



GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
MINISTRY OF LOCAL GOVERNMENT, RURAL DEVELOPMENT AND CO-OPERATIVES
Local Government Engineering Department (LGED)
Agargaon, Sher-E-Bangla Nagar, Dhaka-1207

Final Report on Study-03
‘My Village -My Town’ -Technical Assistance Project
“Feasibility Study for Rural Connectivity including Multi-Modal Transport
System in Char and Haor Areas”

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July, 2022

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GLOSSARY

Hard-to-reach Villages mean in the Study those villages that are not connected by any paved road with the respective Upazila HQ and/or Union Parishad, and to the nearest economic activity hub and social service centres. The following explanations is important for the concept of hard-to-reach villages.

- In haor areas, Village connected with submersible roads dry season and connected with riverine/haor routes in monsoon season has been considered as accessible and excluded from hard-to-reach villages.
- Within Upazila, Villages that needs a bridge to connect has not considered as hard-to-reach villages.
- In case of island Upazilas, villages that are accessible with paved roads from Upazila HQ has been considered as accessible and excluded from hard-to-reach villages.
- In case of villages that are connected with HBB (Herring-Bone-Bond) or Brick flat soling routes has been considered as hard-to-reach villages

Mauza 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 Mauza with strong social bond. Within a Mauza there could be more than one village.

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.

Hat Synonym of bazar or market

Walking Trail mean in the Study the village pathway or access used for walking by commuters, in the most cases do 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.

Climate-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.

ABBREVIATIONS

ADB	– Asian Development Bank
BBS	– Bangladesh Bureau of Statistics
BC	– Bitumen Carpeting
DatEx	– Data Expert (Pvt.) Limited
DECL	– Delight Engineers and Construction Ltd.
DoE	– Department of Environment
DPHE	– Department of Public Health Engineering
DPP	– Development Project Proposal
FGD	– Focus Group Discussion
GIS	– Geographic Information System
GOB	– Government of Bangladesh
HBB	– Herring-Bone-Bond
HQ	– Headquarter
JV	– Joint Venture
KII	– Key Informant Interview
LGD	– Local Government Division
LGED	– Local Government Engineering Department
LGI	– Local Government Institute
MVMT	– My Village My Town
NGO	– Non-Government Organization
PD	– Project Director
PMO	– Project Management Office
RCC	– Reinforced Concrete
RHD	– Roads & Highways Department
SDGs	– Sustainable Development Goals
TA	– Technical Assistance Project
UNDP	– United Nations Development Programme
UNO	– Upazila Nirbahi Officer
UNR	– Union Road
UP	– Union Parishad
UPZ	– Upazila Road
VRA	– Village Road A
VRB	– Village Road B

BACKGROUND

Context of the Project

The Government of Bangladesh made massive plans to ensure equitable development around the country. Under this development philosophy, the GoB requirements are to reduce rural-urban divide to foster developmental benefits for all citizens. As part of this, the government declared an election manifesto on the eve of the national parliament election 2018 uniting the theme **Bangladesh on the March Towards Prosperity** aiming at transforming Bangladesh into a developed nation by 2041. Under this, villages have been considered the basic unit of prosperity for building a developed nation.

This firm commitment was declared following the light of the philosophy of the Father of Nation Bangabandhu Sheikh Mujibur Rahman to build ‘Sonar Bangla’ (Golden Bangla) through inclusiveness, balanced and development for all.

Following the philosophy of the Father of the Nation, the government declared election manifesto 2018 titled ‘My Village-My Town’- Extension of Modern Civic Amenities in Every Villages. The Local Government Division under the Ministry of Local Government, Rural Development and Cooperatives has prepared a comprehensive work plan to make this election commitment a reality. The Local Government Division with its two agencies, Local Government Engineering Department (LGED) and Department of Public Health Engineering (DPHE) has undertaken a technical assistance project named ‘My Village-My Town’- Technical Assistance Project. Under this project, 36 studies and 30 guidelines are being developed on eight thematic components related to mandate of Local Government Division. The eight thematic components are Rural Communications, Growth Centre and Hat bazar, Rural Water Supply and Sanitation, Rural Waste Management, Community Space and Recreation Facilities, Upazila Masterplan, Rural Housing and Capacity building of Upazila and Union Parishad. Besides this, a coordination framework is being developed among the other ministries involved in implementation of My Village-My Town election manifesto. It is notable to mention that a coordination committee has been formed comprising 21 ministries to implement the program in a coordinated way under the leadership of the Minister of Local Government, Rural Development and Co-operatives.

Context of the Report

This report is a part of study of the component ‘Rural Connectivity’. Rural connectivity is the basic of all amenities in the villages. Rural connectivity works as the conduit that can supply a number of bare necessities such as access to market, health, education, employment etc. In general Bangladesh has remarkable progress in rural connectivity. Instead of this, a number of regions of the country are geographically sensitive where rural connectivity is not easy and has lot of challenges. These regions are -Haor, Beel, Hills, Chars, islands etc. The people residing in these regions has considerably low access to civic amenities compared to other villages of the country. Therefore, study and plan development of improvement of rural connectivity is one of the important assignments of the technical assistance project. The project undertook Upazila based special study on the villages of these geographically sensitive regions that are mentioned before.

This report contains rural connectivity status and priority plan of the **Sarail** Upazila of **Brahmanbaria** District.

1 DESCRIPTION OF THE UPAZILA

1.1 GEOGRAPHY AND DEMOGRAPHY

The geographical area of Sarail upazila is 215.27 square kilometers and has 9 unions, 67 mouzas and 141 villages. The upazila is 15 km away from district headquarters of Brahmanbaria. The upazila is covered by 2 major haors and there exists 2 major rivers flowing over the upazila- Meghna & Titash. The total population of the upazila is approximately 3,15,000 of which 1,52,000 are male and 1,63,000 female, total number of households are 58,622 and average household size is 5.36 with a population density of 1464 (as per population census 2011).

1.2 EDUCATION FEATURES

According to the information of the relevant local government offices there are 75 government, 48 registered, 79 NGO schools & 40 kindergarten schools. On the other hand, Sarail has only one government high school, 19 non-government high schools with 2 private colleges, and 35 madrashas. The literacy rate for the upazila is 40.9% as per BBS 2011.

1.3 RURAL ROAD COMMUNICATIONS

Bangladesh scored in the rural accessibility index at around 87 per cent among South Asian and some other Africa countries. Generally, the people of Bangladesh get all weather within 2 kilometers adjacent to their living places. But the feature of rural roads communications in Sarail upazila is contrasted. There are many villages, disconnected from the developed paved road network that brings huge sufferings for the people of the villages. The total rural road network of Sarail is 461.84 km, out of which 154.72 km paved and 307.12 km earthen.

1.4 AGRICULTURE, FOOD PRODUCTION AND FISHERIES

Both the Agriculture & Pisciculture have major importance for the economy of the people of Sarail. There are 36,626 acres of arable land in the upazila. In the fiscal year 2010-11 the Rice production was 126.72, 10114 & 55880 metric tons for Aus, Aman & Boro seasons respectively. The upazila also produced 1302 metric tons of Potato and 256 metric tons of Oilseed in the same fiscal year 2010-11. A notable quantity of vegetable is also produced here in this upazila.

According to the BBS (2010-11) data Sarail has 876 acres of pond, dhighee & other wetlands that produced 652 metric tons of fishes. There also exists 38 poultry & 38 dairy farms.

All the agricultural products are adequate to meet the demand of the upazila and surpluses are sold to outside of Sarail.

