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# An Economic Analysis of the Role of Non-Conventional Mechanized Transport in the Development of Rural Bangladesh

Goni, Md. Nasir Uddin

University of Rajshahi

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**Ph.D.  
Thesis**

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**An Economic Analysis of the Role of Non-Conventional  
Mechanized Transport in the Development of Rural  
Bangladesh**  
**Md. Nasir Uddin Goni**

**An Economic Analysis of the Role of Non-Conventional  
Mechanized Transport in the Development of Rural  
Bangladesh**



**A Thesis**

**Submitted to the Institute of Bangladesh Studies (IBS)**

**University of Rajshahi**

**for the Degree of**

**DOCTOR OF PHILOSOPHY  
IN**

**ECONOMICS**

**By**

**Md. Nasir Uddin Goni**

**Institute of Bangladesh Studies (IBS)  
University of Rajshahi  
Rajshahi-6205  
Bangladesh**

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**June  
2015**

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**June 2015**

## **CERTIFICATE**

We have great pleasure to certify that the dissertation titled *An Economic Analysis of the Role of Non-Conventional Mechanized Transport in the Development of Rural Bangladesh* submitted by Mr. Md. Nasir Uddin Goni to the Institute of Bangladesh Studies, University of Rajshahi, Bangladesh for the degree of Doctor of Philosophy in Economics is an original research work done under our joint supervision and guidance. To the best of our knowledge, this dissertation was not previously submitted for any diploma/degree/fellowship to any other University/Institute. Materials obtained from other sources have been duly acknowledged in this thesis.

**Dr. A. N. K. Noman**  
Professor  
Department of Economics  
Rajshahi University  
Rajshahi  
&  
Supervisor

**Dr. Md. Abdur Rashid Sarker**  
Associate Professor  
Department of Economics  
Rajshahi University  
Rajshahi  
&  
Co-Supervisor

## **DECLARATION**

I do hereby declare that the dissertation entitled *An Economic Analysis of the Role of Non-Conventional Mechanized Transport in the Development of Rural Bangladesh* submitted to the Institute of Bangladesh Studies, University of Rajshahi, as part of the requirements for the degree of Doctor of Philosophy in Economics is my original work. Neither the whole nor any part of it was submitted to any other university or institute for any other degree or diploma. My indebtedness to other works has duly been acknowledged at the relevant places.

**Md. Nasir Uddin Goni**

Ph. D. Researcher

Institute of Bangladesh Studies

Rajshahi University

## ***DEDICATION***

My father Md. Osman Goni, mother Nurjahan Goni, wife Rumana Quader and my two sons: Ahnaf Abid, Ahnaf Adil.

## ACKNOWLEDGMENTS

There is an endless list of organizations and people to whom I am greatly indebted, without whom this thesis could not be initiated and completed. I would firstly thank the Government of Bangladesh through the Ministry of Education that has given me an opportunity to carry out this PhD program. Special thanks go to Institute of Bangladesh Studies (IBS), Rajshahi University, Rajshahi for providing me with formal support during my study. Similar appreciation goes to the Directorate of Secondary and Higher Education (DSHE) who has given me deputation from my job to undertake my PhD. I would particularly like to thank Prof. Dr. M. Mahbubur Rahman, Prof. Dr. M. Shahidullah, Prof. Dr. M. Zainul Abedin, Prof. Dr. Sawrochish Sarker, Dr. M. Mostafa Kamal, Dr. Zakir Hossain, Dr. Mohammad Nazimul Haque, Dr. M. Kamruzzaman. I also thank Bangladesh University Grant Commission (UGC), Bangladesh that granted me a scholarship for this program. I am grateful to the Department of Economics, University of Rajshahi from where I gained knowledge and support for the development of the basic of Economics. Special gratitude goes to Professor Dr. M. Elias Hossain, Professor Dr. Md. Abdul Wadud and Assistant Professor Kazi Julfikar Ali who have provided me with immense support.

My greatest debt is to Professor Dr. A.N.K. Noman, the main supervisor for this thesis, who has continually inspired me with critical thinking in the new era of rural transport studies of Bangladesh from the very beginning of this study and who has provided outstanding supervision for my thesis. I also have been incredibly fortunate to have the immense benefit from his innovative thinking of new ideas on rural economy of Bangladesh.

