

Rural Roads in the Coastal Areas of Bangladesh: Some Concerning Issues

- A Study of Batiaghata Upazila, Khulna District, Bangladesh

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Abstract: The coastal region of Bangladesh is located along the Bay of Bengal spreading over from the south-western to south-eastern part of the country. It has an area of about 710 square kilometers. The whole coastal area is very much susceptible to natural calamities and climate change and these have adversely affected lives and livelihoods in the coastal zone and slowed down the pace of social and economic developments of this region. This zone also has high potential for exploitation of both onshore and offshore natural gas. Originally, this area is being developed by deltaic formation. A number of rivers and creeks are there. Most of the settlements in the coastal area are of linear type located along the rivers. Economically, the people living in this coastal area particularly in the south-western part are heavily dependent on the resources of the Sundarbans, the world largest mangrove forest. Though the waterways is one of the major means of transportations in the coastal areas of the country but the roads also play a significant role in the rural people's movements for social, cultural and economic purposes. Specifically, the present study describes the factual situation of the rural people using rural roads in terms of conditions and types of roads, road users' safety and comfort, mode of transports used for different purposes, users' participation in roads construction, improvement and maintenance, and the role of the organizations involved in roads construction, improvement and maintenance in the study area i.e., one of the sub-district (*Upazila*) named Batiaghata under Khulna District located in the south-western part of the coastal area of Bangladesh. Most of people use brick paved and earthen roads; widths of the roads are narrow; most of the people use the non-motorized vehicle locally known *van* (tricycle); travel time spent is too longer; vehicles plied are older and not regularly maintained and as such unsafe to use; organizational role in the overall management of the rural transport is not satisfactory; and the users' participation in construction, improvement and maintenance of roads is not much significant. The national land transport policy of 2004 does not adequately address all these issues and problems pertinent to the rural roads. The study concludes with some recommendations such as policy options needed for the rural areas with special attention to the coastal area's situation; the holistic approach and involvement of the local people including rural road users i.e., governance in transport should be encouraged.

Key Words: Rural roads, road users, service providers, responsible organizations, road condition, governance in transport.

I. Introduction

Bangladesh came into existence as an independent and sovereign country on the map of the world in 16 December 1971 after a war of liberation. It lies in the north-eastern part of South Asia between 20°34' and 26°38' north latitudes and between 88°01' and 92°41' east longitudes. The country is bounded by India on the west, the north and the north-east, Myanmar (Burma) on the Southeast and the Bay of Bengal on the south. It has a population of about 150 million living on 147,570 square kilometer of land. The Ganges, the Brahmaputra and the Meghna that constitute one of the largest river systems in the world drain through Bangladesh into the Bay of Bengal. It is a land of deltaic plain with a network of numerous rivers and canals. The country has a coastline of 710 km along the Bay of Bengal. There are 19 districts and 147 Upazilas (sub-districts) located within the coastal area of the country. Roughly, about 35 million people are living in this area. The coast of Bangladesh is known as a zone of vulnerabilities as well as opportunities. It is prone to natural disasters like cyclone, storm surge and flood. The combination of natural and man-made hazards, such as erosion, high arsenic content in ground water, water logging, earthquake, water and soil salinity, various forms of pollution, risks from climate change, etc, have adversely affected lives and livelihoods in the coastal zone and slowed down the pace of social and economic developments of this region.

The coast has distinctive development opportunities that can be instrumental in reducing poverty and can contribute significantly to the development of Bangladesh as a whole. The zone has diversity of natural resources including coastal fisheries and shrimp, forest, salt and minerals. Specifically, it is to be mentioned here that the people living in this coastal area particularly in the south-western region are heavily dependent on the resources of the Sundarbans, the world largest mangrove forest. Though the waterways is one the major means of transportations in the coastal areas of the country but the roads also play a significant role in managing rural people's movements for social, cultural and economic purposes. The road transportation system of the coastal areas of Bangladesh in terms of infrastructure and services has some uniqueness. These are the use of polders/embankment as main connecting road, roads frequently affected by the natural calamities, soil condition of earth used for road construction, passengers sharing transports, and so on. Specifically, no study has so far been conducted on the rural roads in the coastal areas of Bangladesh so as to highlight the pertinent problems and issues concerning the infrastructure and services of transportation system vis-à-vis the perspectives of the rural road users, service providers and involved organizations. The present study has made an attempt in this direction. For this purpose, Batiaghata Upazila under Khulna District has been selected as the study area which is strategically located in the south-western part of the coastal areas of Bangladesh.

