	9485062654	
29	Ratheshyom Saha ✓	Acctt. in-charge	(M)	9436517198	
30	Pranjit Barui ✓	J.E. Sonoma Nagan ranchari	(M)	8837210671	

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
31	Er. Arifan Saha ✓	JE. Melaghar M.C.	M	9774119382	
32	Sri P.K. Mondal ✓	Sr. ADO / TUDA	M	9436122820	
33	Ratish Ch. Debbarma ✓	Jr. Er, Bishalgadh M.C.	M	8974073128	
34	Saikat Roy ✓	Acctt. Khowai M.C.	M	9436514027	
35	Prasenjit Deb	Office Assistant	M	8837341214	
36	Mamoni Das ✓	Junior Engg, TUDA	F	7005282954	
37	Sujoy Chakrabarty ✓	Social Safeguard (Support)	M	7862296728	
38	Rita Mondal ✓	Environment Safeguard (Support)	F	9051747939	
39	Pradeep Singh ✓	Social Safeguard	M	8707001669	
40	Jayanta Chakrabarty ✓	Social Safeguard & Gender Expert	M	8761805667	
41	Atanu Chakrabarty ✓	Office Assistant, PDNC	M	8787832479	
42	Dr. K. Srimam ✓	Urban Governance TUDA	M	9440136718	
43	Bilashu Biswas ✓	FM Support, PDNC, TUDA	M	7830154226	
44	Pavan Pareek ✓	Env TUDA TTDL	M	9314602211	
45	Susmita Bhowmik ✓	Socio Economic Support PDNC	F	8132049780	
46	En. Dipankar Chatterjee ✓	J.E. Ambala	M	7005353201	
47	Er. Kaam Nag ✓	J.E. Belowe	M	7623966564	
48	Er. Rajob Debbarma ✓	JE Khawai	M	8416048223	

Appendix 9: Sample Grievance Form

(To be available in Bengali and English)

The _____ Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	Place of registration	Project Town			
		Project:			
Contact information/personal details					
Name		Gender	Male Female	Age	
Home address					
Place					
Phone no.					
E-mail					
Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below:					
If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
Mode of communication: Note/letter E-mail Verbal/telephonic	
Reviewed by: (Names/positions of officials reviewing grievance)	
Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	

অভিযোগ নিবন্ধন ফর্মের নমুনা

..... প্রকল্পকে বাস্তবায়িত করার লক্ষে অভিযোগ, পরামর্শ, অনুসন্ধান এবং মন্তব্যের জন্য স্বাগত।

আমরা অভিযোগকারীকে অভিযোগ সহ নাম জানাতে উৎসাহিত করি এবং আপনার সাহচর্যে এসে এর শোধন ও প্রতিক্রিয়া জানাতে সক্ষম হই।

অবশ্যই আপনি আপনার ব্যক্তিগত বিষয় বিস্তারিত ভাবে যুক্ত করতে ইচ্ছাপ্রকাশ করবেন। যে তথ্য আপনি দেবেন, তা অবশ্যই গোপন থাকবে। তাই অনুগ্রহ করে আপনার নাম লিখে / টাইপ করে জানান।

তারিখ	নিবন্ধনের জায়গা	প্রকল্পের শহর প্রকল্পঃ			
যোগাযোগের তথ্য / বিস্তারিত ব্যক্তিগত তথ্য					
নাম		লিঙ্গ	পুরুষ মহিলা	বয়স	
বাড়ীর ঠিকানা					
জায়গা / স্থান					
ফোন নং					
ই-মেল					
যেকোন অভিযোগ / পরামর্শ / মন্তব্য / প্রশ্ন অনুগ্রহ করে নিচে বিস্তারিতভাবে (কে, কি, কোথায় এবং কেমন করে) আপনার অভিযোগ জানান					
যদি কোন সংযুক্তি / চিরকুট / চিঠি অন্তর্ভুক্ত করতে চান, অনুগ্রহ করে সেখানে টিক দিন।					
আপনার অভিযোগ / মন্তব্যের হালনাগাদ (আপডেট) বা প্রতিক্রিয়া কিভাবে পেতে চান?					

Office ব্যবহারের জন্যঃ

অভিযোগ নিবন্ধনকারী আধিকারিকের নামঃ	
যোগাযোগ ব্যবস্থাঃ	
চিরকুট / চিঠি-	
ই-মেল-	
মৌখিক / টেলিফোন-	
নিবন্ধকৃত অভিযোগ পর্যালোচনাকারী আধিকারিকের নাম ও পদঃ	
অভিযোগের বিরুদ্ধে গৃহীত ব্যবস্থা-	
গৃহীত ব্যবস্থা প্রকাশ্যে আনা হয়েছে কি না	হ্যাঁ না
প্রকাশের উপায়	

Appendix 10: Guidelines for Workers Camps

(Based on IFC benchmark standards for workers accommodation)

Guidelines for Workers' Accommodation

1. Availability of sufficient number of clean rooms for the workers with adequate facilities of ventilation, Drinking water, Electricity/fan/light (natural and artificial lighting) etc. in each room.
2. Camps should not be subjected to periodic flooding nor located within 200 feet of swamps, pools, sink holes or other surface collections of water. All sites should be graded, ditches and rendered free from depressions in which water may become a nuisance.
3. Accessibility to an adequate and convenient supply of potable water to the workers. Depending upon the climate, weather conditions and accommodation standards, 80 to 180 litres per persons per day water should be available and drinking water should meet the national/WHO drinking water standards.
4. Camp site should be adequately drained to avoid the accumulation of stagnant water.
5. All tanks used for the storage of drinking water should be constructed and covered as to prevent water stored therein from becoming polluted or contaminated.
6. All sites should be adequate in size to prevent overcrowding of necessary structures.
7. Camps should have Crèche facility for children with necessary arrangements.
8. The grounds and open areas surrounding the shelters should be maintained in a clean and sanitary condition free from rubbish, debris, waste papers, garbage or other refuse.
9. Beds, cots, or bunks, and suitable storage facilities such as wall lockers for clothing and personal articles should be provided in every room used for sleeping purposes.
10. A separate bed for each worker should be provided. Double deck bunks are not advisable for the safety and hygiene reasons and their use should be minimized. If they are used there must be enough clear space between the lower and upper bunk of the bed. Standard range is 0.7 to 1.10 meters. Triple deck bunks are prohibited.
11. All heating, cooking, and water heating equipment should be installed in accordance with State and local ordinances, codes, and regulations governing such installations. If a camp is used during cold weather, adequate heating equipment should be provided.
12. If food is provided, it should cater for different cultural needs. Kitchens should be provided with facilities to maintain adequate personal hygiene including a sufficient number of washbasins designated for cleaning hands with clean running water and materials for hygiene drying.
13. All kitchen floors, ceiling and wall surface adjacent to or above food preparation and cooking areas should be built using durable, non-absorbent, easily cleanable, non-toxic materials.
14. No person with any communicable disease shall be employed or permitted to work in the preparation, cooking, serving, or other handling of food, foodstuffs, or materials used therein, in any kitchen or dining room operated in connection with a camp or regularly used by persons living in a camp.
15. There should be recreation facilities for the camp workers i.e. TV/sports/newspaper/magazine etc.
16. There should be facility of mosquito's prevention and control i.e. use of mosquito net/coil/electric repellent/pesticide etc.
17. Sanitary and toilet facilities should be constructed of the materials that are easily cleanable. Standard range of the toilets varies from 1 unit for 6 persons to 15 persons. For urinals, standards are 1 unit for 15 persons.
18. There is no need to provide separate urinals in any place where less than 50 workers are