Special thanks go to Dr. Md. Abdur Rashid Sarker, Associate Professor who has lovingly supervised this thesis and has provided me with insight into rural development issues. He has also provided my family with strong moral support during the whole period of my PhD research.

I am grateful to many people in the IBS who have provided a very supportive environment. Special appreciation goes to Mohammad Monirul Islam, Abu Rusho Md. Toab Hossain, Md. Abdullah Al Mamun S.M. Atiar Rahman, Md. Noor Alam, Mohammad Muniruzzaman, Md. Wahiduzzaman, Md. Jamirul Islam, Md. Mahbubur Rahman, Azmeri Ashrafi, Farzana Kayum Keya, Mohsina Ahsan, Masuma Parvin, Md. Atikul Islam, Atikus

Samad, Colonel Ikbāl Azim, Rashed Hossain and loving Matinur Rahman and want to thanks to my friend Dr. Masud Rana Khan, Md. Asaduzzaman and Dr. Muntaseer Billah. I am also grateful to Engr. Major (Rtd) Reza Shah Muhammad Zillullah for his valuable suggestions regarding the technological and environmental issues of NCMT.

I feel obliged to my brother in law Md. Abdul Halim, my elder sister Eliza Parvin and two nephews Jabin and Jasin for their loving appreciation during the three years of this research journey.

I am indebted to hundreds of people who supported my field research in Rajshahi and Bogra. I feel immensely thankful to the people of six study areas, especially those who worked with me and became my key informants.

I am also indebted to many other colleagues and friends who have supported my research in many different ways. I hesitate to single out anyone, lest I slight others, but I would be remiss if I did not acknowledge at least some of those from whom I accepted assistance.

I would now like to thank members of my family who have provided extensive support since the preparation for my departure from home and right up until today: Russel and Keya, Kefayet, Golam Saeed Khan, Bithi, Taoaab and Wafi.

My special thanks go to Md. Ghulam Quader Khan, my father-in-law, who inspired me for this research from the very beginning of my present job. My sincere gratitude goes to my mother-in-law, Hosne Ara Begum, who loves me very much and has given constant encouragement for the completion of this thesis.

My father Md. Osman Goni and mother Noorjahan Goni require a very special place in this acknowledgement, as without them I could have never completed my thesis. Their praying, loving and caring have provided me with immense confidence to embark on and finish this Ph.D journey.

In the end, my highest gratitude goes to my wife, Rumana Quader and my children Audri and Adil, to whom I dedicate this thesis. I always felt free from all kinds of anxiety with her love and faith. She has provided me with inexpressible support. Audri and Adil has been a constant reminder of why I have been doing this thesis. They have truly motivated me to finish my Ph.D on time.

## Abstract

An adequate, reliable, and economic mode of rural transport facility is one of the most important pre-requisite for the overall rural development of a country. This is especially pertinent for developing countries as most of the people here live on rural transport either directly or indirectly. In the case of highly populated country like Bangladesh, the availability of rural transport is always in deficiency to fulfill the demands of rural people. Given this inadequate supply of rural transport in relation to its demand, rural people have innovated different non-mechanized transport such as bullock cart, push cart, rickshaw, van, boat etc to meet their increasing transport demand. These non-mechanized transport systems were highly time-consuming and involved with drudgery. As time passed, people tried to explore for a better mode of transport which could involve less manual labor and commute them faster. As a result of their efforts, a mechanized version of rickshaw and van has appeared to ply on the roads that are popularly known as Non-Conventional Mechanized Transport (NCMT). With the development of road infrastructure and the rapid increase in demand for passengers and goods transport, these NCMT have become the mainstay of rural economic activities specially in transporting agricultural inputs and outputs. This thesis thus aims to substantiate the role of NCMT in the economic development of the rural livelihood.

To achieve the aim, this study employed five types of questionnaire to collect data from people involved in NCMT in six Upazillas of Bogra and Rajshahi Districts. Both the Upazillas and Districts were selected purposively. Total 384 respondents were interviewed using a set of structured questionnaire with face to face interview method. First one was for drivers and owner-drivers of the NCMT and 78 respondents were selected purposively. The second set of questionnaire was for drivers of the conventional transport (CT) to make a comparison with NCMT. Purposively selected 78 respondents were interviewed regarding the issues of existing rural transport functions and their comparative role. Third set of questionnaire was formulated for 78 purposively selected farmers of the rural areas who are the main beneficiaries of NCMT. To analyze the role of NCMT in the rural social development, the fourth set of questionnaire was used to interview 78 students and teachers. They were purposively chosen to investigate the functions of NCMT. The final set of questionnaire was targeted to obtain healthcare related uses of NCMT by the rural people. In this regard, 72 respondents who were health service-takers from the rural health care centers were purposively selected.

