



Government of the People's Republic of Bangladesh
Local Government Engineering Department
Local Government Division
Ministry of Local Government, Rural Development & Co-operatives

FINAL REPORT

STUDY FOR ENHANCING ACCESSIBILITY TO DISPERSEDLY
LOCATED VILLAGES IN THREE HILL DISTRICTS UNDER MY VILLAGE
MY TOWN TECHNICAL ASSISTANCE PROJECT
CONTRACT NO. MVMT-S-13

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Local Government Engineering Department

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GLOSSARY

Disconnected Villages mean in the Study those villages which are not connected by all-weather riverine route and/or paved road with the respective Upazila HQ and/or Union Parishad, and to the nearest economic activity hub and social service centres. The villages located within 2 km buffer from the paved road are considered connected in the rural context of Bangladesh; based on the definition, approximately 1706 villages of total 4761 villages are still very disconnected in the CHT region.

Remote Villages mean in the Study those villages not easily accessible hard-to-reach disconnected villages. People living in those remotest villages have to walk long hours through hilly trails, along water streams called Jhiri, and/or commute using canoe and bamboo raft with goods in the shallow river or channel. As an example, located in the most southeastern part of Bangladesh, the village Singpa is so isolated and remotest that depending on the season, it may take over half a day for the locals to travel to the nearest growth centre in Remakri and almost a day and a half to reach its Thanchi Upazila, a sub-district of Bandarban, by walking and using traditional means of inland waterways transport like bamboo raft or canoe. The condition is the same of the Betling people coming to their Bagaichhari Upazila or to the important Masalong Bazar via Masalong chara that need them staying overnight on their way with the local community.

Para is the synonym of village in the plain land for the Study, on an average consists of 46 households and a population of around 230 persons. In the local language, a para is called ‘Adam’, and few paras make a village which is traditionally called ‘Mouza’ in the CHT. A Karbari is the head of a para, while a headman is the head of such a village called ‘Mouza’ in the traditional system.

Mouza is normally the geographical expression of a unit of landmass for revenue settlement and revenue collection, whereas, the village is a human settlement within a Mouza with strong social bond. Within a Mouza there could be more than one village in the plain. In the CHT, however, in the local language, a village is called ‘Mouza of which a headman is the head responsible for revenue collection.

Union Bangladesh has 3-tiers local government system: District, Upazila and Union. Union is the lowest level of local government below Upazila Parishad

Upazila Sub-district; the third level of government administration below division and district.

CHT Chittagong Hill Tracts (CHT) comprises of the three hill districts of Rangamati, Khagrachhari and Bandarban under the Chittagong Division of Bangladesh.

Hat Synonym of bazar or market

Jhiri The Jhiri in CHT, synonymous to the canal in the plain land, such as, Patang Jhiri and Chingri Jhiri (Bandarban), and Ghagra Jhiri (Rangamati) which are sourced to waterfalls from the top of the hill. Patang Jhiri waterfall is situated before the way of Boga Lake and Chingri Jhiri waterfall around half an hour of straightforward walking distance from the Boga Lake at Ruma Upazila. The water level is normally low; most

of the cases, an average of one foot or less but some places are having very deep-water level in the Jhiri.

Jhiri Path a walking path used by travelers and/or community people where one walk through the water streams. When the water level is low in the Jhiri, normally in winter season, tribal community living in the remotest hills choose to walk through the water streams, instead of informal difficult path through the hilly terrain that they have to walk pass when water level is full with heavy current in the Jhiri.

Walking Trail mean in the Study the village pathway or access used for walking by commuters, in the most cases does not have gazetted or established or commonly used alignment, and to the most, passable by bi-cycle or motor bike. These village trails are not passable by motorized jeep or mini truck or emergency service vehicle or not even by any three wheelers.

Unpaved Roads have no pavement or surface material. They are usually the earthen roads.

Vulnerability is the human dimension of risk that is defined as conditions determined by physical, social, economic, environmental, political, cultural and institutional factors or processes which increases the likelihood of an individual or a community to the impacts of shocks and hazards.

Food security means when all people, at all times, have physical and economic access to sufficient, safe and nutritious food (as defined by WFP). It is important that each and every household including all its members has access to safe, nutritionally adequate, and culturally acceptable food.

Resilience is expressed as the ability of a community to resist, absorb, adapt to and recover better from the impacts of disaster like flood and landslides in a sustainable way.

Landslide is defined as the mass movement of soil/earth and/or debris down a hill slope triggered by both natural (rainfall and geology/lithology) and anthropogenic (hill cutting and deforestation) causes.

Headman & Karbari A Headman is the head of a Mouza (in the CHT, a village is called 'Mouza in their local language). A Karbari is the head of a Para (locally called as 'Adam').

Tribal & Non-tribal is commonly understood as different cultural groups. According to the Constitution of Bangladesh, all people born in Bangladesh are Bengalis, but the Constitution keeps referring to different cultural and linguistic groups living in Bangladesh as "tribes, minor races, ethnic sects and communities", and by doing so, seeks only to protect their culture [article 23 (A)]. In this light, ethnic minority people living in the CHT are treated as 'tribals' in official documents; while in the Act 12 of 1995 and Rules 6, 34, 45, 50 of Chittagong Hill Tracts (CHT) Regulation (1900), they are documented as 'indigenous peoples' or 'aboriginal' as per section 97 of the SAT Act (1950). There are 11 ethnic minority groups in the CHT who are collectively called as tribal, and those Muslims and Hindus settled in the CHT from outsides are treated as non-tribal. According to the survey of 2011, the CHT population was 1.6 million, of which around 51% were tribal population.

Shifting cultivation is the traditional cultivation system practiced by tribal communities in the hills districts, also called slash and burn cultivation or Sweden cultivation. This is a rain fed upland cultivation system and unsustainable at which an area is entirely cleared of its vegetation by cutting and then burning the cut material. Seeds are sown or broadcast after the first April showers. The usual practice is for seeds of hill paddy, maize, millet, vegetables, chilly, melon, pumpkin, hill cotton, spices and other species to be mixed and sown into small holes. Environmental degradation is caused by the slash and burn style of shifting cultivation practices, but Jhumers produce their subsistence food from the Jhum cultivation, since time immemorial.

Village Common Forest (VCF) is a natural forest [other than the government reserve forest], usually situated around the households of ethnic tribal communities. Village Common Forests (VCF) are used sustainably for water source conservation, livelihoods and other daily biomass needs of ethnic communities living in the hilly areas of the CHT in Bangladesh. The current forest degradation rate warrants the importance and potentiality of the aboriginal management techniques and tree species diversity in VCF for sustainable natural resources management. The management practice is not only about conserving hill forests, but also helping to improve degraded forest and create new habitats for biodiversity.

Land ownership of a household in CHT context is to be understood along its three major types of ownership: (i) individual registered ownership, (ii) traditional ownership under usufruct rights, and (iii) usufruct rights to ownership of common property (different from that in the plain land). For example, if an ethnic household uses part of para common property as homestead or as cultivated land, all members from his/her community/para traditionally honor his/her usufruct right of ownership on that part of common property.

Peace Accord refers to the Chittagong Hill Tracts Peace Accord 1997. Also known as Chittagong Hill Tracts Treaty, 1997 is a political agreement and peace treaty signed on 2 December 1997 between the Bangladesh Government and the Parbattya Chattogram Jana Sanghati Samiti ((PCJSS). The agreement ended a decade long arm conflict with a promise to bring peace in the Hill Tracts.

ABBREVIATIONS

ADB	– Asian Development Bank
BBS	– Bangladesh Bureau of Statistics
BC	– Bitumen Carpeting
BDP2100	– Bangladesh Delta Plan 2100
BFS	– Brick Flat Soling
BGB	– Boarder Guard Bangladesh
BWDB	– Bangladesh Water Development Board
BRAC	– Bangladesh Rural Advancement Committee
CEGIS	– Center for Environmental and Geographic Information Services
CHT	– Chittagong Hill Tracts
CHTDB	– Chittagong Hill Tracts Development Board
CHTDF	– Chittagong Hill Tracts Development Facilities
CHTRC	– Chittagong Hill Tracts Regional Council
CHTRDP	– Chittagong Hill Tracts Rural Development Project
DatEx	– Data Expert (Pvt.) Limited
DECL	– Delight Engineers and Construction Ltd.
DoE	– Department of Environment
DoF	– Department of Forest
DPHE	– Department of Public Health Engineering
DPP	– Development Project Proposal
FGD	– Focus Group Discussion
GIS	– Geographic Information System
GOB	– Government of Bangladesh
Government	– Government of Bangladesh
HBB	– Herring-Bone-Bond
HDC	– Hill District Council
HH	– Household
HQ	– Headquarter
INGO	– International Non-Government Organization
ICIMOD	– International Centre for Integrated Mountain Development
JICA	– Japan International Cooperation Agency
JV	– Joint Venture
KII	– Key Informant Interview
LGD	– Local Government Division
LGED	– Local Government Engineering Department
LGRD	– Local Government, Rural Development

LGI – Local Government Institute
Ministry – Ministry of Local Government, Rural Development & Cooperatives/Ministry of LGRD & Cooperatives
MDGs – Millennium Development Goals
MoCHTA– Ministry of Chittagong Hill Tracts Affairs
MVMT – My Village My Town
NGO – Non-Government Organization
NTFPs – Non-timber forest products
PD – Project Director
PPP – Public Private Partnership
PMO – Project Management Office
RCC – Reinforced Concrete
RHD – Roads & Highways Department
SDGs – Sustainable Development Goals
SRDI – Bangladesh’s Soil Resource Development Institute
Study – Study for enhancing accessibility to dispersedly located villages in the three hill districts
TA – My Village My Town Technical Assistance Project
UN – United Nations
UNDP – United Nations Development Programme
UNO – Upazila Nirbahi Officer
UNICEF – United Nations Children Emergency Fund
UP – Union Parishad
WASH – Water, Sanitation & Hygiene
WB – World Bank

ACKNOWLEDGEMENT

‘My Village My Town’: *Extension of Modern Civic Amenities in Every Village* was one of the special commitments in the 2018 Election Manifesto of the present Government to transform the villages into centres of prosperity. Having endorsed in the 8th Five Year Plan (2020-2025), the Perspective Plan (2021-2041) and the Delta Plan 2100, Government is formulating now *‘My Village-My Town Project’* to extend modern civic amenities to every village by undertaking 36 studies under *‘My Village My Town Technical Assistance Project’*. Accordingly, the datEx and DECL JV are hired to conduct 5 (five) feasibility/reviewing studies on rural connectivity under this TA. The managements of the JV are therefore highly indebted to the Local Government Engineering Department (LGED) and the Project Management Office (PMO) for this given opportunity in becoming a part of the nation building agenda.

One of the five is the *“Study for enhancing accessibility to the dispersedly located villages in the three hill districts”*, on which this report is prepared. The Study was conducted by a dedicated team engaged by the datEx and DECL JV during October 2021 to March 2022, in 23 Upazilas except Sadar Upazilas of the three hill districts. Here, both the JV and the Study team acknowledge and express sincere gratitude for some of the unconditional support and facilitation beyond mandate received from the Project Director, the PMO office team, and LGED field offices’ technical staff from start to this end of the Study. Without, smooth completion of the field work with quality and within time, and producing database duly reviewed with the field participation, and maps in the print form illustrating disconnected villages and population, and showing their connecting roads and priority proposals would have been so difficult.

This Study specially owe to Upazila Chairmen, Upazila Nirbahi Officers, Executive Engineers, Upazila Engineers, Senior Assistant Engineers, Union Parishad Chairmen/members, and host community tribal and non-tribal people of the three hill districts for their valuable time, support, participation and cooperation in conducting the study with the team’s satisfaction. On behalf of the JV, the Study team expresses sincere gratitude to the Project Director, to the Senior Rural Infrastructure Specialist (PMO), and to the Project Advisor for their valuable comments on the Draft Report and for the advices and supports that were received on the Study, as well.

It is finally acknowledged that master database, GIS database and maps are prepared with integrity, honesty and sincerity through review at the stakeholder consultation meetings held in each Upazila, Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), and authenticity check by visits to the 23 case study unions (one union from each study Upazila), and then validated at the stakeholder consultation workshop held in Rangamati. The Study expresses special thanks to all who participated the workshop and provided feedbacks and suggestions, and especially to the representatives from the Regional Council, Development Board and Hill District Councils for their valued contributions with active participation in the day-long workshop. Still, in no case, the database and the priority list can be treated as error free and a complete list for establishing a total connectivity to the dispersedly located all villages of the CHT area. Given the time, accessibility and security constraints, authentication was not always possible. For your any query and clarification, please contact the Project Director, Engr. Abul Monzur Md Sadeque at mvmt.hill@gmail.com, monzursadeque@gmail.com and the Deputy Team Leader of the Study, Engr. Nurun Nahar Begum at nurunbangladesh@gmail.com.

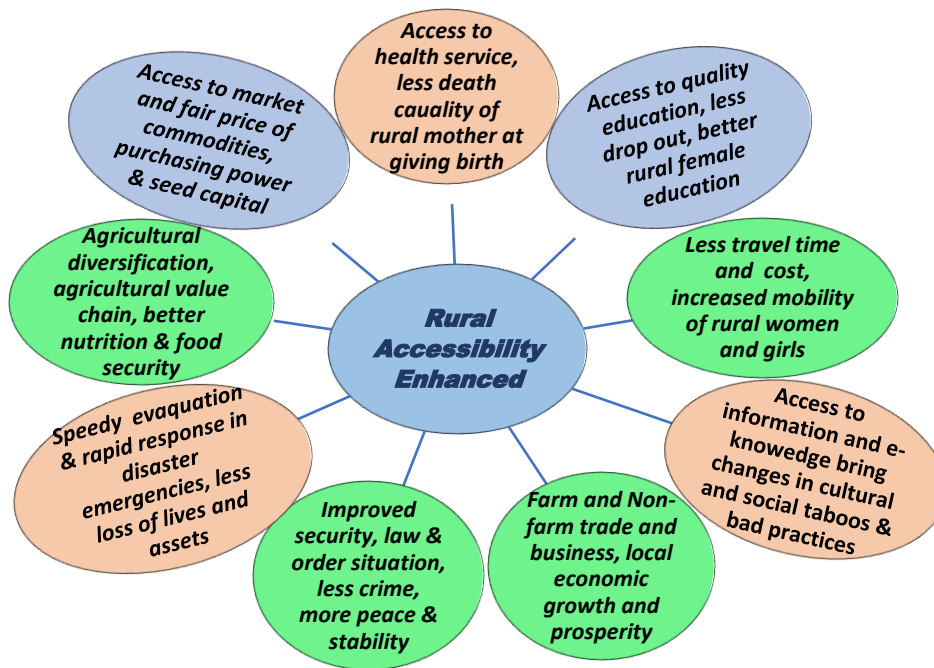
EXECUTIVE SUMMARY

Rural connectivity is a key component of rural development and contributes significantly to the socio-economic development of rural area and population by providing access to amenities like education, health, marketing, etc. Improving rural roads reduces transport cost and stimulates marketing. This results in increased production and productivity, crop diversification and increased profitability. There increases farm and non-farm employment, better access to education, health, recreational facilities, farm management services, information flow and e-commerce. Access to all-weather roads reduces the incidence of poverty and enhances the participation of women in the economy. Enhancing the rural connectivity prevents the rise in urban rural disparities, and check in migration of rural people to urban centres.