1.5 GROWTH CENTRE AND HATBAZAR

Growth Centre and Rural Hatbazar is one of the main centres of the rural economy. Hatbazar is like the heart for the development of the rural economy. Rural hatbazar plays a role in increasing production and creating employment impacting on the supply chain of agriculture and non-agriculture products. There are 21 hatbazar and 3 growth centers in the upazila. The structural development of hatbazar and growth is pivotal to boosting up the rural economy. A details of the growth center & hatbazar of the Upazila has been attached in the [Annexure-I](#).

2 LOCATION OF THE UPAZILA

Sarail upazila is in the Eastern part of the country under Brahmanbaria district of Chattogram division. The location has been shown in the map. It is surrounded by Nasirnagar upazila on the north, Brahmanbaria Sadar upazila on the south, Brahmanbaria Sadar and Nasirnagar upazilas on the east, Bhairab and Bajitpur upazilas on the west. The upazila is within **Middle Meghna Flood Plain zone**. During monsoon the river Meghna carries a large volume of flood water coming from upstream, while the upstream is typically flood plain zone of Sylhet, Sunamganj, Habiganj, Moulvibazar, Kishoreganj & Netrokona districts. The hilly rivers coming down from the ‘Khasi and Jaintia hills’ in Meghalaya, India carry particularly high volumes of water during monsoon as they come from some of the rainiest (**Cherrapunji**) places in the world, resulting flash flood in these mentioned districts inside Bangladesh. Being the downstream, the river Meghna thus receives enormous water from the surface runoff and the stream overflows due to the channel runoff exceeds its carrying capacity. As a result, it inundates a large area of **Meghna Flood Plain zone** as well as the Sarail upazila. Floods induce severe impacts in both the built and the natural environment. The effects of flood can be catastrophic and show extensive diversity, ranging from damages in buildings and infrastructure to impacts on vegetation, human lives and livestock.

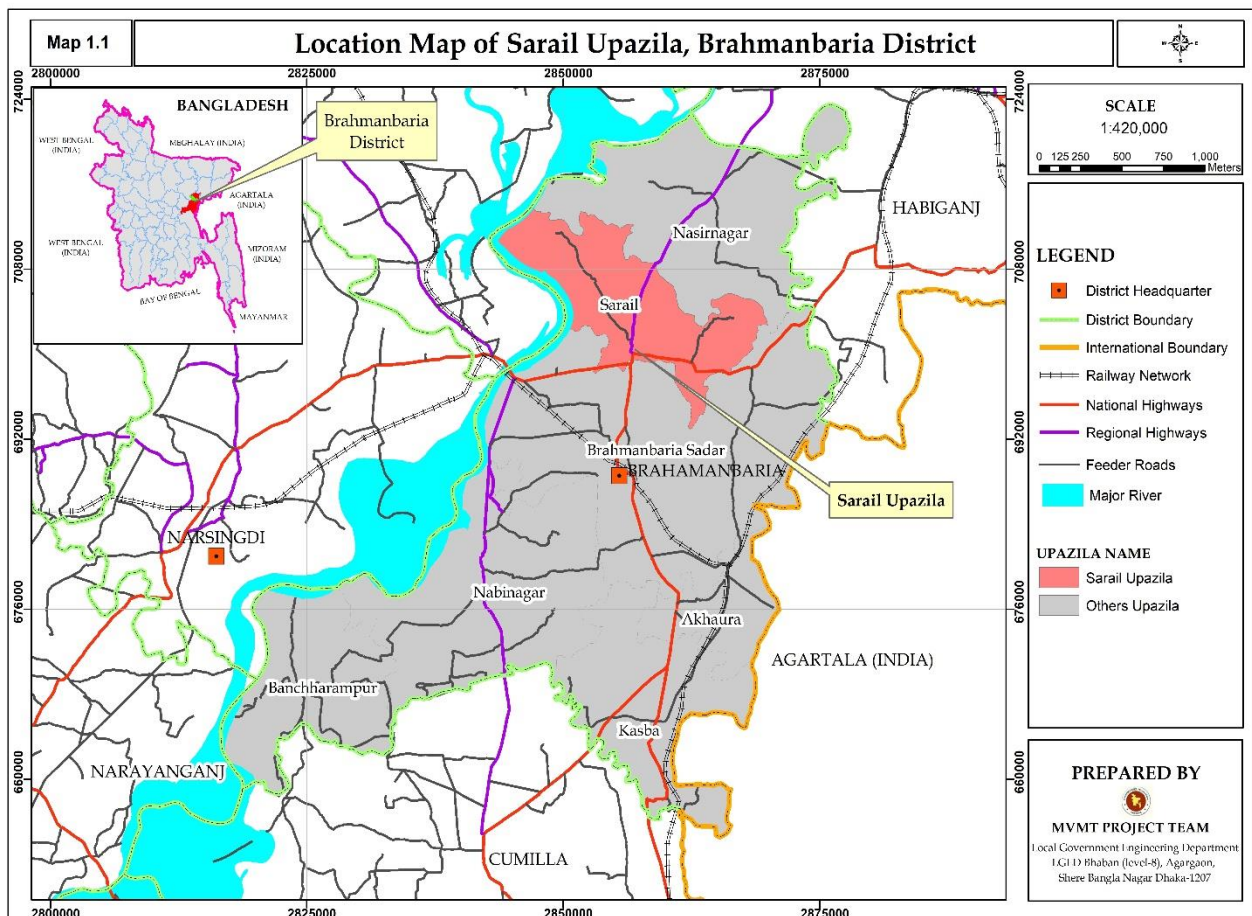


Figure 1: Upazila Location Map.

3 APPROACH & METHODOLOGY

3.1 STUDY TEAM COMPOSITION

A team consisting of Senior Rural Road Infrastructure Specialist, Associate Rural Infrastructure Specialist, Assistant Engineer engaged by Project Management Office (PMO) conducted the study. On the other hand, A team consisting of Deputy Team Leader cum Rural Infrastructure Engineer, Junior GIS expert and Junior Engineer engaged by consulting firm (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 district, the database was reviewed, priority needs identified and mapped working together with the LGI representatives and LGED technical team. LGED and LGI representatives were surveyed each Upazila for collection of detailed observations and validations of the proposed priority needs.

Stakeholder Consultation Meeting

- Hard-to-reach Village Database and database of sub-projects reviewed
- Prioritization of sub-projects for each Upazila with LGI and LGED representatives
- Hard-to-reach villages and priority sub-projects mapped in the LGED GIS Map

3.2 STUDY AREA

The Study was conducted in 72 Upazilas of haor areas, 3 Upazilas of Beel areas, 8 Upazilas of Char areas, and 4 Upazilas of Island areas during the period from December 2021 to June 2022. Apart from this, PMO team conducted the study in 50 Upazilas of Haor areas and rest of the Upazilas of Haor, Beel, Char and Island areas are conducted by consulting firm team. The upazila technical staff of LGED supported in organizing stakeholder consultation meetings and in database review and mapping the Hard-to-reach 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 Upazila, and looking at the feasibility of some proposed sub-projects from technical, social and environmental perspectives.

3.3 DATABASE REVIEW AND ANALYSIS

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 haor areas to understand the need and impact of rural accessibility in remote village 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.

- ❖ Review Hard-to-reach village database at the ‘Stakeholder consultation meeting’ participating by local government representatives such as UP chairman and members, upazila chairman, vice-chairman, and UNO.
- ❖ FGD and KII were conducted using a checklist. Composition in the FGD included local community people: male and female, teacher, local farmer, trader, and student depending on the availability.
- ❖ KIIs of Union Chairman, Upazila chairman, UNO male and female, and teacher depending on availability.
- ❖ Authentication and feasibility check by visits to the sub-projects reviewed and listed for the 40 selected case study unions under MVMT project.
- ❖ Survey with GPS machine and Google apps in collecting Hard-to-reach village location, landmark, chainage at gaps, village road at section vulnerable to land erosion damage, narrow existing width or sharp slope location.