Data from the first set of questionnaire show the present state of NCMT and the socio-demographic information of the respondents. Analyzing the state of NCMT shows that there exist three types of NCMTs: Framed body, Plain body and Steering types are plying on the rural roads. Among these, Framed body and Plain body are in maximum number. Descriptive statistics of socio-demographic data reveals that average 33 years old people drive it with no formal training and education. They were engaged in 15 different types of occupations before migrating as NCMT driver. Over 24000 peoples directly depend on NCMT in the six study areas and 74 percent of total agrarian products have been transported through it. These modes of transport are needed for 21 diversified purposes by different government and non-governmental organizations. Over 6000 NCMTs are plying on six study areas with huge investment of over BDT 84 million. It has been generated

employment opportunities for 6046 people in those areas and creates yearly 37 million working man-hour in the job market. Transitional income growth of the people engaged in NCMT is 405 percent. Those people spent 374 percent more educational expenditure for their children as compared to the educational expenditure with their previous occupation. They also spent 190 percent more medical expenditure as compared to the medical expenditure with their previous occupation.

Data from second set of questionnaire were used to make a comparison between CT and NCMT. A comparison between CT and NCMT was made with the use of their investment data and N-I (Employment-Investment) ratio. This confirms that the N-I ratio of NCMT is four times higher than that for CT which shows the relative efficiency of NCMT. It also reveals that the E-Y (expenditure-income) ratio of NCMT is fifty percent lower than CT. This creates an avenue for huge capital formation through NCMT. Transitional income growth increases by NCMT occupation is 405 percent while this income growth is non-existent for CT. Despite these enormous contributions of NCMTs the owners have limited access to institutional credit support to run the NCMT business. In this regard CT enjoys the highest credit facilities. An analysis of WTP for institutionalize NCMT have also proven that the government can generate more than BDT 28 million revenue per annum from only six study areas.

Farm-level data from third set of questionnaire show that nearly 80 percent farmers use NCMT in farming purposes. They use it as their first option due to the advantages of effortless availability, physical accessibility, time and cost saving facilities in transportation of agrarian products.

Data collected by the fourth set of questionnaire indicate that 47 percent students and teachers use it. Advantages of low cost, need based stopping points, effortless availability, unproblematic in reservation; time savings are the main reasons to choose it as a first option to the students and teachers.

Analysis of data from last set of questionnaire reflects that it is the only transport to carry emergency patient from the rural areas to the health care centers. Health service takers of rural health centers use it in emergency time due to its low cost, graceful availability, trouble-free in reservation and time-saving advantages.

Based on the above findings policy recommendations can be made for two tiers: aggregate and micro. Given the paramount importance of NCMT, the regulatory authority should legalize the sector instead of banning it. On the micro tiers, NCMT association should establish a driving manual for the drivers.

Last but not least, though this research was carried out only in 6 Upazilas out of 488, the findings of this study could also be replicated to the other Upazillas having similar characteristics.

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### **List of abbreviations and acronyms**

B.B.S.	Bangladesh Beuro of Statistics
BDT	Bangladeshi Taka
CMT	Conventional Motorized Transport
CNG	Compressed Natural Gas
CNMT	Conventional Non Motorized Transport
CT	Conventional Transport
FMCH	Faridpur Medical Collage Hospital
GDP	Gross Domestic Product
HSC	Higher Secondary Certificate
HP	Horse Power
ILO	International Labor Organization
IMT	Intermediate Modes of Transport
IWT	Inland Water Transport
IWW	Inland Water Way
Km	Kilometer
LGED	Local Government Engineering Department
LLP	Low Lift Pumps
MDG	Millennium Development Goal
MoE&F	Ministry of Environment and Forest
NCMT	Non Conventional Mechanized Transport
NCT	Non Conventional Transport
NEDECO	Netherlands Engineering Consultants
NGO	Non Governmental Organization
NMT	Non Motorized Transport
SPSS	Statistical Package for Social Science
STW	Shallow Tube Wells
TI	Total Investment
TOC	Total Overhead Cost
TV	Television
VOC	Volatile Organic Compounds
WTP	Willingness to Pay

