

## **Initial Environmental Examination**

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**PUBLIC**

IND: Nagaland Urban Infrastructure Development Project – Road and Storm Water Drain Project for Dimapur and Chumoukedima Town

Prepared by the Nagaland Urban Infrastructure Development Project (NUIDP)  
for the Asian Development Bank.

## **CURRENCY EQUIVALENTS**

(as of 22 Jan 2026)

|               |   |                  |
|---------------|---|------------------|
| Currency Unit | – | Indian rupee (₹) |
| INR 1.00      | – | \$0.011          |
| \$1.00        | = | INR 91.5         |

### **NOTE**

(i) The fiscal year (FY) of the Government of India and Government of Nagaland ends on 31 March. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2025 ends on 31 March 2025.

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

## ABBREVIATIONS

|        |   |
|--------|---|
| ADB    | – Asian Development Bank                                |
| CPCB   | – Central Pollution Control Board                       |
| CTE    | – Consent to establish                                  |
| CTO    | – Consent to operate                                    |
| DBE    | – Design Basis Earthquake                               |
| DBO    | – Design, build and operate                             |
| DHQ    | – District headquarters                                 |
| DTW    | – Deep Tube Well  |
| DWS    | – Drinking water & sanitation                           |
| 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               |
| GLSR   | – Ground level storage reservoir                        |
| GoN    | – Government of Nagaland                                |
| GRC    | – Grievance redress committee                           |
| GRM    | – Grievance redress mechanism                           |
| IEE    | – initial environmental examination                     |
| IRP    | – iron removal plant                                    |
| MoEFCC | – Ministry of Environment, Forest and Climate Change    |
| NWQMP  | – National Water Quality Monitoring Programme           |
| NPCB   | Nagaland Pollution Control Board                        |
| NOC    | – No objection certificate                              |
| OHS    | – Occupational health and safety                        |
| PGA    | – Peak Ground Acceleration                              |
| PIU    | – project implementation unit                           |
| PMDSC  | – Project management & supervision consultant           |
| PMU    | – Project management unit                               |
| RFA    | – Recorded Forest Area                                  |
| ROW    | – Right of way  |
| SDCC   | – Sustainable Development and Climate Change Department |
| SGC    | – Safeguards and gender cell                            |
| SPS    | – Safeguard Policy Statement                            |
| TOR    | – Terms of Reference                                    |
| WHO    | – World Health Organization                             |

## WEIGHTS AND MEASURES

|                 |                          |
|-----------------|--------------------------|
| dBa             | decibel                  |
| °C              | degree Celsius           |
| km              | kilometer                |
| lpcd            | litre per capita per day |
| m               | meter                    |
| mbgl            | meter below ground level |
| mm              | millimeter               |
| MLD             | million liters per day   |
| km <sup>2</sup> | square kilometer         |

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## EXECUTIVE SUMMARY

**Background:** The Government of Nagaland (GoN) has sought financial assistance through the Department of Economic Affairs under the Asian Development Bank's Project Readiness Financing (PRF) facility for the "India: Improving Readiness of Infrastructure Development Projects in Nagaland" initiative. The PRF aims to develop investment-ready, integrated urban infrastructure projects in the district headquarter towns (DHTs) of Nagaland

Under Phase 1 of the project, eight towns have been identified for improvements in water supply, faecal sludge management, drain and roadside drain development, urban roads, landslip protection, and solid waste management. Dimapur and Chümoukedima are among the towns selected under these packages (SWD/DMP, RRD/DMP, SWD/CMD/P2/Lot 1 and Lot 2, RRDD/CMD/P2/Lot2), with Dimapur serving as the headquarters. As part of the NUIDP, road and drainage improvement works are proposed in both towns. The proposed components are as follows:

**Dimapur town** - Subproject includes the following, (i) **Road sector:** Rehabilitation and upgradation of 9 nos. of road at 9 different stretches with the flexible pavement of 12.732 km with urban amenities and side drains. (ii) **Drainage sector:** The priority drainage network in Dimapur, developed under the Nagaland Urban Infrastructure Development Project, is designed to reduce urban flooding and improve stormwater management in low-lying, flood-prone areas. Informed by stakeholder consultations, hydrological modelling, and spatial analysis, the project proposes eight strategically located drains with a total length of 24.72 km to strengthen the existing drainage system.

**Chümoukedima town** - Subproject includes the following, (i) **Road sector:** Construction of 5 nos. road at 5 different stretches with the flexible pavement, length of proposed road approx. 7.102 km, (ii) **Drainage sector:** The priority drainage network in Chümoukedima, developed under the Nagaland Urban Infrastructure Development Project, aims to reduce urban flooding and improve stormwater management, especially in low-lying, flood-prone areas. Based on extensive stakeholder consultations, the plan proposes 10 drains with a total length of 8.7 km to address key causes of waterlogging and enhance the existing drainage system.

**Screening and Categorization and assessment of potential impacts.** Road and Drain subproject of these towns 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.

**Description of the Environment.** The proposed subproject is located in Nagaland, a landlocked state in northeast India bordered by Arunachal Pradesh to the north, Assam to the west, Manipur to the south, and Myanmar to the east. Situated between 25°06'–27°04' N latitude and 93°20'–95°15' E longitude, Nagaland has Kohima as its capital and Dimapur as its largest city and commercial center. The state is predominantly hilly, culturally rich, and strategically important due to its Indo-Myanmar border location.

**Dimapur-** Dimapur, the largest city and municipality in Nagaland, lies in the southwest along the Dhansiri River and covers 927 sq. km of mostly flat, alluvial plains sloping south to north. It

borders Kohima District to the east and south and Assam to the west. A key transport hub, Dimapur is connected by NH-29, NH-36, and NH-37, and hosts Nagaland's only airport and railway station, linking it to Guwahati and Kolkata. Geologically, it lies in the seismically active Zone VI near the Naga Thrust zone, underlain by Surma Group, Tipam Group, and Quaternary sediments, making it prone to frequent earthquakes. The region also faces landslide hazards during monsoons—especially in Paglapahar—and recurrent flooding in low-lying areas due to heavy rainfall (~1,500 mm annually) and inadequate drainage.

The Rangapahar Reserve Forest, about 3 km from the proposed drainage site at Dimapur, spans 49.4 acres and supports diverse wildlife and medicinal plants. Nagaland's floristic diversity includes over 2,400 plant species, with fast-growing Alders and Cedrella species. Demographically, Dimapur district's population rose from 166,663 in 2001 to 378,811 in 2011, with 52.23% in urban areas. Dimapur town had 122,834 residents in 2011, an 86.03% literacy rate, a sex ratio of 919, and children (0–6 years) forming 12.18% of the urban population.

**Chümoukedima.** Chümoukedima, Nagaland's 15th district established on 18 December 2021, covers 6,110 sq. km and shares borders with Kohima, Peren, Tseminyu, Niuland, Dimapur, and Assam's Karbi Anglong. Located in the foothills of the Naga Hills (134–772 m elevation), it features intermontane alluvial plains sloping south to north. The district is well-connected by road, rail, and air, with Dimapur Airport 7 km away and Shokhüvi Railway Station 10 km away. Geologically, it lies in seismically active Zone VI near the Naga Thrust, with Surma Group and Tipam Group formations; 12 major earthquakes have been recorded in the past century.

The climate is subtropical, with hot, humid summers, mild winters, and heavy monsoon rainfall averaging 1,472.5 mm annually. Summer temperatures range from 16°C to 31°C, while winters can drop to 4°C in higher areas. Around 64.9% of the district is covered by subtropical forest, including the 49.4-acre Rangapahar Reserve Forest, home to diverse wildlife and medicinal plants. As per the 2011 Census, the population was 166,911 with 85% literacy, spread across 81 villages. Chümoukedima town had 25,885 residents, including 13.97% children (0–6 years).

**Potential Environmental Impacts and Mitigation measures.** The subproject is unlikely to cause significant irreversible or long term adverse impacts because: (i) the components involves simple construction and operational activities largely confined to the immediate site, so impacts are mainly localized; (ii) there are no environmentally protected or ecologically sensitive areas within or in the immediate vicinity of project sites and (iii) predicted impacts are site-specific and likely to be temporary - associated with the construction process and are produced because the process involves excavation, site clearing and earth movements.

Construction activities will be confined at different wards of the town. There will be temporary negative impacts during construction of drain and road, mainly from construction dust and noise resulting in disturbance to residents, drainage sludge disposal, hauling of construction material, equipment on local roads (traffic, dust, safety etc.), occupational health and safety aspects. The proposed drainage alignments in Dimapur predominantly pass through commercial areas characterized by congested (Super Market area, New Market, Burma Camp and Half Nagarjan, and along NH-29) and dense built-up conditions. During construction, adequate provisions shall be made to ensure public safety and maintain proper access for pedestrians, businesses, and vehicular movement. During the construction of drain along the public roads, resulting impact on businesses, traffic by the construction work, and from the need to dispose of waste soil/ excess excavated earth and drainage silt. The social impacts, particularly temporary access disruptions to businesses and residences, are expected to be moderate in some locations, and will be managed through traffic and access management measures.

In operation phase there may be requirement of repairs in road & drainage system, maintenance of drain including disposal of drainage sludge. 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.

The EMP prepared along with the IEE includes mitigation measures such as (i) barricading, dust suppression and control measures (ii) Borrow areas must be sourced from legally approved locations. Upon completion of construction activities, these areas should be rehabilitated through re-vegetation and restored, as far as possible, to their original condition (iii) traffic management measures for works along the roads and for hauling activities; (iv) provision of walkways and planks to ensure access will not be impeded; and (v) finding beneficial use of excavated materials to extent possible to reduce the quantity that will be disposed of, (vi) disposal of drainage silt/sludge at approved area and (vii) Implement all site-specific occupational health and safety (OHS) Plans at the Facilities and Work Sites” that will be developed by PIU/PMU and implementation measures such as: (a) excluding public from the site; (b) personal hygiene, disinfection and maintaining barricades; (c) ensuring all workers are provided with and use personal protective equipment including face mask; (d) OHS Training and awareness training for all site personnel. EMP will guides the environmentally-sound construction of the sub project. EMP includes a monitoring program to measure the effectiveness of EMP implementation and include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

Prior to construction, a site-specific environmental management plan (SEMP) to be prepared and approved by PIU. The SEMP would include standard and site specific mitigation measures such as (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous waste; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEMP; and (iv) budget for SEMP implementation. A copy of the EMP/approved SEMP will be kept on site during the construction period at all times. The EMP is 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.

**Implementation Arrangements.** The Urban Development Department (UDD), Government of Nagaland, serves as the Executing Agency, while the Nagaland Urban Infrastructure Development Project (NUIDP) is the Implementing Agency for the ADB-financed project. A central Project Management Unit (PMU) led by the Managing Director-cum-Project Director and supported by the Additional Managing Director-cum-Additional Project Director oversees implementation. Four Project Implementation Units (PIUs) are established in Kohima, Dimapur, Mokokchung, and Mon, each headed by a Project Manager (ADC rank) and supported by an Executive Engineer from UDD. The PMU and PIUs are further supported by a Project Management and Design, Supervision Consultant (PMDSC), which ensures project compliance with ADB’s Safeguard Policy Statement (2009) and national regulations. Environmental safeguards are managed by a dedicated Environmental Safeguard Expert (ESE) at PMU, reporting to the APD. At the PIU level, the Executive Officer acts as the safeguard focal point, supported by an Assistant Engineer and Junior Engineers. The PMDSC team includes an Environmental Safeguard Specialist and two Health and Safety Engineers. Each contractor must appoint an on-site Environment, Health, and Safety (EHS) Supervisor per work package to implement the site-specific EMPs.



**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 Discussion (FGD) has also been carried out at different locations (wards) of the project area. In Dimapur, stakeholder consultations/FGDs were held at five locations, involving 139 participants, of whom 19% were women. In Chümoukedima, consultations were conducted at four locations with 97 participants, including 15.5% women. These consultations took place between March and April 2025. Across both towns, participants expressed a clear need for the project, showed willingness to support it, and pledged full cooperation during the construction phase, recognizing that the proposed activities would improve road and drainage infrastructure and enhance living standards.

**Monitoring and Reporting.** The PMU and PMDSC 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 PMU. PMU with the assistance of PMDSC, will monitor the compliance of contractor. 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 NUIDP websites. The semi-annual submission of Environmental Monitoring Reports (EMRs) will be required during both the construction and operation phases of the project.

**Conclusions.** The proposed project in Dimapur and Chümoukedima is unlikely to result in significant adverse environmental impacts. Any potential impacts are expected to be largely limited to the construction phase and effectively manageable through the mitigation measures outlined in the EMP. Residents of both towns are expected to be the primary beneficiaries, as the subproject aims to enhance environmental quality and overall living conditions through improved road and drainage infrastructure. Key anticipated benefits include: (i) enhanced connectivity, (ii) reduced water stagnation during the monsoon season, and (iii) improved public health, particularly through the reduction of waterborne and other 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) and the GoI EIA Notification (2006). This IEE will be revised in case of any change in location, design, or scope, and will be subject to reviewed and approval by ADB, and disclosure before commencement of construction.

## I. INTRODUCTION

### A. Background

1. The Government of Nagaland (GoN) has applied for financial assistance through the Department of Economic Affairs, Ministry of Finance, Government of India under the project readiness financing (PRF) facility from the Asian Development Bank–ADB in the form of a “loan” toward the cost of “India: Improving Readiness of Infrastructure Development Projects in Nagaland” (hereinafter referred as PRF Project). The purpose of the PRF loan is to prepare investment ready integrated infrastructure projects for urban sector components in district headquarter towns (DHTs) in Nagaland. The main outcome under the PRF would be:

- (i) preparation of an urban strategy for integrated infrastructure development across 12 DHTs<sup>1</sup>, with 8 DHTs<sup>2</sup> included in Phase I;
- (ii) improved readiness of prioritized projects in the identified urban areas (amongst 8 DHTs, covering key economic/border trade centres), leading to increased external/donor investments in infrastructure projects; and
- (iii) faster and more efficient development of infrastructure projects, better management of infrastructure assets, and strengthened capacity of urban development, municipal affairs, and public health engineering agencies to deliver urban infrastructure services.

2. The expected outcomes of the project include the development of an integrated urban vision or policy, strategic planning, and subproject prioritization. It aims to enhance project readiness through feasibility studies, preparation of detailed project reports (DPRs), and other preparatory activities. Additionally, the project seeks to strengthen the institutional capacity of relevant Government of Nagaland (GoN) agencies to effectively plan, implement, manage, and ensure the sustainability of investments. Urban Development Department (UDD), Government of Nagaland, and Directorate of Urban Development (DUD), including Directorate of Municipal Affairs (DMA) and Public Health Engineering Department (PHED), and ADB will support delivery of following PRF. The key outputs are as listed below:

(i) **Output 1: Sector strategy and city investment plans prepared.** 1a. supporting improved urban infrastructure plans by preparing and/or strengthening urban strategy, city investment plans and action plans for integrated development of infrastructure in 12 DHTs; 1b. developing a prioritization matrix with multiple indicators to assess and prioritize the infrastructure components under urban sector; and; 1c phasing investments in prioritized urban areas for the ensuing subproject(s).

(ii) **Output 2: Feasibility study, detailed engineering designs, and due diligence of priority subprojects completed.** Indicative components: 2a. undertaking necessary feasibility studies and detailed engineering design tasks for the preparation of detailed project reports; 2b. conducting due diligence to cover the technical, economic, financial, environmental and social safeguard, gender equality and social inclusiveness, impact of coronavirus disease (COVID-19), and climate change and disaster risk aspects of the priority subprojects; 2c. undertaking project procurement risk/ capacity assessment, strategic procurement study (including contract management support requirement

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<sup>1</sup> (i) Kohima (also State Capital); (ii) Dimapur; (iii) Mokokchung; (iv) Wokha; (v) Tuensang; (vi) Zunheboto; (vii) Mon; (viii) Phek; (ix) Peren; (x) Kiphire; (xi) Longleng; and (xii) Chümoukedima

<sup>2</sup> i) Kohima (also State Capital); (ii) Dimapur; (iii) Chümoukedima (iv) Mokokchung; (v) Wokha; (vi) Tuensang; (vii) Zunheboto; (viii) Mon

assessed, and contract management plans prepared) to identify contract packaging with suitable contract modalities, procurement plans, and bid documents;

- (iii) **Output 3: Institutional capacity developed.** Indicative components: 3a. carrying out an institutional and organizational review to determine the project pre-implementation capacity building activities for the executing and implementing agencies of the ensuing project(s) in areas such as safeguards, procurement, gender equality and social inclusion, financial management, and contract management; 3b. establishing institutional mechanisms and processes for undertaking investment-ready infrastructure projects; 3c. reviewing institutional and financial capacities for planning, implementation and operation and maintenance practices in both the state level institutions as well as at the urban local body level; 3d. review municipal finance and financial management status at the ULB level; 3e. prepare strategy for institutional and financial strengthening, including augmenting own source revenue through tax and non-tax reforms at the ULB level, keeping in view the socio-political scenario in the state (short-term/ medium-term/ long-term); 3f. suggest governance performance requirements/ framework in terms of outlining requisite reform actions and the scope of the institutional strengthening component for the ensuing project(s) to ensure the sustainability of assets.

## **B. Proposed Subproject**

3. The proposed subproject is situated in the state of Nagaland in northeastern India, which shares its borders with the Indian states of Arunachal Pradesh, Assam, and Manipur, as well as the international boundary with Myanmar (Burma). This Initial Environmental Examination report covers the proposed road and storm water drainage components located within the Dimapur and Chümoukedima districts.

## **C. Purpose of Initial Environmental Examination Report**

4. 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 2 towns (**Error! Reference source not found.**, subproject is unlikely to cause significant adverse impacts, and classified as Category B and per ADB SPS requirements this IEE is conducted.

## **D. Scope of IEE**

5. 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. The IEE will be updated during implementation if there are any changes in project scope, design or sites. The updated version will supersede the earlier version.

## **E. Report Structure**

6. 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.

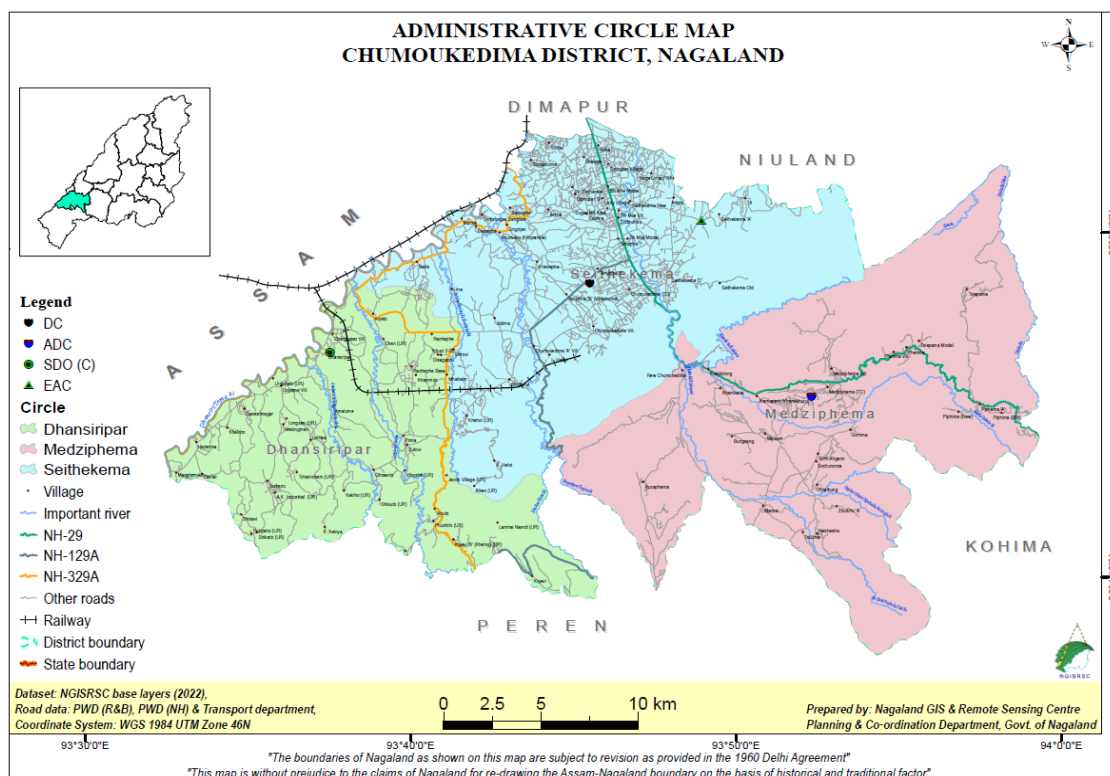
## II. DESCRIPTION OF THE PROJECT

### A. Project Location

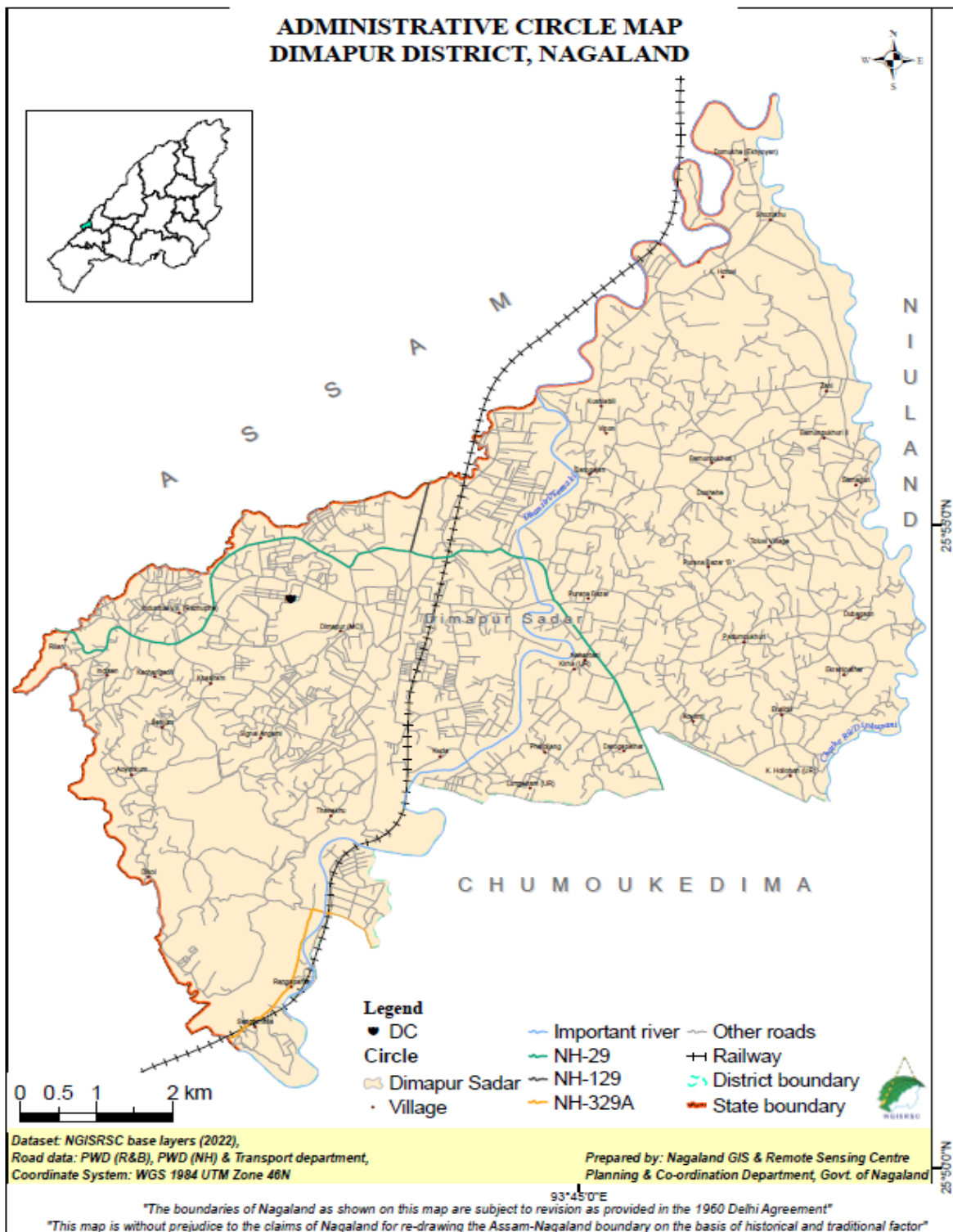
7. Project towns Dimapur and Chümoukedima are in Nagaland state is in northeast India. Dimapur is located in the western part of Nagaland, sharing its border with Assam, while Chümoukedima district and town lie adjacent to Dimapur, also in the western region of the state. Dimapur town is situated at 25°54'45" N latitude and 93°44'30" E longitude. The urban area comprises 23 wards under the Dimapur Municipal Council (DMC) and 7 wards under the East Dimapur Town Council (EDTC), making a total of 30 wards. Chümoukedima town, the administrative headquarters of Chümoukedima district in Nagaland, India, is located at approximately 25°48' N latitude and 93°48' E longitude, as per the district's official website. The town comprises 11 wards under the jurisdiction of the Chümoukedima Town Council, covering a total area of 1,35,12,341.1 square meters. **Figure 1 and Figure 2** present the location of each subproject town on administrative map of Nagaland.

8. Dimapur is the largest city and municipality in the Indian state of Nagaland. Dimapur is in the southwest of Nagaland. Dimapur district is bounded by Kohima District on the east and south by Peren District and the Karbi Anglong and on the west and the DAB (Disputed Area Belt) stretch of Golaghat District of Assam, in the north. The official municipality area of Dimapur town is approximately 18.13 km<sup>2</sup> and it's comprised of 30 wards.

9. Chümoukedima district, the 15th district of Nagaland, was established on 18 December 2021. It is bordered by Kohima district to the east, Peren district to the south, Tseminyu and Niuland districts to the northeast, Dimapur district to the north, and Karbi Anglong district of Assam to the west and northwest. The district headquarters is in the town of Chümoukedima. Chümoukedima town, which encompasses 11 wards under the Chümoukedima Town Council, spans a total area of 1,35,12,341.1 square meters, equivalent to approximately 13.51 km<sup>2</sup>.



**Figure 1: Geographical Location of Chümoukedima District**



Source - Nagaland GIS & Remote Sensing Centre Planning & Co-ordination Department, Govt. of Nagaland  
Figure 2: Geographical Location of Dimapur District

## B. Existing Urban Road and Drain Situation

### Existing Urban Road situation

#### Dimapur

10. A total of nine roads has been identified for improvement within the Dimapur Municipal Council area, covering a combined length of 12.732 km.

11. **Sham Bazar junction to NH.** The road stretch, spanning 3.491 km from Sham Bazar Junction (NH-129A) near the Nagaland Pollution Control Board to Tinali Market, varies in carriageway width from 2.66 m to 18.0 m and has a Bituminous Concrete (BC) pavement. It includes one culvert and frequently experiences congestion due to its narrow width, which cannot efficiently accommodate the increasing volume of vehicles and pedestrians. Poor road conditions, including potholes and surface deterioration, further hinder smooth traffic flow, while inadequate drainage, especially near Sham Bazar, leads to waterlogging during the monsoon season.

12. **MP Road.** This 1.233 km road stretch, starting from NH-129A near CSD Depot and ending at Nyamo Lotha Road near the railway station, has a Bituminous Concrete pavement with a carriageway width ranging from 3.0 m to 10.5 m. Serving as a key commercial corridor, it faces severe congestion due to increasing traffic volumes, population growth, and rising vehicle ownership. Contributing factors include weak enforcement, traffic rule violations, and illegal parking. Additionally, inadequate drainage causes frequent waterlogging during monsoon, leading to traffic disruptions, road damage, and health hazards.

13. **Circuit House to Nagarjan via Science Centre.** The 1.160 km road stretch, beginning at the T-junction near the road to Circuit House and ending at Nagarjan Road near Kin Enterprise Decathlon, has a Bituminous Concrete pavement with a road width ranging from 4.6 m to 12.5 m. Despite being an important route, it frequently experiences congestion due to its narrow width, which cannot accommodate the increasing volume of vehicles and pedestrians. Poor road conditions, including potholes and inadequate maintenance, contribute to traffic delays and vehicle damage. Additionally, insufficient drainage leads to waterlogging during monsoons, further disrupting traffic and posing health and infrastructure risks.

14. **NH via Unity College to Sewak Road.** The 1.119 km road stretch, starting at Dhobinalla Road near Dental Touch & Facial Aesthetics and ending at Sewak Road near Holy Trinity Catholic Church, has a Bituminous Concrete pavement with a carriageway width varying from 3.20 m to 9.20 m and earthen shoulders of 0.50–1.00 m on both sides. The road frequently experiences congestion due to its narrow width, which cannot accommodate the growing traffic, including private vehicles, auto-rickshaws, two-wheelers, and pedestrians. Poor surface conditions with potholes and inadequate maintenance worsen traffic delays and increase the risk of vehicle damage. Additionally, insufficient drainage causes waterlogging during monsoons, further disrupting traffic flow and posing health and structural hazards.

15. **Burma Camp police point junction to Super market junction.** The 1.017 km road stretch begins at the T-junction with NH-229 near Burma Camp Police Point and ends at the Y-junction with RD-13B near Hotel Saramati. The carriageway width varies between 5.3 m and 18.0 m, with earthen shoulders of 0.75 to 1.00 m on both sides. Serving as a vital commercial corridor, the road faces frequent and severe congestion due to heavy traffic and inadequate width. The absence of dedicated footpaths further exacerbates safety concerns, forcing



pedestrians to share space with vehicles, thereby increasing the risk of accidents and contributing to traffic delays.

16. **Teacher Training Institute to Bangjak Phom colony Gate.** The selected 0.782 km road stretch begins at the T-junction with DM-RD-5 near the International Institute of Teacher Training and ends at the Y-junction with NH-29 near Bangjak Phom Colony Gate. The carriageway width ranges from 4.0 m to 5.6 m, with earthen shoulders on both sides varying between 1.00 m and 1.25 m. This corridor serves as an important commercial route but suffers from significant traffic congestion due to the narrow road width, which cannot handle the increasing traffic volume. Additionally, the absence of dedicated footpaths forces pedestrians to walk alongside vehicles, heightening safety risks and further aggravating traffic flow issues.

17. **United Bethel Church to Railway Junction.** The 0.721 km selected road begins at the T-junction with Walford Road near United Bethel Church and ends at the Y-junction near Dimapur Railway Station below the flyover. The carriageway width ranges from 5.9 m to 9.6 m, with earthen shoulders on both sides varying between 0.75 m and 1.25 m. This strategically located corridor frequently experiences high traffic congestion. The absence of dedicated pedestrian pathways forces people to share the road with vehicles, increasing the risk of accidents. Additionally, the presence of potholes and uneven surfaces causes discomfort for commuters and potential damage to vehicles.

18. **Half Nagarjan Junction to Purana Bazar Junction.** The 1.379 km road stretch, running parallel to Supermarket Lane Road, starts at the T-junction with Half Nagarjan Road near Xykai Tech and ends at Purana Bazar Junction. It has a carriageway width varying from 9.3 m to 11.0 m with earthen shoulders (1.0–2.0 m) on both sides and an uncovered brick drain on the LHS, 0.58–0.75 m wide along some sections. Despite its strategic location, the road faces heavy traffic congestion due to inadequate width and absence of pedestrian pathways, forcing pedestrians to share space with vehicles and increasing accident risk. Additionally, pavement defects such as potholes and uneven surfaces cause discomfort and potential vehicle damage, further affecting traffic flow.

19. **Nyamo Lotha Road to Eros Line.** The selected 1.830 km road, beginning at the Y-junction with NH-229 near Bharat Petrol Pump – NES Dimapur City and ending at the T-junction with NH-229 near Circular Road Police, has a carriageway width ranging from 6.6 m to 34.0 m. It features bituminous concrete pavement and earthen shoulders on both sides, varying from 1.0 m to 2.0 m. Due to its strategic location and rising vehicular traffic, the corridor experiences severe congestion. The absence of dedicated pedestrian pathways further compounds safety risks, as pedestrians are compelled to walk alongside moving traffic, increasing the likelihood of accidents.

### **Chümoukedima**

20. A total of five roads, with a combined length of 7.102 km, have been identified for improvement within the Chümoukedima Town Council area. All selected roads are located in plain terrain. A summary of the existing features of these roads is presented in the following sections.

21. **MDR via Norman Putsure to Chamber of Commerce Office.** This 2.811 km road section, starting near Little Flower School and ending near the Chamber of Commerce Office, features a carriageway width ranging from 2.0 to 6.2 meters. The road surface is kutcha and in poor condition, with earthen shoulders on one side or entirely missing. Vegetation encroachment

has further affected the shoulder areas. The lack of dedicated pedestrian pathways compels people to walk alongside vehicular traffic, increasing accident risks. Additionally, inadequate drainage in some stretches leads to water accumulation, causing temporary flooding in low-lying areas and accelerating pavement deterioration, particularly during the rainy season.

22. **Konyak Baptist Church to Shekinah School.** This 0.867 km road section, starting from the intersection near Konyak Baptist Church and ending near Shekinah School, has an available land width ranging from 3.3 to 10.7 meters, with a narrow carriageway width between 1.8 and 3.3 meters. The road is of kutcha type and in very poor condition, with uneven surfaces causing discomfort and potential vehicle damage. Shoulders are either earthen on one side or entirely absent, and vegetation encroachment further reduces usable space. The lack of proper footpaths forces pedestrians to walk on the road or overgrown shoulders, increasing safety risks. Additionally, the absence of an effective drainage system results in frequent waterlogging and artificial flooding in low-lying areas, especially during the rainy season.

23. **Approach Road Weekly Market.** This 0.811 km road segment, running from the Weekly Market intersection with NH-29 to near the Federal Bank intersection with NH-29 in Ward-03, has an available road width (RoW) of 4.6 to 12.2 meters. The road surface is primarily kutcha with some bituminous concrete sections and is in poor condition, causing uneven surfaces and potential vehicle damage. Drainage infrastructure is inconsistent, with pucca covered drains in limited sections that require maintenance and upgrades, while most parts lack any drainage system, leading to water accumulation and flooding during rains. The road's strategic location results in heavy traffic congestion, further worsened by inadequate drainage and deteriorated pavement conditions.

24. **Approach Road to Chutsolie Colony.** This 1.413 km road section, extending from Indian Oil to Chutsolie Colony, has an available RoW ranging from 4.7 m to 15.9 m. The road surface is kutcha and in poor condition, with uneven stretches that cause discomfort and potential damage to vehicles. The existing brick drain is damaged and uncovered in several sections, making the overall drainage system ineffective. There are no proper footpaths, compelling pedestrians to walk on the road or over vegetation-covered shoulders. Additionally, the current carriageway alignment is suboptimal and requires realignment to improve traffic flow and ensure safer movement.

25. **Approach Road at Kikrurazha Colony.** This 1.200 km road section, from the approach road at Kikrurazha Colony to near Life Square Ministries in Ward-10, has an available RoW of 3.4 m to 12.5 m. The road is incomplete, with only a partially constructed sub-base and exposed base grade, leaving the surface kutcha and uneven, causing discomfort and potential vehicle damage. Earthen shoulders are either minimal or absent, providing inadequate lateral support and compromising pavement stability and safety. Additionally, the absence of proper footpaths forces pedestrians to walk on the road or overgrown shoulders, further increasing risks.

## Overview of the Existing Drainage System

### Dimapur

26. Dimapur's urban development is significantly hindered by the absence of an adequate stormwater drainage system. The existing network comprises mainly natural, uncovered earthen drains prone to erosion, debris blockages, and limited capacity. Encroachments and unauthorized constructions along drainage paths disrupt water flow, leading to frequent flooding, particularly in low-lying areas such as Dhobi Nalla, Nyamo Lotha Road, and near the Dhansiri

River. Solid waste accumulation, especially plastic, further clogs drain and exacerbates waterlogging. The drainage system also lacks proper connectivity, leaving many areas unserved. To address these issues, there is an urgent need for a comprehensive drainage infrastructure with enhanced capacity, regular maintenance, connectivity improvements, and strict control over encroachments and waste disposal, ensuring sustainable and flood-resilient urban development in Dimapur.

27. Dimapur's drainage system comprises key natural and man-made channels, including Dhobi Nala, Hospital Drain, and Thaheku Village Drain, which manage stormwater from various city sectors. However, these drains face issues such as encroachments, blockages, and limited capacity. Roadside and secondary drains, essential for surface runoff, are prone to clogging and sediment buildup, reducing their effectiveness. High-density wards like 06, 08, 13, 14, and 18 have more extensive drainage networks, while low-lying areas in wards 15, 16, and 23 are particularly vulnerable to waterlogging due to poor connectivity. Drainage paths along the Dhansiri River also play a vital role in managing stormwater discharge.

28. A 25.43 MLD Waste Stabilization-based Sewage Treatment Plant (STP), the first in Dimapur, was sanctioned under Nagaland Pollution Control Board (NPCB) and National Green Tribunal (NGT) directives. However, as of September 2024, only 12.6 MLD of its capacity is being utilized.<sup>3</sup> Site inspections revealed that untreated sewage continues to flow through drains due to a lack of household sewer connections. To optimize STP capacity, it is proposed to implement interception and diversion measures to channel an additional 12.6 MLD of sewage into the plant, enabling full utilization.

### **Chümoukedima**

29. The study identified existing stormwater drains (SWDs) in Chümoukedima as kaccha, brick-made, covered RCC, and uncovered types. These drains, mainly located in wards 02 to 11, follow natural topography and discharge into the Khova and Dhansiri Rivers. While denser urban areas like wards 05, 06, and 07 show visible runoff paths, the overall drainage network lacks full municipal coverage, especially in low-lying and high-vulnerable areas. This fragmentation raises the risk of flooding and water stagnation. To address these issues, infrastructure upgrades, improved maintenance, and systematic network expansion are essential.

30. Chümoukedima currently lacks stormwater pumping infrastructure. After consultations with the Urban Department, Municipal Council, PWD, and other stakeholders, it was concluded that installing pumping stations is unfeasible due to space constraints, land scarcity, and social safeguard concerns. Instead, the focus will be on managing waterlogging through gravity-based drainage, and natural watercourses.

31. Chümoukedima currently lacks an operational Sewage Treatment Plant (STP), leading to inadequate sewage management. To address this, a 210 KLD Faecal Sludge Treatment Plant (FSTP) is proposed under AMRUT 2.0 to serve 13 Urban Local Bodies, including Chümoukedima. The DPR for the FSTP has been submitted by PHED to the Director of National River Conservation for approval and implementation.

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<sup>3</sup> As per the Nagaland Pollution Control Board (NPCB) and the National Green Tribunal (NGT) order (OA No. 673/2018), a 25.43 MLD Waste Stabilization-based Sewage Treatment Plant (STP) was sanctioned for Dimapur, marking the city's first STP. However, according to the letter dated 17/09/2024 (Annexure -), it has been noted that only 12.6 MLD of the total capacity is currently in use

## C. Proposed Project

### **Road infrastructure** **Dimapur**

32. The proposed urban road development in Dimapur aims to enhance mobility, safety, and accessibility through uniform carriageways, upgraded roadside drains, organized parking, improved pedestrian facilities, and better bus stops. Plans include geometric corrections for safety, landscaping and streetscaping for aesthetics, upgraded street lighting, designated vending zones, and installation of traffic signs and road markings. Additional features such as street furniture, accessible ramps, and improved staircases in hilly areas will ensure inclusivity. Overall, the proposal seeks to improve traffic flow, safety, and the town's livability. The details of these selected roads are presented in the table below.

**Table 1: Proposed roads in Dimapur Town**

| SI No. | Name of Road  | Length (Km) | Existing RoW(m) | Proposed Carriageway Width(m) | Proposed Drain / Footpath                |
|--------|---|-------------|-----------------|-------------------------------|--|
| 1      | Sham Bazar junction to NH                                 | 3.491       | 4.1-14.0        | 3.0-7.0                       | LHS/RHS Drain Cum Footpath               |
| 2      | MP Road   | 1.233       | 4.2-14.6        | 3.5-5.5                       | LHS/RHS Drain Cum Footpath               |
| 3      | Circuit House to Nagarjan via Science Centre              | 1.160       | 4.6-12.0        | 3.75-5.5                      | LHS/RHS Drain Cum Footpath               |
| 4      | NH via Unity College to Sewak Road                        | 1.119       | 4.6-12.0        | 4.5                           | RHS Cover Drain                          |
| 5      | Burma Camp police point junction to Super market junction | 1.017       | 10.1-21.4       | 5.0                           | RHS Drain Cum Footpath                   |
| 6      | Teacher Training Institute to Bangjak Phom colony gate    | 0.782       | 5.6-11.2        | 3.5                           | LHS/RHS open drain                       |
| 7      | United Bethel Church to Railway Junction                  | 0.721       | 8.7-19.6        | 7.0                           | RHS Drain Cum Footpath                   |
| 8      | Half Nagarjan Junction to Purana Bazar Junction           | 1.379       | 9.1-46.1        | 7.5-8.0                       | LHS Footpath Cum Drain + RHS Cover Drain |
| 9      | Nyamo Lotha Road to Eros Line                             | 1.830       | 10.8-48.1       | 7-11                          | BHS Exist. Drain Cum Footpath Retain     |
| Total  |   | 12.732      |                 |                               |  |

Source- DPR of Dimapur Urban Roads

33. The proposed carriageway widths for selected roads in Dimapur have been planned to maximize efficient traffic flow while minimizing land acquisition costs. Where land is available, roads will be widened to meet traffic demand and improve pedestrian safety; in densely built-up areas, widths will be optimized to fit existing space. Pedestrian facilities and drainage systems are included even in constrained areas. Based on engineering studies, ground conditions, and standards, proposed carriageway widths are 3.0m, 3.5m, 4.5m, 5.0m, 5.5m, 7.0m, 7.5m, 11.0m,

and 12.0m.

34. The project involves upgrading 12.732 km of existing roads, currently in poor condition and varying in width from 3.0 to 12.0 meters, in accordance with relevant IRC guidelines (IRC:37–2018, IRC:SP:20–2002, IRC:SP:42–2014, and IRC:SP:122–2017). The improvement works will include the provision of bituminous pavement with proper camber, strengthened base and sub-base layers, and sealed surfaces. Climate-resilient design features—such as adequate roadside drainage and improved cross-sections—will be incorporated to effectively manage intense rainfall events and minimize potential resettlement impacts.

35. Roadside drainage has been designed to accommodate peak hydraulic flow in accordance with IRC:SP:42–2014, ensuring effective runoff management and prevention of erosion. The design includes enlarged drain sections, gratings for safe and efficient water conveyance, and covered drains in major stretches to minimize blockages caused by solid waste. The road-wise proposed drainage details are provided in Table 1.

36. Embankment and drainage protection will include turfing, vegetation, and gabion mattresses, along with robust retaining walls made with OPC 43 grade cement, weepholes for pore water drainage, and channels to divert excess water.

### **Chümoukedima**

37. In Chümoukedima Town, 7.102 km stretch across five identified road segments will be developed to address safety and infrastructure issues, including high vehicle speeds, lack of pedestrian facilities, inadequate signage and lighting, poor drainage causing waterlogging, and congestion from encroachments and unregulated access points. The list of the proposed roads of 7.102 km at 5 different stretches / location is given in **Table 2**.

**Table 2: Proposed roads in Chümoukedima Town**

| SI No. | Name of Road   | Length(Km) | Existing RoW(m) | Proposed Carriageway Width(m) | Proposed Drain / Footpath     |
|--------|--|------------|-----------------|-------------------------------|-------------------------------|
| 1      | MDR via Norman Putsure to Chamber of Commerce Office | 2.811      | 3.4-18.0        | 3.0-7.0                       | RHS/LHS and BHS Open drain    |
| 2      | Konyak Baptist Church to Shekinah School             | 0.867      | 3.3-5.8         | 3.0-3.5                       | RHS Open drain                |
| 3      | Approach Road Weekly Market                          | 0.811      | 4.6-12.2        | 3.0-5.0                       | BHS Cover Drain with footpath |
| 4      | Approach Road to Chutsolie Colony                    | 1.413      | 4.7-15.9        | 5.0                           | LHS Open Drain                |
| 5      | Approach Road at Kikrurazha Colony                   | 1.200      | 3.4-12.5        | 4.0                           | RHS open Drain                |
|        | Total  | 7.102      |                 |                               |                               |

Source- DPR of Chümoukedima Urban Roads

38. Carriageway widths in Chümoukedima town have been planned based on land availability to ensure efficient traffic flow without land acquisition, with widths set at 3.0 m, 4.0 m, 4.5 m, and 5.5 m. Where land permits, widening will be undertaken, while in constrained areas, space will be optimized. Pedestrian facilities and drainage are included in all designs to improve safety and accessibility.

39. The organized road design concept focuses on creating sustainable, inclusive, and technologically advanced road infrastructure that enhances mobility efficiency, environmental performance, safety, and user comfort, while minimizing life-cycle costs and energy use. It emphasizes upgrading both new and existing networks with features for all users, including the elderly, women, children, differently abled, and transgender individuals (EWCDT). Key strategies include advanced traffic management to reduce congestion and optimize flow, safety improvements such as footpaths, smart lighting, parking zones, and better junction geometry, and adaptable designs that support smart mobility. Technology-driven innovations, sustainable materials, and landscape integration aim to reduce energy consumption and emissions. The roads are intended for diverse users, including pedestrians, transit passengers, and students, accommodating both short and transit trips for people of all ages and socio-economic backgrounds.

40. The project will upgrade 7.102 km of poor-condition roads, with widths ranging from 3.0 m to 5.5 m to avoid resettlement impacts. Bituminous pavement will be used for all the proposed roads. Climate-resilient measures include providing appropriate camber to prevent water accumulation, strengthening the foundation with proper base and subbase, applying sealing layers like BC and seal coat, and incorporating roadside drainage to manage excess runoff.

41. The project includes a roadside drainage system designed for peak hydraulic flow to prevent erosion and scour. Climate-resilient features include larger drain sections for smooth flow, gratings for safe runoff collection, and covered drains in major sections to prevent blockages from solid waste. These proposed roads vary in length from about 0.8 km to 2.8 km, with existing Right-of-Way (RoW) ranging between 3.3 m and 18 m. The existing carriageway widths of 3.0–6.2 m are proposed to be upgraded to improved surfaces, including provisions for shoulders, open drains, or covered RCC drains depending on site conditions. Roadside drainage widths range from 300 to 1200 mm, with some existing RCC drains being retained to reduce construction redundancy. The proposed design focuses on enhancing stormwater management through open and covered drains, improving road geometry, and ensuring pedestrian safety through footpaths in selected sections. Tree cutting requirements are minimal, with a few locations needing removal of 4–6 trees, while utility shifting is necessary at several points to accommodate the upgraded alignment. Overall, the proposed engineering interventions aim to strengthen road infrastructure, improve surface drainage, and ensure smooth and safe urban mobility with minimal environmental impact.

## **Proposed Drainage System**

### **Dimapur**

42. The priority drainage network in Dimapur, developed under the Nagaland Urban Infrastructure Development Project, aims to mitigate urban flooding and improve stormwater management, particularly in low-lying and flood-prone areas. Based on consultations with stakeholders and supported by hydrological modeling and spatial analysis, the project enhances the existing system with strategically located priority drains. These interventions address inefficiencies, improve surface runoff conveyance, and strengthen flood resilience by optimizing flow dynamics and ensuring hydrodynamic stability within the urban catchment.

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

**Table 3: Details of Proposed Storm Water Drain in Dimapur**

| SI No. | Name of Drain | Length (m) | Existing condition of the drain  | Proposed type of drain | Section of the drain |                 | Outfall point | Cross section type |
|--------|---------------|------------|--|------------------------|----------------------|-----------------|---------------|--------------------|
|        |               |            |  |                        | Clear Width (m)      | Clear Depth (m) |               |                    |
| 1      | D1            | 3656.65    | One of the Primary Drain Most portions are of Kuchha with some brick Lining and Channelization at road Crossing Sections | Open Rectangular Drain | 3.7                  | 3.1             | Dhansree      | Open               |
| 2      | D2            | 10141.4    | Known as lengri river and part act as a natural stream   | Open Rectangular Drain | 3.7                  | 3.1             | Dhansree      | Open               |
| 3      | D3            | 1150.11    | Covered in Vegetation a part of D4 in the downstream   | Open Rectangular Drain | 1.2                  | 0.9             | D2(Lengri)    | Open               |
| 4      | D4            | 3807.7     | Known as Dhobi Nallah with mostly Earthen Construction and filled with Solid Waste                                       | Open Rectangular Drain | 2.74                 | 1.52            | D3            | Open               |
| 5      | D5            | 1233.96    | Mostly filled with solid waste and made of brick   | Open Rectangular Drain | 2.74                 | 1.52            | D3            | Open               |
| 6      | D6            | 864.3      | Mostly Channelized and made of brick structure with lining   | Open Rectangular Drain | 2.4                  | 2.4             | D3            | Open               |
| 7      | D7            | 582.6      | Secondary Drain made of Brick with kuchha sections in lot of stretches   | Open Rectangular Drain | 1.2                  | 0.9             | D1            | Open               |
| 8      | D8            | 3280.5     | Earthen Section Some portions also have brick linings  | Open Rectangular Drain | 2.4                  | 2.4             | D1            | Open               |

**Table 2: Road Crossing C/D Details – Dimapur**

| Road Name  | Lat      | Long      | Drain ID | RISE (m) | SPAN (m) | Drain Length (Road Formation width) (m) |
|--|----------|-----------|----------|----------|----------|---|
| Burma Camp police point junction to Supermarket junction | 25.91116 | 93.736121 | D-1      | 2.4      | 2.4      | 6.18                                    |
| Railway Junction to Half Nagarjan Junction               | 25.90676 | 93.733036 | D-1      | 2.4      | 2.4      | 15.55                                   |
| Lotha Colony Circular Road                               | 25.909   | 93.723981 | D-4      | 1.5      | 2.7      | 10.4                                    |
| Lotha Colony Circular Road                               | 25.90939 | 93.720853 | D-5      | 1.5      | 2.7      | 10.4                                    |

| Road Name   | Lat      | Long      | Drain ID | RISE (m) | SPAN (m) | Drain Length (Road Formation width) (m) |
|---|----------|-----------|----------|----------|----------|---|
| DC Court junction to Trogopan junction via City Tower | 25.91404 | 93.725715 | D-3      | 1.5      | 2.7      | 12.05                                   |
| Lotha Colony Circular Road                            | 25.91282 | 93.724001 | D-3      | 1.5      | 2.7      | 8.23                                    |
| Nepali Kashiram via Signal Angami to Thaheku Gate     | 25.88917 | 93.716635 | D-8      | 2.4      | 2.4      | 5.68                                    |
| Approach Road to Sematila                             | 25.89503 | 93.723427 | D-8      | 2.4      | 2.4      | 4.5                                     |

44. **Hospital Drain (D1).** The drain originates near Army Supply Road and drains a substantial urban catchment before outfall into the Dhansiri River in the vicinity of the CP Office and Police Colony. Historical records indicate recurring blockages along this stretch, resulting in localized flooding in the Burma Camp, Bank Colony, and Nagarjan areas. Within the project boundary, the drain extends for approximately 3.65 km. The channel is predominantly unlined (kuccha) with intermittent sections of brick lining and localized channelization provided at road crossing locations.

45. **Lengri Nallah (D2).** The drain originates from the Lower Lengri area and flows through densely populated slum settlements along the Assam–Nagaland border before outfall into the Dhansiri River near Burma Camp. The channel is highly susceptible to blockages and excessive vegetation growth, which significantly reduces its conveyance capacity and results in frequent flooding in adjoining communities. The drain is predominantly earthen in nature and is extensively impacted by accumulation of solid waste, further impairing its hydraulic performance. The total length of the drain is approximately 10.14 km.

46. **Khermahal Rd Drain (D3)-** This drain functions as a tributary of Lengri Nallah (D2) and plays a role in the local drainage network. A significant portion of the channel is currently impacted by accumulation of solid waste, affecting its hydraulic efficiency. The drain is predominantly earthen with intermittent sections of brick lining and extends for approximately 1.15 km. It traverses densely populated urban wards, contributing to stormwater conveyance and reduction of localized waterlogging, particularly during the monsoon season.

47. **Dhobi Nallah (D4)-** The drain originates in Sachu Colony (Signal Bosti) and flows through the urban core before confluence with Lengri Nallah near the Holy Cross intersection in the vicinity of the NST Garage. It serves as a primary drainage artery for the city and requires regular maintenance due to its critical role in conveying urban runoff. The channel is predominantly natural in character and also functions as an interstate boundary between Nagaland and Assam.

48. **Viola Colony Drain (D5).** The existing drain is an unlined earthen channel with no defined floodplain, leading to frequent overbank flow and inundation of adjacent residential areas. The channel is also affected by severe bank erosion and accumulation of solid waste, significantly reducing its conveyance capacity. Under the proposed design, the nallah will be upgraded to a concrete-lined section with a total length of approximately 1.23 km, along with provision of a defined channel profile and controlled floodplain to enhance hydraulic efficiency and mitigate flooding.

49. **Neisetuo Colony Drain(D6).** The Neisetuo Colony drain is an uncovered RCC channel and a tributary of Lengri Nallah (D2). The existing boundary walls are structurally weak, and



inadequate desilting has led to frequent blockages, resulting in stagnant water conditions and localized flooding. The total length of the drain is approximately 864 m. While certain stretches are in relatively good condition, improvement measures including wall strengthening, provision of lining in deficient sections, regular desilting, and enhanced solid waste management are required to restore and maintain hydraulic efficiency.

50. **Near Railway Station (D7).** This secondary drain includes sections running along the roadside and is proposed to be integrated with Hospital drain (D1) to improve overall drainage connectivity. The total length of the drain is approximately 582 m. The existing channel is primarily constructed with brick masonry, interspersed with several kuccha (earthen) stretches, resulting in variable structural and hydraulic performance. Improvements are required to ensure continuity, structural stability, and efficient flow conveyance.

51. **Thaheku Village Drain (D8).** This drain forms an extension of D1, commonly referred to as Hospital Nallah. The existing channel is predominantly earthen, with intermittent sections of brick lining. Under the proposed design, the entire stretch will be upgraded to a concrete-lined section to improve structural integrity and hydraulic performance. The total length of the drain is approximately 3.28 km.

52. The Dhansiri River is central to Dimapur's stormwater discharge, with engineered drainage integrated into natural hydrology to reduce backflow and improve outflow. Low-lying flood-prone zones were identified through spatial assessment, guiding the placement of new drains. Computational hydrological modeling confirmed the effectiveness of these interventions, while mapping of urban and ward boundaries enabled targeted drainage improvements within specific catchments.

### **Chümoukedima**

53. The priority drainage network in Chümoukedima has been strategically delineated to address urban flooding risks and strengthen stormwater management. Implemented under the Nagaland Urban Infrastructure Development Project, this initiative is the outcome of extensive consultations with stakeholders, including urban planners, municipal authorities, and infrastructure specialists. The core focus is on augmenting the existing drainage infrastructure by resolving critical issues that contribute to waterlogging, with particular emphasis on interventions in low-lying and flood-prone zones.

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

**Table 4: Details of Proposed Storm Water Drain in Chümoukedima**

| SI No. | Name of Drain | Length (m) | Existing condition of the drain  | Proposed type of drain | Section of the drain |                 | Outfall point                               | Cross section type |
|--------|---------------|------------|--|------------------------|----------------------|-----------------|---|--------------------|
|        |               |            |  |                        | Clear Width (m)      | Clear Depth (m) |   |                    |
| 1      | D1            | 3084.13    | One of the Primary Drain Most portions are of Kuchha with some brick Lining and Channelization at road Crossing Sections | Open Rectangular Drain | 2.4                  | 2.4             | Natural stream near Twyphie Village Road    | Open               |
| 2      | D2            | 1818.77    | One of the Primary Drain Most portions are of Kuchha with some brick Lining and Channelization at road Crossing Sections | Open Rectangular Drain | 1.8                  | 1.8             | D3  | Open               |
| 3      | D3            | 883.718    | One of the Primary Drain Most portions are of Kuchha with some brick Lining and Channelization at road Crossing Sections | Open Rectangular Drain | 1.8                  | 1.8             | D1  | Open               |
| 4      | D4            | 814.181    | Secondary drain with some stone masonry Constructed walls will be converted to RCC Drains                                | Open Rectangular Drain | 1.8                  | 1.8             | Natural Stream near Nagamese Baptist Church | Open               |
| 5      | D5            | 491.268    | Secondary Drain channelization required  | Open Rectangular Drain | 1.8                  | 1.8             | D4  | Open               |
| 6      | D6            | 255.083    | Small earthen channel will be connected to D5  | Open Rectangular Drain | 1.2                  | 0.9             | D5  | Open               |
| 7      | D7            | 191.463    | Secondary drain feeding from road drains will drain into Chathe river  | Open Rectangular Drain | 1.2                  | 0.9             | Chathe River                                | Open               |

| SI No. | Name of Drain | Length (m) | Existing condition of the drain  | Proposed type of drain | Section of the drain |                 | Outfall point | Cross section type |
|--------|---------------|------------|--|------------------------|----------------------|-----------------|---------------|--------------------|
|        |               |            |  |                        | Clear Width (m)      | Clear Depth (m) |               |                    |
| 8      | D8            | 227.212    | Secondary drain feeding from road drains will drain into Chathe river  | Open Rectangular Drain | 0.6                  | 0.6             | Chathe River  | Open               |
| 9      | D9            | 151.731    | Secondary drain feeding from road drains will drain into Chathe river  | Open Rectangular Drain | 0.6                  | 0.6             | Chathe River  | Open               |
| 10     | D10           | 782.1      | One of the Primary Drain Most portions are of Kuchha with some brick Lining and Channelization at road Crossing Sections | Open Rectangular Drain | 2.4                  | 2.4             | D1            | Open               |

55. The assessment of the priority drainage network in Chümoukedima reveals widespread issues of inadequate stormwater conveyance, primarily due to uncovered and poorly maintained natural earthen drains with eroded banks and the absence of protective boundary walls. Across multiple locations—including the New DC Office Drain, N.I.T. Drain, Suruzha Colony Drain, Ward 7 Drain, and Debol Market Drain—high upstream runoff frequently causes overflow and waterlogging in surrounding low-lying areas. Solid waste accumulation and structural encroachments, particularly along the Suruzha Colony and Debol Market drains, further restrict hydraulic capacity and exacerbate flooding.

56. Several roadside drains, such as those along Church Road, Union Baptist Church Road, and Chümoukedima Gas Agency Road, face similar challenges, with additional constraints from damaged sections, dense vegetation growth, and partial or one-sided drainage infrastructure. In Ward 6, both Drain 1 and Drain 2 experience prolonged inundation, with waterlogging lasting up to a week in the most affected sections. Overflow from these drains significantly impacts downstream stretches, including the Union Baptist Church Road and Gas Agency Road areas. The drainage outlets in some locations, such as Drain 2 discharging into the Khova River, are also obstructed, reducing discharge efficiency.

57. Chümoukedima's stormwater drainage network has been strategically assessed to address inefficiencies and strengthen urban flood resilience. Priority drains, identified through hydrological modeling and spatial analysis, have been integrated with the existing system to improve surface runoff conveyance, reduce waterlogging, and enhance connectivity between channels. The mapped network highlights critical interventions across key wards (01, 02, 03, 05, 06, 07, 08, 09, 10, and 11), with light blue indicating existing priority drains and dark blue representing additional modeled drains. The Chathe River serves as the main natural outfall, underscoring the need for efficient runoff channeling. Key nodes (D-1, D-2, and D-3) mark vital junctions or discharge points within the system. Together, these planned measures aim to optimize flow dynamics, prevent water stagnation, and improve overall stormwater management.

in the urban catchment.

58. **Construction methodology.** Most drainage systems in Dimapur and Chümoukedima face significant accessibility constraints due to limited Right-of-Way (RoW), dense urban development, and encroachment from adjacent structures and vegetation. These conditions restrict the maneuverability of heavy construction machinery, particularly for earthwork and drain excavation. Consequently, manual excavation is adopted as the primary construction methodology, utilizing hand tools and skilled labor to achieve precision in confined working environments where mechanized equipment cannot operate efficiently. While this labor-intensive approach increases manpower requirements and may extend construction timelines, it offers better control over excavation accuracy, reduces the risk of structural damage to nearby utilities and buildings, and minimizes disturbance to the surrounding urban fabric.

59. **Reinforcement and Concreting Challenges.** Reinforcement placement in congested urban environments such as Dimapur and Chümoukedima is generally manageable, as steel fixing is largely performed manually, allowing accurate bar placement even within narrow and irregular drain sections. However, greater technical challenges are associated with formwork and concreting works. Formwork erection is constrained by uneven, waterlogged, and weak subgrade conditions, which can affect alignment, level control, and form stability. Concreting, typically carried out through manual placement, limits productivity and makes it difficult to achieve consistent compaction, proper finishing, and effective curing, particularly in deep or continuous drain stretches. Intermittent or manually mixed concrete also increases the risk of segregation, honeycombing, and cold joints, thereby affecting structural continuity and overall construction quality.

60. **Boom Pump Utilization.** The use of boom pumps provides an effective engineering solution for concreting in restricted urban drain corridors by enabling direct, controlled placement of ready-mixed concrete over obstructions and within confined spaces. This method improves placement efficiency, compaction quality, surface finish, and continuity, while significantly reducing manual handling, construction time, and the risk of cold joints in deep and elongated drain sections.

61. The adoption of precast Field Tunnel (FT) flumes or high-strength precast RCC elements offers a technically superior alternative to cast-in-situ construction. Manufactured under controlled conditions, these elements ensure uniform strength, dimensional accuracy, and durability. Their rapid installation minimizes onsite shuttering, curing, and labor requirements, enhances construction safety, and provides improved hydraulic performance and long-term maintainability of urban drainage systems.

#### **D. Implementation Schedule**

62. Implementation of Dimapur and Chümoukedima road and storm water drainage package as item rate contract. Project will be implemented in 36 months. Bids to be invited for the package. It is assumed that the construction will be commenced from the 3<sup>rd</sup> quarter of financial year 2026 and will be completed by 3<sup>rd</sup> quarter of-2029.

Following **Figure 3** to **Figure 4** proposed roads in lay out plan, proposed road network in Dimapur and Chümoukedima town, and

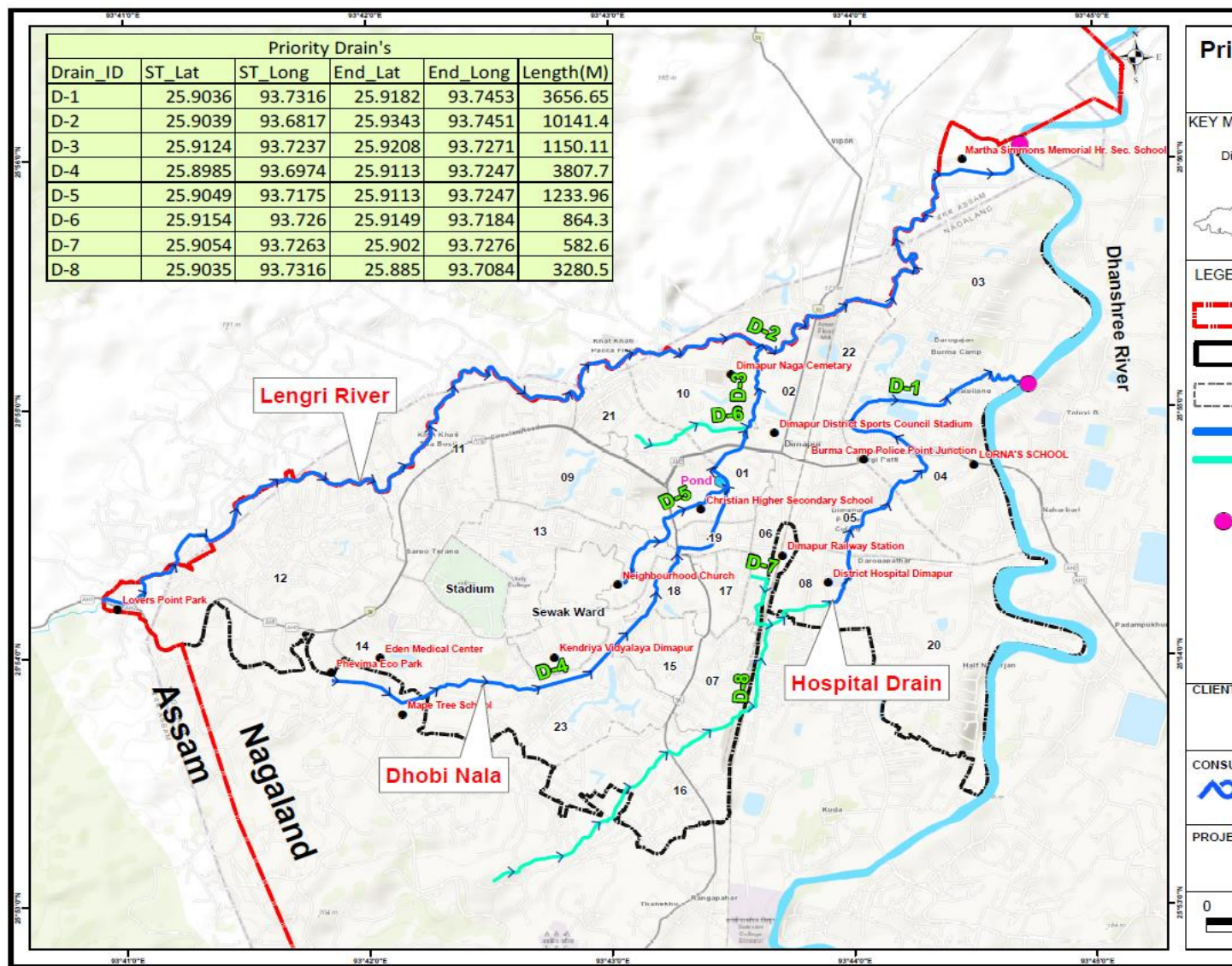
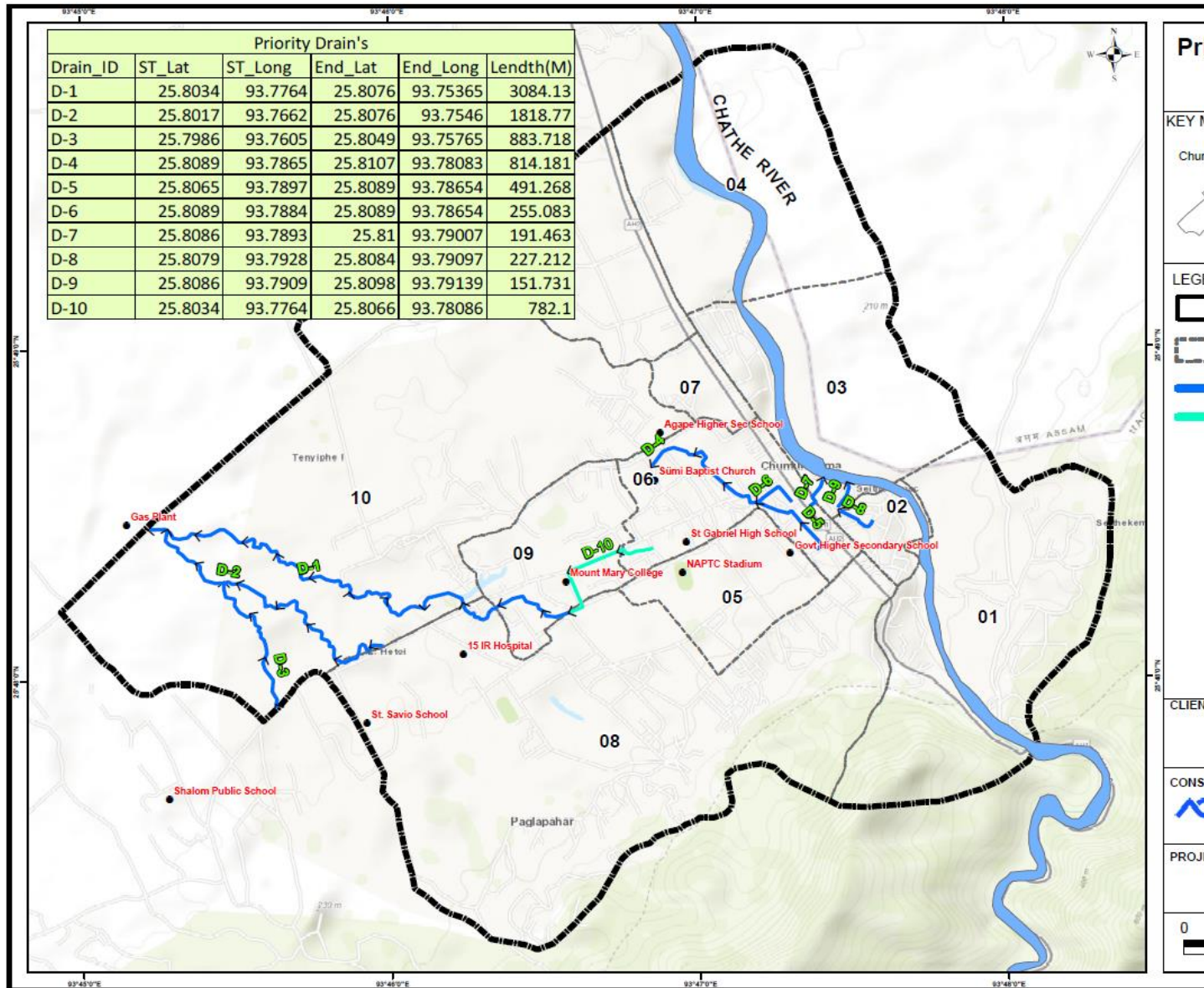


Figure 5 to





**Figure 6** showing the proposed and existing drain network, of Dimapur and Chümoukedima town. **Figure 7 to**

63. **Figure 8** proposed roads in google map of the Dimapur and Chümoukedima town and **Figure 9 to Figure 10** showing the proposed drain of Dimapur and Chümoukedima town.

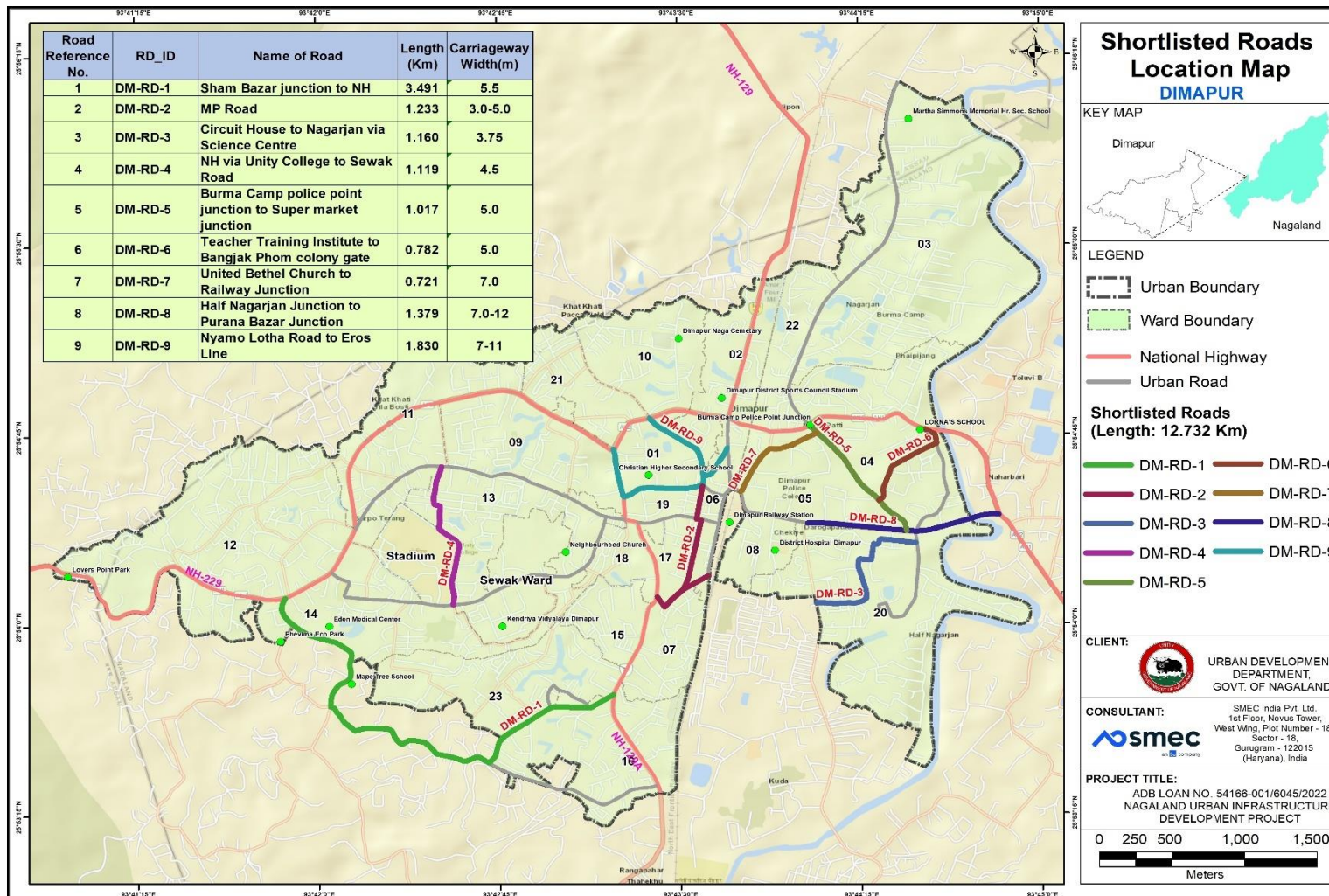


Figure 3: Proposed Road Network Layout for of Dimapur Town



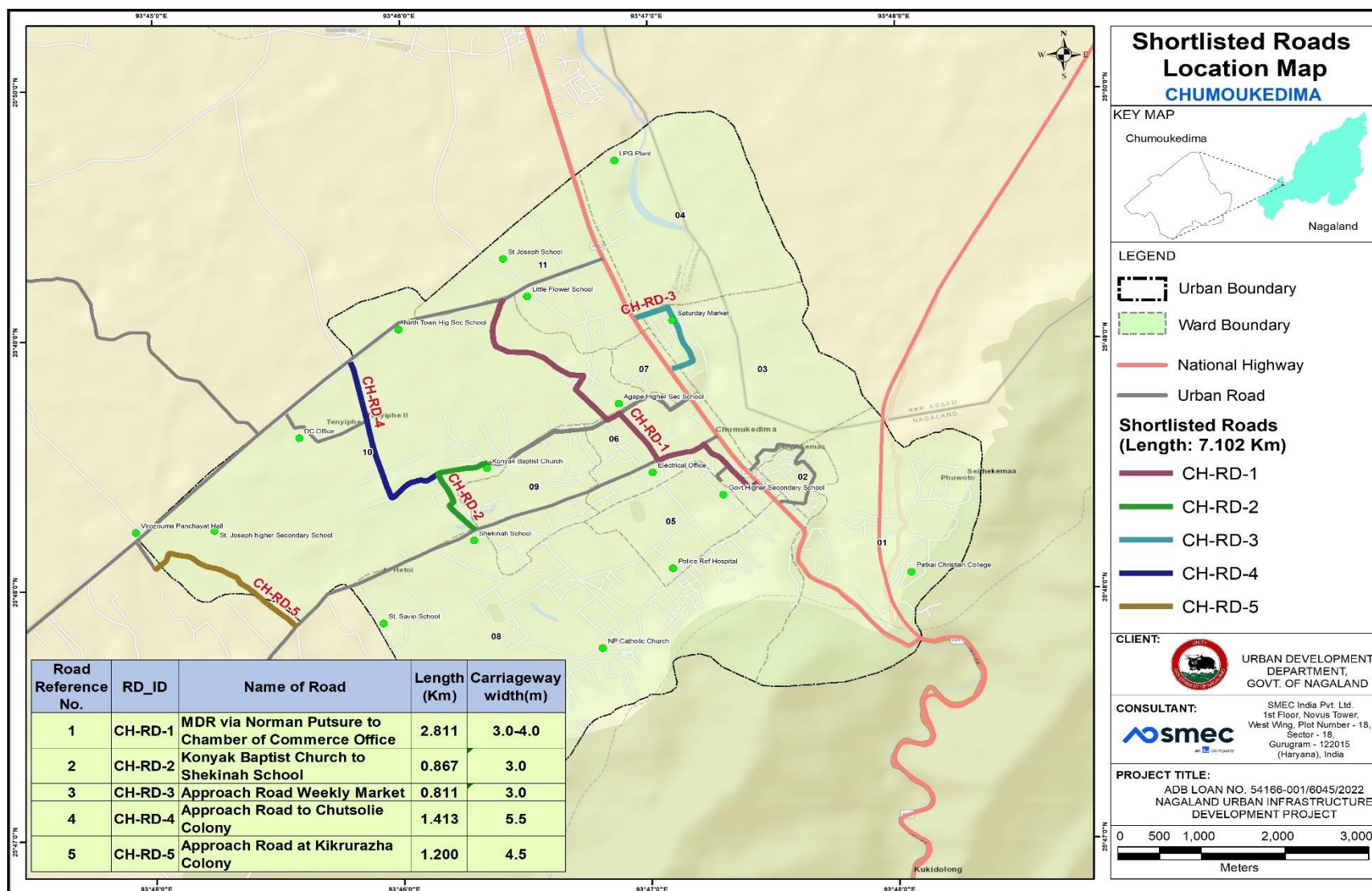


Figure 4: Proposed Road Network Layout for Chumoukedima Town (Source DPR)



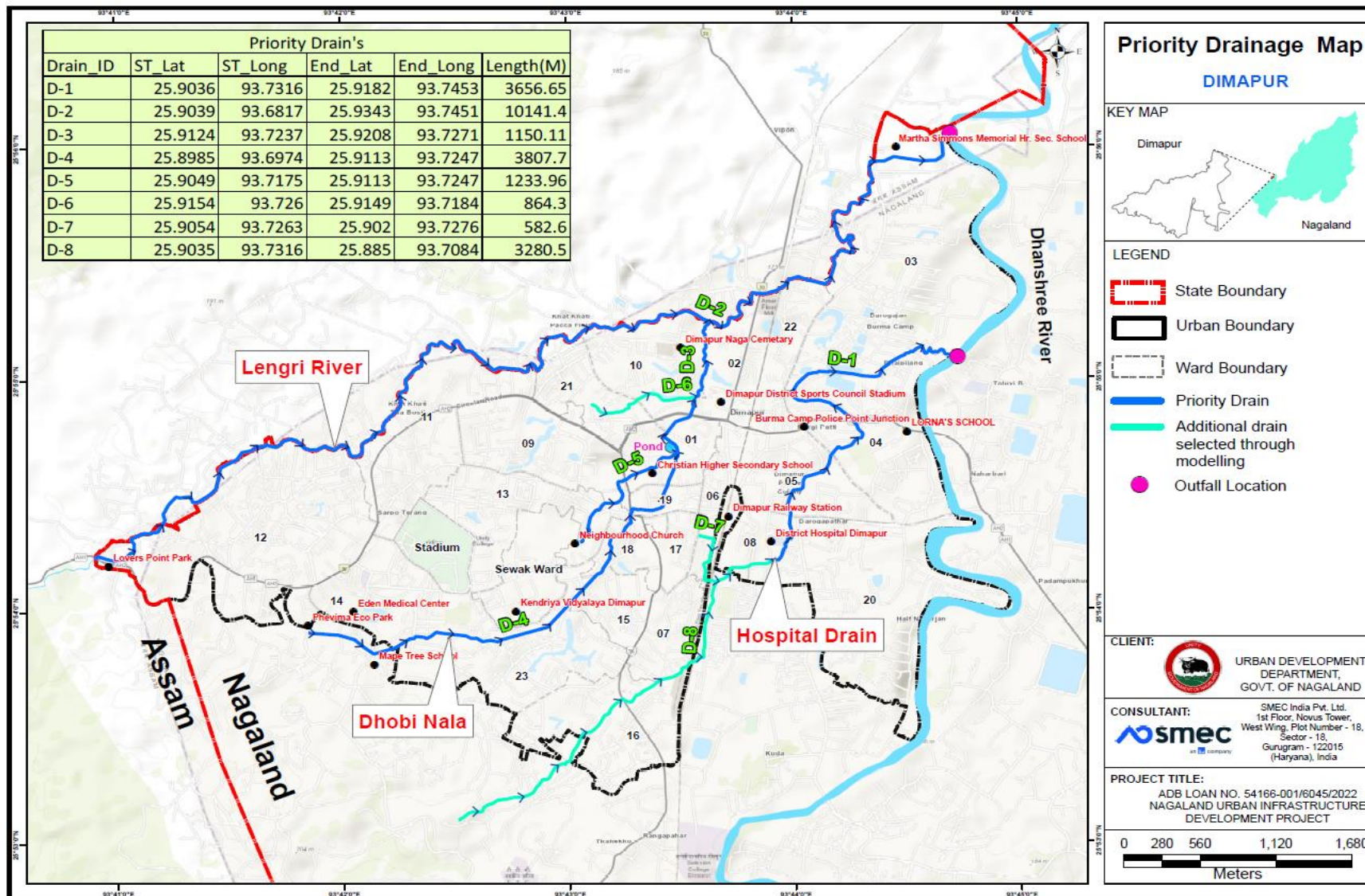


Figure 5: Proposed storm water drainage work area of Dimapur Town

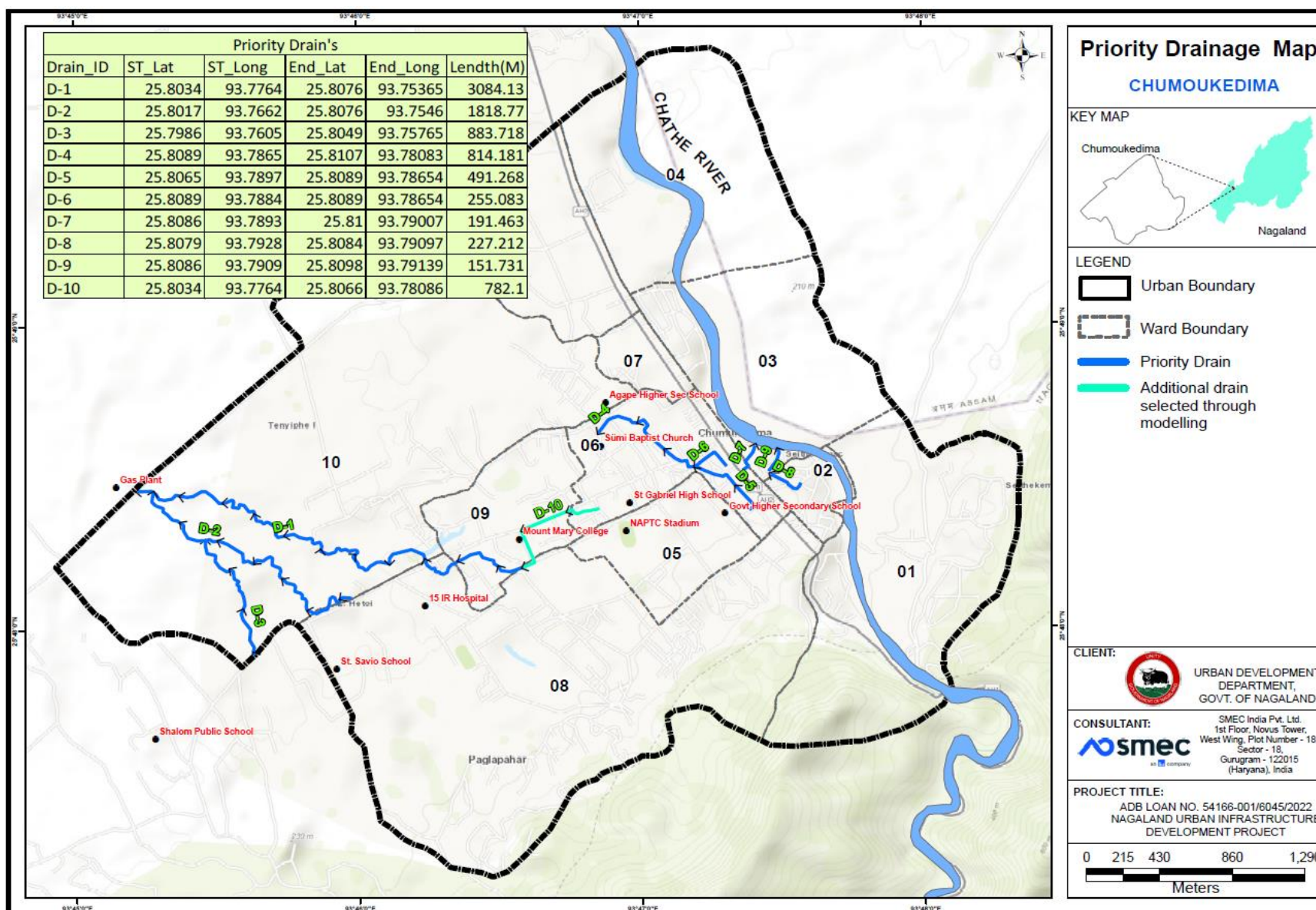
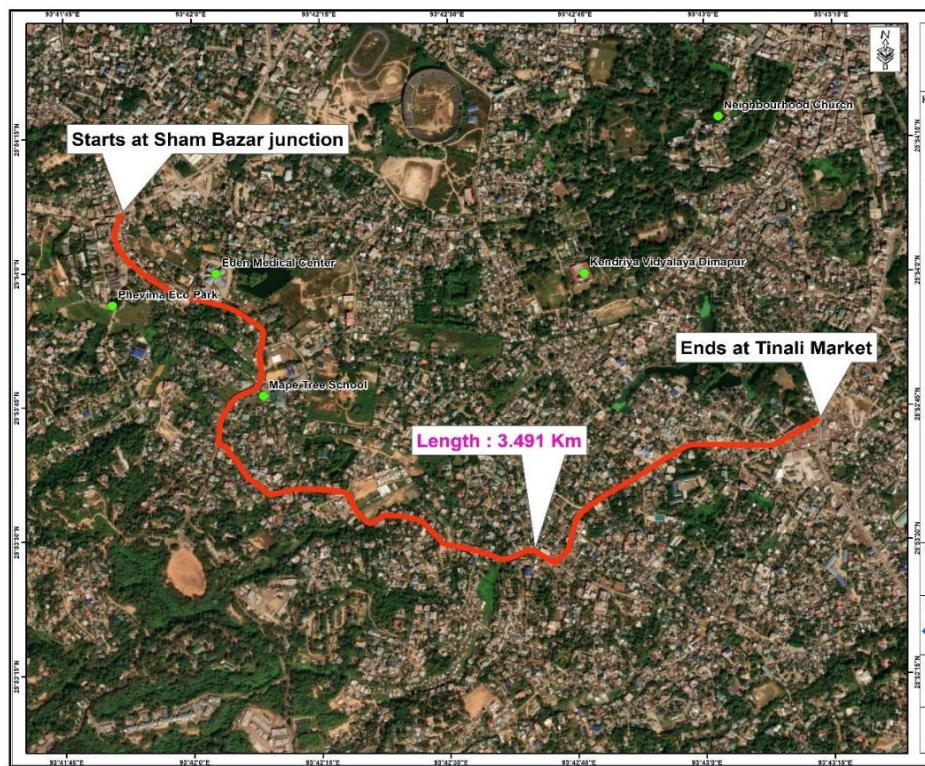
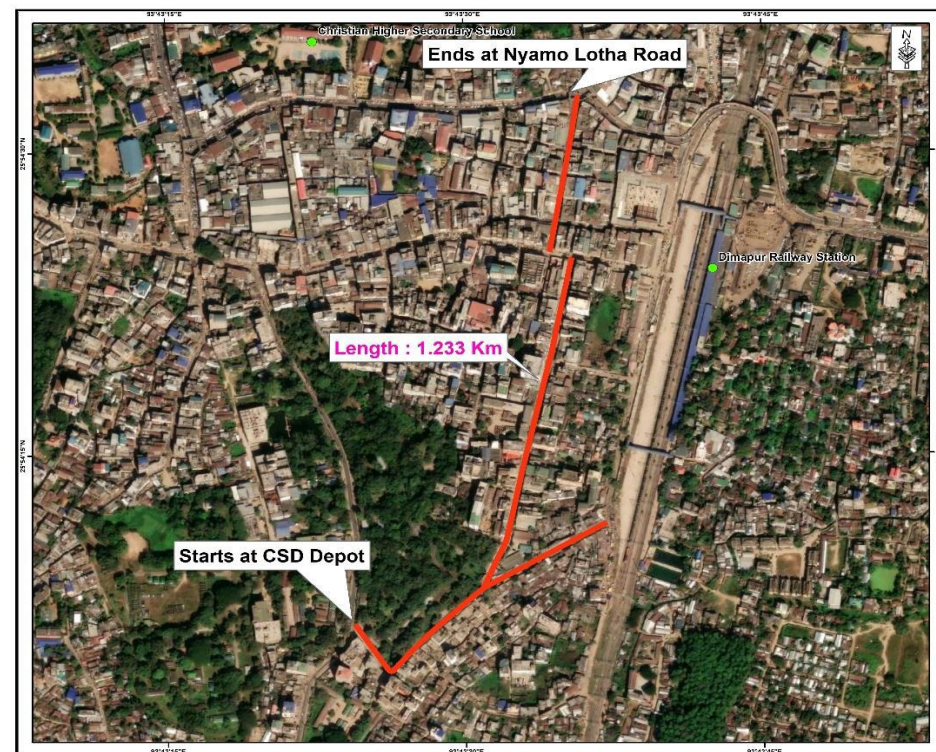