Since the Peace Accord signed in 1997, the overall development happened in the Chittagong Hill Tracts (CHT) region is promising but the rural development is still very lagging as compared to the plain areas of the country. There persist rural-urban disparities within the region itself. The remoteness and inaccessibility persistently impact on the rural growth and development. The maximum village roads are earthen yet to be paved, and all-weather inland waterways are also limited. Traditional country boats, walking, and 2-wheelers' motor cycles are the most common transport modes used by the village dwellers for commuting to their respective Upazila HQ, Union Parishad and market places with commodities produced for selling or purchasing essential goods, and getting basic services. The rural people living in the remotest villages are mostly poor and food insecure, children malnourished, students' drop out high, and vulnerability of mothers will be giving birth to child high without access to medical facilities, and livelihood is dependent on traditional jhum cultivation for lacking market facilities in the vicinity, or owing to market places hard to reach since very old days.

Government of Bangladesh is formulating '*My Village-My Town Project*' to extend modern civic amenities to every village on priority given to the hard-to-reach villages located in hill, haor, char, beel, and island Upazilas of the country by undertaking 36 studies under the '*My Village My Town Technical Assistance Project*'. The datEx and DECL JV are hired for carrying out five feasibility/reviewing studies on rural connectivity under the Technical Assistance. One of the five is the "*Study for enhancing accessibility to the dispersedly located villages in the three hill districts*". The study was conducted during October 2021 to March 2022, in 23 Upazilas except Sadar Upazilas of the three hill districts. The outputs of the Study will contribute towards establishing rural connectivity of the dispersedly located villages by all-weather transport network (paved road and/or multi-modal inland waterways) with the economic activity hubs and social services available at the Upazila HQ, Union Parishad, and growth centres or important markets, and therefore will help enriching local economic growth potential, and uplifting the livelihood and living standard of the village dwellers residing in the three hill districts of the CHT region.

'*My Village-My Town Project*' is well endorsed in the 8th Five Year Plan (2020-2025), the Perspective Plan (2021-2041), and the Delta Plan 2100. Implementation of the Project will contribute to the achievement of SDGs and to the fulfillment of the Vision 2041.



Linkage between Rural Accessibility & Development

A three members’ study team engaged by the datEx and DECL JV conducted the Study including data analysis, mapping and reporting. The database was reviewed, priority needs identified and mapped working together with the LGI representatives and LGED technical staff at the stakeholder consultation meeting held in each Upazila. One union from each study Upazilas were studied in details for observations and authenticity check. The key outputs of the Study include databases of priority sub-projects and maps for each study Upazila illustrating disconnected villages and population and showing proposed roads and riverine routes. One other output are the tourism maps produced for each hill district showing proposed new avenues and priority roads that will facilitate tourism development in the region. The findings of the Study, especially the outputs were validated at a regional workshop held in Rangamati with active participation of the Project Director, key LGED officials and technical staff (Hill districts), and representatives from the Hill District Councils (HDCs), Chittagong Hill Tract Development Board (CHTDB), and Chittagong Hill Tract Regional Council (CHTRC). Incorporating the comments and feedback from the workshop, this Final Report is prepared and presented in three Parts. PART I includes ***Introduction and General Overview***, Part II covers ***General Findings***, and PART II describes ***Proposals, Conclusions and Recommendations***. A separate volume of ***Appendices of Key Outputs & Observations*** includes database, maps and observations printed in A3 Size for easy reference. Excessive rainfall due to climate change, population pressure, and unplanned and uncontrolled use of natural resources led to deforestation, environmental degradation, soil erosion and landslide which threatens environmental sustainability, building climate resilient infrastructure and sustainable agricultural development in the region. The Study strongly recommends to have a land use planning and then for development control with regular monitoring through community engagement. Finally, a National Level Stakeholder Workshop will be held in Dhaka for disseminating the findings and sharing recommendations presented in the Final Report.

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PART I: INTRODUCTION & GENERAL OVERVIEW

Study for enhancing accessibility to dispersedly located villages in the three hill districts under 'My Village-My Town Technical Assistance Project'



1. Introduction

- 1.1 Government is committed to improve the lives of vast rural population through extension of modern civic amenities to each village and transformation of the villages into centre of prosperity (cf. the 2018 Election Manifesto). Accordingly, this is formulating now “*My Village-My Town Project*” to extend modern civic amenities to every village with priority given to the hard-to-reach villages located in hill, haor, char, beel, and island Upazilas of the country by undertaking 36 studies under the ‘*My Village My Town Technical Assistance Project*’. The formulation is led by the Ministry of LGRD & Cooperatives with the support from LGED and DPHE in conducting the studies. The datEx and DECL JV are hired by LGED to conduct five feasibility/reviewing studies on rural connectivity under this TA. One of the five is the “*Study for enhancing accessibility to the dispersedly located villages in the three hill districts*”. The Study was conducted during October 2021 to March 2022 in 23 Upazilas except Sadar Upazilas of the three hill districts. A 3-members study team was engaged by the datEx and DECL JV to conduct the Study. The outputs of the Study will contribute towards establishing rural connectivity of the dispersedly located villages of the three hill districts in the CHT region by all-weather transport network (paved road and/or inland waterways) with the economic activity hubs and social services available or will be made available at the Upazila HQ, Union Parishad and growth centres/important markets, and therefore enriching economic growth potential of the hill districts, and the livelihood and living standard of the village population residing in the CHT. This Final Report is prepared on the Study and presented into three parts. PART I includes introduction and general overview. First, policy context and then the characteristics of the Study area are narrated that covers remoteness, geo-morphological context, nature, hydrology and environment, tradition and culture, livelihood options, and challenges. This is followed by objectives and outputs, approach and methodology of the Study. Then PART II presents general findings and key outputs of the Study. Finally, PART III covers proposals, conclusions and recommendations. A separate volume of **Appendices of Key Outputs & Observations** is provided in A3 Size for easy use.
- 1.2 Rural connectivity is a key component of rural development and contributes significantly to the socio-economic development of rural people by providing access to amenities like education, health, marketing, etc. (**Figure 1**) below. Improving rural roads reduces transport cost and stimulates marketing. This results in increased production and productivity, crop diversification and increased profitability. There increases farm and non-farm employment, better access to education, health, recreational facilities, farm management services, information flow and e-commerce. Access to all-weather roads reduces the incidence of poverty and enhances the participation of women in the economy. Enhancing the rural connectivity is essential to prevent the rise in urban rural disparities in growth and development, and reverse or check migration of rural population to urban centres. According to the 2019 Work Plan drafted by the Local Government Division (LGD) of the Ministry of LGRD & Cooperatives, the Project will include rural road transport and riverine inland communication, telecommunication including internet connectivity, health and education, market development and agricultural value chain,

water, sanitation and solid waste management, among other targets, community space and recreation. Extending or bringing modern facilities and services to each village will not disrupt eco-system and destroy natural village outfit. This will be ensured through a planned development in a coordinated and sustainable manner towards building a prosperous Bangladesh that the Father of the Nation dreamed of.

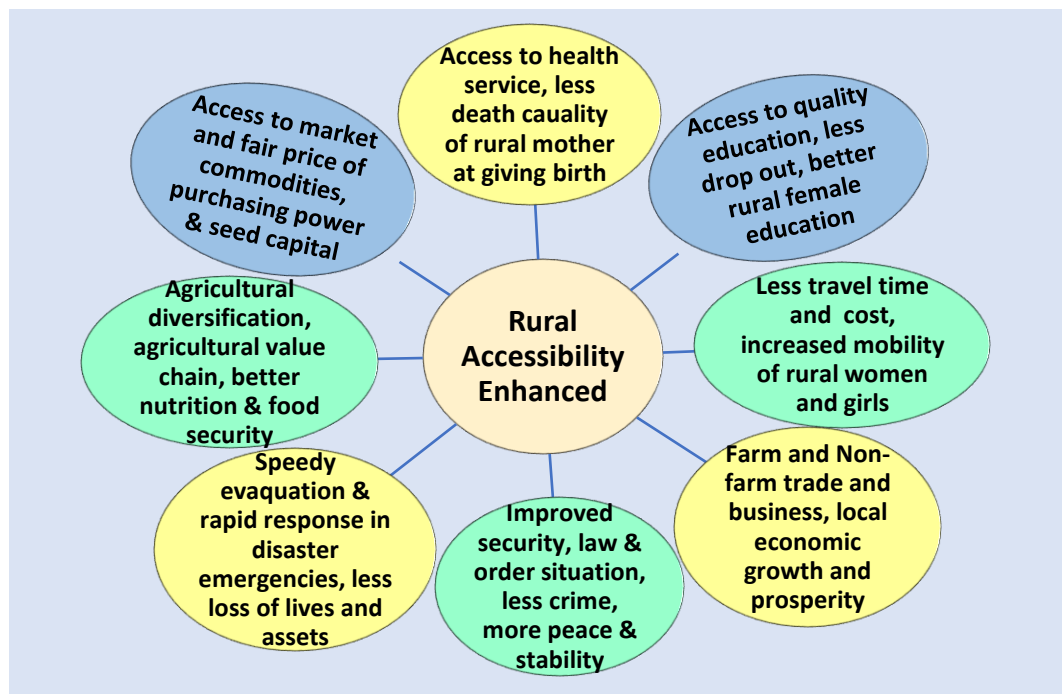


Figure 1: Linkage between Rural Accessibility & Development

1.3 “*My Village-My Town Project*” is being piloted in 15 villages across the country to develop model villages. All facilities including communication and market infrastructure, modern health services, quality education, safe drinking water, information technology and internet, waste management, community space and recreation, banking, rural resources management, power and energy supply, and modernisation and mechanisation of agriculture will be ensured in the model villages. Apart from economic activities, social and cultural aspects will get importance in building the model villages. Eight of the 15 model villages will be in eight divisions of the country. The remaining seven will be in the haor, hill, coastal island, char, barind, and beel areas and one next to an economic zone. The lessons learned from the pilot will help in bringing modifications to the interventions’ design, implementation and replication including of rural accessibility component of the Project.

2. Policy Alignment

2.1 ‘*My Village-My Town Project*’ is well endorsed in the 8th Five Year Plan (2020-2025), the Perspective Plan (2021-2041) and the Delta Plan 2100. Implementation of the Project will contribute to the achievement of SDGs’ targets by 2030 and to the fulfillment of the Vision 2041. This Project’s initiatives are aligned with the 8th Five Year Plan, in particular with the Plan’s Pro-Poor and Inclusive Growth Strategy, and Poverty and Inequality Reduction Strategy. The Plan specifically aims to reduce poverty in the lagging regions, and mentions

that the CHT “exhibits a large concentration of poor people, with two of the three districts in the CHT [Bandarban and Khagrachhari] showing poverty in the 53-63 percentage range, which is more than twice the national average.” The Government sets target to attain yearly GDP growth of 8% and to bring down the poverty rate to 15.6% and extreme poverty rate to 7.4% at the end of the 8th FYP period. The Government also targets to create 11.33 million employments, including 2.25 million overseas jobs during the 8th Five Year Plan.

2.2 The ‘My Village-My Town Project’ is also well aligned with the various Sectoral Development Strategies of the 8th Five Year Plan, in particular with the strategies for Agriculture and Water Resources Management, Transport and Communication, Local Government and Rural Development, and Environment and Climate Change, and also with the objectives and targets for MoCHTA included in the 8th Five Year Plan especially: supporting the strengthening of the CHT Regional Council and Hill District Councils, expanding agricultural activities and non-farm rural enterprises to expand employment and income, value chain development and marketing, encouraging community forest to conserve biodiversity and watersheds, promoting integrated watershed management and sustainable water resources management.

2.3 The ‘My Village-My Town Project’ will respond to the priority given in the Plan to rural infrastructure development relating to irrigation, drainage, access roads, bridges and culverts, imparting training to youth and women for making agro-based business and non-farm enterprises, etc. Finally, the project will also respond to the 8th Five Year Plan’s priorities under social protection, especially its focus on ‘Gender Equality and Women Empowerment’ and ‘Inclusion of Ethnic Communities’, with specific reference to the CHT as “one of the most disadvantaged and vulnerable regions in the country in terms of almost all major development indicators”. Apart from the priorities mentioned, the Plan’s Chapter on social inclusion includes the following measures to be promoted for the CHT: empowerment of ethnic communities, income generating activities, marketing infrastructure, strengthening vocational and social skills, promoting sustainable development, mitigating climate related challenges, and strengthening the implementation capacity of local institutions, such as the Union Parishads, HFCs and CHTRC.

A. Bangladesh Delta Plan 2100

2.4 Bangladesh has been ranked as a highly vulnerable country in terms of risks to shocks and natural hazards. In the face of adverse effects of climate change, the Bangladesh Delta Plan 2100 has identified the CHT region as one of the six hotspots, with water shortage identified as a key problem for households and agriculture, and rapid deforestation as contributing to erosion which in turn causes siltation of rivers and reservoirs, including Kaptai Lake, and flash floods and flooding in low lying areas.