- employed or where the latrines are connected to water borne sewage system.
19. Sanitary and toilet facilities should be designed to provide workers with adequate privacy including ceiling to floor partitions and lockable doors.
 20. Separate toilet and bathing facilities should be available for Men and women. These facilities shall be distinctly marked "for men" and "for women" by signs printed in English and in the native language of the persons using the facilities, and/or marked with easily understood pictures or symbols.
 21. Workers' gender, religious, cultural, and social backgrounds should be respected. Workers should be provided with the possibility of celebrating religious holidays and observances.
 22. No pets, birds or livestock should be kept or fed unless approved by management or camp operator.
 23. There should be proper arrangement of colour coded dustbins i.e., Green for wet/biodegradable wastes, blue for dry/non-biodegradable waste and red for safe disposal of domestic hazardous waste i.e. sanitary napkins and diapers.
 24. There should be adequate facility for waste water management (i.e. septic tanks/soak pits) and for disposal of Municipal solid waste (i.e. composting).
 25. The person in charge of managing the accommodations has a specific duty to report to the health authorities the outbreak of any contagious diseases, food poisoning and any other important casualties.
 26. Guidance on the detrimental effects of the abuse of alcohol and drugs and other potentially harmful substances and the risk, concerns related to HIV/AIDS and other health risk related activities should be provided to the workers through group/individual orientations and should also be displayed at camps as visual boards.
 27. Workers should have easy access to medical facilities and medical staff where possible female doctors/nurses should be available for female workers. Regular health check up should be done for the workers. First-AID Kit/Health care facilities should be available in the camps. There should be proper demarcation/display of First Aid facility and First Aider.
 28. A specific fire safety plan should be prepared including training of fire wardens, periodic testing and monitoring of fire safety equipment.
 29. All key contacts, emergency contact number, including nearby hospital should be posted in a prominent place and in all languages present e.g., at camp gate and throughout the camp.

Appendix 11: Guidelines for Prevention and Control of COVID-19

Introduction:

Construction worksite and other workplaces are relatively close settings, with shared spaces like work area, pathways, Worker camp, Site office and material handling area etc. and COVID-19 infection can spread relatively fast among workers, staffs and visitors.

There is a need to prevent spread of infection and to respond in a timely and effective manner in case suspect case of COVID-19 is detected in these settings, so as to limit the spread of infection.

Principles of Worker Protection:

- Consistently practice social distancing.
- Cover coughs and sneezes.
- Maintain hand hygiene.
- Clean surfaces frequently.

Maximum Precaution for Persons/Labourers Reporting To Work:

- IF SICK, STAY HOME!
- IF SICK, GO HOME!
- IF SOMEONE SICK, SEND THEM HOME!

Covid-19 Typical Symptoms:

- Fever
- Cough
- Shortness of Breath
- Sore Throat

Morning and evening temperature screening of all persons at the worksite is done by EHS officer with Infrared Thermometer and register was also maintained.

Self-Attestation By Persons/Labour Prior To Work:

Prior to starting a work, each labour /worker will self-attest to the supervisor and the documents is collected by EHS Officer. It consists the following points,

- No signs of COVID-19 symptoms within the past 24 hours.
- No contact with an individual diagnosed with COVID-19. (contact means living with a positive person, being within 6 ft. of positive person OR sharing things of positive person).
- Not undergone quarantine or isolation (in case of any labourer /worker who has been quarantined or isolated previously, the engagement shall be only after obtaining the requisite clearance from trained and registered medical practitioner). The self-attestation would be verified by EHS officer deployed at site through discussions with laborers /workers and/or preliminary checks such as temperature checks, etc. prior to their engagement at site.
Persons/Labourers showing COVID-19 symptoms or not providing self-attestation will be directed to leave the work site and report to the fever clinic/quarantine Centre immediately. Labour not to return to the work site until cleared by fever clinic/quarantine Centre.

General Guidelines:

- No hand shake is permissible at site, office.
- Non-essential physical work that requires close contact between workers will not be carried out.
- Hand sanitizer is used before entry of the site.
- No unauthorized person will enter the work site other than mentioned by supervisor during start of work.
- All individual work group meetings/ talks will follow social distancing.
- Worksite had COVID-19 safety guidelines.
- All restroom /toilet facilities will be properly cleaned, and hand washing facilities provided with soap, hand sanitizer.
- Water bottle present at site will not be shared.
- Social Distancing will be maintained during breaks and lunch.
- Coughing or sneezing must cover with a personal handkerchief and then wash hands. Coughing or sneezing in hands was avoided.
- Avoid touching eyes, nose, and mouth with hands.
- If family member is feeling ill, stay home.
- Separate disposal bins were placed for collection of used masks/used hand tissues, etc.
- Spitting will be strictly prohibited.

Work-Site Prevention Practices:

- At the start of each day, confirmation will be taken from all employees that they are healthy and all workers will be informed about reusable and disposable PPE.
- Outside person(s) will be strictly prohibited at worksite.
- Use of eye protection (reusable safety goggles/face shields) is recommended.
- In work conditions where required **social distancing is impossible** to achieve, such employees will be supplied with appropriate PPE's.
- All employees will drive to work site in a single occupant vehicle.
- Workers will maintain separation of 6 feet from each other wherever possible.
- High contact surfaces will be properly disinfected in order to minimize the spread of germs in the areas that people touch frequently.
- The contactless temperature checks was done for the workers prior to site entrance and after site works to identify persons showing signs of being unwell with the COVID-19 symptoms.

Washing Facility:

- Worksites already have access to toilet and hand washing facility.
- At entrances and exits hand cleaning facilities is provided.
- All onsite workers help to maintain and keep work area clean.

Labour Camp

- follows a zero-tolerance policy on wearing of masks.
- Masks provided to all the persons/labourers for use at the camp site as well as at the worksite.

Toilet Facility

- The number of people using Toilet facility will be limited at any one time.
- Hands washing must be done before and after using the facilities.

Eating/snacks Arrangements

- Dedicated eating areas is marked on camp and workers also instructed to reduce

- food waste and contamination.
- Hand cleaning facilities or hand sanitizer is available at the entrance of worker dining room.
- Workers seated at a distance of 2 meters apart from each other while eating.
- Drinking water provided with proper cleaning measures and consists of tap mechanism.
- All areas used for eating is thoroughly cleaned at the end of each break and shift.

EHS Officer will ensure compliances with prevention issues at the labour camp.

Training

- All workers get training by EHS officer on above requirements before start of any construction activities.
- During construction period frequent visual and verbal reminders will be given to workers for improving compliance with hand hygiene practices and thus reduce rates of infection.

Emergency Contact

- Emergency contact number(s) at work site and labour camp for reporting COVID-19 symptoms is provided.