Figure 6: Proposed storm water drainage work area of Chümoukedima Town



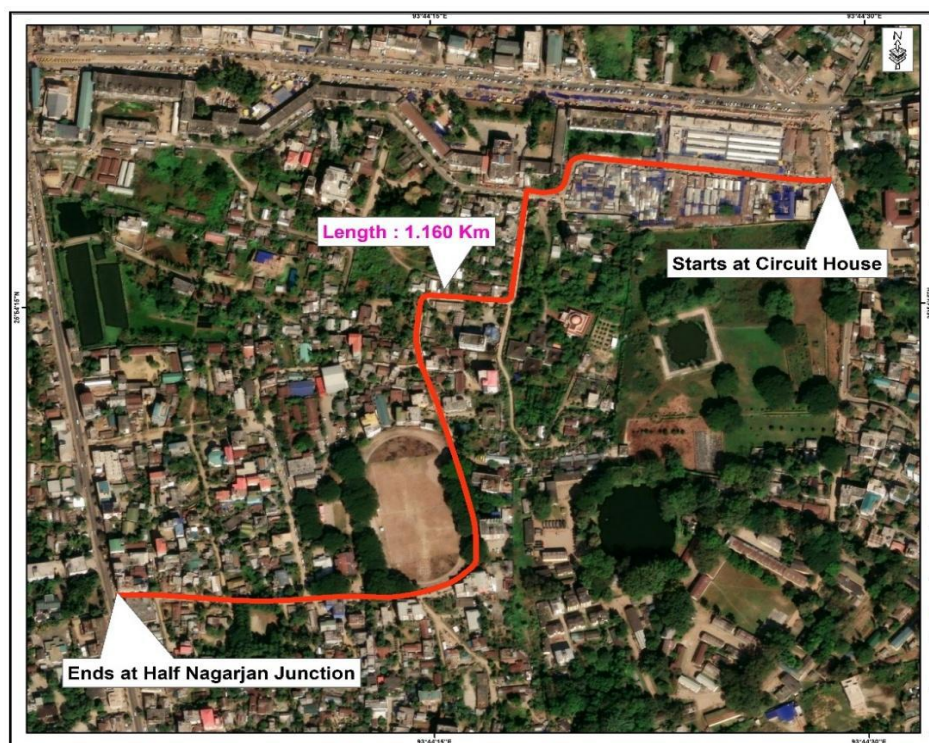


Sham Bazar junction to NH- Dimapur Road No 1



MP Road- Dimapur Road no 2



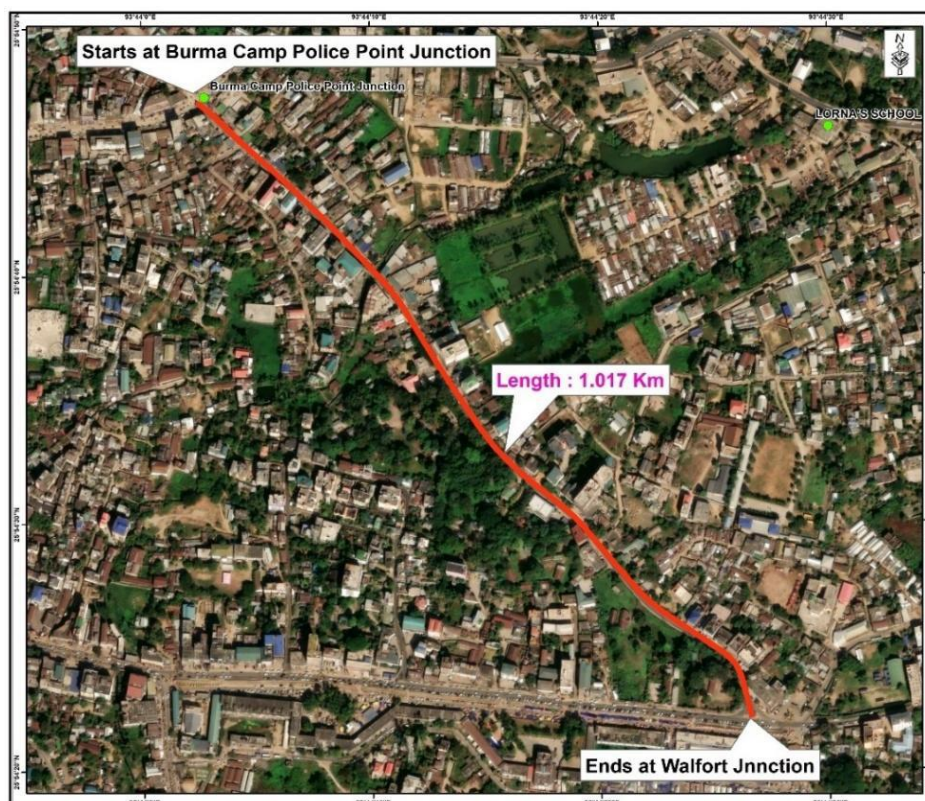


**Circuit House to Nagarjan via Science Centre-Dimapur Road no 3**

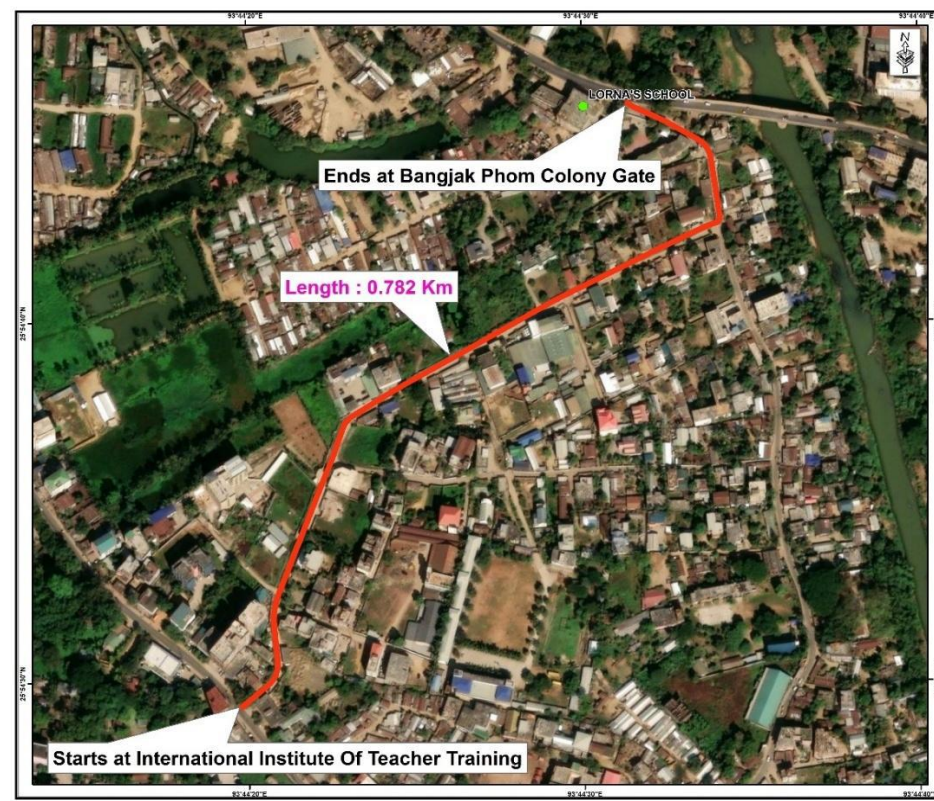


**NH via Unity College to Sewak Road -Dimapur Road no 4**



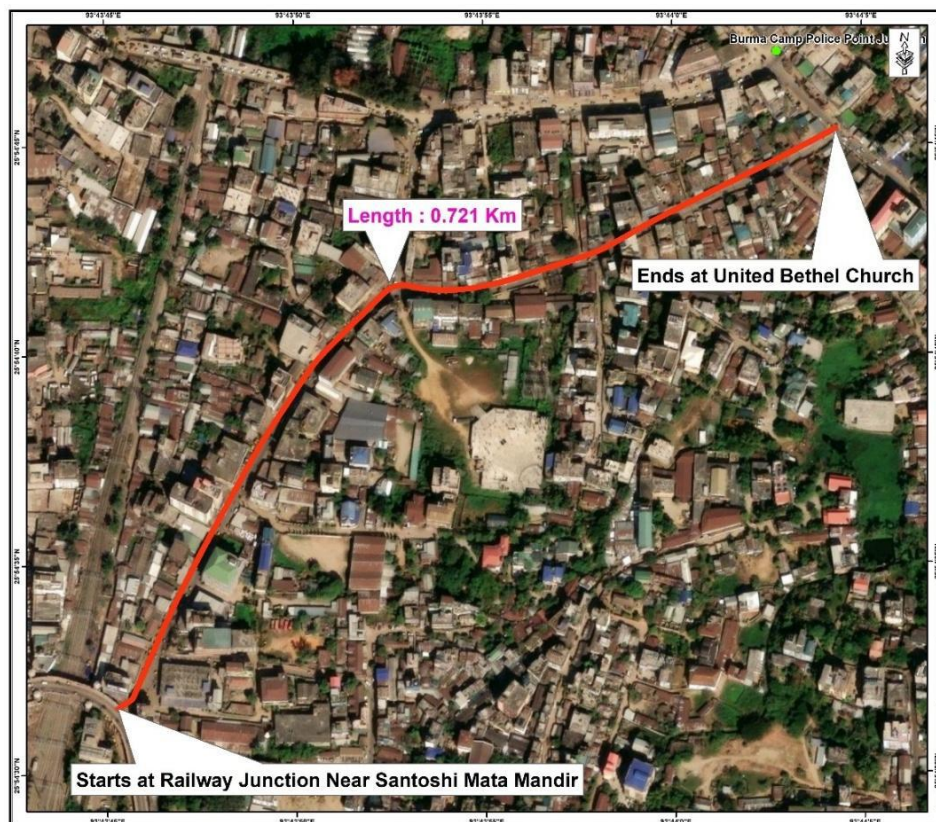


**Burma Camp police point junction to Supermarket junction - Dimapur Road no 5**

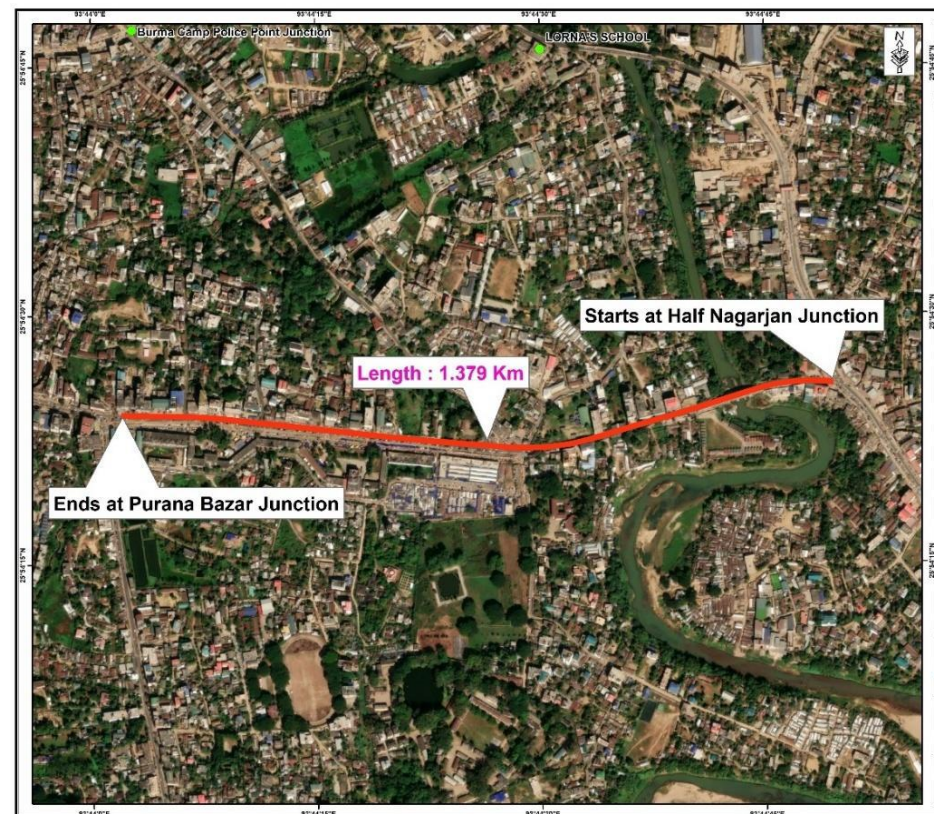


**Teacher Training Institute to Bangjak Phom Colony Gate- Dimapur Road no 6**



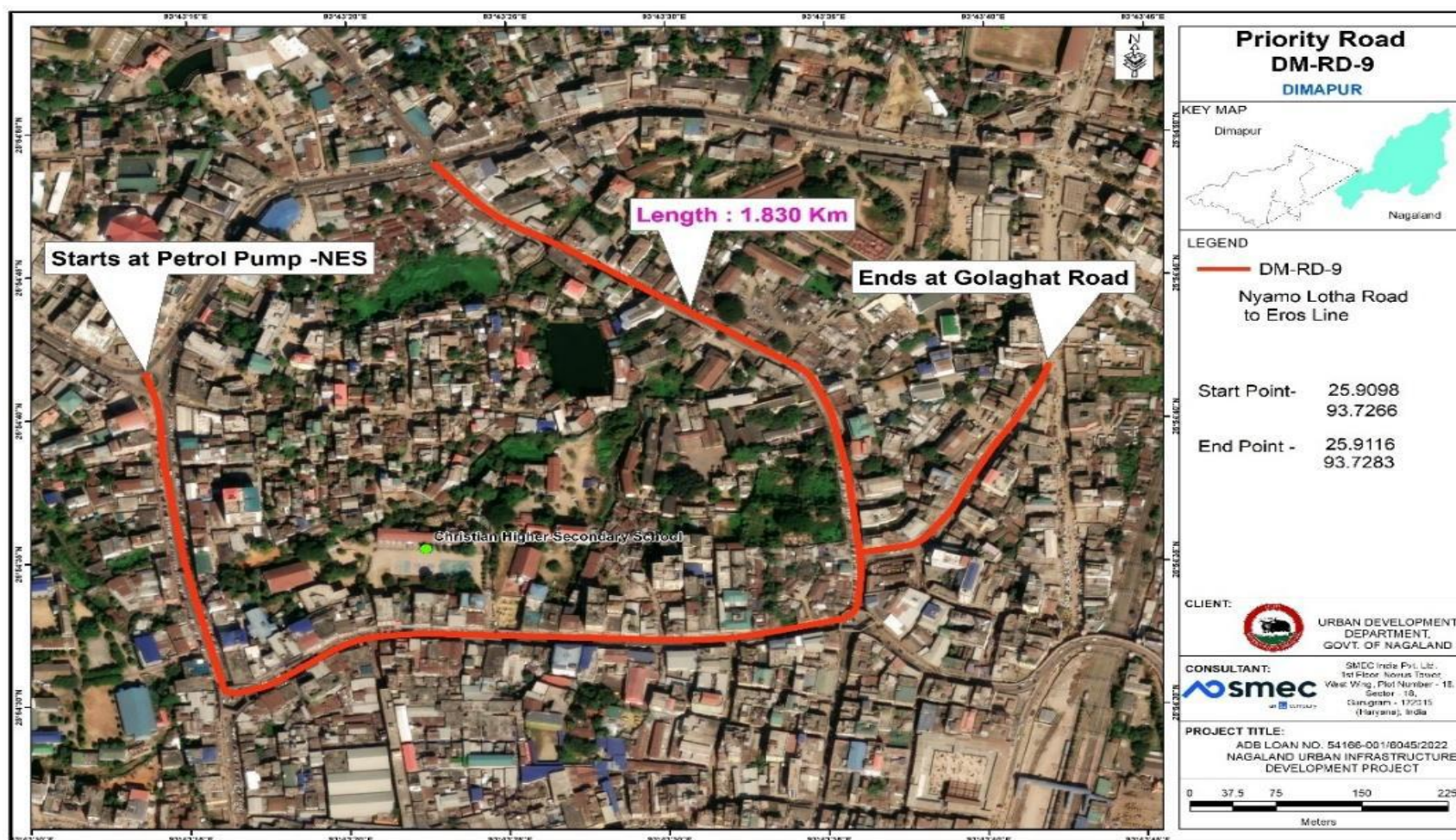


United Bethel Church to Railway Junction- Dimapur Road no 7



United Bethel Church to Railway Junction- Dimapur Road no 8

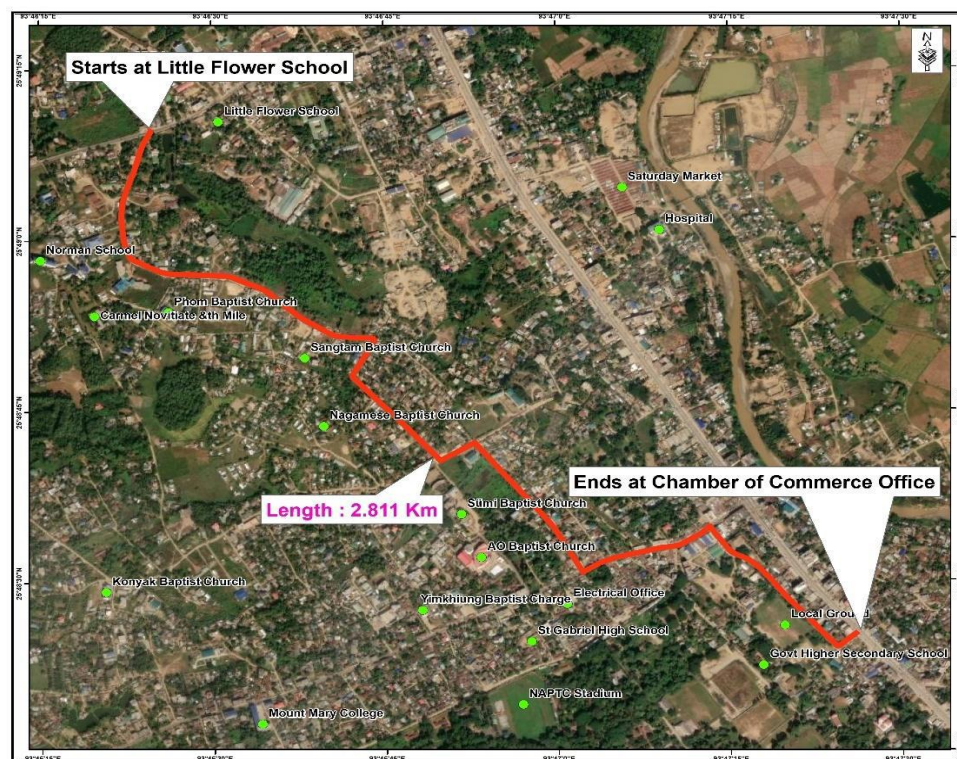




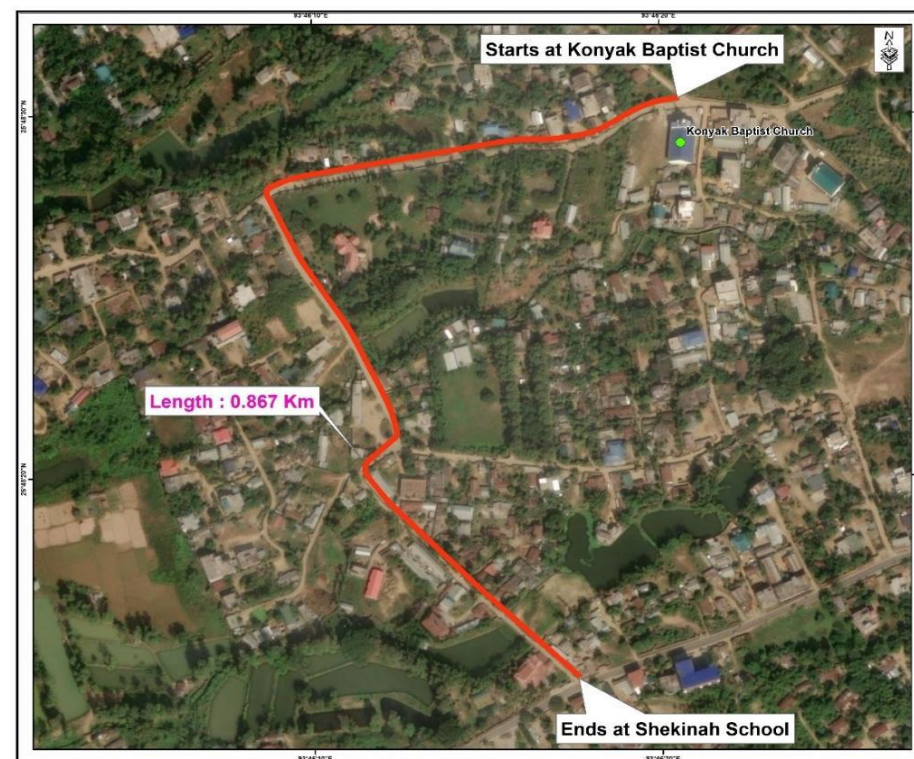
Nyamo Lotha Road to Eros Line - Dimapur Road no 9

Figure 7: Proposed Road of Dimapur town on Google Earth





**MDR via Norman Putsure to Chamber of Commerce Office - Chümoukedima Town no 1**

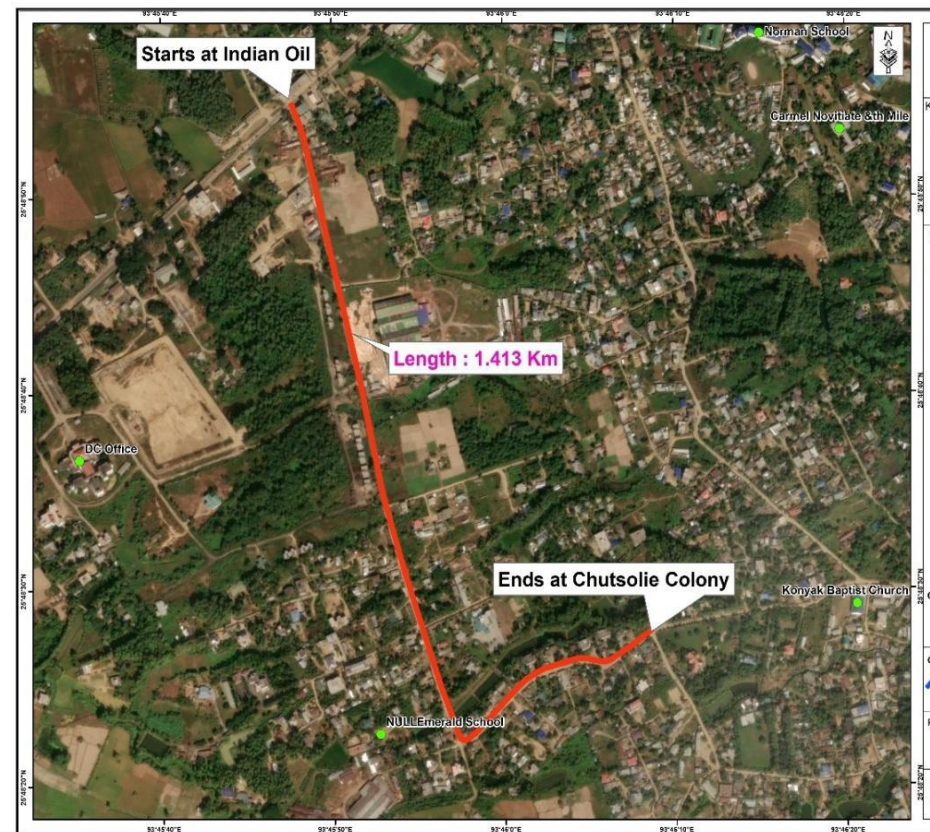


**Konyak Baptist Church to Shekinah School - Chümoukedima Town no 2**



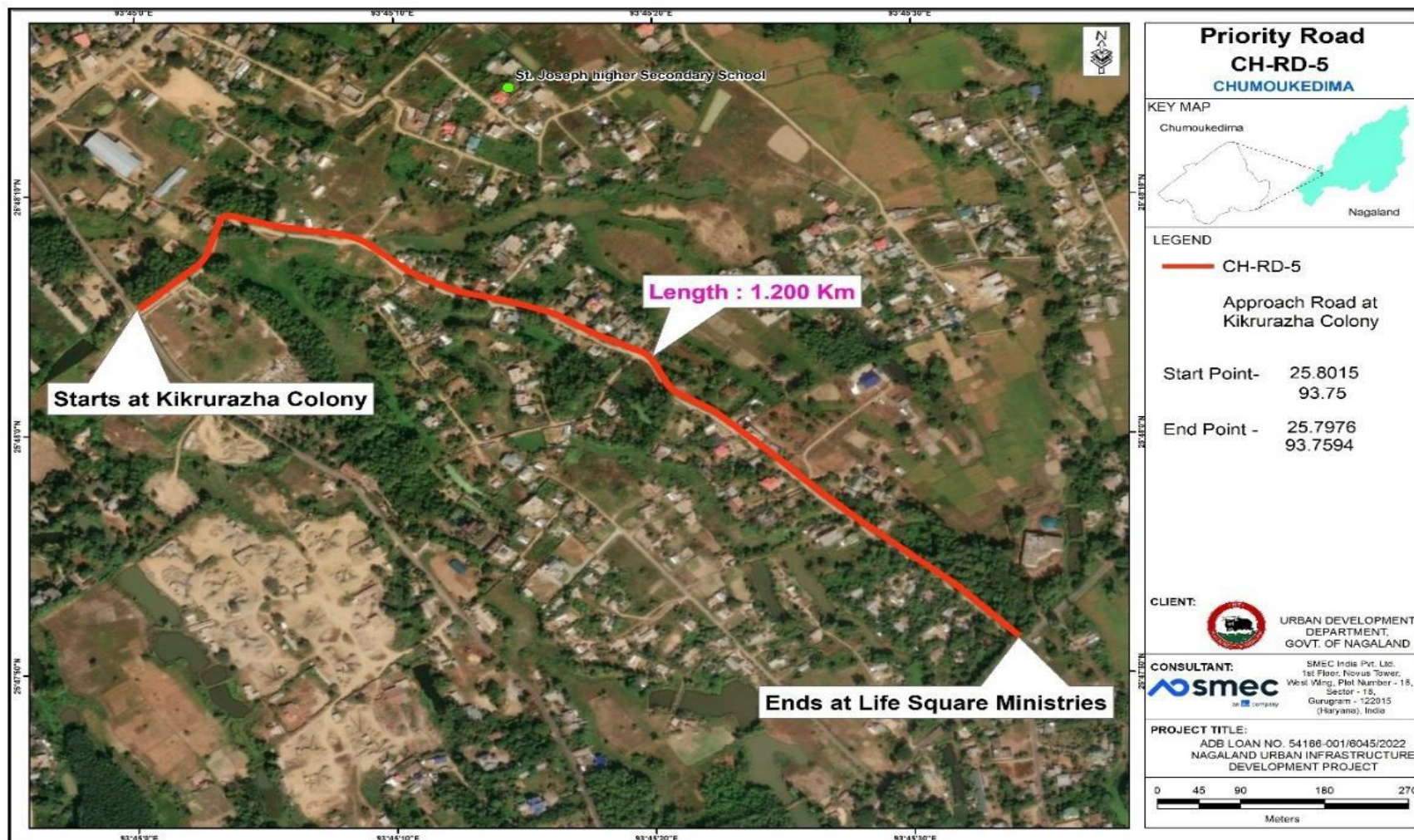


**Approach Road Weekly Market - Chümoukedima Town no 3**



**Approach Road to Chutsolie Colony- Chümoukedima Town no 4**

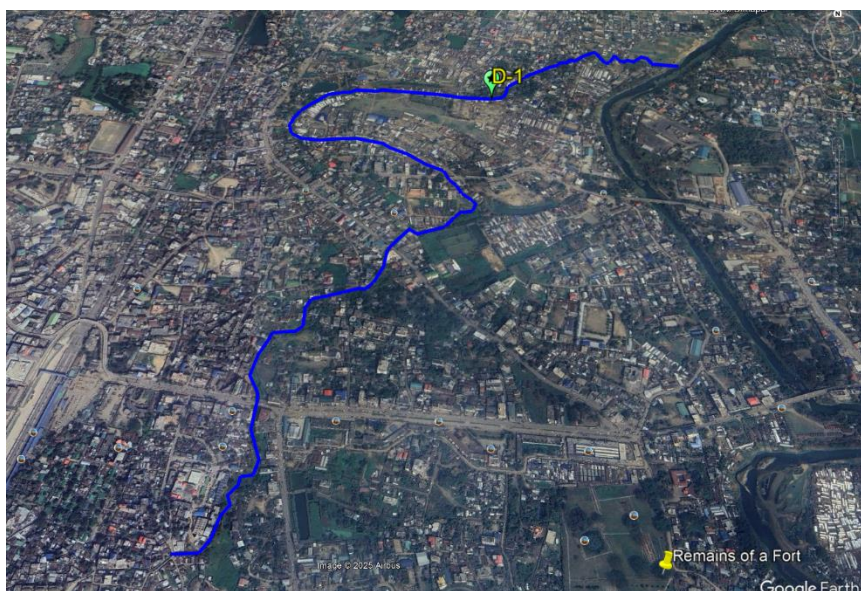




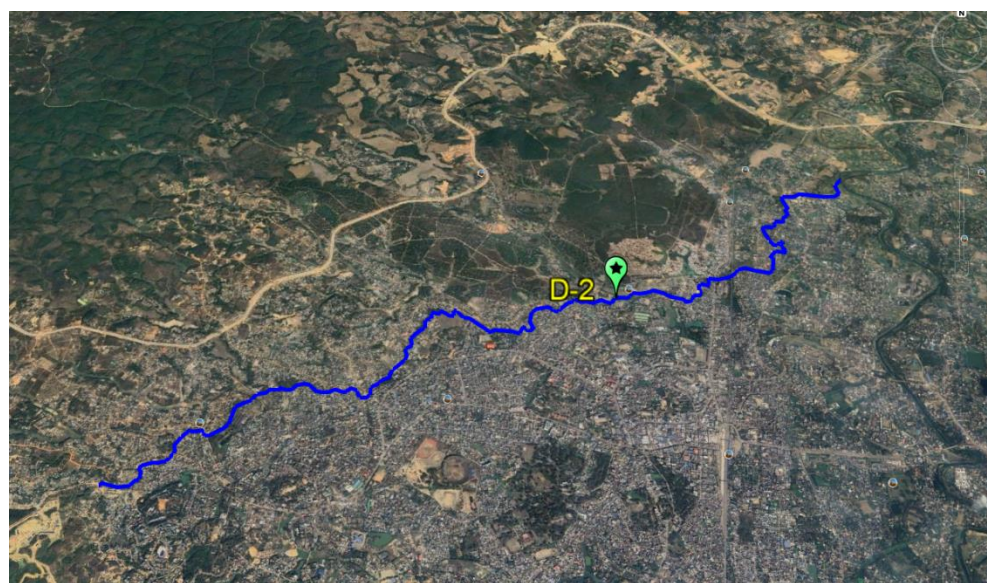
Approach Road at Kikrurazha Colony- Chumoukedima Town no 5

Figure 8: Proposed Road of Chumoukedima town on Google Earth

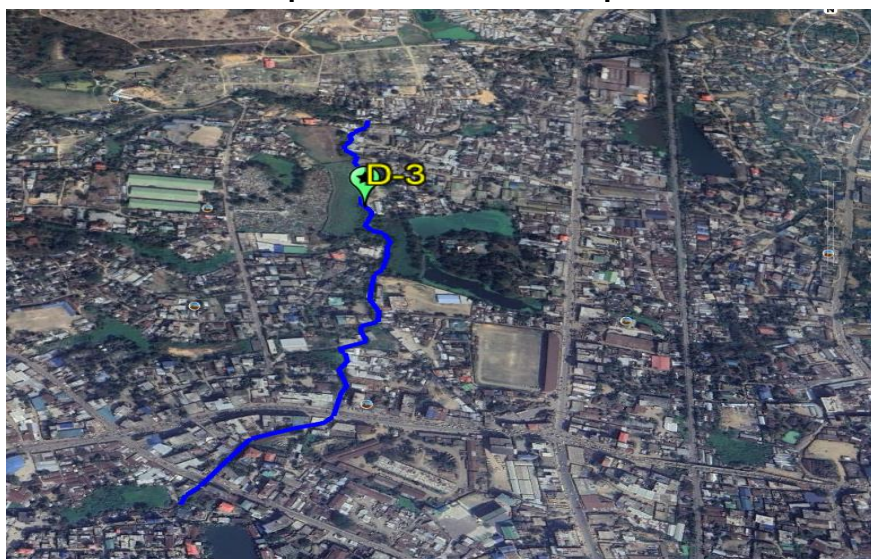




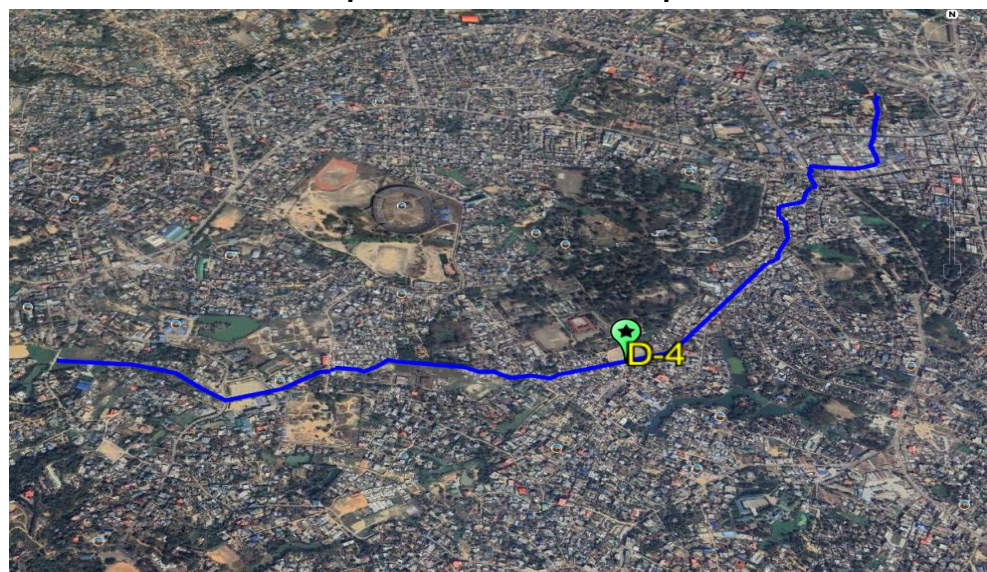
**Proposed Drain 1 in Dimapur**



**Proposed Drain 2 in Dimapur**

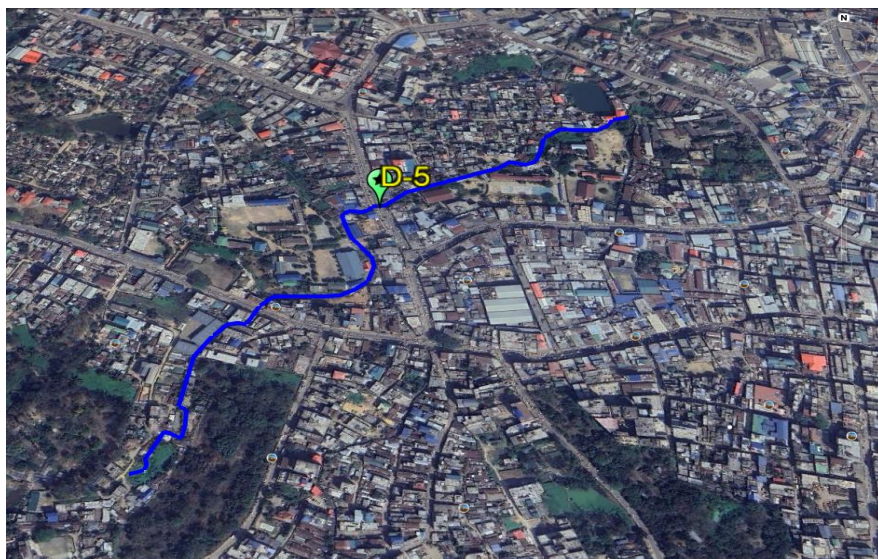


**Proposed Drain 3 in Dimapur**

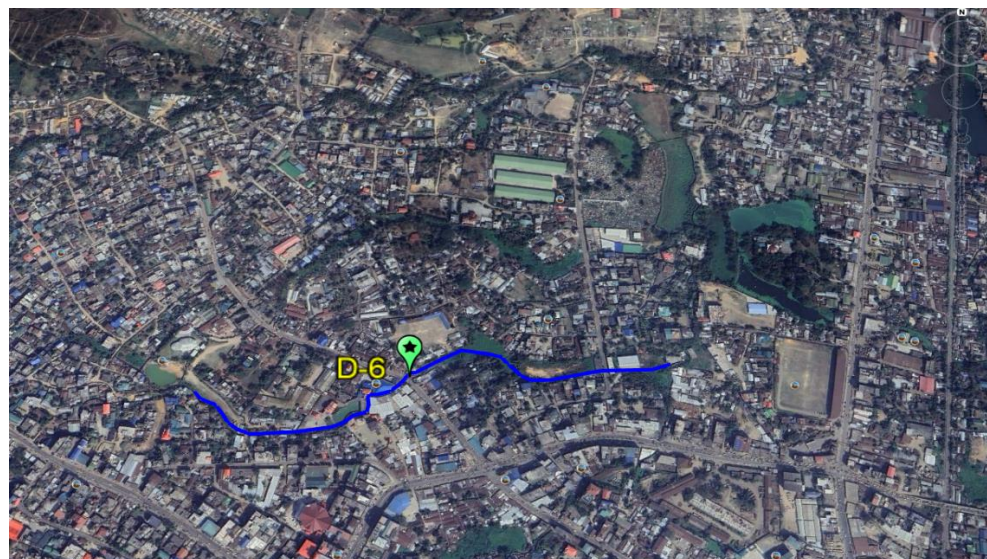


**Proposed Drain 4 in Dimapur**

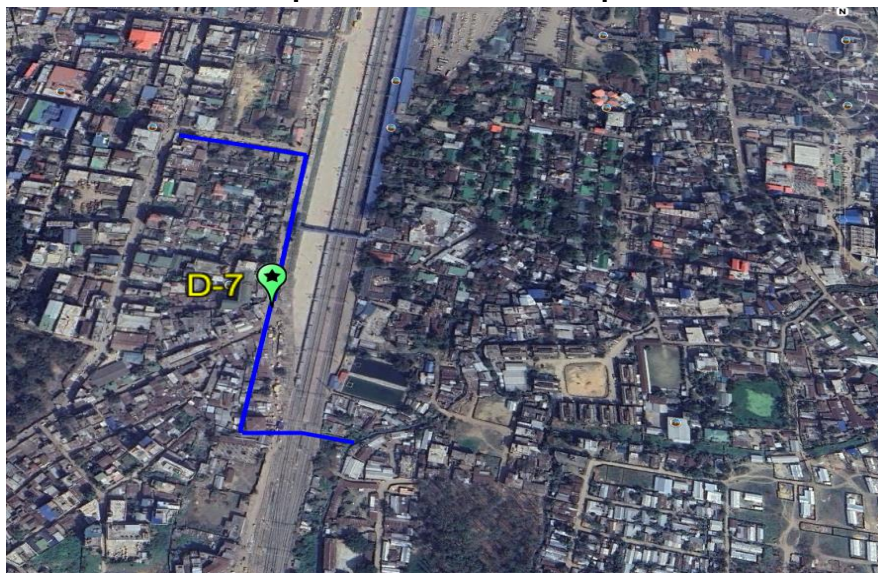




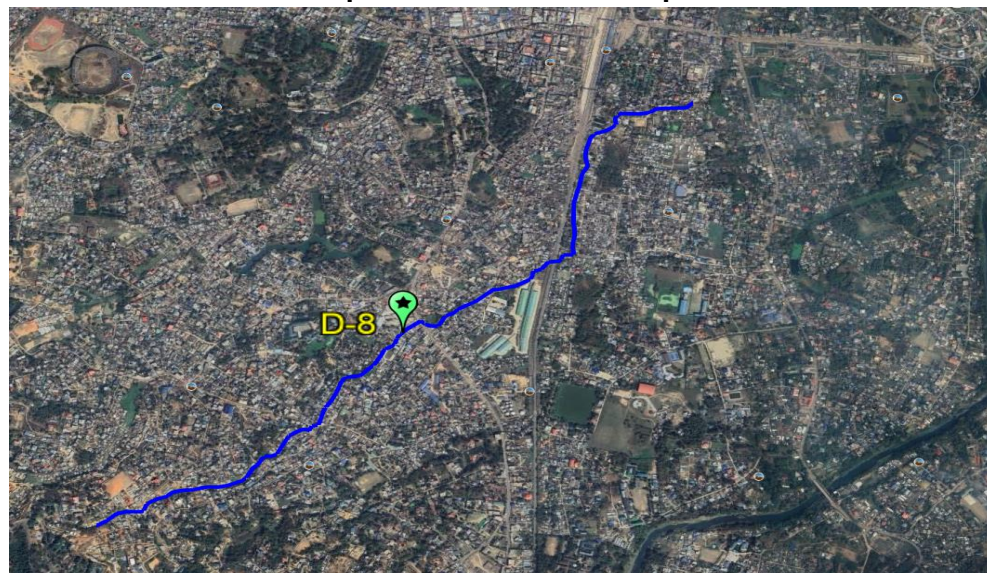
**Proposed Drain 5 in Dimapur**



**Proposed Drain 6 in Dimapur**



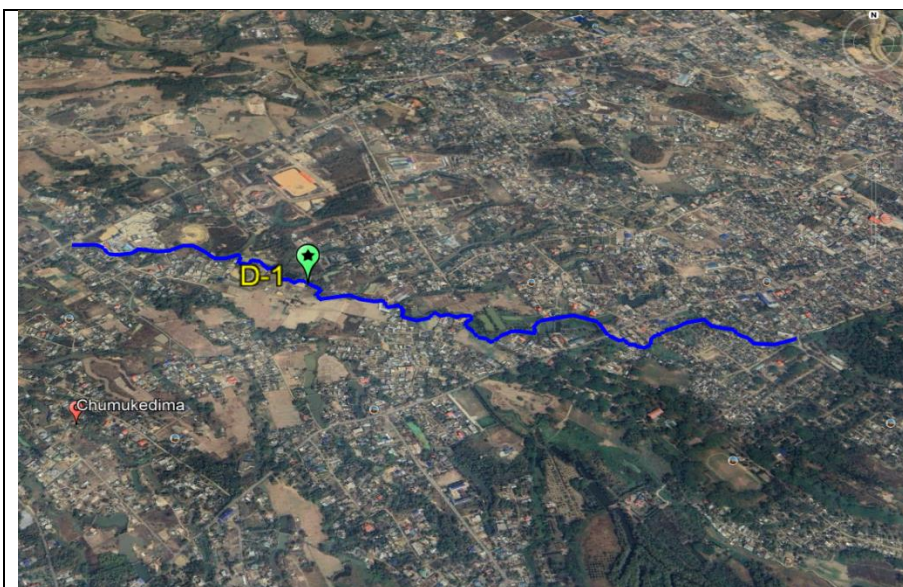
**Proposed Drain 7 in Dimapur**



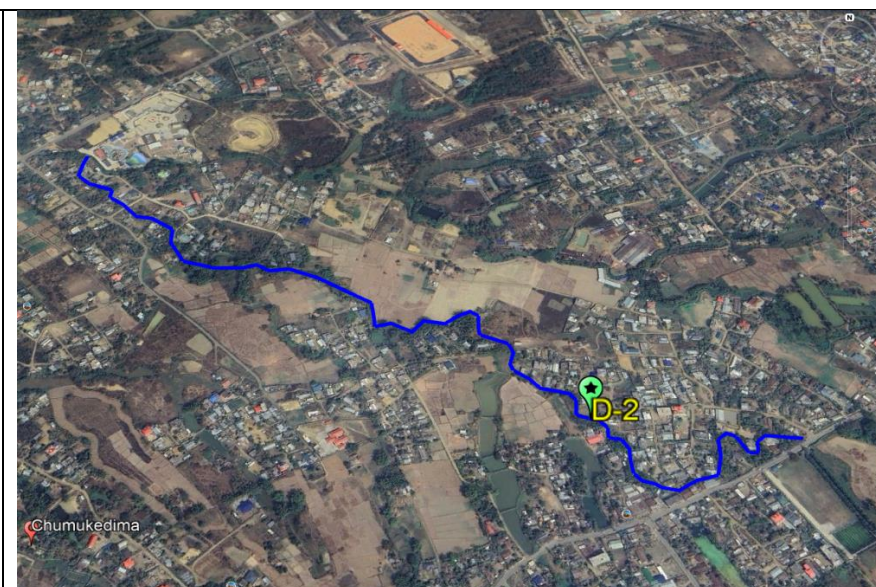
**Proposed Drain 8 in Dimapur**

**Figure 9: Proposed Storm Water Drain of Dimapur town on Google Earth**

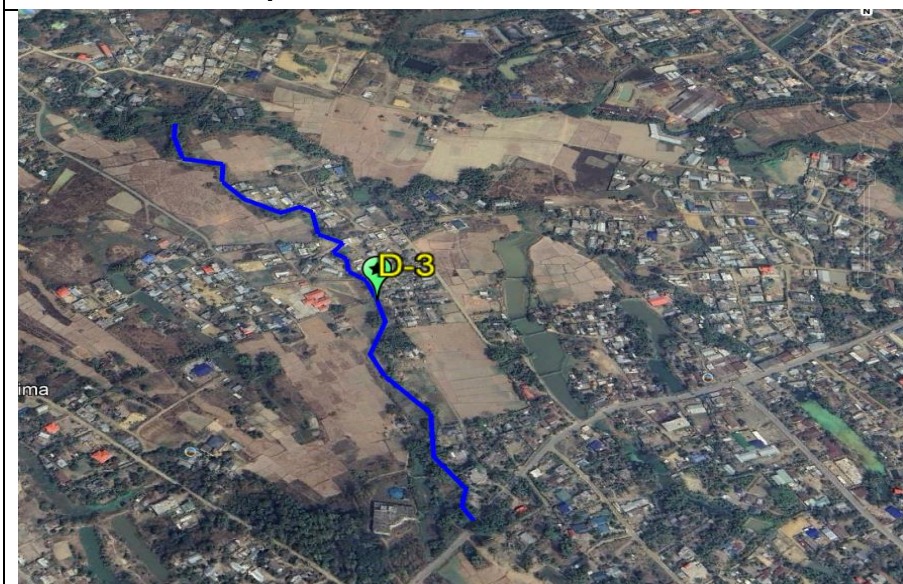




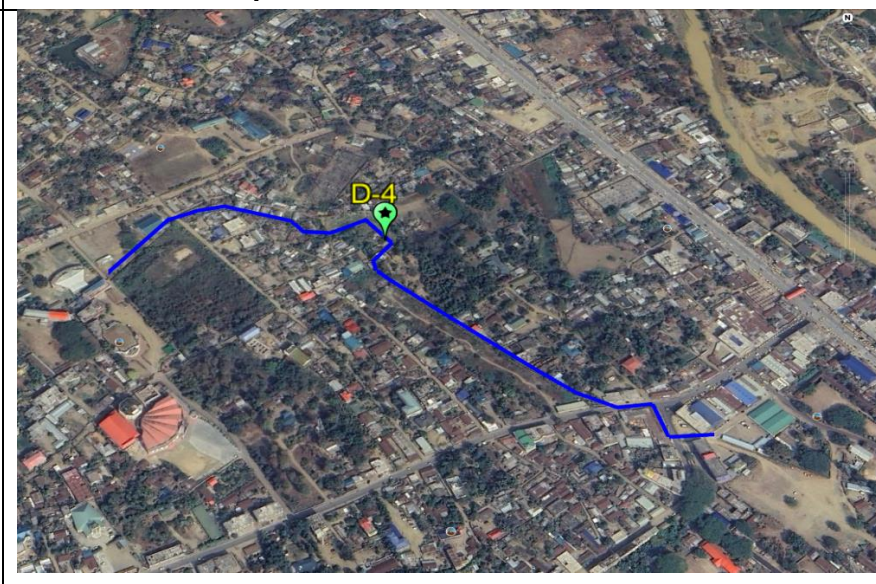
**Proposed Drain 1 in Chümoukedima**



**Proposed Drain 2 in Chümoukedima**



**Proposed Drain 3 in Chümoukedima**

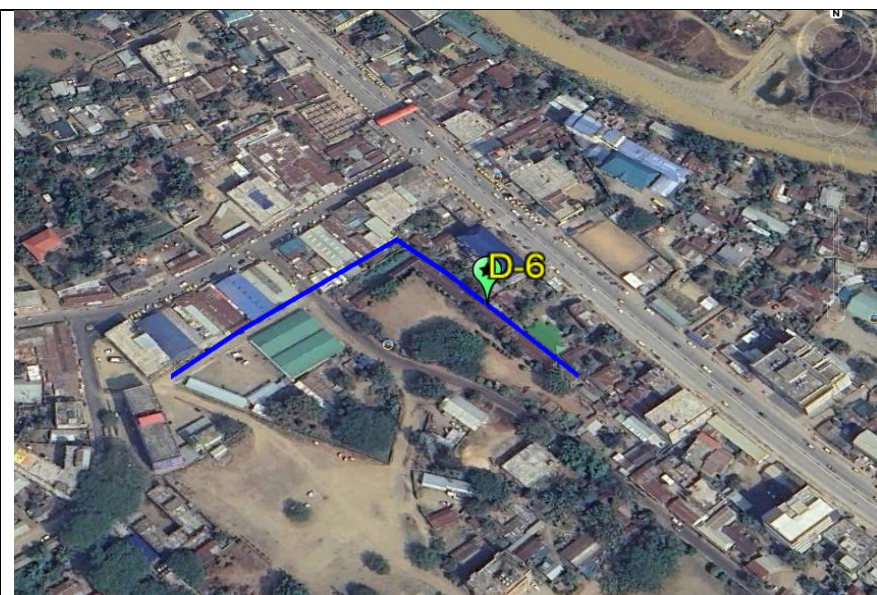


**Proposed Drain 4 in Chümoukedima**





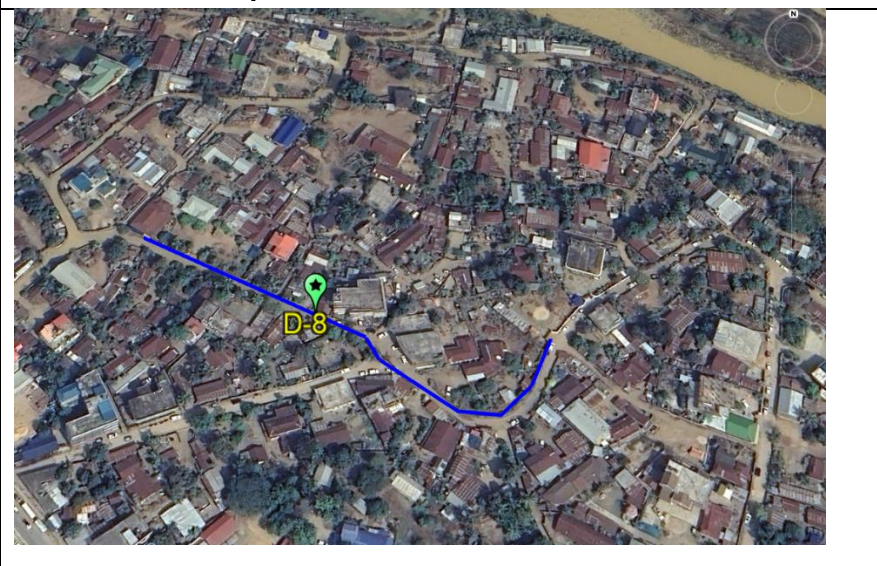
**Proposed Drain 5 in Chümoukedima**



**Proposed Drain 6 in Chümoukedima**

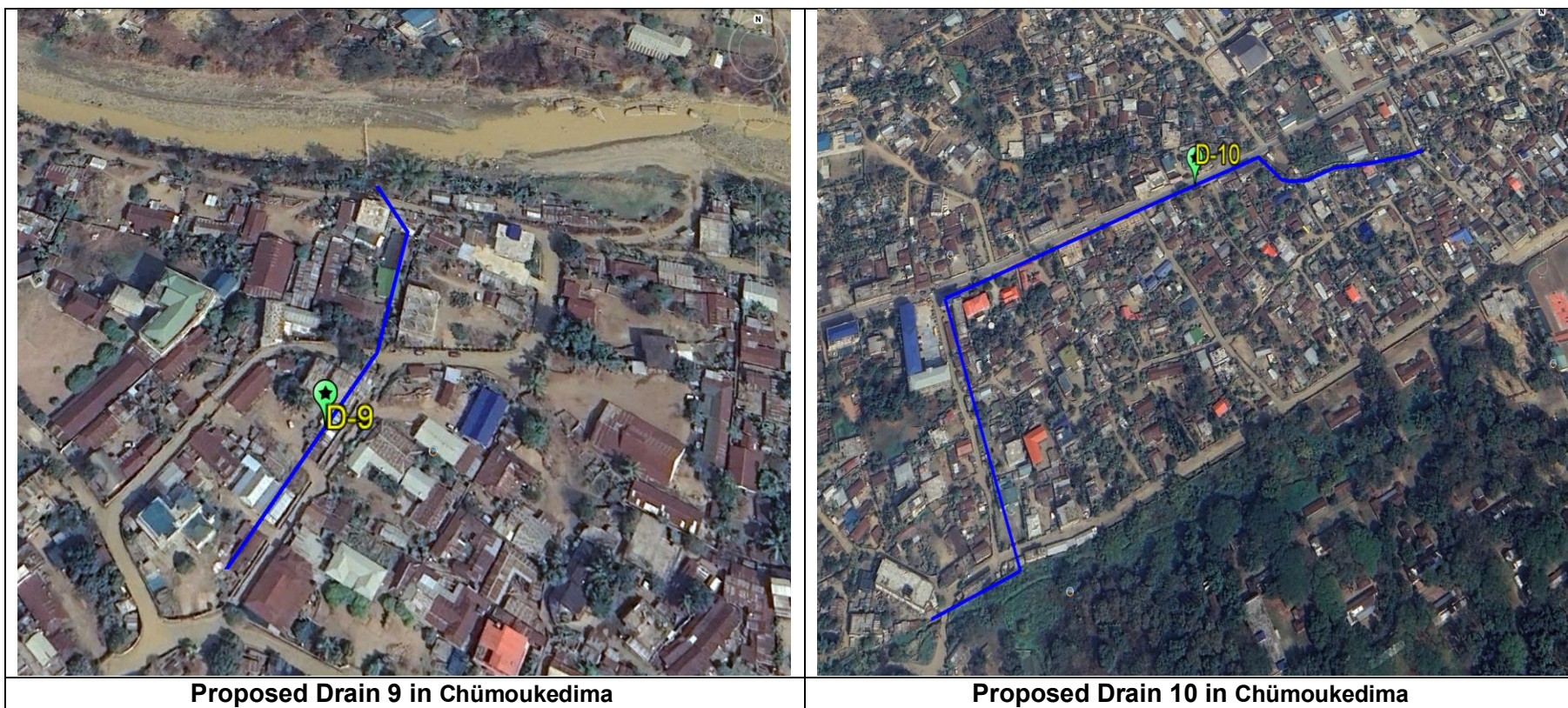


**Proposed Drain 7 in Chümoukedima**



**Proposed Drain 8 in Chümoukedima**





**Proposed Drain 9 in Chumoukedima**

**Proposed Drain 10 in Chumoukedima**

**Figure 10: Proposed Storm Water Drain of Chumoukedima town on Google Earth**

### III. ANALYSIS OF ALTERNATIVES

64. This chapter presents a comparative analysis of feasible alternatives for the proposed project, considering factors such as site location, design, and technology. The analysis evaluates potential future conditions within the project study area under different scenarios, including the “without project” case, to assess their implications.

65. Technical and locational aspects of the subproject components have been examined in detail. The impact assessment indicates that most adverse effects will occur during the construction phase, and these will be temporary in nature. In contrast, the operation phase is expected to deliver substantial socio-economic benefits, particularly through improved sanitation and drainage facilities. Potential negative impacts can be effectively mitigated through the implementation of appropriate engineering designs and mitigation measures.

66. In this project, construction activities are limited to the existing alignments of unpaved tracks. Most of these alignments are traditional broken connecting road, which have gradually evolved into their current form through minor construction works undertaken by local communities, municipal bodies, and the State Government over time. Given these constraints, there are no viable alternative alignments for the proposed works. Therefore, the alternative analysis has been restricted to a comparison between the “with project” and “without project” scenarios.

67. In nearly all subproject components involving roads and drains, works are confined to government land within existing rights-of-way (ROWs), ensuring that no community displacement will occur. During the screening exercise, key areas of concern—such as congested marketplaces along road edges, the presence of sensitive zones, and any potential physical displacement—were carefully assessed. The outcomes of this assessment have informed the engineering design, ensuring compliance with technical requirements while maintaining cost-effectiveness. A comparative analysis of the “with project” and “without project” scenarios is presented in the table below.

**Table 5: Analysis of the “with project” and “without project”**

| Sl. no                      | Parameter                                    | ‘With-Project’ Scenario   | ‘Without-Project’ Scenario  |
|-----------------------------|--|---|---|
| <b>For stormwater Drain</b> |  |   |   |
| 1.                          | Water logging/flooding – extent and duration | Significantly reduced waterlogging during the rainy season in the Dimapur and Chümoukedima town areas.  | The absence of stormwater drain construction would lead to periodic flooding in urbanized areas, causing property damage. Prolonged water stagnation could also create health hazards, including the spread of vector-borne diseases such as dengue and malaria |
| 2.                          | Maintenance of drainage system               | Organized and better maintenance and therefore efficient operation of the created system  | Without proper drainage system, maintenance of drain is not possible  |
| 3                           | Public health                                | Clean and well-maintained surroundings, achieved through proper drainage management, will eliminate foul odors and prevent mosquito breeding in open drains. This will not only enhance the aesthetic appeal of | Mosquito menace due to presence of open drains with low flow velocity   |



| Sl. no         | Parameter             | ‘With-Project’ Scenario   | ‘Without-Project’ Scenario  |
|----------------|-----------------------|---|---|
|                |                       | the area but also improve public health by reducing the risk of vector-borne diseases such as dengue, malaria, and chikungunya.   |   |
| 4              | Roads                 | With the construction of cover stormwater drain, roads will become wide   | No effect. Roads will remain 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        | The current drainage service levels are expected to significantly improve upon implementation of the project. Under the “with project” scenario, no permanent adverse impacts on environmental parameters are anticipated. While minor short-term negative impacts may occur during the construction phase, these will be outweighed by substantial long-term positive outcomes. Therefore, the “with project” scenario is considered far more advantageous compared to the “without project” scenario. |   |
| For Road Works |                       |   |   |
| 1.             | Road Quality          | The proposed urban road improvements are expected to enhance accessibility to health and education facilities while serving as a catalyst for increased economic opportunities. Improved connectivity will facilitate better market access, contributing to higher agricultural incomes and fostering productive employment opportunities within the region.  | Most of the proposed roads are the unpaved tracks which is not motorable, without this project, these roads remains the same.                               |
| 2.             | Drainage              | Side drainage will be enhanced through the development of additional culverts and bridges designed with adequate hydraulic capacity to ensure efficient stormwater conveyance.  | These issues remain unaddressed without the project   |
| 3.             | Environmental Quality | The existing roads, currently comprising earthen and broken bitumen road, will be upgraded with bitumen road, significantly reducing dust pollution. This improvement will provide a higher level of service by enhancing riding quality and ensuring smoother traffic flow, thereby contributing to a reduction in vehicular emissions.  | Without project scenario, the project roads remain the same. Unpaved and broken bitumen 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        | The “With Project” scenario is expected to generate significant positive and beneficial impacts, leading to substantial improvements in the environment and fostering economic development in the region. In contrast, the “Without Project” scenario would likely contribute to the further deterioration of the existing environmental conditions and a decline in the overall quality of life.   |   |

## IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

### A. ADB Policy

68. 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.

69. **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.

70. The environmental impacts of Dimapur and Chumakedima, Urban Road and Drainage subproject have been identified and assessed as part of the planning and design process. An initial environmental assessment using ADB's REA checklist for Urban Road and storm water drain (refer Appendix 1) was conducted, and results of the assessment show that the subproject is unlikely to cause significant adverse impacts. Thus, this IEE has been prepared in accordance with ADB SPS's requirements for environment category B projects.

71. **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.

72. **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.

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

- for environmental category A projects, draft EIA report at least 120 days before Board consideration;

- final or updated EIA and/or IEE upon receipt; and
- environmental monitoring reports submitted by the implementing agency during project implementation upon receipt.

74. **Consultation and Participation.** ADB SPS require borrower to conduct meaningful consultation<sup>4</sup> 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.

75. **Grievance Redress Mechanism.** ADB SPS require 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.

76. **Monitoring and Reporting.** 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. Borrower shall prepare and submit to ADB semi-annual environmental monitoring reports (including COVID 19 compliance) 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.

77. **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.

78. **Occupational Health and Safety.** ADB SPS requires the borrower<sup>5</sup> to ensure that

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<sup>4</sup> 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

<sup>5</sup> 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

workers<sup>6</sup> 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.

79. All site-specific occupational health and safety (OHS) Plan as per the “Standard Operating Procedure for Prevention and Risk Minimization of Corona Virus Disease (COVID-19) at the Facilities and Work Sites” will be developed by PIU/PMU and implemented measures such as: (a) excluding public from the site; (b) personal hygiene, disinfection and maintaining social distancing; (c) ensuring all workers are provided with and use personal protective equipment including face mask; (d) Occupational Health Safety (OHS) Training and COVID 19 awareness training for all site personnel. EMP guides the environmentally-sound construction of the sub project. 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.

80. **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.

81. **Physical Cultural Resources.** 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.

82. **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 Guidelines<sup>7</sup> and

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<sup>6</sup> Including non-employee 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.

<sup>7</sup><https://www.ifc.org/content/dam/ifc/doc/2023/ifc-general-ehs-guidelines.pdf>

Sector Specific [Water and Sanitation] Guidelines<sup>8</sup>). 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.

## **B. National Environmental Laws**

83. The implementation of the subprojects will be governed by Government of India and State of Nagaland and other applicable environmental acts, rules, regulations, and standards. These regulations impose restrictions on the activities to minimize or mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subprojects are consistent with the legal framework, whether applicable international, national, state, or municipal or local. Key standards include those related to drinking water quality, air quality, effluent discharge, and protected areas. Compliance is required in all stages of the subprojects including design, construction, and operation and maintenance.

84. **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.

85. Category A projects require Environmental Clearance from the central Ministry of Environment, Forest and Climate Change (MoEF&CC). The proponent is required to provide preliminary details of the project in the prescribed manner with all requisite details, after which an Expert Appraisal Committee (EAC) of the MoEF&CC prepares comprehensive Terms of Reference (TOR) for the EIA study. On completion of the study and review of the report by the EAC, MoEF&CC considers the recommendation of the EAC and provides the EC if appropriate.

86. Category B projects require environmental clearance from the State Environment Impact Assessment Authority (SEIAA). The State level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study), and prepares TOR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the SEIAA issues the Environmental Clearance based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A if it is located in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries.

87. None of the components of subproject proposed for the Dimapur and Chumakedima town falls under the ambit of the EIA Notification 2006, and, therefore EIA Study or environmental clearance is not required for the subproject.

88. **Applicable Environmental Regulations.** Besides EIA Notification 2006, there are various other acts, rules, policies, and regulations currently in force in India that deal with

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<sup>8</sup><https://www.ifc.org/content/dam/ifc/doc/2000/2007-water-and-sanitation-ehs-guidelines-en.pdf>

environmental issues that could apply to infrastructure development. The specific regulatory compliance requirements of the subproject are shown in **Table 67**.

**Table 6: 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.  | Since the improvement work involves upgrading of existing urban road and Storm Water Drain of the town, this work does not fall in the purview of the EIA Notification 2006 of Government of India (GoI). Hence environmental assessment and environmental clearance is not required for the proposed roads as per GoI regulatory requirements. |
| 2.      | National Environment Policy (NEP), 2006   | NEP is a comprehensive guiding document in India for all environmental conservation programs and legislations by Central, State and Local Government. The dominant theme of this policy is to promote betterment of livelihoods without compromising or degrading environmental resources. The policy also advocates collaboration methods of different stakeholders to harness potential resources and strengthen environmental management.   | NUIDP should adhere to NEP conservation of environmental resources and abatement of pollution.  |
| 3.      | 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 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 Nagaland Pollution Control Board (NPCB) 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 NPCB.   |

| Sr. No. | Law   | Description  | Applicability in the project  |
|---------|---|--|---|
| 4.      | 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.     | <p>Following will require CTE and CTO from NPCB:</p> <p>Establishment of DG sets more than 1 MVA.</p> <p>Batching Plant, and Hot mix plants, if any</p> <p>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 &amp; CTO and copy should be collected from third party and submitted in PIU.</p> <p>Risk- If the contractor fails to provide water tankers for dust suppression, the NPCB can issue a "Stop Work" notice under Section 31A.</p> <p>Integration: The project schedule must front-load earthworks during the dry season but include a high budget for water sprinkling to avoid legal shutdowns.</p> |
| 5.      | 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.   | <p>Ensure applicable standards for ambient air quality. Ensure Emission Limits standards for New DG Sets Ensure stack height standards Requirement for DG Sets.</p> <p><b>Appendix 2</b> provides applicable standards for ambient air quality.</p> <p><b>Appendix 4</b> provides vehicular emission norms</p>  |
| 6.      | 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.   | <p>Ensure applicable noise standards and noise limits for DG sets.</p> <p><b>Appendix 3</b> provides applicable noise standards</p> <p><b>Risk:</b> Many schools and clinics in Chūmoukedima are located within 10 meters of the road/drain alignment. Construction noise typically hits 80–90 dB(A) at the source.</p> <p>Integration: Contractor requires the installation of Temporary Noise Barriers (e.g., acoustic blankets or corrugated sheets) during work near these zones. The cost and time to install these must be in the Bill of Quantities (BoQ).</p>   |
| 7.      | 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.  |

| Sr. No. | Law  | Description   | Applicability in the project  |
|---------|--|---|---|
| 8.      | Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010 | 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).   | <p>Not applicable as no such protected monuments within the project corridors/ area.</p> <p>The Kachari Ruins, an archaeological site in Dimapur, Nagaland, is a protected site managed by the Archaeological Survey of India (ASI). Which is located near the railway station in Dimapur, Nagaland.</p> <p>No proposed subproject road and storm water drain is situated within a 300-meter radius of this ASI site. A "Chance Find Protocol" must be active. If an artifact is found, work must stop immediately, the area must be cordoned off, and the ASI (Archaeological Survey of India) must be notified. Work can only resume after ASI clearance.</p> |
| 9.      | 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 | <p>Applicable.</p> <p>Risk: Civil works cannot technically begin until the Contractor proves they have an active IC and a disseminated POSH Policy.</p> <p><b>Timing:</b> If a contractor from outside Nagaland is hired, setting up a local IC with a qualified "External Member" from a Dimapur-based NGO can take 30–45 days.</p>  |
| 10.     | National Institute of Occupational Safety and Health (NIOSH) Publication No. 98-126  | NIOSH has laid down criteria for a recommended standard: occupational noise exposure. The standard is a combination of noise exposure levels and duration that no worker exposure shall equal or exceed.  | <p>Appendix 5 provides applicable NIOSH occupational noise standards.</p> <p>Contractors are required to provide hearing-protection equipment and ensure exposures of workers to noise-generating activities are within allowed NIOSH standards.</p>  |
| 11.     | Biodiversity Act of 2002, Biodiversity Act 2023  | The Biodiversity Act 2023 primarily addresses provide for conservation, sustainable utilization, fair and equitable sharing of the benefits arising out of the utilization of biological resource. This Act also considered necessary to provide for conservation, sustainable utilization, fair and equitable sharing of the benefits arising out of the utilization of biological resources.        | Not applicable  |
| 12.     | 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.   | <p>There is no Wildlife Sanctuary, National Park are located nearby the proposed project site.</p> <p>“Intanki National Park” is approx. 36 km and 35 Km away (aerial distance) from the Dimapur and Chumakedima town.</p>  |



| Sr. No. | Law  | Description  | Applicability in the project  |
|---------|--|--|---|
| 13.     | 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<br>For tree felling NOC will be required   | Not applicable; none of the components of the subproject are in forest.<br>Rangapahar Reserve Forest located about 7 km and 4 Km (aerial distance) from Chümoukedima and Dimapur town.  |
| 14.     | Notification by Forest Department, Government of Nagaland, Dated 20 <sup>th</sup> October 2010   | Guidelines for extraction of trees from non-forest area stipulates that permission for tree cutting shall be taken from State Forest department  | Applicable. Tree cutting may require for the proposed project.<br>Prior to any tree felling, the required tree-cutting permission shall be obtained from the competent authority.   |
| 15.     | 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 is located nearby the designated wetland  |
| 16.     | Solid Waste Management Rules 2016  | Rules to manage municipal solid waste generated; provides rules for segregation, storage, collection, processing, and disposal<br>Responsibility of Solid Waste Generator:<br>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<br><br>Contractor to follow all the rules during construction works.<br>Improper solid waste handling during road and drainage construction can cause drainage obstruction, environmental pollution, regulatory penalties, and community grievances. |
| 17.     | 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, remodeling, 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  |
| 18.     | 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 with all the requirements of this Act during construction works.   |

| Sr. No.                       | Law   | Description   | Applicability in the project  |
|-------------------------------|---|---|---|
| 19.                           | 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.  |
| 20.                           | Workmen Compensation Act, 1923  | Provides for compensation in case of injury by accident arising out of and during the course of employment.   | Compensation for workers in case of injury by accident  |
| 21.                           | The Building and Other Construction Workers (BOCW) Act 1996   | Labour Department, Government of Nagaland has adopted proactive approach and initiated necessary steps to implement the provisions of the BOCW Act for the welfare of construction workers  | Contractors are required to follow all the provisions of the Act with respect to construction workers.  |
| 22.                           | The inter-state migrant workmen (regulation of Employment and Conditions of service) act, 1979.   | 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.,  | Contractor to comply with the provisions of the Act if interstate migrant workers are engaged for the work  |
| 23.                           | Payment of Wages Act, 1936<br>Minimum Wages Act, 1948   | Minimum wages fixed by appropriate Government as per provisions of the Act if the employment is scheduled employment. Construction of buildings, roads and runways are scheduled employment.  | Contractor to comply with the provisions of the Act<br>All construction workers should be paid not less than the prescribed minimum wage          |
| 24.                           | Equal Remuneration Act, 1979  | 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.  | Contractor to comply with the provisions of the Act<br>Equal wages for work of equal nature to male and female workers                            |
| 25.                           | Notification from Ministry of Jal Shakti (Department of Water Resources, River Development and Ganga Rejuvenation), central ground water authority on 20 <sup>th</sup> 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.-<br><br>All new/existing industries, industries seeking expansion, <b>infrastructure projects</b> 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 |
| <b>International treaties</b> |   |   |   |

| Sr. No. | Law   | Description   | Applicability in the project  |
|---------|---|---|---|
| 26.     | 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  |
| 27.     | 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.   |
| 28.     | 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.  |
| 29.     | 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. |
| 30.     | 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 7: List of NOC Required for Safeguarding the Project**

| <b>S. No</b> | <b>Construction Activity</b>                           | <b>Statute under which Clearance is Required</b>   | <b>Implementation</b>            | <b>Supervision</b> |
|--------------|--|--|----------------------------------|--------------------|
| 1.           | Land for project activity                              | Allotment and approval for specific land use   | Urban Development - UD           | PMU                |
| 2.           | Road cutting for drain construction                    | Permission from UD and PWD (where applicable)  | Project Implementation Unit- PIU | PMU                |
| 3.           | Establishment of construction camps                    | Allotment and approval for specific land use from UD   | Contractor                       | PIU                |
| 4.           | NOC for disposal of excess Earth                       | Construction & Demolition Waste Management Rules, 2016   | Contractor                       | PIU                |
| 5.           | Tree Cutting   | State forest department/Revenue dept. as per requirement   | PIU                              | PMU                |
| 6.           | Hot mix plants, Crushers, Batching plants and DG Set   | Consent to establish and consent to operate under Air Act, 1981 from NPCB  | Contractor                       | PIU                |
| 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 NPCB | Contractor                       | PIU                |
| 8.           | New Sand mining, quarries and borrow areas             | Environmental clearance under EIA Notification 2006 Permission from Directorate of Geology and Mining (DGM), Nagaland                  | Contractor/ Third Party          | PIU                |
| 9.           | Use of vehicles and equipment                          | Pollution under control certificate (PUC) form RTO/ Pollution Control Board  | Contractor                       | PIU                |
| 10.          | Temporary traffic diversion measures                   | Temporary traffic diversion measure including use of alternate road from District traffic police                                       | Contractor                       | PIU                |
| 11.          | Use of highway ROW for construction area/ crossing     | National Highway Authority of India  | PIU                              | PMU                |

89. PMU will be overall responsible for supervision in getting all clearances and provide details to ADB through semi-annual 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

90. **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.

91. The literature survey broadly covered the following:

- (i) Project details, reports, maps, and other documents prepared by the Govt. of Nagaland
- (ii) Discussions with Technical experts of the PDMC team, municipal and Nagar Panchayat authorities, relevant government agencies like Nagaland Pollution Control Board (NPCB) 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. Study Area

92. For baseline establishment a study area has been determined for the site; the subsequent sections provide an understanding of the study area in relation to each environmental parameter and reasons for its selection.

- **Project Footprint:** The Dimapur & Chumoukedima road and drain project site footprint is the area that may reasonably expected to be directly physically disturbed by activities or infrastructure during construction. This includes areas where subproject interventions are proposed.
- **Study area:** The study area has been defined to include the key sources of environmental and socio-economic information surrounding the proposed sites. These sources provide both spatial and contextual data needed to understand baseline conditions. Information has been gathered from multiple levels, ranging from localized observations to broader district-level datasets, ensuring that both immediate and wider surroundings are considered. Based on this approach, the study area has been delineated and divided into two zones:
  - **Core Zone:** The core zone consists of the surroundings of the proposed sites, where primary data were collected through site visits, field surveys, and consultations with local stakeholders. This zone provides detailed information on the physical, biological, and socio-economic characteristics most relevant to the proposed project site.
  - **Buffer Zone:** The buffer zone covers the wider area beyond the proposed project site footprint, where information was obtained from secondary sources such as district statistical handbooks, census data, satellite imagery, and reports from line departments. This zone provides a broader context for understanding regional environmental and socio-economic conditions.

**Table 8: Proposed Subproject Area of Influence**

| Environment Parameter | Core | Buffer | Remarks  |
|-----------------------|------|--------|--|
| Biological            | 1 km | 5 km   | Study area of 5 km radius was considered for undertaking the biological data collection. Surveys provide an understanding of the |

| Environment Parameter | Core | Buffer | Remarks  |
|-----------------------|------|--------|--|
|                       |      |        | proposed subproject site, its immediate surroundings (core zone) and wider setting (buffer zone). For primary biological survey, both floral and faunal surveys were conducted through transects in the proposed subproject footprint and within 1 km radius. For running an Integrated Biodiversity Tool (IBAT) report a 50km buffer was used to pick up on any wide-ranging species and nearest protected/key biodiversity areas. The IBAT report is appended in Appendix 6. |
| Physical              | 500m | 5 km   | Study area of 5 km radius was considered for undertaking physical environment data collection. For most parameters, 500m radius was considered as core zone for mapping of sensitive receptors during the field surveys and for undertaking baseline monitoring.   |
| Socio-economic        | 500m | 5 km   | Study area of 5 km radius is considered for socio-economic context, with a core zone of 500m radius for mapping of individual sensitive receptors and consultations during field surveys.  |

### C. Physical Resources

#### 1. Location, Area and Connectivity

93. Nagaland is a landlocked state located in the northeastern region of India. It shares its northern boundary with Arunachal Pradesh, western boundary with Assam, and southern boundary with Manipur, while its eastern boundary forms an international border with Myanmar. Geographically, the state lies between latitudes 25°06' N to 27°04' N and longitudes 93°20' E to 95°15' E. Kohima serves as the state capital, while Dimapur is the largest city and commercial hub. The state is predominantly hilly, with a rich cultural heritage and strategic significance due to its location along the Indo-Myanmar border.

94. Baseline status of the 2 project towns is given below.

**Table 9: Baseline- Physical Characteristic of project towns**

| Baseline Characteristic | Dimapur  | Chümoukedima   |
|-------------------------|--|--|
| <b>Location</b>         | <b>Dimapur</b> , the largest city and municipality of Nagaland, is situated in the southwest of the state near the Assam border, along the Dhansiri River, a tributary of the Brahmaputra. The area is largely flat, with the district covering 927 sq. km. It is bordered by Kohima district to the east, Peren district to the south, Assam's Karbi Anglong and the Disputed Area Belt of Golaghat district to the west and north. The town lies between latitudes 25° 56' 18.00" N to 25° 52' 37.03" N and longitudes 93° 40' 40.62" E to 93° 45' 08.12" E. | <b>Chümoukedima</b> District, the 15th district of Nagaland, was officially created on 18 December 2021. Geographically, it is bounded by Kohima District to the east, Peren District to the south, Tsemintyu and Niuland Districts to the north-east, Dimapur District to the north, and Karbi Anglong District of Assam to the west and north-west. The district headquarters is situated in the municipality of Chümoukedima. Covering a total area of 6,110 square kilometers, the Chümoukedima Town Council consists of 11 wards. The district is located at 23°03' N latitude and 93°30'30" E longitude (Kukidolong), with an altitude ranging from 200 meters to 2,000 meters above mean sea level. |

| Baseline Characteristic | Dimapur  | Chümoukedima   |
|-------------------------|--|--|
| <b>Area</b>             | <b>Dimapur</b> , the largest urban center in Nagaland, covers an area of approximately 20.31 square kilometers and is administered through 23 municipal wards.   | <b>Chümoukedima</b> , the district headquarters of Chümoukedima District, spans an area of approximately 26.72 square kilometers and is organized into 11 municipal wards under the Chümoukedima Town Council.   |
| <b>Connectivity</b>     | <b>Dimapur</b> is strategically connected by multiple national highways and rail links, serving as a vital transportation hub in Nagaland. National Highway 29 links Dimapur to Kohima, Imphal, and the Myanmar border at Moreh, while NH-36 connects the town with Doboka and Nagaon in Assam. In addition, NH-37 provides a direct route between Guwahati and Dimapur. The town is also traversed by both NH-36 and NH-39, enhancing regional connectivity. Dimapur houses the state's only airport, located approximately 9 kilometers from the district center, offering air connectivity to key destinations. It also has the only railhead in Nagaland, which connects the state with neighboring regions, including Guwahati and Kolkata, through the main line of the North-East Frontier Railway.   | <b>Chümoukedima</b> enjoys good connectivity through road, rail, and air transport networks. Dimapur Airport, located approximately 7 kilometers north of the town center, provides air connectivity, while the Chümoukedima Shokhüvi Railway Station, situated about 10 kilometers southwest, serves as the nearest railhead. The town is linked to the state's commercial hub, Dimapur, and the state capital, Kohima, via the National Highway. The primary approach road from the National Highway to the Town Council office has a carriageway width of approximately 30 feet, whereas most internal roads within the town are narrower, with widths generally less than 6 meters.  |
| <b>Topography</b>       | The topography of Dimapur district is predominantly plain, with an average elevation of around 145 meters above mean sea level. The region lies along the banks of the Dhansiri River, a tributary of the Brahmaputra, which flows along its eastern side. The terrain is largely flat in the central and western parts, gradually transitioning into gentle slopes towards the eastern and southern boundaries where it meets the foothills of Kohima district. This flat landscape, coupled with fertile alluvial soil deposits, supports agriculture and settlement. The district's geographical position near the Assam border also facilitates connectivity and trade, making it an important economic gateway for Nagaland.<br>Dimapur, located in the southwestern part of Nagaland, features predominantly plain terrain with gentle slopes and minor undulations. The town lies at an average elevation of approximately 145 meters above mean sea level. The area gradually slopes toward the Dhansiri River on the western side, which serves as the main natural drainage channel. The eastern periphery transitions into low hill ranges that form the foothills of the Naga Hills. | The topography of Chümoukedima district is characterized by a mix of plains, foothills, and hilly terrain, with elevations ranging from about 200 meters to 2,000 meters above mean sea level. The lower areas, particularly in and around the district headquarters, comprise gentle slopes and flatlands, while the northern, eastern, and southern parts gradually rise into more rugged hill ranges. The district forms part of the transitional zone between the plains of Dimapur and the higher elevations of Kohima and Peren districts. Numerous seasonal streams and rivulets drain the hilly areas, eventually joining larger rivers in the plains. This varied topography influences the district's land use patterns, settlement distribution, and agricultural practices.<br>Chumukedima, located in the Dimapur district of Nagaland, exhibits an undulating and hilly topography, forming part of the foothills of the Naga Hills. The town lies at an average elevation ranging from 150 to 300 meters above mean sea level, with moderate to steep slopes in several areas. The terrain generally slopes westward toward the Dhansiri River basin, while the eastern side is characterized by elevated |

| Baseline Characteristic   | Dimapur   | Chümoukedima   |
|---------------------------|---|--|
|                           | The relatively flat topography facilitates urban expansion and infrastructure development; however, the presence of low-lying areas and inadequate stormwater drainage often leads to waterlogging and localized flooding during intense rainfall events.   | ridges and hillocks. The natural drainage pattern is influenced by the terrain, with numerous small streams and seasonal nallahs flowing westward. Due to its sloping terrain, Chumukedima is prone to soil erosion, slope instability, and high surface runoff during heavy rainfall events, necessitating appropriate slope stabilization and drainage management measures.  |
| <b>Soil &amp; Geology</b> | <p><b>Soil:</b> The soils of Dimapur are predominantly alluvial and loamy, developed from riverine deposits. They are generally fertile, well-drained, and moderately deep, suitable for agriculture and vegetation growth. The texture varies from sandy loam to clay loam, with good moisture-retaining capacity in low-lying areas. However, in certain parts, poor drainage conditions and high-water tables contribute to localized waterlogging. The soil's moderate permeability and gentle slope facilitate urban development, though proper drainage management is essential to prevent flooding and soil degradation.<sup>9</sup></p> <p><b>Geology:</b> Dimapur is located in the southwestern alluvial plains of Nagaland, geologically forming part of the Tertiary formation of the Naga Schuppen Belt. The area primarily comprises alluvium deposits derived from the Dhansiri River system, consisting of fine sand, silt, clay, and gravel. The underlying geological formations are mainly composed of soft sandstone, shale, and conglomerate beds, belonging to the Disang and Tipam Groups. These formations are relatively young and unconsolidated, making the region susceptible to erosion and sedimentation, particularly during heavy monsoon rainfall.</p> | <p><b>Soil:</b> The soils of Chumukedima are primarily red loamy and lateritic, developed from weathered sandstone and shale parent materials. These soils are generally well-drained, moderately fertile, and slightly acidic in nature. The texture varies from sandy loam on the upper slopes to clay loam in the lower foothill zones. Due to high rainfall and sloping terrain, the area experiences surface runoff and erosion, leading to nutrient loss in exposed zones. Proper soil conservation measures, such as contour trenching, vegetative barriers, and slope stabilization, are essential to maintain soil health and reduce erosion hazards in this hilly region.</p> <p><b>Geology:</b> Chumukedima lies in the foothill zone of the Naga Hills, forming a transitional terrain between the plains of Dimapur and the higher hill ranges of Nagaland. The geological formations are mainly composed of sandstone, shale, siltstone, and mudstone of the Disang and Barail Groups of the Tertiary period. These sedimentary rocks are moderately hard and occasionally interbedded with ferruginous materials. The area exhibits signs of structural deformation, such as minor folds and faults, due to its proximity to the tectonically active Naga Hills belt. The rugged terrain and steep slopes in certain parts make the region moderately susceptible to landslides and slope instability during intense rainfall.<sup>10</sup></p> |

## 2. Vulnerability – Earthquake, Flood

95. According to the latest Seismic map of India, the entire North-East region is one of the

<sup>9</sup> Aquifer Mapping and Management of Ground Water Resources Dimapur District, Nagaland

<sup>10</sup> Miocene palynology and geochemistry of the Upper Bhuban Formation at Chümoukedima, Nagaland (India), Geological Journal

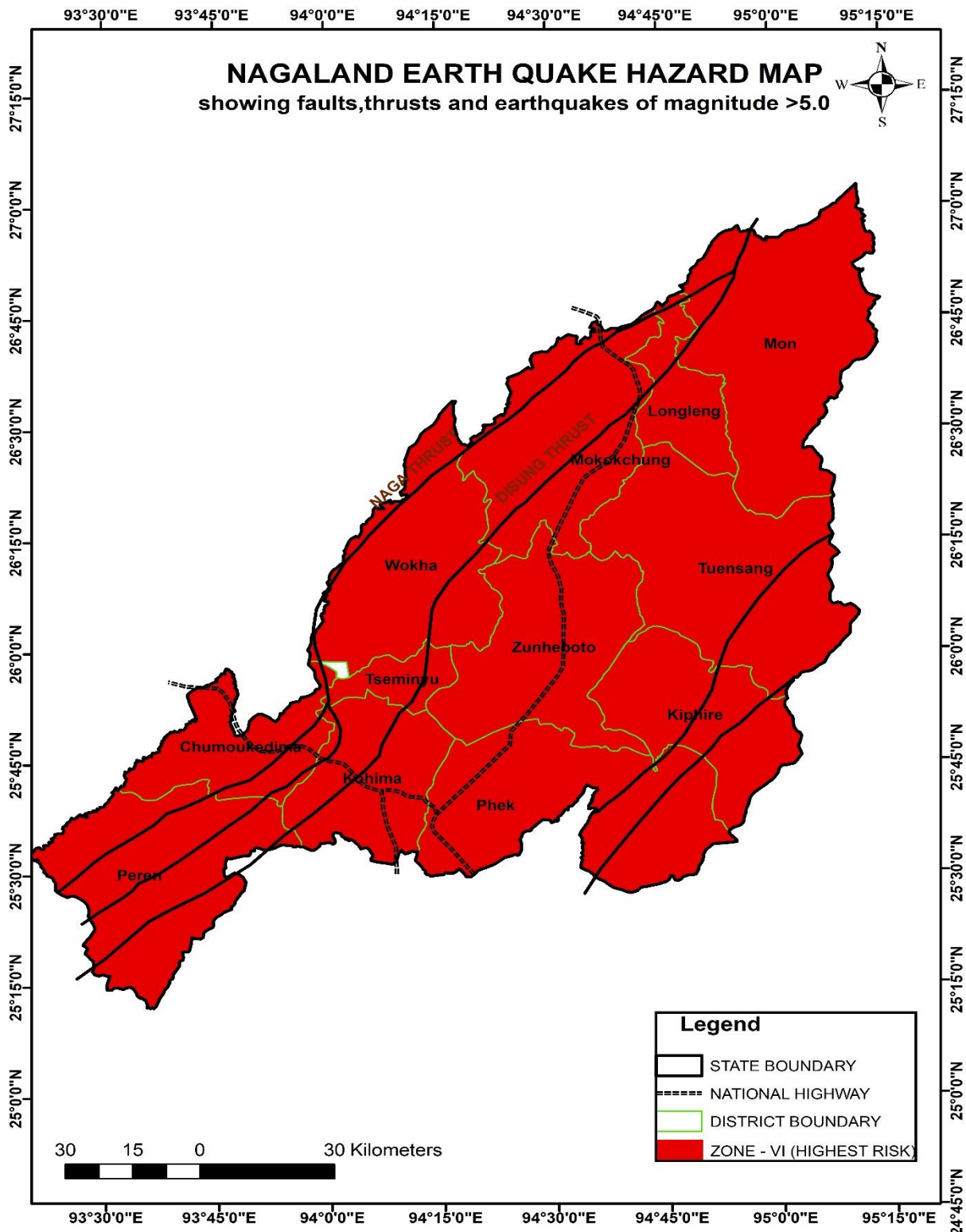


seismically most active regions of the world. The entire Himalayan Region is considered to be vulnerable to high intensity earthquakes of a magnitude sometimes exceeding 8.0 on the Richter scale. Amongst the most severe earthquakes in the world are the two great earthquakes which occurred on the 12th of June 1897 near Rongjuli, Assam (magnitude 8.7) and on the 15th of August 1950 at Tajobum, Arunachal Pradesh (magnitude 8.7). As many as 20 destructive earthquakes of magnitudes 6 to 7 have rocked this region during the past century. Scientific publications have warned that very severe earthquakes are likely to occur anytime in the Himalayan Region that could adversely affect the lives of several million people in the region.

96. The entire state of Nagaland falls under Seismic Zone VI, the newly designated highest earthquake risk zone, indicating extreme seismic vulnerability. This classification reflects the state's complex tectonic setting, as it lies close to major active geological structures, including the Himalayan Frontal Thrust (HFT) and the Indo–Burma subduction zone. These tectonic boundaries are among the most seismically active regions in the world and are capable of generating high-magnitude earthquakes.

97. Nagaland is located at the convergence of the Indian Plate with the Eurasian and Burmese Plates, resulting in frequent crustal deformation, active faulting, and high seismic energy release. Historical seismic records and geophysical studies confirm the occurrence of moderate to strong earthquakes in and around the region. Due to this tectonic complexity, the area is highly susceptible to ground shaking, landslides, slope failures, and secondary hazards during seismic events. Consequently, all infrastructure development in the state must strictly adhere to earthquake-resistant design standards and relevant seismic safety codes to minimize risk to life and property. Earthquake of Nagaland is given below.

98. All the 2 sub project towns fall under seismic zone VI, which is highly vulnerable.



**Figure 11: Earthquake Hazard Map of Nagaland**  
(Source: GIS Map, PDMC, NUIDP)

### 3. Flood

#### Dimapur

99. Dimapur receives heavy rainfall from June to October. Average annual rainfall is approximately 1500 mm. In Dimapur town the artificial drainage system is very poor. It is for this reason that floods are annual recurring problems in some of the low-lying colonies where most of the cultivation happens. Floods are one of the major causes of concern during the monsoon season, which cause huge loss of property, damage to crops and displacement of people. With adverse global climatic changes taking place, this could become a more serious problem in the near future with greater areas being inundated. This could also lead to the loss of lives if appropriate measures are not taken. However, loss of property in the form of homes and business establishments may rise to unprecedented levels.

100. Flood Prone Zone of Dimapur such as Dhobinala, Burma Camp, Sachu Colony, Purana Bazaar, Vilhume Colony, SM Colony, Lengrijan, Walford Colony, Police Colony, Lake View Colony, Island Colony, Zeliangrong Colony, and Half Nagarjan are frequently inundated during heavy rains and suffer from waterlogging. Severe cases have disrupted life, damaged property, and forced evacuations.<sup>11</sup>

101. Landslide is a major disaster that keeps affecting Nagaland especially in Monsoon, when heavy down pour is experienced all over Nagaland. Some of the major Landslide Disasters that Nagaland has faced are - in August 2001 Dimapur area experienced a cloud burst which lasted almost for one hour. This gave rise to so many landslides in that area, particularly the Paglapahar region which experienced the heavy down pour. In a stretch of just 4 kms on National Highway 39, seven major slides occurred which brought traffic to a standstill.

102. **Landslip.** While Dimapur district is largely characterized by plains and flood risks, landslip susceptibility exists in peripheral and foothill zones, particularly along elevated road corridors and cut slopes. Landslips are generally triggered by intense monsoonal rainfall, slope cutting, inadequate drainage, and unregulated construction activities that weaken soil cohesion and increase pore water pressure. Landslip-prone stretches are commonly observed along the Dimapur–Kohima (NH-29) corridor, especially near the Chümoukedima foothill section, where road widening and hill cutting have altered natural slope stability. Areas around 7th Mile–Piphema stretch, parts of Chümoukedima town slopes, and roadside embankments near Medziphema approach sections also exhibit localized slope instability during heavy rainfall. Minor slope failures have been reported along cut slopes near expanding residential developments and construction sites on elevated terrain.

#### Chümoukedima

103. Chümoukedima receives heavy rainfall from June to October. Average rainfall is 1120 mm. The artificial drainage system in the district is very poor and given the type of the soil i.e., loamy and sandy clay, therefore, the chance of a flooding is very high. Some drowning cases are reported from Chathe river and Dhansiripar river during monsoon season.

104. Villages and localities prone to flooding include Tenyiphe, Chekiye, Ward 10 near DC Office, Virazouma, Neiphrolie Colony, Singrijan Village, Khopanala Village, Sovima Village, and

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<sup>11</sup> District Disaster Management Plan, Dimapur, 2018-2019

areas around the 173rd CRPF Camp near the airport.<sup>12</sup>

105. **Landslip.** Chumoukedima district, characterized by undulating terrain and foothill slopes, is comparatively more prone to landslips than the plains of Dimapur. The district lies within a geologically sensitive zone of Northeast India, where fragile hill slopes, weathered rock formations, and high monsoonal rainfall increase slope instability. During the southwest monsoon, prolonged and high-intensity rainfall leads to soil saturation, increased pore water pressure, and weakening of slope materials, resulting in localized landslides and slope failures.

106. Landslip incidents in Chumoukedima district are frequently reported along the Dimapur–Kohima (NH-29) corridor, particularly within the Chumoukedima hill stretch. Vulnerable locations include the 7th Mile–Chumoukedima section of NH-29, the Piphema–Medziphema hill segments, and the slopes surrounding Chumoukedima Town and the New Chumoukedima settlement areas. Additional risk is observed along road cut sections and active construction sites situated on steep gradients. These areas are prone to recurring minor to moderate landslips during periods of heavy rainfall, often leading to traffic disruptions and localized damage to infrastructure.

#### 4. Climatic Conditions

107. Nagaland has a largely monsoon climate with high humidity levels. Annual rainfall averages around 70–100 inches (1,800–2,500 mm), concentrated in the months of May to September. In summer, Temperatures range from 70 °F (21 °C) to 104 °F (40 °C). In winter, temperatures do not generally drop below 39 °F (4 °C), but frost is common at high elevations. There are three well defined seasons in Nagaland. The temperature during the summer season remains between the 16 to 31 degrees Celsius. Heavy rainfall occurs between the months of May and August.. Winter makes an early arrival in the state of Nagaland in which temperature drops as low as of 4 degrees Celsius in winter. The maximum average temperature recorded in the winter season is 24 degrees Celsius. The higher 3 altitudes are enveloped in snow. Strong northwest winds blow across Nagaland during the months of February and March.<sup>13</sup>

108. **Dimapur** district experiences a sub-tropical humid climate, with summer temperatures reaching up to 36 °C and winter temperatures dropping to around 3.2 °C. Relative humidity remains high, typically between 74% and 87%. The district is significantly influenced by the south-west tropical monsoon, which generally lasts from May to September, accompanied by occasional winter showers.

109. The average annual rainfall in Nagaland ranges from 2,000 mm to 2,500 mm, with approximately 135 rainy days per year (variation: 60–190 days). For Dimapur district, meteorological data indicate an average annual rainfall of 1,236.93 mm over the period 2006–2015, while in 2017 the district recorded 2,148.6 mm of rainfall.

110. The climate of the Chümoukedima District falls under sub-tropical type with hot and humid summer, mild winter and heavy rainfall during the monsoon. The annual rainfall is 1472.5 mm and the maximum and minimum temperature recorded is 34 and 24 degree centigrade respectively.

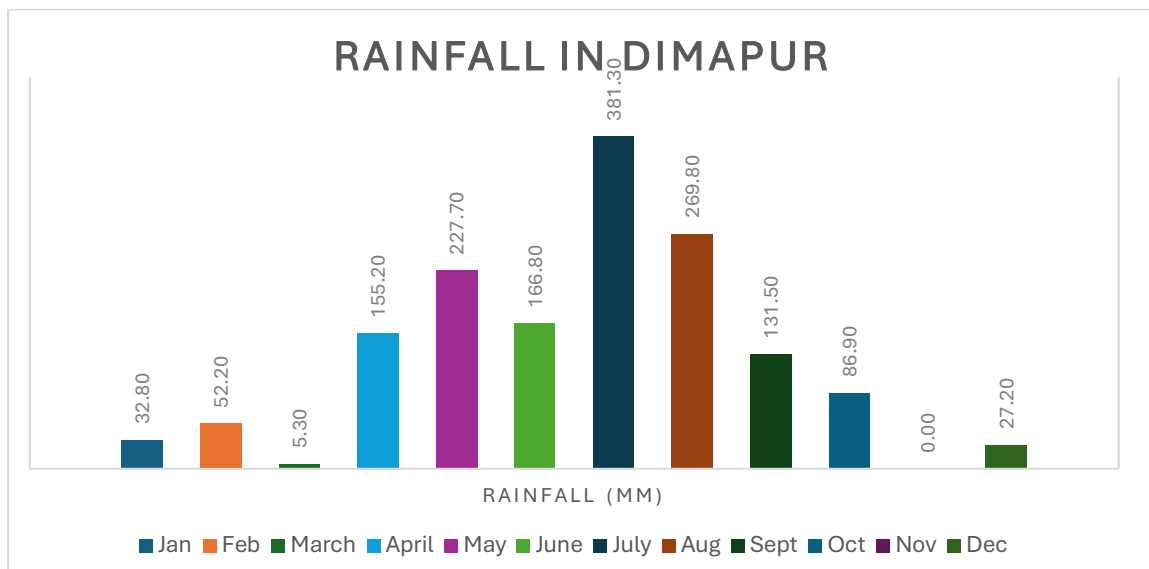
111. Monthly rainfall data of Dimapur and Chümoukedima for the year of 2021 is present in

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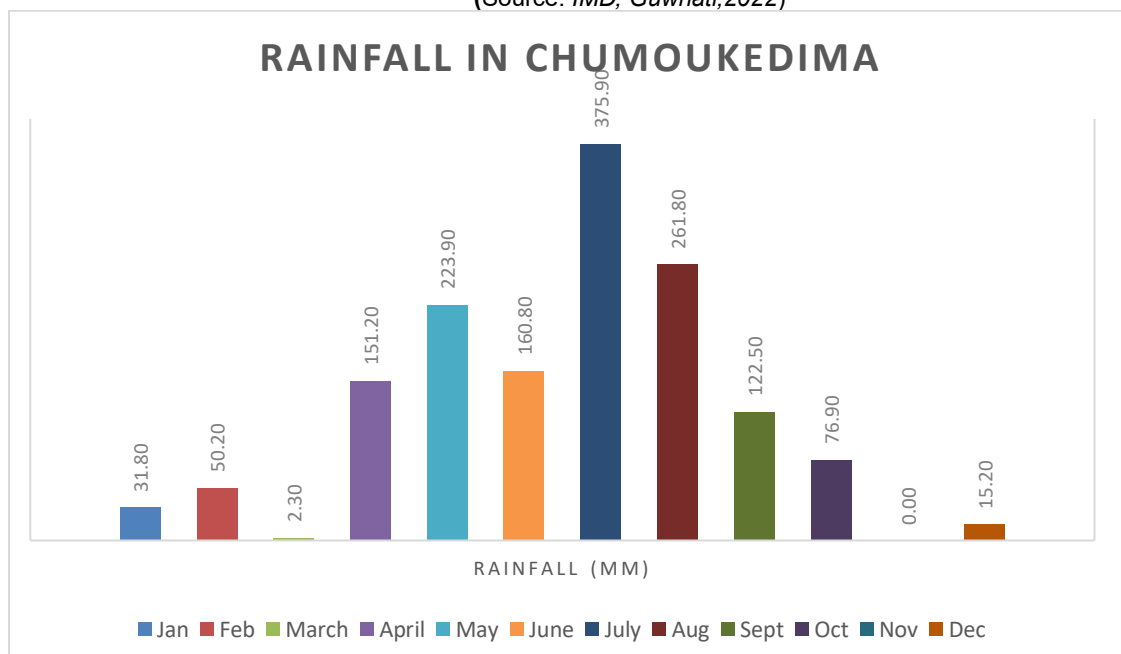
<sup>12</sup> District Disaster Management Plan, Chumoukedima, 2023

<sup>13</sup> <https://www.tribaltoursinindia.com/climate-of-nagaland/>

below figure.