Basically, the present paper encompasses discussion on the following:

- Road Network, Classification and Institutional Responsibilities in Bangladesh and the Coastal Area
- The Study Area
- Objectives
- Scope and Limitations of the Study
- Materials and Method
- Major Findings and Discussion
- The Way Forward

II. Road Network, Classification and Institutional Responsibilities in Bangladesh and in the Coastal Area

2.1 Road Network

So far as surface transport network in Bangladesh is concerned, it is mostly tri-modal. Road, rail and inland waterways constitute the inland surface transport in Bangladesh. Land transport infrastructure particularly road network is fragmented by numerous ferry crossings and land transport has to move over circuitous routes because of extensive river systems and same in the case of the coastal region or even more. Further, costs for construction and maintenance of transport infrastructure particularly road network are very high because of difficult terrain scattered with numerous water courses, periodic flooding requiring elevated infrastructure embankments, and poor soil conditions coupled with general scarcity of construction materials and lack of adequate construction industry. It has also been observed that compared to overall growth of the economy, transport demand growth in Bangladesh has been higher. On the other hand, transport supply in the country is still quite low. This trend in growth of transport demand is likely to persist or may even witness an upswing in the future as the country moves from a subsistence economy to a more market-oriented economy. To supply the matching transport facilities, substantial improvements are needed in the road transport system.

Road traffic scenario in Bangladesh as well as in the coastal areas is characterized by the presence of both motorized and non-motorized vehicles plying on all roads. In other words, locally made motorized vehicles are seen plying more on the rural roads in the country including in the coastal areas. This is one of the serious problems for road network in Bangladesh.

2.2 Classification of Road Network

Roads in Bangladesh are classified in four main groups; national highways, regional highways, feeder roads and local roads. National highways connect the national capital with district headquarters, port

cities and international highways. Regional highways connect different regions and district headquarters (64 districts) not connected by national highways. Feeder roads are of two types: feeder roads type A and feeder roads type B. Type A feeder roads connect Upazila (lowest tier of administration) headquarters and important growth centres to the main arterial road network, while type B feeder roads connect growth centres with other growth centres and Upazila headquarters. Local roads include municipal roads and rural roads.

There are three types of rural roads: type 1 roads that connect about 2100 growth centres with farms; type 2 roads that connect union headquarters (4551) and local markets with villages and farms; and type 3 roads that include roads within the village.

2.3 Institutional Arrangements

Roads and Highways Department (RHD), the central agency of the Government, is responsible for construction, improvement and maintenance of the national, regional and type A feeder roads. The arterial road network under the jurisdiction of RHD in 2001 is about 20,854 km, which includes 3,144 km of national roads, 1,746 km of regional roads and 15,964 km of Type A feeder roads. National and regional highways are almost entirely paved. Around 50% of the Type A feeder roads are paved.

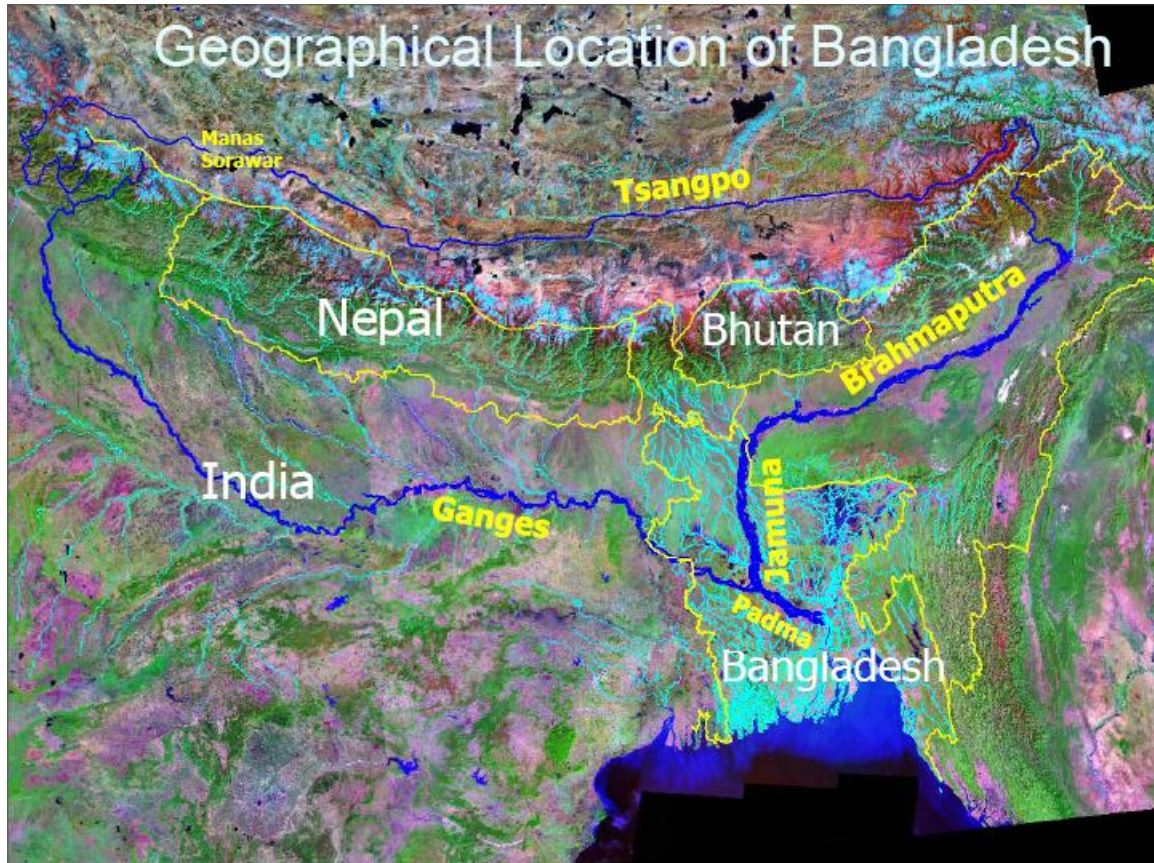
Type B feeder roads and rural roads (except municipal roads) are built and maintained by the Local Government Engineering Department (LGED) in collaboration with local government bodies like district council, Upazila Parishad and Union Parishad. Construction and maintenance of municipal and urban roads are the responsibility of municipal bodies like city corporations and municipalities (Pourashavas). LGED under the Ministry of Local Government and Rural Development and Cooperatives is entrusted with the construction of smaller feeder roads connecting growth centres, villages and Upazila headquarters. Total length of road network constructed by LEGD is about 149,167 km consisting of 14,393 km of Type B feeder road and three types of rural road R1, R2 and R3, respectively of lengths 37,827 km, 49,538 km and 47,409 km.