## **Glossary**

Bazar	The daily market
Chatal	The production units in rural Bangladesh where paddy is processed to rice
Crore	Hundred million
Chain-master	The people who is responsible to maintain the serial of transport to ply on road
Hartal	Strike usually called by the political parties in opposition
Hut	Local weekly Market. Usually this type of market starts from mid day in the rural areas.
Mastan	Muscle man who wants to do something with power in an illegal way
Mishuk	Three wheeler diesel driven two stroke conventional transport
Mohajon	Local money lender, who lend money with a high interest rate
Samity	Association of a group of people with some interest
Thana	Local police station
Tempu	Human holler which is usually carrying passenger
Pourashabha	Urban Local government institution
Rickshaw-van	Three wheeler man driven non motorized transport
Upazilla	Sub- district

## **CHAPTER ONE**

### **Background of the Study**

#### **1.1 Introduction**

A change in rural transport has taken place in Bangladesh that has escaped national notice till today. A massive local innovative system that has developed wholly outside government regulations and policies where locally manufactured mechanized rickshaws and tempooos or auto rickshaws have silently changed the picture of rural transportation in Bangladesh. Besides this, with the expansion of rural road network during last four decades, road transport has turned out to be the dominant mode in carriage of freight and passenger traffic in the rural areas of Bangladesh. While the traditional water transport has continued to show an overall declining trend due to lack of navigability, rural road transport is playing an increasingly effective role in goods and passenger trafficking in the rural areas of the country. The role of rural transport is extremely critical for the economic progress of the country. A well-knit rural transport ensures a well-balanced distribution system of the production, efficient marketing of the produced goods maintaining stability of price and parochial industrialization.

Development of rural Bangladesh seems rooted in a broad range of socio-economic activities to which transport services provide intermediate inputs. The present rural Bangladesh is facing the acute problem of poverty. It is recognized that, poverty persists as a pervasive and devastating condition in most developing countries (Ganon & Liu, 1997). Initially poverty has many root causes, while it is related to few income generating activities. In this regard transport has increased the opportunities as well as productivity of different agricultural and associated activities. This has also created the opportunities of access for

better service delivery both from the part of providers as well as recipients. Reducing poverty and acting as a pivoting element to bring dynamism in socio-economic life in rural Bangladesh. In this particular point of view, transport is a crucial complementary factor for the development of rural Bangladesh.

## **1.2 Role of Transport in the Development of Rural Bangladesh**

As mentioned earlier, development of rural areas of Bangladesh is embedded broadly with socio-economic activities to which transport services provide intermediate inputs. The development of rural areas is still barred mostly by the economic condition of the people. About 31.5% of total population live under the poverty line and about 50% of the rural people are poor (BER, 2014). So poverty is the primary obstacle in the development of rural area and it can be measured in two terms – absolute and relative. People who have to live with a minimum subsistence level such as primarily minimum nutrition, those who live with malnutrition, ill health, illiteracy and lack of access to basic social services are known to suffer from absolute poverty. While relative poor are the people with income less than half of medium income (Ganon & Liu, 1997). These types of poverty can be reduced either indirectly through income redistribution or directly through raising income opportunities. These approaches focus on the provision of basic education, nutrition, health, access to employment and product markets for the rural poor people. Generally the improvement of transport is expected to contribute to the development of rural areas through its indirect impact on economic growth and its direct impact in personal welfare of the poor people.

Transport investment in the rural areas of Bangladesh leads to improvement of the standard of living of the low-income groups of the rural people. Investment in the rural

transport sector implies improved access to economic opportunities by reducing transport costs.

Rural transport market structures are reasonably competitive encompassing many different vehicles; which leads in affordable fare for freight and passenger trafficking as there exists a high degree of competition among transport service providers. Rural transport investment also includes lower market prices for final products and consumer goods as well. Rural products get the opportunity of spatial extension of the market which helps to changes in production and consumption pattern in an improved manner. Effective transport investment increases the personal mobility and stimulates socio economic activities. Generally we can conclude that investment in transport in rural areas would be expected to benefit all income groups in rural society in the form of real income effects and diversified income opportunities (Kessides, 1993). The benefit of transport investment leads to income growth which is quite recognized with the microeconomic analysis (Creightney, 1993). Effective transport investment gets us improved and available transport facility. Improved transports reduce the costs of intermediate inputs of production. By this process people gets the products with lower prices. Cost effective transport services also reduces the delivered price of products and promotes regional and national trade, regional agriculture possibly commercializes, enhances specialized rural cottage industry. Transport investment enhances economic diversification which enables economies of scope and rural economy enabling handling the risk. So, there are many different ways, transport contributes to economic growth.