Table 1: Indicative District Level Hazards for the CHT

Bandarban:	Earthquake		Landslide	Erosion		Flash flood
Khagrachhari:	Earthquake	Cyclone	Landslide	Erosion	Flood	Flash flood
Rangamati:	Earthquake	Cyclone	Landslide	Salinity	Sea Level Rise	Flash flood

Source: Climate Risk and Vulnerability Assessment (CRVA) Tool for Screening Climate Change Risks of Development Projects, GoB and ADB, 2018

2.5 The Delta Plan, modeled on the Netherlands, contains three higher level national goals for elimination of extreme poverty and achieving upper middle-income status by 2030, and being a prosperous country by 2041; while six specific goals of the Plan covers flood and climate change related disasters, water security, river management, wetland and ecosystem, water management, use of land and water resources. The *'My Village-My Town Project'*'s interventions such as Water, Sanitation and Hygiene (WASH), watershed management, waste management, climate resilient infrastructure, and agriculture value chain make an excellent fit with the following BDP2100 strategies for the CHT hotspot:

- Ensure water security and sustainable sanitation (Strategy CH 2), where sub-strategy CH 2.2 recommends installation of location sensitive water supply mechanisms;
- Ensure integrated river management (Strategy CH 3), where sub-strategy CH 3.1 aims at integrated sediment and erosion management in the hills by creating green belt, eco-friendly structures, soil and water conservation, and reforestation; and substrategy CH 3.2 suggests for development of catchment and sub-catchment management plans with particular attention to erosion management in the hills and restricted cultivation on steep slopes (agro-forestry).
- Main Ecological Balance and Values (Strategy CH 4), where sub-strategy CH 4.1 recommends the promotion of sustainable cultivation practices and regeneration of degraded areas, and sub-strategy CH 4.2 aims at prompting wise use of soil and waterbodies for sustainable livelihoods.
- Develop multi-purpose resources management system for sustainable growth (Strategy 5); where Sub-strategy CH 5.1 aims at strengthening institutions and cooperation for integrated holistic watershed management, and Sub-strategy CH 5.2 aims at strengthening resilience of livelihoods and sustainable food production by creating markets, marketing and value chain development for income diversification.

2.6 The catchment of the important rivers in the CHT (e.g. the Matamuhuri and the Sango) is within the country's borders that offer excellent conditions for integrated river basin management and opportunities to address problems holistically. One of the strategies for inland waterway sector is to 'develop the navigation network according to the societal and economic demands. Improvement in the navigability of inland waterways will reduce travel time and transport costs - both for cargo and passengers - thereby boosting national and regional trade. The short-term measures of the Plan will be implemented by 2030, while the mid-term ones by 2050 and the long-term ones by 2100. Effective implementation of the Delta Plan will eliminate extreme poverty, create more jobs and sustain GDP growth above 8% until 2041. Besides, increased trade and navigational opportunities and strengthening food security, the Delta Plan will also help reduce urban migration by about 60%, coastal zone out-migration by 50%, and river area out-migration by 50% (Delta Plan 2100). The Delta Plan will be implemented through the Five-Year Plans which will have sectoral budget allocation to achieve the targets set. Knowing that climate change has an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people, the five-year Plans have a dedicated budget allocation for the Chittagong Hill Tracts area.

B. Perspective Plan of Bangladesh 2021-2041

- 2.7 “*Making Vision 2041 a Reality: Perspective Plan of Bangladesh 2021-2041*” is truly an articulation of the Government to transform the country from a lower middle-income country to Upper Middle-Income Country by 2030 and a High-Income Country by 2041. The other straight goals are eradicating extreme poverty by 2030 and zero poverty by 2041. As stated in the Plan, 17.83 percent of middle-income individuals live in Bangladesh will decline to 9.9% by 2030, and below 5% by 2041. The strategic goals and milestones of the Plan include industrialization with export-oriented manufacturing; paradigm shifts in agriculture to enhance productivity, preparing a service sector that responds to the transformation of the rural agrarian economy to a primarily industrial and digital economy; the urban transition - an essential part of the strategy to move to a high-income economy primarily motivated by the agenda of the government “*our village, our town*”; efficient energy and infrastructure; building a Bangladesh resilient to climate change and other environmental challenges; and establishing Bangladesh as a knowledge hub country.
- 2.8 Without development of a large number of villages and regions that are lagging behind in growth and development, Vision 2041 will be far reaching an agenda and building the nation and country that the Father of the Nation dreamt of will be a dream futile. Being formulated in line with the 2041 Vision, the Perspective Plan (2021-2041), and the Delta Plan 2100, ‘*My Village-My Town Project*’ will help alleviate poverty, create employment and reduce hunger, owing to its focus on infrastructure development and bringing civic amenities to every village. With modern urban facilities expanded to rural areas, and rural youth and agro-entrepreneurs trained, productive employment opportunities will be created. Rural people will also be less inclined towards migration to urban centres with light industries and agro-based enterprises developed locally. It has targets to create jobs for 1.28 crore youths, with overseas jobs for 1,000 youths -- both male and female -- from each Upazila, according to the 2018 Election Manifesto. To attaining high economic growth and transforming rural life and economy into prosperity, while many projects are to be taken based on the studies being conducted by the LGRD & Cooperatives, it has emphasized on enhancing of rural connectivity. In doing so, according to the Work Plan Document (2020), priority will be given to roads that create employment and income opportunities for the rural poor engaged in agriculture and non-agricultural activities; development of multi-modal transport for wetlands, haor, and hill tracts; construction of economically more viable roads that accelerate higher growth. It continues to say that money earned through high growth will be used in construction of next priority roads, expecting that many and more rural population will benefit, if economically and socially more important roads are gradually and continually developed this way. In contribution towards establishing a nation-wide climate and disaster resilient core road network supportive for Middle Income Economy, protection of agricultural land through adaptation of land use plan for building new roads and housing settlement will be ensured.

C. Sustainable Development Goals (SDGs)

2.9 The 'My Village-My Town Project' will make direct contribution to the country's achievement of the Sustainable Development Goals (SDGs), specially to SDG 1.5; SDG 2.3, 2.4; SDG 3.1, 3.3, 3.6; SDG 4.4, SDG 5.5; SDG 6.1, 6.2, 6.3, 6.6; SDG 7.1, SDG 8.2, 8.3; SDG 9.1, 9.3; SDG 10.2; SDG 11.1, SDG 11.2; SDG 13; SDG 15.1, 15.9; and SDG 16.7. The inter-linkages and influences between the 17 SDGs and their respective targets are numerous and complex. Many explicitly refer to one other goal. The Figure 2 below shows inter-linkages between the 17 SDGs for strategic understanding with regard to transport embedded in SDG 9 [Industry, Innovation and Infrastructure].

- The climate action goal (SDG 13) and the partnerships goal (SDG 17) are the general influences and enablers of all the other SDGs, i.e. all influencing SDGs (13 and 17).
- The health and wellbeing goal (SDG 3) are the overarching goal across all the SDGs to which all other SDGs contribute. The three key influential SDGs are those for education (SDG 4), poverty reduction (SDG 1), and decent work and economy (SDG 8).
- The climate resilient infrastructure (SDG 9) influences others but contributes directly to only smaller number of SDGs, for example, SDG 3 and SDG 4 shown in dark blue arrow and indirectly to SDG 1, SDG 2 and SDG 5 shown in blank arrow in the **Figure 2** below. The goal for water, sanitation and hygiene (SDG 6) is embedded among the other SDGs, and thus is both influenced and influences other SDGs.



Figure 2: Sustainable Climate Resilient Transport to achieving SDGs

- 2.10 To ensure Sustainable Development Goals by leaving no one behind by 2030, Chittagong Hill Tracts (CHT) have many potentials and opportunities; while low level of socio-economic development, remoteness and poor accessibility, and climate change related risks and disasters are some of the challenges, as described in the **Box** below:

BOX 1

Potential and opportunities in achieving SDGs in the CHT area

(i) Intensification and diversification of agriculture to enhance productivity and sustainability, (ii) diversification of livelihood options and enhancing resilience, (iii) skills enhancement for women, (iv) protecting agro-biodiversity in farming, (v) horticulture and high-value products, (vi) forest resources, (VII) livestock, (VIII) fisheries, (IX) Kaptai Lake, (X) agro-based micro-enterprises, (XI) engaging the private sector in marketing and skills development, (XII) watershed restoration, (XIII) tourism, and (XIV) migration

Challenges in achieving SDGs in the CHT area

Low level of socio-economic development, poor infrastructure facilities, inaccessibility and poor communication in the rural areas, population pressure, and climate change associated disaster are the main challenges.

- 2.11 While Vision 2041 is the continuation of Vision 2021 *vis-à-vis*. of the First Perspective Plan 2010-2021, the 8th Five Year Plan (2020-2025) commenced in July 2020 will carry on the Second Perspective Plan (2021-2041). Therefore, the Second Perspective Plan (2021-2041) will cover the periods of 8th, 9th, 10th and 11th Five Year Plans through which objectives of the Perspective Plan 2041 would be attained. As well, the Delta Plan is being implemented through the Five-Year Plans to combating the challenges of 2100 century such as climate change, water security, river management, water management, and wetland and ecosystem management. As Bangladesh has incorporated SDG Agenda 2030 into the National Development Plans, implementation of the ‘*My Village-My Town Project*’ will contribute to the achievement of SDGs, Delta Plan agenda, and to the fulfillment of the Vision 2041.

D. Chittagong Hill Tracts Peace Accord 1997

- 2.12 The Chittagong Hill Tracts Peace Accord, signed on December 2, 1997 between the Government of Bangladesh and the Parbattya Chattogram Jana Samhiti Samiti (PCJSS) ended an armed conflict between the Bangladesh Army and the Shanti Bahini of the Chittagong Hill Tracts with a promise to bring stability in the region. Following the Accord, among others, the passing of CHT Regional Council Act 1998, three Hill District Council Act 1998 and CHT Land Dispute Resolution Commission Act 2001 (amended in 2016 in parliament); then establishment of CHT Affairs Ministry and CHT Regional Council; reconstitution of interim Hill District Councils and transfer subjects (some of 33 subjects are transferred till the time of the Study) to these councils; formation of CHT Land Dispute Resolution Commission, Task Force and CHT Accord Implementation Monitoring Committee, etc. are the most remarkable. The ‘*My Village-My Town Project*’ will be implemented within the framework of the Peace Accord and will contribute to bring more peace and stability in the region and more importantly, to the upliftment of the communities and people residing in the region.

E. Existing Institutional Arrangements Pertinent to the MVMT Project

2.13 Given the Government's institutional and policy framework, existing institutional mandates for agencies and local government institutes (LGIs) likely to be involved with the Project are briefed below:

(i) Ministry of Chittagong Hill Tracts Affairs

2.14 The Ministry of Chittagong Hill Tracts Affairs (MoCHTA) was established in July 1998 in accordance with the provisions of the Peace Accord to ensure overall development of the Hill Tracts region. This Ministry is committed to establishing equal rights and opportunities and equitable distribution of resources among the citizens of this region as guaranteed in the Constitution of the People's Republic of Bangladesh. The major functions of the Ministry are:

- Implementation of CHT Peace Accord through formulation of relevant policies and adoption of programmes with the objective to bring about development on socio-economic condition and uphold the originality of social customs, culture and language of tribal/non-tribal people living in the CHT areas;
- Supervision and coordination of all development activities.
- Liaison and coordination with all relevant stakeholders including peer agencies and departments within government in order to preserve the environmental and geo-physical characteristics of the CHT area; As well, maintenance of coordination with International Agency, Donor Agency and Development partners. (e.g. ADB, UNDP, UNICEF, FAO, ILO, EU, USAID, ICIMOD, etc.)
- Conduct and coordinate activities related to social safety net, relief, and rehabilitation, and dealing with crisis situations arising from any calamity in the CHT areas;
- Provide secretariat services to the Council Committees and other special committees formed for the CHT areas and advice to relevant local govt. agencies when required;
- Supervision and monitoring of NGOs activities in the CHT areas.
- Development of biodiversity and eco-friendly tourism in the CHT.
- Enact Hill tracts related rules, regulation and provision.

2.15 The Deputy/State/Minister is the MOCHTA Chief Executive. This has a Planning Unit, headed by a Deputy Chief under the Joint Secretary (Development). During the Project preparation, this officer assumes the responsibility of 'focal person' and assists with the Project design. The Planning Unit is also supported by a separate 'planning cell' on the CHT located at the Planning Commission under the Ministry of Planning. MOCHTA is not mandated to implement development projects directly; this is delegated to local agencies including:

- (i) Chittagong Hill Tracts Regional Council;
- (ii) Chittagong Hill Tracts Development Board;
- (iii) Civil Affairs Office, Chittagong Cantonment;
- (iv) Khagrachhari Hill District Council;
- (v) Bandarban Hill District Council; and
- (vi) Rangamati Hill District Council.

2.16 MOCHTA, however, plays a crucial role in oversight and supervision as well as in the allocation of resources. Its funding allocation is quite significant that MOCHTA, in turn, allocates the amount among its various affiliated institutions including union parishads, Upazila parishads, municipalities, etc. in the region. MOCHTA has a number of donor-supported projects, most notably:

- (i) ADB supported CHTRDP I, II & III; CHTRDP III is awaiting ECNEC approval. LGED is involved in their implementation of the rural connectivity component.
- (ii) Promotion of Development and Confidence Building in the Chittagong Hill Tracts, (popularly known as CHTDF or Chittagong Hill Tracts Development Facility) implemented by UNDP under a multi-donor trust fund. The UNDP CHT Development Fund Project (UNDP/CHTDF) is by far the largest of these projects in terms of both the budget and the areas of intervention;
- (iii) Integrated Community Development Project supported by UNICEF and implemented by CHTDB; and
- (iv) Hygiene Promotion, Sanitation and Water Supply Fund Project (HYSAWA) in the CHT, funded by DANIDA

2.17 Women constitute more than 50% of the beneficiaries of the projects and programs implemented through this ministry. In addition, the Ministry has undertaken some specific programs and projects targeting the women of Chittagong Hill Tracts region.