3.4 PRIORITIZATION CRITERIA OF SUB-PROJECTS

Prepare a priority list of sub-projects by Upazilas that includes gazette ID roads and non-gazette roads (No ID) with attributes like name and number of villages and population. The criteria used in the prioritization are described below.

- Population, travel time needed from the remotest villages to the Upazila HQ, road type and cost per km per 1000 population are the indicators weighted giving a value in a formula.
- 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 deprived communities living in the hard-to-reach villages;
- 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.

3.5 WEIGHTAGE DISTRIBUTION FOR PRIORITIZATION

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 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.

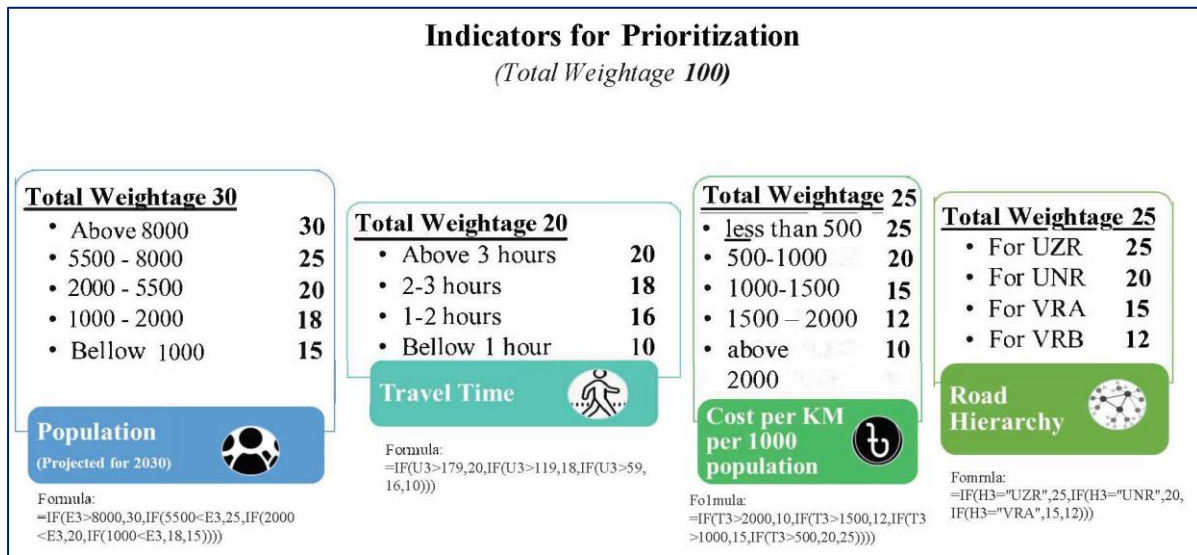


Figure 2: Prioritization indicators & their weightage values

3.6 MAPPING HARD-TO-REACH VILLAGES & POPULATION

- With the active support of LGED technical staff, first, draw every priority listed MVMT roads and Hard-to-reach villages on the LGED GIS map in presence of union Chairman 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-gazette (No ID) road, because not all non-gazette sub-projects were visited and surveyed by the Study team.

3.7 WRAP UP MEETING

Wrap up the field work progress at each district holding a meeting chaired by the Executive Engineer, 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.

3.8 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 validation workshop was held at the respective district on the Draft Report to share and validate the findings. This was participated by the LGED Division, District and Upazila officials and technical staffs.

3.9 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 was held at LGED HQ for sharing and disseminating the results of the Study.

4 DESCRIPTION OF WETLANDS

4.1 DISTRIBUTION OF THE HAORS/ WETLANDS

The upazila has a certain portion of flood plain zone that covers almost 40% of its total area. The roads within the flood zone becomes inundated at monsoon, that requires an attention to take relevant measures during road construction and maintenance.

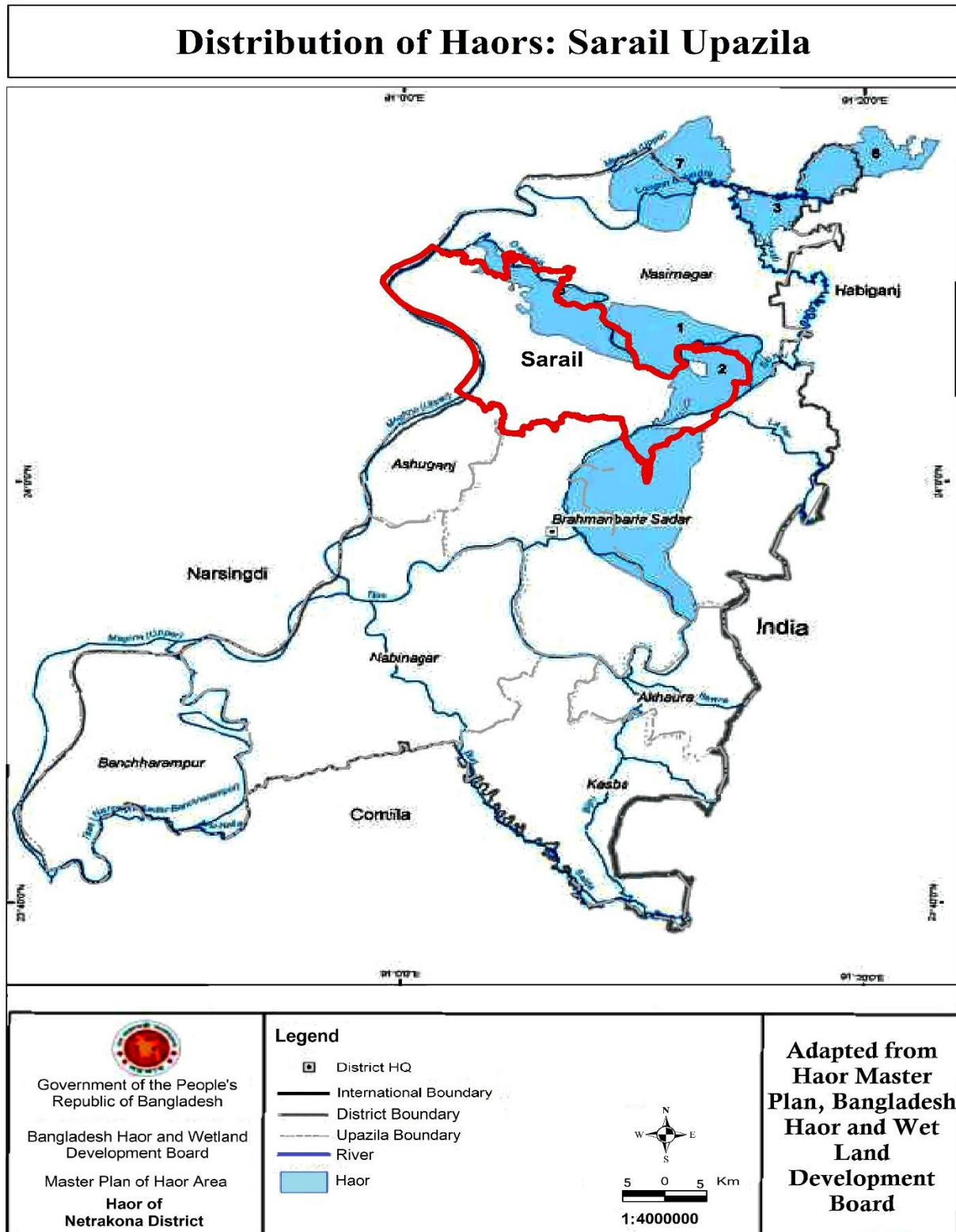


Figure 3: Haor Distribution Map

4.2 HAOR/ WETLAND CATEGORY

However, the upazila has no deeply flooded but has some floodplain zone. Therefore, road or other infrastructure development in this Upazila does not have any major environmental consequences.