Rural people basically fall in the deprivation trap consisting of isolation, powerlessness, vulnerability, poverty and physical weakness. From that trap, the element of isolation will increase marketing and production cost, obstacle to take technologies and

techniques, limit accessibilities to education and health facilities. In that case, improved and rural people friendly transport, as part of a multidisciplinary approach to come out from the deprivation trap, plays an important role in improving access to vital social and economic facilities through more reliable and lower costs access.

### **1.3 Key Issues and Concepts Explained**

#### **1.3.1 Rural Areas of Bangladesh**

All areas in exclusion of the municipalities and the city corporations are rural area. It is defined merely based on the population density, from where the population has migrated to the urban. Agricultural production is the main economic activity of these areas (BBS, 2011).

#### **1.3.2 Rural Development**

By the term rural development, the research means raising the agricultural productivity and consequently the real income of families earning, their livelihood by increasing employment opportunities in agricultural and non-agricultural activities, thereby assisting their levels of physical, social and cultural well-being. The World Bank sector paper on rural development defines it as a strategy” *to improve the economic and social life of a specific group of people – the rural poor... the group includes small-scale farmers, tenants and the landless*”( World Bank, 1975)

#### **1.3.3 Rural Economic Activities**

There are two types of activities seen in rural areas. First comes agricultural activities which include agricultural production, agricultural product marketing, diffusions and others activities that affect agriculture. The second is non-agricultural activities implying non-crop activities or excluding all agricultural and related activities carried out at the farm level

limiting it to non-agricultural pursuits such as manufacturing goods, trading activities, transportation, and construction.

#### **1.3.4 Rural Transport**

This research concentrates on questions of rural transport only on which economic activities of the rural people leads their livelihood. It consists of two types of transportation, namely, conventional and non-conventional. Firstly the conventional transport (CT) , mainly consists of the minibuses, trucks, auto rickshaws upon which government attention has been already focused. Secondly the non-conventional, consists of different mechanized and non-mechanized hman driven transport, upon which the government attention still now generally ignored.

#### **1.3.5 Rural Conventional Transport (CT) in Bangladesh**

The rural people use it in purpose of their regular need to go to their village to district or more than the distance to the district. Generally it is possible only by the buses in consideration of passenger transportation. For the purpose of goods transportation they uses the mini as well as heavy truck or human driven van and push cart. Those transports have to maintain the government rules and regulations.

#### **1.3.6 Rural Non-Conventional Transport (NCT) in Bangladesh**

These type of transport generally ignored by the government but it has been produced in the rural areas of Bangladesh, aims to mitigate the increasing demand of transport in absence of CT. The rural people made it with their local knowledge and resources. These are two types- Non-Mechanized (NMT) and Non-Conventional Mechanized Transport.

### **1.3.7 Non-Conventional Mechanized Transport (NCMT<sup>1</sup>)**

The others means of transport is considered here as Non-Conventional Mechanized Transport (NCMT). Now it is drawing attention through its increasing trend in number and utilities in the rural areas of Bangladesh.

Hence “Non conventional” should indicate something “unusual” or “not established”. It may be wholly new or innovative use of the traditional things and present it in a new way.

Mechanized transport is the transport which uses machinery instead of human labor. Mechanized transport, as herein used, shall include any contrivance which travels over ground, snow, or water on wheels, tracks, skids, or by floatation and is propelled by a nonliving power source contained or carried on within the device.

As the transport called “Nosimon” “Korimon” “Votvoti” “Alom shadhu” are not widely accepted form of transport and as these are powered by diesel engines (a non living power source), these can be correctly termed as “Non-Conventional Mechanized Transport (NCMT)”.