III. Batiaghata Upazila - The Study Area

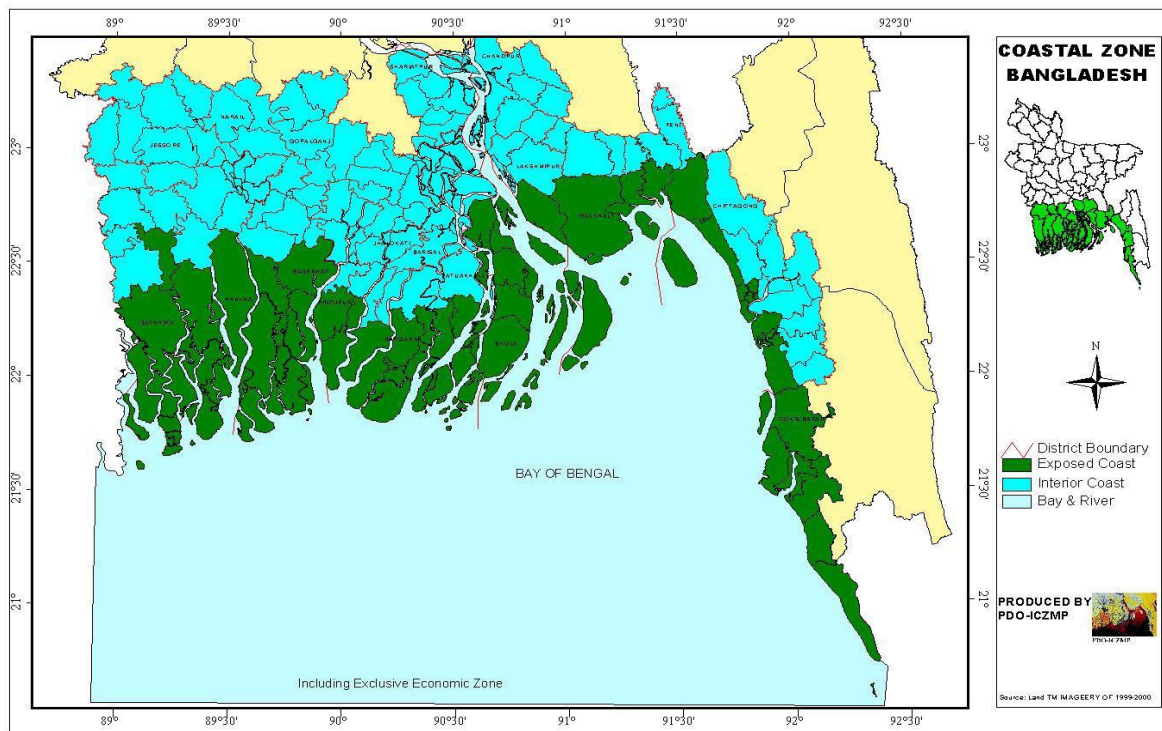
Batiaghata Upazila is located in Khulna District which also lies in the coastal areas of Bangladesh. The following are some socio-economic and physical features of Batiaghata Upazila:

- area: 248.33 sq. km
- location: between 22°34' and 22°46' north latitudes and between 89°24' and 89°37' east longitudes
- Population: 140,574 (as per census, 2001)
- Annual growth rate population: 1%
- Density: 566 persons per sq. km
- Household size: 4.7
- Administrative units: 7 unions, 132 mouzas, 169 villages
- Housing structure: 6.32% *Jhupri* (make shift), 85.45% *katcha* (temporary), 4.73% semi-*pucca* (semi permanent) and 3.50% *pucca* (permanent)
- Literacy rate: average literacy 53% of population aged 7 years and above
- Educational institutions: university 1, college 4, secondary school 26, government primary school 67, non-government primary school 44, madrasa 4.
- Religious institutions: Mosques 116, Temples 82, Church 1
- Main sources of income of the households: 57.45% depend on agriculture of which livestock, forestry and fisheries 36.49%, agricultural labourer 20.96%, wage labourer 8.72%, commerce 13.21%, transport 4.63%, construction 1.69%, service 6.45%, rent and remittance 0.16%, religious service 0.22% and others 7.47%.
- Land use: Total cultivation land 18494.53 hectares, fallow land 60.70 hectares; single crop 87.74%, double crop 11.27%, treble crop 0.99%.
- Average distribution of cultivable land is per head: 0.15 hectares.

- Communication facilities: Roads - pucca 37 km, semi pucca 42 km and mud road 254 km; waterways - 194 nautical miles; embankment 63 km.
- Cottage industries: Handloom 5, iron smith 14, potteries 76, goldsmith 20.
- Markets: 26
- Main exports items: Prawn (both *galda* and *bagda*).
- Health: Upazila health complex 1, satellite clinic 2, Union family planning and welfare centres/clinics 6, veterinary hospital 1.



Map 3.1: Geographical Location of Bangladesh



Map 3.2: Coastal Zone of Bangladesh



Map 3.3: Bataighata Upazila

IV. Objectives of the Study

The following are the objectives of the study:

- finding out the problems and concerns of the rural road users;
- enlisting the problems and concerns of the service providers in the rural road;
- identifying the organization role in rural roads construction, improvement and maintenance; and,
- Putting forward some recommendations in addressing the above issues and problems.

V. Scope and Limitations of the Study

However, the study is beset with the following limitations:

- It has not covered the whole of the coastal area of the country, only a small part of the coastal has been taken for the study purpose.
- Sample size selected for the study is too small. Here, purposive sampling technique has been applied to collect data and information from the rural road users and the service providers due to time and resource constraints.

In this study, rural roads mean only type B feeder roads and rural roads which are built and maintained by the Local Government Engineering Department (LGED) in collaboration with local government bodies like district council, Upazila Parishad and Union Parishad.

Nevertheless, the present study provides an indication of the problems and concerns of the different actors involved with rural road transportation system which is critically important for any policy formulation matter.

VI. Materials and Method

6.1 Selection of the Study Area

The reasons for selecting Batiaghata Upazila which is located in the south-western part of the coastal region of Bangladesh are: firstly, familiarization of the place to the researchers/authors; secondly, nearness to the authors' work place; and thirdly, easiness of collecting data and information.

6.2 Data Sources

The data and information on the problems and concerns of the rural road users, the service providers, the organizational role in rural roads construction, improvement and maintenance, and views and opinions of the rural road users, service providers and involved organizations have been collected from the study area i.e., Batiaghata Upazila (a sub-district of Khulna). Some other pertinent information were also collected from the secondary sources and searching Internet.

6.3 Data Collection Technique

Here, purposive sampling technique has been applied to collect data and information from the rural road users, the service providers and institutions responsible for road construction and maintenance. Altogether 200 rural road users traveling from different important nodes/places, 50 different types of kinds service providers i.e., different vehicles plying, 3 organizations namely LGED, Upazila Parishad, Union Parishad were directly interviewed.

Further, several focus group discussions (FGDs) were also conducted with different groups to obtain and verify field based information.

6.4 Data Analysis, Interpretation and Presentation Techniques

Collected data were interpreted in such a way so that these could help portray the actual situation of the problems and concerns of the rural road users; the service providers in the rural road; the organizational role in rural roads construction, improvement and maintenance; and the views and opinions of the rural road users, service providers and involved organizations. Required tables, graphs and maps were prepared to present pertinent information related to the study objectives.

VII. Findings and Discussion

Types of Vehicles Used

Both motorized and non-motorized vehicles are used in the study area. Majority of the people do not have any personal vehicle. Very few (1-2%) have their own vehicles (motorcycle, bicycle, van or private car) which they use solely for personal purposes. The following vehicles are found as mode of transport in the study area.

- Bicycle
- Van (locally known as van which is a kind of tricycle, mostly shared by a few passengers)
- Nosimon (engine driven tricycle, mostly shared by many passengers)
- Motor cycle
- Easy bike
- Baby taxi/tempo
- Bus



Figure 7.1.1: *Nosimon*



Figure 7.1.2: *Nosimon*

7.2 Number of Vehicles Plying

Van is the vehicle which is using in almost all parts of the coastal roads. It is mostly used because it is less costly on the part of both the men pulling and the passengers. And it is the most suitable vehicle for the earthen roads of the coastal area. Table 7.2 depicts type and number of vehicles plying in the study area.