(ii) Chittagong Hill Tracts Regional Council (CHTRC)

2.18 Chittagong Hill Tracts Regional Council (CHTRC) was established by Chittagong Hill Tracts Regional Council Act No. 12 of 1998 passed in the Parliament on May 1998 which gives it the most central role for the CHT in realizing the commitments of the Peace Accord. It is tasked with the supervision and coordination of: (i) all development activities; (ii) local councils including municipalities; (iii) the Chittagong Hill Tracts Development Board; (iv) the general administration of the hill districts; (v) the issuing of licenses including licenses for heavy industries; (vi) conducting disaster management and relief work; and (vii) coordination of non-government organization (NGO) activities. CHTRC is comprised of 25 council members, representing the different ethnic groups of the region. The Chairman is the head of the institution and is supported by the councilors on relevant policy issues. As it is understood, however, many positions approved for CHTRC have been vacant for a considerable period of time, and the relevant rules and regulations that are required for CHTRC to exercise its authority under the Act are still to be approved, which will follow with relevant amendments/modifications in the other institutions and agencies whose activities CHTRC is supposed to coordinate and supervise under the Act. It is also understood that there will be need for strengthening of the CHTRC to support the 'My Village-My Town Project', in areas to be identified at the Project Design phase.

(iii) Hill District Councils

2.19 With the signing of the CHT Accord, the then Local Government Councils were renamed as Hill District Councils (HDCs) and their mandates were expanded by a separate act in the Parliament. This expanded mandate includes responsibility for supervision,

coordination and implementation of 33 broad areas of interventions, popularly known as ‘transfer subjects. As per the approved organogram, each HDC is supposed to be composed of 33 elected councilors that include three women members with the Chairman, and two thirds of the members to be from the ‘tribal’ community proportionate to the varying numbers of indigenous groups in each of the three Hill Districts.

- 2.20 The HDCs have a very broad mandate over crucial development issues of the Government. The approved organogram includes a team of 72 staff for each HDC with the professional staff coming on secondment from the Government cadre services, to carry out these mandated responsibilities. However, the current staff strength seems inadequate if the HDCs were to fully assume their roles and functions and there are no institutional facilities to carry out some of its core functions such as monitoring, land administration/management, planning, etc. The HDCs will be expected to play a significant role in the implementation of the ‘*My Village-My Town Project*’, through the line departments especially in the areas of ‘transfer subjects’, and thus the HDCs would need capacity building in areas to be identified in details during the Project Design.

(iv) Traditional Institutions

- 2.21 The Traditional Institutions are centered around the office of the Circle Chief and comprise the Circle Chief, Mouza Headmen and village level Karbari. These institutions still continue to play a very significant role in CHT social life and development administration. The roles of these traditional positions are recognized by law and they have a particularly important role in land administration and revenue collection, besides assuming a unique role in the delivery of customary justice to the region’s indigenous people. Given the unique knowledge of the social fabric of ethnic communities and societies, the traditional institutions would be expected to play an important role in the implementation of the ‘*My Village-My Town Project*’, and thus relevant capacity building support would need in the form of training and logistics.

(v) Small ethnic groups

- 2.22 The Chittagong Hill Tracts (CHT) is legitimately proud of its rich ethnic diversity. Besides Bengalis, there are 11 ethnic groups. Some groups are in a particularly precarious and vulnerable situation. Their total population numbers are usually small or fall well below the national average with regard to most indicators of socio-economic development. Given the vulnerable situation and also in line with Government safeguard policy and strategy, they will be targeted by the ‘*My Village-My Town Project*’ as ‘priority beneficiaries’ to make the Project inclusive of all.

(vi) Union and Upazila Parishads

- 2.23 Elected union parishads and Upazila parishads function throughout the CHT in parallel to the traditional institutions. As elected representatives of the people at grassroots, these LGIs have unique knowledge of CHT communities that will be valuable in the facilitation and mobilization of the communities in the Project activities. This aspect of their knowledge and authority will be incorporated in the Project design support to LGIs and be included in the Project Capacity Building Plan.

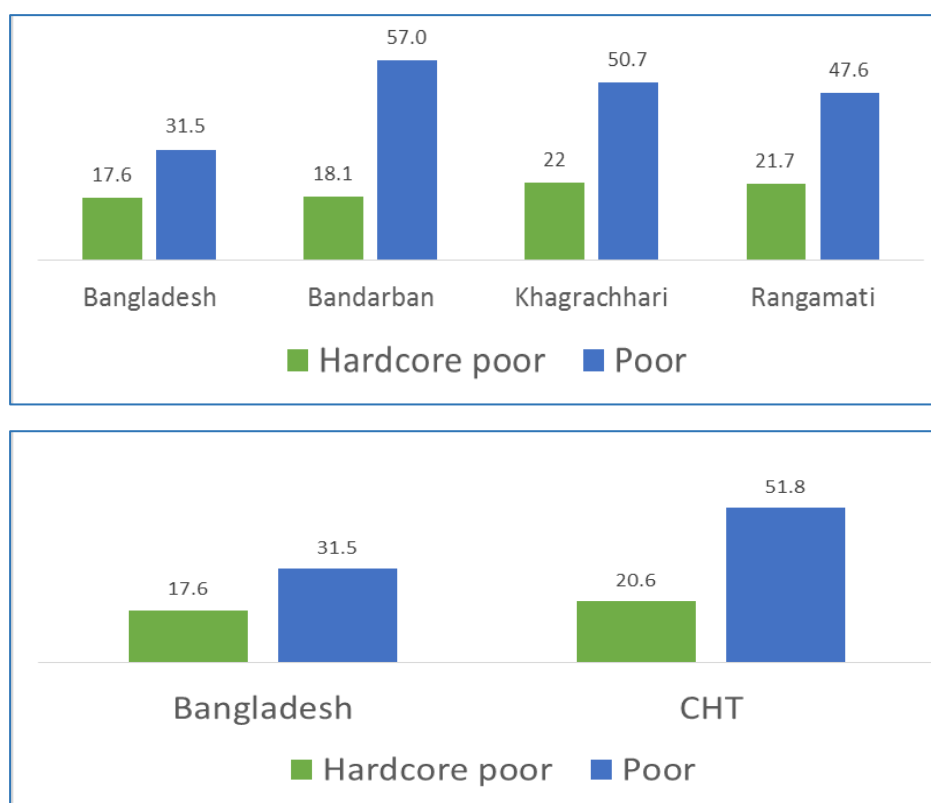
(vii) Local Non-Government Organizations

2.24 Local NGOs would be expected to play an important role in the mobilization of the grassroots communities, and facilitating implementation of the Project activities such as skill development training to the youth and women of the communities.

3. Rationale Background of the Study

- 3.1 The three hill districts of Rangamati, Khagrachhari and Bandarban are collectively known as the Chittagong Hill Tracts (CHT) located in the south-eastern region of Bangladesh. It is a unique territory of Bangladesh with its diversity both in terms of landscape and its people. Prior to the 1950s, the region was inhabited mostly by the tribal people (as quoted in Dasgupta & Ahmed, 1998) who are significantly different from the mainstream population of the country in respect of race, language, culture and religion. They are of Sino-Tibetan descent belonging to Mongolian groups. Currently there are eleven ethnic groups in the CHT. Chakma, Marma and Tripura are the three principal groups. The other groups are Bawm, Chak, Khyang, Khumi, Lusai, Mro, Phangkhuia, and Thangchangya. These tribal groups are collectively known as Jumma for their slash and burn style of agriculture, which is also known as ‘Jhum’ cultivation. The total population in the CHT is estimated at 1.6 million, of which 51 percent constitutes Jumma people (BBS, 2011). Bordered by Myanmar, Indian state of Tripura, Mizoram and Chittagong district, the Chittagong Hill Tracts occupies one-tenth area of the country; approximately 5,133 square miles or 13,295 square kilometers.
- 3.2 Chittagong Hill Tracts has been slower in development in comparison to the other parts of the country till the signing of the CHT Peace Accord in 1997 and ending the long-standing arm conflict. Henceforth, measures have been taken to build an inclusive and equitable society by mainstreaming ethnic, religious and cultural minorities of the CHT into a national and social force. Government has been committed to expediting the process of development in the CHT to make up for the lost time and put it on a fast track on the development path. To this end, some large projects are completed and some are ongoing. Still the disparities persist with a notable gap, and the need for development is huge, as it is understood from this Study.
- 3.3 Home of ‘small ethnic entities’ – as described by the Constitution of Bangladesh - the standard of living of the CHT population is a matter of concern despite notable positive initiatives taken by the government and donor agencies literally after the Peace Accord. National studies show that around 52% of the CHT population is below the poverty line in terms of daily calorie intake per capita (below 2,122 kcal), and 21% are hardcore poor (below 1,805 kcal), compared to 32% and 18% respectively (*Graph 1 below*), in Bangladesh as a whole (Rasul 2015, CHTDF-UNDP 2014). By and large, the CHT people are food insecure, children are malnourished, students drop out high, and vulnerability of mothers will be giving birth to child high without access to medical facilities, and livelihood is dependent on traditional jhum cultivation lacking market facilities in the vicinity, or owing to market places hard to reach since very old days.

Graph 1: Poverty Situation in the three hill districts



Source: CHTDF, UNDP 2014

- 3.4 The CHT region remains behind in comparison to other regions of the country in development indicators, such as poverty, income, food security, health and education, infrastructure such as transport, electricity and internet, access to improved water and sanitation, employment, economic and social empowerment (10 April 2022, *The Daily Star*). Historically, local ethnic communities depend on timber for day-to-day traditional uses such as fuel wood, making seasonal agricultural implements (i.e. baskets for crop harvesting and storing and constructing shelters in the village). Commercial timber plantations on hills or home gardens are a relatively new concept and have been popular since the 1990s. The CHT provides important ecosystem services that play a significant role in economic development, environmental protection, ecological sustainability, and human well-being both for the people of CHT and downstream (as cited in Rasul 2015).
- 3.5 The CHT therefore needs special attention and priority investment, and make sustainable use of land and natural resources. First, Government is committed to create more inclusive and equitable society. Faster and inclusive development is critical for peace and stability in the region. Second, CHT has its special socio-cultural and geographic situation, specific needs and aspirations, and thus requires differentiated approach and measures in making development inclusive and effective, and bridging the gap between hills and plains, and tap the locational potential of CHT – Gateway to the East.

3A. Transport Sector Performance, Policy & Strategy:

- 3.6 Bangladesh is well advanced in rural communication in comparison to other developing countries of the world. According to the LGED web-data source [2021], paved roads are around 116,319 kilometres that includes Upazila Road, Union Road and Village Road. 89% of Upazila Road and 68% of Union Roads are paved. Having 89% of Upazila Road and 68% of Union Roads paved, a functional and developed rural road network is already established in the country. A large part of this already paved network passes through the villages. According to the country-wide survey conducted by LGED in 2017, around 70,000 villages of the country's 87,210 villages are connected by paved roads. Most of the remaining villages not connected with paved roads are located in haor, char or hill areas. Rural Access Index (ratio of rural population percentage living in 2 km from all-weather road) is set to 84% (SDG Target 9.1) with a plan on priority to develop a rural road network that is climate resilient and appropriate for middle-income economy.
- 3.7 Though paved roads have connected and/or reached nearest point to majority of villages, 236,000 km roads inside villages are still earthen (source: LGED). The share of hill, haor and char lands is large. Some upazila and union roads of Barkal, Belaichhari, Juraichhari, Langadu and Naniarchar Upazilas in the CHT districts are still earthen. In the CHT districts, there are important non-gazetted 'No ID' earthen roads or walking trails that would qualify to be Village Road Type A or Type B by gazette notification. With the current capacity, LGED can construct 6000 km paved road each year. All the roads in the LGED database alone will take time to be constructed paved road. So, area-based approach with prioritization and then development in phases are currently being practiced in the LGED projects.
- 3.8 People live in dispersedly located paras in the CHT districts (*Picture 1 below*). The hill areas are far less densely populated than the rural plain areas. Per capita cost of rural road construction in hill areas are much higher than that of rural plain areas. Thus, it is not feasible to connect each and every house in a village and not all inter-and intra-villages/paras, given the length of earthen village roads, budget, maintenance need, and LGED capacity. SDG Index does not suggest either to construct road connecting each and every houses of a village(s). When villages are dispersed, not identical but varied in shapes, areas and population sizes, connecting up to the centre of villages or an important point is not possible to standardize. However, depending on the nature of connectivity, and giving consideration on roads up to village and internal village roads, rural roads are classified as Union Road, Village Road Type-A and Village Road Type-B. The standards of these classified rural roads for the CHT region are discussed in PART III of the report.
- 3.9 Bangladesh is progressing from low income to middle income country. Non-agricultural economies are expanding in parallel to agro-based economy. A sharp trend in agricultural diversity is observed in the CHT region especially where all-weather connectivity is established, and a gradual change is also observed in the rural areas connected by earthen road passable by motor bike. This change will expedite if rural villages connectivity with higher order roads is established. This is thus essential to develop an all-weather rural

transport communication network that is suitable for middle income economy, guided by the concept of *Middle-Income Infrastructure – from Rural Access to Rural Accessibility*.



Picture 1: A typical remotely located hard-to-reach hill top para settlement in CHT

4. Objectives of the Study

4.1 The ‘*My Village-My Town Project*’ aims at extending the modern civic amenities to every villages with special attention to the remotely located, disconnected, and hard to reach villages in the hill, hoar, char and island districts of the country, and thereby improving the living standard of the people residing there through social development and local growth in economy; where the ‘*study for enhancing accessibility to dispersedly located villages in three hill districts*’ will contribute towards establishing an effective rural transport network connecting the village dwellers with diverse economic activities and improved services available at Upazila HQs, Union Parishads, and Growth centres/important market places. This will facilitate agricultural diversification in getting fair prices of the agricultural commodity through linkage established with the agricultural value chain markets.