## **1.4 Conceptual framework**

Bangladesh has experienced rapid expansion of rural road construction during last three decades. This has created ample opportunity to invest in road transport vehicles. But it was significantly absent in this sphere. On the other hand, demand of the motorized transport has been increasing simultaneously. To meet the demand of motorized transport rural people comes forward and made NCMT. Now it is the only transport in the rural areas which is

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<sup>1</sup> NCMT is talking about the non conventional mechanized transport in the rural areas of Bangladesh. Locally it is known as “Nosimon”, “Korimon”, “Votvoti”, “Alomshadhu” etc in the different part of the country. Basically there are two types, nosimon and korimon. It is created by a person named Rafique from Boraigram of Bogra district. He was a bicycle maker. Firstly he made it combining a low horse power shallow engine and a rickshaw van. Since the introduction of these vehicles, it has got high popularity and has used extensively for many different purpose and become the lifeline of rural people.

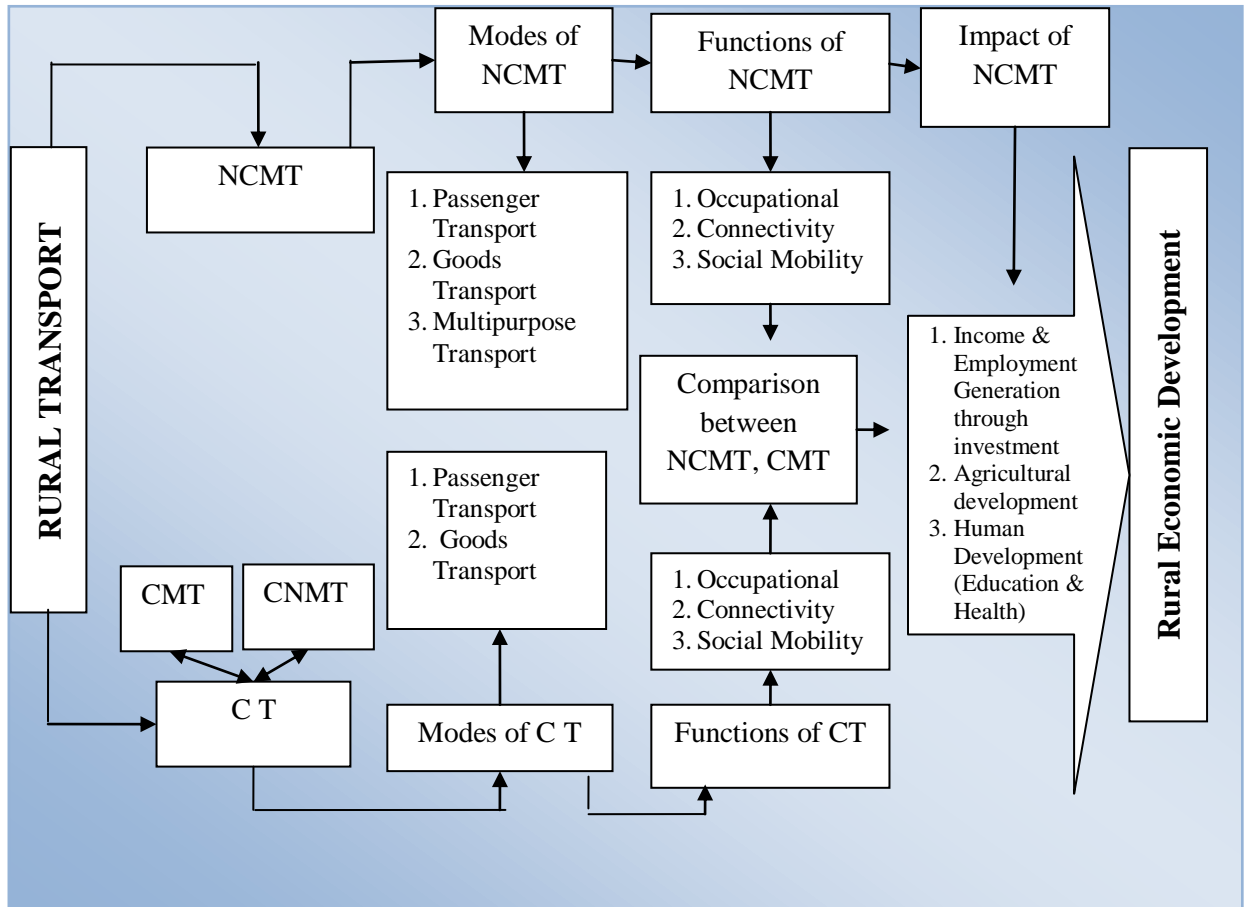
playing a diversified role in rural development. The innovation of NCMT has motivated the rural development as a complementary of CT by its diversified uses for the rural poor. The role of rural transport in the development of rural Bangladesh could be analyzed into three parts as discussed below.