**Figure 12: Month wise rainfall data in Dimapur in Year 2021**  
(Source: IMD, Guwhati, 2022)



**Figure 13: Month wise number of rainy days in year 2021 (Chümoukedima)**  
(Source: IMD, Guwhati, 2022)

## 5. Surface and Ground Water

112. Nagaland's surface water resources are primarily sustained by its dense river network, with major rivers such as the Dhansiri, Doyang, Dikhu, Tizu, and Zungki, along with their numerous tributaries, providing significant water flow throughout the year, especially during the monsoon season. These rivers, fed by high rainfall, follow predominantly dendritic drainage patterns and support agriculture, domestic needs, and fisheries. Groundwater occurs mainly in the valley areas and foothills, stored within alluvial deposits, weathered rock zones, and fractured

bedrock. However, due to the hilly terrain, groundwater availability is uneven, with shallow aquifers dominating and limited deeper groundwater potential. While surface water is generally abundant during the monsoon, seasonal variation often causes scarcity in lean months, making integrated water resource management crucial for the state.

## Surface Water of Dimapur

113. Dhansiri, Diphu and Dayang rivers form the major drainage Sub-basins of the mighty Brahmaputra. Dhansiri flows through the southwestern part of the state through Rangapahar-Dimapur Plains of Dimapur District. Its main tributaries are river Dzuza and Diphu. These rivers are fed by a number of 2nd and 3rd order streams emerging from the hills are dendritic to sub dendritic in the hilly terrain and locally is sub-parallel in the plains. A number of patches of swampy land are observed in the southeast and southwest parts of the area Dhansiri and Diphu (Chathe) rivers and their tributaries serve as the main source of water for irrigation and domestic purposes in Dimapur valley. Dhansiri riverbed consists mainly of fine to sandy loam whereas the Diphu Riverbed is mostly made up of mantle of boulders, cobbles and gravels due to its fast-flowing rate.<sup>14</sup>

114. The Central Pollution Control Board conducted water quality monitoring of different parameters (like pH, conductivity, DO, temperature, nitrate, BOD, etc.) in the State under National Water Quality Monitoring Programme (NWMP), 2023 on monthly basis.

**Table 10: Analytical results of water samples collected from river, 2023**

| Name Of Monitoring Location                            | Temperature (°C) |      | Dissolved Oxygen (mg/L) |     | pH    |     | Conductivity (µmhos/cm) |     | BOD (mg/L) |     | Nitrate (mg/ L) |      |
|--|------------------|------|-------------------------|-----|-------|-----|-------------------------|-----|------------|-----|-----------------|------|
|  | Min              | Max  | Min                     | Max | Min   | Max | Min                     | Max | Min        | Max | Min             | Max  |
| River Dhansiri At Full Nagarjan Bridge                 | 20.8             | 33.4 | 6.1                     | 7.6 | 6.6   | 8.1 | 66                      | 699 | 1.6        | 2.3 | 0.30            | 1.7  |
| River Dhansiri Near Nagaland-Assam Border              | 18.6             | 33.3 | 5.9                     | 6.8 | 7.2   | 7.7 | 76                      | 900 | 1.2        | 2.4 | 0.30            | 2.40 |
| River Dhansiri At Notun Bosti Near Naga Cemetery (Old) | 17.8             | 30.7 | 2.8                     | 5.6 | 7.0   | 8.0 | 154                     | 502 | 2.5        | 4.8 | 0.30            | 4.50 |
| Indian Standard for Surface Water                      | -                |      | 5                       |     | 7-8.5 |     | -                       |     | 3          |     |                 |      |

Source: Water Quality Data of Rivers Monitored Under National Water Quality Monitoring Programme (NWMP), 2023

115. As per CPCB surface water quality standards, the analysis of the Dhansiri River indicates that the water quality at Full Nagarjan Bridge and near the Nagaland–Assam border falls under Class B, suitable for outdoor bathing and as a source for drinking water after conventional treatment. These locations recorded adequate dissolved oxygen (5.9–7.6 mg/L), low biochemical oxygen demand (1.2–2.4 mg/L), and acceptable pH levels (6.6–8.1), reflecting good

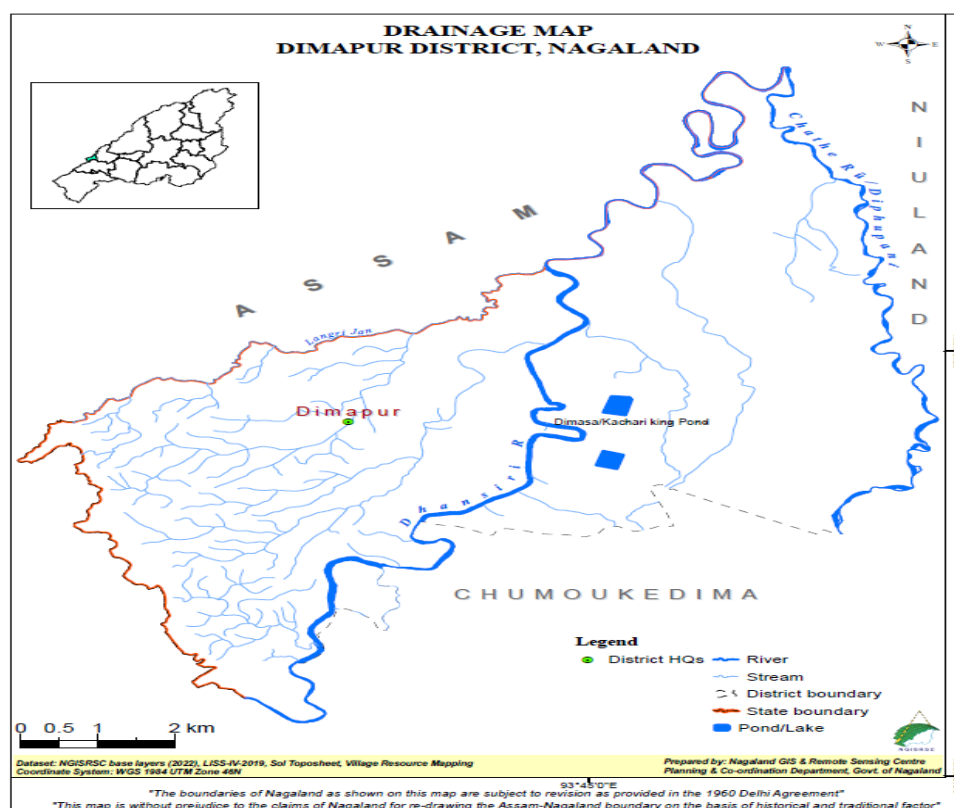
<sup>14</sup> Ground Water Information Booklet Dimapur District, Nagaland

water quality conditions. However, at Notun Bosti near Naga Cemetery, the water quality shows signs of deterioration, with lower dissolved oxygen (as low as 2.8 mg/L) and higher BOD values (up to 4.8 mg/L), indicating organic pollution possibly from domestic wastewater or nearby human activities. The overall assessment suggests that while the upstream stretches of the Dhansiri River remain relatively clean and within Class B standards, the downstream section exhibits localized contamination, placing it under Class D, suitable mainly for the propagation of wildlife and fisheries.

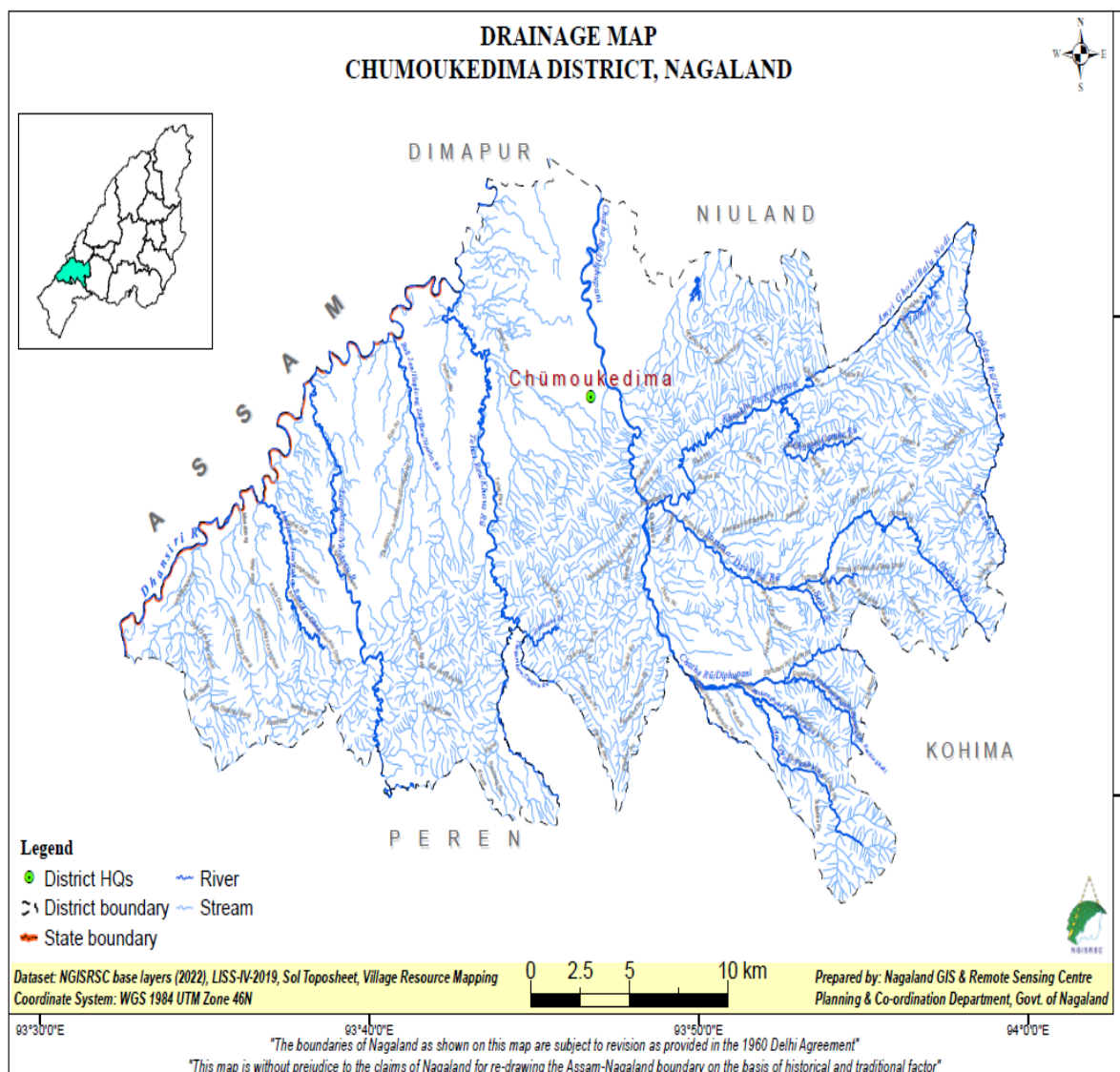
## Surface Water of Chümoukedima

116. Chümoukedima district in Nagaland has a net irrigated area of 300.0 hectares from surface water sources. The primary sources of water in the state include streams, small rivers, springs, and nallas, which also contribute to groundwater recharge. In Chümoukedima, 18% of water supply schemes are based on surface water, while 73% rely on groundwater. Currently, there is no available data on the surface water quality of the project towns. Baseline surface water quality will be established at specific project locations prior to the commencement of construction, as outlined in the Environmental Management Plan (EMP). This requirement will also be incorporated into the Site Environmental Management Plan (SEMP). The baseline monitoring will be carried out by the contractor before the start of construction, engaging a government-approved laboratory to ensure compliance with quality standards.

117. Waterbody map of Dimapur and Chümoukedima district are given below.



**Figure 14: Waterbody Map of Dimapur District**  
(Source- Nagaland GIS & remote Sensing Centre planning & Co-ordination Department, GoN)



**Figure 15: Waterbody Map of Chumoukedima District**

(Source- Nagaland GIS & remote Sensing Centre planning & Co-ordination Department, GoN)

118. **Ground Water.** In Nagaland, groundwater occurs primarily in unconsolidated alluvial deposits, weathered zones, and fractured hard rock formations, with its availability and yield varying according to geological conditions. The major groundwater-bearing formations include the alluvium of river valleys, semi-consolidated sandstones of the Tipam and Dihing formations, and fractured zones in older consolidated rocks. Groundwater is mainly utilized for drinking and irrigation purposes, with dug wells, ring wells, and tube wells being common extraction structures. In valley areas such as Dimapur and parts of Chumoukedima, groundwater occurs under water table to confined conditions, while in hilly regions it is mostly limited to springs and shallow aquifers. Overall, groundwater quality is generally suitable for use, though localized issues of iron and turbidity are reported.

119. Hydro geologically, the district is underlain by two distinct groups of rocks: semi-consolidated formations and valley-fill deposits, where groundwater occurs under both water table and confined conditions. The primary water-bearing formations include unconsolidated



alluvial deposits and semi-consolidated formations of the Dihing and Tipam groups, which are predominantly found in intermontane valleys such as Dimapur and Jaluki-Medziphema, as well as in fractured zones within semi-consolidated and consolidated formations.

120. Ground water development potentiality is restricted to construction of open wells having depth of 5 to 20 meters and deep tube wells down to 100 to 300 meters depth. The yield of the tube wells ranges from 10 to 45 m<sup>3</sup>/day with a reasonable drawdown. Water bearing formation pertaining to Tertiary deposits are found to have moderate potentialities which can sustain deep tube wells having yield prospect varying from 10 to 20 m<sup>3</sup>/hr. The valleys underlain by Tipam sandstone form good aquifers with yield prospect ranging from 30 to 80 m<sup>3</sup>/hr. In the consolidated formations ground water abstraction structures can be constructed in structurally weak zones. Ground water at deeper levels is found to occur under semi confined to confined conditions. Auto flow zones have also been identified in some parts of the district in and around Dhansiripar areas.<sup>15</sup>

121. Ground water quality testing as done by Nagaland Pollution Control board under CPCB within NWM program is shown below table.

**Table 11: Analytical results of Ground water quality of Dimapur District, 2022**

| Station Name                                      | Temperature °C |      | Total Dissolved Solids (mg/L) |      | pH      |     | Conductivity (µmhos/cm) |     | B.O.D. |     | Nitrate-N (mg/l) |     | Fluoride (mg/l) |     | Arsenic (mg/l) |     |
|---|----------------|------|-------------------------------|------|---------|-----|-------------------------|-----|--------|-----|------------------|-----|-----------------|-----|----------------|-----|
|   | min            | max  | min                           | max  | min     | max | min                     | max | min    | max | min              | max | Min             | max | min            | max |
| Open well at Doyapur Near Dimasa Baptist Church   | 23.7           | 28.6 | 89.1                          | 90.6 | 5.7     | 6.2 | 180                     | 196 | BDL    | BDL | 0.6              | 0.7 | BDL             | BDL | BDL            | BDL |
| Borewell At Dhansiripar Near Sibrai (Shiv) Temple | 26.1           | 28.6 | 110                           | 122  | 6.8     | 7.6 | 210                     | 244 | BDL    | BDL | 0.8              | 0.9 | 0.3             | 0.3 | BDL            | BDL |
| Standard  |                |      |                               |      | 6.5-8.5 |     |                         |     |        |     | 45               |     |                 |     |                |     |

(Source- Nagaland Pollution Control Board, 2022)

122. As per CPCB and BIS (IS:10500:2012) drinking water quality standards, the analysis of groundwater samples from Dimapur District (2022) indicates that the overall water quality is within permissible limits. The pH values ranged from 5.7 to 7.6, showing slightly acidic conditions at Doyapur but remaining within the acceptable range at Dhansiripar. Total Dissolved Solids (TDS) were low, ranging from 89.1 to 122 mg/L, indicating fresh and low-mineral content water. Electrical conductivity values (180–244 µmhos/cm) also reflect low ionic concentration. Nitrate levels (0.6–0.9 mg/L) were well below the permissible limit of 45 mg/L, and both fluoride and arsenic were below detectable limits, suggesting the absence of harmful contamination. Overall, the groundwater quality in Dimapur district is good and suitable for drinking and domestic purposes, though pH correction may be required in certain areas with slightly acidic conditions.

## 6. Air Quality

123. There are no data on ambient air quality of Project towns, which is not subject of

<sup>15</sup> Ground Water Information Booklet Dimapur District, Nagaland

monitoring by the NPCB because there are no major industries located in and around. Other than traffic there is no significant source of pollution, so levels of oxides of Sulphur and nitrogen are likely to be well within the National Ambient Air Quality Standards (NAAQS). Contractor will monitor air quality of the specific project locations before start of the construction.

## **7. Noise Level**

124. There is currently no available data on noise levels in the project area, as it is not monitored by the NPCB due to the absence of major industries in and around the vicinity. Baseline noise quality will be assessed at designated project locations prior to the commencement of construction activities.

## **D. Ecological Resources**

125. Nagaland is endowed with rich ecological resources, comprising diverse forest types such as tropical evergreen, sub-tropical evergreen, semi-evergreen, and deciduous forests, along with extensive bamboo groves. The state's varied topography and climate support a wide range of flora, including valuable timber species like teak, sal, hollock, and gamari, as well as medicinal plants, wild fruits, and numerous orchid varieties. Its fauna includes elephants, mithun, hoolock gibbons, hornbills, and other bird species, along with reptiles, amphibians, and freshwater fish found in its rivers and wetlands. The biodiversity of Nagaland plays a critical role in sustaining the ecological balance and supporting the livelihoods of local communities; however, pressures from shifting cultivation, deforestation, and developmental activities pose challenges to conservation.

126. Dimapur district is characterized by a mix of urbanized areas and patches of natural vegetation, including tropical and sub-tropical plant species. The district's ecosystem supports a variety of flora such as bamboo, teak, and cane, along with fruit-bearing trees like mango, jackfruit, and banana. Wetlands and riverbanks along the Dhansiri and Chathe rivers provide habitats for aquatic plants and migratory birds. Faunal diversity includes species of freshwater fish, reptiles, amphibians, and small mammals. However, urban expansion and infrastructural development have led to habitat fragmentation, posing a challenge to the conservation of native biodiversity.

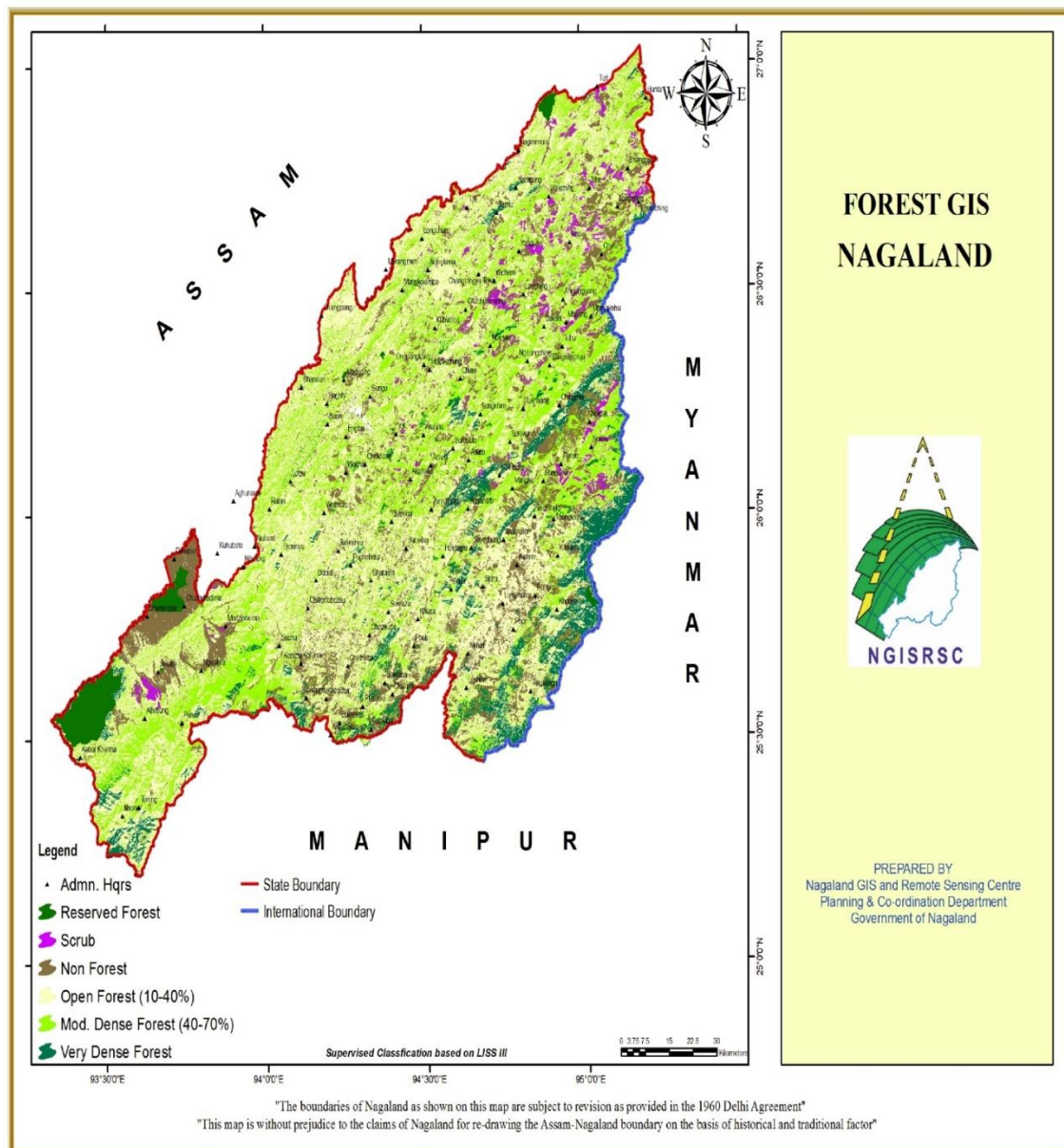
127. Chümoukedima district has a predominantly hilly terrain with rich forest cover, supporting sub-tropical evergreen and semi-evergreen vegetation. The forests host a variety of tree species such as sal, teak, hollock, and various bamboo species, along with medicinal plants and orchids. The region's rivers and streams, including the Chathe and Dhansiri tributaries, sustain freshwater biodiversity and provide vital resources for agriculture and livelihoods. Wildlife includes diverse bird species, small mammals, and reptiles, with some areas serving as seasonal habitats for migratory fauna. Despite its ecological richness, shifting cultivation and land-use changes are gradually impacting the district's natural resources.

## **1. Forest Area & Biodiversity**

128. Nagaland, with a geographical area 16,579 sq km has 234 sq km reserve forest and 8,623 sq km of unclassed forest, which includes all forest other than reserve forest and protected forest. The state has 8,623 sq km of recorded forest areas, which is 52.01% of geographical area. The Reserved Forests constitute 3.06%, Protected Forests 5.51% and Unclassed Forest constitute 93.56%.

129. The Intanki National Park is situated in Peren District which is approximately 36 km and 35 Km away from the Dimapur and Chümoukedima town. The Intanki National Park has a total area of 202.02-kilometer square. Declared as a National Park in the year 1993, it is home to varied wildlife, which include Golden langur, Hoolock gibbon, Palm civets, Tiger, Sloth bear, Wild dogs, flying squirrels, Black stork, Monitor lizard, Python etc. The vast stretch of equatorial forest is known for its scenic beauty and semi-tropical vegetation.

130. Forest map of Nagaland is shown in **Figure 16**. Although Rangapahar Reserve Forest is located within Dimapur district, the proposed subproject sites are not situated in proximity to the reserve forest.. Only few open scrub and social forestry land is noted.

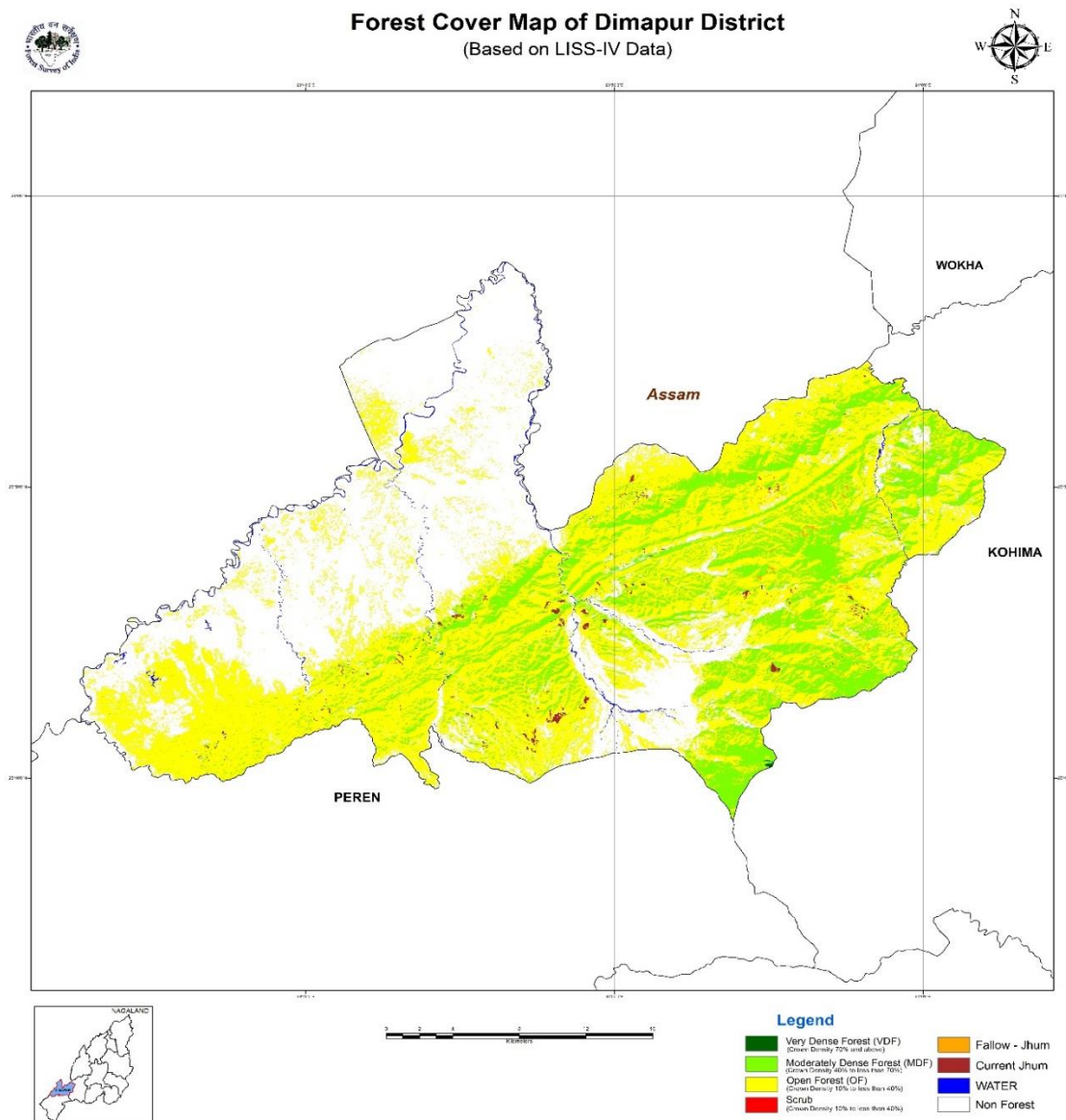


**Figure 16: Forest map of Nagaland**

131. Total forest area in Dimapur district is 589 sq.km which is 63.5% of total geographical

area. Out of 589 sq.km, the maximum portion is open forest which is 402 sq.km.

132. The total area of the Chümoukedima district in Nagaland is approximately 6,110 sq km, and about 64.9% of the district is covered by forest. Type of forest in Chümoukedima district is Sub tropical with immense flora and fauna. Separate Chümoukedima district forest map is not available in authentic source. Forest map of Dimapur (including Chümoukedima) is attached below.

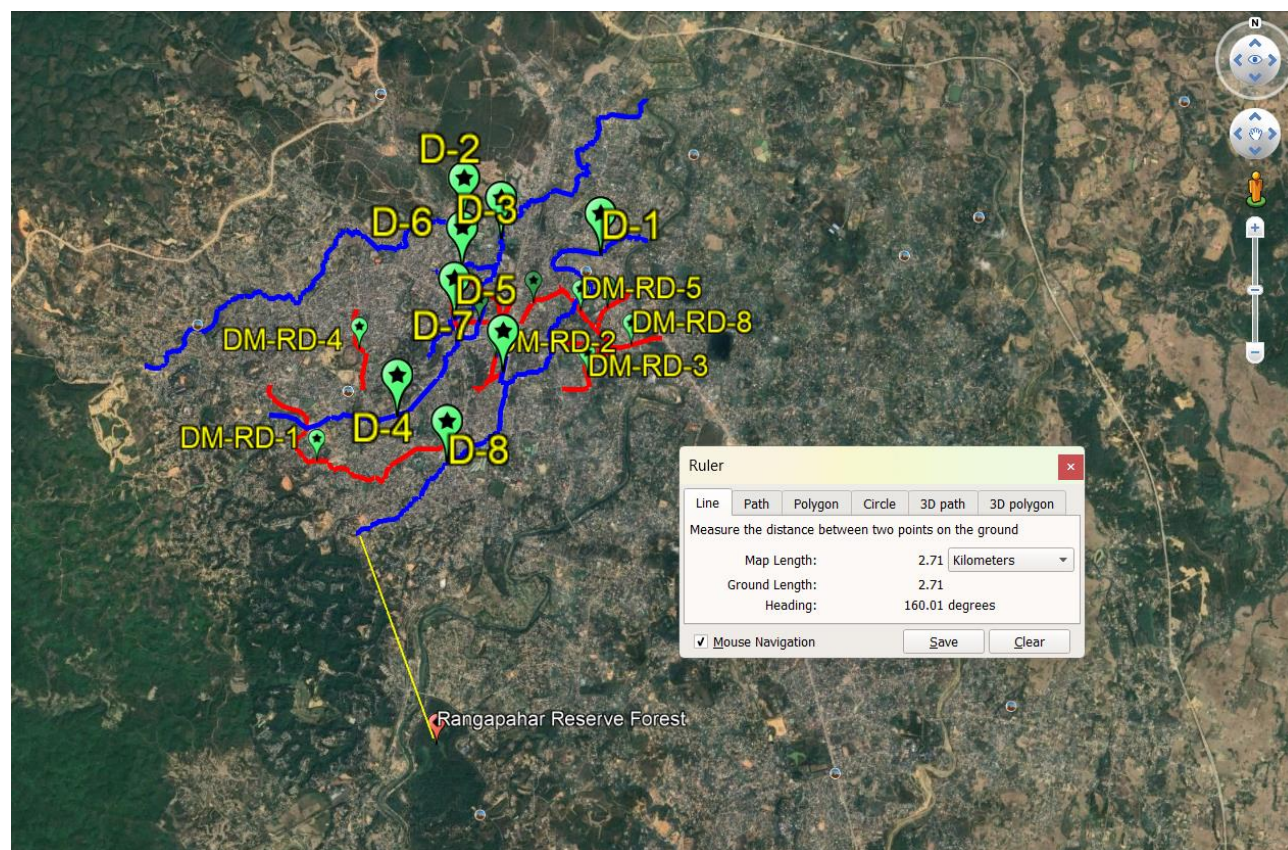


**Figure 17: Forest map of Dimapur (including Chümoukedima)**

133. **Rangapahar** Reserve Forest, one of the notable reserve forests of Nagaland, is renowned for its rich wildlife and diverse flora, including a variety of medicinal plant species preserved and utilized for traditional medicine preparation. The forest is home to common wildlife such as bears, deer, chitals, wild goats, and several other species, along with endangered fauna that are rarely found elsewhere and are on the brink of extinction. Covering an area of 49.4 acres, the reserve is located approximately 2.71 km from the proposed urban road and

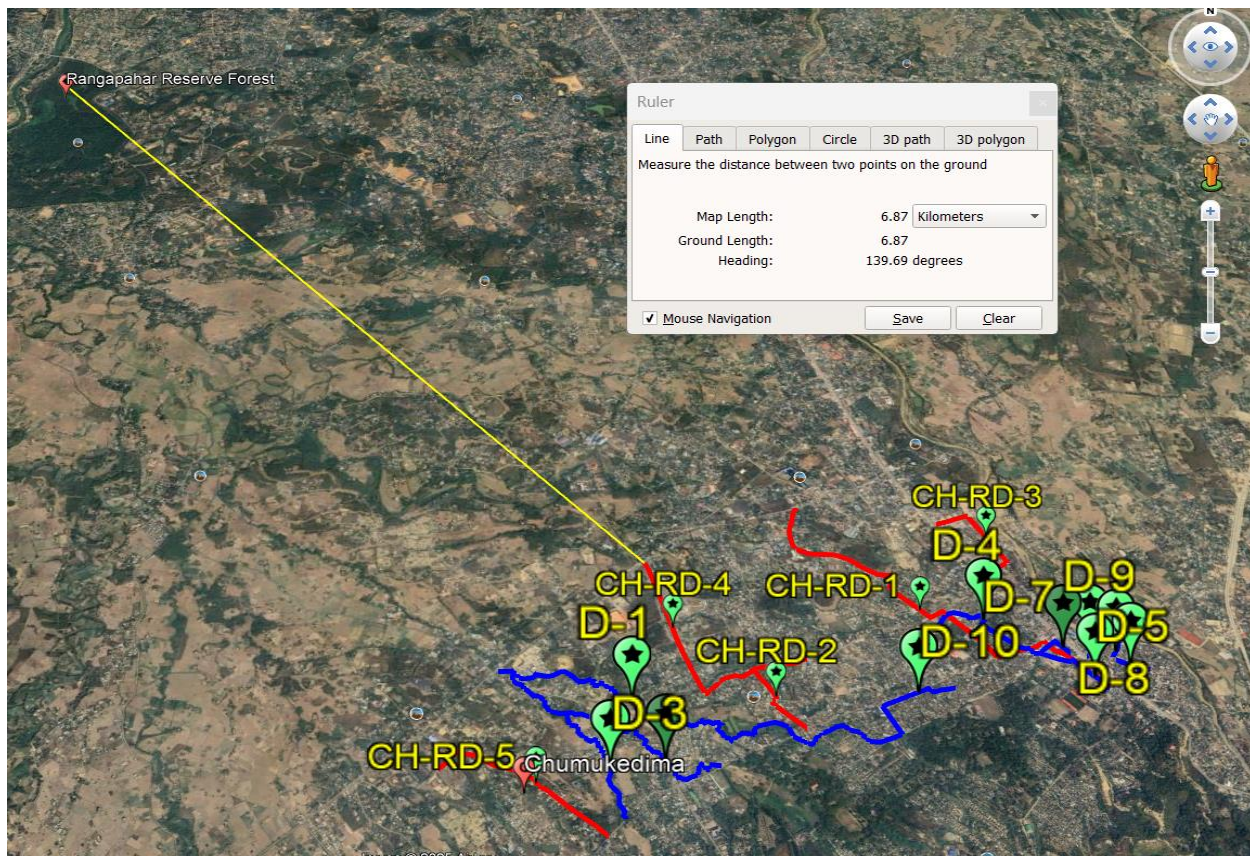


stormwater drainage site in Dimapur. Similarly, Rangapahar Reserve Forest, situated about 6.87 km from Chümoukedima town, also holds ecological significance and contributes to the biodiversity conservation of the region.



**Figure 18: Distance between Rangapahar Reserve Forest and Nearest drain of Dimapur**





**Figure 19: Distance between Rangapahar Reserve Forest and Nearest urban road of Chumukedima**

### **Critical Habitats – Key Biodiversity Area**

134. **Integrated Biodiversity Assessment Tool (IBAT) Screening Assessment (Dimapur).** The IBAT report indicates that the Dimapur Road and drain site lies within a landscape that is highly likely to be classified as Critical Habitat, as multiple Critically Endangered (CR) species (as per IUCN status) are predicted to occur within a 1 km radius, and several CR and Endangered (EN) species, along with 1 Key Biodiversity Areas (KBA), are present within a 10 km radius and 8 KBA present within 50 KM radius. However, no protected area or Key Biodiversity Area is located within the immediate 1 km radius of the project site.

135. The IBAT screening identifies several Endangered (EN) and Critically Endangered (CR) species within the 1 km and 10 km buffer of the proposed Dimapur road and drainage project. A species-specific assessment of potential impacts is provided below:

- **Cuon alpinus – Dhole (EN, decreasing).** The dhole is a wide-ranging carnivore inhabiting forested and semi-forested landscapes. The proposed road and drain works are confined to urban and peri-urban areas and do not extend into forest habitats or wildlife corridors. No new access roads will be created. Therefore, no direct or indirect impact on this species is anticipated.
- **Manouria emys – Asian Giant Tortoise (CR, decreasing).** This species is highly sensitive to forest degradation and habitat fragmentation. The project does not involve construction in forested areas or the removal of natural vegetation. As all works are limited to existing road alignments, no habitat loss or movement barrier for this species

is expected.

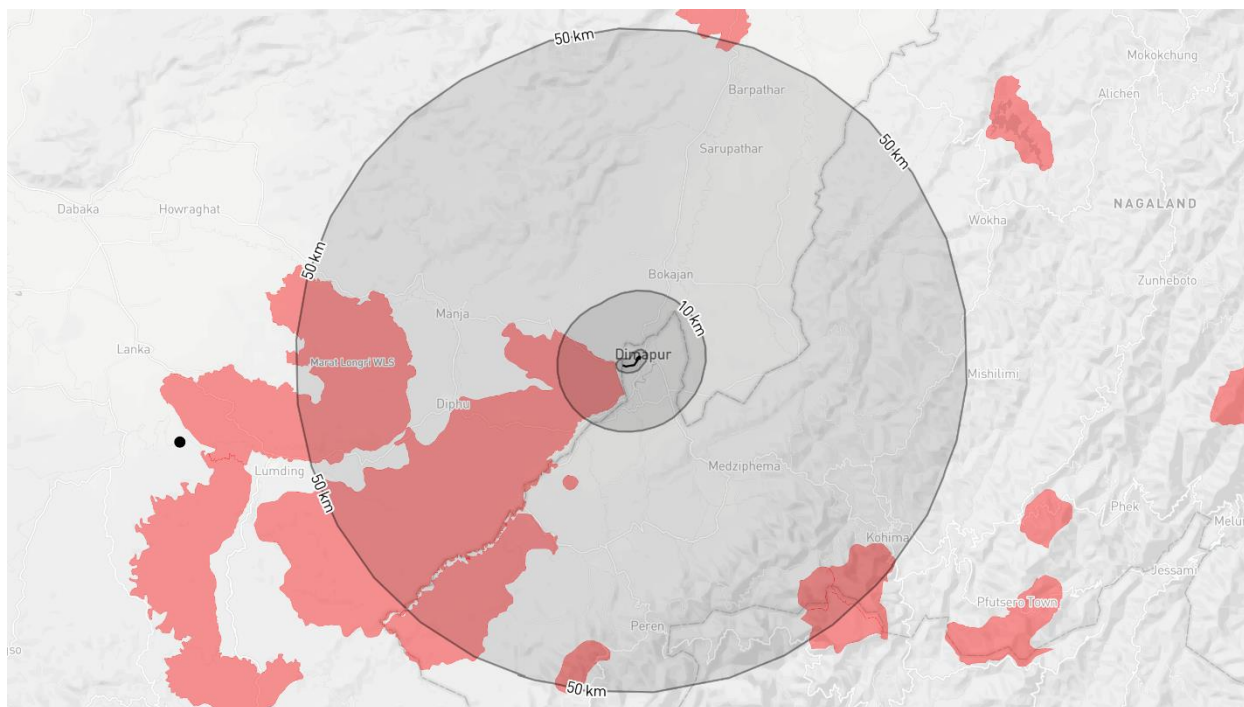
- **Emberiza aureola – Yellow-breasted Bunting (CR, decreasing).** A migratory species that utilizes wetlands, agricultural fields, and open scrub habitats during wintering. The project area does not include such habitats, and no wetland conversion is proposed. Hence, the project is not expected to adversely affect this species.
- **Heliopais personatus – Masked Finfoot (CR, decreasing).** This species is an indicator of undisturbed forest streams and is sensitive to hydrological alterations and riparian vegetation loss. The road and drainage project does not involve modification of natural streams or clearance of riparian vegetation. With appropriate sediment control measures, no significant indirect impact is anticipated.
- **Nycticebus bengalensis – Bengal Slow Loris (EN, decreasing).** The nocturnal arboreal mammal depends on continuous tree cover. The proposed works do not require tree felling or canopy clearance. As construction activities are limited to already disturbed urban areas, no impact on this species is anticipated.
- **Perdica manipurensis – Manipur Bush-quail (CR, population unknown).** This endemic species relies on intact grassland and scrub habitats. The project does not involve conversion or disturbance of such habitats. Therefore, no impact on this species is expected.
- **Manis pentadactyla – Chinese Pangolin (CR, decreasing).** This species is threatened mainly by hunting and habitat disturbance. The project does not involve forest works or creation of new access routes that could increase hunting pressure. Accordingly, no adverse impact on this species is anticipated.
- **Gyps tenuirostris – Slender-billed Vulture (CR, decreasing).** A scavenger species sensitive to disturbance near nesting and roosting sites. The project does not involve erection of tall structures, power lines, or removal of large trees. Therefore, no impact on nesting or foraging behavior is expected.
- **Hoolock hoolock – Western Hoolock Gibbon (EN, decreasing).** This arboreal primate requires contiguous forest canopy. As the project area lacks forest cover and no tree felling is proposed, no impact on this species is anticipated.
- **Sarcogyps calvus – Red-headed Vulture (CR, decreasing).** This solitary tree-nesting vulture depends on large emergent trees. The proposed project does not involve removal of mature trees or disturbance of potential nesting habitats. Hence, no adverse impact is anticipated.
- **Aquila nipalensis – Steppe Eagle (EN, decreasing).** A wide-ranging raptor that may forage over open areas. Temporary construction activities are unlikely to affect foraging behavior, and no permanent habitat alteration is proposed. Therefore, no significant impact is expected.
- **Pangshura sylhetensis – Assam Roofed Turtle (CR, decreasing).** A riverine species dependent on natural flow regimes and stable banks. The drainage works will not alter natural stream flows or disturb riverbanks used for nesting. Adequate sediment and erosion control measures will be implemented to prevent downstream impacts.
- **Nilssonina nigricans – Black Softshell Turtle (CR, decreasing).** This highly aquatic species requires clean, oxygenated water. As no instream works are proposed and sediment control measures will be implemented, no significant impact on this species is anticipated.
- **Asarcornis scutulata – White-winged Duck (CR, decreasing).** A forest-wetland specialist sensitive to habitat disturbance. The project does not involve forest wetland clearance or alteration of shaded streams. Hence, no adverse impact is expected.
- **Elephas maximus – Asian Elephant (EN, decreasing).** Elephants require large contiguous habitats and migratory corridors. The urban project area does not overlap

with elephant corridors or forest habitats. Therefore, no direct or indirect impact is anticipated.

- **Trachypithecus pileatus – Blond-bellied Langur (EN, decreasing).** This arboreal primate depends on forested habitats. As the project is confined to urban areas without forest cover, no impact is anticipated.
- **Gyps bengalensis – White-rumped Vulture (CR, decreasing).** A colonial nester sensitive to disturbance. The project does not involve activities near known nesting or roosting sites, and no blasting or high-noise activities are proposed. Therefore, no adverse impact is anticipated.
- **Aythya baeri – Baer's Pochard (CR, decreasing).** A wetland-dependent migratory species sensitive to disturbance. The project does not involve modification of wetlands or water bodies used by this species. Hence, no impact is anticipated.
- **Cuora mouhotii – Keeled Box Turtle (EN, decreasing).** This species inhabits forest floors and moist terrestrial habitats. The project does not involve forest clearance or soil excavation in natural habitats. Therefore, no impact is expected.
- **Melanochelys tricarinata – Tricarinate Hill Turtle (EN, decreasing).** A terrestrial turtle dependent on undisturbed habitats. As construction is limited to existing roads in urban areas, no impact is anticipated.
- **Cuora amboinensis – Southeast Asian Box Turtle (EN, decreasing).** A semi-aquatic species inhabiting wetlands and forest edges. The project will not affect such habitats; hence, no adverse impact is expected.
- **Tor putitora – Golden Mahseer (EN, decreasing).** This species inhabits clean, fast-flowing rivers. No instream works or flow alterations are proposed under the road and drainage project. Therefore, no impact is anticipated.
- **Houbaropsis bengalensis – Bengal Florican (CR, decreasing).** A grassland-dependent species requiring tall grass habitats. The project does not involve grassland conversion or disturbance of breeding habitats. Hence, no significant impact is anticipated.
- **Calidris tenuirostris – Great Knot (EN, decreasing).** A migratory shorebird using coastal and wetland habitats. The project area does not include such habitats; therefore, no impact is expected.
- **Indotestudo elongata – Elongated Tortoise (CR, decreasing).** This terrestrial species inhabits forest and scrub habitats. The project does not involve works in such habitats. Accordingly, no impact is anticipated.

136. One Key Biodiversity Area, the Dhansiri Reserve Forest, lies within a 10 km radius of the project area. Located in the Karbi Anglong and Golaghat districts of Assam, it comprises tropical moist deciduous and semi-evergreen forests and serves as an important wildlife corridor near Kaziranga National Park. The reserve supports high biodiversity, including elephant populations, and is traversed by the ecologically significant Dhansiri River, though it faces pressures from encroachment and deforestation.





**Figure 20: Key biodiversity area and Protected area within the 50 Km area of Dimapur**

137. Three Critically Endangered species have been identified within a 10 km radius of the proposed Dimapur road and drainage project. A species-specific assessment of the potential impacts is presented below:

- **Indotestudo elongata – Elongated Tortoise (CR, decreasing).** This terrestrial species inhabits forest and scrub habitats. The project does not involve works in such habitats. Accordingly, no impact is anticipated.
- **Panthera tigris – Tiger (EN, decreasing).** Tigers require extensive forest landscapes. The project area does not overlap with tiger habitats or corridors. Hence, no impact is anticipated.
- **Nilssononia hurum – Indian Peacock Softshell Turtle (EN, decreasing).** A freshwater species sensitive to water quality degradation. With proper runoff and sediment control measures in place, no significant impact is anticipated.

138. **Critical Habitat Analysis of Dimapur.** The Critical Habitat Screening (CHS) for the Dimapur Road and Drain project was conducted in accordance with IFC Performance Standards (2012) and ADB Safeguard Policy Statement (2009) to assess biodiversity sensitivity within the project's Area of Influence. The study area includes a project footprint and a 1 km buffer along the Dhansiri River in Nagaland. The area is predominantly modified, with approximately 99.7% comprising built-up land, plantations, and agricultural areas, while natural habitat is limited to only 0.18% inland wetlands. No natural forests are present within the Study Area, indicating low ecological sensitivity.

139. The subproject area is located approximately 7.6 km from the Dhansiri Reserve Forest, which is also designated as a Key Biodiversity Area (KBA). However, the overlapping section comprises modified habitat with limited ecological significance. A total of 1391 species were recorded within a 50 km radius based on IBAT data, of which 61 species were identified as Critical Habitat (CH) candidates, including globally threatened, migratory, and restricted-range

species. No habitat within the Study Area qualified as Critical Habitat.

140. Detailed screening of these species was carried out based on habitat suitability, extent of occurrence, population thresholds, and ecological requirements within the Ecologically Appropriate Area of Analysis (EAAA). The assessment concluded that all 61 species were screened out as Potential CH Triggers due to lack of suitable habitat, minimal habitat availability, absence of confirmed occurrence records, and inability to meet threshold population criteria.

141. Based on the above findings, it is concluded that the Study Area does not qualify as Critical Habitat under IFC PS6 or ADB SPS criteria. The project area is characterized by low biodiversity sensitivity, and no significant impacts on critical biodiversity values are anticipated. Standard environmental management measures and monitoring will be sufficient to manage any minor impacts during project implementation. Details Critical Habitat Analysis is attached in Annexure 13.

142. **Integrated Biodiversity Assessment Tool (IBAT) Screening Assessment (Chümoukedima).** The IBAT report indicates that the Chümoukedima Road and drain site lies within a landscape that is highly likely to be classified as Critical Habitat, as multiple Critically Endangered (CR) species (as per IUCN status) are predicted to occur within a 1 km radius, and several CR and Endangered (EN) species, along with 10 Key Biodiversity Areas, are present within a 50 km radius. However, no protected area or Key Biodiversity Area is located within the immediate 1 km or 10 km radius of the project site.

143. The IBAT screening identifies the following Critically Endangered (CR) species within a 1 km radius of the Chumoukedima project area, along with their respective IUCN status and ecological relevance. The potential interactions with the proposed road and drainage improvement works are assessed below:

- **Indotestudo elongata – Elongated tortoise (CR, decreasing):** This terrestrial tortoise inhabits forest edges, grasslands, and scrub habitats and is highly vulnerable to habitat loss and illegal collection. The proposed road and drain works are located in built-up urban and peri-urban areas and do not extend into forested or grassland habitats. Construction activities will engage local labor and will not involve clearing of natural habitats; therefore, no significant impact on this species is anticipated.
- **Manouria emys – Asian giant tortoise (CR, decreasing):** This species has low recruitment rates and is sensitive to forest degradation and fragmentation. The proposed project does not involve works within forest areas or the creation of new access roads through natural habitats. As the road and drainage improvements are confined to existing alignments, no habitat fragmentation or disruption of movement corridors is expected.
- **Emberiza aureola – Yellow-breasted bunting (CR, decreasing):** A migratory species that winters in parts of Northeast India, typically using wetlands, open agricultural fields, and scrublands. The project area does not include such habitats, and the proposed works will not result in habitat loss or disturbance to potential wintering grounds. Accordingly, no adverse impact on this species is anticipated.
- **Perdica manipurensis – Manipur bush quail (CR, population unknown):** This regionally endemic species depends on intact grassland and scrub habitats. The proposed road and drain project does not involve conversion of grassland or shrub-dominated areas, nor does the project footprint overlap with suitable habitat for this species. Hence, no impact on local populations is expected.
- **Manis pentadactyla – Chinese pangolin (CR, decreasing):** This nocturnal, burrowing

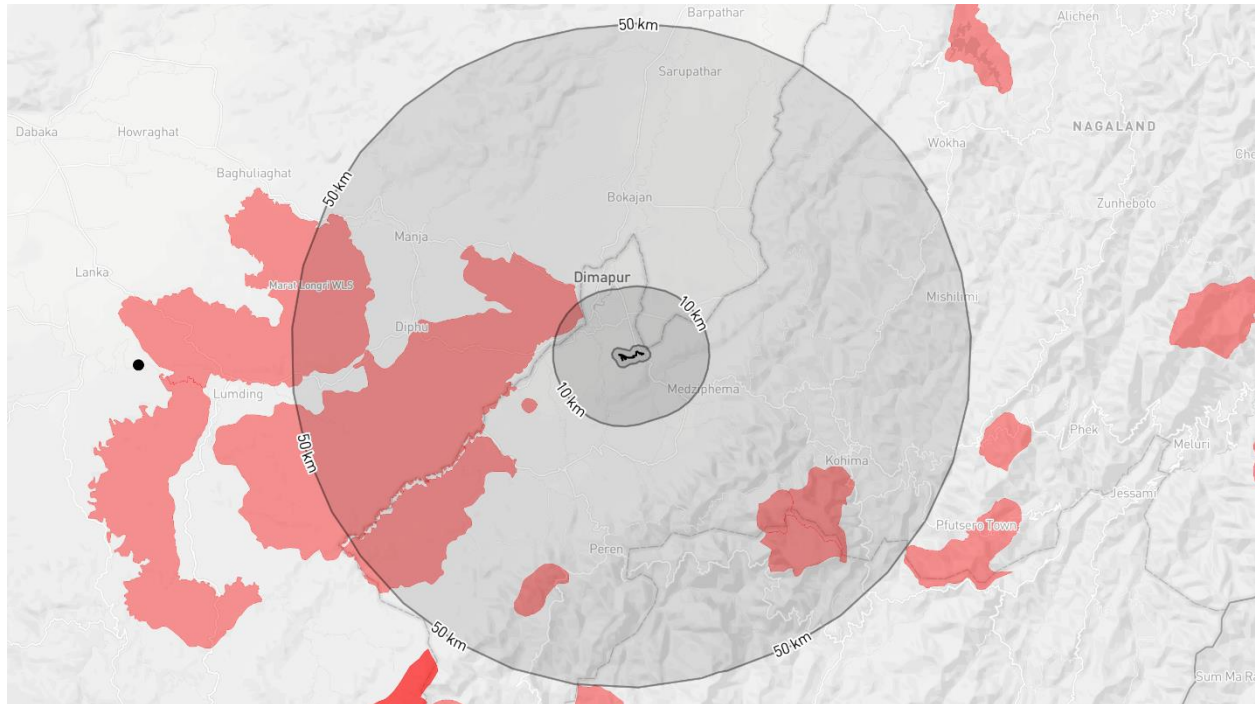
mammal is threatened primarily by hunting and habitat disturbance. The proposed works do not involve construction in forested or ecologically sensitive areas, nor will they create new access routes that could increase hunting pressure. Therefore, the project is not expected to adversely affect this species.

- **Gyps tenuirostris – Slender-billed vulture (CR, decreasing):** This scavenger species nests on cliffs and tall trees and is sensitive to disturbance and loss of nesting sites. The proposed project does not involve removal of large trees, construction of tall structures, or activities in cliff habitats. Consequently, no adverse impact is anticipated.
- **Sarcogyps calvus – Red-headed vulture (CR, decreasing):** A solitary, tree-nesting species reliant on large emergent trees. As the road and drainage works will not require felling of mature trees or establishment of camps in suitable nesting habitats, no significant impact on this species is expected.
- **Gyps bengalensis – White-rumped vulture (CR, decreasing):** A colonial nester vulnerable to disturbance near nesting sites. The proposed works are located away from known nesting or roosting areas, and construction activities will not involve blasting or high-intensity disturbance. Therefore, no adverse impact is anticipated.
- **Pangshura sylhetensis – Assam roofed turtle (CR, decreasing):** This riverine turtle depends on natural flow regimes and stable riverbanks for nesting. The proposed drainage works will not alter natural stream flows or disturb riverbanks used for breeding. Proper design of drains and sediment control measures will ensure that downstream aquatic habitats remain unaffected.
- **Nilssonina nigricans – Black softshell turtle (CR, decreasing):** This aquatic species requires clean, well-oxygenated flowing water. The project will incorporate erosion and sediment control measures to prevent runoff into nearby water bodies. As no direct instream works are proposed, no significant impact on this species is anticipated.
- **Asarcornis scutulata – White-winged duck (CR, decreasing):** A forest-wetland specialist highly sensitive to habitat disturbance. The proposed road and drain works do not involve clearance of forest wetlands or alteration of shaded streams, and therefore no significant impact on this species is expected.
- **Aythya baeri – Baer's pochard (CR, decreasing):** This species depends on undisturbed wetlands and stable water levels during winter. The project does not involve modification of wetlands or reservoirs, and construction activities will be confined to terrestrial urban areas. Accordingly, no adverse impact on this species is anticipated.
- **Houbaropsis bengalensis – Bengal florican (CR, decreasing):** This species relies on intact tall grassland habitats for breeding and foraging. As the project does not involve grassland conversion or disturbance of known lekking or nesting areas, no impact on this species is expected.

144. **Heliopais personatus – Masked finfoot (CR, decreasing)** has been recorded within a 10 km radius of the project area. This species is an indicator of undisturbed forest streams and is sensitive to hydrological changes and riparian disturbance. As the proposed road and drainage works will not involve alteration of natural streams, riparian vegetation clearance, or changes in flow regimes, indirect impacts on this species are considered unlikely. However, standard environmental safeguards will be implemented to prevent sediment runoff and protect nearby aquatic habitats.

145. One Key Biodiversity Area (KBA) is located within a 10 km radius of the proposed project area, namely the Dhansiri Reserve Forest. Situated in the Karbi Anglong and Golaghat districts of Assam, this reserve comprises tropical moist deciduous and semi-evergreen forests and serves as an important wildlife corridor in the vicinity of Kaziranga National Park. The area

supports high biodiversity, including elephant populations, and is traversed by the Dhansiri River, which is ecologically significant. Despite its importance, the reserve faces ongoing pressures from encroachment and deforestation. Key biodiversity area and Protected area within the 10 km area of Chumukedima town is shown in below figure.



**Figure 21: Key biodiversity area and Protected area within the 50 Km area of Chumukedima**

146. **Critical Habitat Analysis of Chumukedima.** The Critical Habitat Screening (CHS) was undertaken for the proposed road and drain project in Chumukedima in accordance with IFC Performance Standards (2012) and ADB Safeguard Policy Statement (2009). The Study Area includes the project corridor along with a 1 km buffer, covering parts of the Chathe River valley and adjoining hill slopes. The area comprises a mix of natural and modified habitats, with approximately 59% natural habitat (mainly tropical moist lowland forest) and 41% modified land including settlements, agricultural areas, and plantations.

147. The project does not overlap with any legally protected or internationally recognized designated area. The nearest protected area is Rangapahar Macaque Sanctuary (KBA), located about 9 km away. Based on IBAT data, a total of 1407 species are reported within 50 km of the project area, out of which 67 species were identified as Critical Habitat (CH) candidates, including globally threatened, migratory, and restricted-range species. However, no habitat within the Study Area qualifies as Critical Habitat.

148. Detailed screening of the identified species was carried out considering habitat suitability, extent of occurrence, population thresholds, and ecological requirements within the Ecologically Appropriate Area of Analysis (EAAA). The assessment indicates that although natural habitats are present, none of the species meet the threshold criteria for designation as Critical Habitat triggers. All 67 species were screened out due to factors such as lack of significant population presence, absence of confirmed records within the project area, and

insufficient habitat suitability to support critical populations.

149. Based on the findings, it is concluded that the road and drain project area does not qualify as Critical Habitat under IFC PS6 or ADB SPS criteria. While the area contains moderate ecological value due to the presence of forested habitats, the project is unlikely to result in significant impacts on biodiversity of critical importance. Standard environmental management measures and careful construction practices will be adequate to mitigate potential impacts.

## **2. Flora**

150. The region of Nagaland exhibits the richest diversity in orchids, zingibers, yams, rhododendrons, bamboos canes and wild relatives of cultivated plants. According to the available information from Botanical Survey of India, the state is rich in floristic diversity represented by 2431 species belonging to 963 genera and 186 families. There are species which grow continuously without any dormant period. For example, the alders (*Alnus nepalensis*) of Nagaland and some Cedrellas outgrow, even the fastest growing Eucalyptus. The land is blessed with an abundance of edible and medical plants and fruits. Wild varieties of vegetables, grapes, apples, lemon, bananas, walnut, mangos, fig, mulberry, cherry, sour and bitter fruits, and host of other indigenous fruits are found.

151. Other important plant species in the hills are oak, chestnut, birch, magnolia, laurel, bonsum, gamari, hollock koroi, khokan, peepul, creepers, cactus, cotton, etc.<sup>16</sup>

152. Common species in and around Dimapur and Chümoukedima district are Bhelu (*Tetrameles nudiflora*), Paroli (*Stereospermum chelonoides*), Jutuli (*Altingia excelsa*), Hollong (*Dipterocarpus macrocarpus*), Makai (*Shorea assamica*), Nahor (*Mesua ferrea*), Nagaland Fir (*Abies densa*), *Elaeocarpus lanceifolius*, *Clerodendrum glandulosum* etc.

153. There are a lot of medicinal plants locally available in the district and are being used by the local doctors called Kaviraj. Many of these have not been identified and documented so there is an urgent need for identification and documentation of these potential spp. Some of the species cultivated on a large scale include, Tulsi (Green and Black both), Chiraita (King leaf), Aloe-vera etc. Citronella / lemon grass is also being promoted for cultivation in the district during 2010-11 value.<sup>17</sup>

## **3. Fauna**

154. The subproject locations are plain agricultural and residential / commercial lands. 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.

155. Dimapur and Chümoukedima districts harbor a rich mosaic of wildlife, including: Hoolock Gibbons (*Hoolock hoolock*), Sloth Bears (*Melursus ursinus*), Gaur (*Bos gaurus*), Small Indian Civets (*Viverricula indica*), Blyth's Tragopan (*Tragopan blythii*), etc

## **E. Economic Development**

156. Economy of Nagaland presents a host of sectors that collectively generate revenue for

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<sup>16</sup> State of Environment Report, 2016 for Nagaland

<sup>17</sup> Brief Industrial Profile of Mon District, Nagaland State

this northeastern state of India. Agriculture is the mainstay of Nagaland. As much as 70% of the total population of Nagaland is engaged in farming activities. Terrace and jhum cultivation are the two methods by which crops are grown in the state of Nagaland.

157. Livestock is another key economic factor of Nagaland which includes fishery, animal husbandry, cattle farming, piggery and poultry. There are many industrial units in Nagaland that provide a major boost to the economic development of the state. The medium scale industries of Nagaland that generate huge amounts of revenue are located in various parts of the state.

158. The state of Nagaland boasts of a huge stock of minerals too like that of coal, natural gas, decorative stones, petroleum, marble, nickel, cobalt-chromium bearing magnetite and so on. The banks located in Nagaland are also known to be a major facilitator in the economic progress of the state. The tourism industry of Nagaland is counted as one of the prime contributors of economic enhancement of the place. This is because with its rich natural treasure Nagaland attracts thousands of tourists to its premises round the year.

## 1. Land use

159. 95% of the total area of the State is covered by hills, shifting and terrace cultivations are practiced in the State of Nagaland. Most areas of the State are covered by dense forest. The rain-fed agriculture is mostly practiced using old traditional cultivation methods and primitive tools. The mountain ecosystem of the district limits the scope for utilization of water resources for irrigation purposes. Most of the irrigation is done tapping only the surface water with no contribution from ground water.

160. However, in relatively flat stretches of land in Dimapur valley, irrigated fields have been developed. Most areas of the State are covered by dense forest. Rain fed agriculture is practiced in the State and the ground water withdrawal for irrigation purpose is practically nil. However, there is a total of 357.05 sq. km. net irrigated area in Dimapur district from surface water sources. Dimapur district has 8.12 sq. km. of area covered by forest.

161. The table below indicates the distribution of various land uses for the project towns. It can be observed that maximum area of the town is allocated to residential land use followed by protective zone comprising of water bodies.

**Table 12: Land use Distribution of Dimapur Town**

| Sl.No. | Landuse Class  | AREA (ha) | Percentage |
|--------|----------------|-----------|------------|
| 1      | Commercial     | 167.485   | 10.95      |
| 2      | Crematorium    | 2.411     | 0.16       |
| 3      | Drain          | 2.925     | 0.19       |
| 4      | Educational    | 47.437    | 3.10       |
| 5      | Hospitals      | 5.317     | 0.35       |
| 6      | Industrial     | 22.299    | 1.46       |
| 7      | Open Area      | 135.361   | 8.85       |
| 8      | Plantation     | 12.861    | 0.84       |
| 9      | PSP            | 100.051   | 6.54       |
| 10     | Public Utility | 8.564     | 0.56       |
| 11     | Recreation     | 34.082    | 2.23       |



| Sl.No. | Landuse Class  | AREA (ha) | Percentage |
|--------|----------------|-----------|------------|
| 12     | Religious      | 5.732     | 0.37       |
| 13     | Residential    | 890.877   | 58.22      |
| 14     | River          | 3.252     | 0.21       |
| 15     | Road           | 57.021    | 3.73       |
| 16     | Transportation | 2.636     | 0.17       |
| 17     | Waterbody      | 31.767    | 2.08       |

Source: GIS Base Map

162. Land use map of Dimapur town is shown below.

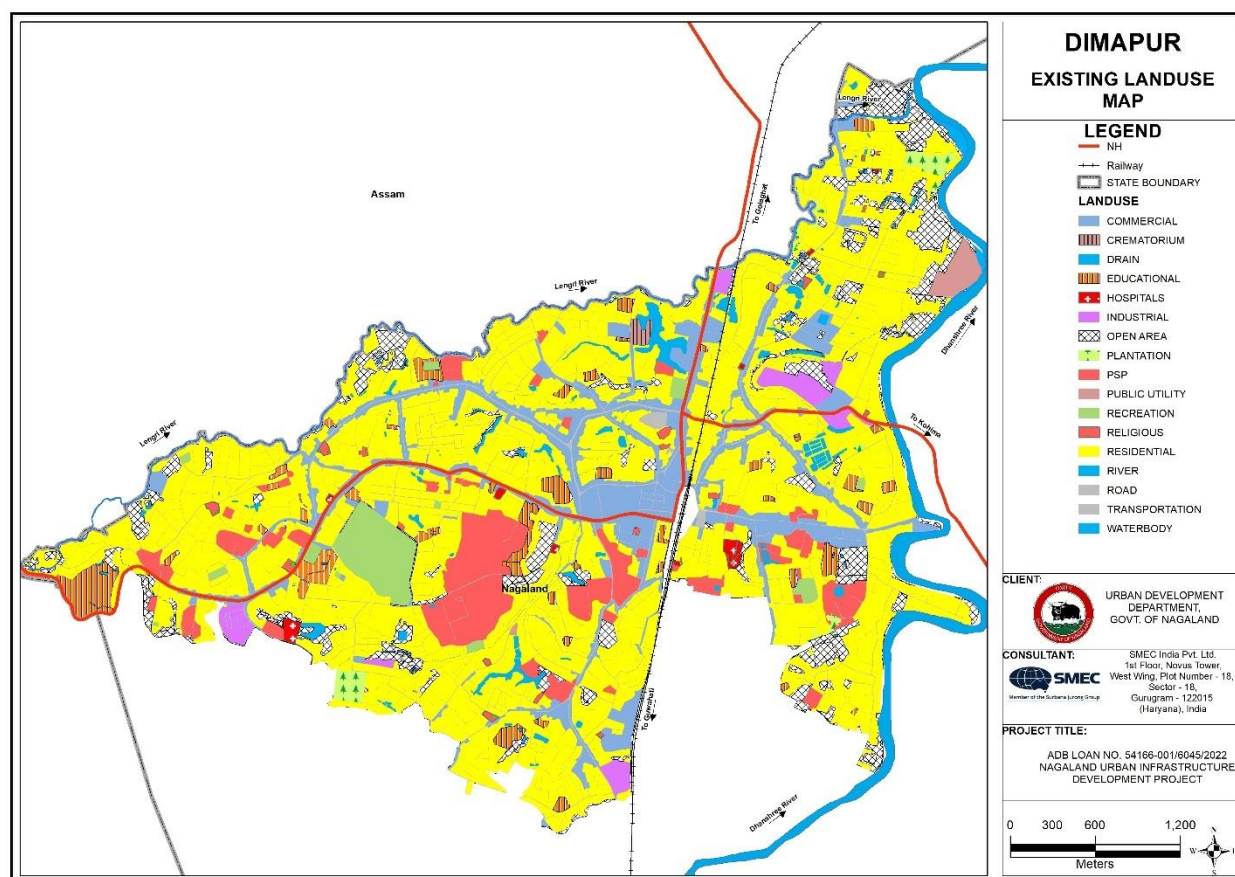


Figure 22: Land use map of Dimapur town

163. The table below indicates the distribution of various land use for the Chümoukedima project town.

Table 13: Land use Distribution of Chümoukedima Town

| Sl.no. | Land use Class | Area(Ha) | Percentage |
|--------|----------------|----------|------------|
| 1      | Agriculture    | 168.006  | 11.27      |
| 2      | Cemetry        | 0.312    | 0.02       |
| 3      | Commercial     | 66.46    | 4.46       |
| 4      | Drain          | 1.041    | 0.07       |
| 5      | Educational    | 55.638   | 3.73       |

| Sl.no. | Land use Class       | Area(Ha) | Percentage |
|--------|----------------------|----------|------------|
| 6      | Forest               | 89.872   | 6.03       |
| 7      | Hospital             | 0.847    | 0.06       |
| 8      | Industrial           | 8.432    | 0.57       |
| 9      | Office               | 38.197   | 2.56       |
| 10     | Open Area            | 229.5    | 15.40      |
| 11     | Plantation           | 61.708   | 4.14       |
| 12     | Public & Semi Public | 140.059  | 9.40       |
| 13     | Public Utility       | 6.242    | 0.42       |
| 14     | Recreation           | 10.672   | 0.72       |
| 15     | Religious            | 4.267    | 0.29       |
| 16     | Residential          | 540.625  | 36.27      |
| 17     | River                | 14.871   | 1.00       |
| 18     | Road                 | 30.05    | 2.02       |
| 19     | Waterbody            | 23.879   | 1.60       |

Source: GIS Base Map

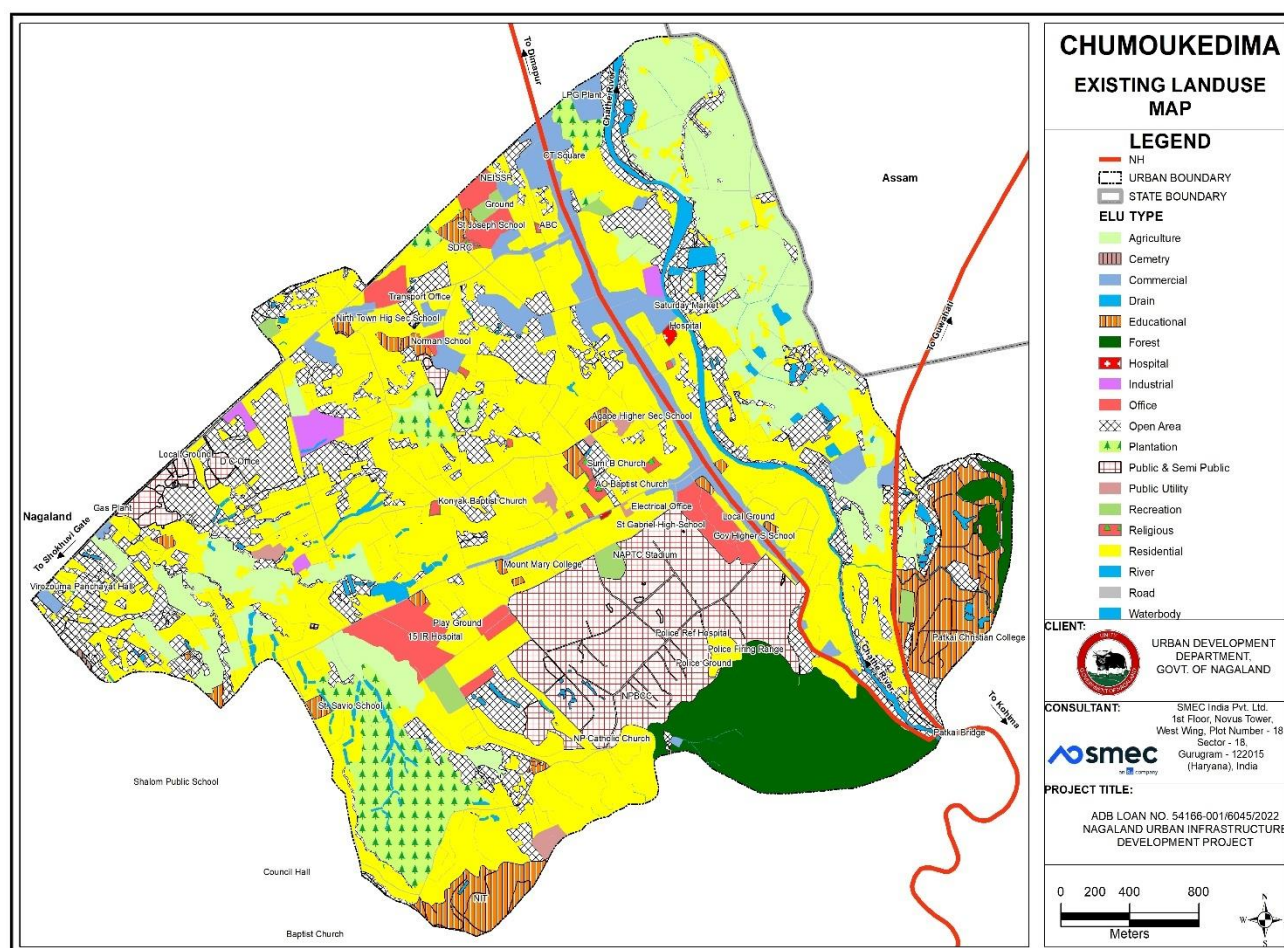


Figure 23: Land use map of Chümoukedima town

## F. Industry & Agriculture

### Industry

164. Nagaland's industrial landscape is largely anchored in agriculture and allied sectors, with approximately 70% of its population engaged in farming through practices like terrace and shifting (jhum) cultivation. The state also hosts a robust cottage industry base, prominently featuring weaving, dyeing, cane and wood crafts, pottery, blacksmithy, and the Dimapur sugar mill, which has a capacity of processing 1,000 tons of cane daily.

165. Nagaland remains heavily agrarian, there is growing strategic emphasis on developing its mineral, agro-based, and renewable energy assets, supported by emerging industrial zones and focused policy incentives.

### Dimapur & Chümoukedima

166. Industries are mostly small and medium scale based. Table below show the industrial state of Dimapur (including Chümoukedima) district.

**Table 14: Industrial status of Dimapur (including Chümoukedima) district**

| Parameters   | Particulars |
|--|-------------|
| Total Industrial unit (MSE sector)                                       | 575 nos.    |
| Registered medium & large unit   | 12 nos.     |
| Estimated Average No. of daily worker Employed in Small Scale Industries | 1250        |
| Employment in large and Medium industries                                | 150         |
| No of Industrial area  | 4           |

Source: District Industrial Profile Report of Dimapur District

### **Agriculture (Dimapur and Chümoukedima)**

167. The agriculture in the district is Terrace Rice Cultivation (TRC), rainfed and traditional. By and large mono cropping of paddy is practiced in the district. The TRC paddy alone covers an area of 32,900 ha whereas Jhum covers about 7,800 ha. Besides, the second important crop in the district is Kharif, Maize covers about 2500ha. Maize is generally grown as an inter-crop with jhum paddy. Winter maize is also grown in certain blocks of the district which covers about 460 ha.

168. Important Pulses are also grown in the district include pea, lentil, black gram, beans, green gram, arhar; these are grown over an area of 1360 ha, in both Kharif and Rabi season.

169. With the favourable agro climatic conditions, oilseeds such as groundnut, soybean, sesame, sunflower, mustard, linseed, etc. are grown in an area of 5800 ha. Commercially viable crops such as sugarcane, ginger, jute, turmeric, tea, potato etc. are also grown in the district covering an area of 1,580 ha. Mechanized farming is encouraged by providing 50% subsidy on power-tillers.

170. In Nagaland, fruits and vegetables are produced in 37479 and 51343 ha with the total production of 286920 MT and 605984MT respectively of which Dimapur district contributes major

portion of production as 13.08% of fruits (37,541 MT) and 8.56 % of vegetables (51899MT). Commercial cultivation of pineapple, banana, cashew nut and lemon is also followed in the district.

171. The state of Nagaland in general and Dimapur in particular has been gifted with a unique topography and varied agro – climatic and soil conditions, which offers opportunities to cultivate a variety of horticultural crops like vegetables and fruits. Among vegetables spring summer (cucurbits, bhindi beans), summer (cucurbits, bhindi, beans) as well as winter vegetables (cabbage, cauliflowers, carrot, radish, palak, pea, etc.) are being cultivated in the district. Fruits like pineapple, guava, lemon, litchi, and mango are the major ones covering the area in the district. Among floriculture, the commercial crop is Anthurium, which is being exported through Zopar Exports under poly house conditions in Sovima village of the district.<sup>18</sup>

172. The main crops grown in Chumokedima, Nagaland are arums, yams, millet, maize, potatoes, and sugarcane. Vegetable crops include melon, cucumbers, spinach leaf, mustard, onion, chillies, carrots, tomatoes, and brinjal.

173. The state government has initiated several agricultural schemes to address challenges faced by farmers, such as land fragmentation, lack of infrastructure, and climate change. Central Government schemes have also made farming viable in remote places of Nagaland, such as Shokhuvi village in the Chümoukedima district.

174. The state of Nagaland in general and Chumokedima in particular has been gifted with a unique topography and varied agro – climatic and soil conditions, which offers opportunities to cultivate a variety of horticultural crops like vegetables and fruits. Among vegetables spring summer (cucurbits, bhindi beans), summer (cucurbits, bhindi, beans) as well as winter vegetables (cabbage, cauliflowers, carrot, radish, palak, pea, etc.) are being cultivated in the district. Fruits like pineapple, guava, lemon, litchi, and mango are the major ones covering the area in the district. Among floriculture, the commercial crop is Anthurium, which is being exported through Zopar Exports under poly house conditions in Sovima village of the district.<sup>19</sup>

175. **Dimapur.** Agriculture in Dimapur district forms an important part of the local economy, with a cultivable area of about 61,197 hectares, constituting nearly 65% of the total district area. The major crops grown include paddy, maize, pulses, and groundnut, with rice being the dominant crop cultivated primarily during the kharif season. In 2022–23, paddy was cultivated over an area of approximately 6,136 hectares, yielding around 18,771 tons with an average productivity of 3.06 tons per hectare. Maize and groundnut are also grown in smaller areas, contributing to the district's mixed-cropping pattern. The region's fertile alluvial soil and moderate rainfall make it suitable for agriculture, though productivity remains moderate due to traditional farming practices and limited irrigation facilities.

176. **Chümoukedima.** Chümoukedima district, located in the foothill region of Nagaland, is also primarily agrarian, with agriculture serving as the main livelihood for a significant portion of the population. The principal crops cultivated are rice, maize, and groundnut, along with minor horticultural crops. During the 2022–23 season, the district recorded about 19,975 hectares under paddy cultivation, producing roughly 57,184 tons at an average yield of 2.86 tons per hectare. Maize was cultivated over an area of 1,260 hectares, while groundnut occupied around 126 hectares, yielding about 131 tons. The district's rolling topography, coupled with favorable

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<sup>18</sup> Dimapur district Inventory of Agriculture- ICAR

<sup>19</sup> Dimapur district Inventory of Agriculture- ICAR



agro-climatic conditions, supports both terrace and lowland paddy cultivation. However, like Dimapur, the area faces challenges such as soil erosion, dependence on rainfall, and limited access to modern agricultural inputs, which affect overall productivity.

## **1. Mineral Resources**

177. The important minerals discovered so far include Petroleum and Natural gas, nickel-cobalt-chromium bearing magnetite, limestone, marble, coal, clay, slate, dimension and decorative stones building materials etc. in various parts of the State

178. In Dimapur district, occurrences of low-grade clay minerals and oil and Natural Gas have been reported in the Dimapur valley, but so far there is no major mining activity in the entire district.

## **G. Socio Cultural Resources**

### **1. Demography**

179. **Dimapur.** In 2011, Dimapur district had population of 378,811 of which male and female were 197,394 and 181,417 respectively. In 2001 census, the total population of Dimapur District in Nagaland was 308,382 people, with 166,335 males and 142,047 females.

180. Out of the total Dimapur district population as per 2011 census, 52.23 percent live in urban regions of district. In total 197,869 people lives in urban areas of which males are 103,959 and females are 93,910. Sex Ratio in urban region of Dimapur district is 903 as per 2011 census data. Similarly, child sex ratio in Dimapur district was 962 in 2011 census. Child population (0-6) in urban region was 24,835 of which males and females were 12,661 and 12,174. This child population figure of Dimapur district is 12.18 % of total urban population.

181. As per the 2011 India census, Dimapur town had a population of 122,834, a 25% increase from 98,096 in 2001. The town comprises 23 wards and has an average literacy rate of 86.03%. The sex ratio in 2011 was 919.

182. SC & ST Population. There are 0 Scheduled Caste (SC) and 59.13% Scheduled Tribe (ST) of total population in Dimapur district.

183. Majority of the population follows Christian (61.84%), Hinduism (28.75%), followed by Islam (8.24%), Jain (0.57%), Buddhist (0.34%), Sikh (0.15%), others (0.04), Not Stated (0.08%).

184. Sex Ratio. The average literacy rate of Dimapur in 2011 was 84.79 compared to 84.79 in 2001. If things are looked out at gender wise, male and female literacy were 87.54 and 81.77 respectively. For the 2001 census, the same figures stood at 81.11 and 71.85 in Dimapur District.

185. Literacy & Educational Facilities. The average literacy rate of Dimapur in 2011 was 84.79 compared to 84.79 in 2001. If things are looked out at gender wise, male and female literacy were 87.54 and 81.77 respectively. Total literate in Dimapur District was 278,037 of which male and female were 150,142 and 127,895 respectively.

186. **Chümoukedima.** According to the 2011 census, the population of Chümoukedima district in Nagaland is 166,911, with an area of 6,110 sq km and a literacy rate of 85%. The district has 81 villages, including 22 under Medziphema, 36 under Seithekiema, and 23 under

Dhansiripar.

187. The Chümoukedima Town Committee has population of 25,885 of which 12,742 are males while 13,143 are females as per report released by Census India 2011. Population of Children with age of 0-6 is 3616 which is 13.97 % of total population of Chümoukedima.

188. SC & ST Population. The town of Chümoukedima has a population of 43,516, with 74.39% of the population being from a Schedule Tribe (ST).

189. Sex Ratio. In Chümoukedima Town Committee, Female Sex Ratio is of 1031 against state average of 931. Moreover, Child Sex Ratio in Chümoukedima is around 1020 compared to Nagaland state average of 943. Literacy rate of Chümoukedima city is 89.72 % higher than state average of 79.55 %. In Chümoukedima, Male literacy is around 92.03 % while female literacy rate is 87.49 %.

190. Literacy & Educational Facilities. According to the 2011 census, the literacy rate of Chümoukedima district in Nagaland is 85%. The literacy rate of Chümoukedima city is 89.72%, which is higher than the state average of 79.55%. The male literacy rate in Chümoukedima is around 92.03%, while the female literacy rate is 87.49%.

## **2. History, culture, and tourism**

191. **Archaeologically protected sites.** There are no archaeological or heritage sites within the subproject area of Dimapur and Chumekedima town proposed urban road and drainage area or its immediate vicinity within the subproject area. The most prominent ASI site within Dimapur and Chumekedima town is the Kachari Rajbari ruins in Dimapur. The Kachari Rajbari ruins is 2.5 km and 11.5 km away from the proposed subproject area in Dimapur and Chümoukedima.

192. The Kachari Rajbari ruins in Dimapur, Nagaland, are remnants of the Kachari civilization that flourished before the Ahom invasion in the 13th century. Dating back to the 10th century, these ruins are primarily known for their distinctive mushroom-domed pillars. The site reflects the architectural style and artistic interests of the Kachari kingdom, which held sway in the region before the Ahom conquest.

### **Dimapur**

193. The name Dimapur comes from the Kachari dialect. Etymologically di means "river", ma means "big", and pur means "city"; in effect, the name means "the city near the great river." The Kachari tribe did not have a name for this city, though the Ahoms called it Che-din-chi-pen, or "the brick city". It was also called Che-dima, meaning "city on the Dirna River" and it was once the ancient capital of 13th century Kachari rulers. "Dimapur" is a later appellation.

194. **Ruins of the Medieval Kachari Kingdom-** Dimapur is the ancient capital of the Kachari who ruled before the 1361 Century AD. Remnants of the glory of this kingdom can be found in the ruins scattered in town. They give evidence of a culture that probably touch of Hinduism, but were predominantly Non-Aryan Besides monoliths, Dimapur contains other ruins of temples, embankments and baths.

195. **Diezephe Craft Village-** This village in Dhansiripar block is located 13 km from Dimapur; most of its inhabitants subsist on handloom and handicraft products. They are experts in wood carving, bamboo and cane works and weaving. Nagaland Handloom and Handicrafts

Development Corporation limited has played a significant role in the promotion of this village.

196. **Rangapahar Reserve Forest-** This is one of the famous tourist attractions in Dimapur, Nagaland. The place is known for its wildlife and there are various plants available that are relevant to medicines. Apart from that, you will also see a variety of bird species, which attracts a lot of bird watchers to the forest. Various medicinal plants are preserved in the forest and are used for preparing medicines. Aside from that, many endangered species are also preserved in the forest which are rarely seen elsewhere and are on the verge of extinction.



### **Chümoukedima**

197. Chümoukedima was the first headquarters of the Naga Hills District of Assam Province during British rule from 1866 to 1875. The town was also known as Nechu Guard and Samaguting during World War II. Today, Chümoukedima is the third-largest urban agglomeration in Nagaland, after Dimapur and Kohima.