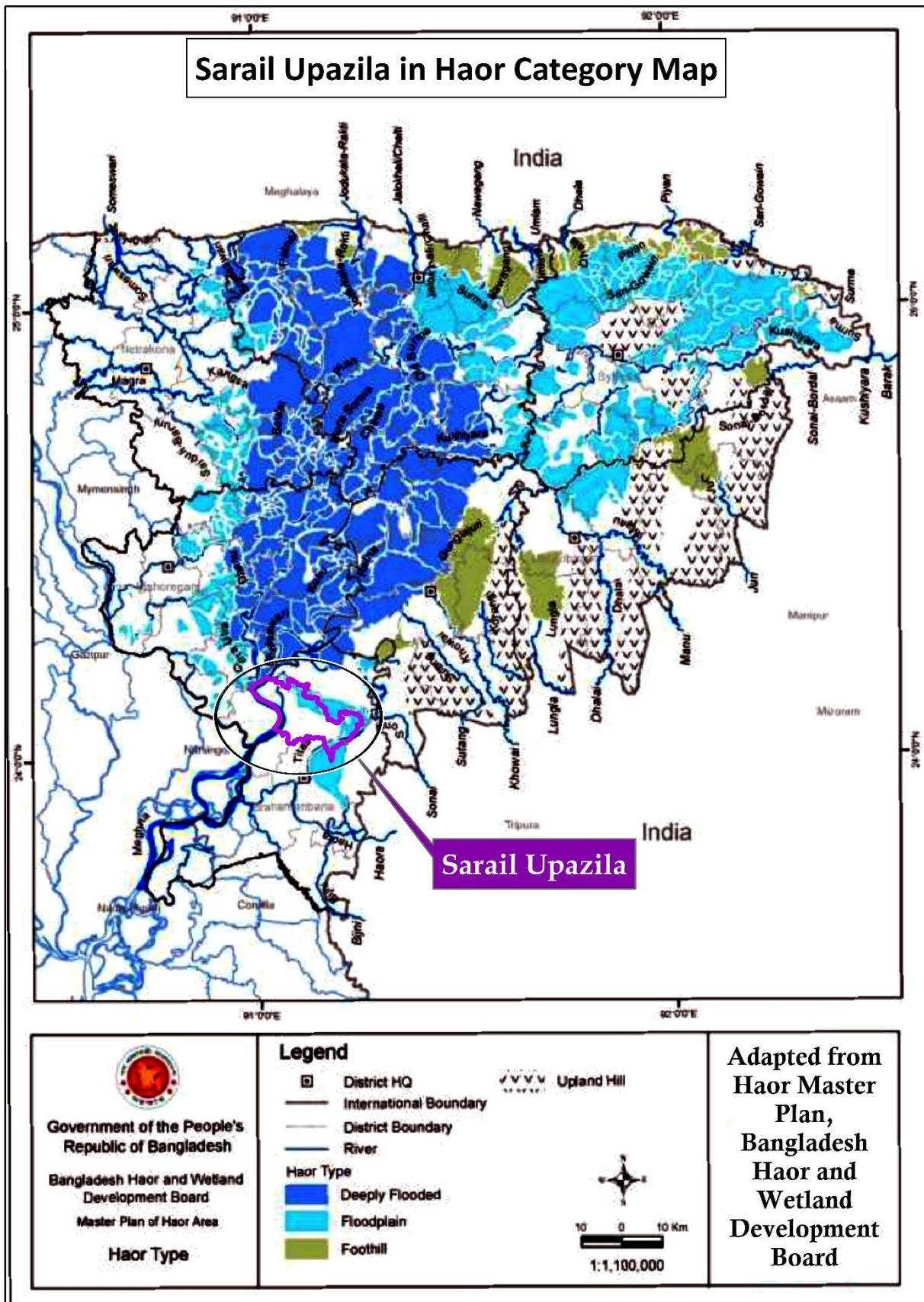


Figure 4: Haor Category Map.

4.3 BIO-ECOLOGICAL CHARACTERISTICS

The Bio-ecological characteristics map of the upazila has been shown below. The map shows that it is completely a haor basin. Therefore, adequate opening for the road and road structures should be maintained.