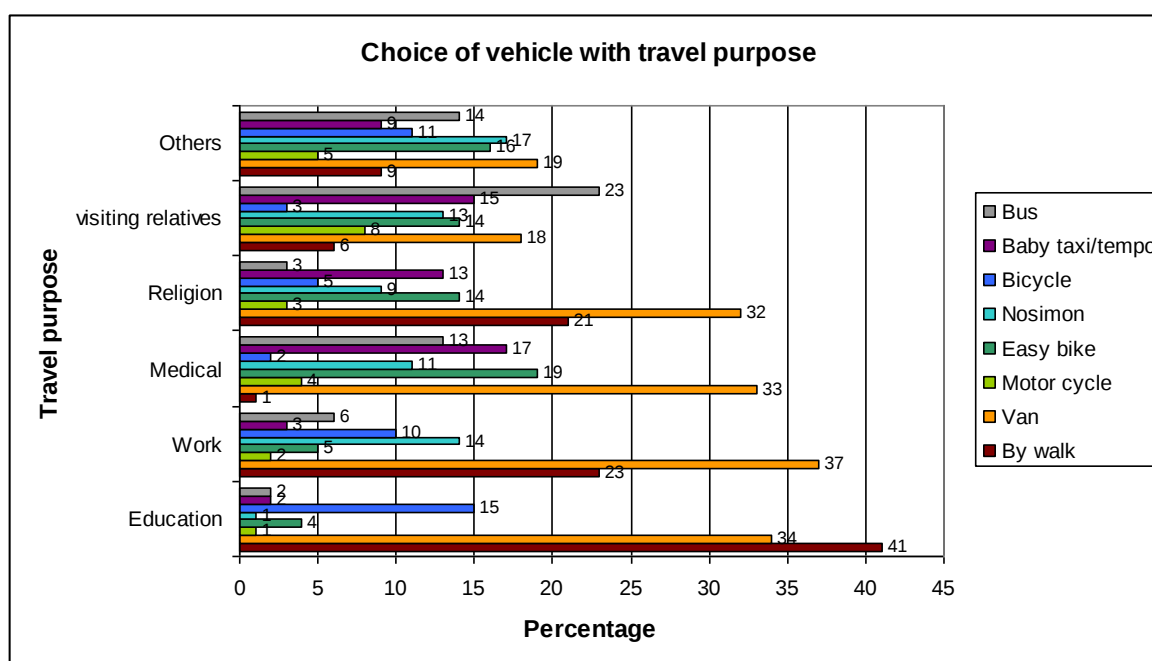
Table 7.2: Number of vehicles/transport plying by types in the study area
(i.e., in Batiaghata Upazila)

Types of vehicle	Number	%
<i>Van</i> (tricycle)	1652	44.66
Bicycle	963	26.03
<i>Nosimon</i> (engine driven tricycle)	243	6.57
Motor cycle	626	16.92
Easy bike	138	3.73
Baby taxi/tempo	40	1.08
Bus	37	1.00
Total	3699	100

Source: Field Survey, 2010

Purposes of Travel/Visits

The purposes for traveling through using different modes of transport found in the study are: education, work, medical treatment, religion, seeing relative and others. Same users use different vehicles for different travel purposes and also use different vehicles for the same reason of travel. The vehicle choice pattern of the rural road users is identified in the field i.e., in the study area through using the 200 samples of the road users. Each user opines different vehicles for the same purpose. For example, in the case of education purpose, schools going (especially primary level) students generally go to schools by walk. But if the distance of the school is very long and the way to school supports any transport vehicle then they use *van* or bicycle and sometimes motorized vehicles. Figure 7.3 shows the existing vehicle use pattern with the purpose of travel.



Source: Field Survey, 2010

Figure 7.3: Types of vehicles used by purposes

Vehicles Used by Age Group and Gender

It is found that use of vehicle in the study area does not vary significantly with age group. People of different age group are found in using almost all types of vehicles. But the choice of vehicle varies with gender. Women are found in using *van*, *nosimon*, and easy bikes in almost equal ratio with those of men. But in bus, bicycle, motorcycle and baby taxi/tempo the ratio varies and men are found in a large proportion. Lack of security, discomfort and over crowding, etc are some of the reasons not for using bus, bicycle, motorcycle and baby taxi/tempo by the women.

7.5 Vehicles Used by Level of Income

It is noticed that use of vehicle in the study area varies with the level of income of the rural road users. The Low income people {upto Taka 5000 per month (1 US\$ = Taka 70)} use *van* (17%), *nosimon* (11%) and bus (14%) as mode of transport since these are less costly which the poor people can afford. The middle income people (Taka 5000 to Taka 25000 per month) use all types of modes available on in the way; their choice of vehicle depends on their travel purposes. The high income people (above Taka 30000 per month) generally avoid public transports and have the tendency of using their personal vehicles.