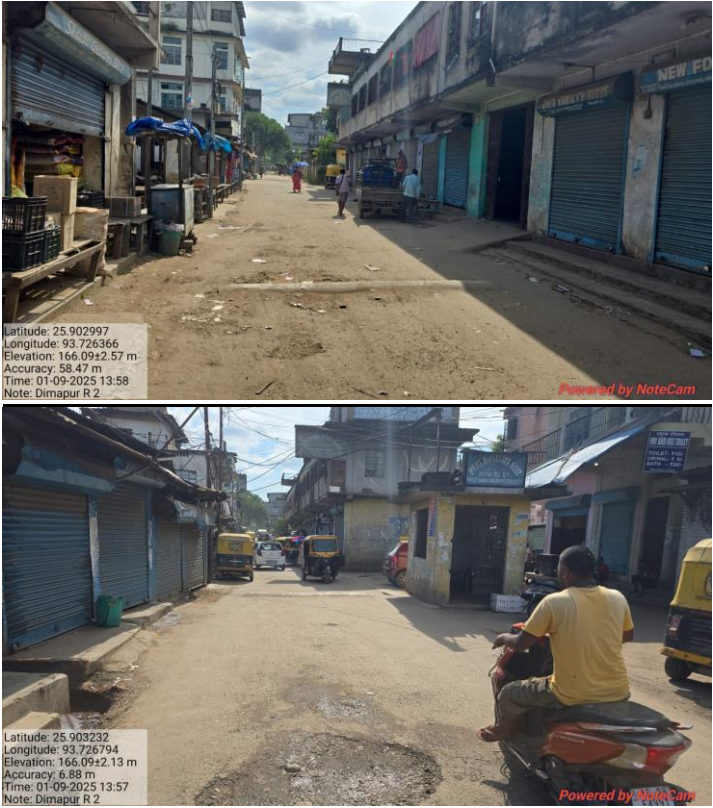
### **H. Subproject Site Environmental Features**


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

**Table 15: Site Environmental Features – Dimapur Urban Road**

| Sl no. | Road Name                 | Length of the road(m)                           | Starting and endpoint of the road   | Environmental Features of the Site  | Photograph   |
|--------|---------------------------|---|---|---|--|
| 1      | Sham Bazar junction to NH | 3.491 km<br>Existing Carriageway<br>Width- 5.5m | Starting point- Lat- 25.8954°<br>Long- 93.7203°<br>End Point<br>Lat- 25.9018°<br>Long- 93.6977° | <p>This stretch lies in plain terrain, with land use along the road predominantly commercial and residential. The available width ranges from 4.1 m to 13.4 m, and the road provides connectivity to Signal Angami Bazar, Lahomithi Baptist Church, and Signal Angami village. The selected road has a Bituminous Concrete (BC) pavement, with its condition varying from poor to good along the stretch. Numerous potholes and instances of raveling are observed on the existing surface. Various types of utilities are present along this road in a scattered, zig-zag manner, with no defined utility corridor in place. Utility shifting is likely to be required for this stretch. A hospital and a school are situated adjacent to the proposed road alignment. There are no trees along the proposed project road, and no waterbodies are located in its vicinity. No demolition works are anticipated for this stretch. There is no existing drain along the project road. Based on the site visit, no sensitive receptors were found in close proximity to the proposed site, and no notable environmental features were observed.</p> |   |




| Sl no. | Road Name                          | Length of the road(m)                                | Starting and endpoint of the road  | Environmental Features of the Site  | Photograph  |
|--------|------------------------------------|--|--|---|---|
| 2      | From CSD Depot to Nyamo Lotha Road | 1.233 km<br>Existing Carriageway 3.0 m to 5.0 m<br>. | Starting point- Lat- 25.9018°<br>Long- 93.7234°<br>End Point Lat- 25.9091°<br>Long- 93.7266° | <p>This stretch lies within plain terrain, with land use along the road predominantly commercial and residential. It serves as a connecting route between NH-129A and Satsang Vihar, Dimapur. The selected road has a Bituminous Concrete (BC) pavement, with its condition ranging from poor to good along different sections. Various utilities are present in a scattered, zigzag manner, and there is no defined utility corridor. Utility shifting may be required for this project road.</p> <p>A major portion of the road passes through densely built-up areas, leaving very limited scope for widening. There is no significant protected forest in and around project area.</p> <p>No waterbody is located near the project road, and the site visit confirmed that no sensitive receptors are present in close proximity to the proposed location.</p> <p>Inadequate drainage infrastructure results in waterlogging during the monsoon season, causing traffic disruptions, deterioration of road surfaces, and potential health hazards.</p> <p>.</p> |  <p>Latitude: 25.902997<br/>Longitude: 93.726366<br/>Elevation: 166.09±2.57 m<br/>Accuracy: 58.47 m<br/>Time: 01-09-2025 13:58<br/>Note: Dimapur R 2<br/>Powered by NoteCam</p> <p>Latitude: 25.903232<br/>Longitude: 93.726794<br/>Elevation: 166.09±2.13 m<br/>Accuracy: 6.88 m<br/>Time: 01-09-2025 13:57<br/>Note: Dimapur R 2<br/>Powered by NoteCam</p> |


| SI no. | Road Name                                    | Length of the road(m)                          | Starting and endpoint of the road   | Environmental Features of the Site  | Photograph  |
|--------|--|--|---|---|---|
| 3.     | Circuit House to Nagarjan via Science Centre | 1.233 km<br>Existing Carriageway width- 3.75 m | Starting point-<br>Lat- 25.9053 °<br>Long- 93.7413°<br>End Point<br>Lat- 25.9014°<br>Long- 93.7344° | <p>This stretch lies in plain terrain, with the land use along the road predominantly commercial and residential. The available road width ranges (RoW) from 4.6 m to 12.5 m, providing connectivity to Hotel Saramati, the Nagaland Science Centre, and the Government Higher Secondary School ground.</p> <p>A total of three trees is located along the project road, which may require removal to facilitate construction activities. A school is located within 3 meters of the edge of the project road. No waterbody is located near the project road.</p> <p>The pavement type of the selected road is Bituminous Concrete (BC). It has been observed that the pavement condition varies from poor to good along different sections of the road. Numerous potholes and signs of raveling are present on the existing surface.</p> <p>Various types of utilities are laid out in a zigzag pattern along the road. It has also been observed that there is no defined or properly planned utility corridor in place</p> |  <p>Latitude: 25.902778<br/>Longitude: 93.73764<br/>Elevation: 162.08±1.08 m<br/>Accuracy: 12.67 m<br/>Time: 01-09-2025 13:40<br/>Note: Dimapur R3</p> <p>Latitude: 25.902596<br/>Longitude: 93.737753<br/>Elevation: 163.08±1.03 m<br/>Accuracy: 6.544 m<br/>Time: 01-09-2025 13:39<br/>Note: Dimapur R3</p> |





| Sl no. | Road Name                          | Length of the road(m)                        | Starting and endpoint of the road   | Environmental Features of the Site   | Photograph   |
|--------|------------------------------------|--|---|--|--|
| 4      | NH via Unity College to Sewak Road | 1.119 km<br>Existing Carriageway width 4.5 m | Starting point-<br>Lat- 25.9105 °<br>Long- 93.7086 °<br>End Point<br>Lat- 25.9014 °<br>Long- 93.7093° | <p>This stretch of road lies in plain terrain. The predominant land use along the corridor is a mix of commercial and residential. The available right-of-way varies between 4.6 meters and 12 meters. The road provides connectivity to Unity College, Dimapur Stadium, Children's Park, and Kyong Colony.</p> <p>The selected road has a Bituminous Concrete pavement. The pavement condition varies from poor to fair along the stretch. The existing surface shows signs of significant distress, including numerous potholes, raveling, and edge drops. No utility shifting is required as per site visit.</p> <p>Two educational institutions (colleges) are located in close proximity to the proposed project road, approximately within 3 meters from the road edge. The presence of these institutions indicates a sensitive receptor zone where project activities may potentially generate temporary environmental impacts such as increased noise, dust, and traffic congestion during the construction phase. Special attention will be required to minimize disturbances to the academic environment and ensure the safety of students and staff. There are no trees along the project road.</p> <p>No sensitive receptors are present in proximity of the proposed site.</p> |  <p>Latitude: 25.909753<br/>Longitude: 93.708232<br/>Elevation: 170.57±1.22 m<br/>Accuracy: 5.783 m<br/>Time: 01-09-2025 16:59<br/>Note: Dimapur R 4</p> <p>Latitude: 25.905744<br/>Longitude: 93.709449<br/>Elevation: 170.02±1.35 m<br/>Accuracy: 3.907 m<br/>Time: 01-09-2025 17:03<br/>Note: Dimapur R 4</p> <p>Latitude: 25.909766<br/>Longitude: 93.708227<br/>Elevation: 170.67±1.47 m<br/>Accuracy: 11.15 m<br/>Time: 01-09-2025 16:59<br/>Note: Dimapur R 4</p> |

| Sl no. | Road Name  | Length of the road(m)                               | Starting and endpoint of the road   | Environmental Features of the Site  | Photograph  |
|--------|--|---|---|---|---|
| 5      | Burma Camp police point junction to Supermarket junction | Length-1.017 Km<br>Existing Carriageway width 5.0 m | Starting point-<br>Lat- 25.9131°<br>Long- 93.734°<br>End Point<br>Lat- 25.9061°<br>Long- 93.7407° | <p>This stretch is located in plain terrain. The land use along the selected road is predominantly commercial and residential. The available right-of-way varies between 10.1 meters and 29.0 meters. This road provides connectivity to NH-229, Burma Camp Police Point, Mahindra Apex Motor Enterprise, and Astral Hotel.</p> <p>The selected road has a Bituminous Concrete (BC) pavement. Based on the findings from the site inspection, the pavement condition varies from poor to good along the stretch. The existing surface exhibits numerous potholes and signs of raveling. Utility shifting not required for this road.</p> <p>Inadequate drainage results in waterlogging during rainfall, which contributes to the deterioration of the road surface.</p> <p>A total of 5 trees is located along the project road, which may require removal to facilitate construction activities.</p> <p>No sensitive receptors are present in close proximity of the proposed site. No as such specific environmental feature observed.</p> |  <p>Latitude: 25.907652<br/>Longitude: 93.739268<br/>Elevation: 161.14±0.911 m<br/>Accuracy: 158.7 m<br/>Time: 01-09-2025 12:51<br/>Note: Dimapur RS</p> <p>Powered by NoteCam</p> <p>Latitude: 25.909203<br/>Longitude: 93.729519<br/>Elevation: 166.26±1.09 m<br/>Accuracy: 7.828 m<br/>Time: 01-09-2025 13:06<br/>Note: Dimapur RS</p> <p>Powered by NoteCam</p> |

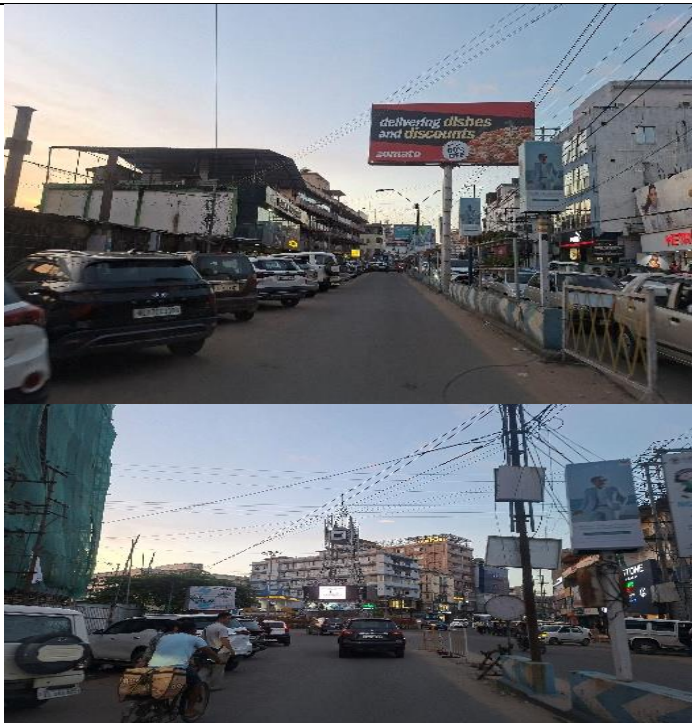


| Sl no. | Road Name   | Length of the road(m)                        | Starting and endpoint of the road   | Environmental Features of the Site   | Photograph   |
|--------|---|--|---|--|--|
| 6      | <b>Teacher Training Institute to Bangjak Phom Colony Gate</b> | 0.782 Km<br>Existing Carriageway width 5.0 m | Starting point-<br>Lat- 25.9081°<br>Long- 93.7388°<br>End Point<br>Lat- 25.9128°<br>Long- 93.742° | <p>This stretch lies in plain terrain, with the surrounding land use predominantly commercial and residential. The available road width varies between 6.50 meters and 11.0 meters. It provides connectivity to the project road, Hotel Grand Vista, and National Highway 29 (NH-29). The selected road is paved with Bituminous Concrete (BC). It has been observed that the pavement condition varies from poor to good along different sections. The existing surface shows widespread deterioration, including numerous potholes and raveling. There are two schools and church located adjacent to the proposed road. Utilities along the road are arranged in a zigzag pattern without a proper utility corridor. A total of 29 utilities are present, and utility shifting may be required for road construction. A total of two trees is located along the project road, which may require removal to facilitate construction activities. There is no major waterbody near the proposed road. No as such specific environmental feature observed</p> |  |

| Sl no. | Road Name                                       | Length of the road(m)                        | Starting and endpoint of the road  | Environmental Features of the Site   | Photograph  |
|--------|---|--|--|--|---|
| 7      | <b>United Bethel Church to Railway Junction</b> | 0.721 Km<br>Existing Carriageway width 7.0 m | Starting point-<br>Lat- 25.9088°<br>Long- 93.7292°<br>End Point<br>Lat- 25.9126°<br>Long- 93.7345° | <p>This stretch is situated in plain terrain, with land use primarily residential and commercial. The available land width ranges (RoW) from 7.40 meters to 19.60 meters.</p> <p>The selected road has a Bituminous Concrete pavement, with conditions ranging from poor to fair. The surface exhibits multiple potholes, raveling, and edge drops.</p> <p>A total of fifty-five utilities are irregularly aligned along the road, with no proper utility corridor. Utility shifting may be necessary for the construction of the subproject road.</p> <p>There is no existing drain along the project road.</p> <p>There is a tree located along the project road, which may require removal to facilitate construction activities.</p> <p>There is no existing drain along the project road.</p> <p>Based on the site visit, no sensitive receptors were found in close proximity to the proposed site, and no notable environmental features were observed.</p> |  <p>Latitude: 25.91731<br/>Longitude: 93.732388<br/>Elevation: 155.88±0.81 m<br/>Accuracy: 6.504 m<br/>Time: 01-09-2025 13:09<br/>Note: Dibrugarh</p> <p>Powered by WikiCam</p> |



| Sl no. | Road Name                                     | Length of the road(m)                           | Starting and endpoint of the road  | Environmental Features of the Site   | Photograph  |
|--------|---|---|--|--|---|
| 8      | <b>Half Nagarjan Junction to Purana Bazar</b> | 1.379 Km<br>Existing Carriageway width 7.0-12 m | Starting point-<br>Lat- 25.9067 °<br>Long- 93.7338 °<br>End Point<br>Lat- 25.9072 °<br>Long- 93.7471 ° | <p>This stretch lies in plain terrain, with the predominant land use along the selected road being commercial. The available land width (RoW) ranges from 12.60 meters to 18.70 meters. The road provides connectivity to Half Nagarajan Road, Bank Colony, Hotel Saramati, and Astral Hotel and Lounge.</p> <p>The selected road is paved with Bituminous Concrete. The pavement condition ranges from poor to fair along different sections. The existing surface exhibits several defects, including potholes, raveling, and edge drops.</p> <p>There is no existing drainage infrastructure along the project road. Based on the site visit, no sensitive receptors were identified in close proximity to the proposed site, and no significant environmental features were observed.</p> <p>There is a tree located along the project road, which may require removal to facilitate construction activities.</p> <p>An uncovered brick drain is present along certain sections of the selected road on the left-hand side (LHS), with its width varying between 0.58 meters and 0.75 meters</p> <p>Utility shifting may be necessary for the construction of the subproject road.</p> |  <p>Address : Burma Camp Road, Police Colony, Dimapur, 797112, NL, India<br/> Latitude : 25.909227<br/> Longitude : 93.733098<br/> Altitude : 150.91 meter<br/> Date : 05/05/2024 17:38<br/> Accuracy : 0.88 meter<br/> Time Zone : GMT+05:30<br/> Note : Dimapur Circular road for signature road near Fire station : condition Good</p> |





| SI no. | Road Name                            | Length of the road(m)                           | Starting and endpoint of the road  | Environmental Features of the Site  | Photograph   |
|--------|--------------------------------------|---|--|---|--|
| 9      | <b>Nyamo Lotha Road to Eros Line</b> | 1.830 Km<br>Existing Carriageway width 7.0-11 m | Starting point-<br>Lat- 25.9098 °<br>Long- 93.7266 °<br>End Point<br>Lat- 25.9116 °<br>Long- 93.7283 ° | <p>This stretch lies in plain terrain, with predominantly commercial and residential land use. The available land width ranges from 10.8 to 48.10 meters. The road provides connectivity to Vishal Mega Mart, NH-229, Drishti Computer Education, and Circular Road Police Point.</p> <p>The selected road has a Bituminous Concrete pavement, with conditions ranging from poor to fair. The surface shows signs of deterioration, including potholes, raveling, and edge drops.</p> <p>No trees are available along the project road.</p> <p>Utility shifting may be necessary for the construction of the subproject road.</p> <p>Based on the site visit, no sensitive receptors were found in close proximity to the proposed site, and no notable environmental features were observed.</p> |  |








**Table 16: Site Environmental Features for Dimapur Drain**

|           |  | Photos  | Environmental Features  |
|-----------|--|---|---|
| <b>D1</b> | <p>Hospital drain, near confluence with Dhansiri River (Kaccha Uncovered Drain)</p> <p><b>Starting Point</b><br/> <b>Lat- 25.902037°</b><br/> <b>Long- 93.727583°</b></p> <p><b>End Point</b><br/> <b>Lat- 25.918353°</b><br/> <b>Long- 93.745214°</b></p> |   | <ul style="list-style-type: none"> <li>• The Hospital Drain in Naga Colony is an unlined natural earthen drain, experiencing significant bank erosion due to continuous water flow and backflow from the Dhansiri River during heavy rainfall.</li> <li>• The majority of the proposed drain passes through residential and commercial areas.</li> <li>• The existing drain is clogged with solid and plastic waste, requiring thorough cleaning to remove the accumulated debris.</li> <li>• Public access to be provided before start of construction of drains</li> <li>• Public access must be ensured before commencing drain construction. Environmental measures should be implemented near sensitive locations during the construction period.</li> <li>• The drain will be widened as required. Several trees are located near the stormwater drain, and some may need to be removed for the widening process.</li> <li>• Public and occupational safety needs to be maintained during construction.</li> <li>• Access needs to be provided during construction.</li> <li>• No as such requirement of shifting of utility, electric post.</li> </ul> |
| <b>D2</b> | <p>Lengri Nallah (Kaccha Uncovered Drain)</p> <p><b>Starting Point</b><br/> <b>Lat- 25.903902°</b><br/> <b>Long- 93.681742°</b></p> <p><b>End Point</b><br/> <b>Lat- 25.934219°</b><br/> <b>Long- 93.745128°</b></p>                                       |  | <ul style="list-style-type: none"> <li>• The nallah originates from the Lower Lengri area and traverses densely populated settlements along the Assam–Nagaland border before discharging into the Dhansiri River near Burma Camp, forming a key drainage feature within the project area.</li> <li>• The proposed drain primarily runs through a residential area. Public access to be provided before start of construction of drains</li> <li>• During the Construction period environmental measure should be taken near the sensitive locations</li> <li>• There are few numbers of tree along the proposed drain. The drain will be widened as needed, and tree cutting may not be necessary for its construction.</li> <li>• The construction of this drain has limited accessibility, and suitable access provisions need to be established to facilitate the work.</li> <li>• Public and occupational safety needs to be maintained during construction</li> </ul>  |

| Photos     |   | Environmental Features  |
|------------|---|---|
|            |   | <ul style="list-style-type: none"> <li>No as such requirement of shifting of utility, electric post.</li> </ul>   |
| <b>.D3</b> | <p>Khermahal Rd Drain (Kaccha Uncovered Drain)</p> <p><b>Starting Point</b><br/> <b>Lat- 25.912494°</b><br/> <b>Long- 93.723674°</b></p> <p><b>End Point</b><br/> <b>Lat- 25.920672°</b><br/> <b>Long- 93.727212°</b></p> |  <ul style="list-style-type: none"> <li>Khermahal Road Drain acts as a tributary of Lengri Nallah (D2) and forms an integral component of the local drainage network within the project area.</li> <li>Silt deposition and plant overgrowth restrict water flow, causing frequent flooding. Eroded banks and poor maintenance further exacerbate drainage issues. Clearing vegetation, regular upkeep, and bank reinforcement are crucial for restoring flow capacity.</li> <li>Drain passing through residential and commercial area</li> <li>Access to be provided before start of construction of drains</li> <li>During the Construction period environmental measure should be taken near the sensitive locations</li> <li>Public and occupational safety needs to be maintained during construction</li> <li>No as such requirement of shifting of utility, electric post.</li> <li>The drain will be widened as required. Several trees are located near the stormwater drain, and some may need to be removed for the widening process. The number of affected trees will be assessed in the IEE.</li> </ul> |
| <b>D4</b>  | <p>Dhobi Nallah (Kaccha Uncovered Drain)</p> <p><b>Starting Point</b><br/> <b>Lat- 25.898405°</b><br/> <b>Long- 93.697433°</b></p> <p><b>End Point</b><br/> <b>Lat- 25.911069°</b><br/> <b>Long- 93.734754°</b></p>       |  <ul style="list-style-type: none"> <li>Dhobi Nallah in Lhonithi Colony is an open, natural earthen drain with eroded edges.</li> <li>Proposed Drain passing through residential area</li> <li>The existing drain often overflows due to insufficient space for water accumulation, with vegetation and solid waste obstructing flow. Reinforced embankments and regular clearing are necessary to restore its capacity.</li> <li>Public access should be ensured before the start of drain construction, and public and occupational safety must be upheld throughout the construction process.</li> <li>During the Construction period environmental measure should be taken near the sensitive locations</li> <li>No as such requirement of shifting of utility, electric post.</li> <li>Tree removal may not be necessary for the construction of this drain.</li> </ul>   |







|           |  | Photos   | Environmental Features   |
|-----------|--|--|--|
|           |  |  | <ul style="list-style-type: none"> <li>Shifting of utility may require as per the preliminary site visit.</li> </ul>   |
| <b>D5</b> | Viola Colony Drain<br>(Kaccha Uncovered Drain)<br><b>Starting Point</b><br><b>Lat- 25.904861°</b><br><b>Long- 93.717484°</b><br><b>End Point</b><br><b>Lat- 25.911248°</b><br><b>Long- 93.724713°</b>      |  <p>Latitude: 25.9036<br/>Longitude: 93.726995<br/>Elevation: 166.241.44 m<br/>Accuracy: 7.513 m<br/>Time: 01-09-2025 13:54<br/>Note: Dimapur D7</p>  | <ul style="list-style-type: none"> <li>The Viola Colony Drain is an uncovered earthen channel without protective lining, causing floodwaters to overflow into residential areas due to the lack of a defined floodplain.</li> <li>Severe bank erosion and waste accumulation obstruct water flow. Concrete lining and the creation of controlled floodplains can help reduce flooding risks.</li> <li>Drain passing through the residential and commercial area</li> <li>During the Construction period environmental measure should be taken near the sensitive locations</li> <li>No as such requirement of shifting of utility, electric post.</li> <li>Tree cutting may be required for construction of this drain.</li> </ul>   |
| <b>D6</b> | Neisetuo Colony Drain<br>(Concrete Uncovered Drain)<br><b>Starting Point</b><br><b>Lat- 25.914973°</b><br><b>Long- 93.718452°</b><br><b>End Point</b><br><b>Lat- 25.915274°</b><br><b>Long- 93.726053°</b> |  <p>Latitude: 25.893464<br/>Longitude: 93.720819<br/>Elevation: 149.2942.26 m<br/>Accuracy: 8.074 m<br/>Time: 01-09-2025 16:19<br/>Note: Dimapur D 8</p> <p>Latitude: 25.893512<br/>Longitude: 93.720616<br/>Elevation: 149.2941.78 m<br/>Accuracy: 172.5 m<br/>Time: 01-09-2025 16:17<br/>Note: Dimapur D 8</p> | <ul style="list-style-type: none"> <li>The Neisetuo Colony Drain is an uncovered RCC drain, with weak and poorly maintained boundary walls. The lack of desilting leads to stagnant water and frequent flooding.</li> <li>The drain runs through both residential and commercial areas.</li> <li>The drain frequently gets clogged with solid and plastic waste dumped from the residential area.</li> <li>Private properties are located on both sides of the drain, leaving minimal space for drainage improvement works. Adequate access arrangements need to be ensured during the construction period to facilitate smooth execution of activities.</li> <li>Widening of the drain is not feasible due to the limited space available on both sides.</li> <li>Public and occupational safety needs to be maintained during construction</li> <li>No as such requirement of shifting of utility, electric post.</li> <li>Tree cutting may be necessary for the construction of this drain. Additionally, utility relocation may be required based on the preliminary site visit.</li> <li>No sensitive receptors are present in proximity of the proposed site.</li> </ul> |

|    |   | Photos  | Environmental Features  |
|----|---|---|---|
| D7 | Railway Colony<br>Drain (Kaccha<br>Uncovered Drain)<br><b>Starting Point</b><br><b>Lat- 25.905372°</b><br><b>Long- 93.726320°</b><br><b>End Point</b><br><b>Lat- 25.902050°</b><br><b>Long- 93.727490°</b>  |  <p>Latitude: 25.906929<br/>Longitude: 93.721188<br/>Elevation: 167.19172 m<br/>Accuracy: 4.233 m<br/>Time: 01-09-2025 14:07<br/>Note: Dimapur D4<br/>Powered by NoteCam</p>   | <ul style="list-style-type: none"> <li>• The Railway Station Drain is a secondary drain with sections running along the roadside and is proposed to be integrated with Hospital Nallah (D1) to enhance overall drainage connectivity. The total length of the drain is approximately 582 m.</li> <li>• The existing drain is an uncovered (Kuchha) drain, while the proposed drain primarily passes through a residential area.</li> <li>• Widening drain will be done as per requirement. Cleaning of accumulated solid waste and plastic waste is necessary, and vegetation may need to be cleared for the widening of the drain.</li> <li>• The construction of this drain has limited accessibility, and suitable access provisions need to be established to facilitate the work</li> <li>• Public and occupational safety needs to be maintained during construction.</li> <li>• During the Construction period environmental measure should be taken near the sensitive locations</li> <li>• Public and occupational safety needs to be maintained during construction</li> <li>• No as such requirement of shifting of utility, electric post.</li> </ul> |
| D8 | Thaheku Village<br>Drain (Kaccha<br>Uncovered Drain)<br><b>Starting Point</b><br><b>Lat- 25.884961°</b><br><b>Long- 93.708518°</b><br><b>End Point</b><br><b>Lat- 25.902029°</b><br><b>Long- 93.727584°</b> |  <p>Latitude: 25.907464<br/>Longitude: 93.719137<br/>Elevation: 166.941.01 m<br/>Accuracy: 9.435 m<br/>Time: 01-09-2025 14:14<br/>Note: Dimapur D 5<br/>Powered by NoteCam</p>  <p>Latitude: 25.915162<br/>Longitude: 93.721698<br/>Elevation: 165.421.18 m<br/>Accuracy: 3.822 m<br/>Time: 01-09-2025 14:34<br/>Note: Dimapur D 5<br/>Powered by NoteCam</p> | <ul style="list-style-type: none"> <li>• The Thaheku Village Drain is a brick-lined natural drain that is significantly obstructed by trash and debris, especially around the culverts.</li> <li>• The lack of proper boundary walls or their poor maintenance allows solid waste to enter the drain, causing blockages that result in continuous waterlogging during rainfall. Vegetation clearance may require for the construction of drain</li> <li>• Private properties are located on both sides of the drain, leaving minimal space for drainage improvement works. Adequate access arrangements need to be ensured during the construction period to facilitate smooth execution of activities.</li> <li>• No as such requirement of shifting of utility, electric post.</li> <li>• No tree cutting may be required for construction of this drain.</li> <li>• No specific environmental features nearby the drain.</li> </ul>  |





**Table 17: Site Environmental Features of Road – Chümoukedima town**

| Sl no. | Road Name   | Length of the road(m)  | Starting and endpoint of the road   | Environmental Features of the Site  | Photograph   |
|--------|---|--|---|---|--|
| 1      | MDR via Norman Putsure Chamber of Commerce Office | Length- 2.811 Km<br>Existing Carriageway<br>Width- 3m- 6.2 m | Start- Lat- 25.8194°, Long- 93.7735°<br>End Lat- 25.8071°, Long- 93.7906° | <p>This stretch lies within plain terrain, with land use predominantly residential and interspersed with institutional buildings. The available road width ranges from 3.4 meters to 17.1 meters. The road surface is of kutcha type and is currently in poor condition. The drainage system is kutcha, uncovered, and generally in poor condition, with vegetation growth observed. In most sections, side drains are absent, obstructing the natural flow of water.</p> <p>A total of 63 utilities, arranged in a zigzag pattern along this stretch, may require relocation.</p> <p>There is no waterbody near the proposed road</p> <p>There are 9 numbers of trees along the proposed road which may need to be cut during the construction period.</p> <p>Two churches, one school, and one college are located adjacent to the proposed road alignment. These institutions are considered sensitive receptors, as they may be affected by noise, dust, and vibration generated during construction activities. Proper mitigation measures, such as controlled construction scheduling, dust suppression, and noise management practices, should be implemented to minimize potential disturbances and ensure a safe and conducive environment for students and the local community. No as such specific environmental feature observed.</p> |    |

| SI no. | Road Name                                | Length of the road(m)  | Starting and endpoint of the road   | Environmental Features of the Site   | Photograph   |
|--------|--|--|---|--|--|
| 2      | Konyak Baptist Church to Shekinah School | Length- 0.867 Km<br>Existing Carriageway 3.0 m to 3.3 m<br>. | Start<br>Lat- 25.8085°,<br>Long- 93.7723°<br>End<br>Lat- 25.804°,<br>Long- 93.7715° | <p>This stretch lies in plain terrain, with land use predominantly residential, interspersed with access routes to a few religious sites and schools. The available land width ranges from 3.3 m to 10.7 m.</p> <p>The road has a Kutcha surface in poor condition, with the carriageway width ranging from 1.8 m to 3.3 m along its entire stretch.</p> <p>There is no roadside drainage system present along this stretch of the road.</p> <p>A total of 35 utilities located in a zigzag pattern are present along this stretch, which may need to be relocated.</p> <p>There is a pond within the impacted zone of the road.</p> <p>There is no tree observed along the project road</p> <p>No sensitive receptors are present in close proximity of the proposed site.</p> <p>No as such specific environmental feature observed.</p> |  <p>Latitude: 25.804028<br/>Longitude: 93.771494<br/>Elevation: 190.86±3.4 m<br/>Accuracy: 3.93 m<br/>Time: 02-09-2025 11:26<br/>Note: Chumukedima R2</p> |




| SI no. | Road Name                   | Length of the road(m)                                     | Starting and endpoint of the road  | Environmental Features of the Site   | Photograph  |
|--------|-----------------------------|---|--|--|---|
| 3.     | Approach Road Weekly Market | Length- 0.811 Km<br>Existing Carriageway width- 3.0-7.0 m | Start<br>Lat- 25.8181°,<br>Long- 93.7824°<br>End<br>Lat- 25.8147°,<br>Long- 93.7849° | <p>This road segment begins at the Weekly Market junction with NH 29 and extends to the vicinity of the Federal Bank intersection. It traverses plain terrain, with land use along the corridor primarily residential, interspersed with a private hospital, hotels, and a weekly market. The available land width ranges from 4.6 m to 12.2 m.</p> <p>The carriageway width varies from 2.0 m to 7.0 m, with a predominantly kutcha surface mixed with some bituminous concrete, and the overall pavement condition is poor.</p> <p>Drainage exists only in parts of the stretch; where present, it is pucca, covered, and in fair condition but needs improvement.</p> <p>A total of 23 utilities arranged in a zig-zag pattern are present along this stretch and may require relocation.</p> <p>No tree cutting may be required for construction of this road. No waterbody exists along the project road.</p> <p>No sensitive receptors are present in close proximity of the proposed site.</p> <p>No as such specific environmental feature observed.</p> |  <p>Latitude: 25.816167<br/>Longitude: 93.78578<br/>Elevation: 200.95±2.66 m<br/>Accuracy: 9.632 m<br/>Time: 02-09-2025 10:25<br/>Note: Chumukedima R3</p> <p>Latitude: 25.814923<br/>Longitude: 93.785467<br/>Elevation: 202.25±1.63 m<br/>Accuracy: 8.295 m<br/>Time: 02-09-2025 10:28<br/>Note: Chumukedima R3</p> |





| SI no. | Road Name                          | Length of the road(m)                                   | Starting and endpoint of the road  | Environmental Features of the Site   | Photograph  |
|--------|------------------------------------|---|--|--|---|
| 4      | Approach Road to Chutsolie Colony  | Length- 1.413 Km<br>Existing Carriageway width 3.6 m-5m | Start<br>Lat- 25.8152°,<br>Long- 93.7632°<br>End<br>Lat- 25.8078°,<br>Long- 93.769°  | <p>This Ward-10 road section, from Indian Oil to Chutsolie Colony, lies in plain terrain with primarily residential land use and access to government offices. The land width ranges from 4.7 m to 15.9 m.</p> <p>The road has a kutcha surface in poor condition, and the brick drain is damaged, uncovered in places, and overall, in poor condition.</p> <p>There are 33 utilities arranged in a zig-zag pattern without a proper utility corridor, which may need relocation.</p> <p>A total of 4 trees is located along the project road, which may require removal to facilitate construction activities. No waterbody presents along the project road.</p> <p>No environmentally sensitive receptors are present along the subproject road.</p> |  <p>Latitude: 25.811662<br/>Longitude: 93.7642<br/>Elevation: 187.16±3.64 m<br/>Accuracy: 3.79 m<br/>Time: 02-09-2025 11:16<br/>Note: Chumukedima R4</p>     |
| 5      | Approach Road at Kikrurazha Colony | Length- 1.200 Km<br>Existing Carriageway width 3.5-6 m  | Start<br>Lat- 25.8015°,<br>Long- 93.7500°<br>End<br>Lat- 25.7976°,<br>Long- 93.7594° | <p>The proposed road is located in Ward-10. This road, from Kikrurazha Colony Approach Road to near Life Square Ministries, lies in plain terrain with predominantly residential land use and a width of 3.4 m to 12.5 m.</p> <p>The proposed road is of earthen type. Utility shifting not required for this road.</p> <p>There are 2 numbers of church is located adjacent to the proposed project road</p> <p>The drain is of kutcha or brick construction and remains uncovered, with the overall drainage system in poor condition. No waterbody presents along the project road.</p> <p>No tree cutting is required for construction of this road. No specific environmental features nearby</p>   |  <p>Latitude: 25.799634<br/>Longitude: 93.756943<br/>Elevation: 184.39±4.06 m<br/>Accuracy: 5.645 m<br/>Time: 02-09-2025 11:50<br/>Note: Chumukedima R5</p> |



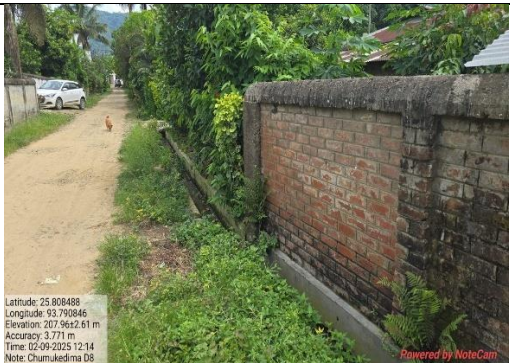




**Table 18: Site Environmental Features of Drain – Chümoukedima town**

| Sample Drains   | Photos   | Environmental Features  |
|---|--|---|
| <b>Drain 1: New DC office Drain, Kaccha Drain, Uncovered</b><br><b>Start Point:</b><br><b>Lat: 25.8034</b><br><b>Long: 93.7764</b><br><b>End Point:</b><br><b>Lat: 25.8076</b><br><b>Long: 93.75365</b><br><b>Length: 3084.13 m</b> |  <p>Latitude: 25.80638<br/>Longitude: 93.779178<br/>Elevation: 198.07±3.82 m<br/>Accuracy: 7.063 m<br/>Time: 02-09-2025 11:33<br/>Note: Chumoukedima 01</p>   | <ul style="list-style-type: none"> <li>The existing drain is a natural gravel drain. In most sections, it remains open and is clogged with solid waste.</li> <li>The drain passes through mainly residential areas.</li> <li>Public access should be ensured before commencing drain construction.</li> <li>No tree cutting will be required for the drain construction.</li> <li>Public and occupational safety must be ensured during the construction period.</li> <li>There is no waterbody near the proposed drain; however, utility shifting will be necessary.</li> <li>Due to high runoff from upstream, the drain frequently overflows, causing severe waterlogging in the surrounding areas.</li> </ul> |
| <b>Drain 2: N.I.T. drain</b><br><b>Start Point:</b><br><b>Lat: 25.8017</b><br><b>Long: 93.7662</b><br><b>End Point:</b><br><b>Lat: 25.8076</b><br><b>Long: 93.75459</b><br><b>Length: 1818.77 m</b>                                 |  <p>Latitude: 25.80173<br/>Longitude: 93.76623<br/>Elevation: 150.89±2.83 m<br/>Accuracy: 7.265 m<br/>Time: 02-09-2025 11:39<br/>Note: Chumoukedima 02</p>   | <ul style="list-style-type: none"> <li>The existing drainage consists of an open, natural earthen channel.</li> <li>The drain passes through both residential and commercial areas.</li> <li>This drain originates from NIT Chümoukedima and carries a high volume of runoff, often leading to overflow and waterlogging in the surrounding areas. The proposed drain ultimately discharges into the Khova River.</li> <li>Clearance of dense bushes, herbs and shrubs is required.</li> <li>As per preliminary site visit, no utility shifting is required.</li> <li>No sensitive receptor is present at proximity.</li> <li>No as such specific environmental feature observed.</li> </ul>                      |
| <b>Drain 3: Suruzha Colony Drain, Brick Drain, Uncovered</b><br><b>Start Point:</b><br><b>Lat: 25.7986</b><br><b>Long: 93.7605</b><br><b>End Point:</b><br><b>Lat: 25.8049</b><br><b>Long: 93.75764</b><br><b>Length: 883.72 m</b>  |  <p>Latitude: 25.79873<br/>Longitude: 93.760462<br/>Elevation: 189.43±2.89 m<br/>Accuracy: 8.899 m<br/>Time: 02-09-2025 11:45<br/>Note: Chumoukedima 03</p> | <ul style="list-style-type: none"> <li>The Suruzha Colony Drain is an open, natural earthen drain with banks that have been eroded.</li> <li>The drain traverses through a residential area.</li> <li>The existing drain is clogged with solid waste, restricting its flow capacity.</li> <li>Clearing of vegetation and removal of a few small trees may be required.</li> <li>The proposed drain alignment passes through a congested residential area and will be developed within the available existing land.</li> </ul>   |

| Sample Drains   | Photos  | Environmental Features  |
|---|---|---|
|   |   | <ul style="list-style-type: none"> <li>Utility shifting may be necessary, as observed during the preliminary site visit.</li> <li>No sensitive receptors are located in the immediate vicinity of the proposed site.</li> <li>No major tree cutting will be required for the construction of this drain.</li> </ul>   |
| <b>Drain 4: Drain of Ward 7, Kaccha Drain, Uncovered</b><br><b>Start Point:</b><br><b>Lat: 25.8089</b><br><b>Long: 93.7865</b><br><b>End Point:</b><br><b>Lat: 25.8107</b><br><b>Long: 93.78083</b><br><b>Length: 814.12 m</b>            |    | <ul style="list-style-type: none"> <li>The proposed drain alignment passes predominantly through open areas.</li> <li>The Ward-7 Drain is an open, natural earthen drain with eroded banks and no boundary walls.</li> <li>Private properties are located on both sides of the drain, leaving minimal space for drainage improvement works. Adequate access arrangements need to be ensured during the construction period to facilitate smooth execution of activities.</li> <li>Vegetation clearance may be necessary for the construction of the drain.</li> <li>Excessive upstream runoff causes the drain to overflow, resulting in waterlogging in adjacent areas.</li> <li>There are no notable environmental features in the vicinity of the drain.</li> <li>Based on the preliminary site visit, no utility shifting will be required.</li> <li>Construction of this drain will not require tree cutting.</li> </ul> |
| <b>Drain 5: Drain near Debal Market, Concrete Drain, Uncovered</b><br><b>Start Point:</b><br><b>Lat: 25.8065</b><br><b>Long: 93.7897</b><br><b>End Point:</b><br><b>Lat: 25.8089</b><br><b>Long: 93.78653</b><br><b>Length: 491.268 m</b> |  | <ul style="list-style-type: none"> <li>A major portion of the proposed drain alignment passes through agricultural land and open areas.</li> <li>High upstream runoff, combined with the presence of a private boundary wall on one side, results in overflow and subsequent waterlogging in the surrounding areas.</li> <li>The drain currently lacks a defined edge, and complete construction is required.</li> <li>Vegetation clearance may be necessary to facilitate drain construction.</li> <li>There is no significant requirement for utility or electric pole shifting.</li> <li>Tree cutting is not anticipated for the construction of this drain.</li> <li>No notable environmental features are present in the vicinity of the drain.</li> </ul>   |



| Sample Drains  | Photos  | Environmental Features   |
|--|---|--|
| <b>Drain 6:</b><br><b>Church Rd</b><br><b>drain</b><br><b>Concrete</b><br><b>Drain,</b><br><b>Uncovered</b><br><b>Start Point:</b><br><b>Lat: 25.8089</b><br><b>Long: 93.7884</b><br><b>End Point:</b><br><b>Lat: 25.8089</b><br><b>Long: 93.78653</b><br><b>Length:</b><br><b>255.083 m</b> |    | <ul style="list-style-type: none"> <li>• The Church Road Drain comprises three uncovered roadside brick drains that converge at a low-lying junction, resulting in significant water accumulation.</li> <li>• The existing drain is an uncovered roadside brick drain designed to bypass waterlogging in the Church Road area and ultimately discharge into the Khova River.</li> <li>• The existing drain seems as a narrow furrow, which is earthen with only signs of demarcation of runoff is present.</li> <li>• No as such safety features of drain is observed for prevention of pollution.</li> <li>• Few spots contain herbs which needs clearance.</li> <li>• No as such specific environmental feature observed.</li> </ul>   |
| <b>Drain 7: Drain</b><br><b>of Ward 6,</b><br><b>Brick Drain,</b><br><b>Uncovered</b><br><b>Start Point:</b><br><b>Lat: 25.8086</b><br><b>Long: 93.7893</b><br><b>End Point:</b><br><b>Lat: 25.8100</b><br><b>Long: 93.79007</b><br><b>Length:</b><br><b>191.463 m</b>                       |   | <ul style="list-style-type: none"> <li>• The proposed drain alignment passes through both residential and open areas.</li> <li>• A swampy stretch is observed along the drain, requiring vegetation clearance.</li> <li>• The low-lying nature of the area leads to frequent flooding caused by water accumulation, further aggravated by damaged boundary walls and dense vegetation that obstruct stormwater flow.</li> <li>• Vegetation removal, primarily consisting of shrubs, will be necessary to improve drainage efficiency.</li> <li>• The project site is located within an urban area and is surrounded by residential structures with temporary boundary walls. No significant protected forests are present in or around the proposed drain alignment.</li> <li>• Private properties are located on both sides of the drain, leaving minimal space for drainage improvement works. Adequate access arrangements need to be ensured during the construction period to facilitate smooth execution of activities.</li> </ul> |
| <b>Drain 8: Union</b><br><b>Baptist Church</b><br><b>Road Drain,</b><br><b>Concrete</b><br><b>Drain,</b><br><b>Uncovered</b><br><b>Start Point:</b><br><b>Lat: 25.8079</b><br><b>Long: 93.7928</b><br><b>End Point:</b><br><b>Lat: 25.8084</b><br><b>Long: 93.79096</b>                      |  | <ul style="list-style-type: none"> <li>• The proposed drain alignment traverses both commercial and residential areas.</li> <li>• The existing drainage system is in poor condition due to choking caused by silt, solid waste, and other debris.</li> <li>• Preliminary site inspection indicated that the existing drain is carrying blackwater.</li> <li>• Vegetation clearance will be necessary prior to the commencement of construction activities.</li> </ul>  |

| Sample Drains   | Photos  | Environmental Features   |
|---|---|--|
| <b>Length:</b><br><b>227.212 m</b>  |   | <ul style="list-style-type: none"> <li>Public and occupational safety measures must be ensured throughout the construction phase.</li> <li>No utility shifting is anticipated based on the preliminary site assessment.</li> <li>There are no environmentally sensitive areas or significant protected forests in or around the proposed alignment.</li> <li>No tree cutting will be required for the construction of this drain.</li> </ul>   |
| <b>Drain 9: Drain near Chumoukdima Gas Agency, Concrete Drain, Uncovered</b><br><b>Start Point:</b><br><b>Lat: 25.8086</b><br><b>Long: 93.7909</b><br><b>End Point:</b><br><b>Lat: 25.8098</b><br><b>Long: 93.79139</b><br><b>Length:</b><br><b>151.731 m</b> |  <p>Latitude: 25.809255<br/> Longitude: 93.791371<br/> Elevation: 159.4715.23 m<br/> Accuracy: 15.14 m<br/> Time: 02-09-2025 12:18<br/> Note: Chumoukdima D9</p> | <ul style="list-style-type: none"> <li>The Chūmoukedima Gas Agency Road Drain is an uncovered roadside RCC drain constructed on one side of the road. Due to inadequate maintenance, it is clogged with solid waste.</li> <li>The surrounding land use is predominantly residential, and the proposed drain alignment follows the main road.</li> <li>The limited width of the existing drain contributes to flooding in the area during the rainy season.</li> <li>Public and household safety must be ensured during rehabilitation works.</li> <li>No notable environmental features are present in the vicinity of the drain.</li> <li>No shifting of utility is required as per the preliminary site visit.</li> <li>No sensitive receptors are present in close proximity of the proposed site.</li> </ul> |
| <b>Drain 10: Ward 6 Drain, Kaccha Drain, Uncovered</b><br><b>Start Point:</b><br><b>Lat: 25.8034</b><br><b>Long: 93.7764</b><br><b>End Point:</b><br><b>Lat: 25.8066</b><br><b>Long: 93.78086</b><br><b>Length: 782.1 m</b>                                   |    | <ul style="list-style-type: none"> <li>The land use along the road is partly residential and partly commercial.</li> <li>The existing drain passes through dense vegetation, which obstructs the flow, leading to overflow and subsequent flooding in the area.</li> <li>The existing drains are not in good condition because of the drains are choked with silt, solid waste etc</li> <li>No tree felling will be required for construction of drain.</li> <li>No environmentally sensitive areas in or near the proposed alignment.</li> <li>There is no significant protected forest in and around project area.</li> <li>There is no waterbody near the proposed drain.</li> </ul>  |



## VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### A. Introduction

199. 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.

200. 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.

201. 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).

202. 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 analyzed 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.

203. 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**

204. **Design of the Proposed Components.** The proposed design for the subproject includes construction of Urban roads and drains. The subproject road involves construction of utility ducts and roadside drainage 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:

- ✓ Storm water drain is provided at the extreme edge of the right of way;
- ✓ 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;
- ✓ There is safe distance between water supply line and drainage line to avoid any intermixing in case of any leakage or pipe burst.
- ✓ Footpaths have been provided along most roads in Dimapur and Chümoukedima to accommodate the needs of pedestrians, including the elderly and persons with disabilities.
- ✓ The cables are away from tree line to avoid possible entrapment of the cable by tree roots.

205. **Utilities.** Telephone lines and wires within the proposed subproject locations may require to be shifted in few cases. 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; and (ii) require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

206. Survey along road in different towns have been carried out Based on the primary field survey, it was observed that in Dimapur, a total of 387 utilities—comprising mainly electric poles, telephone poles, and lamp posts—will require shifting, while in Chümoukedima, approximately 180 utilities are identified for relocation. A detailed confirmatory survey will be undertaken by the respective contractor prior to finalizing the complete list of utilities requiring shifting, as well as the trees to be felled. The chainage-wise strip plan indicating the location of utilities has been provided in **Appendix 17**.

207. **Social and Cultural Resources.** Dimapur and Chümoukedima is an area of numbers of Church and other religious sites, so there is a risk that any work involving ground disturbance can uncover and damage archaeological and historical remains. For the subproject (for drain), excavation will occur in mainly in open area and residential area, so it could be that there is a medium risk of such impacts. Nevertheless, PIU or PMDSC will:

- i. Consider alternatives if the site is found to be of high risk;
- ii. Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved.

208. **Safety in Design:** These towns face problems of flash flood due to poor drainage condition. Issues of inundations are reported after heavy rainfall across the towns and mainly in the low-lying areas. Mitigation measures provided are follows:

209. There is storm water drainage proposed to dispose the flood water into nearby rivers/stream to address the problem of water stagnation.

210. Under this project storm water drainage is proposed on various locations of the town.

211. Under the package only urban roads and drains are considered for 2 towns. As per generic consideration about 80% generation of waste water from supplied water under projected years for all the 2 towns. At few points, along with storm water, sewerage from household's discharge in the drain.

212. **Sewer system – collection and conveyance.** Concept include interception of major drains in the core area and the collection and conveyance of the intercepted wastewater to the final intercepting point by gravity sewer and collection of waste water in the collection well at the final intercepting point. The combined potential diversion from four locations of Dimapur is estimated at approximately 12.83 MLD, which can be directed to the Dimapur STP to optimize its utilization capacity. This strategy will allow interception and treatment of stormwater mixed with sewage at the STP, thereby reducing environmental pollution and enhancing sanitation in the city. The treated effluent shall be discharged into the river or to the cultivation land for agriculture purpose depending upon the need of public in the nearby area.

213. In Chümoukedima, the lack of a proper sewage system results in stormwater drains frequently carrying a mixed flow, as sewage water enters the stormwater drainage network. This contamination of stormwater with sewage is a significant concern, as it can cause environmental degradation and present serious health risks to the community.

214. **Design of the Storm Water Drainage System.** The quality of existing drainage water should be monitored by the contractor prior to the commencement of construction activities. This baseline assessment will help identify any pre-existing contamination and enable comparison with post-construction conditions to evaluate potential environmental impacts arising from project activities. The final detailed design will ensure that the following:

- (i) Inlets to the drainage system are positioned away from outlets of septic tanks and grey water lines of households or commercial establishments. This will avoid the situation where the drainage system will be used as discharge point of septic and household wastes that could pollute the receiving bodies of water; and
- (ii) Silt traps are integrated in the design to avoid heavy siltation in the drainage system during monsoon season that could eventually affect the receiving bodies of water at the outfalls of the drainage system

215. **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 are not 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 avoid disposals near water bodies or in areas which are inconvenient to the community.

216. **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 take into account 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.

217. **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.

218. The natural raw materials like sand, gravel and soil shall be procured/ sourced from the authorized mines listed by Nagaland Government as specified in the website 'Directorate of Geology & Mining Government of Nagaland'<sup>20</sup>. The transportation of raw material from other states may cause trans-boundary pollution leading to air and noise pollution.

219. Water required for construction activities can be sourced from the Dhansiri and Chathe Rivers, which are located within and near the town, subject to obtaining the necessary NOC. In case groundwater is proposed for use, prior approval must be obtained from the competent authority. The contractor shall ensure that all required NOCs are secured before commencing construction works.

220. **Mitigation Measures.** Contractor should procure these materials only from the quarries permitted/ licensed by Directorate of Geology & Mining Government of Nagaland;

- ✓ Contractor should, to the maximum extent possible, procure material from existing authorized quarries;
- ✓ The contractor shall try to procure/ source the material from the nearest possible authorized mines.
- ✓ 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
- ✓ Contractor should submit the details of sources and copies of approvals,

<sup>20</sup> <https://dgm.nagaland.gov.in/>



permissions to Dimapur Municipal Council and Chümoukedima Town Council, and should start procurement only after the respective source is approved by Dimapur Municipal Council and Chümoukedima Town Council.

- ✓ The transportation of raw material should be done in covered vehicles.
- ✓ Borrow areas will be required for the construction of the urban roads. The guidelines for the Borrow Area Management Plan are provided in as **APPENDIX 16**.

221. **Tree cutting.** Cutting of trees in non-forest land requires a tree cutting permit from the local forestry department. As the entire drainage length in Dimapur and Chümoukedima towns is not fully accessible, an approximate assessment based on visual inspection indicates that about 50 trees in each town may need to be felled. The tree marking and exact numbers will be finalized during the pre-construction confirmatory survey. Additionally, within the Right of Way (RoW) of the Dimapur and Chümoukedima urban road subprojects, 11 and 17 trees, respectively, have been identified that may require removal. All trees cut under a project must be compensated by compensatory afforestation as required by the State Forest Department. It should be ensured that

- ✓ Restrict tree cutting within construction limit.
- ✓ As per compensatory afforestation requirement, the tree plantation will be done five times of tree cutting (1:5 of tree cutting).
- ✓ Avoid tree cutting at ancillary sites.

222. **Maintaining Core Labor Standard.** The Contractor and PMU/PIU are responsible for ensuring that international CLS<sup>21</sup> as reflected in national labor laws and regulations are adhered to. PIU is ultimately responsible for monitoring compliance with national labor laws and regulations and international CLS. ADB will undertake due diligence – during loan review missions - to verify 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.

223. **Debris and Silt disposal.** In Dimapur, approximately 13,465 m<sup>3</sup> of silt is expected to be generated from drainage construction activities, while in Chümoukedima, the estimated silt generation is 3,432.8 m<sup>3</sup>. The provision has been made in cost estimate to use the excavated materials as necessary for the construction of road, which are as follows:

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

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

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<sup>21</sup> 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.

to dispose of the unsuitable material generated from road excavation.

225. **Preparation of H&S Plans.** With the existing EHS guidelines contractor has to prepare a site specific EHS plan i i and it get approved from PMU before starting of construction, the Contractor shall abide by the most stringent procedure available.

### **C. Construction Impacts**

226. The civil works for the subproject includes construction storm water drain. This work will be confined to sites, and construction will include general activities like site clearance, excavation for foundations, and creation of concrete structures will be one of the major construction activities for this project. Construction dust, noise, use of local roads for transportation of construction material, waste, labour camps etc., will have negative impacts, which needs to be avoided or mitigated properly.

227. Subprojects include linear works (i) Construction of roads and (ii) construction of storm water drain. This covers almost entire project area of Dimapur Municipal Council and Chümoukedima Town Council.

228. **Construction Methodology of Urban Road.** The construction of urban roads will be executed as per IRC:SP-20, IRC:37, and MoRTH specifications, ensuring quality, durability, and safety. The process begins with site clearance and setting out, where the alignment, width, and levels are established. Existing utilities are identified and protected before starting earthwork.

229. Earthwork and subgrade preparation involve excavation, filling, and compaction to achieve the desired formation level and strength. This is followed by laying a granular sub-base (GSB) and wet mix macadam (WMM) layers, each compacted to the specified density.

230. After the base layers are prepared, a bituminous surfacing (such as DBM and BC) is laid using a mechanical paver to ensure uniform thickness and smooth finish. Rolling is done with vibratory or pneumatic rollers to achieve proper compaction.

231. In urban stretches, side drains, footpaths, and road markings are constructed simultaneously to ensure proper drainage, pedestrian movement, and traffic safety. Quality control is maintained at every stage through regular testing of materials and workmanship. Environmental and safety measures such as dust suppression, noise control, and proper waste management are also ensured during construction.

232. **Construction Methodology for drain.** The construction of storm water drains will be carried out following standard engineering practices in accordance with IRC: SP-42, CPHEEO Manual, and relevant MoRTH specifications to ensure durability, stability, and effective drainage performance. Initially, the work will begin with site clearance and setting out, where the alignment and levels of the proposed drains will be established using proper surveying instruments. Any existing utilities within the construction zone will be identified and protected or relocated before excavation begins.

233. Excavation for the drain trenches will be performed either mechanically or manually, depending on space availability and surrounding structures. In densely built-up urban areas, manual excavation is preferred to avoid damage to adjacent properties. The trench bed will then be levelled and compacted, with a layer of lean concrete provided as a foundation where required.

234. Reinforcement and formwork will be placed as per approved designs, ensuring proper alignment and concrete cover. Concreting will be done using an approved grade of concrete (generally M20 or above), compacted with mechanical vibrators for structural integrity. In areas with limited access, boom pumps or manual methods may be used for concrete placement. After proper curing, precast or cast-in-situ covers will be installed where necessary, particularly in pedestrian and traffic zones.

235. Finally, backfilling will be carried out with suitable excavated material, compacted in layers to restore ground stability. Throughout construction, strict quality control and safety measures will be maintained, including regular material testing, proper site barricading, and adherence to environmental safeguards such as dust suppression and safe waste disposal.

236. The Project will involve improvements to existing roads without widening or realignment. There are no roads that are identified to be in environmentally protected areas.

237. The construction phase impacts are temporary, some are permanent. The permanent impacts would be positive in nature such as increase in business & employment opportunities, reduction in accidents, and comfort in journey. Though project road are only small rural roads not a national highway thus negative impact such as risk of HIV/AIDs and human trafficking will be negligible, however these negative impacts would be during construction phase only.

238. **Screening of non-Significant Impacts:** The construction work is expected not to cause major negative impacts, mainly because:

- ✓ Most of the activities will be on the built-up areas of Dimapur and Chümoukedima town thus could be constructed without causing impacts to biodiversity;
- ✓ The roads will be constructed in rights of way within the government property that is intended for the construction of the carriageway of the roads
- ✓ Overall construction program will be relatively short and is expected to be completed in 36 months with activities to be conducted by small teams and specified location so most impacts will be localized and short in duration; and
- ✓ Most of the predicted impacts associated with the construction process are produced because the process is invasive, such as involving excavation. However, the routine nature of the impacts means that most can be easily mitigated, and the impacts are clearly a result of the construction process rather than the design or location, as impacts will not occur if excavation or other ground disturbance is not involved.

239. **Anticipated Impacts and Mitigation Measures.** Although construction of the subproject components involves simple techniques of civil work, excavation and the subproject locations in the built-up areas of these towns where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are temporary and for short duration. Physical impacts will be reduced by the method of working and scheduling of work, whereby the project components will be (i) constructed by small teams working at a time; (ii) effective traffic management; (iii) planning for utility shifting (iv) any excavation done near sensitive area like school, religious places and house will be protected as per standard norms.

240. **Sources of Materials.** Since the construction work is not heavy, 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. Contractor 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:

- ✓ Obtain construction materials only from government approved quarries with prior approval of PIU;
- ✓ PIU to review, and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval;
- ✓ Contractor to submit to 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 PIU.

241. **Air Quality.** Most of the dust (suspended particulate matter) during construction arises from operations such as excavation and filling during site preparation works, loading, unloading and transportation of construction material, drilling use of heavy equipment's and machinery in the earthworks and pavement works. The fugitive dust released during the construction activities cause immediate effect on the construction workers as well as on the nearby households, businesses and people residing in these structures. Increased suspended particulate matter and fugitive gaseous emissions like, oxides of Sulphur (SO<sub>x</sub>), oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO) etc., will be released from vehicles, Hot mix plants, batching plants and diesel generator sets etc., also add to the problem. Most of the generated pollutants from the above activities are limited to construction phase and confined to construction site due to surrounding buildings and settlement:

242. **For overall construction works**

- ✓ Dust cannot be avoided completely due to the nature of the activities during site preparation and construction. However, it can be managed by regularly spraying water at the site (particularly during the dry season).
- ✓ Control dust generation while unloading the loose material (particularly aggregate, soil) at the site by sprinkling water and unloading inside the barricaded area;
- ✓ Stabilize surface soils where loaders, support equipment and vehicles will operate by using water and maintain surface soils in a stabilized condition
- ✓ Apply water and maintain soils in a visible damp or crusted condition for temporary stabilization;
- ✓ Apply water prior to levelling or any other earth moving activity to keep the soil moist throughout the process;
- ✓ Cover the soil stocked at the sites with tarpaulins;
- ✓ Control access to work area, prevent unnecessary movement of vehicle, public trespassing into work areas; limiting soil disturbance will minimize dust generation.
- ✓ Ensure that all the construction equipment and machinery are fitted with pollution control devices, which are operating correctly, and have a valid pollution under control (PUC) certificate.
- ✓ Construction labours shall be provided with nose masks and other personnel protective equipment.



243. On the proposed subprojects road sections, it is expected that air quality will be affected to some minor extent by dust and particulate matters generated by construction, vehicular movements, site clearance, earth filling and material loading and unloading. The impacts are expected to be localized, temporary and confined to construction areas. Care should, however, be taken at sensitive urban locations so that harmful impacts can be minimized.

244. **Surface Water Quality.** There are some water bodies adjacent to the proposed main drain. Runoff from the excavated areas and material and waste soil stocks likely to contain silt, and this silt runoff will deteriorate the water bodies. This impact is expected to occur primarily during the rainy season. Cleaning/desilting of the drains will produce sludge which needs to be disposed of properly. Run-off from stockpiled materials and chemicals from fuels and lubricants during construction works can contaminate downstream surface water quality of the streams. It is important that runoff from the construction areas, which may contain silt and chemical traces do not enter these water bodies. Impact will be temporary, and may not be significant, but needs to be mitigated. Construction contractor will be required to:

- ✓ All earthworks including excavation to be conducted during the dry season to prevent the problem of soil run-off during monsoon season;
- ✓ Avoid stockpiling of earth fill especially during the monsoon season, unless it is covered by tarpaulins or plastic sheets and stored within bunded areas;
- ✓ Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, only designated disposal areas shall be used;
- ✓ Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
- ✓ Place storage areas for fuels and lubricants away from any drainage
- ✓ Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling
- ✓ Dispose any wastes generated by construction activities in designated sites; and
- ✓ Conduct surface quality inspection according to the environmental management plan (EMP).
- ✓ Avoid spillage or leakage of raw material and fuel, oil etc., in the water bodies.

245. **Surface and 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 leads to silting. To avoid this the contractor needs to be implemented the following measures:

- ✓ Create a temporary drainage channel around the work area to arrest the entry of runoff from upper areas into the work area
- ✓ 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
- ✓ Consider safety aspects related to pit collapse due to accumulation of water

246. **Climate-Related Impacts of Construction.** Construction activities in these low-lying and flood-prone districts present specific environmental risks:

- Construction of new roads and rigid drains can inadvertently block existing natural runoff

paths, leading to localized waterlogging in Chümoukedima's foothill areas and Dimapur's plains.

- Excavation during the monsoon or pre-monsoon period causes loose soil to wash into existing streams (like the Dhansiri river), reducing their carrying capacity and increasing flood risks downstream.
- New bitumen or concrete roads increase surface runoff speed and volume, which can overwhelm old, undersized secondary drainage networks.
- Urban road expansion contributes to higher localized temperatures, a growing concern in Dimapur's dense commercial zones.

**247. Mitigation Measure.**

- Incorporating semi-permeable materials on road shoulders to allow for natural infiltration.
- Ensuring that primary storm water drains in Chümoukedima connect seamlessly to natural outfalls to prevent "bottleneck flooding."
- Heavy earthworks and drain excavations are strictly restricted during the peak monsoon months (June–September) to prevent silt-heavy runoff.
- Installation of temporary silt fences and sedimentation ponds at construction sites to prevent debris from entering the city's main arteries.
- Strict prohibition of dumping construction spoils into existing drains—a primary cause of the "flash floods" seen in Dimapur in recent years.
- Exploring the use of shredded plastic waste in bitumen (Green Roads) to improve road durability against water striping while managing the region's plastic crisis.
- Implementing a Grievance Redress Mechanism (GRM) where residents can report blockages directly to the project unit via a mobile app to prevent pre-monsoon clogging.

**248. Generation of Construction Wastes.** Solid waste to be generated from the construction activities are excess excavated earth (spoils) during road and side drain construction, drain silt/ sludge, discarded construction materials, cement bags, wood, steel, oils, fuels and other similar items. Domestic solid waste 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:

- ✓ Prepare and implement a Construction Waste Management Plan;
- ✓ As far as possible utilize the debris and excess soil in construction purpose,
- ✓ Avoid stockpiling any excess spoils at the site for long time. Excess excavated soils should be disposed at approved designated areas immediately;
- ✓ 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;
- ✓ 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;
- ✓ Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed of in disposal sites approved by NPCB;
- ✓ Prohibit burning of construction and/or domestic waste;
- ✓ 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;

- ✓ Conduct site clearance and restoration to original condition after the completion of construction work; PIU to ensure that site is properly restored prior to issuing of construction completion certificate.

249. The silt generated during drainage construction or desilting activities will be systematically managed to prevent adverse environmental impacts. The collected silt will be temporarily stored in a designated area near the worksite on an impermeable, HDPE-lined surface with peripheral bunds to prevent runoff or leachate infiltration into nearby soil and water bodies. Wet silt will be air-dried before disposal, and dust suppression measures such as water sprinkling or tarpaulin covering will be implemented to minimize air pollution. Once dried, the silt will be transported in covered, leak-proof trucks to an approved municipal disposal site or landfill identified by the local authority. Improper handling and disposal of silt can lead to potential impacts such as surface water contamination, soil degradation, odor generation, and public nuisance. To mitigate these, the contractor will ensure silt is not dumped in open areas or near drains, maintain records of disposal, and enforce PPE use for workers. Reuse of non-hazardous silt for backfilling or landscaping may be permitted after confirming it meets environmental safety standards. Regular monitoring will be carried out to ensure compliance with CPCB and CPHEEO guidelines.

250. **Noise and Vibration Levels.** With the exception of the urban centers such as Dimapur and Chumukedima the ambient noise level along the road sections is expected to be within standards. During the construction period, noise will be generated from the operation of heavy machinery, the haulage of construction materials to the construction yard and the general activities at the yard itself. Concrete mixing and material movements will be the primary noise generating activities and will be uniformly distributed over the entire construction period. These construction activities are expected to produce noise levels in the range of 80-95 dB(A) at a distance of about 5 m from the source.

251. Construction noise is typically not subject to specific regulatory limits; however, it can still be a source of concern for nearby communities. The typical range of noise levels at varying distances from a construction site is presented below.

**Table 19: Construction Noise / Distance Relationship**

| Distance from Construction Site (m) | Typical Noise Level Range dB(A) |
|-------------------------------------|---------------------------------|
| 8                                   | 82 – 102                        |
| 15                                  | 75 – 95                         |
| 30                                  | 69 – 89                         |
| 61                                  | 63 – 83                         |
| 91                                  | 59 – 79                         |
| 122                                 | 57 – 77                         |
| 152                                 | 55 – 75                         |
| 305                                 | 49 – 69                         |

*Source: Department of Transportation, State of Wisconsin (USA)*

252. Typical noise levels associated with various construction activities and equipment are presented in table below.

**Table 20: Typical noise levels of principal construction equipment**

| Activity Phase | Equipment | Noise Level dB(A) |
|----------------|-----------|-------------------|
| Clearing       | Bulldozer | 80                |

|                                      |                      |       |
|--------------------------------------|----------------------|-------|
|                                      | Front end loader     | 72–84 |
|                                      | Jack hammer          | 81–98 |
|                                      | Crane with ball      | 75–87 |
| <b>Excavation &amp; Earth Moving</b> | Bulldozer            | 80    |
|                                      | Backhoe              | 72–93 |
|                                      | Front end loader     | 72–84 |
|                                      | Dump truck           | 83–94 |
|                                      | Jack hammer          | 81–98 |
|                                      | Scraper              | 80–93 |
|                                      |                      |       |
| <b>Grading &amp; Compaction</b>      | Grader               | 80–93 |
|                                      | Roller               | 73–75 |
| <b>Structure Construction</b>        | Crane                | 75–77 |
|                                      | Welding generator    | 71–82 |
|                                      | Concrete mixer       | 74–88 |
|                                      | Concrete pump        | 81–84 |
|                                      | Concrete vibrator    | 76    |
|                                      | Air compressor       | 74–87 |
|                                      | Pneumatic tools      | 81–98 |
|                                      | Bulldozer            | 80    |
|                                      | Cement & dump trucks | 83–94 |
|                                      | Front end loader     | 72–84 |
|                                      | Dump truck           | 83–94 |
|                                      | Paver                | 86–88 |
|                                      |                      |       |
| <b>Landscaping &amp; Clean-up</b>    | Bulldozer            | 80    |
|                                      | Backhoe              | 72–93 |
|                                      | Truck                | 83–94 |
| <b>Paving</b>                        | Paver                | 86–88 |
|                                      | Truck                | 83–94 |
|                                      | Tamper               | 74–77 |

Source: U.S. Environmental Protection Agency, noise from Construction Equipment and Operations. Building Equipment and Home Appliance. NJID. 300.1. December 31, 1971

253. The noise levels associated with various construction activities and equipment may exceed the permissible limits prescribed by CPCB and World Bank EHS guidelines for residential areas. However, such high noise levels are generally intermittent in nature. Despite this, elevated sound levels pose a significant occupational health risk to on-site workers. Proper scheduling of high-noise activities, regular maintenance of machinery, and the use of appropriate personal protective equipment (PPE) can effectively minimize these impacts.

254. Residences, schools, health facilities, and other noise-sensitive receptors located within approximately 100 m of the roadways may experience temporary disturbance during the construction period. The number of people potentially affected, and the duration of these impacts cannot be determined with the information currently available.

255. Proposed road and drain are located predominantly in a rapidly developing urban area. Proposed drain is located close to habitation 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 concrete mixers, and the transportation of equipment, materials, and people. Vibration generated from construction activity will have impact on nearby buildings. This impact is negative but short-term, and reversible by mitigation measures. The construction contractor will be required to:



- ✓ Plan activities in consultation with 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
- ✓ Temporary and movable noise barriers shall be installed in proximity to sensitive receptors, such as schools and colleges, to minimize construction-related noise impacts. The Environmental Specialist of the Supervision Consultant shall develop site-specific noise barrier designs based on the construction activity, receptor distance, and prevailing site conditions, and the approved design specifications shall be provided to the Contractor for implementation.
- ✓ Noise level not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicles;
- ✓ 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, school starting and ending time.

256. **Construction and Demolition Waste:** Construction debris/ waste is generated due to demolition of existing drains and pathways, scarification of existing pavement and excavation at some section of the subproject road, collection of silt from existing drains proposed to be demolished. Improper disposal of scarified bitumen causes decrease in soil fertility and water pollution. Careless disposal of debris can obstruct waterways and reduce capacity. Unleaded demolition wastes will cause traffic blockage and dust causing inconvenience and health risks.

257. Compliance with the environmental safeguards will ensure the subproject sustainability.

258. **Mitigation Measures.**

- Maximum portion of the construction and demolition waste generated from the subproject roads and drain should be utilized in construction works and the balance amount will be dumped at the C&D waste storage area, from where the waste could be re-used for future or other construction activities. Excess C&D waste will be disposed in a designated Construction and Demolition (C&D) waste disposal site is located in Burma Camp, Dimapur.
- The silt/ sludge collected from drains will be disposed on authorized waste management site
- total excavated earth will be reused in construction works.
- collection of recyclable solid wastes and supply to scrap vendors
- ensure all the camp wastes and construction wastes are placed in the designated waste collection pits away from receiving water
- collection of biodegradable wastes in separate vessels and transfer to municipal waste disposal system
- application of various waste disposal systems for diverse wastes produced on site as per consultations with environmentalists.

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

- ✓ Night works should be avoided at construction sites especially 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.
- ✓ Limit construction activities at night. When necessary, ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures. Consult community regarding appropriate timing of noisy activities and avoid noisy activities at night. Use noise-control methods (barriers/shelter/ muffling devices) and maintain a buffer zone if possible. Minimize project transportation, particularly heavy vehicles, through residential areas. Use of high noise generating equipment shall be stopped during night time
- ✓ Safety gear can greatly affect worker visibility. The decision and maneuver distance – how long it takes a driver to notice the worker and make any path or speed changes – is over 5 times greater with reflective clothing than with regular, dark-colored – or even orange-colored – clothes. With this increased decision and maneuver distance, workers, motorists, and equipment are much less likely to have a collision – chances of damage, injury, or death are reduced.
- ✓ Reflective clothing isn't the only available technique to increase visibility at night. Flashing lights on a worker's body or clothing, reflective tape on equipment, and especially proper work area lighting are all good ways to increase visibility.
- ✓ Proper lighting at night includes several different levels and designations of lighting. In order to understand appropriate lighting levels for night work, we first need to talk about how it is measured. Lighting is typically measured by what are called "foot-candles". One foot-candle is the luminance cast on a 1 square foot surface by a single candle's light.
- ✓ Visibility & Training: There are two main ways to ensure that motorists and workers experience the safest possible night-time work zone. First is proper safety training, and second is improving visibility throughout the work zone and especially at critical areas like traffic control workers' stations and on any people or equipment.
- ✓ Through proper training and lighting, night time construction can happen as safely as construction in the daytime. This allows contractors and agencies to take advantage of working with fewer delays for the travelling public and for construction workers to work more safely in lower volume traffic.

260. Guideline for management plan for night work is attached as **APPENDIX 12**.

261. **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 comprising of 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:

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

- Plan transportation routes so that heavy vehicles do not use narrow local roads,

- except in the immediate vicinity of delivery sites;
- Schedule transport and hauling activities during non-peak hours;
- Locate entry and exit points in areas where there is low potential for traffic congestion;
- Drive vehicles in a considerate manner; and
- Notify affected public by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

263. **Traffic diversion or road closure.** On the project road, utilities interfere with the ROW at few locations that will have to be shifted / removed prior to construction. This should not be a major problem.

264. Traffic may experience minor delays when diverted around active construction areas, but will be more severely hampered at the locations where temporary road closures are necessary. Such hazard points will have proper signs indicating the nature of the problem envisaged.

265. 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.

266. At certain locations on the road, particularly at bridge /culvert (refer to **Table 2:3A**) 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.

### **Main Drain Construction works in Dimapur and Chümoukedima**

267. **Proposed drainage subproject will include in Dimapur:** Drainage development works within Dimapur town in low-lying wards such as 15, 16, and 23. Proposed drain to be constructed along the road side and outfall to Dhansiri River and Chate river.

268. **Proposed drainage subproject will include in Chümoukedima:** The entire sub-project area of Chümoukedima has been divided into 10 numbers of drainage catchment depending on the drainage outlet.

269. This work will involve straight forward construction, so if appropriate precautions are taken, physical impacts should not be greatly significant. Since the project involves rehabilitation of existing drains mostly, it will not involve any major earth work or exaction. So typical impacts associated with earth work, like impacts due to disposal of waste/surplus soil, dust and noise, etc. are not anticipated.

270. The proposed works invariably include cleaning and desilting of drains. In the existing situation, drains carry wastewater including sewage, 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. Accumulated silt contains heavy metals and improper handling and disposal may cause health and environmental problems.

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

- Start the work from downstream end of the drains

- 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
- Where manual method is adopted in narrow and inaccessible sections, 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 in case the drain is deeper than four feet. Workers should also be given oils for protecting skin and soap to clean up later.
- Provide onsite training to workers on safe handling of contaminated water and sludge, and
- Silt/soil generated from desilting shall be land filled safely in consultation with Nagaland Pollution Control Board; shall not be used as manure or for land application

272. Another important impact associated with this project is that of removal of some encroachments for improvement of drains. Although removal of encroachments is minimized by redesigning the drain within the existing alignment and footprint, it cannot be avoided in few sections where widening and improvement to the geometric alignment of the drains is proposed as per the design to carry the anticipated discharge. These resettlement issues related to Involuntary Resettlement were assessed by a parallel process of resettlement planning and will be compensated by measures set out in detail in the Resettlement plan/ Due diligence report. Therefore, it is necessary that:

- Resettlement Plan prepared for the subproject is implemented in full and all its recommendations are complied with.

273. 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);

274. **Socio-Economic – Income.** Drainage and road alignment is located along the existing road, government lands and there is no requirement for land acquisition or any resettlement. Resettlement and social issues are being studied in a parallel resettlement planning study of this subproject. Blocking access to the business / livelihood activities, especially during drainage construction along the roads, may impact the income of households. However, access will be maintained during drainage construction works, no notable impact is envisaged.



275. **Socio-Economic – Employment.** Manpower will be required during the 36 months construction stage. This can result in generation of temporary employment and increase in local revenue. Thus, potential impact is positive and long-term. The construction contractor will be required to employ local labor force as far as possible.

276. **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**);
- ✓ In the event of any future pandemic or public health emergency, all project activities shall comply with the prevailing guidelines, advisories, and prevention protocols issued by the Government of India, State Government, and relevant health authorities to ensure the safety and well-being of workers and surrounding communities.
- ✓
- ✓ 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 fellow workers;
- ✓ 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

277. **Drainage works.** Workers need to be mindful of the occupational hazards which can arise from working at drainage construction work. The construction contractor will be required to employ local labor force as far as possible.

- All workers shall be provided with helmets, safety shoes, gloves, reflective jackets, masks, and ear protection as required. PPE use will be mandatory at all times within the construction zone.
- Additional PPE such as gumboots and waterproof gloves will be used in wet or muddy working conditions.
- Proper shoring, benching, and trench supports shall be used to prevent soil collapse.
- Safe access (ladders or ramps) must be provided for entering and exiting deep excavations.
- Excavated areas will be barricaded and marked with warning signage and lights, especially in urban zones.
- Work in deep or narrow drains will be treated as confined space activity. Adequate ventilation and gas detection will be ensured before entry.
- All formwork and scaffolding structures must be stable and properly braced before

concrete placement.

- Workers handling reinforcement and cement shall use gloves and masks to prevent skin or respiratory irritation.
- Concrete pouring areas must be cordoned off, and only trained personnel shall operate vibrators or boom pumps.
- Dewatering activities should be conducted using well-maintained and grounded pumps with protective barriers to prevent accidents, soil erosion, or trench collapse. Workers must wear rubber gloves, boots, and safety gear to avoid electrical or water-related hazards.
- Silt should be manually or mechanically removed using proper tools and PPE, stored on impervious surfaces, and transported in covered vehicles to approved disposal sites to prevent spillage, dust generation, and contamination.

278. **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:

- ✓ 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 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.

279. **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 also 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 (100 m) water bodies, flood plains flood prone/low lying areas, or any ecologically, socially, archeologically sensitive areas
- (v) Construction camp must include safe eating area and maintain Hygiene inside camp 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 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 maintained at the highest standards possible at all times; 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) Provide drinking water, water for other uses, and sanitation facilities for employees
- (xiii) Prohibit employees from cutting of trees for firewood; contractor should be provided proper facilities including cooking fuel (oil or gas; fire wood not allowed)
- (xiv) Train employees in the storage and handling of materials which can potentially cause soil contamination
- (xv) Recover used oil and lubricants and reuse or remove from the site
- (xvi) 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
- (xvii) Remove all wreckage, rubbish, or temporary structures which are no longer required
- (xviii) At the completion of work, camp area shall be cleaned and restored to pre-project conditions, and submit report to PIU; PIU to review and approve camp clearance and closure of work site.

280. **APPENDIX 10** shows guideline for set up worker's camp.

281. **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. 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.

## D. Operation and Maintenance Impacts

### Screening out areas of no significant impact

282. Because a road upgradation project should operate without the need for major repair and maintenance, there are several environmental sectors which should be unaffected once the system begins to function. These are identified in Error! Reference source not found.20 below, with an explanation of the reasoning in each case. These factors are thus screened out of the impact assessment and will not be mentioned further.

**Table 21: Fields in which Operation and Maintenance of the road and drain is Not Expected to have Significant Impacts**

| Field  | Rationale  |
|--|--|
| Climate  | No impact expected   |
| Wildlife, forests, rare species, protected areas | There are no wildlife, forests, rare species, and protected areas.                   |
| Coastal resources                                | Dimapur and Chümoukedima is not located in a coastal area.                           |
| Industries                                       | The road network is for the urban part of the town, hence will not impact industries |

283. **Air Quality:** Operation stage impacts will not be as severe as the construction stage impacts, and they will be confined generally to a ribbon development close to edge of the pavement. After the completion of road project, smoothened new pavement and widened roads reduced fugitive dust emissions. Reduction in the vehicular emissions is due to more uniform speed and less frequent acceleration and deceleration of vehicles. However, there may be localized impact with increase in number of vehicles (traffic) running on the road, adulterated fuel supply and poor maintenance of vehicle, which spreads down depending on wind direction and wind speeds.

284. **Mitigation Measures:** The bad road conditions are the main cause of poor air quality at present. The improved road conditions will result in improved ambient air quality. Also, the subproject road is largely traversing through vast open areas, which will provide adequate dispersion to gaseous pollutants, generated from vehicles and will offset the increased pollutants.

285. **Noise:** During the operational phase, movement of traffic will be the prime source of noise. Traffic congestion and pedestrian interferences increase the use of horns. This may result in increased noise levels at habitat areas, nearby schools and religious places. Although, in these proposed roads not much traffic observed during the site inspection, mostly roads are narrow not sufficient for movement of large and heavy vehicles.

286. **Mitigation Measures:** Awareness signboard shall be provided for safe driving near the habitat areas. Speed limitation and honking restrictions may be enforced near sensitive locations.

287. **Impact.** Without proper maintenance, benefits of the drainage system will not be sustained. The drainage system may clog if no proper operation and maintenance is in place. Also, during maintenance works, drainage system will generate wastes such as solid wastes and silts, which may also cause pollution to the immediate environment and deteriorate aesthetics in the areas affected.

288. **Mitigation.** Dimapur Municipal Council and Chümoukedima Town Council shall ensure



that:

- (i) A program is established for the regular visual inspection of the drainage alignments to identify problems early, before they become critical (breakage, plugging, etc.);
- (ii) When issues are encountered, remedial action is implemented promptly, including clearing sediment and other material that could cause blockage, and conducting any required physical repairs to the drains to prevent leaks;
- (iii) A waste management plan is prepared and implemented in handling and disposing wastes generated during maintenance activities. This includes management on the disposal of solid wastes generated at the site such as the solid wastes and silts. The waste management plan should comply with all the relevant government rules and regulations, including clearances on the use of disposal sites where these wastes will be disposed. The Spoil Disposal Plan and Waste Management Plan utilized during the construction phase may be adopted, but may also be modified accordingly to fit activities during drainage maintenance works only; and
- (iv) Budget a permanent allocation for undertaking the above maintenance works and allied activities for the drainage system.

289. **Hydrology and Drainage:** Hydrology of the project area is least impacted during operation stage, if all design criterion is taken into consideration during construction.

290. **Mitigation measures:** Regular maintenance of drains by removing the silt and dirt before the start of monsoon will prevent choking of drains.

291. **Groundwater:** No impact is anticipated on groundwater due to the project during operation phase; hence, no specific mitigation is proposed.

292. Biological hazards are among the environmental risks that may adversely impact the health and wellness of the workers and the community. Breakouts of diseases such as diarrhea, flu or pandemics such as the COVID-19 shall be avoided.

293. **Positive Impacts:** The better road access is likely to contribute to the overall economic condition of ULB. With quick access to urban market areas, the farmers are likely to get better prices for their farm produce. Children will also be able to access the school and education facilities in the nearby urban areas.

294. The Many adverse impacts of road projects can be avoided or minimized by applying environmentally sound design, construction & operation and maintenance practices.

295. Water stagnation and water logging problems are not identified along the road areas. If problems arise for the roads adequate design measures for drainage, road levels shall be taken for prevention of water logging.

### **Operation and Maintenance Impacts of Main Drain**

296. 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 drains, including buckets and winches to remove silt.

297. Rehabilitation major drain in Dimapur and Chümoukedima will improve the drainage system of this area, through quick discharge of rainwater from the localities. Implementation of

following measures will avoid any risk on health and environment that may result from malfunction of system due to (i) entry of wastewater into drains; and (ii) blocking/choking due to accumulation of silt, and solid waste:

- Prevent entry of wastewater into drains; this requires development of sewerage system (intercepting of waste water) in the town.
- Ensure regular cleaning and desilting of drains; project shall include provision of necessary maintenance equipment
- Prevent encroachment of drains

298. 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 and school timings.

## **E. Cumulative Environmental Impacts**

299. The project is also assessed for indirect, induced and cumulative impacts. Indirect and induced impacts are identified as impacts of the project caused at the operational stage like, rise in vehicular traffic leading to rise emission levels, the improved road conditions may lead to speeding of vehicles and increase the probability of accidents.

300. The cumulative impact assessment (CIA) examined the interaction between the subproject's residual effects (i.e., those effects that remain after mitigation measures have been applied) and those associated with other past, existing and reasonably foreseeable future projects or activities. The subproject's potential cumulative effects were considered with respect to Valued Components (VCs) in the categories of environmental and socio-economic in the following areas:

- Of any potential residual subproject effects that may occur incrementally over time;
- Consideration of other known relevant projects or activities within the specified study area boundaries, even if not directly related to the subproject;
- Potential overlapping impacts that may occur due to other developments, even if not directly related to the proposed subproject; and
- Future developments that is reasonably foreseeable and sufficiently certain to proceed.

301. The subproject IEE has identified the VCs as air quality, water (surface and groundwater) quality, noise, traffic management, solid waste management, social-economic and socio-community, and human health. There are no foreseeable projects that will overlap with the subproject. The spatial boundary of the subproject is the area along the alignment and the existing ROWs. The temporal boundary can be considered as the whole municipal area.

302. Air quality effects will occur during construction. Consequently, although emissions of common air contaminants (CAC) and fugitive dust may be elevated in proximity to active work sites, this impact will be short-term and localized to the immediate vicinity of the alignment. Greenhouse Gas (GHG) emissions may increase because of the subproject activities (i.e., vehicle and equipment operation, concrete production, disposal of excavated and solid waste

material, landfilling of residual wastes). Given the subproject's relatively minor contribution to CAC and GHG emissions during construction, the overall significance rating of both these potential residual effects is negligible.

303. During construction noise levels in the immediate proximity of most work sites are expected to increase. The duration of this exposure will be relatively brief. This exposure represents a temporary, localized, adverse residual effect of low to moderate significance for affected receptors. While building damage due to ground vibrations is unlikely, there may be annoyance to spatially located receptors during construction. Noise levels associated with the subproject activities will be largely imperceptible as the drainage and proposed road areas are located in relatively small sites within the town proper.

304. Land use/traffic management concerns will occur spatially during construction. During construction, site-specific mitigation measures will be implemented to address temporary disruptions to land use and access in the vicinity of the alignment such as road and sidewalk closures, traffic delays and detours, parking modifications, and increased volumes of construction-related traffic. There should be improved traffic movement along the alignment once construction is completed. Since the subproject will be built in developed land and existing drainage, it will not conflict with existing or planned land use. However, following improvement in infrastructures and services, added residential developments, commercial and business facilities and increased densities are expected to develop and enhance the subproject area. This can be considered a long-term cumulative benefit of the subproject, as living conditions would be improved.

305. Adverse impacts such as localized disruption of vehicle traffic and pedestrian movements in areas along the alignment, and elevated particulate matter emissions in proximity to work sites, elevated noise and vibration levels and visual impacts will occur during construction. These short-term effects will be mitigated by providing alternate travel routes or alternating traffic movements and, where possible, access to businesses, schools and residences. However, upon completion of construction the socio-community will benefit from improved road and drainage system. This is considered a long-term cumulative benefit.

306. The subproject, when considered with other projects in the same watershed, may result in cumulative impacts to surface and groundwater quality from increased surface impermeability and resultant runoff. The construction activities could result in increased erosion from exposed soil areas. However, it is reasonably assumed that new construction associated with future projects will be required to meet national, state, and local construction and operation standards at least as rigorous as those required at present. Therefore, the potential for cumulative impacts to water quality and soils is deemed to be less than significant.

307. No adverse residual effects to human health will occur because of subproject construction or operation. While exposure to elevated noise levels and fugitive dust and CAC emissions will occur in proximity to subproject work sites during construction, due to their short-term, localized nature, these effects are expected to be minor and insignificant with no measurable effects on human health.

308. The PMU (Project Management Unit) must coordinate with other agencies (like NHIDCL) to ensure that massive earthworks are not occurring simultaneously in adjacent zones during the pre-monsoon and monsoon windows.

309. The "unloading" of slopes by multiple agencies simultaneously leads to a systemic failure

of the hillside. Heavy rainfall acts as the final trigger, causing mudslides that don't just block the road but also choke the newly constructed urban storm water drains with debris.

310. According to the 2026 Nagaland Climate Action Forum, summer surface temperatures in this corridor have risen by 4.5°C. This increases the "thermal stress" on road materials, leading to premature cracking and rutting of the very infrastructure being built.



## **VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE**

### **A. Overview**

311. The active participation of stakeholders including local community, NGOs/CBOs, etc., 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.

312. Most of the main stakeholders have already been identified and consulted during preparation of this IEE, and any others that are identified during project implementation will be brought into the process in the future.

313. The primary stakeholders are:

- Residents, shopkeepers and businesspeople who live and work alongside the roads in which improvements will be provided and near sites where facilities will be built;
- Custodians and users of socially and culturally important buildings in affected areas;
- Utility agencies responsible for provision of various services in project area, and Nagaland Pollution Control Board (NPCB).
- State and local authorities responsible for the protection and conservation of archaeological relics, historical sites and artifacts; and

314. The secondary stakeholders are:

- UDD as the executing agency and Dimapur and Chümoukedima as implementation agency;
- Other government institutions whose remit includes areas or issues affected by the subproject (state and local planning authorities);
- Forest Department, ASI, State Archeological Department;
- NGOs and CBOs working in the affected communities;
- Other community representatives (prominent citizens, religious leaders, elders, women's groups);
- The beneficiary community in general; and
- ADB, Government of India, State Government of Nagaland and Ministry of Finance.

### **B. Public Consultation**

315. 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**

316. Institutional consultations were conducted with the project agencies, and Government Departments of Nagaland, Nagaland Pollution Control Board, etc. The subproject proposal is formulated in consultation with the local bodies in the project area to suit their requirements.

317. The public participation process included: (i) identifying interested and affected parties

(stakeholders); (ii) informing and providing the stakeholders with sufficient background and technical information regarding the proposed development; (iii) creating opportunities and mechanisms whereby they can participate and raise their viewpoints (issues, comments and concerns) with regard to the proposed development; (iv) giving the stakeholders feedback on process findings and recommendations; and (v) ensuring compliance to process requirements with regard to environmental and related legislations.

318. 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.

319. Different techniques of consultation with stakeholders were used during project preparation (interviews, official meeting, public meetings, etc.). Questionnaire was designed and environmental information was collected. Apart from this, a series of public consultation meetings were conducted during the subproject preparation. Various forms of public consultations (consultation through ad hoc discussions on site) have been used to discuss the subproject and involve the community in planning the subproject design and mitigation measures.

320. A socio-economic household survey was carried out in the project area to gather information on household characteristics, health status, existing infrastructure service levels, and the demand for improved services. Consultations were also held with the general public and residents living along the project activity areas during site visits. Stakeholders participated in the preparation of the IEE through Focus Group Discussions (FGDs) and public consultations at the project area level, with the feedback received incorporated into the IEE as well as into project planning and design. FGDs were conducted across various locations (wards) in the project area.

321. In Dimapur, stakeholder consultations/FGDs were held at five locations, involving 139 participants, of whom 19% were women. In Chümoukedima, consultations were conducted at four locations with 97 participants, including 15.5% women. These consultations took place between March and April 2025. Across both towns, participants expressed a clear need for the project, showed willingness to support it, and pledged full cooperation during the construction phase, recognizing that the proposed activities would improve road and drainage infrastructure and enhance living standards. Key issues and concerns raised during the consultations, along with photographs and attendance records, are provided in **APPENDIX 8**. Additionally, a project-level consultation workshop is planned to be held in the project area.

322. The main objectives of the consultation program were to inform stakeholders on adverse environmental & social impacts, efforts to minimize and mitigate negative impacts while making people aware of the road and storm water drainage project benefits. During the discussion, it seemed that the group of people are very enthusiastic and energetic. They have participated with an open heart and expressed their interest to do something good for betterment of the society.

323. Salient points emerge from the consultation,

- 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 conditions 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.
- It was also informed no road closures are anticipated due to this work, and if needed during the construction phase, alternative access will be provided. Short term impact was explained to local public and it assured that the measures will be included in the Environment Management Plan.

324. It is noted from focus group discussion,

- 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.
- People are supportive of the project.
- Residents expressed their views about the willingness to engage with the project and explore job opportunities. People demanded for the measures of dust suppression such as water sprinkler to control dust and noise during construction phase.

325. **Summary of Stakeholder Consultation-** During the consultation/s the following queries were raised by the local communities, and it was responded by the respected DPR Consultant / PDMC

- 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 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.

326. It was observed that people are willing to extend their cooperation as the proposed activities are to enhance the infrastructure (transport and drainage) service levels and the living standard of the public. The public expressed their concern regarding the nuisance and disturbance (dust, drainage silt accumulation, road closure and traffic management activities) during construction. Team explained about Environment Management Plan (EMP) which will be implemented during construction.

327. The primary intent of the orientation workshop was to enhance the knowledge base of the ULB officials, NUIDP officials and officials of UDD on the mentioned disciplines. Details are attached in **APPENDIX 8**.

## **I. Consultation during Construction**

328. 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 (mainly pipeline 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.

## **C. Information Disclosure**

329. Executive summary of the IEE will be translated in Nagamese (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 create wider public awareness. Electronic version of the IEE in English and Executive Summary in Nagamese will be placed in the official website of the NUIDP (PMU) after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

330. 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 plan. Prior to start of construction, the 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 public.

331. 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**

332. The project will put in place a common grievance redress mechanism (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 GRM.

333. 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. Town wise public awareness campaigns will ensure that awareness of grievance redress procedures is generated through the campaign. The project coordinator, supported by independent consultants (social and environment), will be responsible for timely grievance redress on environmental and social safeguards issues.

334. The established Grievance Redressal Mechanism (GRM) will address stakeholders' grievances and dissatisfactions about actual or perceived impacts and to find a satisfactory solution. Some grievances may arise during the project design and planning stage, while others may come up during project implementation. The GRM will be implemented throughout the project cycle for use by stakeholders to address concerns and complaints promptly and transparently. The GRM will ensure that the stakeholders have access to legitimate, reliable, transparent, and efficient institutional mechanisms that are responsive to their complaints.

335. The GRM will work within existing legal and cultural frameworks, providing an additional opportunity to resolve grievances at the local and project level. The key objectives of the GRM are:

- Educate stakeholders on the GRM
- Receive and record the grievances
- Resolve and close the grievances
- Escalate unsolved grievances to concerned authority
- Notify/ update the stakeholders of the solutions

336. Affected persons will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in grievance/suggestion boxes or through telephone at accessible locations, by e-mail, by post, or by writing in a complaint register or grievance redress format in site office or PIU office. Name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, nature of problem, days required for resolving the problem, how the problem is resolved etc. has to be documented carefully as a record and part of reporting for the Grievance Redressal Mechanism as a whole. Safeguards and Gender Officer, PMU along together with Safeguard Officers of respective PIU will have the joint responsibility for timely grievance redressal on safeguards and any other issues, for registration of grievances, related disclosure, and communication with the aggrieved party. The affected people will be encouraged to seek a complaint registration number through the PIU.

337. All expedient and minor grievances will be resolved at field level, in case of any

unresolved grievances, it will be referred to PIU for redressal. Should the PIU fail to resolve any grievance within the stipulated time, the PMU will be consulted and corrective actions will be taken by PMU within the specified time frame. PIU will also be responsible for follow-up of each grievance, periodic information dissemination to complainants on the status of their grievance and recording their feedback (satisfaction/dissatisfaction and suggestions).

338. **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.

339. **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 as the representative and submits evidence of authority to act on their behalf.

340. **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 9**.

341. **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.

342. **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.

343. **Grievance Redressal Committee:** The Government of Nagaland (GoN), 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.

89. **Site-level GRC (1st level) -** Complaints received (written or oral communication) will be registered in the complaint register, assigning a complaint number with date of receipt, name of complainant, and address/contact number of complainant. The immediate level for lodging complaints will be the field level or site level; the contractor's representatives and the Junior Engineers of the PIU are the immediate point of contact for the community. The Project Site Level grievance redress committee will review the complaint and direct the Contractor for necessary action and will try to resolve the issue within 7 days from the date of receipt of complaint; depending on the type/nature of complaint the Contractor will be given reasonable time for corrective action; the safeguard supports of PDMC will inform/communicate the complainant about the corrective actions by e-mail, text message or telephonically. The action taken will be documented in the complaint register, and the complaint will

be closed if it is satisfactorily addressed. If the grievances cannot be resolved immediately at the site/field level or require additional support and decision-making, they will be brought to the concerned PIU Level. The PIU will maintain the records of grievances with the help of PDMC. The Project Site Level grievance redress committee will comprise of the following members.

- Junior Engineers, UDD
- Safeguard Supports (Social and Environment), PDMC
- Project Manager, Contractor
- Environment Health and Safety (EHS) Supervisor, Contractor
- Representative of affected community Member (as applicable)

90. **PIU level GRC (2nd level)** - All grievances that cannot be redressed within 7 (Seven) days at the field level will be escalated to PIU-level GRC established in each PIU. GRC at the PIU level will be headed by Project Manager (Superintendent/Executive Engineer). The PIU-level GRC will also co-opt the representative of other line departments (PWD, ULB, PHED etc.), as and when required, including representatives from indigenous peoples' communities or CSO working with indigenous peoples, as and when required.<sup>22</sup> PIU will resolve the grievances or issues within the stipulated time frame of 10 (ten) days of receipt of the complaint and will comprise following members:

- Project Manager (Executive Engineer), PIU, UDD
- Safeguards Focal (Assistant Engineer), PIU, UDD
- Safeguard Supports (Social and Environment), PDMC
- Project Manager, Contractors
- Representative of affected community member (as required)

91. **PMU Level GRC (3rd level)** - In case the grievances are not addressed at the PIU level within 7 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, Additional Director as Co-chairman and Project Coordinator (Executive Engineer) as member secretary. The committee can co-opt any other member required for the resolution of the grievances from the line departments (ULB, PWD, TWD, PHED, Department of Environment and Forests etc.) and representative of affected community, including indigenous people community as needed. The GRC at the PMU level will resolve the grievance within 15 (Fifteen) days of receiving the complaint. The GRC will comprise of following members:

- Project Director - Chairman
- Joint Project Director
- Project Manager (Executive Engineer)
- Social Safeguard Focal (Assistant Engineer), PMU, UDD
- Environmental Safeguard Focal (Assistant Engineer), PMU, UDD
- Team Leader, PDMC
- Social Safeguards Specialist, PDMC
- Environmental Safeguard Specialist, PDMC

344. 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

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<sup>22</sup> 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.

run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

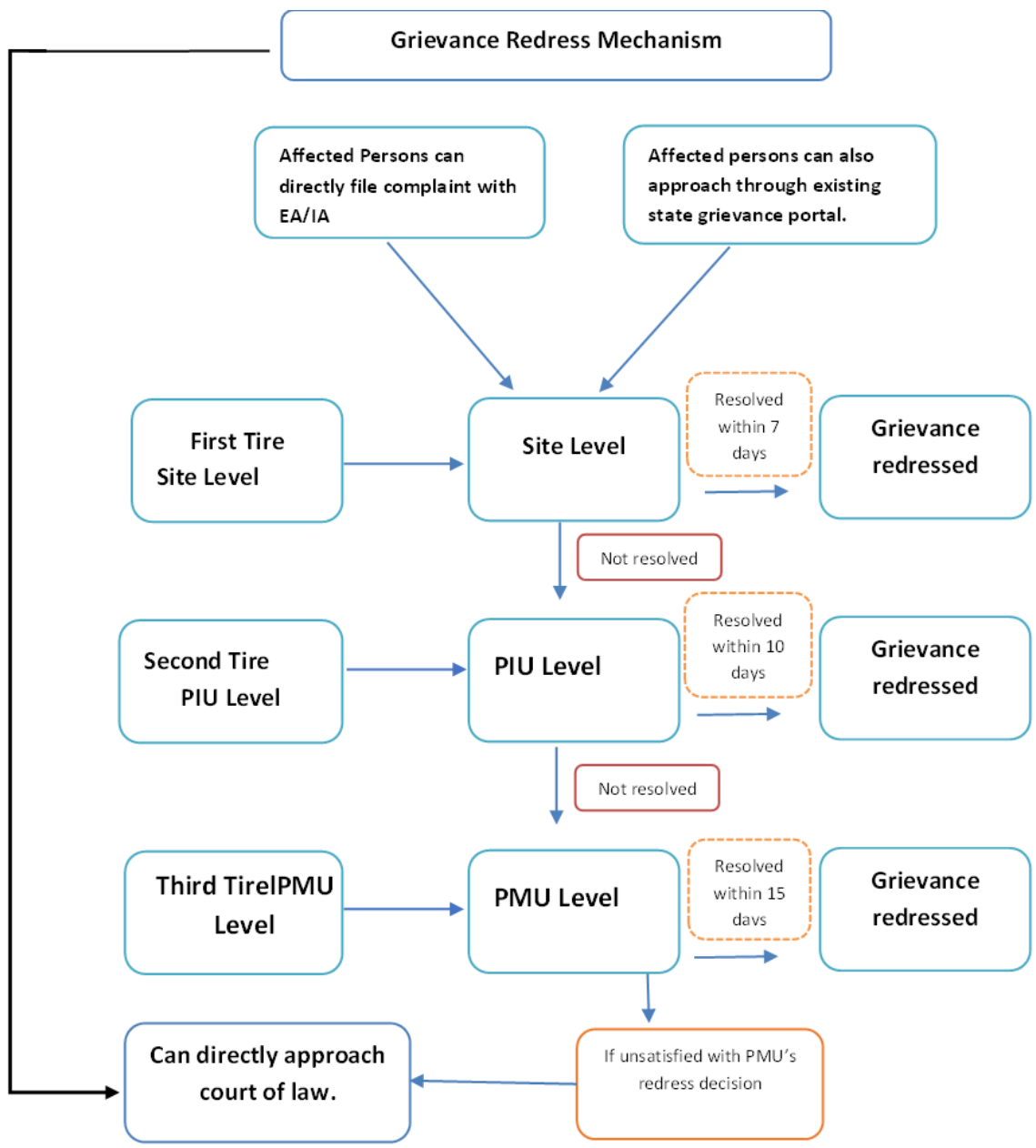


Figure 24: GRM Process for NUIDP



345. **Additional grievance management.** In addition to the project-level grievance [redress] mechanism provided by the UDD, people who are, or may in the future be, adversely affected by the project have a range of forums available to them for purposes of raising their complaints, grievances, and concerns. These include applicable judicial or administrative forums, as well as ADB through its resident missions and ADB project teams. The UDD will help ensure that project-affected people are made aware of these forums to address their complaints, grievances, and concerns. The UDD should provide the applicable ADB contact details as part of stakeholder consultations and information disclosure, including in response letters to a complaint where appropriate, so that project-affected people know how to reach out to ADB.