4.2 **Specific Objectives:** The specific objectives of the Study are:

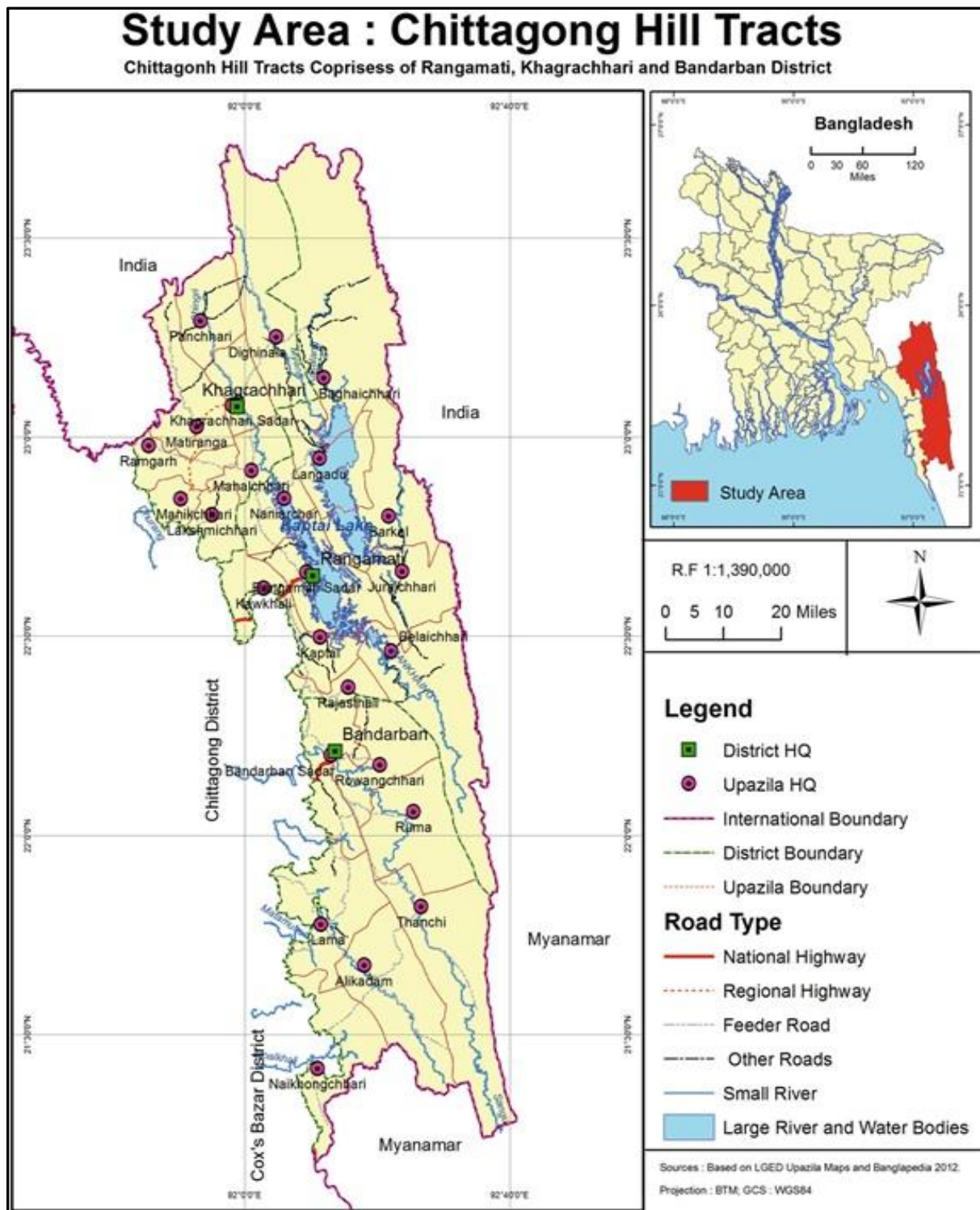
- (a) Review the database of disconnected villages, and population of three hill districts.
- (b) Explore the way of communication system (multimodal) in remotely dispersed area in 23 unions of 23 Upazilas of three hill districts.
- (c) Identify roads which have tourist potential and other important economic activities.
- (d) Explore mechanisms for connecting tourism areas via road network and waterway.
- (e) Find out traditional communication practices in three hill districts in consultation with the stakeholders.
- (f) Prepare a priority list of roads for improvement of connectivity in three hill districts.
- (g) Conduct feasibility study for ropeway communication as multi-modal transport in three hill districts.

4.3 **Expected Outputs:** The expected outputs of the Study are:

- (h) Upazila/District wise GIS map (both soft and hardcopy) illustrating hard- to- reach villages in three hill districts;
- (i) Detailed observations (mostly from planning perspective with preliminary design that may include rural water ways development, road development, pedestrian bridges, etc.) in 23 Unions of 23 Upazilas in three hill districts.
- (j) An overall recommendation for accessibility improvement in three hill districts delineating important tourist places, agro-firms, etc.

5. **Scope of Work of the Study**

- 5.1 The joint venture of Data Expert (Pvt.) Limited (hereinafter datEx, Lead) and Delight Engineers and Consultants Ltd (hereinafter ‘DECL’) was selected for ‘Consultancy Services for Carrying out 5 (five) Feasibility/Reviewing Study on Rural Connectivity under the ‘My Village My Town Technical Assistance Project’ through a competitive bidding process. The contract of consultancy services was signed in October 2021, and the Notice to Proceed was issued on 22 October 2021. The datEx-DECL JV, herein, ‘the Consultant’ commenced the services (*Contract No. MVMT-S-13*) formally from 25 October to complete all 5 (five) studies in 5 (five) months. One of the five is the “*Study for enhancing accessibility to the dispersedly located villages in the three hill districts*”. As per contract agreement and TOR, the existing road database and newly developed LGED database of disconnected villages are to be analyzed, and the second to be cross checked by visiting, using Google/satellite images and teleconference with local stakeholders.
- 5.2 The assignment has key deliverables of Inception Report, Draft Final Report and Final Report. Draft final report and final report requires submitting separate for each study.
- 1) The Inception Report for all five studies submitted in one report.
 - 2) Draft Final Report will contain detailed survey results, analysis of relevant policies, database of priority sub-projects and maps, and recommendations. As per 2nd obligation, the draft final report was also prepared and the findings of the Study were validated in the Regional Workshop held in Rangamati district on 26 May 2022.
 - 3) Another obligation is the Final Report that will be prepared incorporating feedbacks and suggestions received on the draft final report. As per obligations, 5 (sets) upazila maps (23 Upazilas excluding Sadar Upazilas) and 2 sets union maps (23 case study unions) will be submitted in soft and hardcopy. This Final Report contains the updated database of priority sub-projects and GIS maps illustrating disconnected villages and populations of the three hill districts, and is duly prepared incorporating comments and feedbacks.
- 5.3 The Covid-19 situation impacted on the work plan for the Inception Period as it prevented most face-to-face meetings with stakeholders, prevented the study team to made site visits, and delayed field work to start almost by a month.



6. Study Area

6.1 The ‘Study for enhancing accessibility to dispersedly located villages in the three hill districts’ was conducted in the selected 23 Unions of 23 Upazilas except Sadar Upazilas of Rangamati, Khagrachhari and Bandarban districts (*Study Area Map 1*). In collecting essential data with detailed observations, below given 23 unions were identified as case study unions, one union from each upazila of the 23 Upazilas (*below Table 2, Case Study Union Map 2*):

Table 2: Case Study Unions of the Study

District	Upazilas	Case Study Unions	District	Upazilas	Case Study Unions	District	Upazilas	Case Study Unions
Bandarban	Rowangchhari	Alikhong	Rangamati	Naniarchar	Burighat	Khagrachhari	Dighinala	Dighinala
	Lama	Fasyakhali		Langadu	Bagachattar		Panchhari	Latiban
	Naikongchhari	Dochari		Bagaichhari	Sajek		Manikchhari	Manikchhari
	Alikadam	Kurukpata		Barkal	Shuvolong		Mahalchhari	Mobachhari
	Thanchi	Balipara		Juraichhari	Juraichhari		Guimara	Guimara
	Ruma	Galangya		Belaichhari	Belaichhari		Lakshmichhari	Dulyatali
				Rajasthali	Gaindha		Matiranga	Amtali
				Kaptai	Wagga		Ramgarh	Ramgarh
				Kawkhali	Kalampati			

A. Case Study Union:

6.2 The case study unions were selected in consultation with the LGED Upazila engineering team and LGI representatives attended the stakeholder consultation meetings held at each Upazila level. Following criteria mainly governed the decision (*Table 2.1*) in selection of the case study unions:

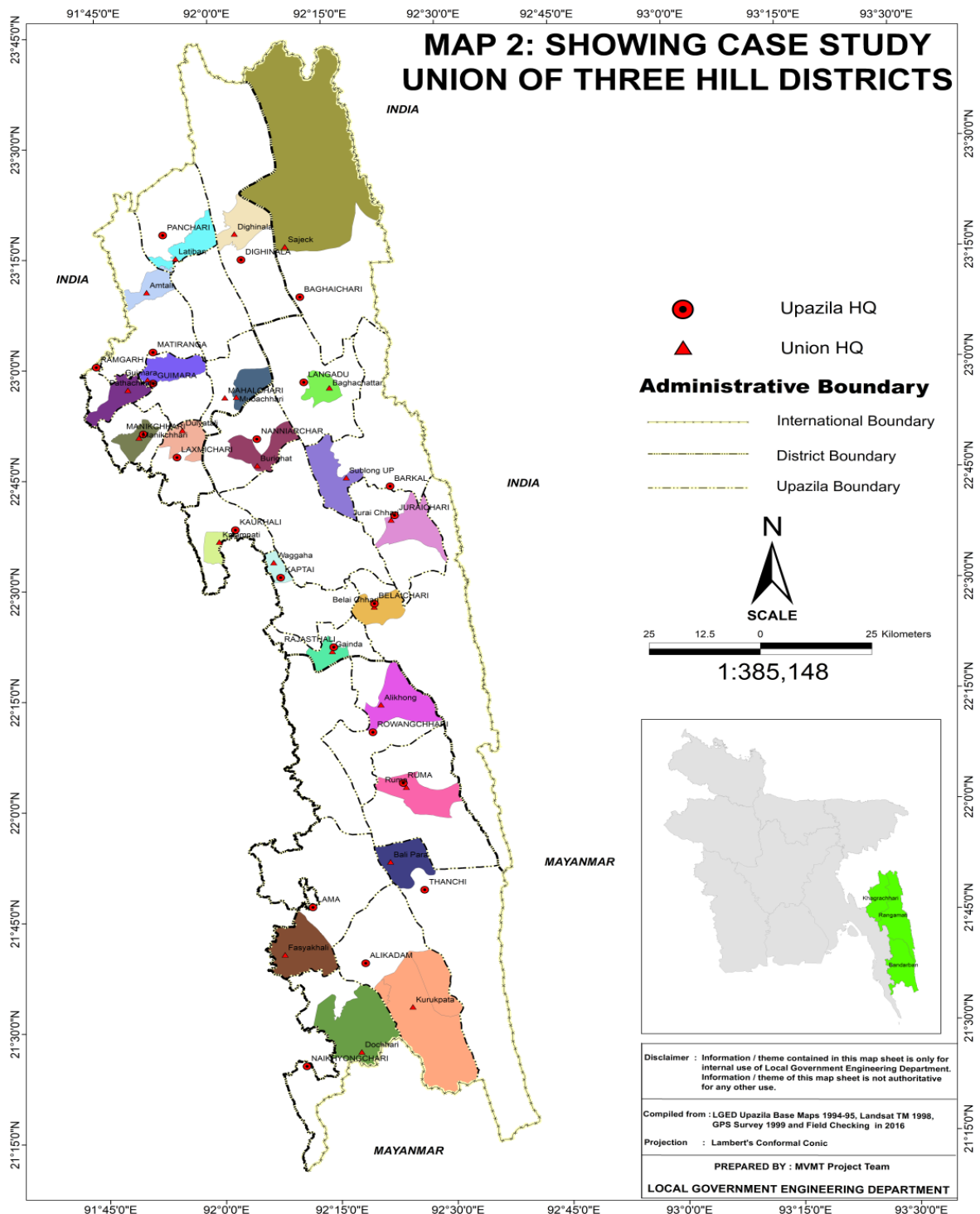
Table 2.1: Criteria used in selecting the Case Study Unions

- *Unions lagging behind in development the most (counted the participatory views);*
- *Unions with number of disconnected villages with beneficiary population count;*
- *Unions have poor transport communication that hindered access to basic services;*
- *Unions with potential for development of tourism and agricultural diversification;*
- *Travel time in commuting to upazila headquarters;*
- *Remoteness and security; and*
- *Inclusiveness; social inclusion of tribal and non-tribal communities*

6.3 The security was an issue in Khagrachhari more than Rangamati and Bandarban. The very remoteness of some upazilas in Rangamati district also influenced the decision. There were unions with a number of disconnected villages and a number of road and/or multi-modal Inland waterways/riverine routes needed development, justifying to be selected for study in details but safe return after conducting the survey in those remotest unions in one day would not be possible. Such examples are the distant and hard-to-reach unions of Barkal, Juraichhari, and Belaichhari Upazilas only connected by waterways, so the easiest day trip possible one was selected. The security and remoteness were the guiding factor in selecting Balipara union instead of Remakri union under Thanchi Upazila of Bandarban district. In selecting Alikhong union from Rowangchhari Upazila under Bandarban district, consideration was given to population number and number of high priority roads needed to connect a large number of disconnected villages living by the ethnic community. Ruma union of Ruma upazila was selected on its tourism potential and agricultural importance as well; while Dochari union of Naikongchhari was selected being the union least developed and home of backward Mro community in the Upazila. Kurukpata union of Alikadam is located in the reserve area 45 km far from Upazila HQ, and is lagging behind the most

among all unions of the Upazila. 5000 Murong people live in the Kurukpata union with no right to land.

6.4 Data and observations were collected and recorded mostly from the planning perspective in enabling to suggest and/or recommend preliminary designs and conceptual framework. This was also to suggest challenges and issues for consideration in climate resilient all-weather transport route development (that may include rural waterways development, road development and pedestrian bridge, etc.). The case study will also help in identifying model villages for development under the 'My Village-My Town Project'.