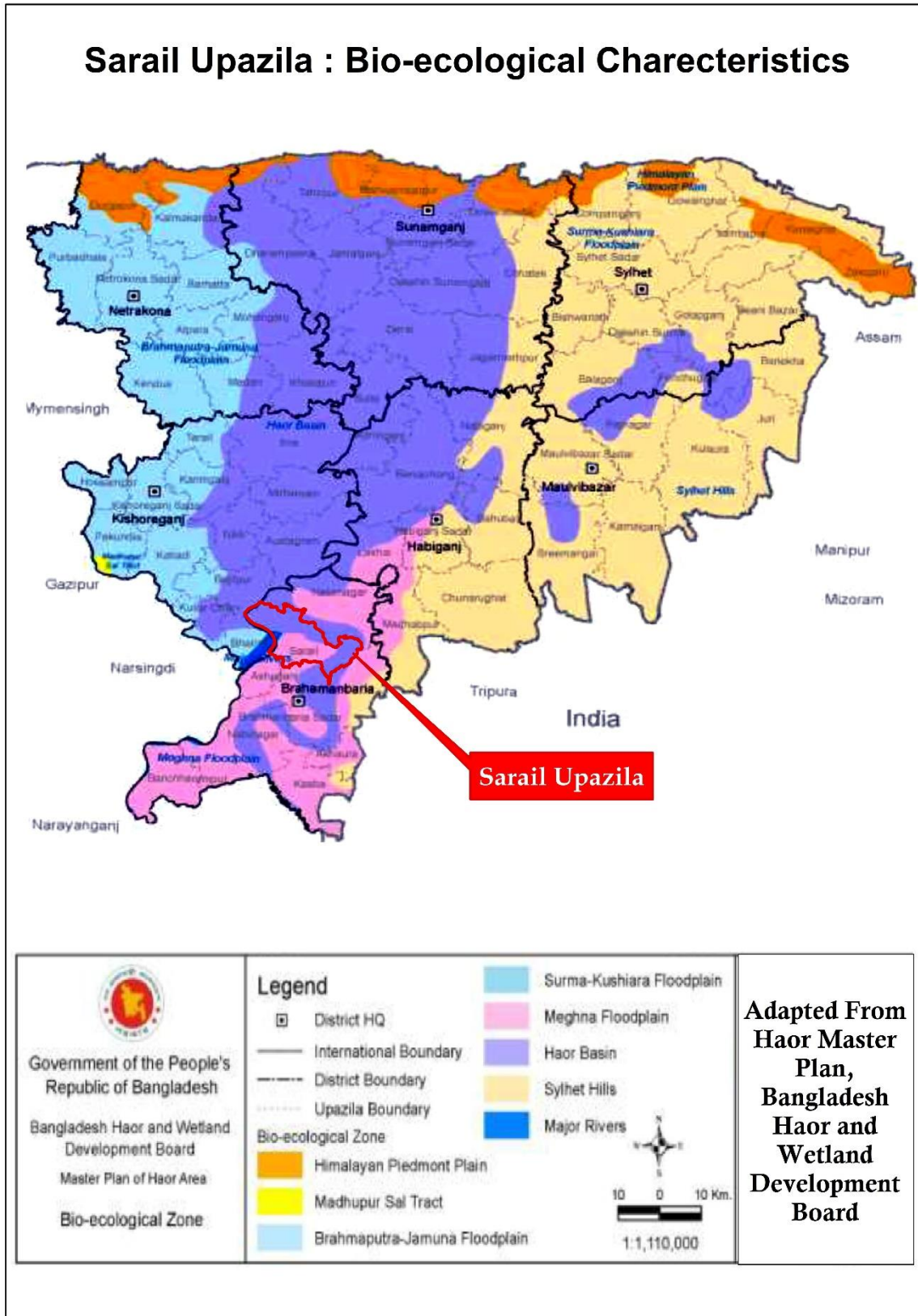


Figure 5: Bio Ecological Characteristics Map

5 RURAL ROAD CONNECTIVITY TO THE VILLAGES

5.1 SUMMARY OF THE VILLAGE CONNECTIVITY

Sarail is an upazila with floodplain zone. The rural road communication is quite poor here. Out of 149 villages, 44 are disconnected from the developed paved road network that brings huge sufferings for the people of those villages. The total rural road network of Sarail is 461.84 km, out of which 154.72 km paved and 307.12 km earthen.

Table 1: Total villages in the unions and their connectivity

SL No	Union	No of Villages	Connected Villages	Disconnected Villages
1	Aorail	17	5	12
2	Chunta	12	4	8
3	Kalikachchha	14	11	3
4	Noagaon	22	15	7
5	Pakshimul	10	9	1
6	Sarail	40	39	1
7	Shahbazpur	10	5	5
8	Shahjadapur	9	9	0
9	Uttar Panisar	15	8	7
Total=		149	105	44

5.2 VILLAGES AND THEIR CONNECTIVITY – UNION LEVEL

The consultant arranged a meeting at upazila conference room with and all the UP Chairmen & their secretaries. The team interviewed representative of each the union and collected data about the HTRV.

Table 2: Union wise connected & disconnected villages and their population

Union	Sl. No	Connected Villages	Population 2021 (Based on BBS 2011)	Disconnected Villages	Population 2021 (Based on BBS 2011)
Aorail (17)	1	Aorail Bazar	442	Aorail	7162
	2	Bade Aorail	2593	Kakaria	
	3	Banertek	558	Rajapur	5389
	4	Joynagar	523	Ranidia	5822
	5	Solakandi	269	Dhamaura	8460
	6			Dubasail	6719
	7			Baropaika	5468
	8			Pulkarkandi	
	9			Dhantuliya	
	10			Boro Nagar	
	11			Chunta	687
	12			Borail	
Sub Total=			4385		39707

Union	Sl. No	Connected Villages	Population 2021 (Based on BBS 2011)	Disconnected Villages	Population 2021 (Based on BBS 2011)
Chunta (12)	1	Bara Ballah	1588	Barail	1580
	2	Karatkandi	1235	Chunta	6771
	3	Nutanhat	2079	Deobari	840
	4	Ranguri Para	992	Ghagrajor	2912
	5			Goyaldhigi	5729
	6			Lopara	3852
	7			Narsinghpur	2463
	8			Rasulpur	7327
			Sub Total=	5894	
Kalikachchha (14)	1	Bepari Para	1231	Chanpur	1884
	2	Bishutara	2185	Dharma Thirta	1863
	3	Gunara	198	Galania	2759
	4	Kabitara	417		
	5	Kalikachchha Aonsho	780		
	6	Kasarpar	354		
	7	Mulbarga	848		
	8	Sahapur	759		
	9	Sariar Pukurpar	216		
	10	Shiddeshwari	737		
	11	Surjyakandi	2410		
		Sub Total=	10135		6506
Noagaon (22)	1	Akhitara	4080	Airal	2206
	2	Baruiura	4186	Dhalla	1136
	3	Batara	150	Gogadh	4248
	4	Buchiura	820	Katanisar	2158
	5	Budda	2492	Kaziura	726
	6	Chandpur	573	Mahaldara	731
	7	Char Ullahati	610	Terkanda	2711
	8	Chowraguda	574		
	9	Guchchhagram	169		
	10	Joynagar	125		
	11	Kaniuch	598		
	12	Kuchni	1344		
	13	Nadda Para	503		
	14	Naogaon	6977		
	15	Teorkona	746		
		Sub Total=	23947		13916
Pakshimul (10)	1	Baraichara	2610	Joydharkandi	8508
	2	Bhuisar	6487		
	3	Brahmangaon	1949		
	4	Fatehpur	2648		
	5	Haripur	802		
	6	Kali Shimul	3416		
	7	Parmanandapur	5058		
	8	Shaitbaria	749		

Union	Sl. No	Connected Villages	Population 2021 (Based on BBS 2011)	Disconnected Villages	Population 2021 (Based on BBS 2011)
	9	Telikandi	3900		
	Sub Total=		27619		8508
Sarail (40)	1	Alinagar	704	Uchalia Para	4229
	2	Baidya Para	2808		
	3	Banik Para	590		
	4	Bara Dewanpara	781		
	5	Bara Gunara	1100		
	6	Brahman Para	568		
	7	Chandmani Para	667		
	8	Chhota Gunara	620		
	9	Dakshin Para	454		
	10	Dakshinarifiel	1367		
	11	Darji Para	926		
	12	Dewan Habli	331		
	13	Fakir Para	707		
	14	Garer Para	754		
	15	Habai Para	359		
	16	Halua Para	852		
	17	Jagur Para	314		
	18	Jahangir Para	365		
	19	Jilukdar Para	637		
	20	Jurasar	609		
	21	Kachari Para	673		
	22	Kutta Para	7421		
	23	Lata Baidya Para	352		
	24	Mira Para	383		
	25	Mogaltula	1395		
	26	Nath Para	685		
	27	Nij Saril	2558		
	28	Noahata	1141		
	29	Paschim Para	1702		
	30	Pathan Para	733		
	31	Purba Chhota Dewan Para			
	32	Purbapaschim Hafijullah Para	681		
	33	Sagar Dighirpar			
	34	Saha Para	412		
	35	Sreedobha	387		
	36	Swalpa Naogaon	1602		
	37	Uttar Arifiel	1033		
	38	Uttar Para	562		
	39	Uttar Paschim Bepari Par	1309		
Sub Total=		38542		4229	
Shah bazpu	1	Bara Dhitpur	5385	Haspatalpara	6073
	2	Bishamara	1550	Postofficepara	

Union	Sl. No	Connected Villages	Population 2021 (Based on BBS 2011)	Disconnected Villages	Population 2021 (Based on BBS 2011)
	3	Jadabpur	713	Dashpara	
	4	Khamatpur	680	Kumarpara	
	5	Sahbazpur	21429	Nagpara	
	Sub Total=		29757		
Shahjadapur (9)	1	Bhatbaria	537		
	2	Deobaria	480		
	3	Deora	6240		
	4	Dhauria	1096		
	5	Gazipur	761		
	6	Malais	3703		
	7	Niamatpur	1267		
	8	Shahjadpur	9771		
	9	Tantar	426		
Sub Total=		24281		0	
Uttar Panisar (15)	1	Bertala	4735	Baraibari	2672
	2	Diobaria	2013	Bitghar	5507
	3	Kanikhai	1355	Sakhaiti	5873
	4	Nailaband	1476	Sakaiti	11885
	5	Natun Dularampur	452	Santinagor	
	6	Panisar	976	Jalalpur	
	7	Sitaharan	1549	Tighar	5976
	8	Sulabari	4049		
	Sub Total=		16605		31913