346. **Court of Law:** Under the project-specific GRM, an aggrieved person shall have access to the country's legal system 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.

347. **ADB's Accountability Mechanism:** The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. If the established GRM cannot resolve the issue, the affected person can use the ADB Accountability Mechanism by directly contacting (in writing) the Complaint Receiving Officer. Before submitting a complaint to the Accountability Mechanism, it is recommended that affected people make a good-faith effort to resolve their problems by working with the concerned ADB operations department (in this case, SAUW/₹M). Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.

348. **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.

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

350. **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.

351. **Costs.** All costs related to 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**

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

353. 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), UDs (Town Council/ 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.

354. The construction contractor will submit to 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.

355. 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 constitute a failure in compliance.

356. 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 budget for compliance with these SEMP measures, requirements, and actions.

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

**Table 22: Design Stage Environmental Impacts and Mitigation Measures**

| Field                                   | Anticipated Impact  | Mitigation Measures   | Responsibility of Mitigation          | Monitoring Indicator  | Cost and Source of Funds |
|---|---|---|---------------------------------------|---|--------------------------|
| Technical design of the project         | Lack of sufficient planning to assure long term sustainability of the improvements and ensure protection of the assets created  | (i) Design will include provisions for ensuring effective maintenance and protection of the assets created so as to ensure the long-term sustainability.<br>(ii) Designs will be worked out and implemented in accordance with the provisions and will strictly conform to state rule   | Contractor / Cluster-PIUs/ PIU/ PMDSC | Design Approval & Compliance<br>Hydraulic & Drainage Design Adequacy<br>Road Safety & Accessibility Features  | Project Costs            |
| Flooding                                | Inadequate drainage capacity results to localized urban flooding<br><br>Poor road/drain interface causes rapid siltation<br><br>Unsafe pedestrian movement and loss of access | (i) Design drains for monsoon peak plus climate margin, not minimum codes.<br>(ii) Raised carriageway / kerb levels near flood-prone stretches.<br>(iii) Continuous covered drains with silt traps and inspection chambers at regular intervals.<br>(iv) Universal access footpaths, crossings, and ramps integrated into design. | Contractor / Cluster-PIUs/ PIU/ PMDSC | Drain design return period explicitly stated.<br><br>% of road length with covered drains.<br><br>Drain inspection chamber spacing (m).<br><br>Pedestrian facilities included in drawings (Yes/No). | Project Costs            |
| Location impacts of proposed components | Nearby community may be affected due to increased pollution during construction   | (i) Sites should be selected so that nearby community may have no or minimum impact due to proposed works<br>(ii) Mitigation measures are prepared and included in design and EMP is attached with contract documents   | Contractor / cluster-PIUs/ PIU        | Impact on Sensitive Receptors<br>Number of temporary access disruptions.  | Project Costs            |
| Spoil disposal                          | Spoil mismanagement leading to drain blockage.  | (i) Identification and pre-approval of spoil disposal sites (no roadside dumping).  |                                       | Approved spoil sites with capacity tracking.  | Project Costs            |
| Selection of road alignment             | Tree cutting  | (i) Minimize removal of trees by adopting suitable alignment selection<br>(ii) Obtain prior permission for tree cutting   | Contractor / Cluster-PIUs/            | Tree & Vegetation Impact<br>Drainage & Flood  | Project Costs            |

| Field   | Anticipated Impact   | Mitigation Measures   | Responsibility of Mitigation   | Monitoring Indicator   | Cost and Source of Funds   |
|---|--|---|--------------------------------|--|----------------------------|
|   |  | (iii) Plant and maintain 5 trees for each tree that is removed  |                                | Risk Consideration<br>Utility & Infrastructure<br>Compatibility  |                            |
| Seismic sensitivity   | Damage to infrastructure and potential risks: project area in High earthquake risk zone (Zone VI)                              | (i) Designs of project component structures shall comply with relevant codes of design such as Bureau of Indian Standard (BIS) specifications for earthquake resistant design (IS: 1893: Criteria for earthquake resistant design of structures).   | Contractor / Cluster-PIUs/     | Seismic-Resilient Design Compliance Structural Integrity During Construction                                   | Contractor / Cluster-PIUs/ |
| Energy Efficiency   | Loss of natural resources  | (i) Use energy efficient electrical equipment Provision of energy efficient equipment in contract agreements and BOQ  | Contractor / cluster-PIUs/ PIU | -  | No cost required           |
| Incorporating EMP and Health and Safety requirements into Contractor Bid Document | Implementation of the EMP  | (i) The EMP should be included in the Bid Document so that the selected Contractor understands the issues and makes necessary plans to prepare and implement the EMP<br>(ii) Health and safety requirements should be incorporated as part of the contract bid document so that the selected Contractor understands the issues and makes necessary plans to prepare and implement the health and safety requirements. | Contractor / cluster-PIUs/ PIU | -  | Project Costs              |
| 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;<br>(ii) Stop work immediately to allow further investigation if any finds are suspected;<br>(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/ PIU | Chance Finds Protocol Implementation Monitoring of excavation depth and methods in culturally sensitive zones. | Project Costs              |
| Construction planning   | Construction planning not responsive enough to urban livelihoods<br><br>Disruption to shops and residences before work starts. | (i) Pre-construction stakeholder notifications and access plans.  |                                | Public notices issued before mobilization (% coverage).  |                            |



| Field    | Anticipated Impact | Mitigation Measures  | Responsibility of Mitigation | Monitoring Indicator                                      | Cost and Source of Funds |
|----------|--------------------|--|------------------------------|---|--------------------------|
| Baseline | Baseline omission  | (i) Full baseline monitoring at schools, hospitals, markets, dense residential sections. | Contractor                   | Number of baseline monitoring locations by receptor type. |                          |

**Table 23: Pre-Construction Stage Environmental Impacts and Mitigation Measures**

| Field   | Anticipated Impact   | Mitigation Measures   | Responsibility of Mitigation   | Monitoring of Mitigation       | Monitoring Indicator  | 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 PIUs, and with approval of PMDSC/ PIU | PMU                            | Screening & Categorization Compliance Climate & Disaster Risk Consideration | 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 NPCB), 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                            | Statutory Clearances & Permits Compliance Documentation                     | 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 baseline environmental conditions   | Environmental monitoring through NABL accredited laboratory   | Construction contractor  | (i) Report for NABL laboratory | Monitoring Program Implementation Compliance with Standards & Methodology   | Project Cost   |
| Utilities   | Telephone lines, electric  | (i) Operators of these utilities have been identified and   | Contractor in collaboration with                                       | (ii)List of affected           | Utility Identification & Mapping  | Project Cost   |

| Field  | Anticipated Impact   | Mitigation Measures  | Responsibility of Mitigation  | Monitoring of Mitigation   | Monitoring Indicator  | Cost and Source of Funds |
|--|--|--|---|--|---|--------------------------|
|  | poles and wires, water lines within proposed project area may be affected          | <p>included in the detailed design documents to prevent unnecessary disruption of services during construction phase;</p> <p>(ii) Utility shifting will be required before start of construction;</p> <p>(iii) Construction contractor will prepare a contingency plan to include actions to be taken in case of unintentional interruption of services.</p> <p>(iv) Require contractors to prepare spoils (waste) management plan and include in SEMP</p> <p>Template of spoil management plan is attached in <b>APPENDIX 11.</b></p> | Cluster-PIUs, and with approval of PMDSC/ PIU                         | <p>utilities (if any) and operators;</p> <p>(iii) Bid document to include requirement for a contingency plan for service interruptions</p>                             | Utility Relocation Planning Protection During Construction  |                          |
| Construction work camps, stockpile areas, storage areas, and disposal areas. | Conflicts with local community; disruption to traffic flow and sensitive receptors | <p>(i) Construction camp to be set up in open area, slightly away from residential area</p> <p>(ii) Extreme care to be taken in selecting sites to avoid direct disposal waste/ excess earth near water body which may inconvenience the community.</p> <p>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</p>   | Contractor to finalize locations in consultation and approval of 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) | Site Selection Compliance Environmental Protection Measures | Project Cost             |

| Field                | Anticipated Impact   | Mitigation Measures  | Responsibility of Mitigation   | Monitoring of Mitigation   | Monitoring Indicator   | Cost and Source of Funds |
|----------------------|--|--|--|--|--|--------------------------|
|                      |  | 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.  |  |  |  |                          |
| Traffic Management   | Impede traffic flow during construction  | Prepare a traffic management plan during preconstruction phase. Template attached in <b>APPENDIX 6.</b>  | Contractor to finalize traffic management plan in consultation with PIUs                               | Ensure Traffic Management Plan is included in bidding documents. | Traffic Management Plan Implementation                                       | Project Cost             |
| Sources of Materials | 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. | <ul style="list-style-type: none"> <li>(i) Construction materials are obtained only from government approved quarries with prior approval of PIU</li> <li>(ii) PIUs ensured that quarry sources have all necessary clearances/ permissions in place prior to approval</li> <li>(iii) Contractor submits to PIU on a monthly basis documentation on material obtained from each source (quarry/ borrow pit)</li> <li>(iv) Creation of new borrow areas, quarries etc., to be avoided for the project (work is small); if unavoidable, contractor to obtain all clearances and permissions as required under law, including Environmental</li> </ul> | Contractor to prepare list of approved quarry sites and sources of materials with the approval of PIUs | (i) List of approved quarry sites and sources of materials;      | Source Authorization & Compliance Protection of Natural Drainage & Hydrology | Project Cost             |

| Field                                     | Anticipated Impact   | Mitigation Measures   | Responsibility of Mitigation                                   | Monitoring of Mitigation  | Monitoring Indicator   | Cost and Source of Funds |
|---|--|---|--|---|--|--------------------------|
|   |  | Clearance prior to approval by PIU<br>(v) Borrow area management plan to be implemented   |  |   |  |                          |
| 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 | <p>Drain cleaning activities in Dimapur and Chümoukedima towns are expected to generate approximately 13,465 m<sup>3</sup> and 3,432 m<sup>3</sup> of sludge, respectively. The generated sludge shall be handled, transported, and disposed of in accordance with applicable regulatory requirements. Identify agreed sites with local officials to dispose of dredge.</p> <ul style="list-style-type: none"> <li>• Sludge shall be removed in a phased and controlled manner to minimize disturbance to traffic, pedestrians, and nearby commercial activities.</li> <li>• Excavated sludge shall be temporarily stored in designated areas on impervious surfaces and covered with tarpaulin to prevent runoff, odor nuisance, and dispersion by wind or rain.</li> <li>• Proper dewatering measures shall be adopted, where feasible, to reduce moisture content prior to transportation and disposal.</li> </ul> | Contractor to finalize disposal plan in consultation with PIUs | PIUs, and PMDSC to ensure sites are agreed with local officials and in locations which are away from sensitive receptors. | Disposal carried out only at designated/approved sites.<br>Volume Tracking & Record Keeping<br>Site Stability & Rehabilitation | Project Cost             |



| Field | Anticipated Impact | Mitigation Measures  | Responsibility of Mitigation | Monitoring of Mitigation | Monitoring Indicator | Cost and Source of Funds |
|-------|--------------------|--|------------------------------|--------------------------|----------------------|--------------------------|
|       |                    | <ul style="list-style-type: none"> <li>Sludge shall be transported using covered vehicles to prevent spillage along haul routes.</li> <li>Disposal shall be carried out only at authorized disposal or dumping sites approved by the Dimapur Municipal Council or the concerned local authority, in compliance with applicable solid waste and C&amp;D waste management rules.</li> <li>Workers involved in sludge handling shall be provided with appropriate personal protective equipment (PPE), including gloves, masks, boots, and protective clothing, and shall be trained in safe handling practices.</li> <li>The work area shall be cleaned and restored promptly after completion of sludge removal to prevent public nuisance, health risks, and vector breeding.</li> </ul> |                              |                          |                      |                          |

**Table 24: Construction Stage Environmental Impacts and Mitigation Measures**

| Field  | Anticipated Impact  | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator   | Cost and Source of Funds   |
|--|---|---|----------------------------|--|--|
| Environmental Management Plan (EMP) Implementation Training along with COVID 19 safety | Irreversible impact to the environment, workers, and community, Impact due to effect of COVID 19  | Project manager and all key workers will have undergone training on EMP implementation including spoils/waste management, Standard operating procedures (SOP) for construction works; occupational health and safety (OHS) including COVID-19(SOP), core labor laws, applicable environmental laws, etc.  | Construction Contractor    |  | Project cost / PIU- PMU cost   |
| Air Quality  | Emissions from construction related vehicles, equipment, machinery, resulting in dusts and increase in concentration of vehicle related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons | <b>For all construction works</b><br>(i) Phased construction to avoid long open stretches.<br>(ii) The Direction of Nagaland Pollution Control Board to follow for controlling air pollutants<br>(iii) The soil and stockpiled material are damped down on site by water sprinkling<br>(iv) Tarpaulins are used to cover the loose material (soil, sand, aggregate etc.,) when transported by trucks;<br>(v) Wheels and undercarriage of haul trucks are cleaned prior to leaving construction site/quarry<br>(vi) Sprinkling water and unloading inside the barricaded area will be made to Control dust generation while unloading the loose material (particularly aggregate, soil) at the site<br>(vii) Water is used to maintain soils in a visible damp or crusted condition for temporary stabilization<br>(viii) Water to be used prior to leveling or any other earth moving activity to keep the soil moist throughout the process<br>(ix) Tarpaulins are used to cover the soil stocked at the sites | Construction Contractor    | Dust pollution, Complaints from local residents<br>Valid Pollution Under Control (PUC) certificates for all vehicles.<br>Fuel & Equipment Management | Cost for implementation of mitigation measures responsibility of contractor. |

| Field                                       | Anticipated Impact  | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator   | Cost and Source of Funds   |
|---|---|--|----------------------------|--|--|
|   |   | <p>(x) Access to be controlled to work area, preventing unnecessary movement of vehicle, public trespassing into work areas; limiting soil disturbance to minimize dust generation</p> <p>(xi) All construction equipment and machinery should be fitted with pollution control devices and have a valid pollution under control (PUC) certificate</p> <p><b><u>Drainage works</u></b></p> <p>(xii) Bring the construction material (aggregate and sand) as and when required to the site; avoid temporary storage</p> <p>(xiii) Use tarpaulins to cover waste soil/ dry sludge in transport</p> <p>(xiv) Ensure speedy completion of work</p>   |                            |  |  |
| Waste water from Drainage Construction work | Handling & disposal of accumulated water and sludge in the drains | <p>(i) Conduct work in small sections, say 100 m at a time; confine the drain in the section and stop all inlets</p> <p>(ii) Temporary diversion drains during excavation.</p> <p>(iii) As far as possible allow the silt to dry before start of desilting work.</p> <p>(iv) 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</p> <p>(v) Where manual method is adopted in narrow and inaccessible sections, 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 in case the drain is deeper than four feet.</p> | Construction Contractor    | Dewatering & Disposal Practices<br>Sludge Handling & Storage<br>Odor & Public Nuisance Control | Cost for implementation of mitigation measures responsibility of contractor. |

| Field                 | Anticipated Impact   | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator   | Cost and Source of Funds   |
|-----------------------|--|---|----------------------------|--|--|
|                       |  | <p>Workers should also be given oils for protecting skin and soap to clean up later.</p> <p>(vi) Covered trenches and steel plates at crossings.</p> <p>(vii) Provide on-site training to workers on safe handling of contaminated water and sludge</p> <p>(viii) Silt/soil/ sludge generated from desilting shall be land filled safely in consultation with Nagaland Pollution Control Board; shall not be used as manure or for land application</p>   |                            |  |  |
| Surface water quality | <p>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</p> | <p>(i) All earthworks to be conducted during the dry season to prevent the problem of soil run-off during monsoon season;</p> <p>(ii) Stockpiling of earth fill especially during the monsoon season will be avoided unless covered by tarpaulins or plastic sheets;</p> <p>(iii) Strict prohibition of spoil storage near drains</p> <p>(iv) Excess spoils and debris will be re-used in the construction works. Only designated area, if required, will be used for soil disposal</p> <p>(v) Install temporary silt traps or sedimentation basins</p> <p>(vi) Storage areas for fuels and lubricants will be selected away from any drainage leading to water bodies.</p> <p>(vii) Fuel, construction chemicals etc., will be stored on an impervious floor, also spillage is avoided by careful handling</p> <p>(viii) Construction wastes to be disposed in designated sites;</p> | Construction Contractor    | Silt Runoff & Sediment Control<br>Soil Erosion & Site Drainage Control | Cost for implementation of mitigation measures responsibility of contractor. |



| Field        | Anticipated Impact   | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator  | Cost and Source of Funds   |
|--------------|--|--|----------------------------|---|--|
|              |  | <ul style="list-style-type: none"> <li>(ix) Temporary drainage channels will be created around the work area to arrest the entry of runoff from upper areas into the work area</li> <li>(x) The water collected in the pits / excavations will be pumped to a temporary sedimentation pond; dispose of only clarified water then dispose into drainage channels / streams after sedimentation in the temporary ponds</li> <li>(xi) Safety aspects will be considered related to pit collapse due to accumulation of water</li> <li>(xii) Conduct surface quality inspection according to the EMP.</li> </ul>   |                            |   |  |
| Noise Levels | Increase in noise level due to earth-moving and excavation equipment, and transportation of equipment, materials, and people | <ul style="list-style-type: none"> <li>(i) Activities to be planned in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance, particularly at sensitive receptors;</li> <li>(ii) Horns will be not used unless it is necessary to warn other road users or animals of the vehicle's approach;</li> <li>(iii) Vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers are used in construction equipment to minimize sound impact to surrounding sensitive receptor;</li> <li>(iv) Maximum sound levels to be maintained which not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s.</li> </ul> | Construction Contractor    | Noise level measurement, field observations, discuss with local residents, Work Scheduling & Timing | Cost for implementation of mitigation measures responsibility of contractor. |

| Field                                      | Anticipated Impact  | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator   | Cost and Source of Funds   |
|--|---|--|----------------------------|--|--|
|  |   | (v) Local communities will be consulted in advance of work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.<br>(vi) Night time work will be avoided   |                            |  |  |
| Landscape and aesthetics– waste generation | Impacts due to excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty paint containers, spoils, oils, lubricants, and other similar items. | (i) Construction Waste Management Plan to be prepared and implemented<br>(ii) As far as possible the debris and excess soil will be utilized in construction purpose, for example for raising the ground level or construction of access roads etc.<br>(iii) Stockpiles, lubricants, fuels, and other materials will be located away from steep slopes and water bodies;<br>(iv) For disposal, the site selected will be preferably from barren, infertile lands; site would be located away from residential areas, forests, water bodies and any other sensitive land uses;<br>(v) Domestic solid wastes will be properly segregated into biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; compost pit to be created at workers' camp sites for disposal of biodegradable waste; non-biodegradable / recyclable material will be collected separately and sold in the local recycling material market;<br>(vi) Residual and hazardous wastes such as oils, fuels, and lubricants to be disposed of through approved vendors of Pollution Control Board;<br>(vii) Burning of construction and/or domestic waste are prohibited; | Construction Contractor    | Site verification against approved waste storage locations, Covered transport of waste materials, Timely removal of excavated spoil and debris | Cost for implementation of mitigation measures responsibility of contractor. |

| Field                                  | Anticipated Impact  | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator  | Cost and Source of Funds   |
|--|---|--|----------------------------|---|--|
|  |   | <p>(viii) Wastes will be not haphazardly dumped/ thrown within and around the project site and adjacent areas; proper collection bins to be provided, and awareness to be created to use the dust bins.</p> <p>(ix) Site clearance and restoration will be done immediately after the completion of construction work to restore to the original condition; Cluster-PIU ensures that site is properly restored prior to issuing of construction completion certificate.</p>  |                            |   |  |
| Existing Infrastructure and Facilities | Disruption of service and damage to existing infrastructure at specified project location | <p>(i) Prepare a list of affected utilities and operators if any; and</p> <p>(ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of service</p>  | Construction Contractor    | Verification of utility survey records and approved strip plans       | Cost for implementation of mitigation measures responsibility of contractor. |
| Ecological Resources Terrestrial       | Loss of vegetation and tree cover.  | <p>(i) Minimize removal of vegetation and disallow cutting of trees;</p> <p>(ii) A total of 11 trees in Dimapur and 17 trees in Chümoukedima may require removal for the urban road construction works. In addition, approximately 50 trees in each town may be affected by the stormwater drainage construction.</p> <p>(iii) A detailed tree enumeration survey shall be carried out along the proposed drainage alignment prior to commencement of construction works. If tree-removal will be required, obtain tree-cutting permit and</p> <p>(iv) Plant 5 native trees for every one that is removed.</p> | Construction Contractor    | No. of tree to be cut and Review clearance papers, field observations | Cost for implementation of mitigation measures responsibility of contractor. |
| Accessibility                          | Traffic problems and conflicts near   | <b>Hauling (material, waste/debris and equipment) activities</b>   | Construction Contractor    | Traffic Management Plan implemented at                                | Cost for   |

| Field | Anticipated Impact   | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator  | Cost and Source of Funds  |
|-------|--|--|----------------------------|---|---|
|       | project locations and haul road<br>Impact on access to house and road user particularly during Construction of road and drain. | <ul style="list-style-type: none"> <li>(i) Transportation routes to be planned so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites</li> <li>(ii) Transport and hauling activities will be scheduled during non-peak hours;</li> <li>(iii) Entry and exit points will be located in areas where there is low potential for traffic congestion;</li> <li>(iv) Vehicles to be driven in a considerate manner</li> <li>(v) Affected public will be notified by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.</li> </ul> <p><b>Road and drain construction works</b></p> <ul style="list-style-type: none"> <li>(i) The proposed drainage alignments in Dimapur and Chümoukedima are predominantly located within congested commercial areas. In Dimapur, access constraints are significant along most sections of the stormwater drainage corridors, which may pose challenges during construction. Similarly, limited accessibility is anticipated along certain drainage stretches in Chümoukedima. Therefore, adequate and well-planned construction access arrangements shall be ensured, with due consideration to occupational health and safety requirements, to facilitate safe movement of labor, materials, and equipment during execution of works.</li> </ul> |                            | work sites and Site verification against approved TMP<br>Safe pedestrian access maintained near construction areas<br>Review of public notices and communication logs | implementation of mitigation measures responsibility of contractor. |

| Field | Anticipated Impact | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator | Cost and Source of Funds |
|-------|--------------------|---|----------------------------|----------------------|--------------------------|
|       |                    | <ul style="list-style-type: none"> <li>(ii) Confine work areas along the roads to the minimum possible extent; all the activities, including material and waste/surplus soil stocking should be confined to this area. Proper barricading should be provided; avoid material/surplus soil stocking in congested areas – immediately removed from site/ or brought to the as and when required</li> <li>(iii) Leave spaces for access between mounds of soil to maintain access to the houses / properties</li> <li>(iv) Provide pedestrian access in all the locations; provide wooden/metal planks over the open trenches at each house to maintain the access.</li> <li>(v) Inform the affected local population 1-week in advance about the work schedule</li> <li>(vi) Avoid work during day time when community facilities such as educational institutes, healthcare centers, religious places, markets will be operating. Also provide alternative access.</li> <li>(vii) Plan and execute the work in such a way that the period of disturbance/ loss of access will be minimum.</li> <li>(viii) Keep the site free from all unnecessary obstructions;</li> <li>(ix) Coordinate with Traffic Police for temporary road diversions, where necessary, and for provision of traffic aids if transportation activities cannot be avoided during peak hours</li> </ul> |                            |                      |                          |



| Field                          | Anticipated Impact   | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator   | Cost and Source of Funds   |
|--------------------------------|--|---|----------------------------|--|--|
| Socio-Economic - Employment    | Generation of temporary employment and increase in local revenue | (i) Employ local labor force as far as possible; and<br>(ii) Comply with labor laws (See <b>Appendix 5</b> of this IEE)   | Construction Contractor    | Number and percentage of local workers employed<br>Participation of women and vulnerable groups in workforce | Contractor costs   |
| Occupational Health and Safety | Occupational hazards which can arise during work,                | (i) All national, state and local core labor laws to be complied with (see <b>Appendix 5</b> of this IEE). Labour license and Workmen Compensation policy to be obtained by contractor before start of construction<br>(ii) In the event of any future pandemic or public health emergency, the Contractor shall implement appropriate health and safety measures in accordance with the prevailing guidelines and protocols issued by the Government and relevant health authorities, to safeguard workers and nearby communities during project implementation.<br>(iii) Availability of First aid box/ facility throughout the project period;<br>(iv) Medical insurance and tie-up with local hospitals to be provided for workers;<br>(v) All installations will be secured from unauthorized intrusion and accident risks;<br>(vi) Potable drinking water to be provided for the workers;<br>(vii) Clean eating areas to be provided where workers are not exposed to hazardous or noxious substances;<br>(viii) 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 | Construction Contractor    | Planning for health and safety, practices being implemented<br>Review records, field check, observations,    | Cost for implementation of mitigation measures responsibility of contractor. |

| Field | Anticipated Impact | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator | Cost and Source of Funds |
|-------|--------------------|--|----------------------------|----------------------|--------------------------|
|       |                    | <p>rules of work at the site, personal protective protection, and preventing injuring to fellow workers;</p> <p>(ix) Visibility of workers to be ensured through the use of high visibility vests when working in or walking through heavy equipment operating areas;</p> <p>(x) Moving equipment will be outfitted with audible back-up alarms;</p> <p>(xi) 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;</p> <p>(xii) 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.</p> <p>(xiii) Implementation of appropriate health and hygiene practices at worksites, offices, meetings, transportation facilities, and other project-related locations to minimize the risk of communicable disease transmission and ensure occupational health and safety.</p> <p>(xiv) Adoption of necessary preventive and precautionary measures at workers' camps and accommodation facilities, including sanitation management,</p> |                            |                      |                          |

| Field                        | Anticipated Impact  | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator  | Cost and Source of Funds   |
|------------------------------|---|---|----------------------------|---|--|
|                              |   | hygiene maintenance, health monitoring, and awareness measures to safeguard worker health and well-being. 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 | <ul style="list-style-type: none"> <li>(i) Movements of construction vehicles are restricted to defined access roads and demarcated working areas (unless in the event of an emergency)</li> <li>(ii) All drainage works in Dimapur and Chümoukedima are located within urban areas, with several stretches passing through highly congested zones characterized by limited available space. During construction, to ensure public safety and minimize risks to pedestrians and vehicular traffic, adequate safety measures shall be implemented. These shall include the installation of appropriate safety signage, caution tapes, and rigid barricades at all critical locations, as required, in accordance with applicable occupational health and safety and traffic management guidelines.</li> <li>(iii) Strict speed limit (20-30 kmph) is enforced for plying on unpaved roads, construction tracks</li> <li>(iv) Night-time haulage is by exception only, as approved by the PIU to minimize driving risk and disturbance to communities</li> <li>(v) Temporary traffic control (e.g. flagmen) and signs will be provided where</li> </ul> | Construction Contractor    | Safe pedestrian pathways and crossings maintained<br>Warning signs, reflectors, and hazard lights installed | Cost for Implementation of mitigation measures responsibility of contractor. |

| Field   | Anticipated Impact  | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator  | Cost and Source of Funds   |
|---|---|--|----------------------------|---|--|
|   |   | <p>necessary to improve safety and provide directions</p> <p>(vi) All drivers should pass through safety and training sessions</p> <p>(vii) Public access will be restricted through the use of barricading and security personnel at construction locations</p> <p>(viii) Warning signs, blinkers will be attached to the barricade to caution the public about the hazards associated with the works,</p> <p>(ix) Control dust pollution –dust control measures will be implemented as suggested under air quality section</p> <p>(x) Vehicles will be regularly maintained and manufacturer- approved parts will be used to minimize potentially serious accidents caused by equipment malfunction or premature failure. Road signs and flag persons will be there to warn of on-going trenching activities.</p> <p>(xi) Road signs and flag persons will be provided to warn of on-going trenching activities.</p> |                            |   |  |
| Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets | <p>Trench excavation in narrow streets will pose high risk to children and elders in the locality</p> <p>Safety of pedestrians, small businesses, and need for emergency access</p> | <p>(i) Provide prior information to the local people about the nature and duration of work</p> <p>(ii) Conduct awareness program on safety during the construction work</p> <p>(iii) Undertake the construction work stretch-wise; excavation, drain trench refilling should be completed on the same day</p> <p>(iv) Provide barricades, and deploy security personnel to ensure safe movement of people and to prevent unnecessary entry and to avoid</p>  | Construction Contractor    | Barricades installed to prevent accidental entry into excavation areas, Safe pedestrian pathways maintained or provided around work zones | Cost for Implementation of mitigation measures responsibility of contractor. |

| Field                    | Anticipated Impact   | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator  | Cost and Source of Funds   |
|--------------------------|--|---|----------------------------|---|--|
|                          |  | accidental fall into open drainage trenches<br>(v) Provide suitable temporary ramps with hand rails for safe emergency access   |                            |   |  |
| 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) Camp site will be established at open space<br>(ii) No Tree will be cut for settling of camp.<br>(iii) Camp site will not be located near (100 m) water bodies, flood plains flood prone/low lying areas, or any ecologically, socially, archeologically sensitive areas<br>(iv) The workers living areas and material storage areas will be separated clearly<br>(v) Proper temporary accommodation with proper materials, adequate lighting and ventilation to be provided, appropriate facilities will be provided for winters and summers; conditions of livability at work camps should be ensured and maintained at the highest standards possible at all times;<br>(vi) Cluster-PIU should be consulted before locating project offices, sheds, and construction plants;<br>(vii) Removal of vegetation is minimized and cutting of trees disallowed without permission from concerned authorities<br>(viii) Camp should be protected from COVID 19 health risk. All Health and safety procedure to be followed for operation of camp (H & S plan for COVID 19 will be used as ref. document) during stay, cooking, eating, use of toilet- common space etc.<br>(ix) Self- hygiene, regular disinfection of entire camp and toilet, maintaining of | Construction Contractor    | Wastewater from camps properly drained<br>Camp inspection checklist<br>Adequate potable drinking water provided | Cost for implementation of mitigation measures responsibility of contractor. |



| Field | Anticipated Impact | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator | Cost and Source of Funds |
|-------|--------------------|---|----------------------------|----------------------|--------------------------|
|       |                    | <p>social distancing to be continued for protection from COVID 19 infection</p> <p>(x) Unknown person will not be allowed within the camp</p> <p>(xi) Camps will be provided with proper drainage, without any water accumulation</p> <p>(xii) Maintenance of hygienic environment at staying area, cooking area and toilet</p> <p>(xiii) Drinking water, water for other uses, and sanitation facilities for employees to be provided</p> <p>(xiv) Employees will be prohibited from cutting of trees for firewood; contractor provided proper facilities including cooking fuel (oil or gas; fire wood not allowed)</p> <p>(xv) Employees will be trained in the storage and handling of materials which can potentially cause soil contamination</p> <p>(xvi) Used oil and lubricants will be recovered and removed from the site</p> <p>(xvii) Solid waste to be managed according to the following preference hierarchy: reuse, recycling and disposal to designated areas; provide a compost pit is provided for biodegradable waste, and non-biodegradable / recyclable waste are collected and sold in local market</p> <p>(xviii) All wreckage, rubbish, or temporary structures which no longer required should be removed</p> <p>(xix) At the completion of work, camp area will be cleaned and restored to pre-project conditions, and report will be</p> |                            |                      |                          |

| Field   | Anticipated Impact   | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator   | Cost and Source of Funds   |
|---|--|--|----------------------------|--|--|
|   |  | submitted to Cluster-PIU; they will review and approve camp clearance and closure of work site   |                            |  |  |
| Impacts due to night works (if required as per nature of works and feasibility at site) | Occupational hazards which can arise during work at night in extreme and unavoidable cases | <ul style="list-style-type: none"> <li>(i) Contractors should have handheld noise level meter for measurement of noise during night hours</li> <li>(ii) Contractors should have handheld lux meter for the measurement of illumination during night hours</li> <li>(iii) Preferably electrical connections are available for running equipment otherwise sound proof/super silent Diesel Generator set should be available</li> <li>(iv) Sound level should not increase as per EMP</li> <li>(v) Illumination should be adequate as required according to nature of works</li> <li>(vi) 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</li> <li>(vii) All the noise activity like hammering, cutting, crushing, running of heavy equipment's should be done in day time and avoided in night time</li> <li>(viii) Workers engaged in night works should have adequate rest/sleep in day time before start of night works</li> <li>(ix) 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</li> <li>(x) All the necessary provisions of traffic aids such as traffic signals, road</li> </ul> | Construction Contractor    | Review of work permits and approval records<br>Night-time noise monitoring;<br>Safe pedestrian and traffic movement maintained | Cost for Implementation of mitigation measures responsibility of contractor. |

| Field                | Anticipated Impact                                    | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator  | Cost and Source of Funds   |
|----------------------|---|---|----------------------------|---|--|
|                      |   | <p>signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent / retro-reflective arrangements</p> <p>(xi) 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</p> <p>(xii) Horns should not be permitted by equipment and vehicles</p> <p>(xiii) Workers should not shout and create noise</p> <p>(xiv) First aid and emergency vehicles should be available at site</p> <p>(xv) Emergency preparedness plan should be operative during night works</p> <p>(xvi) Old persons and pregnant women and women having small kids should not work in night time</p> <p>(xvii) All the vehicles and equipment being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise</p> <p>(xviii) All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night work.</p> <p>Management Plan for night works is attached in <b>APPENDIX 12.</b></p> |                            |   |  |
| Monsoon preparedness | Disruption of utilities and water logging in trenches | <p>(i) Taking into account the monsoonal rainfall patterns in Dimapur and Chümoukedima, the construction work schedule shall be appropriately planned and phased to minimize weather-related disruptions and</p>  | Construction Contractor    | Excavated trenches protected from rainwater ingress, Silt traps, sediment barriers, and bunds installed | Cost for Implementation of mitigation measures responsibility of contractor. |

| Field                  | Anticipated Impact   | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator  | Cost and Source of Funds   |
|------------------------|--|---|----------------------------|---|--|
|                        |  | <p>associated safety and environmental risks.</p> <p>(ii) As for a possible avoid trench works and excavation works (road and drain construction work) during monsoon season to avoid any water logging and accident due to it</p> <p>(iii) if open trenches are not avoidable during monsoon, keep ready all the mitigations measures to avoid water logging such as dewatering pumps and traffic assistance, barricades etc.</p> <p>Guidelines for safety during monsoon is attached as <b>APPENDIX 14</b>.</p> |                            |   |  |
| Climate Related impact | <p>Heavy monsoon runoff washing loose soil into rivers (Dhansiri/Chathe)</p> <p>Localized "Artificial Floods" caused by construction debris.</p> <p>Contamination of water bodies during high-flow events.</p> | <p>(i) Installation of Silt Fences and Sedimentation Traps at all outfall points. No major earthworks during July–August.</p> <p>(ii) Immediate removal of excavated soil. Temporary drainage bypasses must be maintained during work.</p> <p>(iii) Storage of fuels and chemicals on raised, impervious platforms above the 50-year High Flood Level (HFL).</p>  | Construction Contractor    | Zero unmanaged blockages or stagnant water pools in existing channels near the site | Cost for Implementation of mitigation measures responsibility of contractor. |
| Chance Finds           | <p>There are no protected properties in the subproject sites. However, in case of chance finds, contractors will be required to follow a protocol as defined in the mitigation measures.</p>                   | <p>In case of chance finds, works must be stopped immediately, informed to PIU and until such time chance finds are cleared by experts</p>  | PIU                        | Chance Finds Protocol, Chance find incidents record                                 |  |

| Field                                   | Anticipated Impact  | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator   | Cost and Source of Funds   |
|---|---|--|----------------------------|--|--|
| Submission of EMP implementation report | Unsatisfactory compliance to EMP                            | <ul style="list-style-type: none"> <li>(i) Appointment of Environment, Health and Safety (EHS) Supervisor to ensure EMP implementation</li> <li>(ii) Timely submission of monitoring reports including pictures</li> </ul>   | Construction Contractor    | -  | Contractor cost  |
| Post-construction clean-up              | Damage due to debris, spoils, excess construction materials | <ul style="list-style-type: none"> <li>(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) after completion of work;</li> <li>(ii) All excavated roads shall be reinstated to original condition.</li> <li>(iii) All disrupted utilities will be restored</li> <li>(iv) All affected structures will be rehabilitated/ compensated</li> <li>(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.</li> <li>(vi) The contractor must arrange the cancellation of all temporary services.</li> <li>(vii) Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.</li> </ul> | Construction Contractor    | Field inspection and drainage flow verification, Review of disposal records and transport logs | Cost for implementation of mitigation measures responsibility of contractor. |



**Table 25: Operation Stage Environmental Impacts and Mitigation Measures**

| Field   | Anticipated Impact   | Mitigation Measures   | Responsible for Mitigation | Monitoring Indicator   | 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 | <ul style="list-style-type: none"> <li>(i) Prevent entry of wastewater into drains; this requires development of sewerage system in the town. Presently intercepting of combined waste water and storm water from outfall and followed by treatment planned under separate funding.</li> <li>(ii) Ensure regular cleaning and desilting of drains; provide appropriate maintenance equipment &amp; tools as part of the project</li> <li>(iii) Prevent encroachment of drains</li> </ul>  | O&M Contractor             | Routine visual inspection and desilting records<br>Maintenance logs and municipal records      | Operating costs          |
| Monitoring of drain conditions<br>Disposal of silt and solid waste after cleaning of drains | Chocking of drain due to Solid waste/ Silt   | <ul style="list-style-type: none"> <li>(i) Drains shall be regularly inspected and cleaned especially prior to monsoons.</li> <li>(ii) All damaged or missing drain covers should be replaced immediately.</li> <li>(iv) Rubbish and silt that has been removed from the drainage system should not be left alongside the drain and shall be immediately disposed in preidentified site with necessary precautions. Occupational Health and Safety (OHS) to be ensured for all workers, and emergency aid shall be made available,</li> </ul> | O&M Contractor             | Routine visual inspection and maintenance records<br>Site inspection during and after rainfall | Operating costs          |
| Air quality   | Air pollution due to vehicular movement  | <ul style="list-style-type: none"> <li>(i) Road signs shall be provided reminding the motorist to properly maintain their vehicles to economize on fuel consumption and protect the environment</li> <li>(ii) Ambient air quality monitoring. If monitored parameters are above the prescribed limit, suitable control measures must be taken.</li> </ul>   | O&M Contractor             | PM <sub>10</sub> monitoring, Vehicle maintenance record check                                  | Operating costs          |
| Noise   | Noise due to movement of traffic   | <ul style="list-style-type: none"> <li>(i) Effective traffic management and good riding conditions shall be maintained to reduce the noise level throughout the stretch and speed limitation &amp; honking restrictions may be enforced near sensitive locations</li> <li>(ii) Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while</li> </ul>   | O&M Contractor             | Noise level measurements, field observations   | Operating costs          |

| Field                                  | Anticipated Impact   | Mitigation Measures  | Responsible for Mitigation | Monitoring Indicator   | Cost and Source of Funds |
|--|--|--|----------------------------|--|--------------------------|
|  |  | constructing a building close to the road and drain  |                            |  |                          |
| Flooding and Inundation                | Water logging due to blockage of drains, culverts or streams | (i) Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels /streams<br>(ii) Monitoring of water borne diseases due to stagnant water bodies.  | O&M Contractor             | Drains free from silt accumulation and solid waste                     | Operating costs          |
| Maintenance of Right of Way and Safety | Accident risks associated with traffic movement              | (i) Traffic control measures, including speed limits, will be enforced strictly, signage will be placed<br>(ii) Further encroachment of squatters within the ROW will be prevented.<br>(iii) Monitor/ensure that all safety provisions included in design and construction phase are properly maintained   | O&M Contractor             | Drains, culverts, and outfalls free from silt, debris, and solid waste | Operating costs          |
| Occupational health and safety         | Health, social and economic impacts on the workers           | (i) Provide appropriate PPE and training on its proper use and maintenance.<br>(ii) In the event of any future pandemic or public health emergency, the Contractor shall implement appropriate health and safety measures in accordance with the prevailing guidelines and protocols issued by the Government and relevant health authorities, to safeguard workers and nearby communities during project implementation.<br>(iii) Maintain work areas to minimize slipping and tripping hazards.<br>(iv) Prohibit eating, smoking, and drinking except in designated areas. | O&M Contractor             | Workers provided with and using required PPE                           | Operating costs          |
| Environment Safeguard Officer          |  | At the contractor level, an Environment, Health and Safety Supervisor shall be appointed on-site for each package to support the preparation and implementation of the site-specific EMP. In addition, the Contractor shall designate an Environment Safeguard Officer responsible for overseeing day-to-day implementation of the EMP, EHS compliance, community liaison, stakeholder consultations, reporting, and grievance redressal activities during   | O&M Contractor             | -  | Operating costs          |

| Field | Anticipated Impact | Mitigation Measures | Responsible for Mitigation | Monitoring Indicator | Cost and Source of Funds |
|-------|--------------------|---------------------|----------------------------|----------------------|--------------------------|
|       |                    | project execution.  |                            |                      |                          |

**Table 26: Construction Stage Environmental Monitoring Plan**

| Monitoring field  | Monitoring Location                                | Monitoring Parameters   | Frequency                  | Responsibility  | Cost and Source of Funds  |
|---|--|---|----------------------------|---|---|
| Monitoring of drainage water                                    | 4 locations of each town Dimapur and Chumakedima   | pH, Turbidity, Total Suspended Solids (TSS), BOD, COD, Oil & Grease, Nitrate, Sulphate, Chloride, Total Dissolved Solids (TDS), Heavy Metals (Fe, Pb, Cr, Cd, Zn) | Once before construction   | Construction Contractor                                   | Cost for implementation of monitoring measures responsibility of contractor |
| Monitoring of drainage Silt and Drainage water                  | 4 locations of each town Dimapur and Chumakedima   | Moisture Content, pH, Organic Matter, Heavy Metals (Pb, Cr, Cd, Ni, Zn, Cu, Fe), Oil & Grease, NPK  | Once before construction   | Construction Contractor                                   | Cost for implementation of monitoring measures responsibility of contractor |
| 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 <b>APPENDIX 15.</b>          | Weekly during construction | Supervising staff and safeguards specialists              | -Immediate.   |
| Tree cutting  | Along the proposed drain and road network          | Tree cutting permit taken, Tree cutting done  | Continuous                 | Supervising staff, EHS officer and safeguards specialists | 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 | Contractor  |
| Construction, Labour Camp, storage yard Management              | Construction, Labour Camp, storage yard sites      | As per SEMP   | Weekly                     | EHS officer, Environment Specialist of consultant         | contractor  |
| Solid waste management  | Construction, Labour Camp, storage yard Management | As per SEMP   | Weekly                     | EHS officer, Environment Specialist of consultant         | contractor  |

| Monitoring field   | Monitoring Location   | Monitoring Parameters   | Frequency  | Responsibility                                    | Cost and Source of Funds   |
|--|---|---|--|---|--|
| Construction and demolition waste management   | All construction site   | As per SEMP and applicable rules and regulations                            | Monthly  | EHS officer, Environment Specialist of consultant | contractor   |
| Consent to establish 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 | No cost required for monitoring cost for obtaining CTE/CTO from PMU and for others from Contractor |
| Ambient air quality  | <b>Dimapur</b><br>6 locations,<br>(3 location on proposed drain and 3 in proposed road)<br><b>Chümoukedima</b><br>6 locations, (3 locations on proposed drain and 3 locations on proposed road) | PM <sub>10</sub> , PM <sub>2.5</sub> NO <sub>2</sub> , SO <sub>2</sub> , CO | (i) Once before start of construction.<br>(ii) Yearly 3 times (for seasons: pre-monsoon, post-monsoon and winter) during construction (2.5-years period considered)  | Construction Contractor                           | Cost for implementation of monitoring measures responsibility of contractor                        |
| Ambient noise level  | <b>Dimapur</b><br>4 locations,<br>(2 location on proposed drain and 2 in proposed road)<br><b>Chümoukedima</b><br>4 locations, (2 locations on propose drain and 2 locations on proposed road)  | Day time and nighttime noise levels   | (i) Once before start of construction.<br>(ii) Yearly 3 times (for seasons: pre-monsoon, post-monsoon and winter) during construction (2.5 -years period considered) | Construction Contractor                           | Cost for implementation of monitoring measures responsibility of contractor                        |



| Monitoring field      | Monitoring Location  | Monitoring Parameters   | Frequency  | Responsibility          | Cost and Source of Funds  |
|-----------------------|--|---|--|-------------------------|---|
| Surface water quality | Two no. for each town if required (suspected water body contamination) | pH, TDS, Oil and grease, Cl, F, NO3, TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity | (i) Once before start of construction<br><br>(ii) Yearly 3 times (for seasons: pre-monsoon, post-monsoon and winter) during construction (2.5-years period considered) | Construction Contractor | Cost for implementation of monitoring measures responsibility of contractor |

**Table 27: Operation Stage Environmental Monitoring Plan**

| Monitoring Field   | Monitoring Location                        | Monitoring Parameters   | Frequency           | Responsibility   | Cost and Source of Funds |
|--|--|---|---------------------|------------------|--------------------------|
| Monitoring of quality of water on discharge point of the drain | Outfall of the drain sampling in all areas | pH, Nitrite, Nitrate, Turbidity BOD, COD, Hardness, residual chlorine, Total Alkalinity | Quarterly once      | Contractor / ULB | O&M costs                |
| Air quality Monitoring on proposed road                        | On sensitive locations                     | PM <sub>10</sub> , PM <sub>2.5</sub> NO <sub>2</sub> , SO <sub>2</sub> , CO             | Two times in a year | Contractor / ULB | O&M costs                |

## **B. Implementation Arrangements**

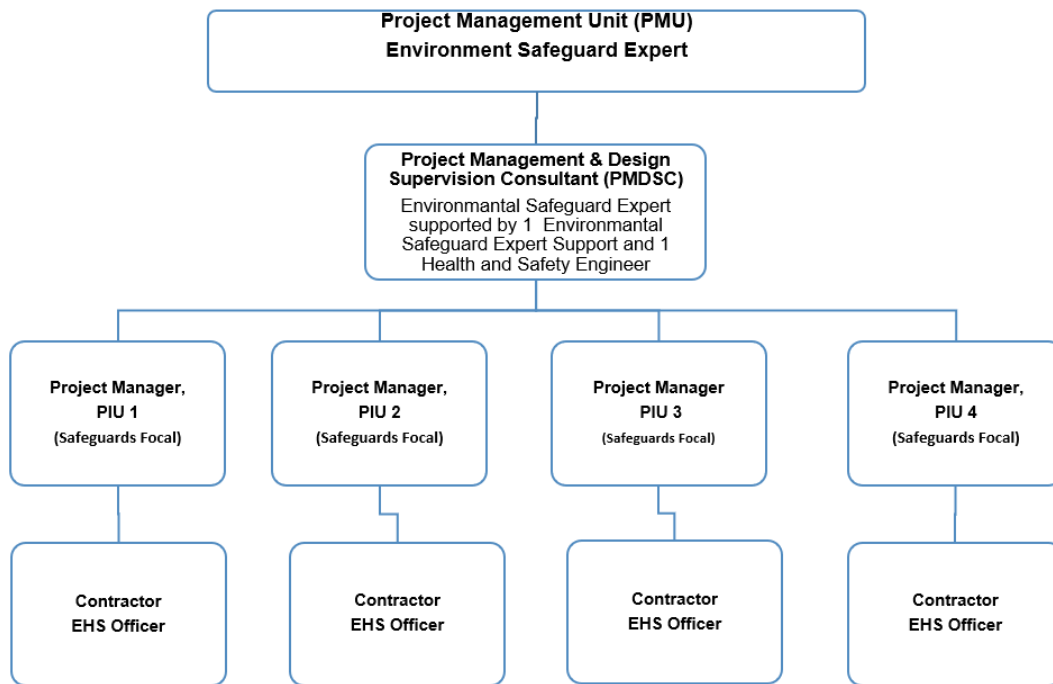
358. The UDD, Govt of Nagaland is the Executing Agency and NUIDP is the Implementing Agency for the ADB financed Directorate of Urban Development. A Project Management Unit (PMU), established within the NUIDP, headed by a Managing Director cum Project Director (PD) and supported by the Joint Project Director and Assistant Director will implement the project. The PMU will be supported by 4 Project Implementation Units (PIUs) established at Kohima, Dimapur, Mokokchung and Mon. These four will be established within the ULB. Each PIU will be headed by a Project Manager in the rank of Executive Engineer and will be supported by 2 Assistant engineer from Urban Development Department. Both PMU and PIU will be supported by a Project Management & Design Supervision Consultant (PMDSC) to supervise, monitor and oversee project implementation including compliance of ADB's SPS 2009 and other environmental and social issues according to the State and GOI rules.

359. PMDSC.

## **C. Environmental Safeguard**

360. At the PMU, Joint Project Director will be the focal person for both social and environmental safeguard. A dedicated Environmental Safeguard Expert (ESE) at PMU will have the overall responsibility of ensuring compliance with environmental safeguards and will report to joint project director. The Executive Officer (EO) of the ULB shall be the Safeguard Focal Person at PIU level supported by one Assistant Engineer from the Nagaland Urban Development Department for environmental safeguard implementation. Further, Junior Engineers of ULB will also assist in safeguard implementation. The PMDSC, will have one Environmental Safeguard Specialist (ESS) and One Health and Safety Engineer and one Environmental Safeguard Expert Support to support PMU and PIUs in all tasks related to environmental safeguards. At contractor level, an Environment, Health and Safety (EHS) supervisor will be appointed on-site, one for each package, to assist in preparing and implementing site-specific EMP. The safeguard arrangement is depicted in the following PMDSC Figure 26.

### Institutional Implementation Arrangements



**Figure 25: Institutional Arrangement for Safeguard Implementation for NUIDP**

361. **Project Management Unit (PMU).** The PMU will be responsible for planning, management, coordination, supervision and progress monitoring. 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 Environmental Safeguard Expert at the PMU level:

- (i) Ensure project compliance with the statutory environmental requirements, and loan covenant, and IEE and EMP requirements of individual subprojects.
- (ii) Ensure that necessary environment assessment studies are conducted, and IEEs including EMPs are prepared and submitted to ADB for approval and disclosure.
- (iii) Ensure that IEEs including EMPs are included in bidding documents and contracts.
- (iv) Ensure that Health and Safety Plans are included in bidding documents and civil works contracts.
- (v) 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 commencement of works;
- (vi) coordinate with design engineers, to consider measures to avoid potential environmental impacts; ensure amended subproject designs/locations, if any, confirm with the subproject selection criteria;
- (vii) review and provide recommendations on the approval of site specific EMPs (SEMPs) of contractors; ensure that no construction works are commenced until SEMP are approved by PIU/PMU;
- (viii) ensure that work method statements submitted by the contractors, and reviewed

and cleared by PMDSC duly considers health and safety risks, and that the work methods, including use of equipment and implements are safe; work method should duly specify the health and safety risks and measures including personnel protection equipment (PPE) are specified

- (ix) ensure overall compliance with all national, state, and local government rules and regulations; ensure that approvals/permits/licenses are obtained in a timely manner;
- (x) Ensure that construction works are not commenced until all applicable government clearances are obtained;
- (xi) Oversee and ensure that contractors and their subcontractors comply with labour legislation
- (xii) provide oversight on environmental management aspects of the project; establish a system to monitor environmental safeguards including monitoring the indicators set out in the monitoring plan of the EMP;
- (xiii) review, monitor and evaluate effectiveness with which the SEMP, EMPs, and Health and Safety Plans are implemented, and recommend necessary corrective actions;
- (xiv) Ensure that the IEEs including EMPs are updated in case of changes in detailed design that may occur during implementation phase;
- (xv) 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;
- (xvi) with support from PMDSC, consolidate monitoring reports from the PIUs and submit semi-annual environmental monitoring reports (SEMRs) to ADB;
- (xvii) ensure availability of budget for safeguards activities;
- (xviii) 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;
- (xix) 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;
- (xx) Carry out awareness and outreach activities to ensure that stakeholders and local communities are informed about the GRM and how to access it;
- (xxi) ensure any grievances brought about through the GRM are redressed in a timely manner;
- (xxii) ensure timely disclosure of draft/updated IEEs/EMPs and SEMRs, including corrective action plans, if any, in project website and in a form accessible to the public; and
- (xxiii) organize periodic capacity building and training programs on safeguards for other PMU members, PIUs and contractors.
- (xxiv) Assist PMU in reporting to ADB in case of any unanticipated impacts during implementation, and take necessary actions as may be required

362. **Project Implementation Units (Town/City Level).** The PIUs will be responsible for the day-to-day activities of project implementation in the field and will have direct supervision to all contractors at subproject sites. At each PIU, the EO of the ULB shall be designated as focal person for both environment and social safeguards. The EO will be supported by one Assistant Engineer and Junior engineers of ULB for environmental safeguard who will perform the following specific tasks, with support from ESE of PMDSC:

- (i) Ensure compliance with government regulations and ADB requirements set forth in IEEs, including corresponding EMPs, and ADB SPS;
- (ii) confirm to ES/PMU that IEEs and EMPs are up-to-date and reflect detailed engineering designs, or any change in location, alignment, or components
- (iii) inform PMU promptly of any change in project locations / designs;
- (iv) Liaise with local offices of regulatory agencies in obtaining clearances /approvals; assist PMU for clearances obtained at town/city level; prior to award of contract; confirm PMU that all statutory clearances are in place;
- (v) Take necessary action for obtaining right of way prior to start of works;
- (vi) Review and approve contractor SEMP;
- (vii) Oversee day-to-day implementation of SEMPs by contractors, including compliance with all government rules and regulations, and conduct regular site visits/inspections;
- (viii) Ensure that contractors and their subcontractors comply with labour legislation cited in IEEs and ADB's SPS Prohibited list requirements; ensure that workers are paid and treated according to labor legislation.
- (ix) ensure contractors and subcontractors (a) comply with the measures forth in the IEEs, the EMPs, and any corrective or preventative actions set forth in a Semi-annual Environmental Monitoring Report; (b) make available a budget for all such environmental and social measures; (c) provide the PIU and 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; (d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and (e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction;
- (x) ensure that work method statements of contractor duly consider health and safety risks, and that the work methods, including use of equipment and implements are safe; work method should duly specify the health and safety risks and measures including personnel protection equipment (PPE) are specified
- (xi) ensure all workers are provided with OSH training prior to start of works and on a regular basis;
- (xii) ensure strict implementation of OHS requirements including but not limited to contractors' no personal protective equipment (PPE), no work policy;
- (xiii) Recommend issuance of work construction work completion certification to the contractor upon verification of satisfactory post-construction clean-up;
- (xiv) Review monthly reports from contractors on SEMP implementation;
- (xv) Prepare quarterly reports on all aspects concerning environmental assessment, management, and monitoring, and submit to PMU;
- (xvi) Ensure continuous public consultation and awareness;
- (xvii) Coordinate grievance redress process and ensure timely actions by all parties; and
- (xviii) Support all other environmental safeguards-related activities and tasks of the PMU as may be needed.
- (xix) Inform PMU of unanticipated impacts and assist in formulating corrective action plan.

363. **Project Management and Supervision Consultant (PMDSC).** The PMDSC will have an Environmental Safeguards Specialist (ESS) and four Health and Safety Engineers. The PMU and PIU will be supported by PMDSC's Environmental Safeguards Specialist who will assist in



preparing, updating, reviewing, implementing, monitoring, and reporting of all tasks related to environmental safeguards. Following are the key tasks of Environment Specialist of PMDSC:

- (i) Assist the PMU in screening project components and update ADB Rapid Environmental Assessment (REA) checklists and category when necessary to reflect project changes based on the final detailed design;
- (ii) Work closely with PMU, PIU and Contractor design teams to include environmental considerations in project location, design, and technical specifications;
- (iii) Identify statutory clearance / permissions / approvals required and assist the PMU and PIU in obtaining them;
- (iv) Assist in including standards/conditions of regulatory clearances and consents, if any, in the project design;
- (v) Carry out baseline environmental surveys and prepare updated/final IEEs and EMPs based on the DBO contractor's detailed design, SEMP, and in accordance with country's environmental legal frameworks and ADB SPS 2009;
- (vi) Lead / assist PIU in public consultations and include inputs from the public consultation in the project design and EMP, and proper documentation in the IEEs;
- (vii) Advise / assist PIU in disclosing relevant information on safeguards to affected people and relevant stakeholders;
- (viii) Assist PMU/PIUs in reviewing and approving contractor SEMP, health and safety plan including measures to prevent/control communicable/infectious diseases such as COVID-19, and any other associated plans as required
- (ix) Review and coordinate with PMDSC technical experts and ensure that that work method statements of contractor duly considers health and safety risks, and that the work methods, including use of equipment and implements are safe; work method should duly specify the health and safety risks and measures including personnel protection equipment (PPE) are specified; ensure that work methods are suitable for site specific conditions, including the public/private roads used for material, workers/staff and debris transport activities which may be outside the site premises.
- (x) Assist the PIU in monitoring the implementation of EMPs/SEMPs and ensure compliance by the Contractors including subcontractors;
- (xi) Carry out site verification of EMP/SEMP implementation on a regular basis; and monitor the implementation and ensure compliance by the Contractors including subcontractors;
- (xii) Conduct regular monitoring and ensure that contractors and their subcontractors comply with labour legislation and ADB SPS Prohibited list requirements; ensure that workers are paid and treated according to the labor legislations
- (xiii) Provide guidance on resolving issues pertaining to effective and efficient implementation of proposed environmental mitigation measures per EMPs/SEMPs during construction phase. Identify, non-compliance or unanticipated impacts, if any, and initiate corrective actions and report to PMU;
- (xiv) Assist the PIU in the review and approval of monthly monitoring reports submitted by Contractor;
- (xv) Assist the PIU in consolidating and preparing quarterly Environmental Monitoring Reports (EMR) and submit to PMU;
- (xvi) Assist the PMU in preparing semi-annual environmental monitoring report per the requirement of ADB;
- (xvii) Identify training needs and implement capacity building activities on environmental safeguards for the PMU, PIU, contractors, and other stakeholders;
- (xviii) Assist PIU in establishing GRM for the Project;
- (xix) Assist PIU in grievance redress, advise the contractor on appropriate actions on grievances, ensure timely resolution and proper documentation;

- (xx) Support all other environmental safeguards-related activities and tasks of the PMU and PIUs as may be needed.

364. Key roles and responsibilities for and Health and Safety Engineer of PMDSC:

- (i) Establishing and maintaining overall project's health and safety systems, protocols, work permit methods and communication structures; expert will be responsible for ensuring safety culture at project sites
- (ii) Promoting safe practices on site and ensuring the safety induction training of workers
- (iii) Assessment and approval of contractor's site-specific health and safety plan
- (iv) Regular inspection of project sites to ensure a hazard-free environment and rectify potential safety issues.
- (v) Ensuring tools and equipment safety, third party audits/inspections etc.,
- (vi) Creating and enforcing safety guidelines and programs
- (vii) Plan and ensuring that contractors carry out drills and exercises on managing emergency situations
- (viii) Conducting investigations on accidents and incidents and prepare reports on findings
- (ix) Responding to workers' safety concerns
- (x) Arrange evaluations of the sites and identify areas for improvement
- (xi) Coordinates all issues regarding hazardous materials
- (xii) Attending periodically project planning meetings and collaborating with construction managers to identify and address safety concerns
- (xiii) Continuous monitoring of all safety related documents, reports and issues to keep them updated.
- (xiv) Engage with local communities to raise awareness about the project's health and safety impacts. Address community concerns related to project activities.

365. **The Contractor.** The approved IEEs and EMPs are to be included in bidding and contract documents and verified by the PIUs and PMU. 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; and (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 with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

366. The contractor will be required to appoint a full-time Environment, Health and Safety (EHS) supervisor on-site to implement the EMP. Prior to start of construction, Contractor will be required to prepare and submit to PMU and PIU, for review and approval, Site-specific EMP (SEMP) which includes (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 EMP in approved draft and final EMP; (iii) monitoring program per EMP; and (iv) budget for SEMP and EMP implementation. No works can commence until SEMP is approved by PMU/PIU. Contractors will carry out all environmental mitigation and monitoring measures outlined in EMP, approved SEMP and their contracts. The contractor will be required to undertake day to day monitoring of the SEMP implementation and submit reports

to the PIU on a monthly basis.

367. A copy of the EMP/approved SEMP will be always kept on-site during the construction period. Non-compliance with, or any deviation from, the conditions set out in the EMP/SEMP constitutes a failure in compliance and will require corrective actions. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites.

368. Key responsibilities of the EHS supervisor are:

- (i) Prepare SEMP including site-specific occupational health and safety plan and submit to PMU/PIU for approval prior to start of construction;
- (ii) Ensure implementation of SEMP and report to PIU/PMDSC on any new or unanticipated impacts; seek guidance from the PMU/PIU/PMDSC to address the new or unanticipated impact in accordance with ADB SPS 2009;
- (iii) Ensure that necessary pre-construction and construction permits are obtained;
- (iv) Conduct trainings<sup>23</sup> orientation and daily briefing sessions to workers on environment, health and safety;
- (v) Ensure that appropriate worker facilities are provided at the workplace and labor camps as per the contractual provisions;
- (vi) Carry out site inspections on a regular basis and prepare site-inspection checklists/reports;
- (vii) Record EHS incidents and undertake remedial actions;
- (viii) Conduct environmental monitoring (air, noise, etc.,) as per the monitoring plan
- (ix) Prepare monthly EMP monitoring reports and submit to PIU;
- (x) Comply with labour legislations, and ensure that subcontractors also implement labor legislations requirements, through cascading of requirements to subcontractors—human resource policy, labour management requirements, any worksite specific grievance redress mechanism.
- (xi) Work closely with PIU and PMDSC to ensure communities are aware of project-related impacts, mitigation measures, and GRM; and
- (xii) Coordinate with the PIU and PMDSC on any grievances received and ensure that these are addressed in an effective and timely manner.

#### **D. Capacity Building and Training**

369. The NUIDP, has some experienced project staff, who have knowledge of environmental safeguards, and experience of ADB environmental safeguard policies and their implementation from previous project implementation under DUD. It is hence understood that they have required familiarity with ADB environmental safeguard policies and its implementation. Designated PMU officials, and PIUs staffs and engineers will be trained by PMDSC safeguards experts on

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<sup>23</sup> 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; (iv) 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.

safeguards issues related to the project, GESI action plan and GRM. The IEE, EMP and DDR, RP and GESI action plan provided indicative capacity building program which included modules on: (i) introduction and sensitization to ADB SPS 2009, on environmental, involuntary resettlement and indigenous people policies and requirements; (ii) project related requirements as provided in the IEE, DDR, RP, EMP and GESI action plan, (iii) review, updating and preparation of the IEEs, SEMP, RPs, DDRs upon the completion of project detailed design; (iii) improved coordination within nodal departments; (iv) monitoring and reporting system; and (v) project GRM. Briefings on safeguards principles, GRM and GESI action plan will also be conducted to the contractors upon their mobilization by PIU safeguard officers supported by PMDSC.

370. The following Table 27 presents the outline of capacity building program to ensure EMP implementation. The estimated cost is Rs.200,000 (excluding training of contractors which will be part of EMP implementation cost during construction) to be covered by the project's capacity building program. The detailed cost and specific modules will be customized for the available skill set after assessing the capabilities of the target participants and the requirements of the project by the Environment Expert of PMDSC.

**Table 28: Indicative Training Needs for Environmental Safeguards**

| Description   | Target Participants and Venue  | Estimate (INR)               | Source of Funds   |
|---|--|------------------------------|-------------------|
| <b>1.Introduction and Sensitization to Environmental Issues (1 day)</b><br>- ADB Safeguards Policy Statement<br>- Government of India and Nagaland applicable safeguard laws, regulations and policies including but not limited to core labor standards, OH and S, etc.<br>- Incorporation of EMP into the project design and contracts<br>- Monitoring, reporting and corrective action planning  | All staff and consultants involved in the project<br>1. At PMU, Kohima (combined program for all subprojects)                                | 75,000 (LS)<br>For each town | PMU               |
| <b>2.Preparing and implementing SEMP-SEMR (1/2 day - once at the beginning and at a frequency of once in six months during implementation)</b><br>- site-specific mitigation & monitoring measures<br>- Roles and responsibilities<br>- Public relations,<br>- Consultations<br>- Grievance redress<br>- Monitoring and corrective action planning<br>- Reporting and disclosure<br>-Construction site standard operating procedures (SOP)<br>-Chance find (archaeological) protocol<br>- AC pipe protocol<br>- Traffic management plan<br>- Waste management plan<br>- Site clean-up & restoration | All staff and consultants involved in the project<br><br>All contractors immediately after mobilization of the contractor<br><br>At all PIUs | 100,000 (LS)                 | PMU               |
| <b>3.Contractors Orientation to Workers (1/2 day)</b>   | Once before start of work, and thereafter  | 50,000 (LS)                  | Contractor's cost |

| Description  | Target Participants and Venue   | Estimate (INR) | Source of Funds |
|--|---|----------------|-----------------|
| - Environment, health and safety in project construction (O H and S, core labor laws, spoils management, etc.) | regular briefing every month once.<br>Daily briefing on safety prior to start of work<br><br>All workers (including unskilled laborers) |                |                 |

**Summary of Capacity Building cost for EMP Implementation**

- Contractor Cost - INR 50,000 for each component of 2 towns = INR 200,000
- PMU Cost - INR 150,000 for each component of 2 towns=INR 600,000
- **Total - INR 800,000**

## **E. Monitoring and Reporting**

371. Immediately after mobilization and prior to commencement of the works, the contractor will submit a compliance report to PMU that all identified pre-construction mitigation measures as detailed in the EMP are undertaken. Contractor should confirm that the staff for EMP implementation (EHS supervisor) is mobilized. PMU will review, and approve the report and allow commencement of works.

372. During construction, results from internal monitoring by the contractor will be reflected in their monthly EMP implementation reports to the PMU. PMDSC will review and advise contractors for corrective actions if necessary.

373. Quarterly report shall be prepared PMDSC and submitted to PMU for review and further actions.

374. Based on monthly & quarterly reports and measurements, PMU (assisted by PMDSC) will submit Semi-Annual Environmental Monitoring Report. Once concurrence from the ADB is received the report will be disclosed on ADB and NUIDP/PMU websites. The semiannual submission of Environmental Monitoring Reports (EMRs) will be required during both the construction and operation phases of the project.

375. ADB will review project performance against the project 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 of social and environmental safeguards will be integrated into the project performance management system

## **F. Environmental Management Plan Implementation Cost**

376. 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 28** indicates cost estimate to implement EMP.



**Table 29: Cost Estimates to Implement the Environmental Management Plan**

| Sr. No.   | Particulars  | Stages                            | Unit   | Total No.  |              | Rate | Cost | Costs Covered By |
|-----------|--|-----------------------------------|--|------------|--------------|------|------|------------------|
|           |  |                                   |  | Dimapur    | Chümoukedima | INR  | INR  |                  |
| <b>A.</b> | <b>Implementation staff</b>  |                                   |  |            |              |      |      |                  |
| 1         | Environment, Health, and Safety Supervisor   | Construction                      | Per month (Effective work period for the town) | 30 months  | 30 months    |      |      | contractor       |
|           | <b>Subtotal (A)</b>  |                                   |  |            |              |      |      |                  |
| <b>B.</b> | <b>Mitigation Measures</b>   |                                   |  |            |              |      |      |                  |
| 1         | Consent for establishments and consent for operation from NPCB   | Pre construction – not applicable | -  | -          | -            |      |      |                  |
| 2         | Provision for tree cutting and compensatory plantation measures (1: 5 ratio replantation)<br>Tree cutting (Urban road + SWD)<br>Dimapur- 11 + 50 = 61<br>Chumukedima- 17+50 = 67 | Construction                      | Per tree                                       | 305        | 335          |      |      | contractor       |
| 3         | Traffic management at work sites (Pavement Markings, Channelizing Devices, Arrow Panels and Warning Lights)  | Construction                      | Lump sum                                       | To be done | To be done   |      |      | contractor       |
| 4         | Provision of appropriate PPE and health protection measures, including masks, sanitizers, and dust protection equipment  | Construction                      | Lump sum                                       | To be done | To be done   |      |      | Contract         |
|           | <b>Subtotal (B)</b>  |                                   |  |            |              |      |      |                  |
| <b>C.</b> | <b>Monitoring Measures</b>   |                                   |  |            |              |      |      |                  |
|           | Drain Water Quality monitoring   | Pre-construction                  | per sample                                     | 4          | 4            |      |      | Contract         |
|           | Drain Silt Quality monitoring  | Pre-construction                  | per sample                                     | 4          | 4            |      |      | Contract         |
| 1         | Air quality monitoring   | Construction                      | per sample                                     | 48         | 48           |      |      | Contract         |

| Sr. No.                | Particulars  | Stages                        | Unit       | Total No.                      |              | Rate INR | Cost INR | Costs Covered By                      |
|------------------------|--|-------------------------------|------------|--------------------------------|--------------|----------|----------|---------------------------------------|
|                        |  |                               |            | Dimapur                        | Chümoukedima |          |          |                                       |
| 2                      | Noise levels monitoring  | Construction                  | Per sample | 48                             | 48           |          |          | Contract                              |
| 3                      | Surface water monitoring   | Construction                  | Per sample | 15                             | 15           |          |          | Contract                              |
|                        | <b>Subtotal (C)</b>  |                               |            |                                |              |          |          |                                       |
| <b>D.</b>              | <b>Capacity Building</b>   |                               |            |                                |              |          |          |                                       |
| 1                      | Introduction and Sensitization to Environmental Issues                                   | Pre-construction              | Lump sum   | 1,50,000                       | 1,50,000     |          |          | PIU                                   |
| 2                      | EMP implementation   | Pre-construction              | Lump sum   | 1,50,000                       | 1,50,000     |          |          | PIU                                   |
| 3                      | Contractors Orientation to Workers on EMP implementation                                 | Prior to dispatch to worksite | Lump sum   | 1,00,000                       | 1,00,000     |          |          | Contract                              |
|                        | <b>Subtotal (D)</b>  |                               |            |                                |              |          |          |                                       |
| <b>E</b>               | <b>Civil Works</b>   |                               |            |                                |              |          |          |                                       |
| 1                      | Water Sprinkling for dust suppression  | Construction                  | KL         | 2500                           | 2500         |          |          | Civil works contract under Contractor |
|                        | <b>Subtotal (E)</b>  |                               |            |                                |              |          |          |                                       |
| <b>F</b>               | <b>Barricading</b>   |                               |            |                                |              |          |          |                                       |
| 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 |
| <b>G</b>               | <b>Grievance Redressal Mechanism</b>   |                               |            | 350000                         | 350000       |          |          |                                       |
|                        | <b>Total (A+B+C+D+E+F+G)</b>   |                               |            |                                |              |          |          |                                       |
| <b>Contractor Cost</b> |  |                               |            |                                |              |          |          |                                       |
| <b>PIU Cost</b>        |  |                               |            |                                |              |          |          |                                       |
| <b>Total</b>           |  |                               |            |                                |              |          |          |                                       |



## **X. CONCLUSION AND RECOMMENDATIONS**

377. The process outlined in this document has evaluated the environmental impacts of all components of the proposed road and drain subproject in Dimapur and Chümoukedima towns. Potential impacts have been identified for the pre-construction, construction, and operation phases. Planning principles and design considerations have been reviewed and integrated into the site planning and design process wherever feasible, ensuring that environmental impacts arising from the project's design or location are not significant.

378. The rehabilitation of roads and drainage systems will be undertaken within the existing Right-of-Way (RoW). Overall, there are no significant sensitive environmental features in the project sites, apart from a few religious places and sensitive receptors such as health facilities and educational institutions.

379. The locations for the main subproject components, including roads and drains, have been selected on government-owned land, and no environmentally sensitive areas are present within these sites.

380. Construction activities will be limited to the identified project areas, ensuring minimal disturbance to the surrounding communities. Temporary adverse impacts may occur, primarily from construction-related dust, noise, transportation of materials, waste handling, and the movement of equipment on local roads, which could lead to traffic congestion, dust emissions, and safety concerns. Additional impacts may arise from sourcing construction materials, occupational health and safety issues, and prevention measures. Construction along public roads may also cause temporary disruption to residents, businesses, and traffic, and will require the disposal of moderate quantities of waste soil and drain sludge. Social impacts, such as restricted access, are expected to be minimal. These are common impacts for urban construction works and can be effectively mitigated through measures outlined in the Environmental Management Plan (EMP).

381. The construction of narrow drains within Dimapur town areas poses several engineering and environmental challenges due to spatial constraints and the presence of dense built-up surroundings. Limited working space often restricts the use of heavy machinery, requiring manual excavation and material handling. This slows down progress and increases labor dependency, while also necessitating careful planning for access, safety, and material storage. Additionally, existing underground utilities such as water pipelines, electrical cables, and telecommunication lines frequently interfere with drain alignment, demanding continuous coordination with utility departments and real-time adjustments during execution.

382. Traffic congestion and public inconvenience are other major concerns in urban settings. Since drain construction typically runs along narrow roads and busy streets, it can disrupt vehicular movement, restrict pedestrian access, and create safety hazards for residents. Inadequate barricading, signage, or lighting around excavation zones can further increase the risk of accidents, particularly during night hours. Therefore, proper traffic management plans, safe access pathways, and phased construction scheduling are essential to minimize public disturbance.

383. From an environmental standpoint, drainage construction generates considerable silt, debris, and construction waste, which, if not properly managed, can lead to choking of existing drains and localized flooding. Waterlogging and seepage issues are common during excavation, especially in areas with a high groundwater table or during monsoon periods.

384. The contractor shall implement the operation-stage EMP, which may include periodic road and drainage repairs, as well as maintenance activities such as the safe disposal of drainage sludge.

385. Public participation during project preparation ensured that stakeholders were actively engaged in the development of the Initial Environmental Examination (IEE). Planned information disclosure and consultation measures will continue to facilitate stakeholder participation during project implementation.

386. The project's grievance redress mechanism (GRM) will provide residents with a clear platform to voice concerns, supported by defined informal and formal channels, timelines, and procedures for addressing environmental performance-related complaints.

387. 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.

388. The EMP will guide the project agencies and contractors in mitigating environmental impacts and ensuring environmentally responsible execution of the works. A copy of the EMP/approved Site Environmental Management Plan (SEMP) will be kept on-site at all times during construction, and compliance will be mandatory for all contractors as per contractual requirements. Non-compliance or deviation from EMP provisions will be treated as a breach of contract.

389. This project will benefit the general public by contributing to long-term improvements in the road and drainage infrastructure and enhancing community livability in Dimapur and Chümoukedima towns. Potential adverse environmental impacts are largely confined to the construction phase and can be minimized through effective mitigation measures and the adoption of environmentally sound engineering and construction practices.

390. 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.

391. **Conclusions and Recommendations.** The following are recommendations applicable to the subproject to ensure no significant impact:

- Obtain all statutory clearances prior to start of construction and ensure conditions/provisions are incorporated in the detailed design;
- Include this IEE in BID and contract documents;
- Update/revise this IEE in case of change in scope, alignment, or location;
- Contractor to prepare Site-specific environmental management plans (SEMP) for both Construction and O&M phases based on the updated EMP, and approved by PIU/PMU; no works can commence under SEMP is approved
- Conduct safeguards induction for the contractor upon award of contract;
- Conduct baseline environmental quality monitoring prior to start of construction
  
- 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



- Ensure contractor appointed qualified environment, health, and safety (EHS) officers prior to start of works;
- Continuous consultations with stakeholders with timely disclosure of information
- Establishment of GRM and operationalization prior to start of works;
- Involvement of contractors, including subcontractors, in first level GRM;
- Strictly supervise EMP implementation;
- Documentation and reporting on a regular basis as indicated in the IEE;
- 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- DIMAPUR

#### Rapid Environmental Assessment Checklist- Dimapur

##### Road and Highway

**Country/Project Title:** India/ Nagaland Urban Development Project

**Sector:** Urban Roads

| Screening Questions  | Yes | No | Remarks   |
|--|-----|----|---|
| <b>A. Project Siting</b><br><b>Is the project area adjacent to or within any of the following environmentally sensitive areas?</b>                                       |     |    |   |
| Cultural heritage site   |     | ✓  | Remains of a fort (Dimapur Ruins) - The Kachari Rajbari Ruins are a series of mushroom domed pillars and which is about 2 km away from the proposed roads. Urban roads components are not located nearby any ASI protected area   |
| 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 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>B. Potential Environmental Impacts Will the Project cause...</b>  |     |    |   |
| 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 have been identified. Impacts of landscape by road embankments, cuts and fills will not be anticipated. Proper management plan for will be required during construction to sustain the quarries.  |
| Encroachment on precious ecology (e.g. sensitive or protected areas)?  |     | ✓  | Not applicable – no sensitive and 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 roadside 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<br>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. Rock crushing and asphalt processing will be sited away from settlements and other sensitive receptors. Measures to minimize local air pollution problems have been proposed in the EMP.<br>Due to the nature of construction works, it is anticipated that air pollution will be increased during construction phase. As such guidance will be provided on the siting requirements for hot mix and ready-mix plants. 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 PPEs to minimize exposure to risks and associated harmful occupational health effects<br>Although, the scale of construction works is relatively small 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 area 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 area is very uncommon although some commercial impacts to air quality will be highly localized and temporary during construction activity. Imposing of appropriate mitigation measures in contract agreement to keep the air pollution within permissible levels will keep a check on this problem.  |
| 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<br>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.<br>Workers will be made aware about communicable diseases.   |

| 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?   | ✓   |    | Adoption of suitable traffic signage system at sensitive places will reduce such possibility. The preparation of traffic management plans and road safety provisions are included in the EMPs. |
| Increased noise and air pollution resulting from traffic volume?   |     | ✓  | Due to improvement in Riding Quality & Comfort in driving due to unidirectional traffic such pollution will be reduced. Mitigation measures along with monitoring plan will be required        |
| 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<br>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 <sup>24</sup>   |
|--------------------------------|--|-------|---|
| 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     | As per local enquiries carried out during field visits and from the vulnerability mapping of the district for flood prone areas indicates that the subproject components are not located in the flood |

<sup>24</sup> 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 <sup>24</sup>   |
|--------------------------------|--|-------|---|
|                                |  |       | prone/tropical cyclone areas<br>Ngaland is highly vulnerable to earthquakes as it lies in seismic zone VI, which is classified as High Damage Risk Zone in India. |
|                                | 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) ?   | 0     |   |
| 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



**Rapid Environmental Assessment Checklist****Storm Water Drainage- Dimapur****Country/Project Title:** India/ Nagaland Urban Development Project**Sector:** Sewerage & Drainage

| Screening Questions   | Yes | No | Remarks  |
|---|-----|----|--|
| <b>A. Project Siting</b><br><b>Is the project area...</b>                         |     |    |  |
| Densely populated?  |     | ✓  | Dimapur is not densely populated. The subproject area comprises different part of the town, Project locations support open area, residential and commercial areas.   |
| Heavy with development activities?  |     | ✓  | The area comprises of residential structures, commercial establishments and opens area. The developmental activities such as construction works are ongoing at an average pace throughout the town.        |
| Adjacent to or within any environmentally sensitive areas?                        |     | ✓  | Storm Water drain work will be carried out within Dimapur town. There is no forest area nearby.<br>Nearest forest area is Rangapahar Reserve Forest located about 4 km (aerial distance) Dimapur town.     |
| Cultural heritage site  |     | ✓  | Drainage components are not located nearby the ASI protected area.<br>The Kachari Rajbari Ruins are a collection of mushroom-shaped domed pillars located approximately 370m from Drain 1 of Dimapur town. |
| Protected Area  |     | ✓  | No as such protected area nearby the proposed project location   |
| Wetland   |     | ✓  | Not applicable   |
| Mangrove  |     | ✓  | No   |
| Estuarine   |     | ✓  | No   |
| Buffer zone of protected area   |     | ✓  | No protected area nearby the project site  |
| Special area for protecting biodiversity  |     | ✓  | No as such   |
| Bay   |     | ✓  | No   |
| <b>B. Potential Environmental Impacts</b><br><b>Will the Project cause...</b>     |     |    |  |
| 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.<br>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.<br>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   |
| 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.   |
| 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   |

| Screening Questions   | Yes | No | Remarks   |
|---|-----|----|---|
| 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 <sup>25</sup>   |
|--------------------------------|--|-------|---|
| 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     | As per local enquiries carried out during field visits and from the vulnerability mapping of the district for flood prone areas indicates that the subproject components are not located in the flood prone/tropical cyclone areas<br>Ngaland is highly vulnerable to earthquakes as it lies in seismic zone VI, which is classified as High Damage Risk Zone in India. |
|                                | 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     |   |

<sup>25</sup> 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.

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- Chümoukedima

### Road & Highways

Country/Project Title: India/ Nagaland Urban Development Project

Sector: Urban development – Chümoukedima

| Screening Questions  | Yes | No | Remarks  |
|--|-----|----|--|
| <b>A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?</b>   |     |    |  |
| Cultural heritage site   |     | ✓  | Remains of a fort (Dimapur Ruins) is about 11.5 km away from the Chümoukedima town. Urban roads components are not located nearby any ASI protected area.  |
| 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 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>B. Potential Environmental Impacts Will the Project cause...</b>  |     |    |  |
| 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 have been identified. The topography of project road sections is in flat. Impacts of landscape by road embankments, cuts and fills will not be anticipated. Proper management plan for will be required during construction to sustain the quarries. |
| Encroachment on precious ecology (e.g. sensitive or protected areas)?  |     | ✓  | Not applicable – no sensitive and 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 roadside 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<br>Poor camp management may lead to runoff of silt and other wastes from workers' camps. This  |

| Screening Questions  | Yes | No | Remarks   |
|--|-----|----|---|
|  |     |    | possible impact has been identified and mitigation measures have been included in the EMPs.   |
| 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. Rock crushing and asphalt processing will be sited away from settlements and other sensitive receptors. 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. As such guidance will be provided on the siting requirements for hot mix and ready-mix plants. 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<br>Although, the scale of construction works is relatively small 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 area 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 area is very uncommon although some commercial Impacts to air quality will be highly localized and temporary during construction activity. Imposing of appropriate mitigation measures in contract agreement to keep the air pollution within permissible levels will keep a check on this problem.   |
| 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  |

| Screening Questions  | Yes | No | Remarks  |
|--|-----|----|--|
|  |     |    | and stress are not expected<br>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.<br>Workers will be made aware about communicable diseases. |
| 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?   | ✓   |    | Adoption of suitable traffic signage system at sensitive places will reduce such possibility.<br>The preparation of traffic management plans and road safety provisions are included in the EMPs.                                |
| Increased noise and air pollution resulting from traffic volume?   |     | ✓  | Due to improvement in Riding Quality & Comfort in driving due to unidirectional traffic such pollution will be reduced. Mitigation measures along with monitoring plan will be required  |
| 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<br>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 <sup>26</sup>   |
|--------------------------------|--|-------|---|
| 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     | As per local enquiries carried out during field visits and from the vulnerability mapping of the district for flood prone areas indicates that the subproject components are not located in the flood prone/tropical cyclone areas<br>Ngaland is highly vulnerable to earthquakes as it lies in seismic zone VI, which is classified as High Damage Risk Zone in India. |
|                                | 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) ?   | 0     |   |
| 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

<sup>26</sup> 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.

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- Chümoukedima

Country/Project Title: India/ Nagaland Urban Development Project

Sector: Sewerage & Drainage

| Screening Questions   | Yes | No | Remarks   |
|---|-----|----|---|
| <b>A. Project Siting</b><br><b>Is the project area...</b>                         |     |    |   |
| Densely populated?  |     | ✓  | Chümoukedima is not densely populated. The subproject area comprises different part of the town, Project locations support open area, residential and commercial areas.   |
| Heavy with development activities?  |     | ✓  | The area comprises of residential structures, commercial establishments and opens area. The developmental activities such as construction works are ongoing at an average pace throughout the town.             |
| Adjacent to or within any environmentally sensitive areas?                        |     | ✓  | Storm Water drain work will be carried out within Chumokedima town. There is no forest area nearby.<br>Nearest forest area is Rangapahar Reserve Forest located about 7 km (aerial distance) Chümoukedima town. |
| Cultural heritage site  |     | ✓  | Drainage components are not located nearby the ASI protected area.<br>The Kachari Rajbari Ruins are a collection of mushroom-shaped domed pillars located approximately 11.5 km from Chümoukedima town.         |
| Protected Area  |     | ✓  | No as such protected area nearby the proposed project location  |
| Wetland   |     | ✓  | Not applicable  |
| Mangrove  |     | ✓  | No  |
| Estuarine   |     | ✓  | No  |
| Buffer zone of protected area   |     | ✓  | No protected area nearby the project site   |
| Special area for protecting biodiversity  |     | ✓  | No as such  |
| Bay   |     | ✓  | No  |
| <b>B. Potential Environmental Impacts</b><br><b>Will the Project cause...</b>     |     |    |   |
| 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.<br>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.<br>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   |
| 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.   |
| 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   |

| Screening Questions   | Yes | No | Remarks   |
|---|-----|----|---|
| 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 <sup>27</sup>   |
|--------------------------------|--|-------|---|
| 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     | As per local enquiries carried out during field visits and from the vulnerability mapping of the district for flood prone areas indicates that the subproject components are not located in the flood prone/tropical cyclone areas<br>Ngaland is highly vulnerable to earthquakes as it lies in seismic zone VI, which is classified as High Damage Risk Zone in India. |
|                                | 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:

<sup>27</sup> 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.

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

| Parameter                                       | Location <sup>a</sup>                         | India Ambient Air Quality Standard ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup> | WHO Air Quality Guidelines ( $\mu\text{g}/\text{m}^3$ ) |                                  |                              | Applicable Per ADB SPS <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ ) |
|---|---|--|---|----------------------------------|------------------------------|--|
|   |   |  | Global Update <sup>c</sup> 2005                         | Second Edition 2000 <sup>d</sup> | Air Pollution Guideline 2021 |  |
| (NH <sub>3</sub> )                              | Residential, Rural and Other Areas            | 400 (24-hr)  |   |                                  |                              | 400 (24-hr)  |
|   | Sensitive Area                                | 100 (Annual)<br>400 (24-hr)  |   |                                  |                              | 100 (Annual)<br>400 (24-hr)                                      |
| Benzene (C <sub>6</sub> H <sub>6</sub> )        | Industrial Residential, Rural and Other Areas | 5 (Annual)   |   |                                  |                              | 5 (Annual)   |
|   | Sensitive Area                                | 5 (Annual)   |   |                                  |                              | 5 (Annual)   |
| Benzo(o)pyrene (BaP) and 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)  |

<sup>a</sup> Sensitive area refers to such areas notified by the India Central Government.

<sup>b</sup> Notification by Ministry of Environment and Forests, Government of India Environment (Protection) Seventh Amendment Rules, 2009

<sup>c</sup> WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. Global update 2005. WHO 2006

<sup>d</sup> Air Quality Guidelines for Europe Second Edition. WHO 2000

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

Note-

<sup>a</sup> Noise Pollution (Regulation and Control) Rules, 2002 as amended up to 2010.

<sup>b</sup> Guidelines for Community Noise. WHO. 1999

<sup>c</sup> 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: SAMPLE OUTLINE TRAFFIC MANAGEMENT PLAN

### A. Principles for TMP around the Road and Drain Construction Sites

1. One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:
  - the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
  - protection of work crews from hazards associated with moving traffic;
  - mitigation of the adverse impact on road capacity and delays to the road users;
  - maintenance of access to adjoining properties; and
  - addressing issues that may delay the project.

### B. Operating Policies for TMP

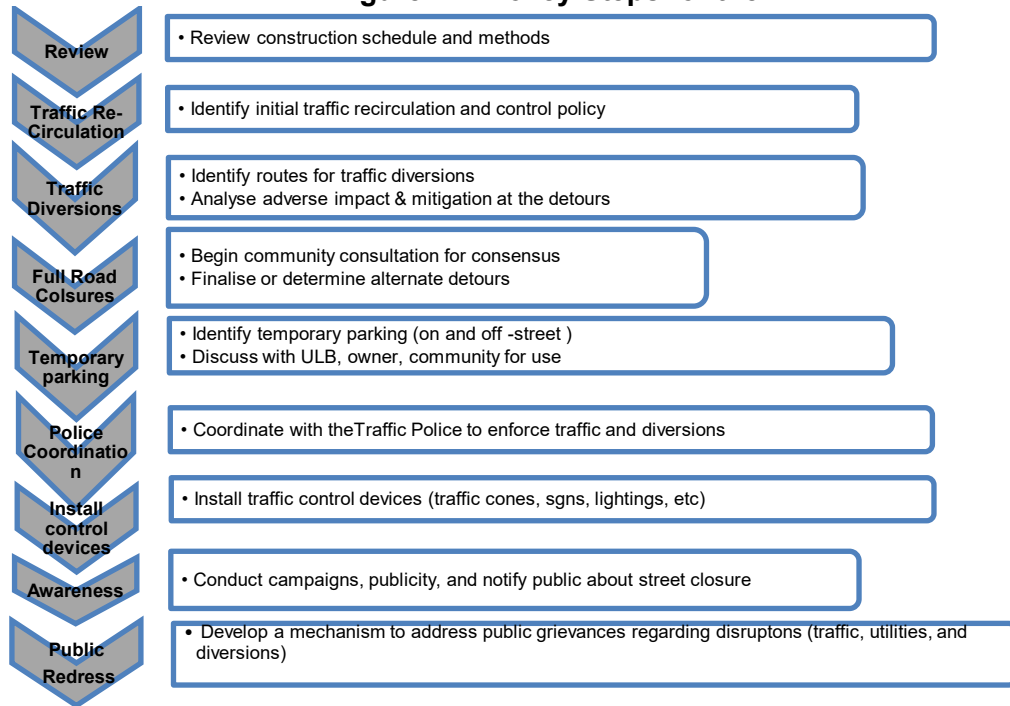
2. The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.
  - Make traffic safety and temporary traffic control an integral and high-priority element of project from planning through design, construction, and maintenance.
  - Inhibit traffic movement as little as possible.
  - Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
  - Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
  - Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
  - Train all persons that select, place, and maintain temporary traffic control devices.
  - Keep the public well informed.
  - Make appropriate accommodation for property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.
3. **Figure A2 to Figure A12** illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

### C. Analyze the impact due to street closure

4. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:
  - approval from the ULB/Public Works Department (PWD) to use the local streets as detours;
  - consultation with businesses, community members, traffic police, PWD, etc., regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
  - determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
  - determining if additional traffic control or temporary improvements are needed along the detour route;
  - considering how access will be provided to the worksite;
  - contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
  - developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

5. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the detour street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

**Figure A1: Policy Steps for the TMP**



#### **D. Public awareness and notifications**

6. As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

7. The PIU will also conduct an awareness campaign to educate the public about the following issues:
- traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
  - defensive driving behaviour along the work zones; and
  - reduced speeds enforced at the work zones and traffic diversions.

8. It may be necessary to conduct the awareness programs/campaigns on road safety



during construction.

9. The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centres. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

- explain why the brochure was prepared, along with a brief description of the project;
- advise the public to expect the unexpected;
- educate the public about the various traffic control devices and safety measures adopted at the work zones;
- educate the public about the safe road user behaviour to emulate at the work zones;
- tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
- indicate the office hours of relevant offices.

#### **E. Install traffic control devices at the work zones and traffic diversion routes**

10. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary "STOP" and "GO").