COVID-19 Safety Coordinator(s)		
Name	Title/Facility Location	Contact Information (office location, phone, email address)

Sequence of operation performed regarding COVID-19 safety performed at site:-

- Before entering the worksite for the first time the workers must fill and sign the self-declaration form and also submit the vaccination certificate.
- Before starting each day work the workers body temperature is monitored. If workers body temperature was found higher, then he was not allowed to work at site and he will be consult with doctor as per guidelines.
- Along with body temperature measurement workers hand also sanitized with hand sanitizer.
- With face mask workers, supervisors & officials were only allowed at worksite.
- If any situation suffocation problem is arise then the worker is instructed to maintain proper distance from others and work individually.
- During the work wherever possible social distance was maintained. But during construction activities where social distancing is not possible to maintain, there proper PPE's was used.
- During lunch or tiffin time the worker was instructed to clean his hand with hand wash and water.
- Worker camp areas and work location were disinfected time to time.
- Before leaving the worksite the workers body temperatures was again measured and noted on the register.

Appendix 12: IBAT Assessment Checklists of Project Towns

KHOWAI

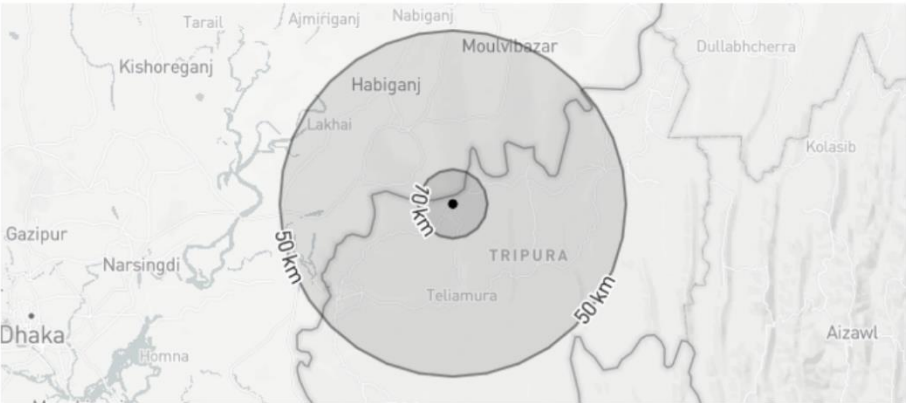


Integrated Biodiversity Assessment Tool
PROXIMITY REPORT
KHOWAI SUBPROJECT

Country: India
Location: [24.1, 91.6]
Date of analysis: 13 January 2023 (GMT)
Buffers applied: 1 km | 10 km | 50 km
IUCN Red List Biomes: Marine, Freshwater, Terrestrial
Generated by: Govind Rathore
Organisation: ADB

Overlaps with:

Protected Areas	4
Key Biodiversity Areas	5
IUCN Red List	75



Displaying project location and buffers: 1 km, 10 km, 50 km



About this report

This report presents the results of [30102-38639] proximity analysis to identify the biodiversity features and species which are located within the following buffers: 1 km, 10 km, 50 km.

This report is one part of a package generated by IBAT on 13 January 2023 (GMT) that includes full list of all species, protected areas, Key Biodiversity Areas in CSV format, maps showing the area of interest in relation to these features, and a 'How to read IBAT reports' document.

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Please note, sensitive species data are currently not included in IBAT reports in line with the [Sensitive Data Access Restrictions Policy for the IUCN Red List](#). This relates to sensitive Threatened species and KBAs triggered by sensitive species.

Data used to generate this report

- UNEP-WCMC and IUCN, 2023. Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net - January 2023.
- BirdLife International (on behalf of the KBA Partnership), 2022. Key Biodiversity Areas - November 2022.
- IUCN, 2022. IUCN Red List of Threatened Species - December 2022.
- IUCN. The IUCN Red List of Threatened Species. Version 2019-3. (2019). <https://www.iucnredlist.org>
- IUCN. Threats Classification Scheme (Version 3.2). (2019)
- Strassburg, B.B.N., Iribarrem, A., Beyer, H.L. et al. Global priority areas for ecosystem restoration. Nature 586, 724–729 (2020). <https://doi.org/10.1038/s41586-020-2784-9>



Protected Areas

The following protected areas are found within 1 km, 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Rema Kalenga	10 km
Barshijora Eco-Park	50 km
Lawachara	50 km
Satchari	50 km

Key Biodiversity Areas

The following key biodiversity areas are found within 1 km, 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Rema-Kalenga Wildlife Sanctuary	10 km
Gumti Wildlife Sanctuary	50 km
Hail Haor	50 km
Lawachara / West Bhanugach Reserved Forest	50 km
Rajkandi Reserved Forest	50 km

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.



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environment
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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Nilssonia nigricans</i>	Black Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Freshwater
<i>Indotestudo elongata</i>	Elongated Tortoise	REPTILIA	CR	Decreasing	Terrestrial
<i>Manis pentadactyla</i>	Chinese Pangolin	MAMMALIA	CR	Decreasing	Terrestrial
<i>Aquilaria malaccensis</i>	Agarwood	MAGNOLIOPSIDA	CR	Decreasing	Terrestrial
<i>Aythya baeri</i>	Baer's Pochard	AVES	CR	Decreasing	Freshwater
<i>Gyps bengalensis</i>	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
<i>Ardea insignis</i>	White-bellied Heron	AVES	CR	Decreasing	Terrestrial, Freshwater
<i>Emberiza aureola</i>	Yellow-breasted Bunting	AVES	CR	Decreasing	Terrestrial, Freshwater
<i>Gyps tenuirostris</i>	Slender-billed Vulture	AVES	CR	Decreasing	Terrestrial
<i>Pelochelys cantorii</i>	Asian Giant Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Marine, Freshwater
<i>Cuon alpinus</i>	Dhole	MAMMALIA	EN	Decreasing	Terrestrial
<i>Cuora amboinensis</i>	Southeast Asian Box Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Nilssonia nigricans</i>	Black Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Freshwater
<i>Indotestudo elongata</i>	Elongated Tortoise	REPTILIA	CR	Decreasing	Terrestrial
<i>Manis pentadactyla</i>	Chinese Pangolin	MAMMALIA	CR	Decreasing	Terrestrial
<i>Aquilaria malaccensis</i>	Agarwood	MAGNOLIOPSIDA	CR	Decreasing	Terrestrial
<i>Aythya baeri</i>	Baer's Pochard	AVES	CR	Decreasing	Freshwater
<i>Gyps bengalensis</i>	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
<i>Ardea insignis</i>	White-bellied Heron	AVES	CR	Decreasing	Terrestrial, Freshwater
<i>Emberiza aureola</i>	Yellow-breasted Bunting	AVES	CR	Decreasing	Terrestrial, Freshwater
<i>Gyps tenuirostris</i>	Slender-billed Vulture	AVES	CR	Decreasing	Terrestrial
<i>Pelochelys cantorii</i>	Asian Giant Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Marine, Freshwater
<i>Cuon alpinus</i>	Dhole	MAMMALIA	EN	Decreasing	Terrestrial
<i>Cuora amboinensis</i>	Southeast Asian Box Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Elephas maximus</i>	Asian Elephant	MAMMALIA	EN	Decreasing	Terrestrial
<i>Geoclemys hamiltonii</i>	Spotted Pond Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Hardella thurjii</i>	Crowned River Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Morenia petersi</i>	Indian Eyed Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Panthera tigris</i>	Tiger	MAMMALIA	EN	Decreasing	Terrestrial
<i>Varanus flavescens</i>	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial
<i>Nilssononia gangetica</i>	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Nilssononia hurum</i>	Indian Peacock Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Nycticebus bengalensis</i>	Bengal Slow Loris	MAMMALIA	EN	Decreasing	Terrestrial
<i>Hoolock hoolock</i>	Western Hoolock Gibbon	MAMMALIA	EN	Decreasing	Terrestrial
<i>Platanista gangetica</i>	Ganges River Dolphin	MAMMALIA	EN	Decreasing	Freshwater
<i>Trachypithecus phayrei</i> ssp. <i>phayrei</i>		MAMMALIA	EN	Decreasing	Terrestrial