7.6 Distance Traveled

It can be said that the choice of vehicle of the people in the study area depends on the distance traveled. In larger travel distances people prefer to use motorized vehicles. As for example, people traveling more than 16 kilometers generally use bus as the mode of transport. People also use baby taxi/tempo, motorcycle and easy bike for longer distances. But some people in the rural area prefer *van* for all types of trips. Table 7.6 illustrates the choice of mode of transport with distance traveled.

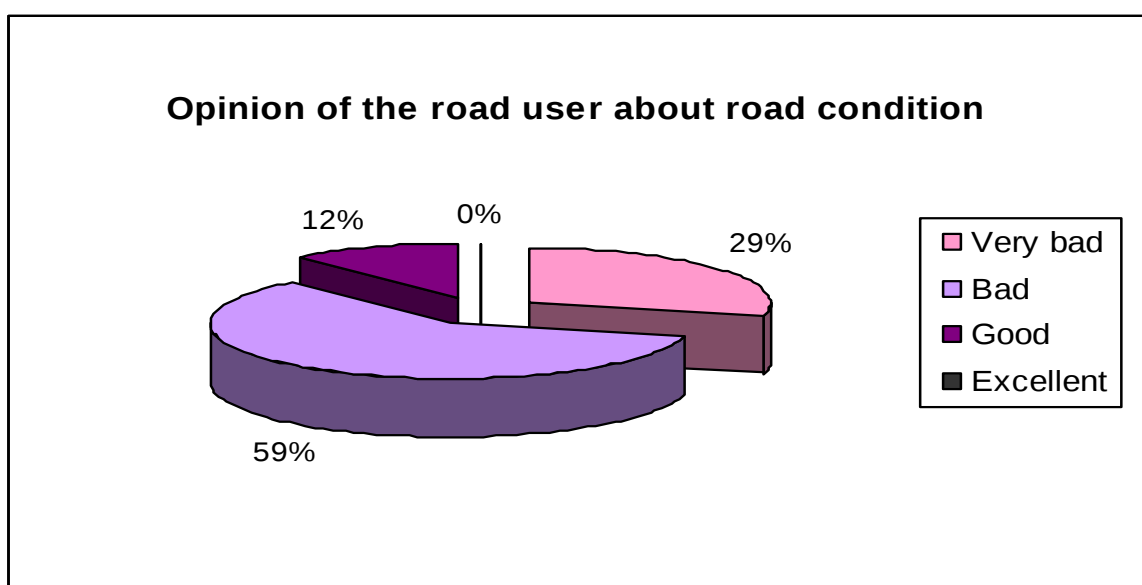
Table 7.6: Distance travel by types of vehicles

Type of vehicle	Distance (Kilometers)									
	0- 5		6 -10		11 – 15		16- 20		21 +	
	N	%	N	%	N	%	N	%	N	%
Van	134	67.0	91	45.5	16	8.0	3	1.5	0	0.5
Nosimon	52	26.0	69	34.5	28	14.0	16	8.0	2	1.0
Bicycle	2	1.0	14	7.0	37	18.5	21	10.5	3	1.5
Motor cycle	1	0.5	3	1.5	4	2.0	10	5.0	11	5.5
Easy bike	7	3.5	9	4.5	22	11.0	17	8.5	3	1.5
Baby taxi /tempo	2	1.0	1	0.5	30	15.0	22	11.0	7	3.5
Bus	2	1.0	13	6.5	63	31.5	111	55.5	174	87.0
Total	200	100	200	100	200	100	200	100	200	100

Source: Field Survey, 2010

7.7 Conditions of the Roads

The rural road users' opinion on the road is not satisfactory. Majority (60%) of the users opine that the road condition is bad. Figure 7.7.1 represents their opinion on the road condition. Here, the bad means there are holes, uneven surface, cracks, no drains, no passenger shed, etc on the roads.



Source: Field Survey, 2010

Figure 7.7.1: Conditions of roads as opined by the road users



Figure 7.7.2: Condition of road on the different points of the study area

7.8 Fare Paid by the Passengers

Bus fare is the lowest and van has the second lowest fare in the study area. Renting of motorcycle is the most costly vehicle in the area. The per kilometer average fare of the *van* is Taka 2.33, motorcycle Taka 6.67, easy bike Taka 2.60, baby taxi/tempo Taka 3.33 and bus Taka 1.10.

7.9 Problems Faced by the Road Users

There are different types of problems faced by the road users. Table 7.9 reveals information on the types of problems faced by the road users. Bad road condition (22.6%), too old vehicles (15.2%), lack of availability of safe vehicles (13.9%) and narrow roads (14.3%) are the major problems faced by the users.