B. Study Area Characteristics:

6.5 The Chittagong Hill Tracts (CHT) is the only extensively hilly area in Bangladesh, bordering India and Myanmar. It has an area of 13,294 square kilometers (5,133 sq. mi), most of which is highland. The population is estimated at 1.6 million, about 1% of total population of the country. It is a low-density area with a population of only 136/sq.km. Tribal Jumma population is 51% and non-tribal Bengalis (Muslim and Hindus settlers) are 49% (**Table 3 below**). The sex ratios are estimated to be 104.4 (number of males per 100 females; national 106). There are eleven different ethnic communities living in the CHT. They collectively identify themselves as the Jumma people, the first people of the CHT region, and are defined as ‘tribes’ in the CHT Peace Accord. They are the Bawm, Chak, Chakma, Khumi, Khyang, Lusai, Marma, Mro, Phangkhua, Thangchangya and Tripura. The Jumma people are distinct and different from the majority Bengali people in the plain area of the country in respect of race, language, culture and religion. They have their own

Box 2: Brief Characteristics of the Study Area

The Chittagong Hill Tracts comprises of three hill districts: Khagrachhari district, Rangamati district and Bandarban district. These are the main hilly areas of the country, rich in ecosystem and have potential tourism spots. Villages are very dispersedly located along hills, on hill tops inside forest, at foothills and valleys, and along rivers and streams. There are places surrounded by thick mountainous rain forests and steep ravines and valleys where no vehicles can reach. Since ancient times, traditional means of transport communication were dingy boat and non-motorized boat used by the common population at times of the year when water was available in the Jiri or channel or canal. In the dry season, this was walking long distance on foot along the Jiri with head loads carrying to and from the market. Walking, rural boats and 2-wheelers motor bikes are the main transport mode today for commuting to markets, health centres, schools, and other social services and economic activity centres. Travelling time ranges from days or hours with loads in ‘thrum’ or patients in back or ‘drum’ from home at the disconnected villages to Upazila HO.

mother tongue and rich folk culture influenced by the serene mountainous environment. The tribal and non-tribal are living side by side and sharing these mountains and forests peacefully with each other except few incidents and exceptions. It is understood, however, more and more settlements of Bengali settlers, missionary activities and the expansion of tourist spots have made the ethnic minority communities retreat to the more remote parts of the districts.

Table 3: Area & Population of the three hill districts

CHT Districts	Population					Growth Rate (%)	Area (Sq. Km)	Population Density (Per Sq. Km)
	Total	Female		Tribal				
Rangamati	595,979	282,903	47.5%	386,153	64.79%	2.30	6116.11	97.45
Khagrachhari	613,917	300,124	48.9%	316,987	51.63%	1.54	2699.55	227.42
Bandarban	388,335	184,985	47.6%	142,402	36.67%	2.25	4479.03	86.70
Total:	1,598,231	768,012	48%	845,542	51%		13294.7	Avg. 137.19

Source: District Statistics, 2011 and Population Census, 2011, BBS. According to the constitution of Bangladesh, all people born in Bangladesh are Bengalis. However, Bangladesh constitution keeps referring to different cultural and linguistic groups living in Bangladesh as “tribes, “minor races, ethnic sects and communities,” and by doing so, seeks only to protect their culture [article 23 (A) enacted].

- 6.6 The main occupation of the rural population in the CHT is agriculture (including horticulture and livestock), mainly for subsistence. Additional sources of rural livelihood include agricultural labor, service, trade, and general business. There is no major industry in the area. The poor collect wood and/or broom flower sticks from forest to earn livelihood income. Over 80% of rural households are involved in agriculture and agricultural labor, and only a small number of households have a secondary income. So, livelihood options are very minimum in the CHT area.
- 6.7 The ethnic community traditionally practices jhum cultivation for their subsistence. Jhum means ‘hat’ to an extent that jhumias’ family could have lived on what grow in their jhum field except kerosene fuel to light, salt and oil to cook. With cotton produced, female members were used to make the clothes for their family. Decline in jhum land and productivity, progress in availability of foods and goods, and improvement in transport communication as compared to the past, a significant change in the lifestyle and diversification in agriculture is visible. Jhum fields are being converted to fruit garden such as pineapple, lychee, mango, papaya and banana on a commercial basis that farmers sell out of the villages to the higher order markets. This is yet to grow agro-processing industry at the local level.
- 6.8 The rural population has a literacy rate lower than the national average and has less access to education. The average literacy rate in the Chittagong Hill Tracts was 43.9 percent compared to the 51.8 percent national average (BBS, 2011). With building of Government Primary Schools (GPSs) and UNICEF schools, access to primary schooling has increased in the last decades as compared to the year of 2009¹. The secondary schools and colleges are, however, far from the place of living normally at the Union Parishads or Upazila HQs, access to which is constrained by remoteness and poverty. “It is very difficult to go to school or college by trekking through hills, streams and rivers. The boarding seats are limited, so the students stay in mess or rented house or with relatives. Ironically, this is possible only by the students whose parents can support their education expenses earned mainly from agricultural cultivation. Those who do not have such financial support drop out after primary or half way of high school or college. Not having residential facilities for teachers at the government primary school premises located in the remote area, teachers are not regular in teaching. So, poverty, limited income

The Manusher Jonno Foundation (2012) and the study by Mallick et al (2022) identified poverty as the main challenge for enrollment and then drop out of students in primary school in the hill tracts. Most of the children cannot complete primary education cycle due to school distance, bad communication, and transportation cost and shortages of transports, proper educational materials and lack of awareness of parents that negatively impact on enrollment as well as dropout.

Literacy Rate (Bangladesh):75.4% (2015)

Literacy rate at CHT (%): Rangamati 43.6, Khagrachhari 41.8, Bandarban 31.7

¹ In 2009, according to the UNDP Survey (2009), “only 7.8 % of all CHT people completed primary education and 2.4% completed secondary education. The average years of schooling for CHT population were only 2.8”

of the parents, poor access to schools, non-availability of teachers, and the extensive involvement of children in households—all account for low literacy rate in the hill area”, said a graduate engineer interviewed from the Chakma community. The literacy rate is the highest among the Chakma community followed by Tripura and Marma. Mro or Murong lives in the remotest hills, mostly the poorer and the least educated among all the tribal ethnicity.



Picture 2: Student's Shack/Cabin. Most of these students at class VI come to the only High School at Choto Harina, cook their own food, and stay at such Cabin to study until they pass SSC.

- 6.9 The National Strategy for Water and Sanitation in Hard to Reach Areas (2011) acknowledges the WASH crisis in the hill tracts. Freshwater scarcity and drinking water supply are major issues, along with inadequate sanitation services. Surface water sources such as springs and streams have seasonal fluctuations, and are used for drinking and other household purposes. These sources are remotely located and usually exposed to heavy pollution. Tube-wells are found difficult to be installed in the hills. Some areas have access to water supply through ring wells using Gravity Flow System (GFS). Water crisis is really acute in the CHT. To meet drinking water needs, individual or community rainwater harvesting systems with adequate storage can be developed. Walking an earthen road or a walking trail, and climbing up and down a hill with water jars is difficult and unsafe for woman fetching water for the family (**Picture 3**). So, essential walkways and gender-friendly stairs need building, especially where the slope is mild to steep.



Picture 3: a woman fetching water from the Boga Lake

6.10 Solar energy is the option to households living in the remotest villages² but all cannot afford buying the solar panel. The hill organizations (CHTHDC, CHTDB, CHTRC), NGOs (Caritas, BRAC and some other local NGOs), LGED, UN agencies (UNDP, UNICEF, WFP) and development partners (ADB, JICA) have been implementing rural development projects and programme to provide infrastructural and non-infrastructural facilities (e.g. rural roads for accessibility, solar panel for lighting, ring well for drinking water, etc.). Due to remoteness, electricity from national grid supply and internet services installing towers locally are not possible to expand till rural connectivity enhanced up to the disconnected villages. A summary of key characteristics, problems, opportunities and challenges is given in **Table 4** below.

Table 4: Summary of characteristics, challenges and opportunities

Characteristics of Chittagong Hill Tracts (CHT):	
<ul style="list-style-type: none"> • Tribal inhabited area • Strong cultural diversity • Predominantly agrarian • Topography: remoteness, inaccessibility, fragility 	<ul style="list-style-type: none"> • Low human resource development – vocational & social skills • CHT Lags Behind: Income & non-income poverty higher in CHT • Livelihoods more susceptible & vulnerable
Chittagong Hill Tracts (CHT) faces particular challenges:	
<ul style="list-style-type: none"> • 95% of land not suitable for intensive agriculture • Massive population growth • Unsustainable use of land • Degradation of natural resources, watersheds • Poor market access • Poor physical and socioeconomic infrastructure 	<ul style="list-style-type: none"> • Limited non-farm employment opportunities • High unemployment • Low livelihood diversification • Low labour mobility • Low vocational & social skills
Chittagong Hill Tracts (CHT) has potential and opportunities:	
<ul style="list-style-type: none"> • Rich in forest, biodiversity, NTFPs • Rich cultural diversity • Gateway to the East • Horticulture, agroforestry, farm forestry, bamboo, rattan 	<ul style="list-style-type: none"> • Organic products, medicinal plants, NTFPs, other niche products • Agro-based micro-enterprises • Non-farm sector <ul style="list-style-type: none"> – Tourism, cultural services, handicrafts, value chains – Kaptai lake – Increase labour mobility

C. Analysis of Key Problems, Challenges & Opportunities in the CHT

6.11 Population in the region is unexpectedly growing at an alarming rate for the very unique ecosystem, occupying the forest land and exhausting the land used for agriculture. Except for the reserve forest, hardly any development control exists to prevent from new settlement development here and there at will. Such unplanned and haphazard settlement invites future challenges requiring new connectivity and utility services (**Picture 4** below). Housing and settlement through model village development under the MVMT project can suggest solution well to this development issue.

² Access to electricity is lowest in the Chittagong Hill Tracts (only 13%) with 2% ethnic tribal (e.g. Chakma) connected to the grid (UNDP, 2009).

- 6.12 Previous establishment (*such as Kaptai Hydro Power Plant*) and larger scale mono culture garden cumulatively have resulted in internal displacement and increased vulnerability of many dwellers. This is thus important to ensure that there will be no need of involuntary resettlement from the enhancement of rural transport network under the MVMT project and/or will keep a minimum provision for land acquisition in the Project.



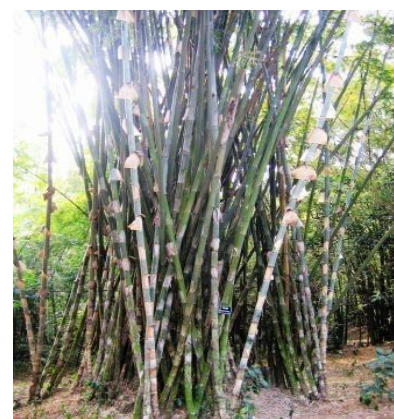
Picture 4: A typical remotely located hard-to-reach scattered para settlement in the CHT

- 6.13 Land is a critical resource for dwellers in the CHT. Still local people and local government representatives are willing to give land required for road development and widening. There will be no need of land acquisition, as promised by the local representatives. This is an opportunity. However, there is provision of land acquisition in the ADB CHTRDP which may instigate a desire for compensation in the land owners and private forest owners at times of road development work starts. *It will be advisable thus to arrange undertakings at the sub-project design stage after the survey conducted. Once negotiated and agreed, embark a demarcation using pillars and planting trees along the demarcation line.*
- 6.14 Leasing of common land is inviting forest degradation in absence of development control on using the land. This encourages new settlement and creates frustration among the tribal communities the most. Commercial fruit gardens and/or new settlements can replace the wild forest. It is a concern thus that new road invites more new settlements and/or influence conversion of forest into fruit gardens in an unsustainable way.
- 6.15 Activists choose to live in the remotest areas do not want some roads development that they safely use for their mobility. Also, there are groups active in the CHT who demand ransom from the contractors to pay before the start of the start an amount fixed by the group. *LGI and community will have a role to play in resolving issues of this kind.*

- 6.16 Although teak (*Tectona grandis*) is not environment friendly, having high demand and price value, monoculture of teak is noticeable that replace the land used for traditional jhum cultivation and especially in the leased land. The 2017 study on the ‘*effects of teak monoculture on forest soils: a case study in Bangladesh*’ showed that the intensive monoculture teak plantation has adversely affected the soil properties in the CHT. Exposure of the soil surface to the sun and gradual disappearance of undergrowth left these teak plantation floors with infertile, degraded soils, and found moisture content in the topsoil was significantly lower than that in the bottom layers due to the exposed and dry condition of the forest floor under teak plantations. For improving depleted teak plantation soils, the study suggests that teak could be planted with other tree species rather than just in monocultures. In addition, the forest floor could be enriched with leguminous herbs and shrubs to improve soil health in these plantations (Abdullah Al Mahmud et. al, 2017).
- 6.17 Mono-culture of teak (*Tectona grandis*) and rubber (*Hevea brasiliensis*) plantation is also reducing soil capacity to hold water and triggering soil erosion and destroying habitats of different life forms. These plant varieties are not eco-friendly for monkeys, deer and birds. Many streams and canals are already dead, so are the sources of water upon which many villages were formed. Along the teak garden area where soil erosion is acute, both communities and their connecting roads are found the most vulnerable to erosion and landslide such as Shilchari Marma Para Road in Wagga Union of Kaptai Upazila.

Teak garden in CHT is not eco-friendly but has teak values and cash income without much investment.	Problems
	Reduce soil’s capacity to hold water
	No grass or plan grow beneath the exposed surface soil
	Trigger soil erosion and siltation of Jhiri and water bodies
	Less or no water in the Jhiri or canal
	Scarcity of water for drinking, irrigation and other domestic use
	Water-borne diseases by drinking polluted water

Solutions
Improvement in rural connectivity will facilitate agricultural diversification and growing of fruit gardens. When cost of transportation becomes less and income from the fruits becomes higher, people will start replacing the teak garden with fruit garden.
Gradual shift from non-ecofriendly mono-culture rubber garden to eco-friendly mix garden
Bamboo ‘ <i>Melocanna baccifera</i> ’ planting along the Jhiri on one side. Bamboo holds water and hold soil from erosion.



D. Landslide in Chittagong Hill Tracts and Possible Measures

- 6.18 Landslide vulnerability is a major problem for people living in the hilly areas of Chittagong city. In the recent years, landslide is occurring regularly causing hundreds of people die. The main mitigation strategies are stopping of hill cutting, resettlement of the vulnerable, vegetation, and then ensuring land use policy and development control. Single method is not effective for preventing landslides; there are different methods to be used depending on their applicability and suitability. Among the different methods, bio-engineering with

jute geo-textiles and vegetation, soil nailing and proper drainage is the most effective solution. With appropriate long rooted vegetation (e.g. vetiver grass) and proper techniques, landslide occurrences can be effectively controlled. At the technical feasibility survey, proper analysis can be done across the dangerous locations of the hill tracts or road alignments in order to identify the vulnerable slopes applying numerical modeling like Finite Element Method and laboratory tests. Accordingly, road has to be designed appropriately for the condition so that built roads are climate resilient and sustainable.