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Cuora mouhotii</i>	Keeled Box Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Urogymnus polylepis</i>	Giant Freshwater Whipray	CHONDRICHTHYES	EN	Decreasing	Marine, Freshwater
<i>Perdicula manipurensis</i>	Manipur Bush-quail	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Sterna acuticauda</i>	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Haliaeetus leucoryphus</i>	Pallas's Fish-eagle	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Aquila nipalensis</i>	Steppe Eagle	AVES	EN	Decreasing	Terrestrial
<i>Leptoptilos dubius</i>	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Laticilla cinerascens</i>	Swamp Grass-babbler	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Tor putitora</i>		ACTINOPTERYGII	EN	Decreasing	Freshwater
<i>Trachypithecus phayrei</i>	Phayre's Leaf-monkey	MAMMALIA	EN	Decreasing	Terrestrial
<i>Trachypithecus pileatus ssp. pileatus</i>	Blond-bellied Langur	MAMMALIA	EN	Decreasing	Terrestrial
<i>Crocodylus palustris</i>	Mugger	REPTILIA	VU	Stable	Terrestrial, Freshwater
<i>Helarctos malayanus</i>	Sun Bear	MAMMALIA	VU	Decreasing	Terrestrial



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Lutrogale perspicillata	Smooth-coated Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater
Macaca arctoides	Stump-tailed Macaque	MAMMALIA	VU	Decreasing	Terrestrial
Neofelis nebulosa	Clouded Leopard	MAMMALIA	VU	Decreasing	Terrestrial
Panthera pardus	Leopard	MAMMALIA	VU	Decreasing	Terrestrial
Prionailurus viverrinus	Fishing Cat	MAMMALIA	VU	Decreasing	Terrestrial, Freshwater
Trachypithecus pileatus	Capped Langur	MAMMALIA	VU	Decreasing	Terrestrial
Ursus thibetanus	Asiatic Black Bear	MAMMALIA	VU	Decreasing	Terrestrial
Dipterocarpus costatus		MAGNOLIOPSIDA	VU	Decreasing	Terrestrial
Dipterocarpus turbinatus		MAGNOLIOPSIDA	VU	Decreasing	Terrestrial
Macaca leonina	Northern Pig-tailed Macaque	MAMMALIA	VU	Decreasing	Terrestrial
Arctictis binturong	Binturong	MAMMALIA	VU	Decreasing	Terrestrial
Rusa unicolor	Sambar	MAMMALIA	VU	Decreasing	Terrestrial
Aonyx cinereus	Asian Small-clawed Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Pangshura tecta	Indian Roofed Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
Wallago attu		ACTINOPTERYGII	VU	Decreasing	Freshwater
Ophiophagus hannah	King Cobra	REPTILIA	VU	Decreasing	Terrestrial
Elaphe taeniura	Cave Racer	REPTILIA	VU	Decreasing	Terrestrial
Python bivittatus	Burmese Python	REPTILIA	VU	Decreasing	Terrestrial
Ortygornis gularis	Swamp Francolin	AVES	VU	Decreasing	Terrestrial, Freshwater
Aythya ferina	Common Pochard	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Mulleripicus pulverulentus	Great Slaty Woodpecker	AVES	VU	Decreasing	Terrestrial
Buceros bicornis	Great Hornbill	AVES	VU	Decreasing	Terrestrial
Gallinago nemoricola	Wood Snipe	AVES	VU	Decreasing	Terrestrial, Freshwater
Sterna aurantia	River Tern	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Clanga clanga	Greater Spotted Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
Leptoptilos javanicus	Lesser Adjutant	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Clanga hastata</i>	Indian Spotted Eagle	AVES	VU	Decreasing	Terrestrial
<i>Arctonyx collaris</i>	Greater Hog Badger	MAMMALIA	VU	Decreasing	Terrestrial
<i>Tropidophorus assamensis</i>	North-Eastern Waterskink	REPTILIA	VU	Unknown	Terrestrial, Freshwater
<i>Oryza malampuzhaensis</i>		LILIOPSIDA	VU	Decreasing	Terrestrial
<i>Lissemys punctata</i>	Indian Flapshell Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
<i>Xenochrophis cerasogaster</i>	Painted Keelback	REPTILIA	VU	Decreasing	Freshwater
<i>Schizothorax plagiostomus</i>	Snow Trout	ACTINOPTERYGII	VU	Decreasing	Freshwater
<i>Beilschmiedia assamica</i>		MAGNOLIOPSIDA	VU	Unknown	Terrestrial
<i>Capricornis sumatraensis</i>	Mainland Serow	MAMMALIA	VU	Decreasing	Terrestrial
<i>Hoolock hoolock ssp. hoolock</i>	Western Hoolock Gibbon	MAMMALIA	VU	Decreasing	Terrestrial
<i>Paris polyphylla</i>	Love Apple	LILIOPSIDA	VU	Decreasing	Terrestrial
<i>Bagarius bagarius</i>		ACTINOPTERYGII	VU	Decreasing	Freshwater



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Recommended citation

IBAT Proximity Report. Generated under licence 30102-38639 from the Integrated Biodiversity Assessment Tool on 13 January 2023 (GMT). www.ibat-alliance.org

How to use this report

This report provides an indication of the potential biodiversity-related features - protected areas, key biodiversity areas and species - close to the specified location. It provides an early indication of potential biodiversity concerns, and can provide valuable guidance in making decisions. For example, this information can be helpful when assessing the potential environmental risk and impact of a site, categorising investments/projects, preparing the terms of reference for an impact assessment, focusing attention on key species of conservation concern and sites of known conservation value, and reviewing the results of an impact assessment.

The report does not provide details of potential indirect, downstream or cumulative impacts. Furthermore, the report should be regarded as a "first-step", providing a set of conservation values sourced from global data sets, and is not a substitute for further investigation and due diligence, especially concerning national and/or local conservation priorities.