12. **Figure A2 to Figure A12** illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:

- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel lane
- Lane closure on road with low volume
- Lane closure on a two-line road with low volume (with yield sign)
- Lane closure on a two-line road with low volume (one flagger operation)
- Lane closure on a two lane road (two flagger operation)
- Lane closure on a four lane undivided Road
- Lane closure on divided roadway
- Half road closure on multi-lane roadway
- Street closure with detour

13. The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required

for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

14. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

16. In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

*Figure A6 & A7: Lane closure on a two-line road with low volume (with yield sign) & Lane closure on a two-line road with low volume (one flagger operation)*

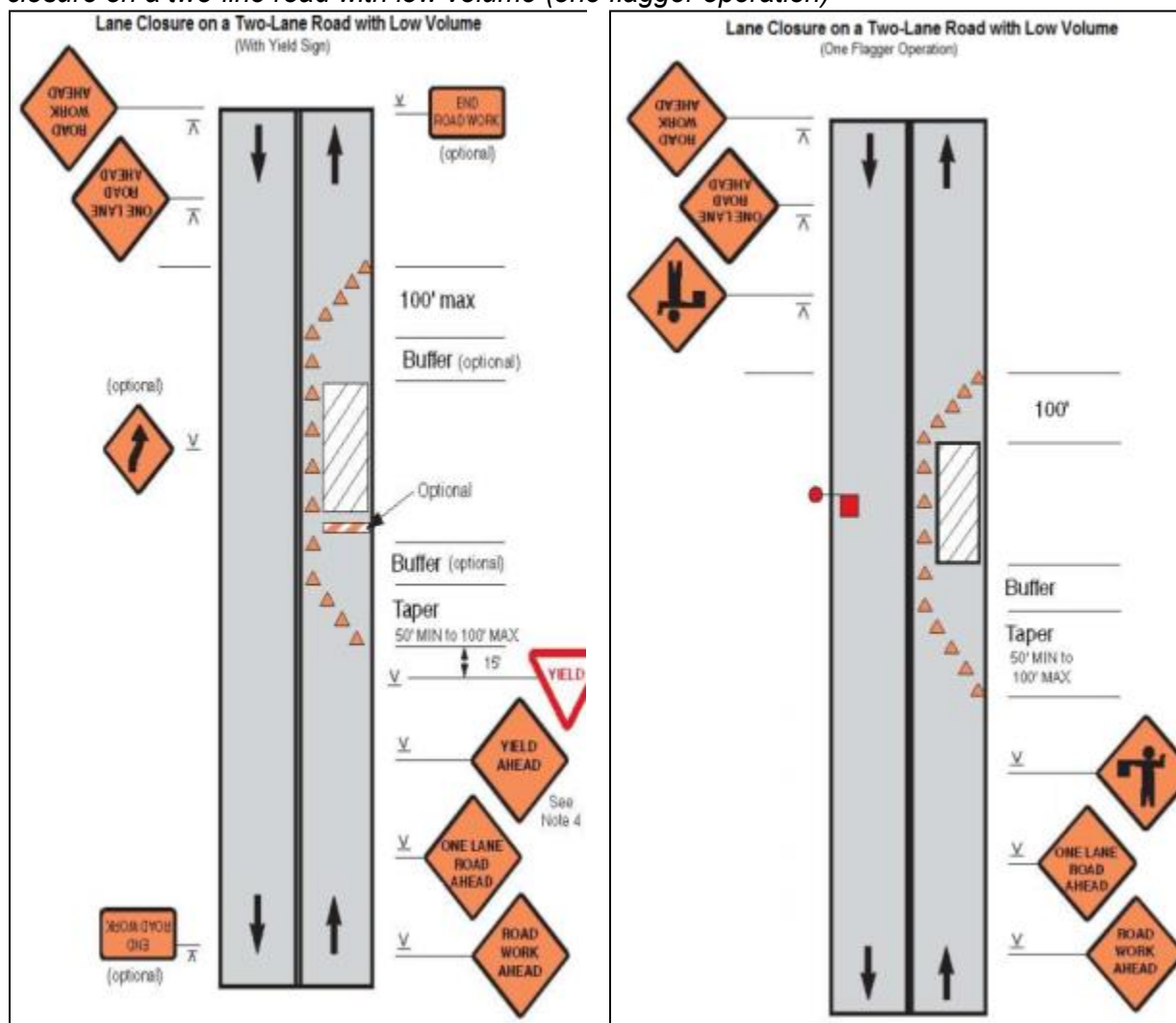


Figure A8 & A9: Lane Closure on a Two-Lane Road (Two Flagger Operation) & Lane Closure on a Four-Lane Undivided Road

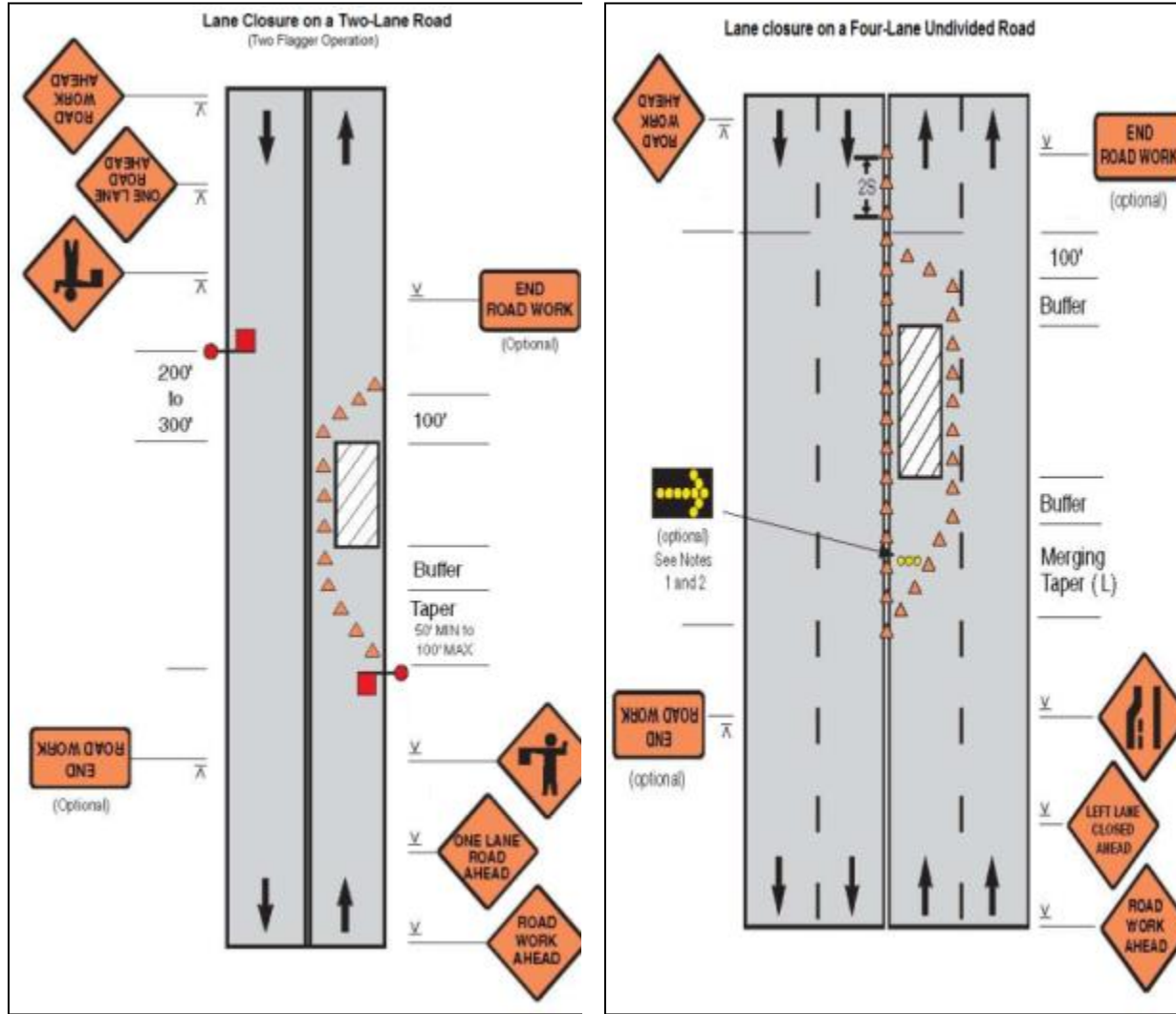
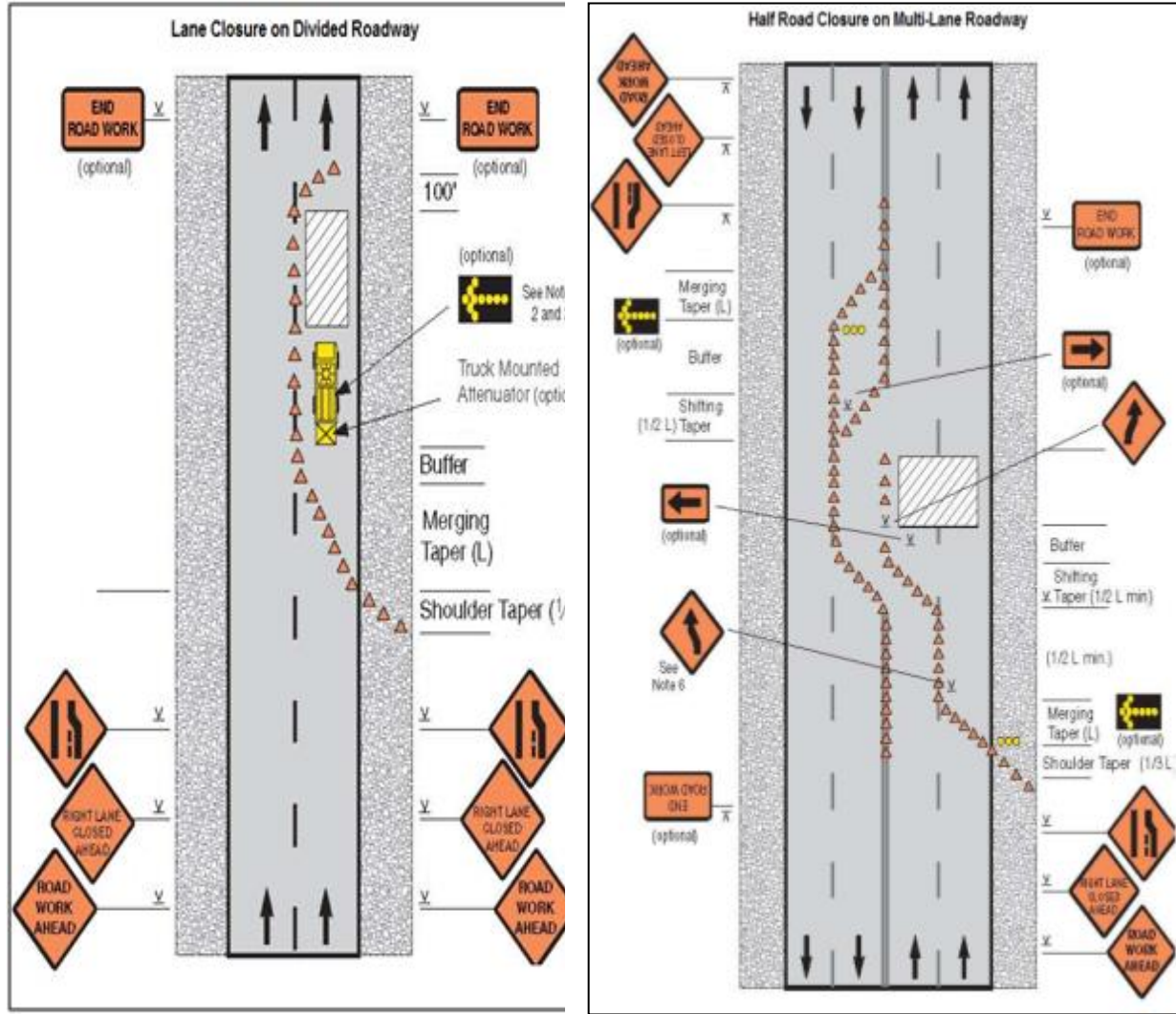


Figure A10 & A11: Lane Closure On Divided Roadway & Half Road Closure On Multi-Lane Roadway



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## APPENDIX 7: DRINKING WATER STANDARDS

| Group       | National Standards for Drinking Water <sup>a</sup> |             |   | WHO Guidelines for Drinking-Water Quality, 4 <sup>th</sup> Edition, 2011 <sup>b</sup> | Applicable Per ADB SPS <sup>c, d</sup>      |
|-------------|--|-------------|---|---|---|
|             | Parameter  | Unit        | Max. Concentration Limits <sup>d</sup>      |   |   |
| 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/100 ml  | 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/100 ml  |   |   |   |

### Note-

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

<sup>b</sup> Health-based guideline values.

<sup>c</sup> 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.

<sup>d</sup> Figures in parenthesis are maximum limits allowed in the absence of alternate source.



## APPENDIX 8: STAKEHOLDER CONSULTATIONS

### Summary of Consultation with Stakeholders- Dimapur

| Date                       | Location                                    | No. of Participants | Participants                   | Topics Discussed  | Issues   |
|----------------------------|---|---------------------|--------------------------------|---|--|
| 8 <sup>th</sup> March 2024 | Wolford Colony, Dimapur Ward-04, 05, 08, 20 | 30<br>M=26 F=04     | Consultation with Local people | <ul style="list-style-type: none"> <li>Briefing on project objectives probable implementation procedures</li> <li>Potential positive and negative impacts due to project implementation</li> <li>Relevant information of the upcoming project and benefits of the project.</li> <li>Information on perceived benefits from the proposed subproject including reduction in water logging in rainy seasons.</li> <li>Availability of labour during construction time</li> </ul> | <ul style="list-style-type: none"> <li>The local residents of Dimapur expressed the need for improvements in water supply, drainage, and road infrastructure, and showed willingness to support the project.;</li> <li>They emphasized the importance of proper operation and maintenance of the facilities developed under the project, along with active community participation</li> <li>Overall, people were enthusiastic about the subproject's potential benefits, particularly in addressing waterlogging issues and enhancing environmental quality.</li> <li>Concerns were raised regarding possible loss of livelihood during project implementation.</li> <li>Socio-economic conditions may be affected by the proposed drain improvement works.</li> <li>Skilled local workers are readily available in the area.</li> </ul> |
| 8 <sup>th</sup> March 2024 | Walford Council Hall                        | 27<br>M=18 F=09     | Community members              | <ul style="list-style-type: none"> <li>Briefing on project objectives probable implementation procedures</li> <li>Relevant information of the upcoming road and drain project and benefits of the project.</li> <li>Information on the benefits of the subproject in terms of</li> </ul>  | <ul style="list-style-type: none"> <li>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.</li> <li>Generally all the people consulted were well aware about the proposed subproject.</li> <li>Short term impact on air quality- dust generation, noise level, access</li> </ul>  |

| Date                        | Location                  | No. of Participants | Participants                   | Topics Discussed  | Issues  |
|-----------------------------|---------------------------|---------------------|--------------------------------|---|---|
|                             |                           |                     |                                | <p>economic and environmental enhancement</p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>   | <p>problem, inconvenience for public and movement of vehicle.</p> <p>The proposed subproject road will provide better road connectivity to the nearby facilities.</p>   |
| 9 <sup>th</sup> March 2024  | Lhomithi Colony Council   | 22<br>M =18, F=4    | Consultation with Local people | <ul style="list-style-type: none"> <li>• Briefing on project objectives probable implementation procedures</li> <li>• 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.</li> </ul>  | <ul style="list-style-type: none"> <li>• Residents expressed their views about the willingness to engage with the project and explore job opportunities.</li> <li>• 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.</li> <li>• 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</li> <li>• Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle.</li> </ul> |
| 11 <sup>th</sup> March 2024 | River Belt Colony Council | 30<br>M=26 F=4      | Community members              | <ul style="list-style-type: none"> <li>• 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</li> <li>• Tentative Project implementation period and possible inconveniences during the construction period shared during consultation</li> </ul> | <ul style="list-style-type: none"> <li>• Few people have told that they are aware of the proposed subproject,</li> <li>• All the residents expressed their concerned about the poor drainage condition and road connectivity.</li> <li>• Residents expressed their views about the willingness to engage with the project and explore job opportunities</li> </ul>  |

| Date                        | Location                 | No. of Participants | Participants      | Topics Discussed   | Issues   |
|-----------------------------|--------------------------|---------------------|-------------------|--|--|
|                             |                          |                     |                   | with community present from the locality   |  |
| 12 <sup>th</sup> March 2024 | Neisatue Colony, Dimapur | 30<br>M=25 F=5      | Community members | <ul style="list-style-type: none"> <li>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</li> <li>Tentative Project implementation period and possible inconveniences during the construction period shared during consultation with community present from the locality</li> </ul> | <ul style="list-style-type: none"> <li>Few people have told that they are aware of the proposed subproject,</li> <li>All the residents expressed their concerned about the poor drainage condition and road connectivity.</li> <li>Residents expressed their views about the willingness to engage with the project and explore job opportunities</li> </ul> |



**Public Consultation Walford Colony**



**Public Consultation River Belt Colony Council**

**Public Consultation at Lhomithi Colony Council**




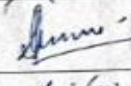
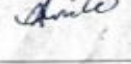


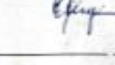


**Community consultation at Neisatue Colony, Dimapur**

## List of Participants in Consultation Walford Colony

### DIRECTORATE OF URBAN DEVELOPMENT Infrastructure Development Projects in Nagaland (ADB loan no: 54166-001 [6045] 2022)


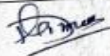




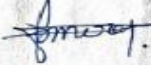




|              |                        |            |         |
|--------------|------------------------|------------|---------|
| Meeting Name | Group focus Discussion |            |         |
| Location     | Walford Colony Dimapur |            |         |
| Ward No      | 04, 05, 08, 20         | Start Time | 9:00 AM |
| Date         | 08.03.2024             | End Time   |         |

#### Record of Discussion

| SN | Name of Attendee and AADHAR No                  | Gender | House No | Phone no       | Signature   |
|----|---|--------|----------|----------------|---|
| 1. | T. JEMU<br>Chairman<br>W.A.C.                   | M      | 11.      | 8416062935     |    |
| 2. | Lumlike<br>Chairman<br>East block colony        | M      | 243.     | 7005314<br>646 |    |
| 3. | Araba chilo<br>Vice Chairman<br>East block      |        | 208      | 93668373<br>50 |    |
| 4. | Pongti Phon<br>Chairman<br>Bangpik Phon Colony  | M      | 02       | 962733128      |    |
| 5. | S. Alani<br>Loupkema<br>Chairman                | M      | 90       | 8974322899     |    |
| 6. | Chingchiwung<br>Guan Chagoo Zang                | M      | 75.      | 897473663      |    |
| 7. | Kemi Seklese<br>Chairperson<br>Dr. Hraha Colony | F      | 84       | 9862006070     |  |
| 8. | Buthokwung (G.O.)                               | M      | 25       | 962767386      |  |



**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
(ADB loan no: 54186-001 | 6045 | 2022)

| SN  | Name of Attendee and AADHAR No                      | Gender | House No | Phone no    | Signature   |
|-----|---|--------|----------|-------------|---|
| 9.  | VIKRAM CHETRI<br>MARALI COLONY<br>W-05              | M      | 36       | 96154477-97 |    |
| 10. | Lamdongzulu<br>Circuit House<br>colony - Ward No 20 | M      | 30       | 9862129-138 |    |
| 11. | Chenari<br>Sangtam                                  | M      | 134      | 9402208051  |    |
| 12. | Sailesh Prasad                                      | M      | 37       | 9862228937  |    |
| 13. | A. Teshi .AO  | M      | 174      | 943609348   |    |
| 14. | Gautam Sarkar                                       | M      | 09       | 7005183474  |    |
| 15. | W. K. K. K. K.                                      | M      | 06       | 89747361660 |    |
| 16. | Z. Kangari Phom                                     | M      | 03       | 8974615035  |    |
| 17. | L. Panyan   | M      | 04       | 8974264657  |    |
| 18. | Lomba Phom  | M      | 02       | 9129800839  |   |
| 19. | T. L. LOTHA   | M      | 108      | 7005900232  |  |



**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
(ADB loan no: 54166-001 [6045] 2022)

| SN  | Name of Attendee and AADHAR No | Gender | House No                  | Phone no                 | Signature          |
|-----|--------------------------------|--------|---------------------------|--------------------------|--------------------|
| 20. | N. ZANTHUSO SHITIRIE           | Male   | 68                        | 9436002176               | <i>[Signature]</i> |
| 21. | Adon Zikimay                   | (M)    | 42                        | 9402865667               | <i>[Signature]</i> |
| 22. | P.K. Rongmei                   | GB.    | 01.                       | 9402022877               | <i>[Signature]</i> |
| 23. | G. Lalthung Rongmei            | M      | 20                        | 9436430189<br>9612901130 | <i>[Signature]</i> |
| 24. | Lakhan Rongmei                 | Male   | 42                        | 9436432151               | <i>[Signature]</i> |
| 25. | Latoli Dye                     | Female | 20                        | 9402696603               | <i>[Signature]</i> |
| 26. | Khezheli                       | Female | 41                        | 9436421338               | <i>[Signature]</i> |
| 27. | Asheto Aye                     | Male   | 20                        | 9436008885               | <i>[Signature]</i> |
| 28. | B. Tingyeik                    | Male   | 401                       | 8974139853               | <i>[Signature]</i> |
| 29. | Stephen Doungel                | Male   | 15 F<br>S.H. colony       | 7005277309               | <i>[Signature]</i> |
| 30. | Kiyagwathie                    | GB     | Villuame<br>Colony<br>107 | 9615194387               | <i>[Signature]</i> |

**List of Participants in Consultation Meeting at Walford Council Hall**

**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 | 6045 | 2022)

|              |                      |            |         |
|--------------|----------------------|------------|---------|
| Meeting Name | FGD                  |            |         |
| Location     | Waldorf council Hall |            |         |
| Ward No      | 04,05,08,20          | Start Time | 9:00 AM |
| Date         | 08.08.2024           | End Time   |         |

**Record of Discussion**

| SN | Name of Attendee and AADHAR No | Gender | House No                      | Phone no   | Signature   |
|----|--------------------------------|--------|-------------------------------|------------|---|
| 1. | Anthony hunter                 | M      | 106<br>S.M COLONY             | 8014174802 |    |
| 2. | Vika Emuino                    | M      | 106<br>Villuine colony        | 9233795632 |    |
| 3. | Wimuri Muro                    | M      | 209<br>NORTHERN ANGAMI COLONY | 9863146773 |   |
| 4. | DZIESEVINUD                    | F      | 395<br>NORTHERN ANGAMI COLONY | 7085231191 |  |
| 5. | WEPETSO (OTSOLO)               | M      | 276<br>Chokhsang Colony       | 9383024363 |  |
| 6. | ZHEUSING GUING.                | M      | Central colony Waldorf        | 8131927757 |  |
| 7. | Zuthoungji                     | M      | 286<br>Chokhsang Colony       | 7629808939 |  |
| 8. | KATI YAPITHA                   | M      | 383<br>central colony         | 841483020  |  |



**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 [6045] 2022)

| SN  | Name of Attendee and AADHAR No | Gender | House No                                  | Phone no   | Signature |
|-----|--------------------------------|--------|---|------------|-----------|
| 9.  | L. Akum                        |        | 1   | 9862459244 |           |
| 10. | N. Jami                        | M      | 273                                       | 8131917335 |           |
| 11. | Razarij                        | M      | 270                                       | 943661090  |           |
| 12. | AVANUS HU<br>(ASHA worker)     | F      | 205                                       | 9862575485 |           |
| 13. | KIBOVI CHITSI                  | M      | 60<br>Medical col.                        | 883734759  |           |
| 14. | HUKAVI SEMA                    | M      | WARD - 20<br><del>CHAKHISING</del> COLONY | 7005652142 |           |
| 15. | AKUM.                          | M      | WARD - 4<br>Rengma Colony                 | 6009350427 |           |
| 16. | Anepa                          | F      | WARD - 4<br>Chakhising Colony             | 9436424704 |           |
| 17. | Rachel                         | F      | WARD - 4<br>Chakhising Colony             | 9612500714 |           |
| 18. | Kukusheli                      | F      | 286 (A1)                                  | 9862251199 |           |
| 19. | Loshumlo                       | F      | 616                                       | 6009000226 |           |

**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 [6045] 2022)


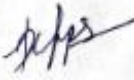



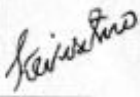


| SN  | Name of Attendee and AADHAR No                | Gender | House No | Phone no   | Signature |
|-----|---|--------|----------|------------|-----------|
| 20. | APONGLA<br>URA VILLA<br>WOMEN STY. PRESIDENT  | F      | 25       | 8732877217 |           |
| 21. | KHUTOLY<br>URA VILLA<br>W.S. Gen. Secy.       | F      | 17       | 8787800649 |           |
| 22. | RUKULHU SHIJON<br>Council Member<br>URA VILLA | M      | 225      | 8730003735 |           |
| 23. | A. Alun G.B<br>Medical Colony                 | M      | 165      | 9856845850 |           |
| 24. | Piniro to the<br>G.B.                         | M      | 152      | 9612666433 |           |
| 25. | TEMSU AO<br>CHAIRMAN                          | M      | 33       | 9383174648 |           |
| 26. | Kame morphis<br>Incher G.B<br>Council Head    | m      | 12       | 8257882694 |           |
| 27. |   |        |          |            |           |
| 28. |   |        |          |            |           |
| 29. |   |        |          |            |           |
| 30. |   |        |          |            |           |

List of Participants in Consultation Meeting at Lhomithi Colony Council

**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 | 8045 | 2022)

|              |                         |            |         |
|--------------|-------------------------|------------|---------|
| Meeting Name | FGD                     |            |         |
| Location     | Lhomithi Colony Dimapur |            |         |
| Ward No      | 07, 15, 16, 23          | Start Time | 9:00 AM |
| Date         | 09.03.2024              | End Time   |         |

Record of Discussion

| SN | Name of Attendee and AADHAR No | Gender | House No               | Phone no   | Signature   |
|----|--------------------------------|--------|------------------------|------------|---|
| 1. | Hepito Aye                     | M      | 194A<br>ward N-7       | 6009442719 |    |
| 2. | Pikato Choply                  | M      | H.NO-72<br>ward N-7    | 7005469341 |    |
| 3. | Hokhuip. Aye                   | M      | H.No. 27<br>ward 16    | 8014568902 |  |
| 4. | Alhoshe Awom                   | M      | H/No 510<br>ward 23    | 8837354169 |  |
| 5. | HOKATO AYE                     | M      | H/No 63<br>ward = 23   | 985625098  |  |
| 6. | KEVISEFO<br>BEHO               | M      | H.NO-9<br>WARD-23      | 9310453869 |  |
| 7. | Kesemaw. m                     | M      | Ho. No. 6<br>Ward - 23 | 8415964715 |  |
| 8. | Impok                          | M      | H. No 5<br>ward 23     | 8974171568 |  |



**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 [6045] 2022)

| SN  | Name of Attendee and AADHAR No | Gender | House No               | Phone no   | Signature |
|-----|--------------------------------|--------|------------------------|------------|-----------|
| 9.  | Priyo K Singh                  | M      | 59<br>WARD NO-7        | 8837307624 |           |
| 10. | Prijoy Singh                   | M      | 45<br>WARD NO-7        | 8257871674 |           |
| 11. | Opentico Singh                 | M      | 43<br>WARD NO-7        | 9774092946 |           |
| 12. | Aketo Swu H                    | M      | H/N 81<br>WARD NO-7    | 7005587585 |           |
| 13. | Holuxi Sam H                   | M      | H/N 48<br>WARD NO-7    | 938320832  |           |
| 14. | Olivia T. Chuko                | F      | H/N 61<br>Ward No - 16 | 8119000756 |           |
| 15. | Holika H Thirai                | F      | H/N 121<br>ward No-16  | 7005109388 |           |
| 16. | Tokali                         | F      | H/N 13<br>ward no - 16 | 7005360880 |           |
| 17. | ATOHO L. Teptham               | M      | H/N 23<br>WARD - 15    | 7085011567 |           |
| 18. | DEBUDUTTA                      |        | H/N 167<br>WARD - 15   | 7636015912 |           |
| 19. | H. Kaurale Chapti              | M      | ward 7                 | 8575657588 |           |

**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 [6045] 2022)



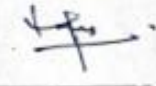


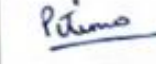
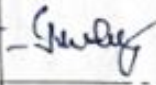
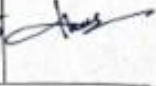
| SN  | Name of Attendee and AADHAR No | Gender | House No              | Phone no   | Signature |
|-----|--------------------------------|--------|-----------------------|------------|-----------|
| 20. | Vili                           | F      | H. No. 159<br>Ward. 7 | 8731889495 |           |
| 21. | ILHOVI WOTSA                   | M      | H. No: 170<br>Ward. 7 | 9436066505 |           |
| 22. | BOKATO WOTSA<br>D V C C F      | M      |                       | 8729811911 |           |
| 23. |                                |        |                       |            |           |
| 24. |                                |        |                       |            |           |
| 25. |                                |        |                       |            |           |
| 26. |                                |        |                       |            |           |
| 27. |                                |        |                       |            |           |
| 28. |                                |        |                       |            |           |
| 29. |                                |        |                       |            |           |
| 30. |                                |        |                       |            |           |

# Place- River Belt Colony Council

## DIRECTORATE OF URBAN DEVELOPMENT Infrastructure Development Projects in Nagaland (ADB loan no: 54166-001 [6045] 2022)



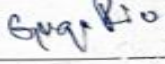
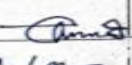
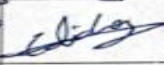


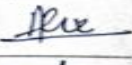
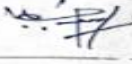


|              |                                 |            |         |
|--------------|---------------------------------|------------|---------|
| Meeting Name | FGD                             |            |         |
| Location     | River Belt Colony Council Hall, |            |         |
| Ward No      | 03, 11, 12, 13, 14              | Start Time | 9:00 AM |
| Date         | 11.03.2024                      | End Time   |         |

### Record of Discussion

| SN | Name of Attendee and AADHAR No               | Gender | House No                          | Phone no   | Signature   |
|----|--|--------|-----------------------------------|------------|---|
| 1. | ANTHONY LOKA<br>RIVER BELT Colony<br>DUMAKA. | M      | 217<br>WARD NO. 11                | 9402613015 |    |
| 2. | T. Rung. Payen                               | M      | 237<br>Ward 12.                   | 8119047506 |    |
| 2. | BENSON GOSHI                                 | M      | 298 Wad<br>12 Hill View<br>LOKOMT | 9436003161 |    |
| 4. | W.Y. Kithan                                  | M      | 10<br>W-12<br>Hill View           | 923342293  |   |
| 5. | Hoshoto Chupky                               | M      | 02<br>Sewer along<br>W-14         | 9436007497 |  |
| 6. | N. PITEMO LOKHA                              | M      | W-14                              | 7005203819 |  |
| 7. | Nyimbemo LOKHA                               | M.     | N. 13. Kyomg<br>GOMYH/NE 24       | 9856705365 |  |
| 8. | Kuphatho Kani                                | M      | W/11<br>R.B.C                     | 9856442085 |  |



**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 | 6045 | 2022)

| SN  | Name of Attendee and AADHAR No | Gender | House No           | Phone no   | Signature   |
|-----|--------------------------------|--------|--------------------|------------|---|
| 9.  | Kenelmba                       | M.     | 164                | 94367937   |  |
| 10. | RUKOOLHOU ANSANG               | M      | 01(W-4)            | 9089238336 |  |
| 11. | Gukku                          | M      | 97(W-14)           | 9856167986 |  |
| 12. | Rhupitay                       | M      | 129(W-14)          | 8730095475 |  |
| 13. | Edichang Imchen                | M      | 145(W-11)          | 7005372300 |  |
| 14. | Lipokyangex                    | M      | 331(W-11)          | 9436602582 |  |
| 15. | ASANUN AIER                    | M      | 343(W-12)          | 7005225133 |  |
| 16. | Alexander                      | M      | 234(W-11)<br>R.B.C | 7005154414 |  |
| 17. | A.B. JAMIR                     | M      | 82 Supply Colony   | 9383204483 |  |
| 18. | Sowaminthi                     | F.     | Duncan Bosti       | 6909811168 |  |
| 19. | T. Yanga                       | M      | 371 Supply Colony  | 9436611212 |  |

**DIRECTORATE OF URBAN DEVELOPMENT**  
**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 | 6045 | 2022)

| SN  | Name of Attendee and AADHAR No | Gender | House No                  | Phone no   | Signature |
|-----|--------------------------------|--------|---------------------------|------------|-----------|
| 20. | K. Jousokho<br>Sachin          | M      | 108                       | 9862700936 |           |
| 21. | E. Lihung<br>Sachin            | M      | 29                        | 9862553447 |           |
| 22. | I. TALI AIER<br>3819 1199 8290 | m      | 98                        | 9366163578 |           |
| 23. | Maken Jiwz                     | M      | 427                       | 743643134  |           |
| 24. | A. Patton                      | M      | 842                       | 9866293907 |           |
| 25. | Indok Lomko                    | M      | 647                       | 9774874847 |           |
| 26. | Bandang Do                     | M      | 13                        | 9436262475 |           |
| 27. | Angeline Ngathie               | F      | 11 ward.<br>139<br>DUNCAN | 9819143564 |           |
| 28. | Angela T. Jyng                 | F      | 29 Duncan<br>11 ward      | 9436002000 |           |
| 29. | N. Kine                        | F      | 93 Duncan<br>11 ward      | 8797444792 |           |
| 30. | K. Melha                       | F      | 23 A Duncan<br>11 ward    | 8416010802 |           |

Place- Neisatue Colony, Dimapur

Infrastr...

|              |                         |            |         |
|--------------|-------------------------|------------|---------|
| Meeting Name | FGD                     |            |         |
| Location     | Neisatuo Colony Dimapur |            |         |
| Ward No      | 10, 18, 19, 21          | Start Time | 9:15 AM |
| Date         | 12-03-2024              | End Time   |         |

Record of Discussion

| SN | Name of Attendee and AADHAR No | Gender | House No                                       | Phone no   | Signature |
|----|--------------------------------|--------|--|------------|-----------|
| 1. | Imkongarasi Imchen             | M      | H/No. 139<br>Noton Bashi<br>Ward 21            | 9436073492 |           |
| 2. | Kikhevi Yathoi                 | M      | H/No-31<br>NOTION BOSTI<br>WARD-21             | 9366119835 |           |
| 3. | Rangam G.D                     | M      | Zeliangrong<br>Ward-18<br>H/No. 64             | 9856303436 |           |
| 4. | Tongjuk ponger                 | M.     | CARE VIEW<br>COLONY: W-10<br>CHAIRMAN          | 9612876682 |           |
| 5. | Heling                         | M.     | Chairman<br>Zeliangrong                        | 9436655535 |           |
| 6. | Gangangpon                     | M      | H/No 100 -<br>Ward 18<br>Zeliangrong<br>Colony | 9787850132 |           |
| 7. | Namcin Pami                    | M      | Zeliangrong<br>Colony W/No                     | 9856788885 |           |
| 8. | Dr. Lden Jamir                 | M      | Island colony<br>H-No. 237                     | 8119580492 |           |

## Summary of Consultation with Stakeholders- Chümoukedima

| Date       | Location      | No. of Participants | Participants             | Topics Discussed  | Issues   |
|------------|---------------|---------------------|--------------------------|---|--|
| 11.04.2024 | At Ward no 03 | M- 15               | Community members        | <ul style="list-style-type: none"> <li>Briefing on project objectives probable implementation procedures</li> <li>Potential positive and negative impacts due to project implementation</li> <li>Relevant information of the upcoming project and benefits of the project.</li> <li>Information on perceived benefits from the proposed subproject including reduction in water logging in rainy seasons.</li> <li>Availability of labour during construction time</li> </ul> | <ul style="list-style-type: none"> <li>Residents expressed frustration over persistent waterlogging and frequent traffic congestion, emphasizing the need for the subproject to be implemented on a fast-track basis to resolve these issues.</li> <li>The current poor road condition requires immediate improvement. Most of the people consulted were well informed about the proposed subproject.</li> <li>Anticipated short-term impacts include dust generation, increased noise levels, temporary access issues, public inconvenience, and disruption to vehicle movement.</li> </ul> |
| 08.04.2024 | At Ward-4     | 33<br>M=25, F=8     | Stakeholder consultation | <ul style="list-style-type: none"> <li>Relevant information of the upcoming project and benefits of the project.</li> <li>Potential positive and negative impacts due to project implementation</li> <li>Relevant information of the upcoming project and benefits of the project.</li> </ul>   | <ul style="list-style-type: none"> <li>The proposed sub-project has been identified for improving the road and drainage system within existing Right of Way (RoW).</li> <li>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.</li> </ul>   |
| 08.04.2024 | At Ward-6     | 18<br>M=16, F=02    | Community members        | <ul style="list-style-type: none"> <li>Briefing on project objectives probable implementation procedures</li> <li>Discussion about requirement of the project and Tentative Project implementation period</li> <li>Quality of water – high iron content</li> </ul>  | <ul style="list-style-type: none"> <li>Residents expressed their views about the willingness to engage with the project and explore job opportunities.</li> <li>Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle.</li> </ul>   |
| 10.04.2024 | At Ward-8     | 31<br>M=26, F=05    | Community members        | Explained about the details of project benefits   | <ul style="list-style-type: none"> <li>As regards the storm water drainage and sewer</li> </ul>  |

| Date | Location | No. of Participants | Participants | Topics Discussed   | Issues  |
|------|----------|---------------------|--------------|--|---|
|      |          |                     |              | <p>proposed under the subproject.</p> <ul style="list-style-type: none"> <li>• Discussion about requirement of the project and willingness of residents to pay for improved services of Sewerage and Storm water drainage</li> </ul> | <p>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.</p> <ul style="list-style-type: none"> <li>• Residents expressed their views about the willingness to engage with the project and explore job opportunities</li> </ul> |



## Photographs of Public Consultation



Public consultation at Ward 03



Public consultation at Ward 04



Public consultation at Ward 06



Public consultation at Ward 08



## Attendance sheets of public consultation

### DIRECTORATE OF URBAN DEVELOPMENT Infrastructure Development Projects in Nagaland (ADB loan no: 54166-001 | 6045 | 2022)

|              |            |            |         |
|--------------|------------|------------|---------|
| Meeting Name | FGD        |            |         |
| Location     |            |            |         |
| Date         | 11.04.2024 | Start Time | 1:30 PM |
| Ward         | 03         | End Time   |         |

#### Record of Discussion

| SN | Name of Attendee         | Gender | House No<br>Organization | Phone no/ Email | Signature |
|----|--------------------------|--------|--------------------------|-----------------|-----------|
| 1. | Kikuvituo                | Male   | 27                       | 897478017       | Kikuvituo |
| 2. | Therja<br>Therja         | Male   |                          | 841500<br>2905  | Therja    |
| 3. | Vikuvituo<br>yhuo        | Male   | 19                       | 95831905<br>201 | Therja    |
| 4. | Thijangituo<br>Zikuvituo | Male   | 66                       | 9612948985      | Therja    |
| 5. | Saka Sharu               | Male   | 68                       | 8837341465      | Therja    |
| 6. | Vikuvituo                | Male   | 19                       | 7630857119      | Therja    |
| 7. | Halong                   | Male   | 3                        | 8415002901      | Therja    |
| 8. | James<br>James           | Male   | 91                       | 762900<br>4473  | Therja    |
| 9. | Sashi<br>AD              | Male   | 96                       | 812105<br>3634  | Therja    |

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 (ADB loan no: 54166-001 | 6045 | 2022)

| SN  | Name of Attendee | Gender | House No<br>Organization | Phone no/ Email | Signature          |
|-----|------------------|--------|--------------------------|-----------------|--------------------|
| 10. | Thozo Yazo       | M      | 59                       | 8730992912      | <i>[Signature]</i> |
| 11. | R. Angon         | M      | 83                       | 9436074840      | <i>[Signature]</i> |
| 12. | N. Lhutor        | M      | 181                      | 7421073703      | <i>[Signature]</i> |
| 13. | Adiel<br>Kuo     | M      | 1                        | 700535<br>2855  | <i>[Signature]</i> |
| 14. | T. Chubao        | M      | 55                       | 9856881344      | <i>[Signature]</i> |
| 15. | AKOLEI           | M      | 62                       | 9436204952      | <i>[Signature]</i> |

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**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 | 6045 | 2022)

|              |                        |            |          |
|--------------|------------------------|------------|----------|
| Meeting Name | Focus Group Discussion |            |          |
| Location     |                        |            |          |
| Ward No      | 04                     | Start Time | 11:00 AM |
| Date         | 09.04.2024             | End Time   |          |

**Record of Discussion**

| SN | Name of Attendee and AADHAR No | Gender | House No | Phone no   | Signature   |
|----|--------------------------------|--------|----------|------------|---|
| 1. | JAMES KIKON                    | M      | 41       | 8413805906 |    |
| 2. | IMRONG                         | M      | 112      | 943640075  |    |
| 3. | NILSHINE                       | F      | 42       | 9862286658 |    |
| 4. | Kezharyeto                     | M      | 154      | 708538008  |   |
| 5. | Thukhute                       | M      | 120      | 8730849275 |  |
| 6. | Banno                          | F      | 41       | 8416059416 |  |
| 7. | Neilakhui                      | F      | 35       | "          |  |
| 8. | Zuberi                         | F      | 40/4     | 9383312202 |  |

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 (ADB loan no: 54166-001 | 6045 | 2022)

| SN  | Name of Attendee and AADHAR No | Gender | House No | Phone no                | Signature          |
|-----|--------------------------------|--------|----------|-------------------------|--------------------|
| 9.  | A songh                        | F      | 146      | 801406342               | <i>[Signature]</i> |
| 10. | Nzamo                          | F      | 88       | 909771616<br>79 8142    | <i>[Signature]</i> |
| 11. | Loshumlo                       | F      | 148      | 6090<br>690941200<br>77 | Latha              |
| 12. | Noksem                         | F      | 116      | 708549<br>4228          | <i>[Signature]</i> |
| 13. | Iyakumzikh                     | F      | 42       | 600977<br>66828         | <i>[Signature]</i> |
| 14. | Aprahie                        | F      | 8250     | 872933<br>8890          | <i>[Signature]</i> |
| 15. | AO TULA                        | F      | 50       | 8787645965              | Atula              |
| 16. | Zubenthung<br>Kikon            | M      | 41       | 6909091880              | Zuben              |
| 17. | Biswajeet Roy                  | M      | 14(6)    | 7085373556              | <i>[Signature]</i> |
| 18. | Vivikali                       | F      | 40/4     | 8132885730              | <i>[Signature]</i> |
| 19. | Ncheumbeni                     | F      | 40       | 8974636476              | <i>[Signature]</i> |

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 (ADB loan no: 54166-001 | 6045 | 2022)

| SN  | Name of Attendee and AADHAR No | Gender | House No | Phone no   | Signature          |
|-----|--------------------------------|--------|----------|------------|--------------------|
| 20. | Peter Kikon                    | M      | 40       | 8729883345 | <i>[Signature]</i> |
| 21. | Rokuoneitwo                    | M      | 56       | 6909639154 | <i>[Signature]</i> |
| 22. | Ngamben Phom                   | F      | 132      | 7005405526 | <i>[Signature]</i> |
| 23. | L. BOMEI                       | F      | 132(A)   | 9862082155 | <i>[Signature]</i> |
| 24. | Selku Sani                     | M      | 07       | 7744293715 | <i>[Signature]</i> |
| 25. | Subend Latha                   | F      |          | 9774613537 | <i>[Signature]</i> |
| 26. |                                |        |          |            |                    |
| 27. |                                |        |          |            |                    |
| 28. |                                |        |          |            |                    |
| 29. |                                |        |          |            |                    |
| 30. |                                |        |          |            |                    |

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|              |          |            |      |
|--------------|----------|------------|------|
| Meeting Name | FGD      |            |      |
| Location     | DZÜDE-I  |            |      |
| Ward No      | 6        | Start Time | 1:50 |
| Date         | 8-4-2024 | End Time   |      |

**Record of Discussion**

| SN | Name of Attendee and AADHAR No | Gender | House No | Phone no   | Signature                            |
|----|--------------------------------|--------|----------|------------|--------------------------------------|
| 1. | Zakietuo Shüya                 | M      | 14       | 9862227310 | <i>Shüya</i>                         |
| 2. | N. G. D. S. S. S.              | M.     | 244      | 9862487845 | <i>N. G. D. S. S. S.</i>             |
| 3. | Harngoy Rengma                 | M      | 258      | 7085874229 | <i>Harngoy Rengma</i>                |
| 4. | Guanhon Kaito                  | M      | 221      | 8414857091 | <i>Guanhon Kaito</i>                 |
| 5. | Grikhan G. S. S. S. Habongmei  | M      | 19       | 9383235153 | <i>Grikhan G. S. S. S. Habongmei</i> |
| 6. | Kemithrai Shüya                | M      | 121      | 7085514701 | <i>Kemithrai Shüya</i>               |
| 7. | Jele Rengma                    | F      | 258      | 9612827277 | <i>Jele Rengma</i>                   |
| 8. | Shaytza                        | F      | 208      | 8415532490 | <i>Shaytza</i>                       |









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

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**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 | 6045 | 2022)

| SN  | Name of Attendee and AADHAR No | Gender | House No | Phone no   | Signature   |
|-----|--------------------------------|--------|----------|------------|---|
| 9.  | Kencingulie Shinge             | M      | 10       | 6909630012 |    |
| 10. | Avituo Koppo                   | M      | 137      | 9862849048 |    |
| 11. | N. Sashu. Ho                   | M      | 218      | 8787617522 |    |
| 12. | Lileiitu                       | M.     | 207      | 9862306658 |    |
| 13. | Agrom                          | m      | 169      | 9856061745 |    |
| 14. | Richard                        | M      | 106      | 9862883796 |    |
| 15. | Neekholo.                      | M      | 10       | 9436014861 |    |
| 16. | Pele                           | M      | 192      | 9436014864 |  |
| 17. |                                |        |          |            |   |
| 18. |                                |        |          |            |   |
| 19. |                                |        |          |            |   |

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|              |            |            |         |
|--------------|------------|------------|---------|
| Meeting Name | FGD        |            |         |
| Location     |            |            |         |
| Ward No      | 08         | Start Time | 1:30 PM |
| Date         | 10.04.2024 | End Time   |         |

**Record of Discussion**


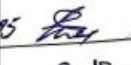


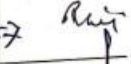


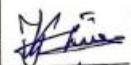



| SN | Name of Attendee and AADHAR No | Gender | House No | Phone no                 | Signature   |
|----|--------------------------------|--------|----------|--------------------------|---|
| 1. | Tankuey                        |        | 38       | 873195609                |    |
| 2. | Triamjen GB                    |        | 49       | 9383194500               |    |
| 3. | N. Chumbem Jami                | MP     | 19       | 9612837746               |    |
| 4. | Rekimong Yi                    |        | 08       | 8974142049<br>8724192009 |    |
| 5. | Lompasoo                       |        | 46       | 8731942157               |  |
| 6. | De Lamber                      |        | 2        |                          |  |
| 7. | Ronga                          |        | 142      | 8191 92557               |  |
| 8. | Hillo Rongo                    |        | 43       |                          |  |

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**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 | 6045 | 2022)

| SN  | Name of Attendee and AADHAR No | Gender | House No | Phone no   | Signature   |
|-----|--------------------------------|--------|----------|------------|---|
| 9.  | V. Kumbi                       | M      | 07       |            |    |
| 10. | Yhuinto                        | M      | 66       | 9566829095 |    |
| 11. | dathrong                       | M      | 159      | 873196021  |    |
| 12. | Satuolisiyo                    | M      | 27       | 8794509131 |    |
| 13. | Ronga                          | M      | 142      | 813194257  |    |
| 14. | St. Peter Mash                 | M      | 42       | 9523502042 |    |
| 15. | KEVILEKHO MEDOZE               | M      | 20       | 8914857915 |    |
| 16. | KHESHIHO SURI                  | M      | 146      | 9856205962 |  |
| 17. | CHUMBEN                        | M      | 163      | 7085582924 |  |
| 18. | Vikeile Medoze                 | M      | 103      | 8259933558 |  |
| 19. | Nungshimeo                     | M      | 94       | 8413984770 |  |

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**Infrastructure Development Projects in Nagaland**  
 (ADB loan no: 54166-001 | 6045 | 2022)

| SN  | Name of Attendee and AADHAR No | Gender   | House No   | Phone no           | Signature          |
|-----|--------------------------------|----------|------------|--------------------|--------------------|
| 20. | <i>Sator AG</i>                | <i>M</i> | <i>162</i> | <i>99 69091986</i> | <i>[Signature]</i> |
| 21. | <i>Lhokheli</i>                | <i>F</i> | <i>34</i>  | <i>9856311612</i>  | <i>[Signature]</i> |
| 22. | <i>Nasheli</i>                 | <i>F</i> | <i>38</i>  | <i>8119977202</i>  | <i>[Signature]</i> |
| 23. | <i>Lhosheli</i>                | <i>F</i> | <i>36</i>  | <i>91804003901</i> | <i>[Signature]</i> |
| 24. | <i>Lhouili Sun</i>             | <i>F</i> | <i>39</i>  | <i>8016664068</i>  | <i>Lhouili</i>     |
| 25. | <i>Fosheli</i>                 | <i>F</i> | <i>37</i>  | <i>9486618611</i>  | <i>[Signature]</i> |
| 26. | <i>Kashiko Futhens</i>         | <i>M</i> | <i>37</i>  | <i>9436008700</i>  | <i>[Signature]</i> |
| 27. |                                |          |            |                    |                    |
| 28. |                                |          |            |                    |                    |
| 29. |                                |          |            |                    |                    |
| 30. |                                |          |            |                    |                    |

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## APPENDIX 9: SAMPLE GR FORM

(To be available in Nagamese 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<br>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<br>E-mail Verbal/telephonic  |        |
| Reviewed by: (Names/positions of officials reviewing grievance) |        |
| Action taken:   |        |
| Whether action taken disclosed:                                 | Yes No |
| Means of disclosure:  |        |

## **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.  
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: SAMPLE OUTLINE SPOIL MANAGEMENT PLAN**

- The Spoil Management Plan should be site specific and be part of the monthly Construction Management Plan.
- The contractor, in consultation with the ULB, must find out appropriate location/s for the disposal of the excess soil generated. The spoils should be deposited only at these sites.
- Further precautions need to be taken in case of the contaminated spoils.
- The vehicle carrying the spoil should be covered properly.
- The spoils generating from each site should be removed on the same day or immediately after the work is complete. The site / road should be restored to the original condition.

### **I. Spoils information**

The spoil information contains the details like a) The type / material, b) Potential contamination by that type, c) Expected volume (site / component specific), d) Spoil Classification etc.

### **II. Spoils management**

The Spoil Management section gives the details of a) Transportation of spoil b) disposal site details c) Precautions taken d) Volume of contaminated spoil, if present, d) Suggested reuse of disposal of the spoil

### **III. Documentation**

The volume of spoil generated (site specific, date wise), site disposed, reuse / disposal details should be documented properly.

## APPENDIX 12: MANAGEMENT PLAN FOR NIGHT WORKS AT PROJECT SITES

Following requirements should be fulfilled for construction works at night hours-

1. 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.
2. Contractor should plan for night works only after directions from PMU/PIU
3. Contractor should submit plan for night works for approval from PIU.
4. PIU should ensure that prior written information should be given to local authorities such as district administration, Police/traffic police, line agencies concerned, residents' welfare association/business association of the affected areas and their consents/permissions should be taken prior to start of night works.
5. PIU 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.
6. Contractor is required to have following equipment/arrangements for night works-
  - Contractors should have hand held noise level meter for measurement of noise during night hours
  - Contractors should have hand held lux meter for the measurement of illumination during night hours
  - Preferably electrical connections is available for running equipment otherwise sound proof/super silent Diesel Generator set should be available
  - 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                        |

- Illumination should be as follows-

| Minimum illumination (lx) | Areas to be illuminated                                   | Type of work activity  |
|---------------------------|---|--|
|                           | Illumination throughout the work area                     | General work area lighting, and performance of visual tasks of large size, or medium contrast, or low require accuracy |
|                           | 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                     |
|                           | Illumination of task                                      | Performance of visual tasks of small size, or low contrast or high required accuracy or fine finish                    |

- 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
- All the noise activity like hammering, cutting, crushing, running of heavy equipment should be done in day time and avoided in night time
- Workers engaged in night works should have adequate rest/sleep in day time before start of night works
- 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
  - 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
  - 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
  - Horns should not be permitted by equipment's and vehicles
  - Workers should not shout and create noise
  - First aid and emergency vehicles should be available at site
  - Emergency preparedness plan should be operative during night works
  - Old persons and pregnant women and women having small kids should not work in night time
  - All the vehicles and equipment's being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise
  - All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works
7. PIU 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 videographic records as well as register the observations
  8. Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement
  9. After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians
  10. Drivers and workers should be alert and responsive during night works
  11. All the wages to workers working in night hours should be as per the applicable labour acts
  12. Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours
  13. Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

## APPENDIX 13: IBAT ASSESSMENT CHECKLISTS OF PROJECT TOWNS

### a. For Dimapur Road and Drain



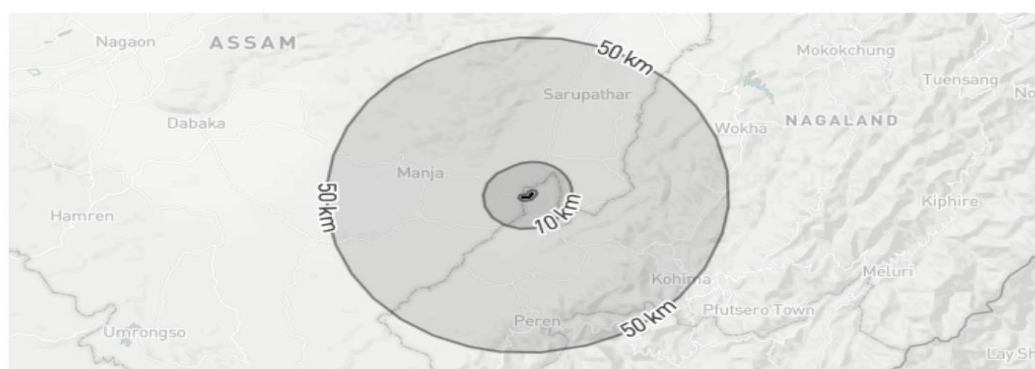
#### Integrated Biodiversity Assessment Tool World Bank Group Biodiversity Risk Screen

#### ALL LINES

- **Country:** India
- **Location:** [ 25.9, 93.7 ]
- **IUCN Red List Biomes:** Freshwater, Terrestrial
- **Created by:** Benjamin Dorsey

#### Overlaps with:

|                                    |          |          |          |    |
|------------------------------------|----------|----------|----------|----|
| <b>Protected Areas</b>             | 1 km: 0  | 10 km: 0 | 50 km: 0 | 0  |
| World Heritage (WH)                | 1 km: 0  | 10 km: 0 | 50 km: 0 | 0  |
| <b>Key Biodiversity Areas</b>      | 1 km: 0  | 10 km: 1 | 50 km: 8 | 9  |
| Alliance for Zero Extinction (AZE) | 1 km: 0  | 10 km: 0 | 50 km: 0 | 0  |
| <b>IUCN Red List</b>               | 1 km: 24 | 10 km: 3 | 50 km: 9 | 36 |
| <b>Critical Habitat</b>            | Likely   |          |          |    |



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



This report is based on IFC Performance Standard 6 (PS6) but applies to World Bank Environmental and Social Standard 6 (ESS6)



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## About this report

The recommendations stated alongside any Protected Areas and Key Biodiversity Areas identified in this report are determined by the following:

### Protected Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies a designation that includes either 'natural' or 'mixed world heritage site'.
- 'Assess for Critical Habitat' is stated if the report identifies a Strict Nature Reserve, Wilderness Area or National Park as coded by IUCN protected area categories Ia, Ib and II.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of protected area.

### Key Biodiversity Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies an Alliance for Zero Extinction site.
- 'Assess for Critical Habitat' is stated if the report identifies Critically Endangered or Endangered species OR species with restricted ranges OR congregatory species as coded in the IUCN Red List of Threatened Species.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of Key Biodiversity Area.

IBAT provides initial screening for Critical Habitat values. Performance Standard 6 (PS6) defines these values for Critical Habitat (PS6: para. 16) and legally protected and internationally recognized areas (PS6: para. 20). PS6 will be triggered when IFC client activities are located in modified habitats containing "significant biodiversity value," natural habitats, Critical Habitats, legally protected areas, or areas that are internationally recognized for biodiversity. References to PS6 and Guidance Note 6 (GN6) are provided to guide further assessment and detailed definitions where necessary. Please see <https://www.ifc.org/ps6> for full details on PS6 and GN6.

This report identifies restricted range species according to the KBA Standard definition (hyperlink KBA Standard <https://portals.iucn.org/library/sites/library/files/documents/2016-048.pdf>):

Species having a global range size less than or equal to the 25th percentile of range-size distribution in a taxonomic group within which all species have been mapped globally, up to a maximum of 50,000 km<sup>2</sup>. If all species in a taxonomic group have not been mapped globally, or if the 25th percentile of range-size distribution for a taxonomic group falls below 10,000 km<sup>2</sup>, restricted range should be defined as having a global range size less than or equal to 10,000 km<sup>2</sup>. For coastal, riverine and other species with linear distributions that do not exceed 200 km width at any point, restricted range is defined as having a global range less than or equal to 500 km linear geographic span (i.e. the distance between occupied locations furthest apart).

Note, sites supporting restricted range species can qualify as KBAs under criterion B2. These are sites that hold a significant proportion of the global population size of multiple restricted-range species, and so contribute significantly to the global persistence of biodiversity at the genetic and species level.

The report screens for known risks within a standard 50km buffer of the coordinates used for analysis. This buffer is not intended to indicate the area of impact. The report can be used to:

- Scope risks to include within an assessment of risks and impacts
- Identify gaps within an existing assessment of risks and impacts
- Prioritize between sites in a portfolio for further assessment of risks and impacts
- Inform a preliminary determination of Critical Habitat
- Assess the need for engaging a biodiversity specialist



- Identify additional conservation experts or organizations to inform further assessment or planning

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 as described in PS6 and GN6. 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.

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#### Data used to generate this report

- UNEP-WCMC and IUCN, 2025. Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: [www.protectedplanet.net](http://www.protectedplanet.net) - December 2025.
- BirdLife International (on behalf of the KBA Partnership), 2025. Key Biodiversity Areas - September 2025.
- IUCN. The IUCN Red List of Threatened Species. Version 2025-2. <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>

## Priority Species

Habitat of significant importance to priority species will trigger Critical Habitat status (See PS6: para 16). IBAT provides a preliminary list of priority species that could occur within a 1 km, 10 km or 50 km buffer. This list is drawn from the IUCN Red List of Threatened Species (IUCN RL). This list should be used to guide any further assessment, with the aim of confirming known or likely occurrence of these species within the site area. It is also possible that further assessment may confirm occurrence of additional priority species not listed here. It is strongly encouraged that any new species information collected by the site be shared with species experts and/or IUCN wherever possible in order to improve IUCN datasets.

## IUCN Red List of Threatened Species - CR & EN

The following species are potentially found within 1 km, 10 km or 50 km of the area of interest. For the full IUCN Red List, including the results from the 1 km, 10 km and 50 km buffers please refer to the associated CSV in the report folder.

| Species Name           | Common Name             | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|------------------------|-------------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Cuon alpinus           | Dhole                   | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| Manouria emys          | Asian Giant Tortoise    | REPTILIA        | CR            | Decreasing       | Terrestrial             | 1 km             |
| Emberiza aureola       | Yellow-breasted Bunting | AVES            | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Heliopais personatus   | Masked Finfoot          | AVES            | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Nycticebus bengalensis | Bengal Slow Loris       | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| Perdica manipurens     | Manipur Bush-quail      | AVES            | CR            | Unknown          | Terrestrial             | 1 km             |
| Manis pentadactyla     | Chinese Pangolin        | MAMMALIA        | CR            | Decreasing       | Terrestrial             | 1 km             |
| Gyps tenuirostris      | Slender-billed Vulture  | AVES            | CR            | Decreasing       | Terrestrial             | 1 km             |
| Hoolock hoolock        | Western Hoolock         | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |

| Species Name                          | Common Name                | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|---------------------------------------|----------------------------|-----------------|---------------|------------------|-------------------------|------------------|
|                                       | Gibbon                     |                 |               |                  |                         |                  |
| Sarcogyps calvus                      | Red-headed Vulture         | AVES            | CR            | Decreasing       | Terrestrial             | 1 km             |
| Aquila nipalensis                     | Steppe Eagle               | AVES            | EN            | Decreasing       | Terrestrial             | 1 km             |
| Pangshura sylhetensis                 | Assam Roofed Turtle        | REPTILIA        | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Nilssonina nigricans                  | Black Softshell Turtle     | REPTILIA        | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Asarcornis scutulata                  | White-winged Duck          | AVES            | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Elephas maximus                       | Asian Elephant             | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| Trachypithecus pileatus ssp. pileatus | Blond-bellied Langur       | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| Gyps bengalensis                      | White-rumped Vulture       | AVES            | CR            | Decreasing       | Terrestrial             | 1 km             |
| Aythya baeri                          | Baer's Pochard             | AVES            | CR            | Decreasing       | Freshwater              | 1 km             |
| Cuora mouhotii                        | Keeled Box Turtle          | REPTILIA        | EN            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Melanochelys tricarinata              | Tricarinate Hill Turtle    | REPTILIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| Cuora amboinensis                     | Southeast Asian Box Turtle | REPTILIA        | EN            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Tor putitora                          |                            | ACTINOPTERYGII  | EN            | Decreasing       | Freshwater              | 1 km             |



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| Species Name             | Common Name                             | Taxonomic Group | IUCN Category | Population Trend | Biome                           | Within buffer of |
|--------------------------|---|-----------------|---------------|------------------|---------------------------------|------------------|
| Houbaropsis bengalensis  | Bengal Florican                         | AVES            | CR            | Decreasing       | Terrestrial                     | 1 km             |
| Calidris tenuirostris    | Great Knot                              | AVES            | EN            | Decreasing       | Marine, Freshwater, Terrestrial | 1 km             |
| Indotestudo elongata     | Elongated Tortoise                      | REPTILIA        | CR            | Decreasing       | Terrestrial                     | 10 km            |
| Panthera tigris          | Tiger                                   | MAMMALIA        | EN            | Decreasing       | Terrestrial                     | 10 km            |
| Nilssonina hurum         | Indian Peacock Softshell Turtle         | REPTILIA        | EN            | Decreasing       | Freshwater, Terrestrial         | 10 km            |
| Dactylophiza hatagirea   | Salampanja                              | LILIOPSIDA      | EN            | Decreasing       | Terrestrial                     | 50 km            |
| Sterna acuticauda        | Black-bellied Tern                      | AVES            | EN            | Decreasing       | Freshwater, Terrestrial         | 50 km            |
| Megophrys flavipunctata  | Yellow Spotted White-lipped Horned Frog | AMPHIBIA        | EN            | Decreasing       | Freshwater, Terrestrial         | 50 km            |
| Megophrys zunhebotoensis | Zunheboto's Horned Toad                 | AMPHIBIA        | EN            | Decreasing       | Freshwater, Terrestrial         | 50 km            |
| Pterocryptis barakensis  | Barak silurus                           | ACTINOPTERYGII  | EN            | Unknown          | Freshwater                      | 50 km            |
| Schistura tigrina        |   | ACTINOPTERYGII  | EN            | Unknown          | Freshwater                      | 50 km            |
| Geoclemys hamiltonii     | Spotted Pond Turtle                     | REPTILIA        | EN            | Decreasing       | Freshwater, Terrestrial         | 50 km            |
| Axis porcinus            | Hog Deer                                | MAMMALIA        | EN            | Decreasing       | Freshwater, Terrestrial         | 50 km            |

| Species Name           | Common Name         | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|------------------------|---------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Haliaeetus leucoryphus | Pallas's Fish-eagle | AVES            | EN            | Decreasing       | Freshwater, Terrestrial | 50 km            |

### Restricted Range Species

| Species Name              | Common Name                 | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|---------------------------|-----------------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Megophrys parva           | Concave-crowned Horned Toad | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 1 km             |
| Amolops marmoratus        | Marbled Sucker Frog         | AMPHIBIA        | LC            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Batasio batasio           |                             | ACTINOPTERYGII  | LC            | Unknown          | Freshwater              | 1 km             |
| Lymnaea horae             |                             | GASTROPODA      | DD            | Unknown          | Freshwater              | 1 km             |
| Parreysia corbis          |                             | BIVALVIA        | DD            | Unknown          | Freshwater              | 1 km             |
| Parreysia annandalei      |                             | BIVALVIA        | DD            | Unknown          | Freshwater              | 1 km             |
| Pila olea                 |                             | GASTROPODA      | DD            | Unknown          | Freshwater              | 1 km             |
| Macrobrachium rosenbergii | Giant River Prawn           | MALACOSTRACA    | LC            | Unknown          | Freshwater              | 1 km             |
| Batasio merianiensis      |                             | ACTINOPTERYGII  | DD            | Unknown          | Freshwater              | 1 km             |
| Oreochthys cosuatis       |                             | ACTINOPTERYGII  | LC            | Unknown          | Freshwater              | 1 km             |



| Species Name                      | Common Name                 | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|-----------------------------------|-----------------------------|-----------------|---------------|------------------|-------------------------|------------------|
| <i>Heliopais personatus</i>       | Masked Finfoot              | AVES            | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| <i>Pellorneum palustre</i>        | Marsh Babbler               | AVES            | VU            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| <i>Badis kanabos</i>              |                             | ACTINOPTERYGII  | DD            | Unknown          | Freshwater              | 1 km             |
| <i>Xenentodon cancila</i>         |                             | ACTINOPTERYGII  | LC            | Unknown          | Freshwater              | 1 km             |
| <i>Raorchestes garo</i>           | Garo Hills Bubble-nest Frog | AMPHIBIA        | DD            | Unknown          | Terrestrial             | 10 km            |
| <i>Elatoneura campioni</i>        |                             | INSECTA         | DD            | Unknown          | Freshwater, Terrestrial | 10 km            |
| <i>Channa bleheri</i>             | Rainbow Snakehead           | ACTINOPTERYGII  | NT            | Unknown          | Freshwater              | 10 km            |
| <i>Protosticta fraseri</i>        |                             | INSECTA         | DD            | Unknown          | Freshwater, Terrestrial | 10 km            |
| <i>Devario assamensis</i>         |                             | ACTINOPTERYGII  | VU            | Unknown          | Freshwater              | 10 km            |
| <i>Megophrys wuliangshanensis</i> | Wuliangshan Horned Toad     | AMPHIBIA        | NT            | Unknown          | Freshwater, Terrestrial | 50 km            |
| <i>Amolops kohimaensis</i>        | Kohima Spiny Torrent Frog   | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| <i>Amolops nidorbellus</i>        | Spotted Stinky Torrent Frog | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| <i>Odorrana mawphlangensis</i>    | Mawphlang Wart Frog         | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |



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| Species Name                | Common Name                             | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|-----------------------------|---|-----------------|---------------|------------------|-------------------------|------------------|
| Megophrys flavipunctata     | Yellow Spotted White-lipped Horned Frog | AMPHIBIA        | EN            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Theloderma nagalandense     | Nagaland Treefrog                       | AMPHIBIA        | DD            | Unknown          | Terrestrial             | 50 km            |
| Megophrys zunhebotoensis    | Zunheboto's Horned Toad                 | AMPHIBIA        | EN            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Chikila alcocki             | Alcock's Chikila                        | AMPHIBIA        | LC            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Ichthyophis sendenyu        | Sendenyu Striped Ichthyophis            | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Kurixalus yangi             | Yang's Frill-limbed Treefrog            | AMPHIBIA        | LC            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Duttaphrynus chandai        | Nagaland Montane Torrent Toad           | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Megophrys awuh              | Naga Hills Horned Frog                  | AMPHIBIA        | VU            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Garra manipurensis          |   | ACTINOPTERYGII  | VU            | Unknown          | Freshwater              | 50 km            |
| Pterocryptis barakensis     | Barak silurus                           | ACTINOPTERYGII  | EN            | Unknown          | Freshwater              | 50 km            |
| Schistura tigrina           |   | ACTINOPTERYGII  | EN            | Unknown          | Freshwater              | 50 km            |
| Psilorhynchus amplexiphalus |   | ACTINOPTERYGII  | DD            | Unknown          | Freshwater              | 50 km            |

| Species Name                | Common Name          | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|-----------------------------|----------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Phricotelphusa elegans      |                      | MALACOSTRACA    | VU            | Unknown          | Freshwater              | 50 km            |
| Indotyphlops tenuicollis    | Samagutin Worm Snake | REPTILIA        | DD            | Unknown          | Terrestrial             | 50 km            |
| Tragopan blythii            | Blyth's Tragopan     | AVES            | VU            | Decreasing       | Terrestrial             | 50 km            |
| Anisopleura valleii         |                      | INSECTA         | VU            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Schmidtaphaea chittaranjani |                      | INSECTA         | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Badis assamensis            | Assam Badis          | ACTINOPTERYGII  | DD            | Unknown          | Freshwater              | 50 km            |
| Ceriagrion rubiae           |                      | INSECTA         | LC            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Cyrtodactylus nagalandensis |                      | REPTILIA        | DD            | Unknown          | Terrestrial             | 50 km            |
| Spelaeornis chocolatinus    | Naga Wren-babbler    | AVES            | VU            | Decreasing       | Terrestrial             | 50 km            |
| Megophrys major             | Major's Horned Toad  | AMPHIBIA        | LC            | Stable           | Freshwater, Terrestrial | 50 km            |

## Biodiversity features which are likely to trigger Critical Habitat

### Protected Areas

There are no protected areas to show for this report.

### Key Biodiversity Areas

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

| Area name  | Distance | AZE | Recommendation               |
|--|----------|-----|------------------------------|
| Dhansiri Reserve Forest                            | 10 km    | No  | Assess for critical habitat  |
| Dzuku Valley                                       | 50 km    | No  | Assess for critical habitat  |
| Garampani, Nambor and Doigrung                     | 50 km    | No  | Assess for critical habitat  |
| Intaki National Park                               | 50 km    | No  | Assess for critical habitat  |
| Khonoma Nature Conservation and Tragopan Sanctuary | 50 km    | No  | Assess for critical habitat  |
| Lumding - Marat Longri                             | 50 km    | No  | Assess for critical habitat  |
| Mount Paona  | 50 km    | No  | Assess for critical habitat  |
| Puliebadze-Dzukou-Zapfu                            | 50 km    | No  | Assess for critical habitat  |
| Rangapahar Macaque Sanctuary                       | 50 km    | No  | Assess for biodiversity risk |

### Species with potential to occur

| Area Taxonomic group | Total assessed species | Total (CR, EN & VU) | CR | EN | VU | NT | LC  | DD |
|----------------------|------------------------|---------------------|----|----|----|----|-----|----|
| MALACOSTRACA         | 26                     | 2                   | 0  | 0  | 2  | 2  | 11  | 11 |
| AMPHIBIA             | 68                     | 3                   | 0  | 2  | 1  | 1  | 55  | 9  |
| LILIOPSIDA           | 63                     | 3                   | 0  | 1  | 2  | 0  | 57  | 3  |
| AVES                 | 643                    | 33                  | 9  | 4  | 20 | 37 | 573 | 0  |
| MAGNOLIOPSIDA        | 66                     | 1                   | 0  | 0  | 1  | 0  | 62  | 3  |
| REPTILIA             | 104                    | 14                  | 4  | 5  | 5  | 5  | 81  | 4  |
| INSECTA              | 116                    | 1                   | 0  | 0  | 1  | 2  | 109 | 4  |
| BIVALVIA             | 37                     | 0                   | 0  | 0  | 0  | 1  | 31  | 5  |
| ACTINOPTERYGII       | 87                     | 11                  | 0  | 3  | 8  | 8  | 60  | 8  |
| MAMMALIA             | 121                    | 26                  | 1  | 7  | 18 | 9  | 84  | 2  |
| GASTROPODA           | 52                     | 1                   | 0  | 0  | 1  | 0  | 40  | 11 |
| POLYPODIOPSIDA       | 3                      | 0                   | 0  | 0  | 0  | 0  | 3   | 0  |
| ARACHNIDA            | 3                      | 0                   | 0  | 0  | 0  | 0  | 3   | 0  |
| AGARICOMYCETES       | 2                      | 0                   | 0  | 0  | 0  | 0  | 2   | 0  |



### Recommended citation

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### Recommended Experts and Organizations

For sites located in Critical Habitat, clients must ensure that external experts with regional expertise are involved in further assessment (GN6: GN22). Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes, especially with respect to potential developments in natural or Critical Habitat (GN6: GN23). Where Critical Habitats are triggered by priority species, species specialists must be involved. IBAT provides data originally collected by a large network of national partners, while species information is sourced via the IUCN Red List and affiliated Species Specialist Groups. These experts and organizations are listed below. **Please note that this is not intended as a comprehensive list of organizations and experts. These organizations and experts are under no obligation to support any further assessment and do so entirely at their discretion and under their terms. Any views expressed or recommendations made by these stakeholders should not be attributed to the IFC or IBAT for IFC partners.**

### Birdlife Partners

URL: <https://www.birdlife.org/worldwide/partnership/birdlife-partners>

### Directory for Species Survival Commission (SSC) Specialist Groups and Red List Authorities

URL: <https://www.iucn.org/commissions/ssc-groups>





## Desk-based Critical Habitat (CH) Screening- Dimapur

This annexure presents the details of the desk-based CH Screening (hereinafter referred to as 'CHS') undertaken for the project, including the reference framework within which it was conducted, the approach and methodology followed, a description of the habitat profile of the ecologically appropriate area of analysis (EAAA) considered, the screening rationales applied and the final outcome of the screening.

### Reference Framework

The CHS has been conducted as per the guidance available in the following environmental and social sustainability standards:

- The International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (2012)
- Asian Development Bank (ADB) Safeguard Policy Statement (2009)

### Approach and Methodology

This section outlines the broad approach adopted and the stepwise methodology applied for the CHS.

#### Approach

The approach adopted for screening of species involved the following strategies:

- Delineation of the area to be subjected to the CHS based on the estimated collective Area of Influence (AoI) of the Project infrastructure and activities (hereinafter referred to as the 'Study Area').
- Use of a detailed IBAT (Integrated Biodiversity Assessment Tool) Report generated for the Project Site, based on the latest version of the IUCN Red List, as the reference source for a site-specific species baseline.
- Inclusion of all IUCN Red List-assessed globally threatened species of higher flora and fauna as Critical Habitat (CH) Candidates.

#### Note:

*The term 'higher flora' refers to all Spermatophyte species, comprising Angiosperms and Gymnosperms, while the term 'higher fauna' refers to all Vertebrate species, comprising Mammals, Birds, Reptiles, Amphibians, and Fishes.*

- Inclusion of any IUCN Red List-assessed non-threatened species (listed as Near Threatened, Least Concern or Data Deficient) as CH Candidates, only if it qualifies as 1 or more of the following –
  - endemic or restricted range with respect to the Study Area.
  - congregatory with respect to the Study Area.
  - cited as trigger species for any KBAs overlapping the Study Area.
- Delineation of an Ecologically Appropriate Area of Analysis (EAAA) for each CH Candidate or group of CH Candidates.
- Screening of CH Candidates based on the proportion of their geographical range constituted by the applicable Ecologically Appropriate Area of Analysis (EAAA), extent of suitable habitat-type(s) in the EAAA or availability of suitable elevation range within the EAAA.

The approach adopted for screening of habitats involved the following strategies:

- Use of the IBAT outputs on Key Biodiversity Areas (KBA) and Protected Areas, in conjunction with any maps available on the corresponding websites, to identify the nearest designated areas that are both, legally protected and internationally recognized.
- Use of governmental LULC maps of the corresponding area in conjunction with governmental Protected Area (PA) maps to identify the nearest designated areas that are legally protected, but not internationally recognized.

### Methodology

The methodology applied for screening of species involved the following steps:

- Screening in CH Candidates that have geographic ranges overlapping the Study Area as per IUCN Red List spatial data.
- Screening in CH Candidates that are deemed Extant or Possibly Extant with respect to the

#### Study Area.

- Identifying the CH Criteria applicable to each screened in CH Candidate.
- Classifying the habitat-types within the Study Area, as per the IUCN Habitat Classification.
- Evaluating each CH Candidate, based on its extent of occurrence (EOO), global population, suitable habitat types and elevation range.
- Screening in CH Candidates likely to trigger CH Criteria (i) to (iv) as per ADB SPS or CH Criteria 1, 2 and/or 3 as per IFC PS6, as Potential CH Trigger Species, based on screening outcomes.
- Screening as per thresholds defined in IFC PS6 CH Criteria wherever quantifiable thresholds are not defined in ADB SPS.
- Consulting appropriate SMEs and/or referring to relevant published research to confirm whether the Study Area contains or is situated within CH as per CH Criteria 1, 2 and/or 3 with respect to any of the said Potential CH Trigger Species.

The methodology applied for screening of habitats involved the following steps:

- Screening in Designated Areas that overlap with the Study Area as per maps available on the corresponding websites.
- Identifying the CH Criteria applicable to the screened in Designated Areas.
- Evaluating each screened in Designated Area against the applicable criteria based on public domain data.
- Screening in Designated Areas likely to trigger CH Criteria (v) to (vii) as per ADB SPS or CH Criteria 4 and/or 5 as per IFC PS6, a Potential CH Trigger Area.
- Consulting an appropriate SME and/or referring to relevant published research to confirm whether the Study Area contains or is situated within CH as per CH Criteria 4 and/or 5 with respect to any Potential CH Trigger Area.

The methodology applied for assessment of any Potential CH Trigger Species or Area involved the following steps:

- Conducting a detailed desk-based assessment to collate detailed secondary data on each Potential CH Trigger Species or Area.
- Conducting a brief field-based assessment to map the habitat profile of the Study Area and EAAA(s), as also, to collect relevant Study Area-specific primary and secondary data on each Potential CH Trigger Species or Area.
- Consulting appropriate Subject Matter Experts (SMEs) and/or stakeholders to understand the present status of any Potential CH Trigger Species or Area vis-à-vis the Study Area and applicable EAAA.
- Determining whether the Project Site contains, or is situated within, CH with respect to any Potential CH Trigger Species or Area.
- Designating the corresponding Species or Area as a CH Qualifying (CHQ) Species or Area.
- Recommending further assessments, if required, to address any data gaps preventing decision-making on presence or absence of CH.

#### Details of the Study Area

This section delineates the Study Area subjected to the CHS and describes its ecological context.

##### Delineation of the Study Area

The Study Area is defined as the overall area of influence (Aol) of the project (hereinafter referred to as 'Project'). The Aol of the Project comprises the area of direct, as well as indirect influence of the Project.

The area of direct influence is estimated to contain ecological receptors of any direct Project impacts, while the area of indirect influence is estimated to contain ecological receptors of any indirect Project impacts.

Based on the nature and scale of the Project, the area of direct influence of the Project is estimated to be largely limited to the footprint of the Project infrastructure and activities (hereinafter referred to as 'Project Site').

Based on the type, quality, homogeneity and contiguity of habitats around the Project Site, the area of indirect influence of the Project is estimated as the area situated within 100 m buffer of the Project Site (hereinafter referred to as 'Buffer Area').

Thus, the Project Site and Buffer Area collectively constitute the Study Area.

#### Ecological Context of the Study Area

The Study Area is distributed along the banks of the Dhansiri River in southwestern Nagaland. The terrain of the Study Area is generally flat, with an elevation profile ranging from 160-200 m amsl.

The Study Area is drained mainly by the Dhansiri River.

The vegetation of the Study Area is characterized mainly by cultivation, plantations or gardens in the plains. While there are no natural forests within the Study Area, based on Champion and Seth (1968), the forest-types occurring within the region in which the Study Area is located represents 'Northern Tropical Semi-evergreen Forest'. Based on its description, the said forest-type, qualifies as 'Tropical Moist Lowland Forest' as per the IUCN Habitat Classification Scheme.

The land-use of the Study Area is composed of built-up areas and plantations, besides the river channel.

Figure 1 presents a map indicating the location and extent of the Study Area.

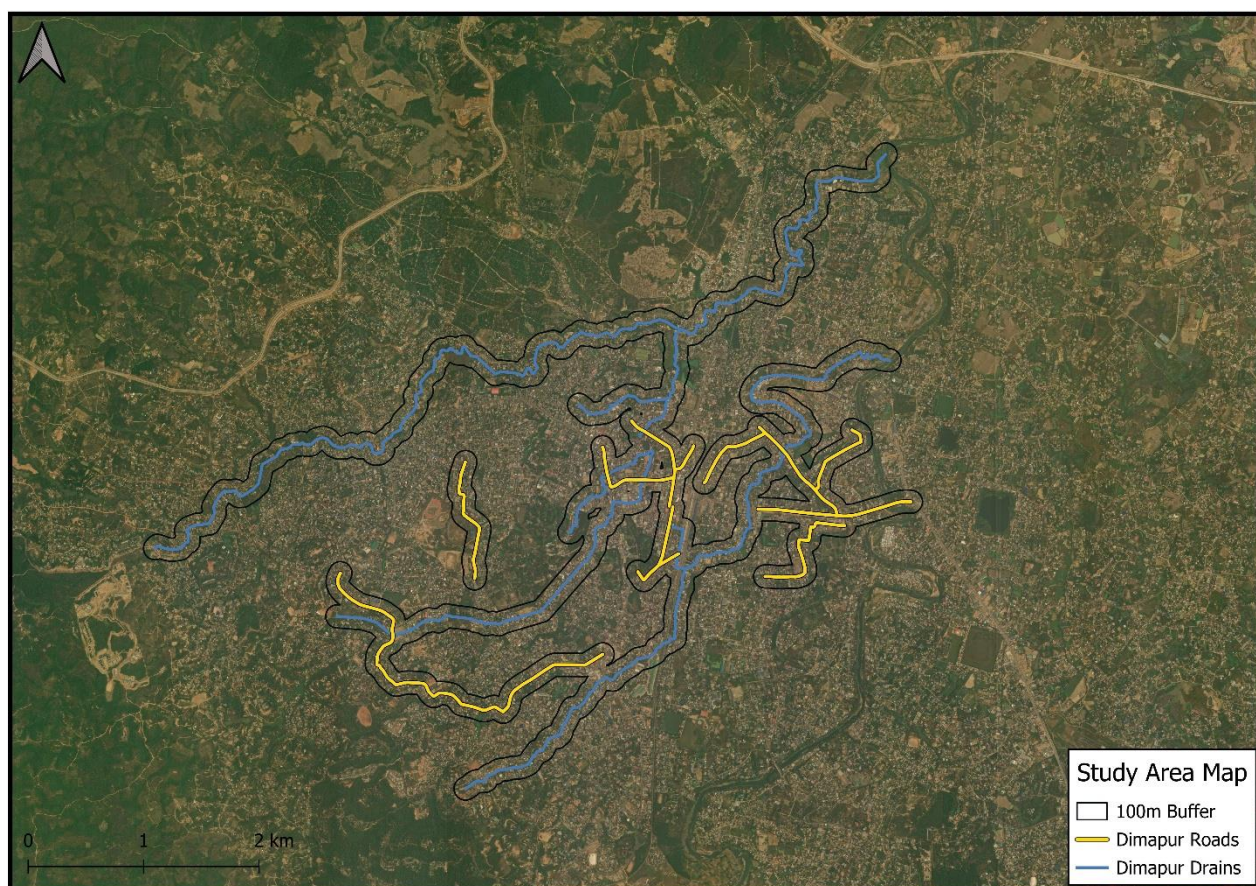


Figure 1: Map indicating Location and Extent of the Study Area

#### Habitat Profile of the Study Area

The Study Area was subjected to a habitat profiling based on the ESRI Sentinel-2 LULC data and satellite imagery, as available on Google Earth.

The results indicate that the habitat profile of the Study Area is dominated by modified habitats, which are interspersed by aquatic natural habitats.

Table 1 presents the quantified habitat profile of the Study Area in terms of habitat-types aligned with the IUCN Habitat Classification.

Table 1: Habitat Profile of the Study Area

| Habitat Type | Habitat Class                 | Total Area (sq.km) | Percent Area (%) |
|--------------|-------------------------------|--------------------|------------------|
| Natural      | Inland Wetlands               | 0.012              | 0.18%            |
| Modified     | Urban Areas and Rural Gardens | 7.017              | 99.7%            |



|             |             |       |        |
|-------------|-------------|-------|--------|
|             | Arable Land | 0.002 | 0.03%  |
| Grand Total |             | 7.032 | 100.00 |

Figure 2 presents a map indicating the habitat profile of the Study Area.

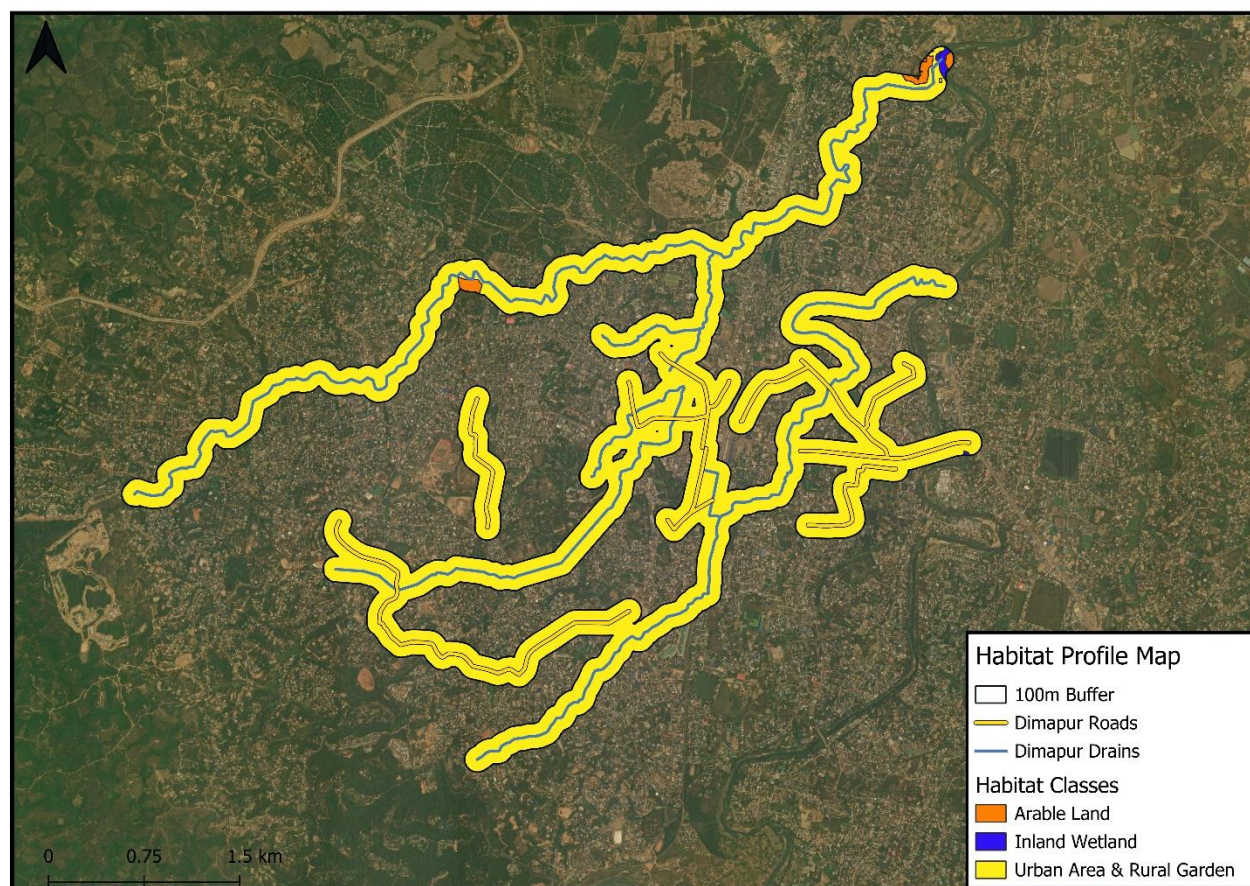


Figure 2: Map indicating Habitat Profile of the Study Area  
Designated Areas

The Project Site partially overlaps a Designated Area, namely the Dhansiri Reserve Forest, which is a Legally Protected Area (LPA), as well as an Internationally Recognized Area (IRA) i.e. a Key Biodiversity Area (KBA). Approximately 30 m of the project component D-2 drain overlaps the said KBA. However, it should be noted that the overlapped areas contain no natural habitats. As informed by the KBA Secretariat, this site is an Important Bird and Biodiversity site (assessment dated 2004) which is incorporated in the KBA database but ideally needs a more comprehensive KBA assessment as only birds have been assessed to date. The said bird species triggering the said KBA have been screened as CH Candidates.

The next nearest Designated Area with respect to the Project Site is the Rangapahar Macaque Sanctuary and Key Biodiversity Area (KBA), which qualifies as both an LPA and an IRA and is situated approximately 18 km southwest of the Project Site.

Based on the IBAT Report, there are 8 other Designated Areas situated fully or partially within 50 km of the Project Site.

Table 2 presents the details of each Designated Area situated within 50 km of the Project Site, along with its designation(s), as well as distance and direction from the nearest point of the Project Site.

Table 2: Details of Designated Areas within 50km of the Project Site

|  |                         |                |                       |
|--|-------------------------|----------------|-----------------------|
|  |                         |                |                       |
|  | Dhansiri Reserve Forest | LPA; IRA (KBA) | Overlap with D2 drain |



|  |   |                |           |
|--|---|----------------|-----------|
|  |   |                |           |
|  | Rangapahar Macaque Sanctuary                          | LPA; IRA (KBA) | 1.5 km SW |
|  | Intaki National Park                                  | LPA; IRA (KBA) | 26 km SW  |
|  | Lumding - Marat Longri                                | IRA (KBA)      | 30 km W   |
|  | Mount Paona   | IRA (KBA)      | 40 km S   |
|  | Khonoma Nature Conservation and<br>Tragopan Sanctuary | LPA; IRA (KBA) | 40 km SE  |
|  | Puliebadze-Dzukou-Zapfu                               | IRA (KBA)      | 42 km SE  |
|  | Dzuku Valley  | IRA (KBA)      | 44 km SE  |
|  | Garampani, Nambor and Doigrung                        | IRA (KBA)      | 45 km N   |

*Note: The Project Site is situated in proximity to the Daldali-Dimapur Elephant Corridor identified as part of the Elephant Corridors of India 2023 Report. Since this is not a nationally designated protected area, it does not qualify as a Designated Area. However, owing to the globally threatened status of the species, information on the same has been presented in Figure 2, along with a detailed screening in Table 5.*

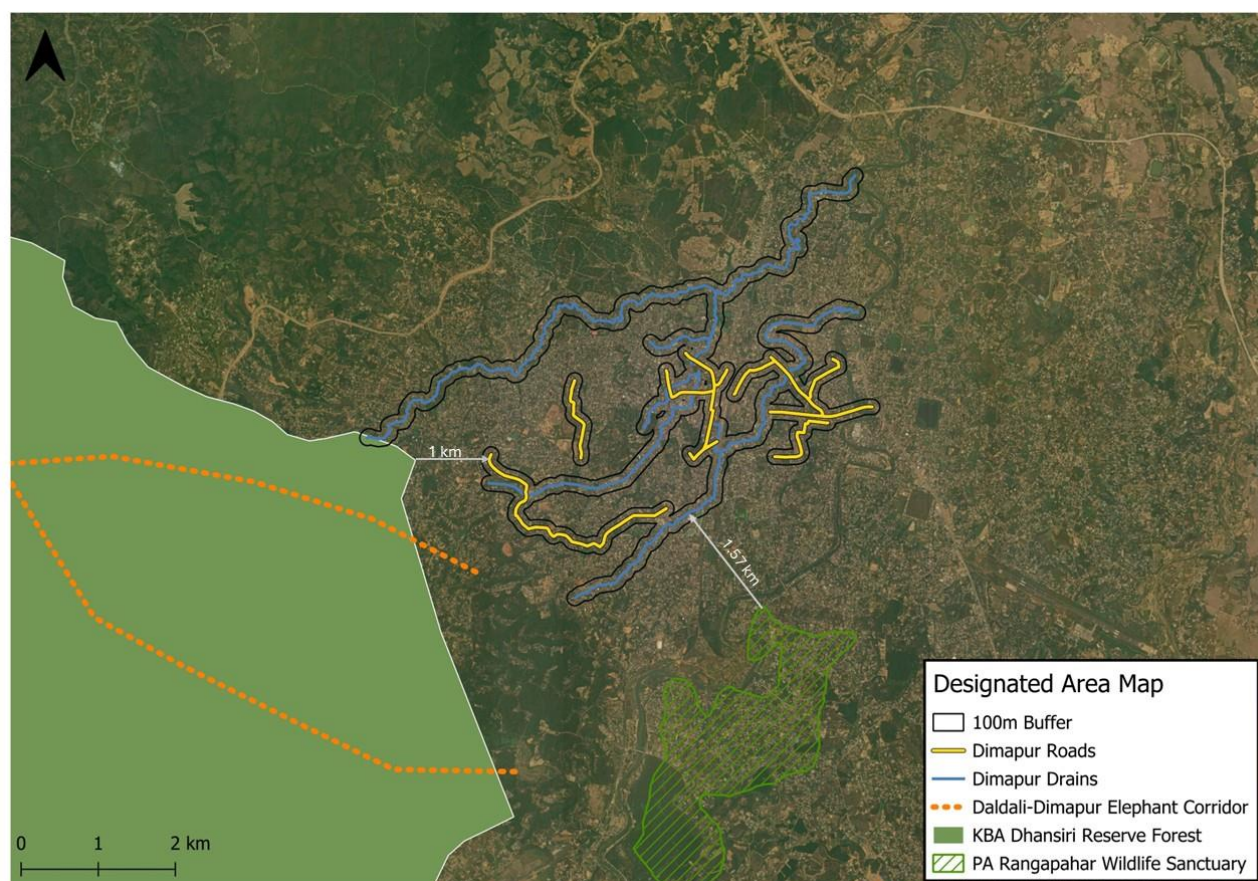


Figure 2: Map indicating Designated Areas within 50km of the Project Site  
Identification of CH Candidates

This section presents an overview of the species and areas listed in the IBAT Report, describes the criteria defined by ADB SPS and IFC PS6 for identifying species or areas that can potentially trigger CH and lists the species or areas that qualify as CH Candidates with respect to the Study Area.

#### Overview of the IBAT Report

As per the IBAT Report, 1391 IUCN Red List-assessed species potentially occur within 50 km of the Project Site, and therefore, within the Study Area.

Of the said 1391 species, 95 are categorized by the IUCN Red List as globally threatened,

comprising 14 Critically Endangered (CR), 22 Endangered (EN) and 59 Vulnerable (VU) species, while 358 are classified as migratory species and 45 as restricted range species.

The said 95 globally threatened species consist of 26 mammals, 33 birds, 14 reptiles, 3 amphibians, 11 freshwater fishes, 4 lower fauna and 4 plants.

As per the IBAT Report, there are 9 Designated Areas, all Key Biodiversity Areas (KBAs), situated within 50 km of the Project Site.

*Source: IBAT PS6 & ESS6 Report. Generated under licence 33091-98182 from the Integrated Biodiversity Assessment Tool on 15 December 2025 (GMT). [www.ibat-alliance.org](http://www.ibat-alliance.org)*

#### Overview of the CH Criteria

As per ADB SPS guidance, CH refers to areas with high biodiversity value and necessarily includes the following [hereinafter referred to as the 'ADB CH Criteria (i) through (vii)']: (i) habitat required for the survival of critically endangered or endangered species (ii) areas having special significance for endemic or restricted-range species (iii) sites that are critical for the survival of migratory species (iv) areas supporting globally significant concentrations or numbers of individuals of congregatory species (v) areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services (vi) areas having biodiversity of significant social, economic, or cultural importance to local communities (vii) areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's World Natural Heritage Sites.