5.3 MAP OF DISCONNECTED VILLAGES & PROPOSED ROADS

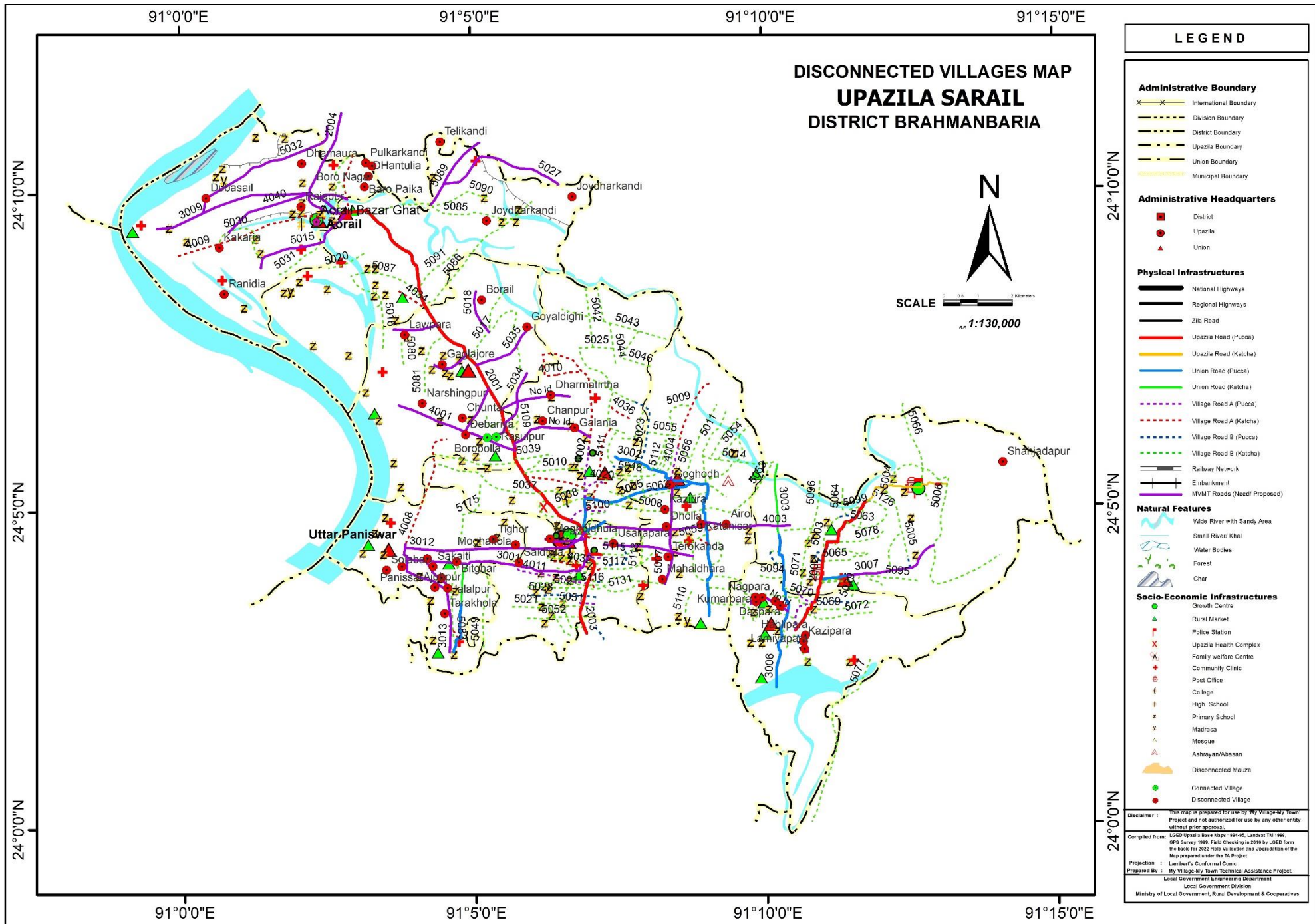


Figure 6: Upazila Map

6 CONSULTATION MEETING & FIELD VISIT

6.1 UPAZILA LEVEL MEETING

The consultant arranged a meeting at upazila conference room with the support of the UE office, Sarail that was participated by UNO, UE and all the UP Chairmen & their secretaries.



Figure 7: Upazila level Consultation Meeting

During the meeting, consultant team briefly discussed about the project and instructed the UP Chairmen and UE office for the database correction along with mapping procedure. The team worked on both the database and upazila map and obtained the necessary outputs subsequently.

6.2 VISIT TO CASE STUDY UNION

The team went Aorail, the case study union in Sarail upazila and visited “Dubasail - Dhamaura Road” having the Road ID: 412945032. The road was selected for the site visit considering the beneficiary population, educational institutes along the road and the recommendations of the UE Office as the road has a priority within the union.

The consultant observed and collected necessary information for the study discussing inhabitants and UE office. Team recorded GPS data, interviewed road users and took photos of the alignment condition.



Figure 8: Condition of the visited road alignment at Case Study union



Figure 9: Condition of the visited road alignment at Case Study union

The length of this road is 3 km, that is completely earthen. The road connects a major village of the union named Dhamaura having the total population of approx. 8500. People living here doesn't have any good road network with the upazila HQ due to having unpaved road communication. There exists, 3 madrasa and 2 Primary Schools. Some other villagers also use this road. Slope protection for the alignment had already done with concrete blocks and to protect the soil erosion Binna Grass has been planted through the hole of those cc blocks. A bridge (45m) is required at the very beginning of this road.

7 DATA COLLECTION & ANALYSIS

The consultant collected data from the field on hard to reach/ disconnected villages. Data were collected of those villages including population, road alignment information (*type, length, condition*), travel time, structure required on the alignment, potential riverine routes that can be used for multi-modal transport system etc. The data then analyzed, categorized and finally used to obtain a priority list along with a map (*Figure:6*) showing prioritized roads and disconnected villages. The proposed riverine & road connectivity by the UE office have been discussed in this section.

7.1 PROPOSED RIVERINE ROUTES

As per actual field visit and data analysis from haor development board, Sarail upazila is partially a Haor Basin and partially Meghna Floodplain zone. As per Haor Development Board around 60% of the area is highland and 40% are floodplain zone. Two major rivers have passed through the upazila, that are Meghna & Titash. As per the Ue office, Sarail there exists a riverine route that can be used as multi-modal transport system. The proposed riverine route connects with the river Meghna using the Rasulpur Khal. Generally smaller engine boats are used in the dry seasons as the water level reduces. At monsoon large area of the upazila gets inundated due to over flowing of the river Meghna and heavy rainfall. The water depth rises and resulting the waterways only mode of transport in the submerged, i.e., haor area. During this part of the year, larger boats are readily available to transport community & commodity

The name of the riverine routes & the associated streams with types of water vehicle are as follows;

Table 3: Proposed riverine routes of the upazila

Sl. No	Name of the Riverine Route	Name of the Stream	Type of the Stream	Types of Water Vehicle	Need of excavation
1	Rasulpur vill – Azobpur vill – Meghna River	Rasulpur Khal	Intermittent (April – Aug)	Small Boat, Engine Boat	Yes

7.2 PROPOSED ROADWAY FOR DISCONNECTED VILLAGES:

At present, roads are the most dominant mode of transportation. Most of the structures were built on the rivers to make the road communication effective. No bridges are needed in the upazila along the proposed road.