- 6.19 Warning system relating with rainfall can also be developed to aware people living in risk areas of probable landslides. On 12 June 2017, heavy monsoon rain over 343 millimeters triggered a series of landslides and floods in Rangamati, Chittagong and Bandarban - three hilly districts of Bangladesh - and killed at least 152 people. Hundreds of homes have been buried in mud and rubble, including over 5,000 homes in the Kawkhali upazila of Rangamati district. The district's power grid was also destroyed, hundreds injured and many missing as well as houses were destroyed by the land mass. Part of the Rangamati-Chittagong road was collapsed at Manikchhari that disrupted traffic flow. Effective early warning system could have reduced damage and casualties of this kind.
- 6.20 **Causes of Landslide:** Landslide occurs by both internal forces and external factors. When the gravitational force acting on a slope exceeds its resisting force, slope failure and mass wasting occurs. The usual type of soil at the hill slope is silty clay. At most areas, the soil consists of different layers of sand and clay/shale. Shear strength of silty clay type soil is much lower than regular sand or clay soils. Again, excessive rainfall saturates soil resulting increase of soil mass. Rainwater seeps through the layers and over the ages reduce the bond between the sand and clay/shale layers.

Geology of Chittagong Hill Tracts

The hill areas are underlain by tertiary and quaternary sediments that have been folded, faulted and uplifted, then deeply dissected by rivers and stream. These areas consist of sandstones and shale and also with siltstone which have less stability. The bedrock and soil structure of these hills are not stable for which reason these areas are highly prone to landslide. The composition of soil of these hilly regions is complex and the young rocks have higher contents of easily weather able feldspars. The hill soils are mainly yellowish brown to reddish brown loams which grade into broken shale or sandstone as well as mottled sand at a variable depth. The soils are very strongly acidic. The soil of the hill slope is usually silty clay (liquid limit: 32-40; plasticity index: 15-21). Percent finer # 200 sieve (0.074 mm) and clay content varied between 92%-94% and 18%-19%, respectively (Islam, 2014).

- 6.21 **Possible Measures:** Usually two types of approaches: one is structural solutions and the other is nonstructural measures (soft engineering) can be taken for prevention from the disaster. The selection of appropriate measures should be based on assessment of risk, uncertainty, possible consequences, constructability, environmental impacts and costs.
- 6.22 **Structural Measures:** Structural measures considering the safety measures, building codes and better drainage facilities are inevitable for mitigation of landslide disaster risk. In Bangladesh, retaining wall is widely used to stabilize slope which is a costly technology. Therefore, new affordable and sustainable technology should be explored to stabilize slopes. **Table 5** below describes different types of possible structural measures with their applicability in the context of Bangladesh.

6.23 Non-Structural Measures: Soft engineering is as much important as structural solutions. Land use vulnerability assessment and zoning, early warning system, relocation of the foothill settlements, controlling hill cutting through proper enforcement of legal provisions, real time monitoring and early warning measures can be taken for the mitigation of landslides.

Table 5. Types of Structural Measures for Prevention of Landslides

Group	Remedial Measures	Brief Description	Applicability in the context of Bangladesh
<i>Modification of Slope Geometry</i>	<i>1. Reducing general slope angle</i>	<i>This method reduces the driving force and thereby improves stability</i>	<i>This method is suitable only for cuts into deep soil where rotational landslides may occur.</i>
	<i>A complete solution involves additional modification of the land. Lightweight material can be added replacing the original in situ material, but not suitable since a lot of earth works need to be done.</i>		
<i>Drainage</i>	<i>1. Surface Drains</i>	<i>Any sags, depressions or ponds above the slope line can be drained to minimize the possibility of percolation of surface water into potentially unstable area.</i>	<i>Surface drainage alone will seldom correct an active landslide, any improvement in surface drainage will be beneficial.</i>
	<i>2. Sub-drainage</i>	<i>Sub-surface drainage is carried out by installing horizontal drains, vertical drains and deep trench drains.</i>	<i>In the case of presence of groundwater, sub drainage is important under proposed embankments and roads</i>
	<i>3. Hydrological effect of vegetation</i>	<i>Consumptive use of vegetation extracts water from groundwater which decreases the soil saturation.</i>	<i>Most effective drainage method both natural and environment friendly.</i>
<i>Retaining Structures</i>	<i>1. Gravity Retaining wall</i>	<i>A mass of plain concrete with weep holes, free-draining backfill.</i>	<i>Large excavation requires. Can take no tensile stresses and is uneconomical for high walls.</i>
	<i>2. Gabion walls</i>	<i>Free-draining. Retention is obtained from the stone weight and its interlocking and frictional strength.</i>	<i>Have high resistance to impact and weathering and also possess good and elongation characteristics.</i>
	<i>3. RCC Retaining wall</i>	<i>Free-draining and tolerant of different settlements, they can have high capacity and have been constructed to heights of at least 18m.</i>	<i>Construction cost is high for retaining walls. Relatively large space is required for the wall. It is not possible to build retaining walls to all dangerous slopes along the hill sides.</i>
<i>Internal Slope Reinforcement</i>	<i>1. Soil Nailing</i>	<i>Soil nail can prevent landslides by inserting steel reinforcement bars into the soil and anchoring them to the soil strata.</i>	<i>This method is ideal for tight spaces and irregular shapes. Minimum shoring is required and height of wall is not restricted. Hence this method is suitable for Bangladesh.</i>
	<i>2. Anchors.</i>	<i>Anchors can be applied by linking at the surface to each other by a beam frame which is generally made of reinforced concrete.</i>	<i>Installing cost is much higher, not a suitable method for Bangladesh</i>
	<i>3. Geo-textiles and reinforcing grids</i>	<i>Geotextiles is layered in compacted fill embankments to engender additional shear strength.</i>	<i>Greatly enhancing repair options when space is tight</i>
<i>Bio Engineering</i>	<i>Vegetation planting</i>	<i>Rooted soil has higher shear strength than bare soil. For deep rooted soil, stability increases significantly due to root strength mechanical effect.</i>	<i>Bio-engineering solution is effective for Bangladesh. Initial cost is very low compared to other techniques.</i>

7. Approach & Methodology of the Study

7.1 A three members' team consisting of Deputy Team Leader cum Rural Infrastructure Engineer, Junior GIS expert and Junior Engineer engaged by Data Experts (Pvt.) Limited and Design Engineers & Construction Ltd., hereinafter referred to 'datEx' & 'DECL' JV conducted the study. Participatory approach to review the database and identify priority transport infrastructure needs ('sub-projects') was instrumental. At the stakeholder consultation meeting held in each upazila, the database was reviewed, priority needs identified and mapped working together with the LGI representatives and LGED technical team. One union from each study Upazilas were surveyed for collection of detailed observations and validations of the proposed priority needs by visits together with the LGED and LGI representatives.

Stakeholder Consultation Meeting

- Disconnected Village Database and database of sub-projects reviewed
- Prioritization of sub-projects for each union with LGI and LGED representatives
- Disconnected villages and priority sub-projects mapped in the LGED GIS Map

7.2 The Study was conducted in 23 case study unions of 23 Upazilas except Sadar Upazilas of the three hill districts of the Chittagong Hill Tracts during the period from December 2021 to March, 2022. The upazila technical staff of LGED supported in organizing stakeholder consultation meetings and in database review and mapping the disconnected villages and population during this study period. They also supported in the field work and authentication check by visits to the sub-projects in their respective case study union, and looking at the feasibility of some proposed sub-projects from technical, social and environmental perspectives.

Case Study Union: Alikhong Union of Rowangchhari Upazila in Bandarban Hill District



Picture 5 & 6: Consultation and participation of LGED Rowangchhari Upazila Office and Local people of Alikhong Union under Rowangchhari Upazila, Bandarban Hill District

7.3 The Study applied both qualitative (e.g., focused group discussions and in-depth case study field work) and quantitative (structured and semi structured interviews) approach and methods in reviewing and conducting field work in all the three hill districts to understand the need and impact of rural accessibility in both tribal and non-tribal community contexts. The most applied methods in the reviewing and conducting field work were:

- Key Informants Interview (KII)
- Focus Group Discussion (FGD)
- Case Study for authentication check and individual sub-project feasibility study.



Picture 7: Focus Group Discussion at Dosari, Naikongchhari Upazila, Bandarban District



Picture 8: Focus Group Discussion at Choto Harina Bazar, Barkal Upazila, Rangamati

Desk Review

- Desk review of development plans and policies pertinent to the study such as, Perspective Plan, 8th Five Year Plan, Delta Plan, National Transport Policy, CHT manual, Environmental and social safeguard policy and framework, etc.
- Desk review of rural development projects and programmes implemented or being implemented in the CHT region such as ADB/GoB funded Chittagong Hill Tract Rural Development Projects. Existing and future potential in tourism development that includes eco-tourism, community tourism, etc.
- International practices in hill areas' development, best practice examples on structures, mega projects and community tourism, etc.

Meetings

- Meetings with key officials from LGED, Hill District Council, Regional Council, Hill Tract Development Board, CHT Affairs Ministry, Department of Forest, NGO Caritas, and development partners UNDP.

Review Disconnected Village Database

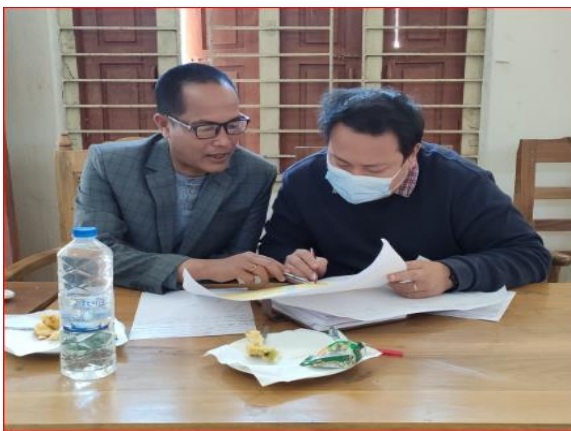
- Review disconnected village database at the 'Stakeholder consultation meeting' participating by local government representatives such as UP chairmen and members, upazila chairmen, vice-chairmen, and UNO.



Picture 9: Stakeholder Consultation meeting in Dighinala Upazilas, Khagrachhari



Picture 10: Stakeholder Consultation Meeting in Juraichhari Upazilas, Rangamati



Picture 11 & 12: Database Review with LGI representatives at Lakshmichhari Upazila



Picture 13 & 14: Database Review with LGI representatives [Left] and Upazila Engineer [Right]

Participatory Key Informant Interview & Focus Group Discussion

- FGD and KII were conducted using a checklist provided in *Annex-1*. Composition in the FGD included tribal and non-tribal community people: male and female, teacher, local farmer, trader, young biker, and student depending on the availability.

- KIIs of traditional tribal leaders (Headman and Karbari), Union Chairman tribal and non-tribal, Upazila chairmen tribal and non-tribal, female member, UNO male and female, and teacher male and female depending on availability.



Picture 15: Community Consultation at Kurukpata Union, Alikadam Upazila, Bandarban



Picture 16: Community Consultation at Bagachattar Union, Langadu Upazila, Rangamati

Union Case Study at the 23 selected Unions

- Authentication and feasibility check by visits to the sub-projects reviewed and listed for the 23 selected case study unions under MVMT project.
- Survey with GPS machine and Google apps in collecting disconnected village location, landmark, chainage at gaps, village road at section vulnerable to landslide or erosion damage, steep hill or narrow existing width or sharp slope at other side of the hill, where retaining wall or mild hill cutting or L-drain with guard wall would be needed.

Prioritization & Tabulation of Disconnected Village Sub-projects

- Prepare a priority list of sub-projects by upazilas, districts and CHT that includes gazetted ID roads and non-gazetted No ID roads with attributes like name and number of villages and population. The criteria used in the prioritization are described below.

(I) Criteria used in Union Level prioritization

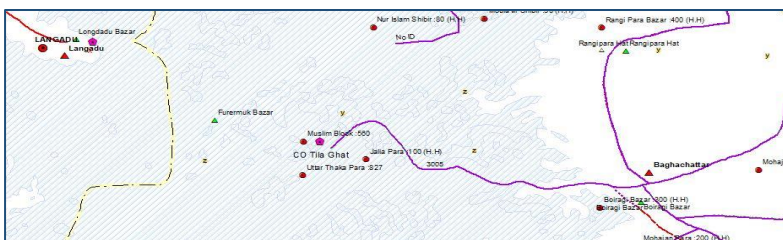
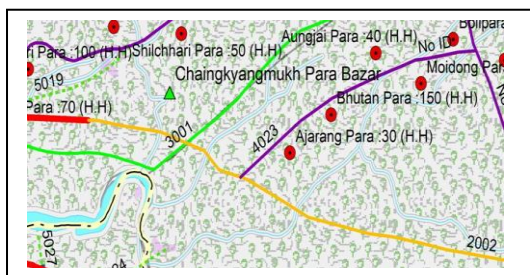
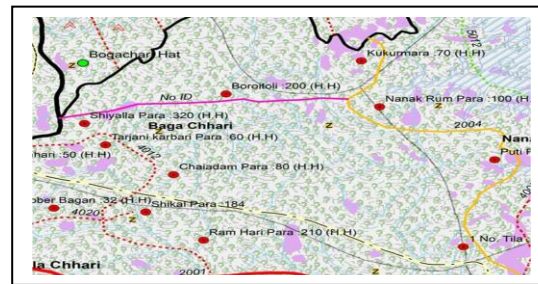
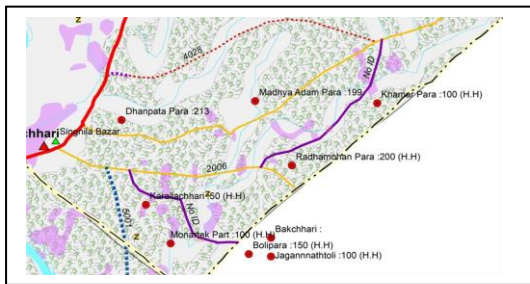
- First, people's need understood from the Upazila level stakeholder meeting, FGDs and KIIs and also from the visits in case study union;
- Have ranking by the LGI and LGED representatives participated the stakeholder meeting facilitated by the study team: 1-3, 1 the highest priority and 3 the lowest;
- Priority is given to single connection with no alternative transport road and multi-modal transport route to connecting the villages with Upazila HQ and Union Parishad, growth centre and important markets and social service centres; villages with higher number of population and travel time get higher weightage;
- Priority is given to roads, ghats and collection points that will facilitate agricultural diversification, reduce transportation cost, ensure fair price and create farm and non-farm employment and income;
- Priority is given to roads' development and inland waterways dredging that will enable year-round mobility of general public and villagers in particular, health workers, teachers and students, and tourists to facilitate tourism development, quality education and better health service in the district and region;

- Special priority is given to sub-projects of roads, riverine routes/inland waterways that will mainstream ethnic minority communities living in the reserve forest or forest;
- Special priority is given to sub-projects of roads and inland waterways for inclusive development of the most lagging remotely located ethnic minority communities;
- Identified sub-projects more cost-effectiveness than others using per km per 1000 population cost for each sub-project;
- Every sub-project(s) is to be climate-resilient, sustainable and cost-effective. Sub-projects not climate resilient or sustainable are excluded from the long list.