As per the IFC PS6 CH Criteria 1, 2 and 3, habitats - either natural or modified - that are critical for the survival of IUCN Red List-designated globally threatened species, endemic or restricted range species and migratory and/or congregatory species qualify as CH. As per the IFC PS6 CH Criteria 4 and 5, highly threatened or unique ecosystems, as well as, spatial features that support key evolutionary processes, also qualify as CH.

As stated in the Methodology section, the 5 IFC PS6 CH Criteria largely subsume the ADB CH Criteria (i) through (vii), while IFC PS6 guidance provides quantitative thresholds and/or nuanced procedures to apply the same for CH screening. Hence, the said 5 IFC PS6 CH Criteria have been applied to the CHS hereafter.

Table 3 presents detailed definitions and quantitative thresholds of the 5 IFC PS6 CH Criteria, as well as an overview of the species or habitats of the Study Area that qualify as CH Candidates as per one or more of the said CH Criteria.



Table 3: Details of CH Criteria

| CH Criterion                       | Description of the CH Criterion and its stipulated thresholds   | Rationale/Remarks  | Number of Identified CH Candidates                                 |
|------------------------------------|---|--|--|
| CH 1 - Globally Threatened Species | <p>Globally Threatened Species are defined as species designated by the IUCN Red List as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). As per CH Criterion 1, an area that supports a globally important concentration of a CR or EN species, as well as, an area that supports a globally important concentration of a VU species, the loss of which would lead to the species being designated as EN or CR, both qualify as potential CH.</p> <p>Thresholds stipulated for triggering CH Criterion 1 are:</p> <p>(a) Areas that support globally important concentrations of an IUCN Red-listed CR or EN species (0.5% of the global population containing 5 reproductive units of a CR or EN species).</p> <p>(b) Areas that support globally important concentrations of an IUCN Red-listed VU species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds specified in (a).</p> <p>(c) As appropriate, areas containing nationally/regionally important concentrations of an IUCN Red-listed CR or EN species.</p> | <p>Of the species potentially occurring in the Study Area, 59 species are categorized by the IUCN Red List as globally threatened. These include 13 CR species, 11 EN species and 35 VU species.</p> <p>Note: Two species namely, EN <i>Pavo muticus</i> and VU <i>Aceros nipalensis</i> which are trigger species for the Dhansiri RF KBA do not have geographic ranges overlapping the EAAA and hence have been screened out as CH Candidates.</p> | <p>1(a): 24 species<br/>1(b): 35 species<br/>Total: 59 species</p> |

| CH Criterion                                 | Description of the CH Criterion and its stipulated thresholds  | Rationale/Remarks   | Number of Identified CH Candidates  |
|--|--|---|---|
| CH 2 - Endemic or Restricted Range Species   | <p>Species which occur in a limited area are referred to as Endemic or Restricted Range species. The species reported from the Study Area have been evaluated as endemic or restricted range species based on their extent of occurrence (EOO), described as follows:</p> <p>(a) For terrestrial vertebrates and plants, a restricted-range species is defined as those species that have an EOO less than 50,000 km<sup>2</sup></p> <p>(b) For marine systems, restricted-range species are provisionally being considered those with an EOO of less than 100,000 km<sup>2</sup></p> <p>(c) For coastal, riverine, and other aquatic species in habitats that do not exceed 200 km width at any point (e.g., rivers), restricted range is defined as having a global range less than or equal to 500 km linear geographic span (i.e., the distance between occupied locations farthest apart).</p> <p>The threshold stipulated for triggering Criterion 2 is the following:</p> <p>a) Areas that regularly hold ≥10% of the global population size AND ≥10 reproductive units of a species.</p> | 1 of the species potentially occurring in the Study Area meets the applicable definition of endemic or restricted range species.  | 1   |
| CH 3 - Migratory and/or Congregatory Species | <p>Migratory Species are defined as species of which a significant proportion of its members cyclically and predictably move from one geographical area to another, including within the same ecosystem. Species whose individuals gather in large groups on a cyclical, or otherwise regular and/or predictable basis, are known as congregatory species.</p> <p>Thresholds stipulated for triggering CH Criterion 3 are:</p>   | The Study Area is located within the Central Asian Flyway. Based on the available data, migratory waterbirds occur in the Study Area during the September to March period every year, which coincides with the chief annual migratory season with | 3(a): 22 species<br><i>Note: Of the said 22 species, 20 also qualify as CH Candidates for CH 1(a) and 1(b).</i> |

| CH Criterion | Description of the CH Criterion and its stipulated thresholds   | Rationale/Remarks  | Number of Identified CH Candidates |
|--------------|---|--|------------------------------------|
|              | <p>(a) areas known to sustain, on a cyclical or otherwise regular basis, <math>\geq 1</math> percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.</p> <p>(b) areas that predictably support <math>\geq 10</math> percent of the global population of a species during periods of environmental stress.</p> | <p>respect to the Indian sub-continent.</p> <p>The nearest significant habitat for migratory and/or congregatory birds with respect to the Study Area is the Khonoma Nature Conservation and Tragopan Sanctuary, designated as KBA and LPA situated ~24 km SE of the Project Site.</p> <p>As per the IBAT Report, 358 species occurring within 50 km of the Project Site are migratory. Of these, 328 species are birds, 19 are fish, 2 are mammals and 9 belong to lower fauna groups. Of these 358 species, only 20 are globally threatened, while the rest are non-threatened with wide distribution ranges with large global population sizes.</p> <p>Based on the available data, it was concluded that only globally threatened migratory and/or congregatory species occurring in the Study Area, owing to their relatively small and/or decreasing</p> |                                    |

| CH Criterion                                      | Description of the CH Criterion and its stipulated thresholds   | Rationale/Remarks  | Number of Identified CH Candidates |
|---|---|--|------------------------------------|
|   |   | <p>global populations, are likely to trigger CH. Review of the species potentially occurring in the Study Area indicates that only 20 globally threatened species, all birds, are classified by the IUCN Red List as migratory and/or congregatory.</p> <p><i>Note: Two species, namely NT Leptoptilus dubius and NT Leptoptilus javanicus have been screened in as CH Candidates as they are Congregatory and flagged as KBA trigger species for Dhansiri RF.</i></p> |                                    |
| CH 4 – Highly Threatened and/or Unique Ecosystems | <p>Assessment of the Study Area towards Criterion 4 is based on national/regional level assessments carried out by governmental bodies, recognized academic institutions and/or internationally recognized NGOs.</p> <p>Thresholds stipulated for triggering CH Criterion 4 are:</p> <p>(a) areas representing <math>\geq 5\%</math> of the global extent of an ecosystem-type meeting the criteria for IUCN status of CR or EN.</p> <p>(b) areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.</p> | <p>No part of the Study Area is assessed by IUCN towards the IUCN Red List of Ecosystems.</p> <p>The Study Area is dominated by artificial habitats such as cultivated, fallow or disused arable lands, rural gardens and urban areas and natural habitats such as inland wetlands. While these habitats support biodiversity, they are not determined to be of high</p>   | None                               |

| CH Criterion                      | Description of the CH Criterion and its stipulated thresholds  | Rationale/Remarks  | Number of Identified CH Candidates |
|-----------------------------------|--|--|------------------------------------|
|                                   |  | priority for conservation.   |                                    |
| CH 5 – Key Evolutionary Processes | <p>Assessment of the Study Area towards CH Criterion 5 is based on structural attributes such as topography, geology, soil, temperature and vegetation or combinations of these variables, which can influence evolutionary processes that give rise to regional species-configurations or ecological properties. The overall aim of evaluating the Study Area against this criterion is to conserve genetic and species diversity, as also, processes which drive speciation, for the purpose of ensuring evolutionary flexibility in a rapidly changing climate. Features associated with key evolutionary processes include:</p> <ul style="list-style-type: none"> <li>• Landscapes with high spatial heterogeneity, which drive speciation</li> <li>• Ecotones, which aid speciation and are associated with high species and genetic diversity</li> <li>• Edaphic interfaces, which drive formation of unique plant communities characterized by endemism and rarity</li> <li>• Connectivity between habitats, which facilitates migration and gene flow, aiding conservation of meta-populations in fragmented habitats.</li> </ul> | No such features are associated with the habitats of the Study Area. Further, the Study Area is not known to contain isolated sub-populations of any species | None                               |

Thus, the CH Candidates identified with respect to the Study Area consist of 61 species and no habitats.

Table 4 presents details of each CH Candidate species including its scientific name, common name, applicable CH criteria, global population, minimum CH trigger threshold number, extent of occurrence (EOO), elevation range, and suitable habitat type/s.

Table 4: Details of CH Candidates

| SN | Scientific Name                | Common Name             | IUCN Status | Applicable CH Criterion | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO      | Elevation Range (in m) | Suitable Habitat Type(s) |
|----|--------------------------------|-------------------------|-------------|-------------------------|--|-------------------------------------|----------|------------------------|--------------------------|
| 1  | <i>Asarcornis scutulata</i>    | White-winged Duck       | CR          | 1a, 3a                  | 150–450                                | 0.75                                | 2620000  | 0-400                  | F, W                     |
| 2  | <i>Aythya baeri</i>            | Baer's Pochard          | CR          | 1a, 3a                  | 250-999                                | 1.25                                | 2270000  | -                      | W                        |
| 3  | <i>Emberiza aureola</i>        | Yellow-breasted Bunting | CR          | 1a                      | -                                      | -                                   | 11317030 | 0-3000                 | SH, G, A, W              |
| 4  | <i>Gyps bengalensis</i>        | White-rumped Vulture    | CR          | 1a                      | 6000-9000                              | 30                                  | -        | -                      | F, S, Sh, G, U           |
| 5  | <i>Gyps tenuirostris</i>       | Slender-billed Vulture  | CR          | 1a                      | 1100-1300                              | 5.5                                 | -        | -                      | F, S, Sh, G, U           |
| 6  | <i>Heliopais personatus</i>    | Masked Finfoot          | CR          | 1a                      | (108-304)                              | 0.54                                | 6361     | 1200-1800              | F, W                     |
| 7  | <i>Houbaropsis bengalensis</i> | Bengal Florican         | CR          | 1a                      | 350-1500                               | 1.75                                | 420      | -                      | G, A                     |
| 8  | <i>Manis pentadactyla</i>      | Chinese Pangolin        | CR          | 1a                      | -                                      | -                                   | -        | 0-1850                 | F, Sh, G                 |
| 9  | <i>Manouria emys</i>           | Asian Giant Tortoise    | CR          | 1a                      | -                                      | -                                   | -        | 0-1850                 | F                        |
| 10 | <i>Nilssonina nigricans</i>    | Black Softshell Turtle  | CR          | 1a                      | -                                      | -                                   | -        | 0-200                  | W, AA                    |
| 11 | <i>Pangshura sylhetensis</i>   | Assam Roofed Turtle     | CR          | 1a                      | -                                      | -                                   | 1437     | 500-1300               | W                        |
| 12 | <i>Perdicula manipurensis</i>  | Manipur Bush-quail      | CR          | 1a                      | (1-200)                                | 1                                   | 14300    | 0-500                  | Sh, G, W                 |
| 13 | <i>Sarcogyps calvus</i>        | Red-headed Vulture      | CR          | 1a                      | 3,750-14,999                           | 18.75                               | -        | -                      | F, S, Sh, G, U           |
| 14 | <i>Aquila nipalensis</i>       | Steppe Eagle            | EN          | 1a                      | 78,042-110,193                         | 390.21                              | -        | -                      | F, S, G, RA, D           |
| 15 | <i>Calidris tenuirostris</i>   | Great Knot              | EN          | 1a, 3a                  | 255,000-340,000                        | 1275                                | 355000   | 0-70                   | G, M                     |
| 16 | <i>Cuon alpinus</i>            | Dhole                   | EN          | 1a                      | 4,500–10,500                           | 22.5                                | -        | 0-5300                 | F, Sh, G                 |
| 17 | <i>Cuora amboinensis</i>       | Southeast Asian         | EN          | 1a                      | -                                      | -                                   | -        | 0-400                  | F, W, AA                 |



| SN | Scientific Name                              | Common Name              | IUCN Status | Applicable CH Criterion | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO      | Elevation Range (in m) | Suitable Habitat Type(s)  |
|----|--|--------------------------|-------------|-------------------------|--|-------------------------------------|----------|------------------------|---------------------------|
|    |  | Box Turtle               |             |                         |  |                                     |          |                        |                           |
| 18 | <i>Cuora mouhotii</i>                        | Keeled Box Turtle        | EN          | 1a                      | -                                      | -                                   | -        | 350-1200               | F, W                      |
| 19 | <i>Elephas maximus</i>                       | Asian Elephant           | EN          | 1a                      | 48,323–51,680                          | 241.615                             | 11317030 | 0-3000                 | F, Sh, G, P, DF           |
| 20 | <i>Hoolock hoolock</i>                       | Western Hoolock Gibbon   | EN          | 1a                      | -                                      | -                                   | -        | 0-2500                 | F, P, RG                  |
| 21 | <i>Melanochelys tricarinata</i>              | Tricarinate Hill Turtle  | EN          | 1a                      | -                                      | -                                   | -        | ?-300                  | F, S, G, W                |
| 22 | <i>Nycticebus bengalensis</i>                | Bengal Slow Loris        | EN          | 1a                      | -                                      | -                                   | -        | 0-2400                 | F                         |
| 23 | <i>Tor putitora</i>                          |                          | EN          | 1a, 3a                  | -                                      | -                                   | -        | -                      | W, AA                     |
| 24 | <i>Trachypithecus pileatus ssp. pileatus</i> | Blond-bellied Langur     | EN          | 1a                      | -                                      | -                                   | -        | 600-3000               | F, P                      |
| 25 | <i>Aonyx cinereus</i>                        | Asian Small-clawed Otter | VU          | 1b                      | -                                      | -                                   | -        | -                      | F, Sh, G, W, M, AA        |
| 26 | <i>Arctictis binturong</i>                   | Binturong                | VU          | 1b                      | -                                      | -                                   | -        | 0-1000                 | F, DF                     |
| 27 | <i>Arctonyx collaris</i>                     | Greater Hog Badger       | VU          | 1b                      | -                                      | -                                   | -        | 0-1000                 | F, S, Sh, G, DF           |
| 28 | <i>Aythya ferina</i>                         | Common Pochard           | VU          | 1b, 3a                  | 1.14-1.18 million                      |                                     | 2270000  | -                      | W, M, AA                  |
| 29 | <i>Bagarius bagarius</i>                     |                          | VU          | 1b, 3a                  | -                                      |                                     | 2270000  | -                      | W, AA                     |
| 30 | <i>Bos gaurus</i>                            | Gaur                     | VU          | 1b                      | 15,000-35,000                          |                                     | 0-100    | 100-350                | F, S, Sh, G, A, PL, P, DF |
| 31 | <i>Buceros bicornis</i>                      | Great Hornbill           | VU          | 1b, 3a                  | 23,000 - 71,000                        |                                     | -        | 0-2100                 | F, P, RG                  |
| 32 | <i>Calidris falcinellus</i>                  | Broad-billed Sandpiper   | VU          | 1b                      | (96,000-136,000)                       |                                     | -        | 1200-1400              | W, M, AA                  |
| 33 | <i>Calidris ferruginea</i>                   | Curlew Sandpiper         | VU          | 1b                      | 700,000-1,200,000                      |                                     | -        | 1200-1400              | G, W, M, AA               |

| SN | Scientific Name                     | Common Name                 | IUCN Status | Applicable CH Criterion | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO               | Elevation Range (in m) | Suitable Habitat Type(s) |
|----|-------------------------------------|-----------------------------|-------------|-------------------------|--|-------------------------------------|-------------------|------------------------|--------------------------|
| 34 | <i>Capricornis sumatraensis</i>     | Mainland Serow              | VU          | 1b                      | -                                      |                                     | 65.9              | 200-300                | F, Sh, G, RA, RG         |
| 35 | <i>Clanga clanga</i>                | Greater Spotted Eagle       | VU          | 1b                      | (3,900-10,000)                         |                                     | 4000-5000         | 900-2600               | F, Sh, G, W, M, A, AA    |
| 36 | <i>Columba punicea</i>              | Pale-capped Pigeon          | VU          | 1b                      | 3,750-14,999                           |                                     | 2990              | 100-600                | F, Sh, A, P              |
| 37 | <i>Crocodylus palustris</i>         | Mugger                      | VU          | 1b                      | (5,700-8,700)                          |                                     | 64709             | 1200-1600              | W, M, AA                 |
| 38 | <i>Elaphe taeniura</i>              | Cave Racer                  | VU          | 1b, 3a                  | -                                      |                                     | 10171             | 400-800                | F, Sh, C, P, RG          |
| 39 | <i>Gallinago nemoricola</i>         | Wood Snipe                  | VU          | 1b                      | (2,500-9,999)                          |                                     | -                 | -                      | F, G, W                  |
| 40 | <i>Hoolock hoolock ssp. hoolock</i> | Western Hoolock Gibbon      | VU          | 1b                      | -                                      |                                     | -                 | 0-2500                 | F                        |
| 41 | <i>Lutrogale perspicillata</i>      | Smooth-coated Otter         | VU          | 1b, 3a                  | -                                      |                                     | 72000             | 2400-3600              | F, Sh, G, W, M, A        |
| 42 | <i>Macaca arctoides</i>             | Stump-tailed Macaque        | VU          | 1b, 3a                  | -                                      |                                     | 72000             | 2400-3600              | F                        |
| 43 | <i>Macaca leonina</i>               | Northern Pig-tailed Macaque | VU          | 1b                      | 4,000                                  |                                     | -                 | 0-2250                 | F                        |
| 44 | <i>Melursus ursinus</i>             | Sloth Bear                  | VU          | 1b                      | -                                      |                                     | -                 | -                      | F, S, Sh, G, RG, DF      |
| 45 | <i>Mulleripicus pulverulentus</i>   | Great Slaty Woodpecker      | VU          | 1b                      | (10,000-70,000)                        |                                     | -                 | 2500-?                 | F, S                     |
| 46 | <i>Panthera pardus</i>              | Leopard                     | VU          | 1b                      | -                                      |                                     | -                 | 0-5200                 | F, S, Sh, G, RA, D       |
| 47 | <i>Paris polyphylla</i>             | Love Apple                  | VU          | 1b                      | -                                      |                                     | 5500000 - 6500000 | 1800-3300              | F                        |
| 48 | <i>Pellorneum palustre</i>          | Marsh Babbler               | VU          | 1b, 2a                  | (2,500-9,999)                          |                                     | 14300             | 0-500                  | Sh, G, W                 |
| 49 | <i>Python bivittatus</i>            | Burmese Python              | VU          | 1b                      | -                                      |                                     | -                 | 10-4050                | F, G, W, C, D            |
| 50 | <i>Rhinoceros</i>                   | Greater One-horned          | VU          | 1b                      | (2100-2200)                            |                                     | 1286037           | 0-415                  | F, G, W                  |

| SN | Scientific Name                | Common Name        | IUCN Status | Applicable CH Criterion | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO      | Elevation Range (in m) | Suitable Habitat Type(s) |
|----|--------------------------------|--------------------|-------------|-------------------------|--|-------------------------------------|----------|------------------------|--------------------------|
|    | <i>unicornis</i>               | Rhino              |             |                         |  |                                     |          |                        |                          |
| 51 | <i>Rhyticeros undulatus</i>    | Wreathed Hornbill  | VU          | 1b                      | -                                      |                                     | 7020000  | ?-2560                 | F                        |
| 52 | <i>Rusa unicolor</i>           | Sambar             | VU          | 1b                      | -                                      |                                     | -        | 0-3900                 | F, S, Sh, G, W, P, DF    |
| 53 | <i>Schoenicola striatus</i>    | Bristled Grassbird | VU          | 1b, 3a                  | (6,800-12,800)                         |                                     | 2780000  | 0-1000                 | Sh, G, W                 |
| 54 | <i>Sitta formosa</i>           | Beautiful Nuthatch | VU          | 1b, 3a                  | 3,750-14,999                           |                                     | 1220000  | 600-2400               | F                        |
| 55 | <i>Sterna aurantia</i>         | River Tern         | VU          | 1b, 3a                  | 30,000-100,000                         |                                     | 9330000  | ?-600                  | W, M                     |
| 56 | <i>Trachypithecus pileatus</i> | Capped Langur      | VU          | 1b                      | -                                      |                                     | -        | 402042                 | F                        |
| 57 | <i>Turdus feae</i>             | Grey-sided Thrush  | VU          | 1b, 3a                  | (2500-9999)                            |                                     | 322000   | 1000-2565              | F, DF                    |
| 58 | <i>Ursus thibetanus</i>        | Asiatic Black Bear | VU          | 1b                      | -                                      |                                     | -        | 0-4300                 | F, Sh, G, W, A, P, DF    |
| 59 | <i>Wallago attu</i>            |                    | VU          | 1b, 3a                  | -                                      |                                     | 10446620 | -                      | W, AA                    |
| 60 | <i>Leptoptilos dubius</i>      | Greater Adjutant   | NT          | 3a                      | 3,180-3,300                            | 16                                  | 1200000  | 0-500                  | F, G, A, U, W            |
| 61 | <i>Leptoptilos javanicus</i>   | Lesser Adjutant    | NT          | 3a                      | (5,000-15,000)                         | 25                                  | 13000000 | 0-500                  | F, S, A, W, M, AA        |

### Delineation of the EAAA

This section delineates the EAAA to be taken into consideration while screening the CH Candidate species.

The EAAA for screening any given CH Candidate species would need to include all its suitable habitat-types within and contiguous with the Study Area.

Based on the habitat profile of the Study Area and the ecology of the CH Candidate species, the EAAA for aquatic CH Candidate species is limited to only the aquatic habitats, namely Inland Wetlands, within and contiguous with the Study Area, while the EAAA for terrestrial CH Candidate species includes the entire Study Area.

### Screening of CH Candidates

This section describes the screening of the CH Candidates to identify as a 'Potential CH Trigger' any species that is likely to occur within the applicable EAAA in the minimum threshold number required to render the Study Area a CH for the said species.

For an IUCN Red-listed VU and NT species to qualify as Potential CH trigger, at least one of the following 2 attributes must apply to it:

(a) qualification as endemic or restricted range with respect to the applicable EAAA

(b) significant congregation records within or in proximity to the applicable EAAA

None of the 37 CH Candidate species categorized by the IUCN Red List as VU or NT qualify as potential CH triggers based on the said attributes. Hence all the said CH Candidate species are screened out at this stage of the CHS.

Screening of each of the 24 CH Candidate species categorized by the IUCN Red List as CR/EN was based on the following attributes, as available in its IUCN Red List assessment:

- its lowest global population estimate, which provides its minimum CH-triggering threshold
- its extent of occurrence (EOO), and therefore, the percentage of the EOO represented by the applicable EAAA
- its known elevation range and availability of the same in the applicable EAAA
- its suitable habitat-types and therefore, the percentage of the EAAA that constitutes suitable habitat for the species.

The screening of the 24 CH Candidate species categorized by the IUCN Red List as CR/EN as per the above-mentioned attributes resulted in all 24 species being screened out as Potential CH Triggers with respect to the EAAA.

Hence, the CHS resulted in all 61 CH candidate species being screened out as Potential CH Triggers with respect to the EAAA.

Table 5 presents details of the CH Screening, along with detailed rationales for screening out each CH Candidate species.

Table 5: Details of the Critical Habitat Screening

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|---|-------------------|
| 1  | <i>Asarcornis scutulata</i> , White-winged Duck, CR, 1a, 3a       | 150–450                                | 0.75                                | 2620000 | 0-400                  | F, W                     | <p>As per the IUCN Red List<sup>28</sup>, the species is Possibly Extinct with respect to the EAAA. With a large historical range, the species now occurs in eight countries including India, Myanmar and Thailand, with limited populations in Cambodia and Indonesia.</p> <p>As per the IUCN Red List, in India, the species is found in Assam and Arunachal Pradesh.</p> <p>Based on the Habitat Profile of the Study Area, less than 1% of the EAAA contains habitat types deemed suitable to the species.</p> <p>As per the IUCN Red List, the species' global population size is estimated to be 150-450 mature individuals, whereas in India the population size is approximately 50-150 mature individuals.</p> <p>As per the conservation strategy and action plan for the White-winged Duck (dated 2023)<sup>29</sup>, major population of the species is recorded from two protected areas in Assam – Nameri National Park</p> | Screened out      |

<sup>28</sup> BirdLife International. 2024. *Asarcornis scutulata*. *The IUCN Red List of Threatened Species* 2024: e.T22680064A244637841. <https://dx.doi.org/10.2305/IUCN.UK.2024-2.RLTS.T22680064A244637841.en>. Accessed on 18 February 2026.

<sup>29</sup> Ahmed A., Barman R., Samir S.K., Choudhury, A.U., Yadava M.K., Young G., Stanley Price M. R., Kaul R., and Menon V. (2023). Call of the Divine Duck : Conservation Strategy and Action Plan for the White Winged Duck in Assam.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>and Dihing Patkai National Park, with with smaller fragmented populations in Assam and Arunachal Pradesh.</p> <p>As per the said report, the species inhabits forested wetlands, pools, swamps and slow-moving streams and channels, favouring contiguous undisturbed primary forests.</p> <p>Review of the said report indicates that 24 individuals of the species were recorded from three forests in Assam during 2019-2020 surveys.</p> <p>As per the citizen science portal eBird<sup>30</sup>, the nearest record of the species is from Jorhat in Assam (~103 km NE), India and Nampagan in Myanmar (~173 km E).</p> <p>Considering the species' current distribution range, recent presence records and availability of suitable habitat types, it is unlikely that species occurs within the applicable EAAA.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |

<sup>30</sup> <https://ebird.org/species/whwdudc1>



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|---|-------------------|
| 2  | <i>Aythya baeri</i> , Baer's Pochard, CR, 1a, 3a                  | 250-999                                | 1.25                                | 2270000 | -                      | W                        | <p>As per the IUCN Red List<sup>31</sup>, the EAAA is situated within the non-breeding range of the species. The species is known to breed in parts of Russia and China and winters in parts of South and Southeast Asia, including India.</p> <p>As per the IUCN Red List, the distribution of the species is now highly localized, with just a handful sites used regularly either during the breeding or non-breeding (winter) season.</p> <p>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per the IUCN Red List, the species' wintering habitats include freshwater lakes and reservoirs.</p> <p>As per a research article (dated 2023)<sup>32</sup>, the species currently occurs in only one Protected Area in India which is Kaziranga National Park, Assam.</p> | Screened out      |

<sup>31</sup> BirdLife International. 2019. *Aythya baeri*. *The IUCN Red List of Threatened Species* 2019: e.T22680384A154436811. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T22680384A154436811.en>. Accessed on 18 February 2026.

<sup>32</sup> Wu, L.; Wang, Y.; Mo, X.; Wei, Q.; Ma, C.; Wang, H.; Townshend, T.; Jia, Y.; Hu, W.; Lei, G. Shifted to the South, Shifted to the North, but No Expansion: Potential Suitable Habitat Distribution Shift and Conservation Gap of the Critically Endangered Baer's Pochard (*Aythya baeri*). *Remote Sens.* 2022, 14, 2171. <https://doi.org/10.3390/rs14092171>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO      | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|----------|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |          |                        |                          | <p>As per the citizen science portal eBird<sup>33</sup>, the nearest record of the species is from Jorhat in Assam (~103 km NE), and Imphal in Manipur (~124 km S), of 2-5 individuals recorded as recent as 2023. Review of records on the citizen science portal indicate that the species likely occurs frequently in Assam, with records ranging from December to March.</p> <p>Considering the species' current distribution range, recent presence records and availability of suitable habitat types, it is unlikely that species occurs within the applicable EAAA.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species or cyclically in the EAAA.</p> |                   |
| 3  | <i>Emberiza aureola</i> , Yellow-breasted Bunting, CR, 1a         | -                                      | -                                   | 11317030 | 0-3000                 | SH, G, A, W              | <p>As per the IUCN Red List<sup>34</sup>, the EAAA is situated within the non-breeding range of the species. The species is known to breed in parts of Central Asia and winters in parts of South and Southeast Asia, including northeastern India.</p>   | Screened out      |

<sup>33</sup> <https://ebird.org/species/baepoc1>

<sup>34</sup> BirdLife International. 2017. *Emberiza aureola*. *The IUCN Red List of Threatened Species* 2017: e.T22720966A119335690. <https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22720966A119335690.en>. Accessed on 18 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>The global population size of the species is not available. As per the IUCN Red List, only 120-600 mature individuals are estimated in the European population. However, such regional estimates are not available for other regions in the species' distribution range.</p> <p>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per the IUCN Red List, the species' wintering habitats include cultivated areas, rice fields and grasslands. The species prefers scrubby dry-water rice fields for foraging and reedbeds for roosting. As per a research article (dated 2021)<sup>35</sup>, the species' wintering stronghold in northeastern India is Assam, primarily the Brahmaputra River Valley.</p> <p>As per the citizen science portal eBird<sup>36</sup>, the nearest records of the species include multiple records from Jorhat in Assam (~103 km NE), and Imphal in Manipur (~124</p> |                   |

<sup>35</sup> Choudhury, A. and A. S. Choudhury (2021). The Critically Endangered Yellow-breasted Bunting *Emberiza aureola* in southern Assam. Indian BIRDS Vol 17 No. 5

<sup>36</sup> <https://ebird.org/species/yebbun>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>km S). Review of records on the citizen science portal indicates that the species likely occurs in Assam, Manipur and Tripura in northeastern India as well as in West Bengal, Sikkim and Uttarakhand. The species has also been recorded in western and southern coast of India</p> <p>Considering the species' current distribution range, recent presence records and availability of suitable habitat types, it is unlikely that species occurs within the applicable EAAA.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |
| 4  | <i>Gyps bengalensis</i> , White-rumped Vulture, CR, 1a            | 6000-9000                              | 30                                  | -   | -                      | F, S, Sh, G, U           | <p>As per the IUCN Red List<sup>37</sup>, the species is Resident with respect to the EAAA. Besides India, the species occurs in countries in the South and Southeast Asia.</p> <p>Based on Google Earth imagery, ~99% of the applicable EAAA contains parts of the habitat types suitable, but not of major importance, to the species, as per IUCN Red List data.</p>  | Screened out      |

<sup>37</sup> BirdLife International. 2021. *Gyps bengalensis*. *The IUCN Red List of Threatened Species* 2021: e.T22695194A204618615. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22695194A204618615.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>As per the citizen science portal eBird<sup>38</sup>, recent nearest records of the species are from Jorhat, Assam (~103 km NE).</p> <p>No recent published literature is available for vultures in Nagaland. As per a research article (dated 2001)<sup>39</sup>, the species is very rare in Nagaland and frequently hunted for food.</p> <p>As per the IUCN Red List, the species has a large extent of occurrence and is widespread throughout India.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |
| 5  | <i>Gyps tenuirostris</i> , Slender-billed Vulture, CR, 1a         | 1100-1300                              | 5.5                                 | -   | -                      | F, S, Sh, G, U           | <p>As per the IUCN Red List<sup>40</sup>, the species is Resident with respect to the EAAA. Besides India, the species occurs in Nepal and Bangladesh, with few records from Cambodia, Laos and Myanmar.</p> <p>Based on Google Earth imagery, ~99% of the applicable EAAA contains parts of the habitat types suitable, but not of major</p>  | Screened out      |

<sup>38</sup> <https://ebird.org/species/whrvul1>

<sup>39</sup> Choudhury, A. (2001) Some bird records from Nagaland, north-east India. Forktail (17), pp 91-103.

<sup>40</sup> BirdLife International. 2021. *Gyps tenuirostris*. *The IUCN Red List of Threatened Species* 2021: e.T22729460A204781113. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22729460A204781113.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO  | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|------|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |      |                        |                          | <p>importance, to the species, as per IUCN Red List data.</p> <p>As per the citizen science portal eBird<sup>41</sup>, recent nearest records of the species are from Jorhat, Assam (~103 km NE).</p> <p>The EAAA appears to be understudied with respect to vulture diversity. No recent published literature is available for vultures in Nagaland.</p> <p>As per the IUCN Red List, the species occurs in dry, open and forested areas away from human habitation.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |
| 6  | <i>Heliopais personatus</i> , Masked Finfoot, CR, 1a              | (108-304)                              | 0.54                                | 6361 | 1200-1800              | F, W                     | <p>As per the IUCN Red List<sup>42</sup>, the species is Possibly Extant with respect to the EAAA, meaning its presence in the EAAA is uncertain but probable.</p> <p>As per the IUCN Red List, the species' stronghold is assumed to be the Sunderbans in Bangladesh, with records from Myanmar, Cambodia, Vietnam and Laos.</p>   | Screened out      |

<sup>41</sup> <https://ebird.org/species/slbvul1>

<sup>42</sup> BirdLife International. 2022. *Heliopais personatus*. *The IUCN Red List of Threatened Species* 2022: e.T22692181A181604713. <https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T22692181A181604713.en>. Accessed on 23 February 2026.



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>As per the IUCN Red List, the species primarily occurs in rivers in lowland riverine forests including mangroves but is also recorded from coastal and inland wetlands such as tidal creeks, flooded forest, swamps and lakes (rarely reservoirs or industrial pools on passage).</p> <p>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per the citizen science portal eBird<sup>43</sup>, all records of the species within the last ten years are restricted to Bangladesh, with no records from India.</p> <p>As per a research article (dated 2020)<sup>44</sup>, the only verified records of the species from India are from specimens collected in the early twentieth century from Assam and Arunachal Pradesh. The article indicates that while no recent records are available for the species in other northeastern states, it is possible that small, and</p> |                   |

<sup>43</sup> <https://ebird.org/species/masfin3>

<sup>44</sup> Chowdhury, SAYAM U., et al. "The status and distribution of the Masked Finfoot *Heliopais personatus*—Asia's next avian extinction." *Forktail* 36 (2020): 16-24.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | as yet undetected, populations of the species persist in the densely forested swamps and hill tracts in remoter parts of Arunachal Pradesh, Assam and other of India's north-east states, especially along the Dibang and Lohit drainages<br>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.   |                   |
| 7  | <i>Houbaropsis bengalensis</i> , Bengal Florican, CR, 1a          | 350-1500                               | 1.75                                | 420 | -                      | G, A                     | As per the IUCN Red List <sup>45</sup> , the species is Possibly Extinct with respect to the EAAA. The species occurs in two disjunct populations, one in the Indian subcontinent and the other in South-east Asia. The Indian Subcontinent occurs in India, Nepal and Bangladesh.<br>In India, the species is known to occur in Uttar Pradesh, Assam and Arunachal Pradesh.<br>As per the IUCN Red List, the species occurs in lowland dry, or seasonally inundated, natural and semi-natural grasslands, often interspersed with scattered scrub or patchy open forest. | Screened out      |

<sup>45</sup> BirdLife International. 2018. *Houbaropsis bengalensis*. *The IUCN Red List of Threatened Species* 2018: e.T22692015A130184896. <https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22692015A130184896.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per the citizen science portal eBird<sup>46</sup>, recent nearest records of the species are from Kaziranga National Park, Assam (~82 km N). There are no relevant records of the species from Nagaland.</p> <p>As per a research article (dated 2017)<sup>47</sup>, the species occurs along the foothills of the Himalayas and the Brahmaputra Plains. It is possible that undetected populations may remain along large rivers such as the Brahmaputra which support large grasslands.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |
| 8  | <i>Manis pentadactyla</i> , Chinese Pangolin, CR, 1a              | -                                      | -                                   | -   | 0-1850                 | F, Sh, G                 | As per the IUCN Red List <sup>48</sup> , this species is Resident with respect to the EAAA. It occurs in the  | Screened out      |

<sup>46</sup> <https://ebird.org/species/benflo2>

<sup>47</sup> Jha, R. R., Thakuri, J. J., Rahmani, A. R., Dhakal, M., Khongsai, N., Pradhan, N. M. B., ... & Donald, P. F. (2018). Distribution, movements, and survival of the critically endangered Bengal Florican *Houbaropsis bengalensis* in India and Nepal. *Journal of Ornithology*, 159(3), 851-866.

<sup>48</sup> Challender, D., Wu, S., Kaspal, P., Khatiwada, A., Ghose, A., Ching-Min Sun, N., Mohapatra, R.K. & Laxmi Suwal, T. 2019. *Manis pentadactyla* (errata version published in 2020). *The IUCN Red List of Threatened Species* 2019: e.T12764A168392151. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12764A168392151.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>Himalayan foothills of India, Nepal and Bhutan, as also in Bangladesh, Myanmar, Leo PDR, Viet Nam, Thailand and China.</p> <p>As per the IUCN Red List, the species is found in a wide range of habitats, including primary and secondary tropical forests, limestone, bamboo, broad-leaf and coniferous forests, grasslands and agricultural fields.</p> <p>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per the citizen science portal iNaturalist, the nearest record of the species is from the forests near Akhegwo, Nagaland (~100 km E).</p> <p>Based on the species' distribution range, recent presence records and availability of suitable habitat types, the minimum CH triggering number of individuals of the species is unlikely to occur regularly or cyclically in the EAAA.</p> |                   |
| 9  | <i>Manouria emys</i> , Asian Giant Tortoise, CR, 1a               | -                                      | -                                   | -   | 0-1850                 | F                        | As per the IUCN Red List <sup>49</sup> , the species is Resident with respect to   | Screened out      |

<sup>49</sup> Choudhury, B.C., Cota, M., McCormack, T., Platt, K., Das, I., Ahmed, M.F., Timmins, R.J., Rahman, S.C. & Singh, S. 2019. *Manouria emys* (errata version published in 2019). *The IUCN Red List of Threatened Species* 2019: e.T12774A152052098. <https://dx.doi.org/10.2305/IUCN.UK.2019->

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>the EAAA. It occurs from Bangladesh to northeastern India, Myanmar, Thailand, Malaysia and Indonesia.</p> <p>As per the IUCN Red List (assessed 2018), recent records from India are only from Manipur, Mizoram, and Assam.</p> <p>The species exclusively inhabits evergreen forests and is typically found near water and burrow in damp soil.</p> <p>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>There are no relevant research or other articles regarding the species in Nagaland.</p> <p>As per the citizen science portal iNaturalist<sup>50</sup>, the nearest record of the species, dated 2009, is from Langlokso Bay in Assam (~24 km SW).</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |

[1.RLTS.T12774A152052098.en](#). Accessed on 23 February 2026.

<sup>50</sup> <https://www.inaturalist.org/>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
| 10 | <i>Nilssonia nigricans</i> , Black Softshell Turtle, CR, 1a       | -                                      | -                                   | -   | 0-200                  | W, AA                    | <p>As per the IUCN Red List<sup>51</sup>, the species is Resident with respect to the EAAA. It occurs along the Brahmaputra River and its tributaries, as well as several temple ponds in Assam and Tripura, and river systems in Bangladesh.</p> <p>As per the IUCN Red List, in the wild it is known to occur in large riverine habitats and captive populations in temple ponds.</p> <p>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>There are no relevant research or other articles regarding the species in Nagaland.</p> <p>As per the citizen science portal iNaturalist<sup>52</sup>, the nearest record of the species is from near Kaziranga National Park, Assam (~82 km N).</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> | Screened out      |

<sup>51</sup> Praschag, P., Ahmed, M.F. & Singh, S. 2021. *Nilssonia nigricans*. *The IUCN Red List of Threatened Species* 2021: e.T2173A2778172. <https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T2173A2778172.en>. Accessed on 23 February 2026.

<sup>52</sup> <https://www.inaturalist.org/>



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO   | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-------|------------------------|--------------------------|---|-------------------|
| 11 | <i>Pangshura sylhetensis</i> , Assam Roofed Turtle, CR, 1a        | -                                      | -                                   | 1437  | 500-1300               | W                        | <p>As per the IUCN Red List<sup>53</sup>, the species is Resident with respect to the EAAA. It occurs in the foothill areas adjoining the Brahmaputra valley of Bangladesh and India, and Bhutan.</p> <p>It is confined to small, clear, fast-flowing streams and may seasonally use nearby waterbodies with less or no current.</p> <p>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>There are no relevant research or other articles regarding the species in Nagaland.</p> <p>As per the citizen science portal iNaturalist<sup>54</sup>, the nearest record of the species is from Assam (~60 km N and further NW).</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> | Screened out      |
| 12 | <i>Perdicula manipurensis</i> ,                                   | (1-200)                                | 1                                   | 14300 | 0-500                  | Sh, G, W                 | <p>As per the IUCN Red List<sup>55</sup>, the species is Resident with respect to</p>   | Screened out      |

<sup>53</sup> Praschag, P., Das, I., Ahmed, M.F. & Singh, S. 2021. *Pangshura sylhetensis*. *The IUCN Red List of Threatened Species* 2021: e.T10950A499618. <https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T10950A499618.en>. Accessed on 23 February 2026.

<sup>54</sup> <https://www.inaturalist.org/>

<sup>55</sup> BirdLife International. 2024. *Perdicula manipurensis*. *The IUCN Red List of Threatened Species* 2024:

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    | Manipur Bush-quail, CR, 1a  |  |                                     |     |                        |                          | <p>the EAAA. It is known historically from northern West Bengal, Assam and Manipur, with unconfirmed historical records from Nagaland and Meghalaya and Bangladesh. As per the IUCN Red List assessment, there has been no confirmed record of this species since 1932. Remaining populations are likely very small and fragmentated and thought most likely to be in Assam.</p> <p>Although very little is known about the species, it is known to inhabits damp grassland, particularly stands of tall grass, and sometimes bogs and swamps.</p> <p>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>Based on multiple research articles (dated 2009<sup>56</sup> and 2024<sup>57</sup>), the species has not been recorded for over a century. While one website<sup>58</sup> mentions a 2006 (unconfirmed)</p> |                   |

e.T22679012A218880247. <https://dx.doi.org/10.2305/IUCN.UK.2024-2.RLTS.T22679012A218880247.en>. Accessed on 23 February 2026.

<sup>56</sup> Choudhury, Anwaruddin. "Significant recent ornithological records from Manipur, north-east India, with an annotated checklist." *Forktail* 25 (2009): 71-89.

<sup>57</sup> Manna, S., Chatterjee, S., Jha, S., Rahut, B., Baidya, K., Das, S., ... & Sengupta, S. (2024). A checklist of the birds of West Bengal, India. *Indian Birds*, 20(4), 97-128.

<sup>58</sup> <https://www.birdfund.org/new-page-4>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | record from Manas National Park, Assam and proposes a survey for the species in non-protected areas of Assam from December 2025-March 2026.<br>There are no records of the species on the citizen science portals such as eBird <sup>59</sup> or iNaturalist.<br>Based on the available data and considering the habitat requirements of the species, the minimum CH triggering number of individuals of the species is unlikely to occur regularly or cyclically in the EAAA. |                   |
| 13 | <i>Sarcogyps calvus</i> , Red-headed Vulture, CR, 1a              | 3,750-14,999                           | 18.75                               | -   | -                      | F, S, Sh, G, U           | As per the IUCN Red List <sup>60</sup> , the species is Possibly Extinct with respect to the EAAA. Besides India, the species occurs in countries in the South and Southeast Asia.<br>As per the IUCN Red List, the species occurs in open country usually away from human habitation, well-wooded hills and dry deciduous forest with rivers.<br>Based on Google Earth imagery, ~99% of the applicable EAAA contains parts of the habitat types suitable, but not of major    | Screened out      |

<sup>59</sup> <https://ebird.org/species/mabqua1>

<sup>60</sup> BirdLife International. 2021. *Sarcogyps calvus*. *The IUCN Red List of Threatened Species* 2021: e.T22695254A205031246. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22695254A205031246.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | importance, to the species, as per IUCN Red List data.<br>As per the citizen science portal eBird <sup>61</sup> , recent nearest records of the species are from Kaziranga National Park, Assam (~82 km N).<br>No recent published literature is available for vultures in Nagaland.<br>As per the IUCN Red List, the species is sparsely distributed in India, and now rare or absent from the northeastern states. It is common in the west Himalayan foothills.<br>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species. |                   |
| 14 | <i>Aquila nipalensis</i> , Steppe Eagle, EN, 1a                   | 78,042-110,193                         | 390.21                              | -   | -                      | F, S, G, RA, D           | As per the IUCN Red List <sup>62</sup> , the EAAA is situated within the non-breeding range of the species. The species is known to breed in parts of Central Asia and China. Birds from Altai, Siberia and eastwards migrate to South and Southeast Asia in winter.<br>As per the IUCN Red List, the suitable habitat-types during the non-breeding season appear to be   | Screened out      |

<sup>61</sup> <https://ebird.org/species/rehvul1>

<sup>62</sup> BirdLife International. 2021. *Aquila nipalensis*. *The IUCN Red List of Threatened Species* 2021: e.T22696038A205452572. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22696038A205452572.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO    | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|--------|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |        |                        |                          | <p>forests, savanna, grasslands and desert.</p> <p>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>There are no relevant research or other articles regarding Steppe Eagles in Nagaland.</p> <p>As per the citizen science portal eBird<sup>63</sup>, the nearest record of the species is from Kaziranga National Park in Assam (~82 km N), and Imphal in Manipur (~122 km S), of 2-5 individuals recorded as recent as 2023. Review of records on the citizen science portal indicate that the species winters in various parts of India.</p> <p>Considering the species' current distribution range, recent presence records and availability of suitable habitat types, it is unlikely that species occurs within the applicable EAAA.</p> |                   |
| 15 | <i>Calidris tenuirostris</i> , Great Knot, EN, 1a, 3a             | 255,000-340,000                        | 1275                                | 355000 | 0-70                   | G, M                     | As per the IUCN Red List <sup>64</sup> , the species is a Passage Migrant with respect to the EAAA. The species is   | Screened out      |

<sup>63</sup> <https://ebird.org/species/steeag1>

<sup>64</sup> BirdLife International. 2025. *Calidris tenuirostris*. *The IUCN Red List of Threatened Species* 2025: e.T22693359A254641184. <https://dx.doi.org/10.2305/IUCN.UK.2025-2.RLTS.T22693359A254641184.en>. Accessed on 23 February 2026.

| SN | Scientific Name,<br>Common Name,<br>IUCN<br>Status, Applicable<br>CH Criteria | Global<br>Population<br>(mature<br>individuals) | Minimum<br>CH Trigger<br>Threshold<br>Number | EOO | Elevation<br>Range (in<br>m) | Suitable<br>Habitat Type(s) | Screening Rationale  | Screening<br>Outcome |
|----|---|---|--|-----|------------------------------|-----------------------------|--|----------------------|
|    |   |   |  |     |                              |                             | <p>known to breed in parts of Siberia and Russia, wintering across the coastline of Southeast Asia and the Indian Subcontinent, as well as Australia, and the eastern coast of Arabian Peninsula.</p> <p>As per the IUCN Red List, the wintering habitats of the species include sheltered coastal areas such as inlets, bays, harbours, estuaries and lagoons with large intertidal mud and sandflats, oceanic sandy beaches with nearby mudflats, sandy spits and islets, muddy shorelines with mangroves and occasionally exposed reefs or rock platforms. On passage the species stages in estuaries and on intertidal mudflats.</p> <p>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>There are no relevant research or other articles regarding Steppe Eagles in Nagaland.</p> <p>Review of records on the citizen science portal eBird<sup>65</sup> indicates that the species occurs along the Indian</p> |                      |

<sup>65</sup> <https://ebird.org/species/grekno>



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | coastline, with stray inland records in Rajasthan and Madhya Pradesh. Considering the species' distribution range, recent presence records and availability of suitable habitat types, it is unlikely that species occurs within the applicable EAAA.   |                   |
| 16 | <i>Cuon alpinus</i> , Dhole, EN, 1a                               | 4,500–10,500                           | 22.5                                | -   | 0-5300                 | F, Sh, G                 | <p>As per the IUCN Red List<sup>66</sup>, the species is Resident with respect to the EAAA. The species is distributed in Central and East Asia, Indian Subcontinent and other countries in South and Southeast Asia.</p> <p>As per the IUCN Red List, the species is found in several regions of India. Relatively high populations of the species are found in Western Ghats and the central Indian forests. Their numbers in northeastern states are low and decreasing.</p> <p>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> | Screened out      |

<sup>66</sup> Kamler, J.F., Songsasen, N., Jenks, K., Srivathsa, A., Sheng, L. & Kunkel, K. 2015. *Cuon alpinus*. *The IUCN Red List of Threatened Species* 2015: e.T5953A72477893. <https://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T5953A72477893.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>As per a research article (dated 2019)<sup>67</sup>, records of Dhole in northeastern India were reviewed from 2010-2018. The review indicates that the species has been recorded from the forests of eastern Nagaland. The nearest record of the species is from Intaki National Park (~26 km SW).</p> <p>As per a research article (dated 2020)<sup>68</sup>, the species now occurs in small populations mostly restricted to forest habitats and agroforests abutting protected areas.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |
| 17 | <i>Cuora amboinensis</i> , Southeast Asian Box Turtle, EN, 1a     | -                                      | -                                   | -   | 0-400                  | F, W, AA                 | <p>As per the IUCN Red List<sup>69</sup>, the species is Resident with respect to the EAAA. It occurs in India, Bangladesh and throughout Southeast Asia</p> <p>It largely inhabits most types of waterbodies except large rivers and reservoirs, preferring lowland</p>  | Screened out      |

<sup>67</sup> Singh P, Srivathsa A, Macdonald DW. Conservation status of the dhole *Cuon alpinus* in north-east India, with a focus on Dampa Tiger Reserve, Mizoram. *Oryx*. 2020;54(6):873-877. doi:10.1017/S0030605319000255

<sup>68</sup> Srivathsa, A., Sharma, S., Singh, P., Punjabi, G. A., & Oli, M. K. (2020). A strategic road map for conserving the Endangered dhole *Cuon alpinus* in India. *Mammal Review*, 50(4), 399-412.

<sup>69</sup> Cota, M., Hoang, H., Horne, B.D., Kusrini, M.D., McCormack, T., Platt, K., Schoppe, S. & Shepherd, C. 2020. *Cuora amboinensis*. *The IUCN Red List of Threatened Species* 2020: e.T5958A3078812. <https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T5958A3078812.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | swampy areas with dense vegetation as well as intermittent streams in hill forests, mangrove creeks, rice paddies, irrigation canals and tidal areas.<br>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.<br>As per a research article (dated 2017) <sup>70</sup> , the species has a historical record from Nagaland. However, no published literature is available on the distribution of the species in the state.<br>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species. |                   |
| 18 | <i>Cuora mouhotii</i> , Keeled Box Turtle, EN, 1a                 | -                                      | -                                   | -   | 350-1200               | F, W                     | As per the IUCN Red List <sup>71</sup> , the species is Resident with respect to the EAAA. It has a disjunct distribution in the Indian subcontinent, northern Myanmar, southern China, Laos PDR and Viet Nam.  | Screened out      |

<sup>70</sup> Das, K.C. & A. Gupta (2017). An ecological note on the new record of *Cuora amboinensis* (Riche in Daudin, 1801) (Reptilia: Testudines: Geoemydidae) in northeastern India. *Journal of Threatened Taxa* 9(7): 10459–10462; <http://doi.org/10.11609/jott.1915.9.7.10459-10462>

<sup>71</sup> Ahmed, M.F., Horne, B.D., Li, P., Platt, K., Rahman, S.C. & Wang, L. 2020. *Cuora mouhotii*. *The IUCN Red List of Threatened Species* 2020: e.T163414A1006285. <https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T163414A1006285.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>In India, it is known to occur in Arunachal Pradesh, Assam, Meghalaya and Mizoram.</p> <p>It largely inhabits tropical moist evergreen forests with low undergrowth and leaf litter, and lowland swamp areas.</p> <p>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per a research article (dated 2013)<sup>72</sup>, two specimens were found in a zoo from Nagaland, which were collected from nearby regions. However, there is no clarity regarding the location of these specimens.</p> <p>Based on the citizen science portal iNaturalist, all records of the species are from Assam and Arunachal Pradesh.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |

<sup>72</sup> Bhupathy, S., Kumar, S. R., Paramanandham, J., Thirumalainathan, P., & Sarma, P. K. (2013). Conservation of reptiles in Nagaland, India. *Bioresources and Traditional Knowledge of Northeast India. Mizo Post Graduate Science Society (MIPOGRASS), Sikulpuikawn, Aizawl, 796001*, 181-186.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO      | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|----------|------------------------|--------------------------|--|-------------------|
| 19 | <i>Elephas maximus</i> , Asian Elephant, EN, 1a                   | 48,323–51,680                          | 241.615                             | 11317030 | 0-3000                 | F, Sh, G, P, DF          | <p>As per the IUCN Red List<sup>73</sup>, the species is Resident with respect to the EAAA. It occurs in Bangladesh, Bhutan, India, Nepal, and Sri Lanka in South Asia and Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Thailand, and Viet Nam in Southeast Asia.</p> <p>In India, it is restricted to four regions, northeastern India, central India, northwestern India, and southern India. In northeastern India.</p> <p>As per the IUCN Red List, the species is found in grassland, tropical evergreen forest, semi-evergreen forest, moist deciduous forest, dry deciduous forested and dry thorn forest, in addition to cultivated and secondary forests or scrublands.</p> <p>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per a scientific report (dated 2017), the northeastern population of the species ranges in the states of Assam, Arunachal Pradesh,</p> | Screened out      |

<sup>73</sup> Williams, C., Tiwari, S.K., Goswami, V.R., de Silva, S., Kumar, A., Baskaran, N., Yoganand, K. & Menon, V. 2020. *Elephas maximus*. *The IUCN Red List of Threatened Species* 2020: e.T7140A45818198. <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T7140A45818198.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>Manipur, Meghalaya, Mizoram, Nagaland and Tripura. There are also a few isolated populations in Dhansiri-Intanki region (N of the Project Site).</p> <p>As per a scientific report (dated 2023)<sup>74</sup> on elephant corridors in India, the nearest corridor wrt the Project Site is the Daldali-Dimapur Corridor. While no information is available on the number of elephants using this corridor, the elephant movement status is recorded as occasional, and is connected to the forest ranges of Rangapahar and Kuhuboto. The Report also notes that the intensity of use of the corridor by elephants has decreased.</p> <p>A document on the Nagaland Pollution Control Board (dated 2021)<sup>75</sup> indicates that as of a census report dated 2017, Nagaland has a population of 446 elephants.</p> <p>Review of the media articles<sup>76</sup> suggests that occurrence of elephants in human habitation is</p> |                   |

<sup>74</sup> Project Elephant, MoEF&CC, Government of India (2023), Elephant Corridors of India 2023 (Edition – 1/2023).

<sup>75</sup> <https://npcb.nagaland.gov.in/wp-content/uploads/World-Elephant-Day.pdf>

<sup>76</sup> <https://www.easternmirrornagaland.com/elephant-herd-sighted-near-hovishe-dimapur-wildlife-division-issues-advisory>, <https://nagalandtribune.in/herd-of-elephants-damages-crops-and-properties-in-ralan-area-ralh-appeals-wildlife-warden-to-take-prompt-action/>



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>limited to areas near the hills and forests, such as Niuland (~25 km E), Hovishe (~23 km E) and Ralan (~27 km NE).</p> <p>As per a media article (dated 2025)<sup>77</sup>, Wokha (~60 km NE) supports the highest number of elephants in Nagaland (200 individuals as of 2023).</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p>  |                   |
| 20 | <i>Hoolock hoolock</i> , Western Hoolock Gibbon, EN, 1a           | -                                      | -                                   | -   | 0-2500                 | F, P. RG                 | <p>As per the IUCN Red List<sup>78</sup>, the species is Resident with respect to the EAAA. It is found in eastern Bangladesh, northeastern India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura), and northwestern Myanmar.</p> <p>As per the IUCN Red List, it is a forest-dwelling species inhabiting tropical evergreen rainforests, tropical evergreen and semi-evergreen forests, tropical mixed deciduous forests, and subtropical broadleaf hill forests.</p> | Screened out      |

<sup>77</sup> <https://nagalandtribune.in/wokha-in-the-crosshairs-of-growing-human-elephant-conflict-leaders-demand-long-term-strategy/>

<sup>78</sup> Brockelman, W, Molur, S. & Geissmann, T. 2019. *Hoolock hoolock*. *The IUCN Red List of Threatened Species* 2019: e.T39876A17968083. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T39876A17968083.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per a research article (dated 2014)<sup>79</sup>, the species has been recorded in all districts in Nagaland. It occurs in Intaki National Park (~26 km SW), Fakim Wildlife Sanctuary (~128 km E) and Singphan Reserved Forest (~160 km NE), but had apparently disappeared from Pulie Badge Wildlife Sanctuary (~44 km SE) and Rangapahar Wildlife Sanctuary (~2 km S).</p> <p>As per the citizen science portal iNaturalist, nearest observations of the species are from Assam.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |
| 21 | <i>Melanochelys tricarinata</i> , Tricarinate Hill Turtle, EN, 1a | -                                      | -                                   | -   | ?-300                  | F, S, G, W               | As per the IUCN Red List <sup>80</sup> , the species is Resident with respect to the EAAA. It inhabits the Himalayan foothills western Uttar Pradesh to  | Screened out      |

<sup>79</sup> Deb, P., Rai, P. K., & Bhattacharjee, P. C. (2014). A review on the distribution of Western Hoolock Gibbon (Hoolock hoolock) in Northeast India. *Journal of Research in Biology*, 4(3), 1301-1310.

<sup>80</sup> Horne, B.D., Praschag, P., Choudhury, B.C. & Singh, S. 2020. *Melanochelys tricarinata*. *The IUCN Red List of Threatened Species* 2020: e.T13038A511526. <https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T13038A511526.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>Arunachal Pradesh of northern and northeastern India and southern Nepal.</p> <p>As per the IUCN Red List, the species is found in grasslands along the Ganga and Brahmaputra at the foot of the Himalayas, moist deciduous and wet evergreen forests of the nearby foothill areas. Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>There are no relevant research or other articles regarding the species in Nagaland.</p> <p>As per the citizen science portal iNaturalist<sup>81</sup>, the nearest record of the species is from Assam.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |
| 22 | <i>Nycticebus bengalensis</i> , Bengal Slow Loris, EN, 1a         | -                                      | -                                   | -   | 0-2400                 | F                        | <p>As per the IUCN Red List<sup>82</sup>, the species is Resident with respect to the EAAA. It is found in India, Bangladesh, Bhutan, Cambodia,</p>   | Screened out      |

<sup>81</sup> <https://www.inaturalist.org/>

<sup>82</sup> Nekaris, K.A.I., Al-Razi, H., Blair, M., Das, N., Ni, Q., Samun, E., Streicher, U., Xue-long, J. & Yongcheng, L. 2020. *Nycticebus bengalensis* (errata version published in 2020). *The IUCN Red List of Threatened Species* 2020: e.T39758A179045340. <https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T39758A179045340.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>China, Myanmar, Laos PDR, Thailand and Vietnam.</p> <p>In India, the species is found in northeastern states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura.</p> <p>As per the IUCN Red List, this nocturnal, arboreal species inhabits tropical evergreen rainforest, semi-evergreen forest, and mixed deciduous forest.</p> <p>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per a research article (dated 2021)<sup>83</sup>, approximately 20% of Nagaland contains potential areas suitable to the species.</p> <p>As per a research document (dated 2021)<sup>84</sup>, the species is reported from Fakim Wildlife Sanctuary, Intaki Wildlife Sanctuary, Pulie Badge Wildlife Sanctuary and Singphan Wildlife Sanctuary. It is</p> |                   |

<sup>83</sup> Kumara, H. N., Babu, S., Nitte, M., & Karunakaran, P. V. (2021). Conservation status and potential distribution of the Bengal Slow Loris *Nycticebus bengalensis* in Northeast India. *Primate Conservation*, 35, 1-10.

<sup>84</sup> Lyngdoh, A.W., Khatonier, P., Das., J., & Lyngdoh, S. (2021). A Survival Blueprint for the conservation and management of the Bengal Slow Loris, *Nycticebus bengalensis*, in Meghalaya, India. An output from the EDGE of Existence fellowship, Zoological Society of London and National Geographic PhotoArk Program, 2019-2021.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | also recorded from Mokukchung village. However, the population or number of individuals in these regions are not known.<br>As per the citizen science portal iNaturalist, the nearest record of the species is from Sirhima (~25 km SE).<br>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.  |                   |
| 23 | <i>Tor putitora</i> , EN, 1a, 3a                                  | -                                      | -                                   | -   | -                      | W, AA                    | As per the IUCN Red List <sup>85</sup> , the species is Resident with respect to the EAAA. It naturally occurs in the rivers of the South Himalayan drainage, namely the Indus, Ganges-Yamuna and Brahmaputra.<br>As per the IUCN Red List, the species inhabits high energy river systems characterized by rapids and pools with rocky substrate. It has also adapted to lacustrine habitats created by impoundment of dams.<br>Based on Google Earth imagery, less than 1% of the applicable EAAA contains parts of the habitat | Screened out      |

<sup>85</sup> Jha, B.R., Rayamajhi, A., Dahanukar, N., Harrison, A. & Pinder, A. 2018. *Tor putitora*. *The IUCN Red List of Threatened Species* 2018: e.T126319882A126322226. <https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T126319882A126322226.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria                  | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|--|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |  |  |                                     |     |                        |                          | <p>types suitable to the species, as per IUCN Red List data.</p> <p>As per a research article (dated 2025)<sup>86</sup>, the species is recorded from Tsurang and Milak Rivers of Mokokchung District in Nagaland (~90 km NE).</p> <p>As per a research article (dated 2025)<sup>87</sup>, the species has been frequently recorded from Doyang River in Nagaland (~57 km NE).</p> <p>As per a research article (dated 2012)<sup>88</sup>, the species has been recorded from the Dhansiri River near Ranagpahar WLS&gt; However, more recent data on presence and numbers of the species with respect to the EAAA are not available.</p> <p>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</p> |                   |
| 24 | <i>Trachypithecus pileatus</i> ssp. <i>pileatus</i> , Blond-bellied Langur, EN, 1a | -                                      | -                                   | -   | 402042                 | F, P                     | As per its IUCN Geographic Range, the species is resident with respect to the applicable EAAA. It is distributed in Bhutan and north-eastern India.   | Screened out      |

<sup>86</sup> Khesoh, V., Pulo, Z., & Pankaj, P. P. (2025). Ichthyofaunal diversity and conservation status of the Tsurang and Milak Rivers of Mokokchung District, Nagaland. *Journal of Applied & Natural Science*, 17(4).

<sup>87</sup> Sukha, P., & Sarma, K. J. (2025). Checklist of Ichthyofaunal diversity of Nagaland, India. *Journal of Fisheries*, 13(2), 132301-132301.

<sup>88</sup> Acharjee, B., Borah, P., Das, M., & Purkayastha, J. (2012). Ichthyofaunal diversity of dhansiri river, Dimapur, Nagaland, India. *Check List*, 8(6), 1163-1165.



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <p>As per an article (dated 2014)<sup>89</sup>, 3 subspecies of the species <i>Trachypithecus pileatus</i> have been recognized. Of these the <i>Trachypithecus pileatus</i> ssp. <i>pileatus</i> occurs in northeastern India. It is cut away from the other two subspecies by the Brahmaputra. Most of these species have been distinguished based on their distribution and facial hair patterns.</p> <p>As per the said article, the species has scattered occurrence in Nagaland. Its presence in Pulie Badge Wildlife Sanctuary and Rangapahar Wildlife Sanctuary is nearly extirpated. It occurs near the Indo-Myanmar border near Saramati and Noklak where good habitat still remains.</p> <p>While the concerned subspecies has been assessed as Endangered in the year 2020, an updated assessment for the parent species</p> |                   |

<sup>89</sup> Choudhury, A. 2014. Distribution and current status of the Capped Langur *Trachypithecus pileatus* in India, and a review of geographic variation in its subspecies. *Primate Conservation* 28: 143-157.

| SN | Scientific Name,<br>Common Name,<br>IUCN<br>Status, Applicable<br>CH Criteria | Global<br>Population<br>(mature<br>individuals) | Minimum<br>CH Trigger<br>Threshold<br>Number | EOO | Elevation<br>Range (in<br>m) | Suitable<br>Habitat Type(s) | Screening Rationale   | Screening<br>Outcome |
|----|---|---|--|-----|------------------------------|-----------------------------|---|----------------------|
|    |   |   |  |     |                              |                             | (dated 2024) <sup>90</sup> categorizes the species as Vulnerable. Therefore, based on the available data and availability of suitable habitats beyond the EAAA, it is unlikely that the EAAA supports CH-triggering populations of these species. |                      |

<sup>90</sup> Das, J., Chetry, D., Choudhury, A.U. & Bleisch, W. 2024. *Trachypithecus pileatus* (amended version of 2020 assessment). *The IUCN Red List of Threatened Species* 2024: e.T22041A259357527. <https://dx.doi.org/10.2305/IUCN.UK.2024-2.RLTS.T22041A259357527.en>. Accessed on 23 February 2026.

b. For Chumukedima Road and Drain



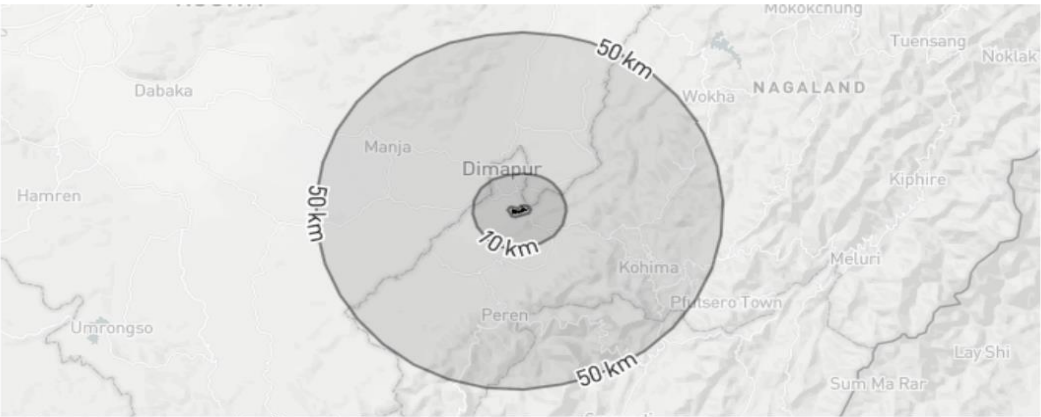
Integrated Biodiversity Assessment Tool  
World Bank Group Biodiversity Risk Screen

CHKDM SWD

- **Country:** India
- **Location:** [ 25.8, 93.8 ]
- **IUCN Red List Biomes:** Freshwater, Terrestrial
- **Created by:** Koel Kumar

Overlaps with:

|                                    |          |          |           |    |
|------------------------------------|----------|----------|-----------|----|
| Protected Areas                    | 1 km: 0  | 10 km: 0 | 50 km: 0  | 0  |
| World Heritage (WH)                | 1 km: 0  | 10 km: 0 | 50 km: 0  | 0  |
| Key Biodiversity Areas             | 1 km: 0  | 10 km: 1 | 50 km: 9  | 10 |
| Alliance for Zero Extinction (AZE) | 1 km: 0  | 10 km: 0 | 50 km: 0  | 0  |
| IUCN Red List                      | 1 km: 25 | 10 km: 1 | 50 km: 11 | 37 |
| Critical Habitat                   | Likely   |          |           |    |



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



This report is based on IFC Performance Standard 6 (PS6) but applies to World Bank Environmental and Social Standard 6 (ESS6)



## About this report

The recommendations stated alongside any Protected Areas and Key Biodiversity Areas identified in this report are determined by the following:

### Protected Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies a designation that includes either 'natural' or 'mixed world heritage site'.
- 'Assess for Critical Habitat' is stated if the report identifies a Strict Nature Reserve, Wilderness Area or National Park as coded by IUCN protected area categories Ia, Ib and II.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of protected area.

### Key Biodiversity Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies an Alliance for Zero Extinction site.
- 'Assess for Critical Habitat' is stated if the report identifies Critically Endangered or Endangered species OR species with restricted ranges OR congregatory species as coded in the IUCN Red List of Threatened Species.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of Key Biodiversity Area.

IBAT provides initial screening for Critical Habitat values. Performance Standard 6 (PS6) defines these values for Critical Habitat (PS6: para. 16) and legally protected and internationally recognized areas (PS6: para. 20). PS6 will be triggered when IFC client activities are located in modified habitats containing "significant biodiversity value," natural habitats, Critical Habitats, legally protected areas, or areas that are internationally recognized for biodiversity. References to PS6 and Guidance Note 6 (GN6) are provided to guide further assessment and detailed definitions where necessary. Please see <https://www.ifc.org/ps6> for full details on PS6 and GN6.

This report identifies restricted range species according to the KBA Standard definition (hyperlink KBA Standard <https://portals.iucn.org/library/sites/library/files/documents/2016-048.pdf>):

Species having a global range size less than or equal to the 25th percentile of range-size distribution in a taxonomic group within which all species have been mapped globally, up to a maximum of 50,000 km<sup>2</sup>. If all species in a taxonomic group have not been mapped globally, or if the 25th percentile of range-size distribution for a taxonomic group falls below 10,000 km<sup>2</sup>, restricted range should be defined as having a global range size less than or equal to 10,000 km<sup>2</sup>. For coastal, riverine and other species with linear distributions that do not exceed 200 km width at any point, restricted range is defined as having a global range less than or equal to 500 km linear geographic span (i.e. the distance between occupied locations furthest apart).

Note, sites supporting restricted range species can qualify as KBAs under criterion B2. These are sites that hold a significant proportion of the global population size of multiple restricted-range species, and so contribute significantly to the global persistence of biodiversity at the genetic and species level.

The report screens for known risks within a standard 50km buffer of the coordinates used for analysis. This buffer is not intended to indicate the area of impact. The report can be used to:

- Scope risks to include within an assessment of risks and impacts
- Identify gaps within an existing assessment of risks and impacts
- Prioritize between sites in a portfolio for further assessment of risks and impacts
- Inform a preliminary determination of Critical Habitat
- Assess the need for engaging a biodiversity specialist

- Identify additional conservation experts or organizations to inform further assessment or planning

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 as described in PS6 and GN6. 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.

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### Data used to generate this report

- UNEP-WCMC and IUCN, 2025. Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: [www.protectedplanet.net](http://www.protectedplanet.net) - December 2025.
- BirdLife International (on behalf of the KBA Partnership), 2025. Key Biodiversity Areas - September 2025.
- IUCN. The IUCN Red List of Threatened Species. Version 2025-2. <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>



## Priority Species

Habitat of significant importance to priority species will trigger Critical Habitat status (See PS6: para 16). IBAT provides a preliminary list of priority species that could occur within a 1 km, 10 km or 50 km buffer. This list is drawn from the IUCN Red List of Threatened Species (IUCN RL). This list should be used to guide any further assessment, with the aim of confirming known or likely occurrence of these species within the site area. It is also possible that further assessment may confirm occurrence of additional priority species not listed here. It is strongly encouraged that any new species information collected by the site be shared with species experts and/or IUCN wherever possible in order to improve IUCN datasets.

## IUCN Red List of Threatened Species - CR & EN

The following species are potentially found within 1 km, 10 km or 50 km of the area of interest. For the full IUCN Red List, including the results from the 1 km, 10 km and 50 km buffers please refer to the associated CSV in the report folder.

| Species Name           | Common Name             | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|------------------------|-------------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Cuon alpinus           | Dhole                   | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| Indotestudo elongata   | Elongated Tortoise      | REPTILIA        | CR            | Decreasing       | Terrestrial             | 1 km             |
| Manouria emys          | Asian Giant Tortoise    | REPTILIA        | CR            | Decreasing       | Terrestrial             | 1 km             |
| Emberiza aureola       | Yellow-breasted Bunting | AVES            | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Heliopais personatus   | Masked Finfoot          | AVES            | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Nycticebus bengalensis | Bengal Slow Loris       | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| Perdica manipurens     | Manipur Bush-quail      | AVES            | CR            | Unknown          | Terrestrial             | 1 km             |
| Manis pentadactyla     | Chinese Pangolin        | MAMMALIA        | CR            | Decreasing       | Terrestrial             | 1 km             |

| Species Name  | Common Name             | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|---|-------------------------|-----------------|---------------|------------------|-------------------------|------------------|
| <i>Gyps tenuirostris</i>                            | Slender-billed Vulture  | AVES            | CR            | Decreasing       | Terrestrial             | 1 km             |
| <i>Hoolock hoolock</i>                              | Western Hoolock Gibbon  | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| <i>Sarcogyps calvus</i>                             | Red-headed Vulture      | AVES            | CR            | Decreasing       | Terrestrial             | 1 km             |
| <i>Aquila nipalensis</i>                            | Steppe Eagle            | AVES            | EN            | Decreasing       | Terrestrial             | 1 km             |
| <i>Pangshura sylhetensis</i>                        | Assam Roofed Turtle     | REPTILIA        | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| <i>Nilssonina nigricans</i>                         | Black Softshell Turtle  | REPTILIA        | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| <i>Asarcornis scutulata</i>                         | White-winged Duck       | AVES            | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| <i>Elephas maximus</i>                              | Asian Elephant          | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| <i>Trachypithecus pileatus</i> ssp. <i>pileatus</i> | Blond-bellied Langur    | MAMMALIA        | EN            | Decreasing       | Terrestrial             | 1 km             |
| <i>Gyps bengalensis</i>                             | White-rumped Vulture    | AVES            | CR            | Decreasing       | Terrestrial             | 1 km             |
| <i>Aythya baeri</i>                                 | Baer's Pochard          | AVES            | CR            | Decreasing       | Freshwater              | 1 km             |
| <i>Cuora mouhotii</i>                               | Keeled Box Turtle       | REPTILIA        | EN            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| <i>Melanochelys tricarinata</i>                     | Tricarinate Hill Turtle | REPTILIA        | EN            | Decreasing       | Terrestrial             | 1 km             |

| Species Name             | Common Name                             | Taxonomic Group | IUCN Category | Population Trend | Biome                           | Within buffer of |
|--------------------------|---|-----------------|---------------|------------------|---------------------------------|------------------|
| Cuora amboinensis        | Southeast Asian Box Turtle              | REPTILIA        | EN            | Decreasing       | Freshwater, Terrestrial         | 1 km             |
| Tor putitora             |   | ACTINOPTERYGII  | EN            | Decreasing       | Freshwater                      | 1 km             |
| Houbaropsis bengalensis  | Bengal Florican                         | AVES            | CR            | Decreasing       | Terrestrial                     | 1 km             |
| Calidris tenuirostris    | Great Knot                              | AVES            | EN            | Decreasing       | Marine, Freshwater, Terrestrial | 1 km             |
| Panthera tigris          | Tiger                                   | MAMMALIA        | EN            | Decreasing       | Terrestrial                     | 10 km            |
| Dactylorhiza hatagirea   | Salampanja                              | LILIOPSIDA      | EN            | Decreasing       | Terrestrial                     | 50 km            |
| Sterna acuticauda        | Black-bellied Tern                      | AVES            | EN            | Decreasing       | Freshwater, Terrestrial         | 50 km            |
| Megophrys flavipunctata  | Yellow Spotted White-lipped Horned Frog | AMPHIBIA        | EN            | Decreasing       | Freshwater, Terrestrial         | 50 km            |
| Megophrys zunhebotoensis | Zunheboto's Horned Toad                 | AMPHIBIA        | EN            | Decreasing       | Freshwater, Terrestrial         | 50 km            |
| Megophrys dzukou         | Dzukou Valley Horned Frog               | AMPHIBIA        | CR            | Unknown          | Freshwater, Terrestrial         | 50 km            |
| Pterocryptis barakensis  | Barak silurus                           | ACTINOPTERYGII  | EN            | Unknown          | Freshwater                      | 50 km            |
| Schistura tigrina        |   | ACTINOPTERYGII  | EN            | Unknown          | Freshwater                      | 50 km            |
| Geoclemys hamiltonii     | Spotted Pond Turtle                     | REPTILIA        | EN            | Decreasing       | Freshwater, Terrestrial         | 50 km            |

| Species Name           | Common Name                     | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|------------------------|---------------------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Axis porcinus          | Hog Deer                        | MAMMALIA        | EN            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Haliaeetus leucoryphus | Pallas's Fish-eagle             | AVES            | EN            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Nilssonina hurum       | Indian Peacock Softshell Turtle | REPTILIA        | EN            | Decreasing       | Freshwater, Terrestrial | 50 km            |

### Restricted Range Species

| Species Name         | Common Name                 | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|----------------------|-----------------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Raorchestes garo     | Garo Hills Bubble-nest Frog | AMPHIBIA        | DD            | Unknown          | Terrestrial             | 1 km             |
| Megophrys parva      | Concave-crowned Horned Toad | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 1 km             |
| Amolops marmoratus   | Marbled Sucker Frog         | AMPHIBIA        | LC            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Batasio batasio      |                             | ACTINOPTERYGII  | LC            | Unknown          | Freshwater              | 1 km             |
| Lymnaea horae        |                             | GASTROPODA      | DD            | Unknown          | Freshwater              | 1 km             |
| Parreysia corbis     |                             | BIVALVIA        | DD            | Unknown          | Freshwater              | 1 km             |
| Parreysia annandalei |                             | BIVALVIA        | DD            | Unknown          | Freshwater              | 1 km             |
| Pila olea            |                             | GASTROPODA      | DD            | Unknown          | Freshwater              | 1 km             |



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| Species Name               | Common Name               | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|----------------------------|---------------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Macrobrachium rosenbergii  | Giant River Prawn         | MALACOSTRACA    | LC            | Unknown          | Freshwater              | 1 km             |
| Batasio merianiensis       |                           | ACTINOPTERYGII  | DD            | Unknown          | Freshwater              | 1 km             |
| Oreochthys cosuatis        |                           | ACTINOPTERYGII  | LC            | Unknown          | Freshwater              | 1 km             |
| Heliopais personatus       | Masked Finfoot            | AVES            | CR            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Indotyphlops tenuicollis   | Samagutin Worm Snake      | REPTILIA        | DD            | Unknown          | Terrestrial             | 1 km             |
| Pellorneum palustre        | Marsh Babbler             | AVES            | VU            | Decreasing       | Freshwater, Terrestrial | 1 km             |
| Badis kanabos              |                           | ACTINOPTERYGII  | DD            | Unknown          | Freshwater              | 1 km             |
| Xenentodon cancila         |                           | ACTINOPTERYGII  | LC            | Unknown          | Freshwater              | 1 km             |
| Tragopan blythii           | Blyth's Tragopan          | AVES            | VU            | Decreasing       | Terrestrial             | 10 km            |
| Anisopleura vallei         |                           | INSECTA         | VU            | Decreasing       | Freshwater, Terrestrial | 10 km            |
| Spelaeornis chocolatinus   | Naga Wren-babbler         | AVES            | VU            | Decreasing       | Terrestrial             | 10 km            |
| Megophrys wuliangshanensis | Wuliangshan Horned Toad   | AMPHIBIA        | NT            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Amolops kohimaensis        | Kohima Spiny Torrent Frog | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |



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| Species Name             | Common Name                             | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|--------------------------|---|-----------------|---------------|------------------|-------------------------|------------------|
| Amolops nidorbellus      | Spotted Stinky Torrent Frog             | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Odorrana mawphlangensis  | Mawphlang Wart Frog                     | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Megophrys flavipunctata  | Yellow Spotted White-lipped Horned Frog | AMPHIBIA        | EN            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Theloderma nagalandense  | Nagaland Treefrog                       | AMPHIBIA        | DD            | Unknown          | Terrestrial             | 50 km            |
| Megophrys zunhebotoensis | Zunheboto's Horned Toad                 | AMPHIBIA        | EN            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Chikila alcocki          | Alcock's Chikila                        | AMPHIBIA        | LC            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Ichthyophis sendenyu     | Sendenyu Striped Ichthyophis            | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Kurixalus yangi          | Yang's Frill-limbed Treefrog            | AMPHIBIA        | LC            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Duttaphrynus chandai     | Nagaland Montane Torrent Toad           | AMPHIBIA        | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Megophrys awuh           | Naga Hills Horned Frog                  | AMPHIBIA        | VU            | Decreasing       | Freshwater, Terrestrial | 50 km            |
| Megophrys dzukou         | Dzukou Valley Horned Frog               | AMPHIBIA        | CR            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Elatoneura campioni      |   | INSECTA         | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |



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| Species Name                | Common Name       | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|-----------------------------|-------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Garra manipurensis          |                   | ACTINOPTERYGII  | VU            | Unknown          | Freshwater              | 50 km            |
| Pterocryptis barakensis     | Barak silurus     | ACTINOPTERYGII  | EN            | Unknown          | Freshwater              | 50 km            |
| Schistura tigrina           |                   | ACTINOPTERYGII  | EN            | Unknown          | Freshwater              | 50 km            |
| Psilorhynchus ampiccephalus |                   | ACTINOPTERYGII  | DD            | Unknown          | Freshwater              | 50 km            |
| Channa bleheri              | Rainbow Snakehead | ACTINOPTERYGII  | NT            | Unknown          | Freshwater              | 50 km            |
| Protosticta fraseri         |                   | INSECTA         | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Anourosorex assamensis      | Assam Mole Shrew  | MAMMALIA        | LC            | Unknown          | Terrestrial             | 50 km            |
| Phricotelphusa elegans      |                   | MALACOSTRACA    | VU            | Unknown          | Freshwater              | 50 km            |
| Devario assamensis          |                   | ACTINOPTERYGII  | VU            | Unknown          | Freshwater              | 50 km            |
| Schmidtphaea chittaranjani  |                   | INSECTA         | DD            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Badis assamensis            | Assam Badis       | ACTINOPTERYGII  | DD            | Unknown          | Freshwater              | 50 km            |
| Ceriagrion rubiae           |                   | INSECTA         | LC            | Unknown          | Freshwater, Terrestrial | 50 km            |
| Cyrtodactylus nagalandensis |                   | REPTILIA        | DD            | Unknown          | Terrestrial             | 50 km            |

| Species Name    | Common Name         | Taxonomic Group | IUCN Category | Population Trend | Biome                   | Within buffer of |
|-----------------|---------------------|-----------------|---------------|------------------|-------------------------|------------------|
| Megophrys major | Major's Horned Toad | AMPHIBIA        | LC            | Stable           | Freshwater, Terrestrial | 50 km            |

## Biodiversity features which are likely to trigger Critical Habitat

### Protected Areas

There are no protected areas to show for this report.

### Key Biodiversity Areas

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

| Area name  | Distance | AZE | Recommendation               |
|--|----------|-----|------------------------------|
| Dhansiri Reserve Forest                            | 10 km    | No  | Assess for critical habitat  |
| Bunning Wildlife Sanctuary                         | 50 km    | No  | Assess for critical habitat  |
| Dzuku Valley                                       | 50 km    | No  | Assess for critical habitat  |
| Intaki National Park                               | 50 km    | No  | Assess for critical habitat  |
| Khonoma Nature Conservation and Tragopan Sanctuary | 50 km    | No  | Assess for critical habitat  |
| Lumding - Marat Longri                             | 50 km    | No  | Assess for critical habitat  |
| Mount Paona  | 50 km    | No  | Assess for critical habitat  |
| Pfutsero-Chizami                                   | 50 km    | No  | Assess for critical habitat  |
| Puliebadze-Dzukou-Zapfu                            | 50 km    | No  | Assess for critical habitat  |
| Rangapahar Macaque Sanctuary                       | 50 km    | No  | Assess for biodiversity risk |

### Species with potential to occur

| Area Taxonomic group | Total assessed species | Total (CR, EN & VU) | CR | EN | VU | NT | LC  | DD |
|----------------------|------------------------|---------------------|----|----|----|----|-----|----|
| MALACOSTRACA         | 26                     | 2                   | 0  | 0  | 2  | 2  | 11  | 11 |
| AMPHIBIA             | 69                     | 4                   | 1  | 2  | 1  | 1  | 55  | 9  |
| LILIOPSIDA           | 64                     | 3                   | 0  | 1  | 2  | 0  | 58  | 3  |
| AVES                 | 640                    | 33                  | 9  | 4  | 20 | 36 | 571 | 0  |
| MAGNOLIOPSIDA        | 68                     | 1                   | 0  | 0  | 1  | 0  | 64  | 3  |
| REPTILIA             | 103                    | 14                  | 4  | 5  | 5  | 4  | 81  | 4  |
| INSECTA              | 116                    | 1                   | 0  | 0  | 1  | 2  | 109 | 4  |
| BIVALVIA             | 37                     | 0                   | 0  | 0  | 0  | 1  | 31  | 5  |
| ACTINOPTERYGII       | 87                     | 11                  | 0  | 3  | 8  | 8  | 60  | 8  |
| MAMMALIA             | 122                    | 26                  | 1  | 7  | 18 | 9  | 85  | 2  |
| GASTROPODA           | 52                     | 1                   | 0  | 0  | 1  | 0  | 40  | 11 |
| POLYPODIOPSIDA       | 3                      | 0                   | 0  | 0  | 0  | 0  | 3   | 0  |
| ARACHNIDA            | 3                      | 0                   | 0  | 0  | 0  | 0  | 3   | 0  |
| AGARICOMYCETES       | 2                      | 0                   | 0  | 0  | 0  | 0  | 2   | 0  |

### Recommended citation

IBAT PS6 & ESS6 Report. Generated under licence 53959-98178 from the Integrated Biodiversity Assessment Tool on 15 December 2025 (GMT). [www.ibat-alliance.org](http://www.ibat-alliance.org)

### Recommended Experts and Organizations

For sites located in Critical Habitat, clients must ensure that external experts with regional expertise are involved in further assessment (GN6: GN22). Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes, especially with respect to potential developments in natural or Critical Habitat (GN6: GN23). Where Critical Habitats are triggered by priority species, species specialists must be involved. IBAT provides data originally collected by a large network of national partners, while species information is sourced via the IUCN Red List and affiliated Species Specialist Groups. These experts and organizations are listed below. **Please note that this is not intended as a comprehensive list of organizations and experts. These organizations and experts are under no obligation to support any further assessment and do so entirely at their discretion and under their terms. Any views expressed or recommendations made by these stakeholders should not be attributed to the IFC or IBAT for IFC partners.**

### Birdlife Partners

URL: <https://www.birdlife.org/worldwide/partnership/birdlife-partners>

### Directory for Species Survival Commission (SSC) Specialist Groups and Red List Authorities

URL: <https://www.iucn.org/commissions/ssc-groups>

## Desk-based Critical Habitat (CH) Screening Chumukedima

This annexure presents the details of the desk-based CH Screening (hereinafter referred to as 'CHS') undertaken for the project, including the reference framework within which it was conducted, the approach and methodology followed, a description of the habitat profile of the ecologically appropriate area of analysis (EAAA) considered, the screening rationales applied and the final outcome of the screening.

### Reference Framework

The CHS has been conducted as per the guidance available in the following environmental and social sustainability standards:

- The International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (2012)
- Asian Development Bank (ADB) Safeguard Policy Statement (2009)

### Approach and Methodology

This section outlines the broad approach adopted and the stepwise methodology applied for the CHS.

#### Approach

The approach adopted for screening of species involved the following strategies:

- Delineation of the area to be subjected to the CHS based on the estimated collective Area of Influence (Aoi) of the Project infrastructure and activities (hereinafter referred to as the 'Study Area').
- Use of a detailed IBAT (Integrated Biodiversity Assessment Tool) Report generated for the Project Site, based on the latest version of the IUCN Red List, as the reference source for a site-specific species baseline.
- Inclusion of all IUCN Red List-assessed globally threatened species of higher flora and fauna as Critical Habitat (CH) Candidates.

*Note:*

*The term 'higher flora' refers to all Spermatophyte species, comprising Angiosperms and Gymnosperms, while the term 'higher fauna' refers to all Vertebrate species, comprising Mammals, Birds, Reptiles, Amphibians, and Fishes.*

- Inclusion of any IUCN Red List-assessed non-threatened species (listed as Near Threatened, Least Concern or Data Deficient) as CH Candidates, only if it qualifies as 1 or more of the following –
  - endemic or restricted range with respect to the Study Area.
  - congregatory with respect to the Study Area.
  - cited as trigger species for any KBAs overlapping the Study Area.
- Delineation of an Ecologically Appropriate Area of Analysis (EAAA) for each CH Candidate or group of CH Candidates.
- Screening of CH Candidates based on the proportion of their geographical range constituted by the applicable Ecologically Appropriate Area of Analysis (EAAA), extent of suitable habitat-type(s) in the EAAA or availability of suitable elevation range within the EAAA.

The approach adopted for screening of habitats involved the following strategies:

- Use of the IBAT outputs on Key Biodiversity Areas (KBA) and Protected Areas, in conjunction with any maps available on the corresponding websites, to identify the nearest designated areas that are both, legally protected and internationally recognized.
- Use of governmental LULC maps of the corresponding area in conjunction with governmental Protected Area (PA) maps to identify the nearest designated areas that are legally protected, but not internationally recognized.

#### Methodology

The methodology applied for screening of species involved the following steps:

- Screening in CH Candidates that have geographic ranges overlapping the Study Area as per IUCN Red List spatial data.
- Screening in CH Candidates that are deemed Extant or Possibly Extant with respect to the Study Area.



- Identifying the CH Criteria applicable to each screened in CH Candidate.
- Classifying the habitat-types within the Study Area, as per the IUCN Habitat Classification.
- Evaluating each CH Candidate, based on its extent of occurrence (EOO), global population, suitable habitat types and elevation range.
- Screening in CH Candidates likely to trigger CH Criteria (i) to (iv) as per ADB SPS or CH Criteria 1, 2 and/or 3 as per IFC PS6, as Potential CH Trigger Species, based on screening outcomes.
- Screening as per thresholds defined in IFC PS6 CH Criteria wherever quantifiable thresholds are not defined in ADB SPS.
- Consulting appropriate SMEs and/or referring to relevant published research to confirm whether the Study Area contains or is situated within CH as per CH Criteria 1, 2 and/or 3 with respect to any of the said Potential CH Trigger Species.

The methodology applied for screening of habitats involved the following steps:

- Screening in Designated Areas that overlap with the Study Area as per maps available on the corresponding websites.
- Identifying the CH Criteria applicable to the screened in Designated Areas.
- Evaluating each screened in Designated Area against the applicable criteria based on public domain data.
- Screening in Designated Areas likely to trigger CH Criteria (v) to (vii) as per ADB SPS or CH Criteria 4 and/or 5 as per IFC PS6, a Potential CH Trigger Area.
- Consulting an appropriate SME and/or referring to relevant published research to confirm whether the Study Area contains or is situated within CH as per CH Criteria 4 and/or 5 with respect to any Potential CH Trigger Area.

The methodology applied for assessment of any Potential CH Trigger Species or Area involved the following steps:

- Conducting a detailed desk-based assessment to collate detailed secondary data on each Potential CH Trigger Species or Area.
- Conducting a brief field-based assessment to map the habitat profile of the Study Area and EAAA(s), as also, to collect relevant Study Area-specific primary and secondary data on each Potential CH Trigger Species or Area.
- Consulting appropriate Subject Matter Experts (SMEs) and/or stakeholders to understand the present status of any Potential CH Trigger Species or Area vis-à-vis the Study Area and applicable EAAA.
- Determining whether the Project Site contains, or is situated within, CH with respect to any Potential CH Trigger Species or Area.
- Designating the corresponding Species or Area as a CH Qualifying (CHQ) Species or Area.
- Recommending further assessments, if required, to address any data gaps preventing decision-making on presence or absence of CH.

### Details of the Study Area

This section delineates the Study Area subjected to the CHS and describes its ecological context.

#### Delineation of the Study Area

The Study Area is defined as the overall area of influence (AoI) of the project (hereinafter referred to as 'Project'). The AoI of the Project comprises the area of direct, as well as indirect influence of the Project. The area of direct influence is estimated to contain ecological receptors of any direct Project impacts, while the area of indirect influence is estimated to contain ecological receptors of any indirect Project impacts. Based on the nature and scale of the Project, the area of direct influence of the Project is estimated to be largely limited to the footprint of the Project infrastructure and activities (hereinafter referred to as 'Project Site').

Based on the type, quality and contiguity of habitats around the Project Site, the area of indirect influence of the Project is estimated as the area situated within 1 km buffer of the Project Site (hereinafter referred to as

‘Buffer Area’).

Thus, the Project Site and Buffer Area collectively constitute the Study Area.

### Ecological Context of the Study Area

The Study Area is distributed over the lower Chumukedima town area and the associated offshoot ridges of the Naga Hills in southeastern Nagaland.

The terrain of the Study Area ranges from plains to steep hills, with an elevation profile ranging from 200-600 m amsl.

The Study Area is drained mainly by the Chathe River.

The vegetation of the Study Area is characterized by light to dense forests on hill slopes and cultivation, plantations or gardens in the plains. Based on Champion and Seth (1968), the forest-types occurring within the Study Area represent ‘Northern Tropical Semi-evergreen Forest’. Based on its description, the said forest-type, qualifies as ‘Tropical Moist Lowland Forest’ as per the IUCN Habitat Classification Scheme.

The land-use of the Study Area is composed of forest, agricultural land and built-up areas, besides the river channel.

### Habitat Profile of the Study Area

The Study Area was subjected to a habitat profiling based on the ESRI Sentinel-2 LULC data and satellite imagery, as available on Google Earth.

The results indicate that the habitat profile of the Study Area is dominated by natural habitats, which are interspersed by modified habitats.

The said natural habitats constitute approximately 59% of the Study Area and comprise tropical moist lowland forest (57%) and inland wetlands (~2%).

The said modified habitats constitute approximately 41% of the Study Area and comprise urban areas and rural gardens (~39%) and arable land (~2%).

**Table 1** presents the quantified habitat profile of the Study Area in terms of habitat-types aligned with the IUCN Habitat Classification.

**Table 1: Habitat Profile of the Study Area**

| Habitat Type       | Habitat Class                 | Total Area (sq.km) | Percent Area (%) |
|--------------------|-------------------------------|--------------------|------------------|
| Natural            | Tropical Moist Lowland Forest | 06.93              | 57.00            |
|                    | Inland Wetlands               | 00.27              | 02.26            |
| Modified           | Urban Areas and Rural Gardens | 04.76              | 39.19            |
|                    | Arable Land                   | 00.19              | 01.55            |
| <b>Grand Total</b> |                               | <b>12.15</b>       | <b>100.00</b>    |

**Figure 2** presents a map indicating the habitat profile of the Study Area.

### Designated Areas

The Project Site does not overlap any Designated Area, either a Legally Protected Area (LPA) or an Internationally Recognized Area (IRA).