First part of this analysis includes the different modes of CT and NCMT existing in the rural areas. The modes have been taken place in this research as the using characteristics of the transport modes. To do so, three types of usage such as passenger transport, goods transport and multipurpose transport has been identified. Based on the modes of the transport by using the categorical use, the superiority of NCMT has been assessed.

The second part of the concept is based on the functional behavior of that rural transport. It is also divided into three parts. The three parts have been identified as occupational, connectivity and social mobility. Following the three parts different modes of NCMT has been justified for the development of rural livelihood. To do so, comparison between CT and NCMT based on the three functions has been carried out to find out the impact of NCMT in rural livelihood development. Particularly, income and employment generating activities through the investment in those transports, agricultural development and human development componants has been considered for the livelihood development.

The final part of this thesis focused mainly on the role of NCMT in the rural development ground predominantly in the areas of income, employment through investment in NCMT sector. Agricultural development is also a major concern as influenced by the NCMT. Social development through education and health has been explored to establish the superiority of NCMT.

The nexus of the comparison of NCMT and impact of NCMT through the above socio-economic indicators comprises as the development of rural Bangladesh through the innovation of NCMT.



**Figure 1.1: Conceptual Framework of the Study**

### 1.5 Statement of the Problem

Substantial development has been achieved through rural road network construction by LGED in the last three decades. BBS (2011) shows the increasing trend of rural population. For having an easy way of earning livelihood for this increasing population, effective, timesaving and cost-effective movement is a must. This in turn can change their consumption pattern or diversify their consumption and production. They also need

movement for the purpose of marketing their agricultural products. For the overall development of agriculture as well as life standard of agrarian people, due price of the agricultural product is undoubtedly important.

Besides these, rural people need viable movement for better educational facilities of their children. It is also instrumental to get basic health facilities existing in *upazilla sadar* which is poor and scarce in their villages. In such situation, for meeting up the increasing demand of movement, huge transportation investment is needed. But it is significantly absent.

Because of the lack of interest in providing investment in this sector, alternative to conventional transportation has been sought for. In these circumstances rural people have innovated NCMT using their local knowledge and resources to fulfill the demand and supply gap bypassing government rules and regulations. This is not the sole importance of NCMT. Apparently we see NCMTs are supposed to play an important role to generate income, to increase agricultural production and production diversification, human development such as health, nutrition and education, reducing isolation of the rural people. As many people are involved in this sphere directly and/or indirectly it is viable to conjecture that NCMTs play a proactive role to enhance the life standard of rural people.

Some controversies over the existence of NCMT have drawn the attention of many. There have been overt clashes with the CT and many claims to ban such enterprises while others are vocal against its environment friendliness. But this is the reality that it has economic viability regarding increasing rural transport investment, employment generation agricultural product diffusion by reducing transport cost and to the people of the rural areas due to its availability, accessibility in all the places of the rural areas.

But the role of NCMT is not yet economically proved whether it is improving the living standard of rural people or not. In the above context an economic analysis of NCMT's role in the development of rural areas of Bangladesh is a demand of the hour.

## **1.6 Objectives**

The principal objective of this study is to explore the role of NCMT in the economic development of rural Bangladesh. To achieve the principal objective the following specific objectives have been formulated:

1. To explore the overall structure of NCMT in terms of modes and its usages;
2. To make a comparison between NCMT and CT in terms of their influence on the growth of rural economic activities;
3. To investigate the effects of NCMT on rural income generating activities and human resource development; and
4. To devise some policy suggestions to strengthen the increasing role of NCMT.

## **1.7 Study Rationale**

Within the last three or four decades a change in rural transport has taken place in Bangladesh. A huge locally made transport has been developed wholly bypassing government transport policies. The main reason behind flourishing tendency of this transport is the increasing demand of the convenient transport in the rural areas. It has escaped national notice till now. The conventional transports are inadequate in meeting up the increasing demand of the rural people. They have also been found costly. In these circumstances, people of the rural areas are trying to secure some cheaper alternatives. Naturally these non-conventional transports have influenced the lives of the rural people, particularly in the economic aspect of

their livelihoods. Now it is important to measure the impact of the role of those transports on rural livelihood. But so far the researcher's knowledge goes there is no comprehensive study on NCMTs. To fill up this gap, this study is an attempt.