Table 7.9: Types of problems faced by the road users

Type of problem faced	Frequency	%
Too much fare	19	2.69
Road in bad condition	159	22.55
Too old vehicle	107	15.18
Lack of availability of safe vehicle	98	13.90
Too much time spent in journey	55	7.80
Absence of passenger shed	47	6.67
Too narrow roads	101	14.33
Too much accident occur	27	3.83
Traffic lanes not specified	92	13.05
Total	705	100

Source: Field Survey, 2010

7.10 Road Users' Opinions in Improving the Rural Roads and Services

The rural road users opine some suggestions so as to deal with the problems that they are facing. The suggestions are improving the road (36.4%), making availability of safe mode of transport (32%), providing passenger shed (10.1%), involvement of road users (14.1%) and so on. In fact, these are priority areas where there is need for interventions by the appropriate authorities so as to improve the road condition of the rural areas. Table 7.10 illustrates the road users' opinions regarding improvement of the rural transport infrastructures and services.

Table 7.10: Road users' opinion in improving transport infrastructures and services

Type of improvements	Frequency	%
Improvement of roads	173	36.4
Availability of safe vehicle	152	32.0
Fixing the fare	35	7.37
Providing passenger shed	48	10.1
Involvement of road users	67	14.1
Total	475	100.0

Source: Field Survey, 2010

7.11 Problem Faced by the Service Providers

There are also some problems faced by the service providers in the study area. Table 7.11 provides information on the problems faced by the service providers. Bad road condition (21.6%), lack of parking facilities (16.6%) and narrow roads (20.6%), lack of maintenance (19.1%), toll extraction (11.6%) are the major problems faced by the service providers.

Table 7.11: Types of problem faced as opined by the transport service providers

Type of problem faced	Number	%
Lack of parking facilities	33	16.58
Road in bad condition	43	21.61
No well maintained roads	38	19.10
Harassment by the Police	21	10.55
Toll Extraction	23	11.56
Too narrow roads	41	20.60
	199	100

Source: Field Survey, 2010

7.12 Road Length by Types

Roads of the study area can be divided into four (4) broad categories. Upazila road, union road, Village road type A and village road type B.

Another classification can be done as concrete paved roads, brick soling (single soling and double soling) roads and earthen roads.

Upazila roads are concrete paved road, union roads are both concrete paved or brick soling, village road type A consists both single and double brick soling roads and the village road type B consists earthen and single brick soling roads.

Table 7.12 depicts the length of roads by types in the study area.

Table 7.12: Road length by types of roads

Types of roads	Length (kilometers)
Upazila road	84.473
Union road	64.408
Village road A	160.64
Village road B	253.45
Total	562.971