The nearest Designated Area with respect to the Project Site is the Rangapahar Macaque Sanctuary and Key Biodiversity Area (KBA), which qualifies as both an LPA and an IRA and is situated approximately 9 km northwest of the Project Site.

Based on the IBAT Report, there are 9 other Designated Areas situated fully or partially within 50 km of the Project Site.

**Table 2** presents the details of each Designated Area situated within 50 km of the Project Site, along with its designation(s), as well as distance and direction from the nearest point of the Project Site.

*Table 2: Details of Designated Areas within 50km of the Project Site*

| SN | Name of the Designated Area  | Type of Designated Area (LPA, IRA) | Distance and Direction from Project Site |
|----|------------------------------|------------------------------------|--|
| 1  | Rangapahar Macaque Sanctuary | LPA; IRA (KBA)                     | 8.9 km NW                                |
| 2  | Dhansiri Reserve Forest      | LPA; IRA (KBA)                     | 12.3 km NW                               |
| 3  | Intaki National Park         | LPA; IRA (KBA)                     | 24.5 km SW                               |

| SN | Name of the Designated Area                        | Type of Designated Area (LPA, IRA) | Distance and Direction from Project Site |
|----|--|------------------------------------|--|
| 4  | Khonoma Nature Conservation and Tragopan Sanctuary | LPA; IRA (KBA)                     | 24.4 km SE                               |
| 5  | Dzuku Valley                                       | IRA (KBA)                          | 28 km SE                                 |
| 6  | Puliebadze-Dzukou-Zapfu                            | IRA (KBA)                          | 29.8 km SE                               |
| 7  | Mount Paona  | IRA (KBA)                          | 31 km SW                                 |
| 8  | Lumding - Marat Longri                             | IRA (KBA)                          | 40 km NW                                 |
| 9  | Bunning Wildlife Sanctuary                         | LPA; IRA (KBA)                     | 47 km S                                  |
| 10 | Pfutsero-Chizami                                   | IRA (KBA)                          | 47 km SE                                 |

### Identification of CH Candidates

This section presents an overview of the species and areas listed in the IBAT Report, describes the criteria defined by ADB SPS and IFC PS6 for identifying species or areas that can potentially trigger CH and lists the species or areas that qualify as CH Candidates with respect to the Study Area.

### Overview of the IBAT Report

As per the IBAT Report, 1407 IUCN Red List-assessed species potentially occur within 50 km of the Project Site, and therefore, within the Study Area.

Of the said 1407 species, 104 are categorized by the IUCN Red List as globally threatened, comprising 15 Critically Endangered (CR), 25 Endangered (EN) and 64 Vulnerable (VU) species, while 356 are classified as migratory species and 55 as restricted range species.

The said 49 globally threatened species consist of 26 mammals, 33 birds, 14 reptiles, 4 amphibians, 20 freshwater fishes, 4 lower fauna and 3 plants.

As per the IBAT Report, there are 10 Designated Areas, all Key Biodiversity Areas (KBAs), situated within 50 km of the Project Site.

Source: IBAT PS6 & ESS6 Report. Generated under licence 53959-98177 from the Integrated Biodiversity Assessment Tool on 15 December 2025 (GMT). [www.ibat-alliance.org](http://www.ibat-alliance.org)

### Overview of the CH Criteria

As per ADB SPS guidance, CH refers to areas with high biodiversity value and necessarily includes the following [hereinafter referred to as the 'ADB CH Criteria (i) through (vii)']: (i) habitat required for the survival of critically endangered or endangered species (ii) areas having special significance for endemic or restricted-range species (iii) sites that are critical for the survival of migratory species (iv) areas supporting globally significant concentrations or numbers of individuals of congregatory species (v) areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services (vi) areas having biodiversity of significant social, economic, or cultural importance to local communities (vii) areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's World Natural Heritage Sites.

As per the IFC PS6 CH Criteria 1, 2 and 3, habitats - either natural or modified - that are critical for the survival of IUCN Red List-designated globally threatened species, endemic or restricted range species and migratory and/or congregatory species qualify as CH. As per the IFC PS6 CH Criteria 4 and 5, highly threatened or unique ecosystems, as well as, spatial features that support key evolutionary processes, also qualify as CH.

As stated in the Methodology section, the 5 IFC PS6 CH Criteria largely subsume the ADB CH Criteria (i) through (vii), while IFC PS6 guidance provides quantitative thresholds and/or nuanced procedures to apply the same for CH screening. Hence, the said 5 IFC PS6 CH Criteria have been applied to the CHS hereafter.

**Table 3** presents detailed definitions and quantitative thresholds of the 5 IFC PS6 CH Criteria, as well as an overview of the species or habitats of the Study Area that qualify as CH Candidates as

per one or more of the said CH Criteria.

**Table 3: Details of CH Criteria**

| CH Criterion                               | Description of the CH Criterion and its stipulated thresholds  | Rationale/Remarks   | Number of Identified CH Candidates                                 |
|--|--|---|--|
| CH 1 - Globally Threatened Species         | <p>Globally Threatened Species are defined as species designated by the IUCN Red List as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). As per CH Criterion 1, an area that supports a globally important concentration of a CR or EN species, as well as, an area that supports a globally important concentration of a VU species, the loss of which would lead to the species being designated as EN or CR, both qualify as potential CH. Thresholds stipulated for triggering CH Criterion 1 are:</p> <p>(a) Areas that support globally important concentrations of an IUCN Red-listed CR or EN species (0.5% of the global population containing 5 reproductive units of a CR or EN species).</p> <p>(b) Areas that support globally important concentrations of an IUCN Red-listed VU species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds specified in (a).</p> <p>(c) As appropriate, areas containing nationally/regionally important concentrations of an IUCN Red-listed CR or EN species.</p> | <p>Of the species potentially occurring in the Study Area, 67 species are categorized by the IUCN Red List as globally threatened.</p> <p>These include 14 CR species, 12 EN species and 41 VU species.</p> | <p>1(a): 26 species<br/>1(b): 41 species<br/>Total: 67 species</p> |
| CH 2 - Endemic or Restricted Range Species | <p>Species which occur in a limited area are referred to as Endemic or Restricted Range species. The species reported from the Study Area have been evaluated as endemic or restricted range species based on their extent of occurrence (EOO), described as follows:</p> <p>(a) For terrestrial vertebrates and plants, a restricted-range species is defined as those species that have an EOO less than 50,000 km<sup>2</sup></p> <p>(b) For marine systems, restricted-range species are provisionally being considered those with an EOO of less than 100,000 km<sup>2</sup></p> <p>(c) For coastal, riverine, and other aquatic species in habitats that do not exceed 200 km width at any point (e.g., rivers), restricted range is defined as having a global range</p>  | <p>1 of the species potentially occurring in the Study Area meets the applicable definition of endemic or restricted range species.</p>   | <p>1</p>   |

| CH Criterion                                 | Description of the CH Criterion and its stipulated thresholds   | Rationale/Remarks   | Number of Identified CH Candidates  |
|--|---|---|---|
|  | <p>less than or equal to 500 km linear geographic span (i.e., the distance between occupied locations farthest apart).</p> <p>The threshold stipulated for triggering Criterion 2 is the following:</p> <p>a) Areas that regularly hold <math>\geq 10\%</math> of the global population size AND <math>\geq 10</math> reproductive units of a species.</p>  |   |   |
| CH 3 - Migratory and/or Congregatory Species | <p>Migratory Species are defined as species of which a significant proportion of its members cyclically and predictably move from one geographical area to another, including within the same ecosystem. Species whose individuals gather in large groups on a cyclical, or otherwise regular and/or predictable basis, are known as congregatory species. Thresholds stipulated for triggering CH Criterion 3 are:</p> <p>(a) areas known to sustain, on a cyclical or otherwise regular basis, <math>\geq 1</math> percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.</p> <p>(b) areas that predictably support <math>\geq 10</math> percent of the global population of a species during periods of environmental stress.</p> | <p>The Study Area is located within the Central Asian Flyway. Based on the available data, migratory waterbirds occur in the Study Area during the September to March period every year, which coincides with the chief annual migratory season with respect to the Indian sub-continent. The nearest significant habitat for migratory and/or congregatory birds with respect to the Study Area is the Khonoma Nature Conservation and Tragopan Sanctuary, designated as KBA and LPA situated ~24 km SE of the Project Site.</p> <p>As per the IBAT Report, 356 species occurring within 50 km of the Project Site are migratory. Of these, 326 species are birds, 19 are fish, 2 are mammals and 9 belong to lower fauna groups. Of these 356 species, only 22 are globally threatened, while the rest are non-threatened with wide</p> | <p>3(a): 22 species</p> <p><b>Note:</b> All the said 22 species also qualify as CH Candidates for CH 1(a) and 1(b).</p> |



| CH Criterion                                      | Description of the CH Criterion and its stipulated thresholds  | Rationale/Remarks  | Number of Identified CH Candidates |
|---|--|--|------------------------------------|
|   |  | <p>distribution ranges with large global population sizes.</p> <p>Based on the available data, it was concluded that only globally threatened migratory and/or congregatory species occurring in the Study Area, owing to their relatively small and/or decreasing global populations, are likely to trigger CH.</p> <p>Review of the species potentially occurring in the Study Area indicates that only 22 globally threatened species, all birds, are classified by the IUCN Red List as migratory and/or congregatory.</p> |                                    |
| CH 4 – Highly Threatened and/or Unique Ecosystems | <p>Assessment of the Study Area towards Criterion 4 is based on national/regional level assessments carried out by governmental bodies, recognized academic institutions and/or internationally recognized NGOs. Thresholds stipulated for triggering CH Criterion 4 are:</p> <p>(a) areas representing ≥5% of the global extent of an ecosystem-type meeting the criteria for IUCN status of CR or EN.</p> <p>(b) areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.</p> | <p>No part of the Study Area is assessed by IUCN towards the IUCN Red List of Ecosystems.</p> <p>The Study Area is dominated by artificial habitats such as cultivated, fallow or disused arable lands, plantations and natural habitats such as savanna or shrubland. While these habitats support significant biodiversity, they are not determined to be of high priority for conservation.</p>   | None                               |
| CH 5 – Key Evolutionary Processes                 | <p>Assessment of the Study Area towards CH Criterion 5 is based on structural attributes such as topography, geology, soil, temperature and vegetation or combinations of these variables, which can influence evolutionary processes that give rise to regional species-configurations or ecological properties. The overall aim of evaluating the Study Area against this criterion is to conserve genetic and species diversity, as also, processes which drive speciation, for the purpose of ensuring evolutionary flexibility in a rapidly</p>                   | <p>No such features are associated with the habitats of the Study Area. Further, the Study Area is not known to contain isolated sub-populations of any species</p>  | None                               |

| CH Criterion | Description of the CH Criterion and its stipulated thresholds  | Rationale/Remarks | Number of Identified CH Candidates |
|--------------|--|-------------------|------------------------------------|
|              | <p>changing climate.<br/>Features associated with key evolutionary processes include:</p> <ul style="list-style-type: none"> <li>• Landscapes with high spatial heterogeneity, which drive speciation</li> <li>• Ecotones, which aid speciation and are associated with high species and genetic diversity</li> <li>• Edaphic interfaces, which drive formation of unique plant communities characterized by endemism and rarity</li> <li>• Connectivity between habitats, which facilitates migration and gene flow, aiding conservation of meta-populations in fragmented habitats.</li> </ul> |                   |                                    |

Thus, the CH Candidates identified with respect to the Study Area consist of 67 species and no habitats.

**Table 4** presents details of each CH Candidate species including its scientific name, common name, applicable CH criteria, global population, minimum CH trigger threshold number, extent of occurrence (EOO), elevation range, and suitable habitat type/s.

**Table 4: Details of CH Candidates**

| SN | Scientific Name                | Common Name             | IUCN Status | Applicable CH Criterion | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) |
|----|--------------------------------|-------------------------|-------------|-------------------------|--|-------------------------------------|---------|------------------------|--------------------------|
| 1  | <i>Asarcornis scutulata</i>    | White-winged Duck       | CR          | 1a, 3a                  | 150–450                                | 0.75                                | 2620000 | 0-400                  | F, W                     |
| 2  | <i>Aythya baeri</i>            | Baer's Pochard          | CR          | 1a, 3a                  | 250-999                                | 1.25                                | 2270000 | -                      | W                        |
| 3  | <i>Emberiza aureola</i>        | Yellow-breasted Bunting | CR          | 1a, 3a                  | -                                      | -                                   | 7390000 | 0-?                    | SH, G, A, W              |
| 4  | <i>Gyps bengalensis</i>        | White-rumped Vulture    | CR          | 1a, 3a                  | 6000-9000                              | 30                                  | 7370000 | 0-1500                 | F, S, Sh, G, U           |
| 5  | <i>Gyps tenuirostris</i>       | Slender-billed Vulture  | CR          | 1a, 3a                  | 1100-1300                              | 5.5                                 | 2130000 | 0-2000                 | F, S, Sh, G, U           |
| 6  | <i>Heliopais personatus</i>    | Masked Finfoot          | CR          | 1a, 3a                  | (108-304)                              | 0.54                                | 1650000 | 0-1220                 | F, W                     |
| 7  | <i>Houbaropsis bengalensis</i> | Bengal Florican         | CR          | 1a, 3a                  | 350-1500                               | 1.75                                | 1550000 | 0-?                    | G, A                     |

| SN | Scientific Name                 | Common Name                | IUCN Status | Applicable CH Criterion | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO             | Elevation Range (in m) | Suitable Habitat Type(s) |
|----|---------------------------------|----------------------------|-------------|-------------------------|--|-------------------------------------|-----------------|------------------------|--------------------------|
| 8  | <i>Indotestudo elongata</i>     | Elongated Tortoise         | CR          | 1a                      | -                                      | -                                   | -               | 0-600                  | F, Sh                    |
| 9  | <i>Manis pentadactyla</i>       | Chinese Pangolin           | CR          | 1a                      | -                                      | -                                   | -               | 0-3000                 | F, Sh, G                 |
| 10 | <i>Manouria emys</i>            | Asian Giant Tortoise       | CR          | 1a                      | -                                      | -                                   | -               | 600-1500               | F                        |
| 11 | <i>Nilssononia nigricans</i>    | Black Softshell Turtle     | CR          | 1a                      | -                                      | -                                   | -               | -                      | W, AA                    |
| 12 | <i>Pangshura sylhetensis</i>    | Assam Roofed Turtle        | CR          | 1a                      | -                                      | -                                   | -               | ?-200                  | W                        |
| 13 | <i>Perdica manipurens</i>       | Manipur Bush-quail         | CR          | 1a                      | (1-200)                                | 1                                   | 144000          | 0-1000                 | Sh, G, W                 |
| 14 | <i>Sarcogyps calvus</i>         | Red-headed Vulture         | CR          | 1a, 3a                  | 3,750-14,999                           | 18.75                               | 5230000         | 0-2500                 | F, S, Sh, G, U           |
| 15 | <i>Aquila nipalensis</i>        | Steppe Eagle               | EN          | 1a, 3a                  | 78,042-110,193                         | 390.21                              | 12600000        | 0-3000                 | F, S, G, RA, D           |
| 16 | <i>Calidris tenuirostris</i>    | Great Knot                 | EN          | 1a, 3a                  | 255,000-340,000                        | 1275                                | 2600000         | 0-1600                 | G, M                     |
| 17 | <i>Cuon alpinus</i>             | Dhole                      | EN          | 1a                      | 4,500-10,500                           | 22.5                                | -               | 0-5300                 | F, Sh, G                 |
| 18 | <i>Cuora amboinensis</i>        | Southeast Asian Box Turtle | EN          | 1a                      | -                                      | -                                   | -               | 0-400                  | F, W, AA                 |
| 19 | <i>Cuora mouhotii</i>           | Keeled Box Turtle          | EN          | 1a                      | -                                      | -                                   | -               | 350-1200               | F, W                     |
| 20 | <i>Dactylorhiza hatagirea</i>   | Salampanja                 | EN          | 1a                      | -                                      | -                                   | 4000000-5000000 | 2500-5000              | F, Sh, G                 |
| 21 | <i>Elephas maximus</i>          | Asian Elephant             | EN          | 1a                      | 48,323-51,680                          | 241.615                             | 11317030        | 0-3000                 | F, Sh, G, P, DF          |
| 22 | <i>Hoolock hoolock</i>          | Western Hoolock Gibbon     | EN          | 1a                      | -                                      | -                                   | -               | 0-2500                 | F, P, RG                 |
| 23 | <i>Melanochelys tricarinata</i> | Tricarinate Hill Turtle    | EN          | 1a                      | -                                      | -                                   | -               | ?-300                  | F, S, G, W               |
| 24 | <i>Nycticebus bengalensis</i>   | Bengal Slow Loris          | EN          | 1a                      | -                                      | -                                   | -               | 0-2400                 | F                        |
| 25 | <i>Tor putitora</i>             |                            | EN          | 1a                      | -                                      | -                                   | 1305202         | -                      | W, AA                    |

| SN | Scientific Name                              | Common Name              | IUCN Status | Applicable CH Criterion | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO      | Elevation Range (in m) | Suitable Habitat Type(s)  |
|----|--|--------------------------|-------------|-------------------------|--|-------------------------------------|----------|------------------------|---------------------------|
| 26 | <i>Trachypithecus pileatus ssp. pileatus</i> | Blond-bellied Langur     | EN          | 1a                      | -                                      | -                                   | #N/A     | #N/A                   | F, P                      |
| 27 | <i>Aceros nipalensis</i>                     | Rufous-necked Hornbill   | VU          | 1b                      | 12,000-15,000                          |                                     | 1580000  | 300-2400               | F                         |
| 28 | <i>Anisopleura vallei</i>                    |                          | VU          | 1b                      | -                                      |                                     | -        | 790-1500               | F, W, AA                  |
| 29 | <i>Aonyx cinereus</i>                        | Asian Small-clawed Otter | VU          | 1b                      | -                                      |                                     | -        | 0-2000                 | F, Sh, G, W, M, AA        |
| 30 | <i>Arctictis binturong</i>                   | Binturong                | VU          | 1b                      | -                                      |                                     | -        | 0-3000                 | F, DF                     |
| 31 | <i>Arctonyx collaris</i>                     | Greater Hog Badger       | VU          | 1b                      | -                                      |                                     | -        | 0-2300                 | F, S, Sh, G, DF           |
| 32 | <i>Aythya ferina</i>                         | Common Pochard           | VU          | 1b, 3a                  | 1.14-1.18 million                      |                                     | 548000   | 0-2690                 | W, M, AA                  |
| 33 | <i>Bagarius bagarius</i>                     |                          | VU          | 1b                      | -                                      |                                     | 3883000  | -                      | W, AA                     |
| 34 | <i>Bos gaurus</i>                            | Gaur                     | VU          | 1b                      | 15,000-35,000                          |                                     | -        | 0-2800                 | F, S, Sh, G, A, PL, P, DF |
| 35 | <i>Buceros bicornis</i>                      | Great Hornbill           | VU          | 1b                      | 23,000 - 71,000                        |                                     | 10300000 | 0-2000                 | F, P, RG                  |
| 36 | <i>Calidris falcinellus</i>                  | Broad-billed Sandpiper   | VU          | 1b, 3a                  | (96,000-136,000)                       |                                     | 6100000  | 0-2000                 | W, M, AA                  |
| 37 | <i>Calidris ferruginea</i>                   | Curlew Sandpiper         | VU          | 1b, 3a                  | 700,000-1,200,000                      |                                     | 3000000  | 0-2000                 | G, W, M, AA               |
| 38 | <i>Capricornis sumatraensis</i>              | Mainland Serow           | VU          | 1b                      | -                                      |                                     | -        | 200-3000               | F, Sh, G, RA, RG          |
| 39 | <i>Catopuma temminckii</i>                   | Asian Golden Cat         | VU          | 1b                      | (1,000–12,000)                         |                                     | 5697094  | 0-4600                 | F, Sh, G, RA, P, RG, DF   |
| 40 | <i>Clanga clanga</i>                         | Greater Spotted Eagle    | VU          | 1b, 3a                  | (3,900-10,000)                         |                                     | 15300000 | 0-1400                 | F, Sh, G, W, M, A, AA     |
| 41 | <i>Columba punicea</i>                       | Pale-capped Pigeon       | VU          | 1b                      | 3,750-14,999                           |                                     | 1530000  | ?-1600                 | F, Sh, A, P               |
| 42 | <i>Crocodylus palustris</i>                  | Mugger                   | VU          | 1b                      | (5,700- 8,700)                         |                                     | -        | ?-420                  | W, M, AA                  |
| 43 | <i>Elaphe taeniura</i>                       | Cave Racer               | VU          | 1b                      | -                                      |                                     | -        | 0-3000                 | F, Sh, C, P, RG           |

| SN | Scientific Name                     | Common Name                 | IUCN Status | Applicable CH Criterion | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO             | Elevation Range (in m) | Suitable Habitat Type(s)  |
|----|-------------------------------------|-----------------------------|-------------|-------------------------|--|-------------------------------------|-----------------|------------------------|---------------------------|
| 44 | <i>Gallinago nemoricola</i>         | Wood Snipe                  | VU          | 1b, 3a                  | (2,500-9,999)                          |                                     | 117700          | 0-5000                 | F, G, W                   |
| 45 | <i>Helarctos malayanus</i>          | Sun Bear                    | VU          | 1b                      | -                                      |                                     | -               | 1-3000                 | F, Sh, P, RG, DF          |
| 46 | <i>Hoolock hoolock ssp. hoolock</i> | Western Hoolock Gibbon      | VU          | 1b                      | #N/A                                   |                                     | #N/A            | #N/A                   | F                         |
| 47 | <i>Lutrogale perspicillata</i>      | Smooth-coated Otter         | VU          | 1b                      | -                                      |                                     | -               | 0-700                  | F, Sh, G, W, M, A         |
| 48 | <i>Macaca arctoides</i>             | Stump-tailed Macaque        | VU          | 1b                      | -                                      |                                     | -               | 50-2800                | F                         |
| 49 | <i>Macaca leonina</i>               | Northern Pig-tailed Macaque | VU          | 1b                      | 4,000                                  |                                     | -               | 100-1800               | F                         |
| 50 | <i>Melursus ursinus</i>             | Sloth Bear                  | VU          | 1b                      | -                                      |                                     | -               | 0-2000                 | F, S, Sh, G, RG, DF       |
| 51 | <i>Mulleripicus pulverulentus</i>   | Great Slaty Woodpecker      | VU          | 1b                      | ( 10,000-70,000)                       |                                     | 9650000         | 0-600                  | F, S                      |
| 52 | <i>Ophiophagus hannah</i>           | King Cobra                  | VU          | 1b                      | -                                      |                                     | -               | ?-2000                 | F, Sh, G, A, P, DF, W, AA |
| 53 | <i>Panthera pardus</i>              | Leopard                     | VU          | 1b                      | -                                      |                                     | -               | 0-5200                 | F, S, Sh, G, RA, D        |
| 54 | <i>Paris polyphylla</i>             | Love Apple                  | VU          | 1b                      | -                                      |                                     | 5500000-6500000 | 1800-3300              | F                         |
| 55 | <i>Pellorneum palustre</i>          | Marsh Babbler               | VU          | 1b, 2a                  | ( 2,500-9,999)                         |                                     | 14300           | 0-500                  | Sh, G, W                  |
| 56 | <i>Pluvialis squatarola</i>         | Grey Plover                 | VU          | 1b, 3a                  | (1,250,000-2,250,000)                  |                                     | 19000000        | 0-?                    | G, W, M, AA               |
| 57 | <i>Python bivittatus</i>            | Burmese Python              | VU          | 1b                      | -                                      |                                     | -               | 10-4050                | F, G, W, C, D             |
| 58 | <i>Rhyticeros undulatus</i>         | Wreathed Hornbill           | VU          | 1b                      | -                                      |                                     | 7020000         | ?-2560                 | F                         |
| 59 | <i>Rusa unicolor</i>                | Sambar                      | VU          | 1b                      | -                                      |                                     | -               | 0-3900                 | F, S, Sh, G, W, P, DF     |
| 60 | <i>Schizothorax plagiostomus</i>    | Snow Trout                  | VU          | 1b, 3a                  | -                                      |                                     | -               | -                      | W                         |
| 61 | <i>Sitta formosa</i>                | Beautiful Nuthatch          | VU          | 1b, 3a                  | 3,750-14,999                           |                                     | 1220000         | 600-2400               | F                         |

| SN | Scientific Name                | Common Name        | IUCN Status | Applicable CH Criterion | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO      | Elevation Range (in m) | Suitable Habitat Type(s) |
|----|--------------------------------|--------------------|-------------|-------------------------|--|-------------------------------------|----------|------------------------|--------------------------|
| 62 | <i>Sterna aurantia</i>         | River Tern         | VU          | 1b, 3a                  | 30,000-100,000                         |                                     | 9330000  | ?-600                  | W, M                     |
| 63 | <i>Trachypithecus pileatus</i> | Capped Langur      | VU          | 1b                      | -                                      |                                     | -        | 402042                 | F                        |
| 64 | <i>Tragopan blythii</i>        | Blyth's Tragopan   | VU          | 1b, 3a                  | 3,750-14,999                           |                                     | 355000   | 1800-3300              | F                        |
| 65 | <i>Turdus feae</i>             | Grey-sided Thrush  | VU          | 1b, 3a                  | (2500-9999)                            |                                     | 322000   | 1000-2565              | F, DF                    |
| 66 | <i>Ursus thibetanus</i>        | Asiatic Black Bear | VU          | 1b                      | -                                      |                                     | -        | 0-4300                 | F, Sh, G, W, A, P, DF    |
| 67 | <i>Wallago attu</i>            |                    | VU          | 1b, 3a                  | -                                      |                                     | 10446620 | -                      | W, AA                    |



### Delineation of the EAAA

This section delineates the EAAA to be taken into consideration while screening the CH Candidate species.

The EAAA for screening any given CH Candidate species would need to include all its suitable habitat-types within and contiguous with the Study Area.

Based on the habitat profile of the Study Area and the ecology of the CH Candidate species, the EAAA for aquatic CH Candidate species is limited to only the aquatic habitats, namely Inland Wetlands, within and contiguous with the Study Area, while the EAAA for terrestrial CH Candidate species includes the entire Study Area.

### Screening of CH Candidates

This section describes the screening of the CH Candidates to identify as a 'Potential CH Trigger' any species that is likely to occur within the applicable EAAA in the minimum threshold number required to render the Study Area a CH for the said species.

For an IUCN Red-listed VU species to qualify as Potential CH trigger, at least one of the following 2 attributes must apply to it:

- (c) qualification as endemic or restricted range with respect to the applicable EAAA
- (d) significant congregation records within or in proximity to the applicable EAAA

None of the 41 CH Candidate species categorized by the IUCN Red List as VU qualify as potential CH triggers based on the said attributes. Hence all the said CH Candidate species are screened out at this stage of the CHS.

Screening of each of the 26 CH Candidate species categorized by the IUCN Red List as CR/EN was based on the following attributes, as available in its IUCN Red List assessment:

- its lowest global population estimate, which provides its minimum CH-triggering threshold
- its extent of occurrence (EOO), and therefore, the percentage of the EOO represented by the applicable EAAA
- its known elevation range and availability of the same in the applicable EAAA
- its suitable habitat-types and therefore, the percentage of the EAAA that constitutes suitable habitat for the species.

The screening of the 26 CH Candidate species categorized by the IUCN Red List as CR/EN as per the above-mentioned attributes resulted in all 26 species being screened out as Potential CH Triggers with respect to the EAAA.

Hence, the CHS resulted in all 67 CH candidate species being screened out as Potential CH Triggers with respect to the EAAA.

**Table 5** presents details of the CH Screening, along with detailed rationales for screening out each CH Candidate species.

**Table 5: Details of the Critical Habitat Screening**

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|---|-------------------|
| 1  | <i>Asarcornis scutulata</i> , White-winged Duck, CR, 1a, 3a       | (150–450)                              | 0.75                                | 2620000 | 0-400                  | F, W                     | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>91</sup>, the species is Possibly Extinct with respect to the EAAA. With a large historical range, the species now occurs in eight countries including India, Myanmar and Thailand, with limited populations in Cambodia and Indonesia.</li> <li>As per the IUCN Red List, in India, the species is found in Assam and Arunachal Pradesh.</li> <li>Based on the Habitat Profile of the Study Area, ~60% of the EAAA contains habitat types deemed suitable to the species.</li> <li>As per the IUCN Red List, the species' global population size is estimated to be 150-450 mature individuals, whereas in India the population size is approximately 50-150 mature individuals.</li> <li>As per the conservation strategy and action plan for the White-winged Duck (dated 2023)<sup>92</sup>, major population of the</li> </ul> | Screened out      |

<sup>91</sup> BirdLife International. 2024. *Asarcornis scutulata*. *The IUCN Red List of Threatened Species* 2024:

e.T22680064A244637841. <https://dx.doi.org/10.2305/IUCN.UK.2024-2.RLTS.T22680064A244637841.en>. Accessed on 18 February 2026.

<sup>92</sup> Ahmed A., Barman R., Samir S.K., Choudhury, A.U., Yadava M.K., Young G., Stanley Price M. R., Kaul R., and Menon V. (2023). Call of the Divine Duck :

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>species is recorded from two protected areas in Assam – Nameri National Park and Dihing Patkai National Park, with smaller fragmented populations in Assam and Arunachal Pradesh.</p> <ul style="list-style-type: none"> <li>• As per the said report, the species inhabits forested wetlands, pools, swamps and slow-moving streams and channels, favouring contiguous undisturbed primary forests.</li> <li>• Review of the said report indicates that 24 individuals of the species were recorded from three forests in Assam during 2019-2020 surveys.</li> <li>• As per the citizen science portal eBird<sup>93</sup>, the nearest record of the species is from Jorhat in Assam (~107 km N), India and Nampagan in Myanmar (~160 km E).</li> <li>• Considering the species' current distribution range, recent presence records and availability of suitable habitat types, it is unlikely that species</li> </ul> |                   |

Conservation Strategy and Action Plan for the White Winged Duck in Assam.

<sup>93</sup> <https://ebird.org/species/whwduc1>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |         |                        |                          | <p>occurs within the applicable EAAA.</p> <ul style="list-style-type: none"> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul>   |                   |
| 2  | <i>Aythya baeri</i> , Baer's Pochard, CR, 1a, 3a                  | 250-999                                | 1.25                                | 2270000 | -                      | W                        | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>94</sup>, the EAAA is situated within the non-breeding range of the species. The species is known to breed in parts of Russia and China and winters in parts of South and Southeast Asia, including India.</li> <li>As per the IUCN Red List, the distribution of the species is now highly localized, with just a handful sites used regularly either during the breeding or non-breeding (winter) season.</li> <li>Based on Google Earth imagery, ~2% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per the IUCN Red List, the species' wintering habitats</li> </ul> | Screened out      |

<sup>94</sup> BirdLife International. 2019. *Aythya baeri*. *The IUCN Red List of Threatened Species* 2019: e.T22680384A154436811. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T22680384A154436811.en>. Accessed on 18 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>include freshwater lakes and reservoirs.</p> <ul style="list-style-type: none"> <li>As per a research article (dated 2023)<sup>95</sup>, the species currently occurs in only one Protected Area in India which is Kaziranga National Park, Assam.</li> <li>As per the citizen science portal eBird<sup>96</sup>, the nearest record of the species is from Jorhat in Assam (~107 km N), and Imphal in Manipur (~110 km S), of 2-5 individuals recorded as recent as 2023. Review of records on the citizen science portal indicate that the species likely occurs frequently in Assa, with records ranging from December to March.</li> <li>Considering the species' current distribution range, recent presence records and availability of suitable habitat types, it is unlikely that species occurs within the applicable EAAA.</li> </ul> |                   |

<sup>95</sup> Wu, L.; Wang, Y.; Mo, X.; Wei, Q.; Ma, C.; Wang, H.; Townshend, T.; Jia, Y.; Hu, W.; Lei, G. Shifted to the South, Shifted to the North, but No Expansion: Potential Suitable Habitat Distribution Shift and Conservation Gap of the Critically Endangered Baer's Pochard (*Aythya baeri*). Remote Sens. 2022, 14, 2171. <https://doi.org/10.3390/rs14092171>

<sup>96</sup> <https://ebird.org/species/baepoc1>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |         |                        |                          | <ul style="list-style-type: none"> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species or cyclically in the EAAA.</li> </ul>  |                   |
| 3  | <i>Emberiza aureola</i> , Yellow-breasted Bunting, CR, 1a, 3a     | -                                      | -                                   | 7390000 | 0-?                    | Sh, G, A, W              | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>97</sup>, the EAAA is situated within the non-breeding range of the species. The species is known to breed in parts of Central Asia and winters in parts of South and Southeast Asia, including northeastern India.</li> <li>The global population size of the species is not available. As per the IUCN Red List, only 120-600 mature individuals are estimated in the European population. However, such regional estimates are not available for other regions in the species' distribution range.</li> <li>Based on Google Earth imagery, ~4% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> </ul> | Screened out      |

<sup>97</sup> BirdLife International. 2017. *Emberiza aureola*. *The IUCN Red List of Threatened Species* 2017: e.T22720966A119335690. <https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22720966A119335690.en>. Accessed on 18 February 2026.



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <ul style="list-style-type: none"> <li>As per the IUCN Red List, the species' wintering habitats include cultivated areas, rice fields and grasslands. The species prefers scrubby dry-water rice fields for foraging and reedbeds for roosting.</li> <li>As per a research article (dated 2021)<sup>98</sup>, the species' wintering stronghold in northeastern India is Assam, primarily the Brahmaputra River Valley.</li> <li>As per the citizen science portal eBird<sup>99</sup>, the nearest records of the species include multiple records from Jorhat in Assam (~107 km N), and Imphal in Manipur (~110 km S). Review of records on the citizen science portal indicates that the species likely occurs in Assam, Manipur and Tripura in northeastern India as well as in West Bengal, Sikkim and Uttarakhand. The species has also been recorded in western and southern coast of India</li> <li>Considering the species' current distribution range,</li> </ul> |                   |

<sup>98</sup> Choudhury, A. and A. S. Choudhury (2021). The Critically Endangered Yellow-breasted Bunting *Emberiza aureola* in southern Assam. Indian BIRDS Vol 17 No. 5

<sup>99</sup> <https://ebird.org/species/yebbun>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |         |                        |                          | <p>recent presence records and availability of suitable habitat types, it is unlikely that species occurs within the applicable EAAA.</p> <ul style="list-style-type: none"> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul>   |                   |
| 4  | <i>Gyps bengalensis</i> , White-rumped Vulture, CR, 1a, 3a        | 6000-9000                              | 30                                  | 7370000 | 0-1500                 | F, S, Sh, G, U           | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>100</sup>, the species is Resident with respect to the EAAA. Besides India, the species occurs in countries in the South and Southeast Asia.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per the citizen science portal eBird<sup>101</sup>, recent nearest records of the species are from Jorhat, Assam (~107 km N).</li> <li>No recent published literature is available for vultures in Nagaland. As per a research</li> </ul> | Screened out      |

<sup>100</sup> BirdLife International. 2021. *Gyps bengalensis*. *The IUCN Red List of Threatened Species* 2021: e.T22695194A204618615. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22695194A204618615.en>. Accessed on 23 February 2026.

<sup>101</sup> <https://ebird.org/species/whrvul1>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |         |                        |                          | <p>article (dated 2001)<sup>102</sup>, the species is very rare in Nagaland and frequently hunted for food.</p> <ul style="list-style-type: none"> <li>As per the IUCN Red List, the species has a large extent of occurrence and is widespread throughout India.</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul>  |                   |
| 5  | <i>Gyps tenuirostris</i> , Slender-billed Vulture, CR, 1a, 3a     | 1100-1300                              | 5.5                                 | 2130000 | 0-2000                 | F, S, Sh, G, U           | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>103</sup>, the species is Resident with respect to the EAAA. Besides India, the species occurs in Nepal and Bangladesh, with few records from Cambodia, Laos and Myanmar.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per the citizen science portal eBird<sup>104</sup>, recent nearest records</li> </ul> | Screened out      |

<sup>102</sup> Choudhury, A. (2001) Some bird records from Nagaland, north-east India. Forktail (17), pp 91-103.

<sup>103</sup> BirdLife International. 2021. *Gyps tenuirostris*. *The IUCN Red List of Threatened Species* 2021: e.T22729460A204781113. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22729460A204781113.en>. Accessed on 23 February 2026.

<sup>104</sup> <https://ebird.org/species/slbvul1>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |         |                        |                          | <p>of the species are from Jorhat, Assam (~107 km N).</p> <ul style="list-style-type: none"> <li>The EAAA appears to be understudied with respect to vulture diversity. No recent published literature is available for vultures in Nagaland.</li> <li>As per the IUCN Red List, the species occurs in dry, open and forested areas away from human habitation.</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul> |                   |
| 6  | <i>Heliopais personatus</i> , Masked Finfoot, CR, 1a, 3a          | (108-304)                              | 1                                   | 1650000 | 0-1220                 | F, W                     | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>105</sup>, the species is Possibly Extant with respect to the EAAA, meaning its presence in the EAAA is uncertain but probable.</li> <li>As per the IUCN Red List, the species' stronghold is assumed to be the Sunderbans in Bangladesh, with records from Myanmar, Cambodia, Vietnam and Laos.</li> <li>As per the IUCN Red List, the species primarily occurs in</li> </ul>   | Screened out      |

<sup>105</sup> BirdLife International. 2022. *Heliopais personatus*. *The IUCN Red List of Threatened Species* 2022: e.T22692181A181604713. <https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T22692181A181604713.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>rivers in lowland riverine forests including mangroves but is also recorded from coastal and inland wetlands such as tidal creeks, flooded forest, swamps and lakes (rarely reservoirs or industrial pools on passage).</p> <ul style="list-style-type: none"> <li>• Based on Google Earth imagery, ~60% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>• As per the citizen science portal eBird<sup>106</sup>, all records of the species within the last ten years are restricted to Bangladesh, with no records from India.</li> <li>• As per a research article (dated 2020)<sup>107</sup>, the only verified records of the species from India are from specimens collected in the early twentieth century from Assam and Arunachal Pradesh. The article indicates that while no recent records are available for the species in other northeastern states, it is possible that small,</li> </ul> |                   |

<sup>106</sup> <https://ebird.org/species/masfin3>

<sup>107</sup> Chowdhury, SAYAM U., et al. "The status and distribution of the Masked Finfoot *Heliopais personatus*—Asia's next avian extinction." *Forktail* 36 (2020): 16-24.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |         |                        |                          | <p>and as yet undetected, populations of the species persist in the densely forested swamps and hill tracts in remoter parts of Arunachal Pradesh, Assam and other of India's north-east states, especially along the Dibang and Lohit drainages</p> <ul style="list-style-type: none"> <li>• Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul>   |                   |
| 7  | <i>Houbaropsis bengalensis</i> , Bengal Florican, CR, 1a, 3a      | 350-1500                               | 1.75                                | 1550000 | 0-?                    | G, A                     | <ul style="list-style-type: none"> <li>• As per the IUCN Red List<sup>108</sup>, the species is Possibly Extinct with respect to the EAAA. The species occurs in two disjunct populations, one in the Indian subcontinent and the other in South-east Asia. The Indian Subcontinent occurs in India, Nepal and Bangladesh.</li> <li>• In India, the species is known to occur in Uttar Pradesh, Assam and Arunachal Pradesh.</li> <li>• As per the IUCN Red List, the species occurs in lowland dry, or seasonally inundated, natural and semi-natural</li> </ul> | Screened out      |

<sup>108</sup> BirdLife International. 2018. *Houbaropsis bengalensis*. *The IUCN Red List of Threatened Species* 2018: e.T22692015A130184896. <https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22692015A130184896.en>. Accessed on 23 February 2026.



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>grasslands, often interspersed with scattered scrub or patchy open forest.</p> <ul style="list-style-type: none"> <li>Based on Google Earth imagery, ~2% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per the citizen science portal eBird<sup>109</sup>, recent nearest records of the species are from Kaziranga National Park, Assam (~95 km NW). There are no relevant records of the species from Nagaland.</li> <li>As per a research article (dated 2017)<sup>110</sup>, the species occurs along the foothills of the Himalayas and the Brahmaputra Plains. It is possible that undetected populations may remain along large rivers such as the Brahmaputra which support large grasslands.</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-</li> </ul> |                   |

<sup>109</sup> <https://ebird.org/species/benflo2>

<sup>110</sup> Jha, R. R., Thakuri, J. J., Rahmani, A. R., Dhakal, M., Khongsai, N., Pradhan, N. M. B., ... & Donald, P. F. (2018). Distribution, movements, and survival of the critically endangered Bengal Florican *Houbaropsis bengalensis* in India and Nepal. *Journal of Ornithology*, 159(3), 851-866.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | triggering populations of this species.  |                   |
| 8  | <i>Indotestudo elongata</i> , Elongated Tortoise, CR, 1a          | -                                      | -                                   | -   | 0-600                  | F, Sh                    | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>111</sup>, the species is Resident with respect to the EAAA. It has localised occurrences in northern and eastern India, Nepal, Bangladesh, Bhutan, Myanmar, Thailand, Cambodia, Lao PDR, Viet Nam, and Peninsular Malaysia.</li> <li>As per the IUCN Red List, the species inhabits deciduous forest types with open, broken canopy.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per a research article (dated 2016)<sup>112</sup>, the distribution range of the species in India does not include the state of Nagaland, but includes the northeastern</li> </ul> | Screened out      |

<sup>111</sup> Rahman, S.C., Platt, K., Das, I., Choudhury, B.C., Ahmed, M.F., Cota, M., McCormack, T., Timmins, R.J. & Singh, S. 2019. *Indotestudo elongata* (errata version published in 2019). *The IUCN Red List of Threatened Species* 2019: e.T10824A152051190. <https://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T10824A152051190.en>. Accessed on 23 February 2026.

<sup>112</sup> Rhodin, A. G. J., Pritchard, P. C. H., van Dijk, P. P., Saumure, R. A., Buhlmann, K. A., Iverson, J. B., & Mittermeier, R. A. (2016). *Indotestudo elongata* (Blyth 1854)–Elongated Tortoise, Yellow-headed Tortoise, Yellow Tortoise in Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group doi:10.3854/crm.5.096.elongata.v1.2016

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>states of Assam, Meghalaya, Mizoram, Sikkim and Tripura.</p> <ul style="list-style-type: none"> <li>There are no relevant research or other articles regarding the species in Nagaland.</li> <li>As per the citizen science portal iNaturalist<sup>113</sup>, the nearest record of the species are from Tripura (~225 km SW).</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul> |                   |
| 9  | <i>Manis pentadactyla</i> , Chinese Pangolin, CR, 1a              | -                                      | -                                   | -   | 0-3000                 | F, Sh, G                 | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>114</sup>, this species is Resident with respect to the EAAA. It occurs in the Himalayan foothills of the India, Nepal and Bhutan, as also in Bangladesh, Myanmar, Leo PDR, Viet Nam, Thailand and China.</li> <li>As per the IUCN Red List, the species is found in a wide range of habitats, including primary and secondary tropical forests, limestone, bamboo, broad-leaf and coniferous</li> </ul>   | Screened out      |

<sup>113</sup> <https://www.inaturalist.org/>

<sup>114</sup> Challender, D., Wu, S., Kaspal, P., Khatiwada, A., Ghose, A., Ching-Min Sun, N., Mohapatra, R.K. & Laxmi Suwal, T. 2019. *Manis pentadactyla* (errata version published in 2020). *The IUCN Red List of Threatened Species* 2019: e.T12764A168392151. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12764A168392151.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>forests, grasslands and agricultural fields.</p> <ul style="list-style-type: none"> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per the citizen science portal iNaturalist, the nearest record of the species is from the forests near Akhegwo, Nagaland (~75 km E).</li> <li>Based on the species' distribution range, recent presence records and availability of suitable habitat types, the minimum CH triggering number of individuals of the species is unlikely to occur regularly or cyclically in the EAAA.</li> </ul> |                   |
| 10 | <i>Manouria emys</i> , Asian Giant Tortoise, CR, 1a               | -                                      | -                                   | -   | 600-1500               | F                        | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>115</sup>, the species is Resident with respect to the EAAA. It occurs from Bangladesh to northeastern India, Myanmar, Thailand, Malaysia and Indonesia.</li> </ul>   | Screened out      |

<sup>115</sup> Choudhury, B.C., Cota, M., McCormack, T., Platt, K., Das, I., Ahmed, M.F., Timmins, R.J., Rahman, S.C. & Singh, S. 2019. *Manouria emys* (errata version published in 2019). *The IUCN Red List of Threatened Species* 2019: e.T12774A152052098. <https://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T12774A152052098.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <ul style="list-style-type: none"> <li>As per the IUCN Red List (assessed 2018), recent records from India are only from Manipur, Mizoram, and Assam.</li> <li>The species exclusively inhabits evergreen forests and is typically found near water and burrow in damp soil.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>There are no relevant research or other articles regarding the species in Nagaland.</li> <li>As per the citizen science portal iNaturalist<sup>116</sup>, the nearest record of the species, dated 2009, is from Langlokso Bay in Assam (~30 km W).</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul> |                   |

<sup>116</sup> <https://www.inaturalist.org/>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
| 11 | <i>Nilssononia nigricans</i> , Black Softshell Turtle, CR, 1a     | -                                      | -                                   | -   | -                      | W, AA                    | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>117</sup>, the species is Resident with respect to the EAAA. It occurs along the Brahmaputra River and its tributaries, as well as several temple ponds in Assam and Tripura, and river systems in Bangladesh.</li> <li>As per the IUCN Red List, in the wild it is known to occur in large riverine habitats and captive populations in temple ponds.</li> <li>Based on Google Earth imagery, ~2% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>There are no relevant research or other articles regarding the species in Nagaland.</li> <li>As per the citizen science portal iNaturalist<sup>118</sup>, the nearest record of the species is from near Kaziranga National Park, Assam (~95 km N).</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-</li> </ul> | Screened out      |

<sup>117</sup> Praschag, P., Ahmed, M.F. & Singh, S. 2021. *Nilssononia nigricans*. *The IUCN Red List of Threatened Species* 2021: e.T2173A2778172. <https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T2173A2778172.en>. Accessed on 23 February 2026.

<sup>118</sup> <https://www.inaturalist.org/>



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | triggering populations of this species.  |                   |
| 12 | <i>Pangshura sylhetensis</i> , Assam Roofed Turtle, CR, 1a        | -                                      | -                                   | -   | ?-200                  | W                        | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>119</sup>, the species is Resident with respect to the EAAA. It occurs in the foothill areas adjoining the Brahmaputra valley of Bangladesh and India, and Bhutan.</li> <li>It is confined to small, clear, fast-flowing streams and may seasonally use nearby waterbodies with less or no current.</li> <li>Based on Google Earth imagery, ~2% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>There are no relevant research or other articles regarding the species in Nagaland.</li> <li>As per the citizen science portal iNaturalist<sup>120</sup>, the nearest record of the species are from Assam (~100 km N and NW).</li> <li>Therefore, based on the available data, it is unlikely that</li> </ul> | Screened out      |

<sup>119</sup> Praschag, P., Das, I., Ahmed, M.F. & Singh, S. 2021. *Pangshura sylhetensis*. *The IUCN Red List of Threatened Species* 2021: e.T10950A499618. <https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T10950A499618.en>. Accessed on 23 February 2026.

<sup>120</sup> <https://www.inaturalist.org/>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO    | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|--------|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |        |                        |                          | the EAAA supports CH-triggering populations of this species.   |                   |
| 13 | <i>Perdicula manipurensis</i> , Manipur Bush-quail, CR, 1a        | (1-200)                                | 1                                   | 144000 | 0-1000                 | Sh, G, W                 | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>121</sup>, the species is Resident with respect to the EAAA. It is known historically from northern West Bengal, Assam and Manipur, with unconfirmed historical records from Nagaland and Meghalaya and Bangladesh.</li> <li>As per the IUCN Red List assessment, there has been no confirmed record of this species since 1932. Remaining populations are likely very small and fragmented and thought most likely to be in Assam.</li> <li>Although very little is known about the species, it is known to inhabit damp grassland, particularly stands of tall grass, and sometimes bogs and swamps.</li> <li>Based on Google Earth imagery, ~2% of the applicable EAAA contains parts of the habitat types suitable to the</li> </ul> | Screened out      |

<sup>121</sup> BirdLife International. 2024. *Perdicula manipurensis*. *The IUCN Red List of Threatened Species* 2024: e.T22679012A218880247. <https://dx.doi.org/10.2305/IUCN.UK.2024-2.RLTS.T22679012A218880247.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <p>species, as per IUCN Red List data.</p> <ul style="list-style-type: none"> <li>Based on multiple research articles (dated 2009<sup>122</sup> and 2024<sup>123</sup>), the species has not been recorded for over a century. While one website<sup>124</sup> mentions a 2006 (unconfirmed) record from Manas National Park, Assam and proposes a survey for the species in non-protected areas of Assam from December 2025-March 2026.</li> <li>There are no records of the species on the citizen science portals such as eBird<sup>125</sup> or iNaturalist.</li> <li>Based on the available data and considering the habitat requirements of the species, the minimum CH triggering number of individuals of the species is unlikely to occur regularly or cyclically in the EAAA.</li> </ul> |                   |

<sup>122</sup> Choudhury, Anwaruddin. "Significant recent ornithological records from Manipur, north-east India, with an annotated checklist." *Forktail* 25 (2009): 71-89.

<sup>123</sup> Manna, S., Chatterjee, S., Jha, S., Rahut, B., Baidya, K., Das, S., ... & Sengupta, S. (2024). A checklist of the birds of West Bengal, India. *Indian Birds*, 20(4), 97-128.

<sup>124</sup> <https://www.birdfund.org/new-page-4>

<sup>125</sup> <https://ebird.org/species/mabqua1>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|--|-------------------|
| 14 | <i>Sarcogyps calvus</i> , Red-headed Vulture, CR, 1a, 3a          | 3,750-14,999                           | 18.75                               | 5230000 | 0-2500                 | F, S, Sh, G, U           | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>126</sup>, the species is Possibly Extinct with respect to the EAAA. Besides India, the species occurs in countries in the South and Southeast Asia.</li> <li>As per the IUCN Red List, the species occurs in open country usually away from human habitation, well-wooded hills and dry deciduous forest with rivers.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per the citizen science portal eBird<sup>127</sup>, recent nearest records of the species are from Kaziranga National Park, Assam (~95 km N).</li> <li>No recent published literature is available for vultures in Nagaland.</li> <li>As per the IUCN Red List, the species is sparsely distributed in India, and now rare or absent</li> </ul> | Screened out      |

<sup>126</sup> BirdLife International. 2021. *Sarcogyps calvus*. *The IUCN Red List of Threatened Species* 2021: e.T22695254A205031246. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22695254A205031246.en>. Accessed on 23 February 2026.

<sup>127</sup> <https://ebird.org/species/rehvul1>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO      | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|----------|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |          |                        |                          | <p>from the northeastern states. It is common in the west Himalayan foothills.</p> <ul style="list-style-type: none"> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul>  |                   |
| 15 | <i>Aquila nipalensis</i> , Steppe Eagle, EN, 1a, 3a               | 78,042-110,193                         | 390.21                              | 12600000 | 0-3000                 | F, S, G, RA, D           | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>128</sup>, the EAAA is situated within the non-breeding range of the species. The species is known to breed in parts of Central Asia and China. Birds from Altai, Siberia and eastwards migrate to South and Southeast Asia in winter.</li> <li>As per the IUCN Red List, the suitable habitat-types during the non-breeding season appear to be forests, savanna, grasslands and desert.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> </ul> | Screened out      |

<sup>128</sup> BirdLife International. 2021. *Aquila nipalensis*. *The IUCN Red List of Threatened Species* 2021: e.T22696038A205452572. <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22696038A205452572.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO     | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|---------|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |         |                        |                          | <ul style="list-style-type: none"> <li>There are no relevant research or other articles regarding Steppe Eagles in Nagaland.</li> <li>As per the citizen science portal eBird<sup>129</sup>, the nearest record of the species is from Kaziranga National Park in Assam (~95 km N), and Imphal in Manipur (~110 km S), of 2-5 individuals recorded as recent as 2023. Review of records on the citizen science portal indicate that the species winters in various parts of India.</li> <li>Considering the species' current distribution range, recent presence records and availability of suitable habitat types, it is unlikely that species occurs within the applicable EAAA.</li> </ul> |                   |
| 16 | <i>Calidris tenuirostris</i> , Great Knot, EN, 1a, 3a             | 255,000-340,000                        | 1275                                | 2600000 | 0-1600                 | G, M                     | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>130</sup>, the species is a Passage Migrant with respect to the EAAA. The species is known to breed in parts of Siberia and Russia, wintering across the coastline of Southeast Asia and the Indian Subcontinent, as</li> </ul>  | Screened out      |

<sup>129</sup> <https://ebird.org/species/steeag1>

<sup>130</sup> BirdLife International. 2025. *Calidris tenuirostris*. *The IUCN Red List of Threatened Species* 2025: e.T22693359A254641184. <https://dx.doi.org/10.2305/IUCN.UK.2025-2.RLTS.T22693359A254641184.en>. Accessed on 23 February 2026.



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>well as Australia, and the eastern coast of Arabian Peninsula.</p> <ul style="list-style-type: none"> <li>As per the IUCN Red List, the wintering habitats of the species include sheltered coastal areas such as inlets, bays, harbours, estuaries and lagoons with large intertidal mud and sandflats, oceanic sandy beaches with nearby mudflats, sandy spits and islets, muddy shorelines with mangroves and occasionally exposed reefs or rock platforms. On passage the species stages in estuaries and on intertidal mudflats</li> <li>Based on Google Earth imagery, none of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>There are no relevant research or other articles regarding Steppe Eagles in Nagaland.</li> <li>Review of records on the citizen science portal eBird<sup>131</sup> indicates that the species occurs along the Indian</li> </ul> |                   |

<sup>131</sup> <https://ebird.org/species/grekno>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | coastline, with stray inland records in Rajasthan and Madhya Pradesh. <ul style="list-style-type: none"> <li>Considering the species' distribution range, recent presence records and availability of suitable habitat types, it is unlikely that species occurs within the applicable EAAA.</li> </ul>   |                   |
| 17 | <i>Cuon alpinus</i> , Dhole, EN, 1a                               | 4,500–10,500                           | 22.5                                | -   | 0-5300                 | F, Sh, G                 | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>132</sup>, the species is Resident with respect to the EAAA. The species is distributed in Central and East Asia, Indian Subcontinent and other countries in South and Southeast Asia.</li> <li>As per the IUCN Red List, the species is found in several regions of India. Relatively high populations of the species are found in Western Ghats and the central Indian forests. Their numbers in northeastern states are low and decreasing.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to</li> </ul> | Screened out      |

<sup>132</sup> Kamler, J.F., Songsasen, N., Jenks, K., Srivathsa, A., Sheng, L. & Kunkel, K. 2015. *Cuon alpinus*. *The IUCN Red List of Threatened Species* 2015: e.T5953A72477893. <https://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T5953A72477893.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>the species, as per IUCN Red List data.</p> <ul style="list-style-type: none"> <li>As per a research article (dated 2019)<sup>133</sup>, records of Dhole in northeastern India were reviewed from 2010-2018. The review indicates that the species has been recorded from the forests of eastern Nagaland. The nearest record of the species is from Intaki National Park (~25 km SW).</li> <li>As per a research article (dated 2020)<sup>134</sup>, the species now occurs in small populations mostly restricted to forest habitats and agroforests abutting protected areas.</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul> |                   |
| 18 | <i>Cuora amboinensis</i> , Southeast Asian Box Turtle, EN, 1a     | -                                      | -                                   | -   | 0-400                  | F, W, AA                 | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>135</sup>, the species is Resident with respect to the EAAA. It occurs</li> </ul>   | Screened out      |

<sup>133</sup> Singh P, Srivathsa A, Macdonald DW. Conservation status of the dhole *Cuon alpinus* in north-east India, with a focus on Dampa Tiger Reserve, Mizoram. *Oryx*. 2020;54(6):873-877. doi:10.1017/S0030605319000255

<sup>134</sup> Srivathsa, A., Sharma, S., Singh, P., Punjabi, G. A., & Oli, M. K. (2020). A strategic road map for conserving the Endangered dhole *Cuon alpinus* in India. *Mammal Review*, 50(4), 399-412.

<sup>135</sup> Cota, M., Hoang, H., Horne, B.D., Kusriani, M.D., McCormack, T., Platt, K., Schoppe, S. & Shepherd, C. 2020. *Cuora amboinensis*. *The IUCN Red List of Threatened Species* 2020: e.T5958A3078812. <https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T5958A3078812.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>in India, Bangladesh and throughout Southeast Asia</p> <ul style="list-style-type: none"> <li>• It largely inhabits most types of waterbodies except large rivers and reservoirs, preferring lowland swampy areas with dense vegetation as well as intermittent streams in hill forests, mangrove creeks, rice paddies, irrigation canals and tidal areas.</li> <li>• Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>• As per a research article (dated 2017)<sup>136</sup>, the species has a historical record from Nagaland. However, no published literature is available on the distribution of the species in the state.</li> <li>• Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul> |                   |

<sup>136</sup> Das, K.C. & A. Gupta (2017). An ecological note on the new record of *Cuora amboinensis* (Riche in Daudin, 1801) (Reptilia: Testudines: Geoemydidae) in northeastern India. *Journal of Threatened Taxa* 9(7): 10459–10462; <http://doi.org/10.11609/jott.1915.9.7.10459-10462>

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
| 19 | <i>Cuora mouhotii</i> , Keeled Box Turtle, EN, 1a                 | -                                      | -                                   | -   | 350-1200               | F, W                     | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>137</sup>, the species is Resident with respect to the EAAA. It has a disjunct distribution in the Indian subcontinent, northern Myanmar, southern China, Laos PDR and Viet Nam.</li> <li>In India, it is known to occur in Arunachal Pradesh, Assam, Meghalaya and Mizoram.</li> <li>It largely inhabits tropical moist evergreen forests with low undergrowth and leaf litter, and lowland swamp areas.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per a research article (dated 2013)<sup>138</sup>, two specimens were found in a zoo from Nagaland, which were collected from nearby regions.</li> <li>Based on the citizen science portal iNaturalist, all records of</li> </ul> | Screened out      |

<sup>137</sup> Ahmed, M.F., Horne, B.D., Li, P., Platt, K., Rahman, S.C. & Wang, L. 2020. *Cuora mouhotii*. *The IUCN Red List of Threatened Species* 2020: e.T163414A1006285. <https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T163414A1006285.en>. Accessed on 23 February 2026.

<sup>138</sup> Bhupathy, S., Kumar, S. R., Paramanandham, J., Thirumalainathan, P., & Sarma, P. K. (2013). Conservation of reptiles in Nagaland, India. *Bioresources and Traditional Knowledge of Northeast India*. Mizo Post Graduate Science Society (MIPOGRASS), Sikulpuikawn, Aizawl, 796001, 181-186.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO             | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----------------|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |                 |                        |                          | <p>the species are from Assam and Arunachal Pradesh.</p> <ul style="list-style-type: none"> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul>   |                   |
| 20 | <i>Dactylorhiza hatagirea</i> , Salampanja, EN, 1a                | -                                      | -                                   | 4000000-5000000 | 2500-5000              | F, Sh, G                 | <ul style="list-style-type: none"> <li>As per the IUCN Red List Geographic Range<sup>139</sup>, the species is Resident with respect to the EAAA. It is distributed in the Himalayan ranges of Afghanistan, Bhutan, China, India, Nepal, and Pakistan. In India, it is found in Jammu and Kashmir, Himachal Pradesh, Uttarakhand, and Sikkim.</li> <li>As per the IUCN Red List, this ground-dwelling orchid occurs in temperate and alpine regions, near tree-lines under <i>Rhododendron campanulatum</i> and <i>Betula utilis</i> and herbaceous meadows.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to</li> </ul> | Screened out      |

<sup>139</sup> Chauhan, H.K. 2022. *Dactylorhiza hatagirea*. *The IUCN Red List of Threatened Species* 2022: e.T184558707A206539925. <https://dx.doi.org/10.2305/IUCN.UK.2022-2.RLTS.T184558707A206539925.en>. Accessed on 23 February 2026.



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO      | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|----------|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |          |                        |                          | <p>the species, as per IUCN Red List data.</p> <ul style="list-style-type: none"> <li>As per the IUCN Red List, the species occurs in elevations ranging from 2500 to 5000 meters, which is much higher than the average elevation range of the EAAA.</li> <li>As per the citizen science portal iNaturalist, all observations of the species are from the western Himalayan region including Nepal, Uttarakhand, Himachal Pradesh, Ladakh, and Jammu &amp; Kashmir.</li> <li>There are no relevant published literature with respect to the distribution of the species in Nagaland.</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul> |                   |
| 21 | <i>Elephas maximus</i> , Asian Elephant, EN, 1a                   | 48,323–51,680                          | 241.615                             | 11317030 | 0-3000                 | F, Sh, G, P, DF          | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>140</sup>, the species is Resident with respect to the EAAA. It occurs in Bangladesh, Bhutan, India, Nepal, and Sri Lanka in South Asia and Cambodia, China,</li> </ul>  | Screened out      |

<sup>140</sup> Williams, C., Tiwari, S.K., Goswami, V.R., de Silva, S., Kumar, A., Baskaran, N., Yoganand, K. & Menon, V. 2020. *Elephas maximus*. *The IUCN Red List of Threatened Species* 2020: e.T7140A45818198. <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T7140A45818198.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>Indonesia, Lao PDR, Malaysia, Myanmar, Thailand, and Viet Nam in Southeast Asia.</p> <ul style="list-style-type: none"> <li>• In India, it is restricted to four regions, northeastern India, central India, northwestern India, and southern India. In northeastern India.</li> <li>• As per the IUCN Red List, the species is found in grassland, tropical evergreen forest, semi-evergreen forest, moist deciduous forest, dry deciduous forested and dry thorn forest, in addition to cultivated and secondary forests or scrublands.</li> <li>• Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>• As per a scientific report (dated 2017), the northeastern population of the species ranges in the states of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. There are also a few isolated populations in Dhansiri-Intanki region (N of the Project Site).</li> </ul> |                   |

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <ul style="list-style-type: none"> <li>A document on the Nagaland Pollution Control Board (dated 2021)<sup>141</sup> indicates that as of a census report dated 2017, Nagaland has a population of 446 elephants.</li> <li>As per a media article (dated 2025)<sup>142</sup>, Wokha (~60 km NE) supports the highest number of elephants in Nagaland (200 individuals as of 2023).</li> <li>There are no designated elephant corridors within or around the EAAA.</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul> |                   |
| 22 | <i>Hoolock hoolock</i> , Western Hoolock Gibbon, EN, 1a           | -                                      | -                                   | -   | 0-2500                 | F, P, RG                 | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>143</sup>, the species is Resident with respect to the EAAA. It is found in eastern Bangladesh, northeastern India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura), and northwestern Myanmar.</li> </ul>  | Screened out      |

<sup>141</sup> <https://npcb.nagaland.gov.in/wp-content/uploads/World-Elephant-Day.pdf>

<sup>142</sup> <https://nagalandtribune.in/wokha-in-the-crosshairs-of-growing-human-elephant-conflict-leaders-demand-long-term-strategy/>

<sup>143</sup> Brockelman, W, Molur, S. & Geissmann, T. 2019. *Hoolock hoolock*. *The IUCN Red List of Threatened Species* 2019: e.T39876A17968083. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T39876A17968083.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <ul style="list-style-type: none"> <li>As per the IUCN Red List, it is a forest-dwelling species inhabiting tropical evergreen rainforests, tropical evergreen and semi-evergreen forests, tropical mixed deciduous forests, and subtropical broadleaf hill forests.</li> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per a research article (dated 2014)<sup>144</sup>, the species has been recorded in all districts in Nagaland. It occurs in Intaki National Park (~25 km SW), Fakim Wildlife Sanctuary (~120 km E) and Singphan Reserved Forest (~160 km NE), but had apparently disappeared from Pulie Badge Wildlife Sanctuary (~30 km SE) and Rangapahar Wildlife Sanctuary (~8 km NW).</li> <li>As per the citizen science portal iNaturalist, nearest observations of the species are from Assam.</li> </ul> |                   |

<sup>144</sup> Deb, P., Rai, P. K., & Bhattacharjee, P. C. (2014). A review on the distribution of Western Hoolock Gibbon (*Hoolock hoolock*) in Northeast India. *Journal of Research in Biology*, 4(3), 1301-1310.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria    | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|--|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |  |  |                                     |     |                        |                          | <ul style="list-style-type: none"> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul>   |                   |
| 23 | <i>Melanochelys tricarinata</i> ,<br>Tricarinate Hill Turtle, EN, 1a | -                                      | -                                   | -   | ?-300                  | F, S, G, W               | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>145</sup>, the species is Resident with respect to the EAAA. It inhabits the Himalayan foothills western Uttar Pradesh to Arunachal Pradesh of northern and northeastern India and southern Nepal.</li> <li>As per the IUCN Red List, the species is found in grasslands along the Ganga and Brahmaputra at the foot of the Himalayas, moist deciduous and wet evergreen forests of the nearby foothill areas.</li> <li>Based on Google Earth imagery, ~60% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>There are no relevant research or other articles regarding the species in Nagaland.</li> </ul> | Screened out      |

<sup>145</sup> Horne, B.D., Praschag, P., Choudhury, B.C. & Singh, S. 2020. *Melanochelys tricarinata*. *The IUCN Red List of Threatened Species* 2020: e.T13038A511526. <https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T13038A511526.en>. Accessed on 23 February 2026.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <ul style="list-style-type: none"> <li>As per the citizen science portal iNaturalist<sup>146</sup>, the nearest record of the species are from Assam.</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul>  |                   |
| 24 | <i>Nycticebus bengalensis</i> , Bengal Slow Loris, EN, 1a         | -                                      | -                                   | -   | 0-2400                 | F                        | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>147</sup>, the species is Resident with respect to the EAAA. It is found in India, Bangladesh, Bhutan, Cambodia, China, Myanmar, Lao PDR, Thailand and Vietnam.</li> <li>In India, the species is found in northeastern states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura.</li> <li>As per the IUCN Red List, this nocturnal, arboreal species inhabits tropical evergreen rainforest, semi-evergreen forest, and mixed deciduous forest.</li> </ul> | Screened out      |

<sup>146</sup> <https://www.inaturalist.org/>

<sup>147</sup> Nekaris, K.A.I., Al-Razi, H., Blair, M., Das, N., Ni, Q., Samun, E., Streicher, U., Xue-long, J. & Yongcheng, L. 2020. *Nycticebus bengalensis* (errata version published in 2020). *The IUCN Red List of Threatened Species* 2020: e.T39758A179045340. <https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T39758A179045340.en>. Accessed on 23 February 2026.



| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|--|-------------------|
|    |   |  |                                     |     |                        |                          | <ul style="list-style-type: none"> <li>Based on Google Earth imagery, ~57% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per a research article (dated 2021)<sup>148</sup>, approximately 20% of Nagaland contains potential areas suitable to the species.</li> <li>As per a research document (dated 2021)<sup>149</sup>, the species is reported from Fakim Wildlife Sanctuary, Intaki Wildlife Sanctuary, Pulie Badge Wildlife Sanctuary and Singphan Wildlife Sanctuary. It is also recorded from Mokukchung village. However, the population or number of individuals in these regions are not known.</li> <li>As per the citizen science portal iNaturalist, the nearest record of the species is from Sirhima (~10 km SE).</li> </ul> |                   |

<sup>148</sup> Kumara, H. N., Babu, S., Nitte, M., & Karunakaran, P. V. (2021). Conservation status and potential distribution of the Bengal Slow Loris *Nycticebus bengalensis* in Northeast India. *Primate Conservation*, 35, 1-10.

<sup>149</sup> Lyngdoh, A.W., Khatonier, P., Das., J., & Lyngdoh, S. (2021). A Survival Blueprint for the conservation and management of the Bengal Slow Loris, *Nycticebus bengalensis*, in Meghalaya, India. An output from the EDGE of Existence fellowship, Zoological Society of London and National Geographic PhotoArk Program, 2019-2021.

| SN | Scientific Name,<br>Common Name,<br>IUCN<br>Status, Applicable<br>CH Criteria | Global<br>Population<br>(mature<br>individuals) | Minimum<br>CH Trigger<br>Threshold<br>Number | EOO     | Elevation<br>Range (in<br>m) | Suitable<br>Habitat Type(s) | Screening Rationale   | Screening<br>Outcome |
|----|---|---|--|---------|------------------------------|-----------------------------|---|----------------------|
|    |   |   |  |         |                              |                             | <ul style="list-style-type: none"> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul>  |                      |
| 25 | <b>Tor putitora</b> ,<br>Golden Mahseer,<br>EN, 1a                            | -   | -  | 1305202 | -                            | W, AA                       | <ul style="list-style-type: none"> <li>As per the IUCN Red List<sup>150</sup>, the species is Resident with respect to the EAAA. It naturally occurs in the rivers of the South Himalayan drainage, namely the Indus, Ganges-Yamuna and Brahmaputra.</li> <li>As per the IUCN Red List, the species inhabits high energy river systems characterized by rapids and pools with rocky substrate. It has also adapted to lacustrine habitats created by impoundment of dams.</li> <li>Based on Google Earth imagery, ~2% of the applicable EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</li> <li>As per a research article (dated 2025)<sup>151</sup>, the species is recorded from Tsurang and</li> </ul> | Screened out         |

<sup>150</sup> Jha, B.R., Rayamajhi, A., Dahanukar, N., Harrison, A. & Pinder, A. 2018. *Tor putitora*. *The IUCN Red List of Threatened Species* 2018: e.T126319882A126322226. <https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T126319882A126322226.en>. Accessed on 23 February 2026.

<sup>151</sup> Khesoh, V., Pulo, Z., & Pankaj, P. P. (2025). Ichthyofaunal diversity and conservation status of the Tsurang and Milak Rivers of Mokokchung District, Nagaland. *Journal of Applied & Natural Science*, 17(4).

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria                  | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO  | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale  | Screening Outcome |
|----|--|--|-------------------------------------|------|------------------------|--------------------------|--|-------------------|
|    |  |  |                                     |      |                        |                          | <p>Milak Rivers of Mokokchung District in Nagaland (~90 km NE).</p> <ul style="list-style-type: none"> <li>As per a research article (dated 2025)<sup>152</sup>, the species has been frequently recorded from Doyang River in Nagaland (~90 km NE).</li> <li>As per a research article (dated 2018), which reports a study of the ichthyofaunal diversity in the Chumoukedima-seithekima area of the Chathe River over a period of one year (December 2015 to November 2016). The said study did not record the species within the Chathe River which constitutes the applicable EAAA.</li> <li>Therefore, based on the available data, it is unlikely that the EAAA supports CH-triggering populations of this species.</li> </ul> |                   |
| 26 | <i>Trachypithecus pileatus</i> ssp. <i>pileatus</i> , Blond-bellied Langur, EN, 1a | -                                      | -                                   | #N/A | #N/A                   | F, P                     | <ul style="list-style-type: none"> <li>As per its IUCN Geographic Range, the species is resident with respect to the applicable EAAA. It is distributed in Bhutan and north-eastern India.</li> <li>Based on Google Earth imagery, ~57% of the applicable</li> </ul>   | Screened out      |

<sup>152</sup> Sukha, P., & Sarma, K. J. (2025). Checklist of Ichthyofaunal diversity of Nagaland, India. *Journal of Fisheries*, 13(2), 132301-132301.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>EAAA contains parts of the habitat types suitable to the species, as per IUCN Red List data.</p> <ul style="list-style-type: none"> <li>As per an article (dated 2014)<sup>153</sup>, 3 subspecies of the species <i>Trachypithecus pileatus</i> have been recognized. Of these the <i>Trachypithecus pileatus</i> ssp. <i>pileatus</i> occurs in northeastern India. It is cut away from the other two subspecies by the Brahmaputra. Most of these species have been distinguished based on their distribution and facial hair patterns.</li> <li>As per the said article, the species has scattered occurrence in Nagaland. Its presence in Pulie Badge Wildlife Sanctuary and Rangapahar Wildlife Sanctuary is nearly extirpated. It occurs near the Indo-Myanmar border near Saramati and Noklak where good habitat still remains.</li> <li>While the concerned subspecies has been assessed</li> </ul> |                   |

<sup>153</sup> Choudhury, A. 2014. Distribution and current status of the Capped Langur *Trachypithecus pileatus* in India, and a review of geographic variation in its subspecies. *Primate Conservation* 28: 143-157.

| SN | Scientific Name, Common Name, IUCN Status, Applicable CH Criteria | Global Population (mature individuals) | Minimum CH Trigger Threshold Number | EOO | Elevation Range (in m) | Suitable Habitat Type(s) | Screening Rationale   | Screening Outcome |
|----|---|--|-------------------------------------|-----|------------------------|--------------------------|---|-------------------|
|    |   |  |                                     |     |                        |                          | <p>as Endangered in the year 2020, an updated assessment for the parent species (dated 2024)<sup>154</sup> categorizes the species as Vulnerable.</p> <ul style="list-style-type: none"> <li>Therefore, based on the available data and availability of suitable habitats beyond the EAAA, it is unlikely that the EAAA supports CH-triggering populations of these species.</li> </ul> |                   |

<sup>154</sup> Das, J., Chetry, D., Choudhury, A.U. & Bleisch, W. 2024. *Trachypithecus pileatus* (amended version of 2020 assessment). *The IUCN Red List of Threatened Species* 2024: e.T22041A259357527. <https://dx.doi.org/10.2305/IUCN.UK.2024-2.RLTS.T22041A259357527.en>. Accessed on 23 February 2026.

## **APPENDIX 14: 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 15: SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name Contract Number

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_ TITLE: \_\_\_\_\_ DMA: \_\_\_\_\_ LOCATION: \_\_\_\_\_ GROUP: \_\_\_\_\_

|                 |                               |                          |  |
|-----------------|-------------------------------|--------------------------|--|
| <b>WEATHER:</b> | <b>Project Activity Stage</b> | <b>Survey</b>            |  |
|                 |                               | <b>Design</b>            |  |
|                 |                               | <b>Implementation</b>    |  |
|                 |                               | <b>Pre-Commissioning</b> |  |
|                 |                               | <b>Guarantee Period</b>  |  |

|  | 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  |            |
| Worker's 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

## **APPENDIX 16: Guidelines for Borrow Areas Management**

### **1. SELECTION OF BORROW AREAS**

Location of borrow areas shall be finalized as per IRC: 10-1961 guidelines. The finalization of locations in case of borrow areas identified in private land shall depend upon the formal agreement between landowners and contractor. If, agreement is not reached between the contractor and landowners for the identified borrow areas sites, arrangement for locating the source of supply of material for embankment and sub-grade as well as compliance to environment requirements in respect of excavation and borrow areas as stipulated from time to time by the Ministry of Environment Forests and Climate Change, Government of India, and local bodies, as applicable shall be the sole responsibility of the contractor.

The contractor in addition to the established practices, rules and regulation will also consider following criteria before finalizing the locations.

- (1) The borrow area should not be located in agriculture field unless unavoidable i.e. barren land is not available.
- (2) The borrow pits preferably should not be located along the roads.
- (3) The loss of productive and agriculture soil should be minimum.
- (4) The loss of vegetation is almost nil or minimum.
- (5) The Contractor will ensure that suitable earth is available.

### **2. CONTRACTOR'S RESPONSIBILITY**

The Contractor shall obtain representative samples from each of the identified borrow areas and have these tested at the site laboratory following a testing programme approved by the Engineer. It shall be ensured that the sub-grade material when compacted to the density requirements shall yield the design CBR value of the sub-grade. Contractor shall begin operations keeping in mind following;

- (1) Haulage of material to embankments or other areas of fill shall proceed only when sufficient spreading and compaction plants is operating at the place of deposition.
- (2) No excavated acceptable material other than surplus to requirements of the Contract shall be removed from the site. Contractor should be permitted to remove acceptable material from the site to suit his operational procedure, then shall make consequent deficit of material arising there from.
- (3) Where the excavation reveals a combination of acceptable and un-acceptable materials, the Contractor shall, unless otherwise agreed by the Engineer, carry out the excavation in such a manner that the acceptable materials are excavated separately for use in the permanent works without contamination by the un-acceptable materials. The acceptable material shall be stockpiled separately.
- (4) The Contractor shall ensure that he does not adversely affect the stability of excavation or fills by the methods of stockpiling materials, use of plants are siting of temporary buildings or structures.

### **3. BORROWING FROM DIFFERENT LAND-FORMS**

#### **A. Borrow Areas located in Agricultural Lands**

- (i) The preservation of topsoil will be carried out in stockpile.
- (ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iii) Borrowing of earth will be carried out up to a depth of 1.5m from the existing ground level.
- (iv) Borrowing of earth will not be done continuously throughout the stretch.

- (v) Ridges of not less than 8m widths will be left at intervals not exceeding 300m.
- (vi) Small drains will be cut through the ridges, if necessary, to facilitate drainage.
- (vii) The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal).
- (viii) The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside.

#### **B. Borrow Areas located in Elevated Lands**

- (i) The preservation of topsoil will be carried out in stockpile.
- (ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iii) At location where private owners desire their fields to be levelled, the borrowing shall be done to a depth of not more than 1.5m or up to the level of surrounding fields

#### **C. Borrow Areas near River side**

- (i) The preservation of topsoil will be carried out in stockpile.
- (ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iii) Borrow area near to any surface water body will be at least at a distance of 15m from the toe of the bank or high flood level, whichever is maximum.

#### **D. Borrow Areas near Settlements**

- (i) The preservation of topsoil will be carried out in stockpile.
- (ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iii) Borrow pit location will be located at least 0.75 km from villages and settlements. If unavoidable, the pit will not be dug for more than 30 cm and drains will be cut to facilitate drainage.
- (iv) Borrow pits located in such location will be re-developed immediately after borrowing is completed. If spoils are dumped, that will be covered with a layer of stockpiled topsoil in accordance with compliance requirements with respect MOEFCC/PCB guidelines.

#### **E. Borrow Pits along the Road**

Borrow pits along the road shall be discouraged and if deemed necessary and permitted by the Engineer; following precautions are recommended

- (i) The preservation of topsoil will be carried out in stockpile.
- (ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iii) Ridges of not less than 8m widths should be left at intervals not exceeding 300m.
- (iv) Small drains shall be cut through the ridges of facilitate drainage.
- (v) The depth of the pits shall be so regulated that there bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontal projected from the edge of the final section of bank, the maximum depth of any case being limited to 1.5m.
- (vi) Also, no pit shall be dug within the offset width from the toe of the embankment required as per the consideration of stability with a minimum width of 10m.

### **4. REHABILITATION OF BORROW AREAS**

The objective of the rehabilitation programme is to return the borrow pit sites to safe and secure area, which the general public should be able to safely enter and enjoy. Securing borrow pits in a stable condition is fundamental requirement of the rehabilitation process. This could be achieved by filling the borrow pit floor to approximately the access road level.

Re-development plan shall be prepared by the Contractor before the start of work in line with the owners will require and to the satisfaction of owner. The Borrow Areas shall be rehabilitated as per following;

- Borrow pits shall be backfilled with rejected construction wastes and will be given a vegetative cover. If this is not possible, then excavation sloped will be smoothed and depression will be filled in such a way that it looks more or less like the original round surface.
- Borrow areas might be used for aquaculture in case landowner wants such development. In that case, such borrow area will be photographed after their post use restoration and Environment Expert of Supervision Consultant will certify the post use redevelopment.

The Contractor will keep record of photographs of various stages i.e., before using materials from the location (pre-project), for the period borrowing activities (construction Phase) and after rehabilitation (post development), to ascertain the pre and post borrowing status of the area.



# APPENDIX 17: Strip Plan for Proposed Subproject Road

## Dimapur Town

| SI no | RD_ID (New) | Chainage |       |        | Nam of the Road                              | Number of Junction | Existing RoW | Carriageway Width(m) |          | Roadside Drain  |                        |                                | Tree and Utility |                  |
|-------|-------------|----------|-------|--------|--|--------------------|--------------|----------------------|----------|-----------------|------------------------|--------------------------------|------------------|------------------|
|       |             | FROM     | TO    | LENGTH |  |                    |              | Existing             | Proposed | Existing (type) | Proposed (width in mm) | Proposed (side)                | Tree Cutting     | Utility Shifting |
| 1     | DM-RD-1     | 0.000    | 0.700 | 0.700  | Sham Bazar junction to Signal Angami         | 8                  | 7.3-12.2     | 5.5                  | 5        |                 | 1200                   | LHS Drain Cum Footpath         | NA               | 24               |
|       |             | 0.700    | 0.950 | 0.250  |  | 3                  | 6.2-13.5     |                      | 5        |                 | 1200                   | BHS Drain Cum Footpath         |                  | 9                |
|       |             | 0.950    | 1.051 | 0.101  |  | 2                  | 8.6-11.7     |                      | 7        |                 | 1200                   | BHS Drain Cum Footpath         |                  | 5                |
|       |             | 1.051    | 1.451 | 0.400  |  | 6                  | 6-15.5       |                      | 5.5      |                 | 300                    | LHS Open Drain                 |                  | 9                |
|       |             | 1.451    | 2.321 | 0.870  |  | 2                  | 4.1-11.5     |                      | 3.5      |                 | 300                    | LHS Open Drain                 |                  | 24               |
|       |             | 2.321    | 2.351 | 0.030  |  | 1                  | 6.2-8.9      |                      | 3        | NA              | NA                     | (Both side building)           |                  | 1                |
|       |             | 2.351    | 3.491 | 1.140  |  | 6                  | 5.2-14       |                      | 5.5      |                 | 300 + 1200             | LHS Cover Drain + RHS Footpath |                  | 17               |
| 2     | RD-2(2_1)   | 0.000    | 0.271 | 0.271  | MP Road                                      | 3                  | 8.6-13.2     | 3.0-5.0              | 5.5      |                 | 1200                   | LHS Drain Cum Footpath         | NA               | 9                |
|       |             | 0.271    | 0.469 | 0.198  |  | 1                  | 4.2-12       |                      | 3.5      |                 | 300                    | LHS Cover Drain                |                  | 10               |
|       | RD-2(2_2)   | 0.469    | 0.999 | 0.530  |  | 5                  | 8.1-14.6     |                      | 5        |                 | 1200                   | BHS Drain Cum Footpath         |                  | 24               |
|       | RD-2(2_3)   | 0.999    | 1.233 | 0.234  |  | 5                  | 10-12.4      |                      | 5.5      |                 | 1200                   | BHS Drain Cum Footpath         |                  | 19               |
| 4     | DM-RD-3     | 0.000    | 0.320 | 0.320  | Circuit House to Nagarjan via Science Centre | 2                  | 4.6-10.9     | 3.75                 | 5.5      |                 | 1200                   | LHS Drain Cum Footpath         | NA               | 1                |
|       |             | 0.320    | 1.161 | 0.841  |  | 5                  | 4.9-12.5     |                      | 3.75     |                 | 300                    | BHS Cover Drain                | 3                | 33               |
| 5     | DM-RD-4     | 0.000    | 0.120 | 0.120  | NH via Unity College to                      | 0                  | 6.2-9.6      | 4.5                  | 4.5      |                 | 300                    | RHS Cover Drain                | NA               | 4                |
|       |             | 0.120    | 0.300 | 0.180  |  | 3                  | 6.4-10.4     |                      | 4.5      | RCC             | 300                    | RHS Exist. Cover Drain Retain  |                  | 5                |
|       |             | 0.300    | 0.470 | 0.170  |  | 2                  | 4.6-12       |                      | 4.5      |                 | 300                    | RHS Cover Drain                |                  | 3                |

| SI no | RD_ID (New) | Chainage |       |        | Nam of the Road   | Number of Junction | Existing RoW | Carriageway Width(m) |          | Roadside Drain  |                        |  | Tree and Utility |                  |
|-------|-------------|----------|-------|--------|---|--------------------|--------------|----------------------|----------|-----------------|------------------------|--|------------------|------------------|
|       |             | FROM     | TO    | LENGTH |   |                    |              | Existing             | Proposed | Existing (type) | Proposed (width in mm) | Proposed (side)                          | Tree Cutting     | Utility Shifting |
|       |             | 0.470    | 1.119 | 0.649  | Sewak Road  | 3                  | 7.1-12       |                      | 4.5      | RCC             | 300                    | RHS Exist. Cover Drain Retain            |                  | 4                |
| 6     | DM-RD-5     | 0.000    | 1.017 | 1.017  | Burma Camp police point junction to Super market junction | 5                  | 10.1-21.4    | 5.0                  | 5        |                 | 1200                   | BHS Drain Cum Footpath                   | 5                | 20               |
| 7     | DM-RD-6     | 0.000    | 0.350 | 0.350  | Teacher Training Institute to Bangjak Phom colony gate    | 3                  | 5.6-10.5     | 5.0                  | 3.5      |                 | 300                    | LHS Open Drain                           | NA               | 8                |
|       |             | 0.350    | 0.620 | 0.270  |   | 2                  | 6.4-11.2     |                      | 3.5      |                 | 300                    | BHS Open Drain                           |                  | 6                |
|       |             | 0.620    | 0.680 | 0.060  |   | 0                  | 6.2-9.5      |                      | 3.5      |                 | 300                    | LHS Open Drain                           |                  | 1                |
|       |             | 0.680    | 0.782 | 0.102  |   | 2                  | 6.2-9.5      |                      | 3.5      |                 | 300                    | BHS Open Drain                           | 2                | 2                |
| 8     | DM-RD-7     | 0.000    | 0.721 | 0.721  | United Bethel Church to Railway Junction                  | 7                  | 8.7-19.6     | 7.0                  | 7        |                 | 1200                   | BHS Drain Cum Footpath                   | 1                | 44               |
| 9     | DM-RD-8     | 0.000    | 0.801 | 0.801  | Half Nagarjan Junction to Super market Junction           | 4                  | 23-46.1      | 7.0-12               | 8        |                 | 1200 + 300             | LHS Footpath Cum Drain + RHS Cover Drain | NA               | 27               |
|       |             | 0.801    | 0.995 | 0.194  |   | 0                  | 12.7-14.3    |                      | 7        |                 | 1201 + 300             | LHS Footpath Cum Drain + RHS Cover Drain |                  | 7                |
|       |             | 0.995    | 1.151 | 0.156  |   | 0                  | 9.5-16.7     |                      | 7        |                 | 300                    | LHS Open Drain                           | 1                | 4                |
|       |             | 1.151    | 1.251 | 0.100  |   | 0                  | 10.9-11.3    |                      |          | NA              | NA                     | NA                                       | NA               | 0                |

| SI no | RD_ID (New)  | Chainage |       |        | Nam of the Road               | Number of Junction | Existing RoW | Carriageway Width(m) |          | Roadside Drain  |                        |                                      | Tree and Utility |                  |
|-------|--------------|----------|-------|--------|-------------------------------|--------------------|--------------|----------------------|----------|-----------------|------------------------|--------------------------------------|------------------|------------------|
|       |              | FROM     | TO    | LENGTH |                               |                    |              | Existing             | Proposed | Existing (type) | Proposed (width in mm) | Proposed (side)                      | Tree Cutting     | Utility Shifting |
|       |              | 1.251    | 1.379 | 0.128  |                               | 1                  | 10.9-11.3    |                      | 7.5      | RCC             | 300                    | LHS Exist. Open Drain Retain         |                  | 0                |
| 11    | DM-RD-9(9_1) | 0.000    | 0.900 | 0.900  | Nyamo Lotha road to Eros Line | 5                  | 12.8-48.1    | 7.0- 11              | 11       | RCC             | 1200                   | BHS Exist. Drain Cum Footpath Retain | NA               | 25               |
|       |              | 0.900    | 1.150 | 0.250  |                               | 1                  | 13.8-15.7    |                      | 7        | RCC             | 1200                   | BHS Exist. Drain Cum Footpath Retain |                  | 6                |
|       |              | 1.150    | 1.450 | 0.300  |                               | 1                  | 10.8-16.3    |                      | 7        | RCC             | 1200                   | BHS Exist. Drain Cum Footpath Retain |                  | 13               |
|       |              | 1.450    | 1.576 | 0.126  |                               | 1                  | 12.3-14      |                      | 7        | RCC             | 1200                   | BHS Exist. Drain Cum Footpath Retain |                  | 3                |
| 12    | DM-RD-9(9_2) | 1.576    | 1.600 | 0.024  |                               | 0                  | 10.8-17.9    |                      | 7.5      | RCC             | 1200                   | BHS Exist. Drain Cum Footpath Retain | NA               | 2                |
|       |              | 1.600    | 1.830 | 0.230  |                               | 2                  | 12.4-22.3    |                      | 7        | RCC             | 1200                   | BHS Exist. Drain Cum Footpath Retain |                  | 18               |

### ChumukedimaTown

| SI no | RD_ID (New) | Chainage |       |        | Nam of the Road                                      | Number of Junction | Existing RoW | Carriageway Width(m) |          | Roadside Drain  |                     |                         | Tree and Utility |                  |
|-------|-------------|----------|-------|--------|--|--------------------|--------------|----------------------|----------|-----------------|---------------------|-------------------------|------------------|------------------|
|       |             | FROM     | TO    | LENGTH |  |                    |              | Existing             | Proposed | Existing (type) | Proposed (width mm) | Proposed (side)         | Tree Cutting     | Utility Shifting |
| 1     | CH-RD-1     | 0.000    | 1.000 | 1.000  | MDR via Norman Putsure to Chamber of Commerce office | 9                  | 3.4-12.3     | 3 to 6.2             | 4.0      | NA              | Shoulder            | BHS Shoulder            | 6                | 32               |
|       |             | 1.000    | 1.200 | 0.200  |  | 1                  | 3.5-5.8      |                      | 3.0      |                 | 400                 | RHS Open Drain          | NA               | 2                |
|       |             | 1.200    | 1.320 | 0.120  |  | 1                  | 3.5-5.4      |                      | 4.0      |                 | 400                 | RHS Open Drain          |                  | 4                |
|       |             | 1.320    | 1.520 | 0.200  |  | 2                  | 6.5-11.5     |                      | 5.5      |                 | 500                 | RHS Open Drain          |                  | 8                |
|       |             | 1.520    | 1.780 | 0.260  |  | 3                  | 3.8-7.1      |                      | 3.0      |                 | 500                 | RHS Open Drain          |                  | 10               |
|       |             | 1.780    | 2.030 | 0.250  |  | 2                  | 3.4-11.3     |                      | 3.0      |                 | 300                 | LHS Open Drain          |                  | 12               |
|       |             | 2.030    | 2.140 | 0.110  |  | 3                  | 9.8-11.8     |                      | 7.0      | RCC             | 500                 | RHS Exist. Drain Retain | 1                | 7                |
|       |             | 2.140    | 2.300 | 0.160  |  | 3                  | 8.6-17.1     |                      | 7.0      | RCC             | 500                 | BHS Exist. Drain Retain | 0                | 5                |
|       |             | 2.300    | 2.500 | 0.200  |  | 2                  | 4.2-18       |                      | 5.0      |                 | 300                 | RHS Cover Drain         | 1                | 6                |
|       |             | 2.500    | 2.750 | 0.250  |  | 2                  | 4.1-10.1     |                      | 5.0      | RCC             | 300                 | RHS Exist. Drain Retain | 1                | 2                |
|       |             | 2.750    | 2.811 | 0.061  |  | 1                  | 6.1-12.2     |                      | 5.0      |                 | Shoulder            | BHS Open Shoulder       | 0                | 2                |

| SI no | RD_ID (New) | Chainage |       |        | Nam of the Road                          | Number of Junction | Existing RoW | Carriageway Width(m) |          | Roadside Drain  |                     |                                  | Tree and Utility |                  |
|-------|-------------|----------|-------|--------|--|--------------------|--------------|----------------------|----------|-----------------|---------------------|----------------------------------|------------------|------------------|
|       |             | FROM     | TO    | LENGTH |  |                    |              | Existing             | Proposed | Existing (type) | Proposed (width mm) | Proposed (side)                  | Tree Cutting     | Utility Shifting |
| 2     | CH-RD-2     | 0.000    | 0.630 | 0.630  | Konyak Baptist Church to Shekinah School | 4                  | 4.1-10.7     | 3.0 to 3.3           | 3.5      |                 | 500                 | RHS Open Drain                   | NA               | 19               |
|       |             | 0.630    | 0.867 | 0.237  |  | 3                  | 3.3-5.8      |                      | 3.0      |                 | 500                 | RHS Open Drain                   |                  | 3                |
| 3     | CH-RD-3     | 0.000    | 0.580 | 0.580  | Approach Road Weekly Market              | 4                  | 5.1-10.9     | 3 to 7               | 5.0      |                 | 1200                | BHS Cover Drain with footpath    | NA               | 12               |
|       |             | 0.580    | 0.670 | 0.090  |  | 0                  | 4.6-8.1      |                      | 3.0      |                 | 1200                | RHS Cover Drain with footpath    |                  | 5                |
|       |             | 0.670    | 0.811 | 0.141  |  | 2                  | 4.7-12.2     |                      | 5.0      |                 | 1200                | BHS Cover Drain with footpath    |                  | 6                |
| 4     | CH-RD-4     | 0.000    | 1.413 | 1.413  | Approach Road to Chutsolie Colony        | 15                 | 4.7-15.9     | 3.6 to 5             | 5.0      |                 | 400                 | LHS Open Drain With RHS Shoulder | 4                | 37               |
| 5     | CH-RD-5     | 0.000    | 0.120 | 0.120  | Approach Road at Kikrurazha Colony       | 1                  | 5.3-12       | 3.5 to 6             | 4.0      |                 | 400                 | Open Drain With RHS Shoulder     | NA               | 0                |
|       |             | 0.120    | 1.200 | 1.080  |  | 6                  | 3.4-12.5     |                      | 4.0      |                 | 400                 | RHS Open Drain With LHS Shoulder |                  | 8                |