MOHANPUR



Integrated Biodiversity Assessment Tool PROXIMITY REPORT MOHANPUR SUBPROJECT

Country: India

Location: [24, 91.4]

Date of analysis: 13 January 2023 (GMT)

Buffers applied: 1 km | 10 km | 50 km

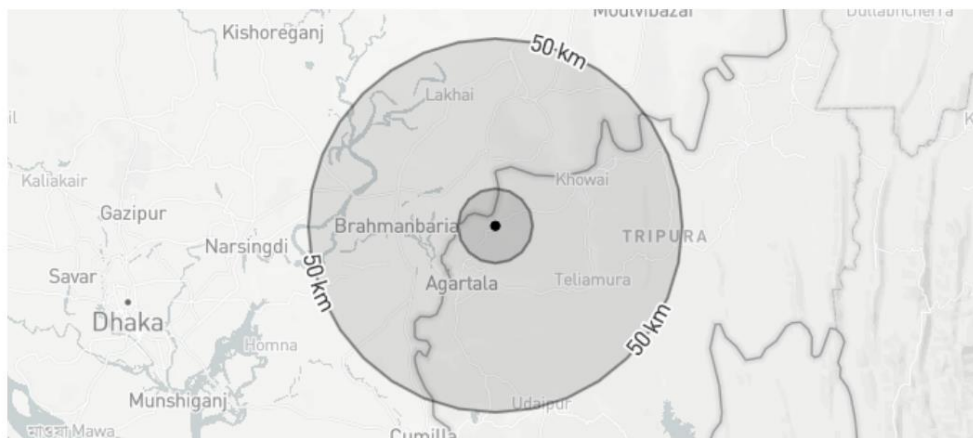
IUCN Red List Biomes: Marine, Freshwater, Terrestrial

Generated by: Govind Rathore

Organisation: ADB

Overlaps with:

Protected Areas	2
Key Biodiversity Areas	4
IUCN Red List	71



Displaying project location and buffers: 1 km, 10 km, 50 km



About this report

This report presents the results of [30102-38628] proximity analysis to identify the biodiversity features and species which are located within the following buffers: 1 km, 10 km, 50 km.

This report is one part of a package generated by IBAT on 13 January 2023 (GMT) that includes full list of all species, protected areas, Key Biodiversity Areas in CSV format, maps showing the area of interest in relation to these features, and a 'How to read IBAT reports' document.

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Please note, sensitive species data are currently not included in IBAT reports in line with the [Sensitive Data Access Restrictions Policy for the IUCN Red List](#). This relates to sensitive Threatened species and KBAs triggered by sensitive species.

Data used to generate this report

- UNEP-WCMC and IUCN, 2023. Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net - January 2023.
- BirdLife International (on behalf of the KBA Partnership), 2022. Key Biodiversity Areas - November 2022.
- IUCN, 2022. IUCN Red List of Threatened Species - December 2022.
- IUCN. The IUCN Red List of Threatened Species. Version 2019-3. (2019). <https://www.iucnredlist.org>
- IUCN. Threats Classification Scheme (Version 3.2). (2019)
- Strassburg, B.B.N., Iribarrem, A., Beyer, H.L. et al. Global priority areas for ecosystem restoration. Nature 586, 724–729 (2020). <https://doi.org/10.1038/s41586-020-2784-9>



Protected Areas

The following protected areas are found within 1 km, 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Rema Kalenga	50 km
Satchari	50 km

Key Biodiversity Areas

The following key biodiversity areas are found within 1 km, 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Gumti Wildlife Sanctuary	50 km
Hail Haor	50 km
Rema-Kalenga Wildlife Sanctuary	50 km
Sepahijala	50 km

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Nilssononia nigricans	Black Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Freshwater



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Indotestudo elongata	Elongated Tortoise	REPTILIA	CR	Decreasing	Terrestrial
Manis pentadactyla	Chinese Pangolin	MAMMALIA	CR	Decreasing	Terrestrial
Aquilaria malaccensis	Agarwood	MAGNOLIOPSIDA	CR	Decreasing	Terrestrial
Aythya baeri	Baer's Pochard	AVES	CR	Decreasing	Freshwater
Houbaropsis bengalensis	Bengal Florican	AVES	CR	Decreasing	Terrestrial
Gyps bengalensis	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
Ardea insignis	White-bellied Heron	AVES	CR	Decreasing	Terrestrial, Freshwater
Emberiza aureola	Yellow-breasted Bunting	AVES	CR	Decreasing	Terrestrial, Freshwater
Gyps tenuirostris	Slender-billed Vulture	AVES	CR	Decreasing	Terrestrial
Pelochelys cantorii	Asian Giant Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Marine, Freshwater
Cuon alpinus	Dhole	MAMMALIA	EN	Decreasing	Terrestrial
Elephas maximus	Asian Elephant	MAMMALIA	EN	Decreasing	Terrestrial
Geoclemys hamiltonii	Spotted Pond Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Hardella thurjii</i>	Crowned River Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Morenia petersi</i>	Indian Eyed Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Panthera tigris</i>	Tiger	MAMMALIA	EN	Decreasing	Terrestrial
<i>Varanus flavescens</i>	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial
<i>Nilssonia gangetica</i>	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Nilssonia hurum</i>	Indian Peacock Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Nycticebus bengalensis</i>	Bengal Slow Loris	MAMMALIA	EN	Decreasing	Terrestrial
<i>Hoolock hoolock</i>	Western Hoolock Gibbon	MAMMALIA	EN	Decreasing	Terrestrial
<i>Platanista gangetica</i>	Ganges River Dolphin	MAMMALIA	EN	Decreasing	Freshwater
<i>Trachypithecus phayrei</i> ssp. <i>phayrei</i>		MAMMALIA	EN	Decreasing	Terrestrial
<i>Urogymnus polylepis</i>	Giant Freshwater Whipray	CHONDRICHTHYES	EN	Decreasing	Marine, Freshwater
<i>Perdicula manipurensis</i>	Manipur Bush-quail	AVES	EN	Decreasing	Terrestrial, Freshwater



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Sterna acuticauda</i>	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Haliaeetus leucoryphus</i>	Pallas's Fish-eagle	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Aquila nipalensis</i>	Steppe Eagle	AVES	EN	Decreasing	Terrestrial
<i>Leptoptilos dubius</i>	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Laticilla cinerascens</i>	Swamp Grass-babbler	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Tor putitora</i>		ACTINOPTERYGII	EN	Decreasing	Freshwater
<i>Trachypithecus phayrei</i>	Phayre's Leaf-monkey	MAMMALIA	EN	Decreasing	Terrestrial
<i>Trachypithecus pileatus</i> ssp. <i>pileatus</i>	Blond-bellied Langur	MAMMALIA	EN	Decreasing	Terrestrial
<i>Crocodylus palustris</i>	Mugger	REPTILIA	VU	Stable	Terrestrial, Freshwater
<i>Helarctos malayanus</i>	Sun Bear	MAMMALIA	VU	Decreasing	Terrestrial
<i>Lutrogale perspicillata</i>	Smooth-coated Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater
<i>Macaca arctoides</i>	Stump-tailed Macaque	MAMMALIA	VU	Decreasing	Terrestrial
<i>Neofelis nebulosa</i>	Clouded Leopard	MAMMALIA	VU	Decreasing	Terrestrial