Source: Field Survey, 2010

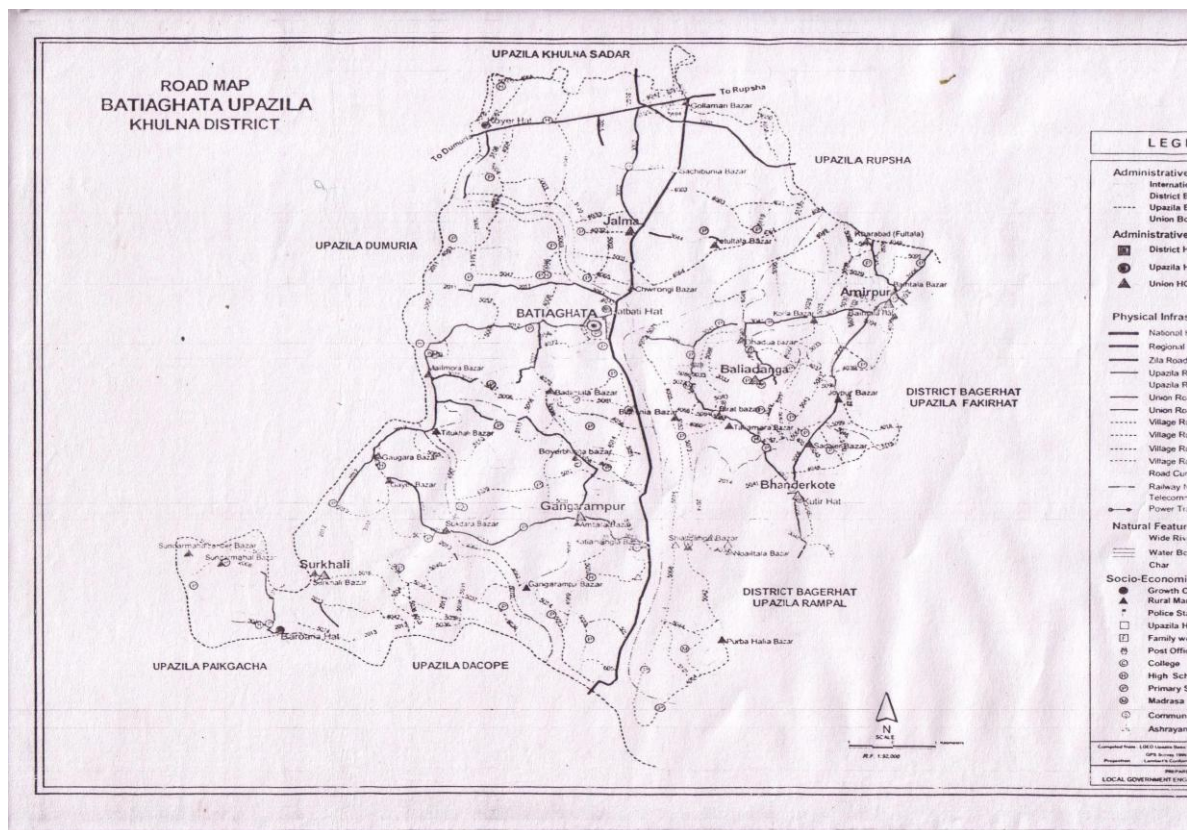


Figure 7.12: Road length by types of roads in the study area

7.13 Road Accidents Occurred

Every year a large number of road accidents occurred in the study area mostly due to bad road and vehicle condition. Over crowding in the vehicles is another main reason for accidents. Large proportion of non-motorized vehicles in the roads causes accidents with simple injuries not deaths. In the study area, there is no system of record keeping on accidents. Therefore, it was very difficult to get information on the road accidents. However, efforts were made to collect information on the recent trend on the accidents from the Police Station, the Upazila health complex and the rural road users. It is reported that 20 to 25 road accidents occurred each year in the study area and the rate of accidents is increasing.

7.14 Involved Organizations

The following are the responsible organizations for roads construction/improvements and maintenance in the study area:

- LGED: constructs roads
- Upazila Parishad: prepares plan, allocates and provides approval for road construction /improvement
- Union Parishad: prepares plan, allocates and provides approval for road construction /improvement
- Water Development Board: prepares and approves polders which are using as rural roads
- NGO (Non Government Organization): constructs roads in some especial cases

There is lack of functional cooperation among these organizations both vertically and horizontally. No system has yet been developed to involve the local people including the road users in road construction and road maintenance.

7.15 Uniqueness of Rural Roads of the Coastal Areas

The following are some of the identified peculiarities of the rural roads in the coastal areas of Bangladesh:

- use of polders/embankment as main connecting roads
- roads are affected by the natural calamities
- soil condition of earth used for road construction
- roads are of roundabout shaped
- van is the most used type of vehicle by the poor people

7.16 The Initiatives of the Government

The rural transport policy directions are contained in the National Land Transport Policy of 2004, issued by the Ministry of Communication. The policy objectives are as follows:

- providing paved connections between all the economic growth centres and the country's road network
- increasing rural incomes through use of labour-based methods of roads construction and maintenance
- encouraging a high density of vehicles and technologies through tax incentives
- creating closer linkages between rural development programmes and rural transport
- improving roads design - including segregation and gradient bridges to reflect the wide diversity of users

The main objectives of the rural road connectivity is development of road Communication to link growth centres, union Parishad headquarters, Upazila Parishad, social service institutions like schools, and hospitals with the national road network on a priority basis. In fact, the Government of Bangladesh has taken up a number of plans and programmes in these directions.

7.17 Challenges Encountered

The following are the challenges faced by the organizations involved in rural road construction/improvement and maintenance:

- lack of availability of land
- presence of local conflict in prioritizing roads for development
- shortage of skilled manpower at the local government organization level
- inadequate flow of funds
- overloaded trucks causing early damage to the pavement
- existence of number of gaps in road network increasing road development costs
- frequent inundation by floods and other natural calamities
- soil condition

VIII. The Way Forward

Based on the above findings, the following are some of the specific recommendations put forward to address the problems and issues relating to the rural roads of the coastal areas of Bangladesh:

- inclusion of the problems and issues of uniqueness of the rural roads of the coastal areas in the national land transport policy of 2004 so that it is being addressed as a separate matter
- ensure effective cooperation among the GOs and NGOs currently working in the rural road construction/improvement and maintenance sector
- involvement/participation of i.e., the local people including roads users and service providers in the process of rural road construction/improvement and maintenance so as to ensure governance in the rural transport
- need for preparing need for strategic plan for each year as a short term measure and a master plan of the rural roads in commensurate with land use proposals as a long term measure

- arrange training programmes for capacity building of the manpower of the local government organizations working in the areas of road construction/improvement and maintenance

IX. Concluding Observations

There are good examples of involvement of the local people in rural road maintenance in Bangladesh in terms of road side tree plantation developed by LGED. The lessons learnt from this type of programme and other innovative initiatives are to be upheld and sustained. It is also to be agreed by all concerns that no single suggestion or action can solve the problem of rural roads of the coastal areas but there is urgent need for holistic approach to address the subject problem and issue. Above all, all concerted efforts are to be made to ensure governance in the rural transport so that the concerns of the rural poor people are included and addressed who are the most end user's of rural roads. Let all actors be involved there and let there be development of sense of ownership that roads belong to them. And, eventually all concerned people and organizations will work for their own things.

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