Table 4: Summary of the rural roads in the upazila

Total Road Length of the Upazila (KM)	Paved Length (KM)	Unpaved Length (KM)	Length of unpaved roads of disconnected villages (KM)
461.84	154.72	307.12	89.2

7.2.1 PROPOSED ALL WEATHER ROUTES:

There are only 13 all weather roads proposed to connect the HTRV within the upazila. The road name, ID, road condition and the length of the unpaved roads are as bellow;
461.84 km, out of which km paved and km earthen

Table 5: Proposed all weather roads in the upazila

Sl. No	Road Name	Road ID	Road Condition	Unpaved length (Km)
1	Aruail-Chatalpar GC road	412942004	All Weather	0.58
2	Sarail UP -panissar bazar	412943001	All weather	4.5
3	Aorail UP - Dubasail Bazar Road	412943009	All Weather	3.27
4	Sarail - T- Ghar - Panishwar UP Road.	412943012	All weather	11
5	Boddapara - Kuchni Sarak	412944003	All Weather	4.27
6	Shitahoron Borobari rd st from bertola bazar - Panishore UP road via bitghor bazar	412944027	All weather	2.5
7	Aruail UP - Rajapur Bazar Via Ranidia Road	412944040	All Weather	6.95
8	Goghodh - Surjokandi Sarak	412945007	All Weather	3.43
9	Aorail - Ranidia connecting Road	412945015	All Weather	5
10	Dubasail - Dhamaura Road	412945032	All Weather	3
11	Terokanda - Usalia Sarak	412945061	All Weather	3.3
12	Galania Pashcimpara Mosque - Madrasha Bridge	No ID	All Weather	2
13	Dharmatirtha Shoshan - Dharmatirtha	No ID	All Weather	2

7.2.2 PROPOSED SUBMERSIBLE ROUTES:

There are 11 submersible roads proposed to connect the HTRV within the upazila. The road name, ID, road condition and the length of the unpaved roads are as bellow;

Table 6: Proposed submersible roads in the upazila

Sl. No	Road Name	Road ID	Road Condition	Unpaved length (Km)
1	Rasulpur- Azabpur Road	412944001	Submersible	3.8
2	Ahamodabad-Chanpur Road	412944005	Submersible	6
3	Chunta Gagrajore	412944006	Submersible	2
4	Chunta-Charabadha	412945017	Submersible	3
5	Chunta-Barail Road	412945018	Submersible	2.5
6	Joydarkandi-Talikandi Rd.	412945027	Submersible	3.4

Sl. No	Road Name	Road ID	Road Condition	Unpaved length (Km)
7	Lowpara rd	412945033	Submersible	5
8	Rasulpur Barail- Sarker rd	412945034	Submersible	3
9	Chunta Goadhighi	412945035	Submersible	3
10	Aorail Hat road - Baropaika Road	412945180	Submersible	3.2
11	Haspatal road - moin sarak	No ID	Submersible	2.5

7.2.3 PROPOSED ROADS FOR DISCONNECTED VILLAGES HAVING NO ID:

There are only 3 roads proposed to connect the HTRV within the upazila that have no ID yet. The road name, ID and the length of the unpaved part are as bellow;

Table 7: Proposed roads for disconnected villages having No ID

Sl. No	Road Name	Road ID	Unpaved length (Km)
1	Galania Pashcimpara Mosque - Madrasha Bridge	No ID	2
2	Dharmatirtha Shoshan - Dharmatirtha	No ID	2
3	Haspatal road - moin sarak	No ID	2.5

7.2.4 PRIORITY FOR ROAD DEVELOPMENT

Considering resources constraint, benefited group of people, time required to travel & road hierarchy, a priority list has been developed (Annexure- 2) for the HTRV (Hard to Reach Villages). The priority score has been determined according to following

Table 8: Considered weightage values for the prioritization

Criteria	Weightage
Population	30
Travel Time	20
Cost per 1000 Population	25
Road Type	25
Total=	100

It has been observed that, there are a number of roads that bear same score. At these cases, the minimum budget required for providing connectivity to thousand people- will get more priority compared to more budget required roads. The roads bearing ID will have the higher priority than the roads without ID.

8 CONCLUSION & RECOMMENDATIONS

- Sarail Upazila is located within *Middle Meghna Flood Plain zone*. There are 2 (Two) major rivers that dominate the ecosystem & transport system of the Upazila. That are Meghna, Titas rivers. During monsoon, these rivers carry huge volume of flood water. Though the Upazila has a number of rivers, riverine transport is available in this Upazila. Small boats, Engine boats carrying agricultural products and passengers during monsoon.
- As the Upazila is heavily flooded during monsoon, rural roads and structures are highly vulnerable in this Upazila.
- The Upazila has a total number of 44 disconnected villages. To develop rural connectivity, there are proposals for both all weather & submersible roads. This report contains a list of roads with their priority. The priority has been determined based on Population, Travel Time, Cost per KM/1000 people & Road Hierarchy.
- This Upazila is highly vulnerable to disasters. Due to climate change, the vulnerability is getting intense. The year 2022 has shown catastrophic flood that was not seen over the last 18years (*last in 2004 similar to 1998 & 1988*). Therefore, it is highly recommended to study the road alignments before going for investment.
- Case by case design of roads in this Upazila considering different aspects such as exposure to floods, erosion etc. is highly recommended. A special study regarding the road and structure design of the Upazila Sarail in Brahmanbaria district is highly recommended.

ANNEXURE - 1

DETAILS OF GROWTH CENTER & HATBAZAR

Union	Market Name	Market Category (GC= Growth Center, HB= Hat Bazar)	Market Listed? (Yes/ No)	Market Category (General/ Special/ Collection center)	Market Category (Wholesale/ Retail/both)	Hat Day	Chandina Viti (Number)	Chandina Viti (Land)	Chandina Viti (Shop)	Land Area (Acre)			Lease/ Khas Collection BDT (2020)	Lease/ Khas Collection BDT (2019)
										Toha	Khas	Private		
Aruail	Arauail Bazar	GC	Yes	General Market	Retail	2	55	0.81	100	0.81	0.81	0.50	205000	200000
Aruail	Dubachail Bazar	HB	No	General Market		7	20	0.25	30	0.50	0.50	0.60		
Chunta	Rasulpur Bazar	HB	No											
Chunta	Chunta Bazar	HB	Yes	General Market	Wholesale	1	6	0.03	160	83.57	2.37		130000	115600
Chunta	Ajabpur Bazar	HB	No											
Kalikuchha	Kalikuchha Bazar	HB	Yes	General Market	Wholesale	2				0.122 5	0.14 93	1.10	156200	156000
Noagaon	Akitara Bazar	HB	Yes	General Market	Wholesale						0.05 0			
Noagaon	Bariura Bazar	HB	No	General Market	Wholesale					0.100 0	0.18		21600	21500
Noagaon	Budda Bazar	HB	No	General Market							0.05 0			
Pakshimul	Bwishor Bazar	HB	Yes	General Market		7	71	0.55	71	0.50	0.50	0.35		
Pakshimul	Pakshimul Bazar	HB	Yes	General Market		7	65	0.88	65	0.88	0.88	0.30		
Panishwar	Panishwar Bazar	HB	Yes	General Market	Wholesale	1			30	0.130 00	0.13 000	1.32		
Panishwar	Bertala Bazar	HB	Yes	General Market	Wholesale	1			15			0.95		
Panishwar	Bitghor Bazar	HB	Yes	General Market	Wholesale	1			20	0.160 0	0.16 00	2.01		
SARAIL	Kuttapara Natun Bazar	HB	Yes	Collection Center	Wholesale							0.15		
SARAIL	Sarail Bazar	GC	Yes	Special Market	Both	2	39	0.1950	81	0.735 0	0.93	0.143 0	72500	52000