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Panthera pardus</i>	Leopard	MAMMALIA	VU	Decreasing	Terrestrial
<i>Prionailurus viverrinus</i>	Fishing Cat	MAMMALIA	VU	Decreasing	Terrestrial, Freshwater
<i>Trachypithecus pileatus</i>	Capped Langur	MAMMALIA	VU	Decreasing	Terrestrial
<i>Ursus thibetanus</i>	Asiatic Black Bear	MAMMALIA	VU	Decreasing	Terrestrial
<i>Dipterocarpus costatus</i>		MAGNOLIOPSIDA	VU	Decreasing	Terrestrial
<i>Dipterocarpus turbinatus</i>		MAGNOLIOPSIDA	VU	Decreasing	Terrestrial
<i>Macaca leonina</i>	Northern Pig-tailed Macaque	MAMMALIA	VU	Decreasing	Terrestrial
<i>Arctictis binturong</i>	Binturong	MAMMALIA	VU	Decreasing	Terrestrial
<i>Rusa unicolor</i>	Sambar	MAMMALIA	VU	Decreasing	Terrestrial
<i>Aonyx cinereus</i>	Asian Small-clawed Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater
<i>Pangshura tecta</i>	Indian Roofed Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
<i>Wallago attu</i>		ACTINOPTERYGII	VU	Decreasing	Freshwater
<i>Elaphe taeniura</i>	Cave Racer	REPTILIA	VU	Decreasing	Terrestrial
<i>Python bivittatus</i>	Burmese Python	REPTILIA	VU	Decreasing	Terrestrial



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Ortygornis gularis</i>	Swamp Francolin	AVES	VU	Decreasing	Terrestrial, Freshwater
<i>Aythya ferina</i>	Common Pochard	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
<i>Buceros bicornis</i>	Great Hornbill	AVES	VU	Decreasing	Terrestrial
<i>Gallinago nemoricola</i>	Wood Snipe	AVES	VU	Decreasing	Terrestrial, Freshwater
<i>Sterna aurantia</i>	River Tern	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
<i>Clanga clanga</i>	Greater Spotted Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
<i>Leptoptilos javanicus</i>	Lesser Adjutant	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
<i>Clanga hastata</i>	Indian Spotted Eagle	AVES	VU	Decreasing	Terrestrial
<i>Arctonyx collaris</i>	Greater Hog Badger	MAMMALIA	VU	Decreasing	Terrestrial
<i>Oryza malampuzhaensis</i>		LILIOPSIDA	VU	Decreasing	Terrestrial
<i>Lissemys punctata</i>	Indian Flapshell Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
<i>Xenochrophis cerasogaster</i>	Painted Keelback	REPTILIA	VU	Decreasing	Freshwater



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Schizothorax plagiostomus	Snow Trout	ACTINOPTERYGII	VU	Decreasing	Freshwater
Beilschmiedia assamica		MAGNOLIOPSIDA	VU	Unknown	Terrestrial
Capricornis sumatraensis	Mainland Serow	MAMMALIA	VU	Decreasing	Terrestrial
Hoolock hoolock ssp. hoolock	Western Hoolock Gibbon	MAMMALIA	VU	Decreasing	Terrestrial
Dalbergia thomsonii		MAGNOLIOPSIDA	VU	Unknown	Terrestrial
Bagarius bagarius		ACTINOPTERYGII	VU	Decreasing	Freshwater



Recommended citation

IBAT Proximity Report. Generated under licence 30102-38628 from the Integrated Biodiversity Assessment Tool on 13 January 2023 (GMT). www.ibat-alliance.org

How to use this report

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RANIRBAZAR

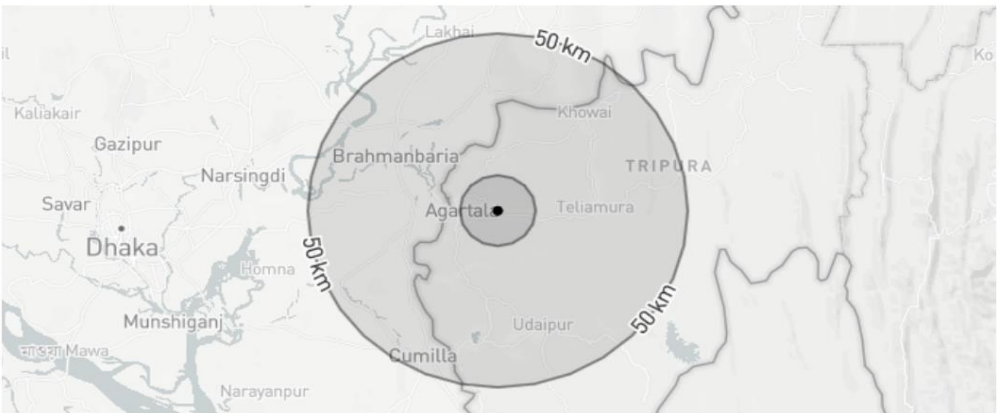


Integrated Biodiversity Assessment Tool PROXIMITY REPORT RANIRBAZAR SUBPROJECT

Country: India
Location: [23.8, 91.4]
Date of analysis: 13 January 2023 (GMT)
Buffers applied: 1 km | 10 km | 50 km
IUCN Red List Biomes: Marine, Freshwater, Terrestrial
Generated by: Govind Rathore
Organisation: ADB

Overlaps with:

Protected Areas	3
Key Biodiversity Areas	5
IUCN Red List	72



Displaying project location and buffers: 1 km, 10 km, 50 km



About this report

This report presents the results of [30102-38629] proximity analysis to identify the biodiversity features and species which are located within the following buffers: 1 km, 10 km, 50 km.

This report is one part of a package generated by IBAT on 13 January 2023 (GMT) that includes full list of all species, protected areas, Key Biodiversity Areas in CSV format, maps showing the area of interest in relation to these features, and a 'How to read IBAT reports' document.

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Data used to generate this report

- UNEP-WCMC and IUCN, 2023. Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net - January 2023.
- BirdLife International (on behalf of the KBA Partnership), 2022. Key Biodiversity Areas - November 2022.
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Protected Areas

The following protected areas are found within 1 km, 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Rema Kalenga	50 km
Rudrasagar Lake	50 km
Satchari	50 km

Key Biodiversity Areas

The following key biodiversity areas are found within 1 km, 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Gumti Wildlife Sanctuary	50 km
Rema-Kalenga Wildlife Sanctuary	50 km
Rudrasagar Lake	50 km
Sepahijala	50 km
Trishna Wildlife Sanctuary	50 km

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.





Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Nilssononia nigricans</i>	Black Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Freshwater
<i>Indotestudo elongata</i>	Elongated Tortoise	REPTILIA	CR	Decreasing	Terrestrial
<i>Manis pentadactyla</i>	Chinese Pangolin	MAMMALIA	CR	Decreasing	Terrestrial
<i>Aquilaria malaccensis</i>	Agarwood	MAGNOLIOPSIDA	CR	Decreasing	Terrestrial
<i>Aythya baeri</i>	Baer's Pochard	AVES	CR	Decreasing	Freshwater
<i>Houbaropsis bengalensis</i>	Bengal Florican	AVES	CR	Decreasing	Terrestrial
<i>Gyps bengalensis</i>	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
<i>Ardea insignis</i>	White-bellied Heron	AVES	CR	Decreasing	Terrestrial, Freshwater
<i>Emberiza aureola</i>	Yellow-breasted Bunting	AVES	CR	Decreasing	Terrestrial, Freshwater
<i>Pelochelys cantorii</i>	Asian Giant Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Marine, Freshwater
<i>Cuon alpinus</i>	Dhole	MAMMALIA	EN	Decreasing	Terrestrial
<i>Elephas maximus</i>	Asian Elephant	MAMMALIA	EN	Decreasing	Terrestrial



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Geoclemys hamiltonii</i>	Spotted Pond Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Hardella thurjii</i>	Crowned River Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Morenia petersi</i>	Indian Eyed Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Panthera tigris</i>	Tiger	MAMMALIA	EN	Decreasing	Terrestrial
<i>Varanus flavescens</i>	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial
<i>Nilssononia gangetica</i>	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Nilssononia hurum</i>	Indian Peacock Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Nycticebus bengalensis</i>	Bengal Slow Loris	MAMMALIA	EN	Decreasing	Terrestrial
<i>Hoolock hoolock</i>	Western Hoolock Gibbon	MAMMALIA	EN	Decreasing	Terrestrial
<i>Platanista gangetica</i>	Ganges River Dolphin	MAMMALIA	EN	Decreasing	Freshwater
<i>Trachypithecus phayrei</i> ssp. <i>phayrei</i>		MAMMALIA	EN	Decreasing	Terrestrial
<i>Urogymnus polylepis</i>	Giant Freshwater Whipray	CHONDRICHTHYES	EN	Decreasing	Marine, Freshwater



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Perdicula manipurensis</i>	Manipur Bush-quail	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Asarcornis scutulata</i>	White-winged Duck	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Sterna acuticauda</i>	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Haliaeetus leucoryphus</i>	Pallas's Fish-eagle	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Aquila nipalensis</i>	Steppe Eagle	AVES	EN	Decreasing	Terrestrial
<i>Leptoptilos dubius</i>	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Laticilla cinerascens</i>	Swamp Grass-babbler	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Tor putitora</i>		ACTINOPTERYGII	EN	Decreasing	Freshwater
<i>Trachypithecus phayrei</i>	Phayre's Leaf-monkey	MAMMALIA	EN	Decreasing	Terrestrial
<i>Trachypithecus pileatus</i> ssp. <i>pileatus</i>	Blond-bellied Langur	MAMMALIA	EN	Decreasing	Terrestrial
<i>Crocodylus palustris</i>	Mugger	REPTILIA	VU	Stable	Terrestrial, Freshwater
<i>Helarctos malayanus</i>	Sun Bear	MAMMALIA	VU	Decreasing	Terrestrial
<i>Lutrogale perspicillata</i>	Smooth-coated Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Macaca arctoides	Stump-tailed Macaque	MAMMALIA	VU	Decreasing	Terrestrial
Neofelis nebulosa	Clouded Leopard	MAMMALIA	VU	Decreasing	Terrestrial
Panthera pardus	Leopard	MAMMALIA	VU	Decreasing	Terrestrial
Prionailurus viverrinus	Fishing Cat	MAMMALIA	VU	Decreasing	Terrestrial, Freshwater
Trachypithecus pileatus	Capped Langur	MAMMALIA	VU	Decreasing	Terrestrial
Ursus thibetanus	Asiatic Black Bear	MAMMALIA	VU	Decreasing	Terrestrial
Dipterocarpus costatus		MAGNOLIOPSIDA	VU	Decreasing	Terrestrial
Dipterocarpus turbinatus		MAGNOLIOPSIDA	VU	Decreasing	Terrestrial
Macaca leonina	Northern Pig-tailed Macaque	MAMMALIA	VU	Decreasing	Terrestrial
Arctictis binturong	Binturong	MAMMALIA	VU	Decreasing	Terrestrial
Rusa unicolor	Sambar	MAMMALIA	VU	Decreasing	Terrestrial
Aonyx cinereus	Asian Small-clawed Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater
Pangshura tecta	Indian Roofed Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
Wallago attu		ACTINOPTERYGII	VU	Decreasing	Freshwater



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Ophiophagus hannah	King Cobra	REPTILIA	VU	Decreasing	Terrestrial
Elaphe taeniura	Cave Racer	REPTILIA	VU	Decreasing	Terrestrial
Python bivittatus	Burmese Python	REPTILIA	VU	Decreasing	Terrestrial
Ortygornis gularis	Swamp Francolin	AVES	VU	Decreasing	Terrestrial, Freshwater
Aythya ferina	Common Pochard	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Buceros bicornis	Great Hornbill	AVES	VU	Decreasing	Terrestrial
Gallinago nemoricola	Wood Snipe	AVES	VU	Decreasing	Terrestrial, Freshwater
Sterna aurantia	River Tern	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Clanga clanga	Greater Spotted Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
Leptoptilos javanicus	Lesser Adjutant	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Clanga hastata	Indian Spotted Eagle	AVES	VU	Decreasing	Terrestrial
Arctonyx collaris	Greater Hog Badger	MAMMALIA	VU	Decreasing	Terrestrial



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Oryza malampuzhaensis</i>		LILIOPSIDA	VU	Decreasing	Terrestrial
<i>Lissemys punctata</i>	Indian Flapshell Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
<i>Xenochrophis cerasogaster</i>	Painted Keelback	REPTILIA	VU	Decreasing	Freshwater
<i>Schizothorax plagiosomus</i>	Snow Trout	ACTINOPTERYGII	VU	Decreasing	Freshwater
<i>Beilschmiedia assamica</i>		MAGNOLIOPSIDA	VU	Unknown	Terrestrial
<i>Capricornis sumatraensis</i>	Mainland Serow	MAMMALIA	VU	Decreasing	Terrestrial
<i>Hoolock hoolock</i> ssp. <i>hoolock</i>	Western Hoolock Gibbon	MAMMALIA	VU	Decreasing	Terrestrial
<i>Dalbergia thomsonii</i>		MAGNOLIOPSIDA	VU	Unknown	Terrestrial
<i>Bagarius bagarius</i>		ACTINOPTERYGII	VU	Decreasing	Freshwater



Recommended citation

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How to use this report

This report provides an indication of the potential biodiversity-related features - protected areas, key biodiversity areas and species - close to the specified location. It provides an early indication of potential biodiversity concerns, and can provide valuable guidance in making decisions. For example, this information can be helpful when assessing the potential environmental risk and impact of a site, categorising investments/projects, preparing the terms of reference for an impact assessment, focusing attention on key species of conservation concern and sites of known conservation value, and reviewing the results of an impact assessment.

The report does not provide details of potential indirect, downstream or cumulative impacts. Furthermore, the report should be regarded as a "first-step", providing a set of conservation values sourced from global data sets, and is not a substitute for further investigation and due diligence, especially concerning national and/or local conservation priorities.



Appendix 13: Guidelines for Safety During Monsoon/ Heavy Rainfall

Excavation and refilling of earth are common activities, which, if not carefully executed may pose problems to the safety of works as well as passers-by and road users during the impending Monsoon.