(II) Criteria used in Upazila Level 2nd Tier Prioritization

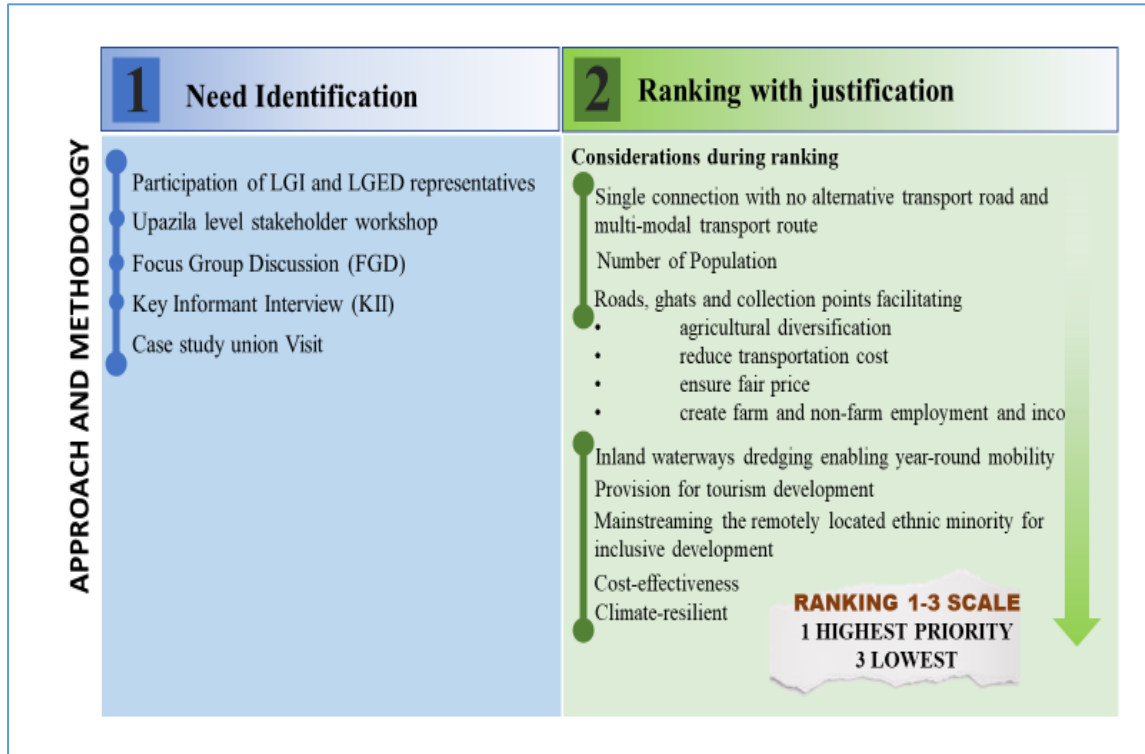
- Population, travel time needed from the remotest villages to the Upazila HQ, road type and cost per 1000 population are the indicators weighted giving a value in a formula.
- Also ranked value (1-3) for the Union level prioritization is given a weighted value, and then sum with the weighted value found using population and other indicators to calculate a total weighted value.

- Prepare a priority list of non-gazetted No ID sub-projects compiled at the upazila, district and CHT level, suggesting qualifying road types for gazette notification, and subsequent endorsement under the MVMT project.

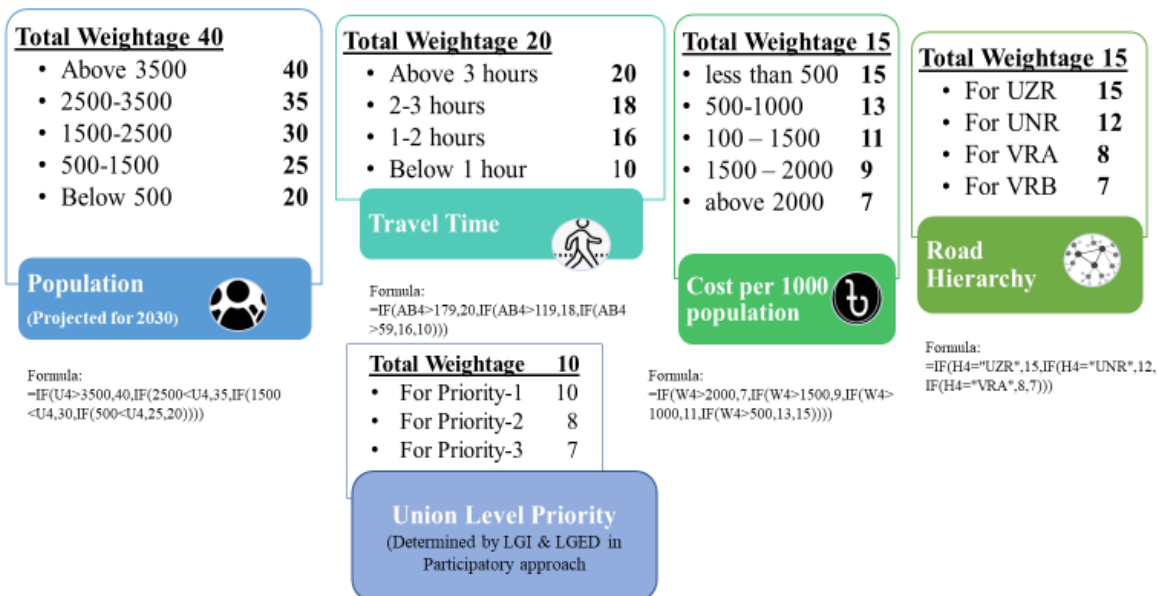


1st, Picture 1: Mahalchhari- 2006 Upazila road is taken to connect two No ID link roads.
 2nd, Picture 2: Naniarchar- 2004 Road has been proposed in order to connect Nan Krum - Shiyallachhari Road.
 3rd, Picture 3: Rajasthali- 2002 Upazila Road has been proposed in order to connect 4023 Union Road
 4th, Picture 4: Dighinala-110m Bridge has been proposed on Main river, connects 6 villages with union and upazila
 5th, Picture 5: Langadu- CO Tila Ghat, Connecting Boiragi Bazar & Bagachattar Union Parishad with upazila via water way and road ID 3005.

7.4 The approaches and methodologies of the Study for reviewing database and prioritization are synthesized in the diagrams below, noting that the proposed sub-projects of roads in the databases are prioritized based on weightage calculated on the set criteria (as shown in the diagram). People’s demand and local need are reflected in the prioritization: 10 points is given for Priority 1 (the highest), and 7 points to Priority 3, the lowest, which were determined by the Study, working together with LGI representatives and LGED field level technical staff at the stakeholder consultation meetings held in each upazila.

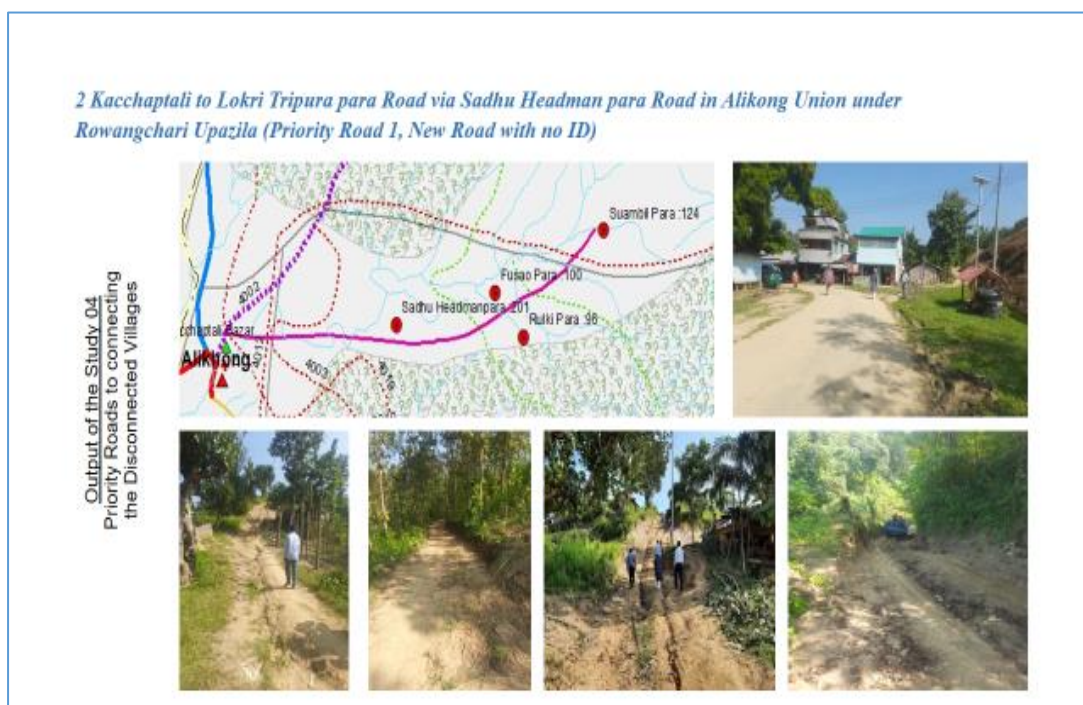
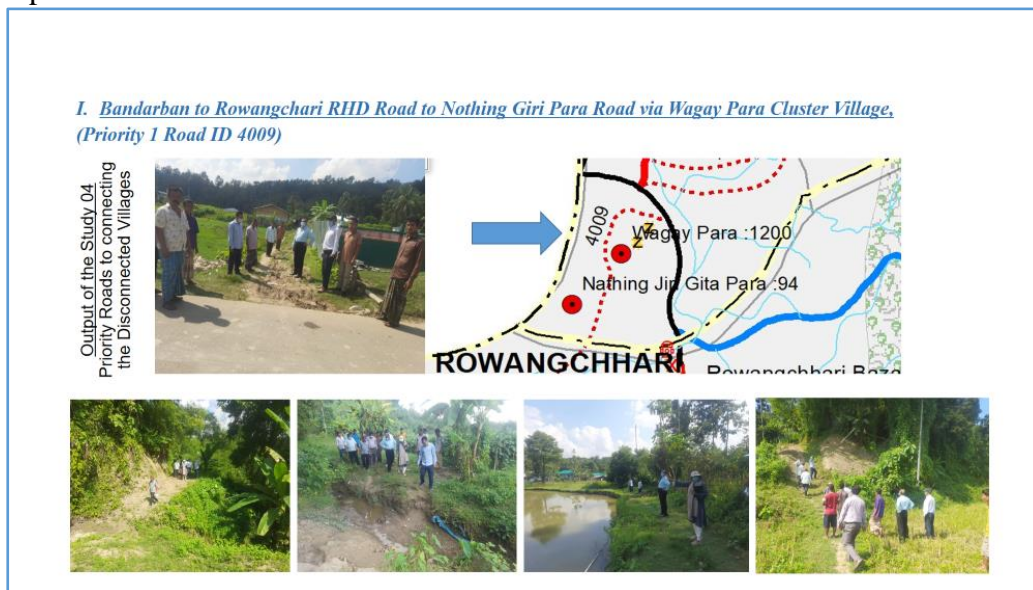


Indicators for Prioritization
(Total Weightage 100)



Mapping Disconnected Villages & Population

- With the active support of LGED technical staff, first, draw every priority listed MVMT roads and disconnected villages on the LGED GIS map in presence of union Chairmen and members who knows the sub-project and area the best. This was not in scale but approximation was reached by triangulation. Then digitized on screen using GIS, and validate with Google map and checked with data and information on important features and points collected using GPS during field visits.
- There were challenges in deciding on starting node and/or zero chainage of the non-gazetted (No ID) road, because not all non-gazetted sub-projects were visited and surveyed by the Study team. Maps below are examples of visited ID & non-gazetted No-ID road with pictures:



Wrap Up Meeting

- Wrap up the field work progress at each district holding a meeting chaired by the respective Executive Engineer (LGED, Hill Districts), LGED and participated by all upazila engineers of the respective district. On completion of the fieldwork, this was conducted to share issues and updates to the district Executive Engineer for feedback and action, as necessary.

Validation Workshop

- On completion of data analysis and drafting of the database and mapping, the Study outputs were shared with the respective districts and upazilas for final review. Later a validation workshop was held on 26 May 2022 at the Rangamati district on the Draft Report to share and validate the findings. This was participated by the LGED Division, District and Upazila officials and technical staff, representatives from Hill District Council, CHT Regional Council and CHT Development Board, etc. That helped in duplication check and also allowed discussion on sub-projects pass-through the reserve forest and hills.

National Workshop

- The Draft Report is finalized, incorporating comments received from the validation workshop, LGED head office staff and PMO office. A National Level workshop will be held at LGED HQ for sharing and disseminating the results of the Study.

7.4 Limitations of the Study Approach & Methodology:

Due to budget constraint, use of high-resolution satellite images, use of GPS survey and/or 'Drone Survey' was not possible in the Study. My track mobile apps were used for tracking some of alignments visited during the field work at the case study unions; GPS was used at a limited capacity for locational point features of some landmarks and gaps where need bridges, etc. As expected, GIS was used in preparing maps illustrating disconnected villages and populations. Google earth was only helpful in validating or geo-referencing. The findings of the Study strongly suggest for bringing improvement in GIS attributes and spatial data using Drone Survey and high-resolution satellite images to have all features geo-spatially referenced with errors to a minimum and within acceptable limits.