Union	Market Name	Market Category (GC=Growth Center, HB=Hat Bazar)	Market Listed? (Yes/ No)	Market Category (General/ Special/ Collection center)	Market Category (Wholesale/ Retail/both)	Hat Day	Chandina Viti (Number)	Chandina Viti (Land)	Chandina Viti (Shop)	Land Area (Acre)			Lease/ Khas Collection BDT (2020)	Lease/ Khas Collection BDT (2019)
										Toha	Khas	Private		
SARAIL	Sarail Cattle Market	HB	Yes	General Market	Wholesale	1	18	0.09	6	0.94	1.03		46985	33187
SARAIL	Sarail Morning bazar	HB	Yes	General Market	Wholesale	1	8	0.04	12	0.11	0.15	0.56	46985	33187
Shahbazpur	Modubazar	HB												
Shahbazpur	Moulvibazar	HB												
Shahbazpur	Sahbajpur Bazar	HB	Yes	Collection Center	Wholesale	7			37	0.26		0.40	23000	22000
Shahjadapur	Shahzadapur Bazar	GC	Yes	General Market	Wholesale	7	40	0.1068	7	0.050 0	0.23 00			
Shahjadapur	Doara Bazar	HB	Yes	General Market	Wholesale	7			5			0.080 0		
Shahjadapur	Molaish Bazar	HB	Yes	General Market	Wholesale	7	5	0.2174 8	12	0.217 48	0.05 00	0.100 0		

ANNEXURE - 2

PRIORITY LIST FOR ROAD DEVELOPMENT

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Priority	Connecting Union	Connecting Village	Population 2021 (Based on BBS 2011)	Road Name	Road ID	Road Type	Road Type by Surface Condition	Total Road Length (10+11+12)	Paved length (km)	HBB Length (km)	Unpaved length (km)	HBB + Unpaved (11+12) in (km)	Approx. Cost of Road (lac)	Structure/ Gap (meter)	Cost of Structure (in Lac)	Total Cost (in lac) (Roads + Structures)	Population /KM (4-13)	Tentative Budget/1000 Population (in lac)	Travel Time (in min)	Weightage for Population	Weightage for Travel Time	Weightage for Cost per 1000 Population	Weightage for Road Type	Total Weightage (21+22+23+24)
1	Uttar Panissar	Moghaltola, T-Ghor	8445	Sarail - T- Ghar - Panishwar UP Road.	412943012	UNR	All weather	15	4		11	11	1320	60	540	1860	768	220	165	30	18	25	20	93
2	Uttar Panissar	Saidtula, Baroibari, Bitghor	11090	Sarail UP -panissar bazar	412943001	UNR	All weather	6	1.5		4.5	4.5	540	15	135	675	2464	61	68	30	16	25	20	91
3	Aorail	Dhamaura	8460	Aruail-Chatalpar GC road	412942004	UZR	All Weather	1.83	1.25		0.58	0.58	69.6	35.7	321.3	390.9	14587	46	9	30	10	25	25	90
4	Chunta	Chunta , Deobariya	8720	Ahamodabad-Chanpur Road	412944005	VRA	Submersible	6			6	6	1080	30	270	1350	1453	155	90	30	16	25	15	86
5	Aorail	Aorail, Ranidia, Kakaria	12984	Aorail - Ranidia connecting Road	412945015	VRB	All Weather	5			5	5	600	75	675	1275	2597	98	75	30	16	25	12	83
6	Aorail	Rajapur	6175	Aruail UP - Rajapur Bazar Via Ranidia Road	412944040	VRA	All Weather	6.95			6.95	6.95	834	15	135	969	888	157	104	25	16	25	15	81
7	Uttar Panissar	Sakaiti, Santinagor, Jalalpur	11885	Shitahoron Borobari rd st from bertola bazar - Panishore UP road via bitghor bazar	412944027	VRA	All weather	2.5			2.5	2.5	300	45	405	705	4754	59	38	30	10	25	15	80
8	Aorail	Dubasail	6719	Aorail UP - Dubasail Bazar Road	412943009	UNR	All Weather	3.27			3.27	3.27	392.4	80	720	1112.4	2055	166	49	25	10	25	20	80
9	Chunta	Rasulpur	8395	Rasulpur Barail- Sarker rd	412945034	VRB	Submersible	3			3	3	540		0	540	2798	64	45	30	10	25	12	77
10	Noagoan	Goghodh, Kajjora, Mahaldhara, Terokanda, Dholla	10944	Goghodh - Surjokandi Sarak	412945007	VRB	All Weather	4.43	0.5	0.5	3.43	3.93	471.6	35	315	786.6	2785	72	51	30	10	25	12	77
11	Aorail	Dhamaura	8460	Dubasail - Dhamaura Road	412945032	VRB	All Weather	3			3	3	360	45	405	765	2820	90	45	30	10	25	12	77
12	Pakshimul	Joydharkandi	9748	Joydarkandi-Talikandi Rd.	412945027	VRB	Submersible	3.4			3.4	3.4	612	30	270	882	2867	90	51	30	10	25	12	77
13	Noagoan	Airol, Katanisar	4998	Boddapara - Kuchni Sarak	412944003	VRA	All Weather	5.85		1.58	4.27	5.85	702	25	225	927	854	185	64	20	16	25	15	76
14	Chunta	Lowpara	4413	Lowpara rd	412945033	VRB	Submersible	5			5	5	900		0	900	883	204	75	20	16	25	12	73
15	Chunta	Goyaldhigi	5729	Chunta Goyalhighi	412945035	VRB	Submersible	3			3	3	540		0	540	1910	94	45	25	10	25	12	72
16	Chunta	Gagrajore	3336	Chunta Gagrajore	412944006	VRA	Submersible	2			2	2	360		0	360	1668	108	30	20	10	25	15	70
17	Chunta	Narsingpur	2822	Rasulpur- Azabpur Road	412944001	VRA	Submersible	3.8			3.8	3.8	684	60	540	1224	743	434	57	20	10	25	15	70
18	Aorail	Baropaika, Pulkarkandi, Dhantuliya, Boro Nagar	5468	Aorail Hat road - Baropaika Road	412945180	VRB	Submersible	3.2			3.2	3.2	576		0	576	1709	105	48	20	10	25	12	67
19	Sarail	Usalia Para	4845	Terokanda - Usalia Sarak	412945061	VRB	All Weather	3.3			3.3	3.3	396	20	180	576	1468	119	50	20	10	25	12	67
20	Chunta	Borail	1810	Chunta-Charabadha	412945017	VRB	Submersible	3			3	3	540		0	540	603	298	45	18	10	25	12	65
21	Aorail	Chunta,Borail	687	Chunta-Barail Road	412945018	VRB	Submersible	3	0.5		2.5	2.5	450		0	450	275	655	38	15	10	20	12	57
22	Shahbazpur	Haspatalpara, Postofficepara, Dashpara, Kumarpara, Nagpara	6073	Haspatal road - moin sarak	No ID	VRB	Submersible	2.5			2.5	2.5	450		0	450	2429	74	38	25	10	25	12	72
23	Kalikacchcha	Galanía,Chanpur	5320	Galanía Pashcimpara Mosque - Madrasha Bridge	No ID	VRB	All Weather	2	0		2	2	240	20	180	420	2660	79	30	20	10	25	12	67
24	Kalikacchcha	Dharmatirtha	2135	Dharmatirtha Shoshan - Dharmatirtha	No ID	VRB	All Weather	2			2	2	240		0	240	1067	112	30	20	10	25	12	67

*** Cost for Roads & Structures; (All Weather Rd= 120 lac/km, Submersible= 180 lac/km, Structure= 9 lac/m)
 *** Weightage Values; (Population = 30, Travel Time= 20, Cost per1000 people= 25, Road Hierarchy= 25)