Normal and heavy rainfall event affect our ongoing works, It should be our conscientious effort to ensure that such events do not prove to be problematic to people and structures in town. During monsoon Cluster-PIU should ensure that any further excavation work is taken up only after ensuring that the earlier work is in safe stage. It is desired that PIU should inspect all sites during rains and take proactive actions.

Some of the precautions and mitigation measures to be taken are discussed below-

1. The execution of works having deep excavation in smaller lanes and congested areas should be completed well before monsoon. The works of deep excavation during monsoon should not be preferably taken up or extensive care should be taken for execution of such works.
2. The settlement in refilled trenches of sewerage and water supply lines may occur during monsoon. Cluster PIU team should inspect all sites after a storm to identify such reaches and take immediate corrective action by proper refilling and compacting. It is responsibility of all engineers to look after this activity during monsoon and ensure corrective actions from Contractor's side.
3. The contractor's crew should be equipped with vehicle, gum boots, raincoats, torch etc. to tackle such situation during and after rains. Adequate quantities of earth, debris and gravel should be stacked at strategic places so that no time is lost in procuring such material.
4. In trenches where pipe laying has been done and duly tested and approved, refilling should be done and all surplus material relocated to safe disposal sites such that it does not obstruct traffic or waterways.
5. All open ends of WS pipelines should be firmly plugged to prevent debris from entering the pipeline. Manhole covers of sewer lines should be fixed in place to avoid any harm to road users.
6. Drains are primary or secondary carriers of storm water. Any unutilized construction material should be relocated to allow free passage of storm water. Surplus earth should be suitably and immediately be relocated to avoid earth from falling into the drain so that choking does not occur.
7. Overhead works should not be carried on in-weather conditions that threaten the safety of workers. More frequent checks on scaffold and bracings should be done during monsoon season.
8. Additional precautions should be taken of the power lines, ignorance and carelessness can cause major accidents and casualty.
9. Take preventive measures for water logging in working areas by providing dewatering pumps. Place bright and reflective warning signs.
10. Inspection should also be carried out before resumption of work after a shower/rain.
11. Storage of Construction Material: Steel & Cement are vital ingredients for quality construction work but in absence of proper storage, especially during monsoon, cement and steel may rapidly decline in quality and strength. Care should be taken to protect these materials and use of any exposed material should be allowed only after conducting fresh tests. Improper storage of such material should be reported to PIU and use of any apparently affected material should be done after permission of PIU.

Additional Precautions

1. Adequate set up and resources such as dewatering pumps, electrical routings etc should be planned ahead. Water logging on main roads to be avoided, where construction works are going on.
2. Ensuring the monsoon specific PPE's issued in adequate and are used during monsoon.
3. Use of electric extension box should be avoided; extension cables (if used) should not be wet and damaged. Cables connections should be only weatherproof/waterproof. Electrical and HSE personnel of contractor should visit permanent and running sites regularly. Transparent protective sheets/rain sheds should be placed for the power distribution boards.
4. Welding machines, bar cutting machines etc. should be kept in dry conditions; should not stand in water logged area. Brakers and Drill machines should not be used when raining; dirt/mud should be scrubbed with cloth.
5. Special Trainings to all drivers and operators on safe practices and all vehicles/equipment's maintenance checks to be more frequent.
6. High boom equipment to be stopped during blowing of high speed wind and rain storm. Arresting of parked vehicles, equipment during monsoon should be done.
7. All chemicals should be stored as per MSDS, chemicals to be protected from water ingress. Chemical waste should be disposed for preventing overflow of chemicals.
8. At labor camps following precautions should be taken:-
 - Maintaining hygiene & proper housekeeping.
 - Additional health checkup camp to identify seasonal diseases
 - Preventive measures on mosquito/parasite breeding mainly in work locations and camps
 - Frequent cleaning of toilets
 - To avoid water borne diseases, high level of cleanliness to be maintained, drinking water containers need to be cleaned and kept covered. Walk areas and pathways to be covered with Murom and soft rock particles (to avoid soft soil conditions).
 - Obstacle free approach to rest sheds, camp and toilets.
 - Proper illumination, provision of battery operated emergency lights
 - No bonfires inside resting sheds. No use of wood.

Note-

PIU should oversee the arrangements to effectively deal with the eventuality.

EHS officer of contractor should visit each site and camps more frequently. Contractor/EHS officer will also impart training on safe working methods during Monsoon and will keep a daily watch on weather conditions to share with site team to act accordingly.

Contractor should organize Monsoon Health Camps and Monitor Workmen Habitat and Hygiene.

Appendix 14: Sample Environmental Site Inspection Report

Project Name Contract Number

NAME: _____ DATE: _____ TITLE: _____ DMA: _____ LOCATION: _____ GROUP: _____

WEATHER:	Project Activity Stage	Survey	
		Design	
		Implementation	
		Pre-Commissioning	
		Guarantee Period	

	Compliance
Compliance marked as Yes / No / Not applicable (NA) / Partially Implemented (PI)	
EHS supervisor appointed by contractor and available on site	
Construction site management plan (spoils, safety, schedule, equipment etc.,) prepared	
Traffic management plan prepared	
Dust is under control	
Excavated soil properly placed within minimum space	
Construction area is confined; no traffic/pedestrian entry observed	
Surplus soil/debris/waste is disposed without delay	
Construction material (sand/gravel/aggregate) brought to site as & when required only	
Tarpaulins used to cover sand & other loose material when transported by vehicles	
After unloading , wheels & undercarriage of vehicles cleaned prior to leaving the site	
No chance finds encountered during excavation	
Work is planned in consultation with traffic police	
Work is not being conducted during heavy traffic	
Work at a stretch is completed within a day (excavation, pipe laying & backfilling)	
Pipe trenches are not kept open unduly	
Road is not completely closed; work is conducted on edge; at least one line is kept open	
Road is closed; alternative route provided & public informed, information board provided	
Pedestrian access to houses is not blocked due to pipe laying	
Spaces left in between trenches for access	
Wooden planks/metal sheets provided across trench for pedestrian	
No public/unauthorized entry observed in work site	
Children safety measures(barricades, security)in place at works in residential areas	
Prior public information provided about the work, schedule and disturbances	
Caution/warning board provided on site	

	Compliance
Guards with red flag provided during work at busy roads	
Workers using appropriate PPE (boots, gloves, helmets, ear muffs etc)	
Workers conducting or near heavy noise work is provided with ear muffs	
Contractor is following standard & safe construction practices	
Deep excavation is conducted with land slip/protection measures	
First aid facilities are available on site and workers informed	
Drinking water provided at the site	
Toilet facility provided at the site	
Separate toilet facility is provided for women workers	
Workers camps are maintained cleanly	
Adequate toilet & bath facilities provided	
Contractor employed local workers as far as possible	
Workers camp set up with the permission of PIU	
Adequate housing provided	
Sufficient water provided for drinking/washing/bath	
No noisy work is conducted in the nights	
Local people informed of noisy work	
No blasting activity conducted	
Pneumatic drills or other equipment creating vibration is not used near old/risky buildings	

Signature

Name

Position

Name

Position