## **1.8 Organization of the Dissertation**

In addition to this introductory chapter, this study is organized into six chapters.

Chapter two is the revelation of the methodology employed in the research. This chapter includes the details of the selection of study areas, determination of sample size, selection of the respondents, questionnaire development, data sources, research approach, data analysis and presentation techniques, procedure of validity and reliability check.

Chapter three reviews the existing literature on rural transport and rural development in Bangladesh and the developing countries as well. This chapter comprises the theoretical basis of the thesis, review of literature regarding employment and income generation through rural transport, investment in rural transport, rural transport and agricultural development, rural transport condition in Bangladesh, rural transport and social development. This chapter also finds out the literature gap through the reviewed literature.

Chapter four is one of the major chapters to describe the overview of NCMT in the rural areas. It includes different typologies of NCMT, area wise existence in number of the typologies of the NCMT.

Chapter five is the main chapter by which the results of the research have been described elaborately. It has been divided into five sub-sections based on the main findings of this research.

First section of this part has been analyzed the socio-demographic information regarding the driver and the owner driver of the NCMT and the family information of the

same. It also includes the diverse usages of NCMT in the rural areas. Second section of this chapter reflects the investment in NCMT sector. Total investment and employment growth has been examined in this section. Comparison between CT and NCMT through the above indicator has been made in this chapter. Third section outlines the financial issues relating to NCMT in the rural areas. It includes income, savings and transitional growth, credit sources of the rural transport sectors, revenue generation and potentials by NCMT. Fourth section of this chapter documents the agricultural development through rural transport. Particularly perception of the farmers and drivers of the NCMT has been considered for the developmental role of NCMT in agriculture. Availability, accessibility, time and cost saving transport has been examined through the perception of farmers and the driver of the NCMT. The fifth section indicates the involvement of NCMT in different social issues particularly in the promotion of education and health service. Perception of educational institution going people and the driver and owner driver of NCMT has been considered in this sphere. Similarly health service taker of the local central medical center and the driver of the NCMT have been opined about the development of health sector through NCMT in this section.

Chapter six describes the challenges of NCMT faced to ply on the road. It includes the pressure from different opposition group, technological inefficiencies, accident, training, basic education of the driver, traffic congestion through NCMT, and land use for parking and environmental pollution through NCMT.

Finally, Chapter seven provides an overview of the results of the study and suggests policy recommendations and an agenda for additional future research.

## **1.9 Conclusion**

Apparently we see the increasing tendency in number of NCMT in the rural areas of Bangladesh. Now it is a reality in the context of rural livelihood and undoubtedly a complementary to national transport system. The objective of the study is analyzing economic role of the NCMT's in the development of rural areas of Bangladesh particularly in the sector of income and employment generation, agricultural development and human development in rural areas. This study also formulates some policy implications so that the authority thinks further regarding NCMT for enhancing the local revenue earnings. The present study also aims at finding out the different modes and usages of the NCMT and identifying their functions to find out the advantages, disadvantages so that some policy options can be formulated to integrate NCMT within the national transport system.

## **CHAPTER TWO**

### **Methodology of the Study**

#### **2.1 Introduction**

The methodology of this study includes the selection of study areas, sample size, selection of respondents, data analysis tools, development and structure of questionnaire. To address the issues of this study, primary data has been used for the most part of this thesis. Secondary data are used to support the arguments in favor of the different aspects in favor of the importance of the NCMT in rural perspective.

#### **2.2 Study Area Selection**

From the pre-visit in the study areas by the researcher it is observed that the rural people of the hilly and coastal areas use only the conventional transport because the roads are crisscrossed and the areas are undulating there. It becomes impossible for the NCMTs to ply in those areas. In that case, only conventional transport is available there with the modes of mechanized and non-mechanized types. But this research focuses mainly on the NCMTs existing only in the plain land of the rest of the country. So the study has covered only the rural areas of the plain land of the rural Bangladesh. Economic activities of the rural people of the plain land all over the country are almost the same. Within the plane lands, therefore any areas could be the research area and it is likely that assumed result should be similar. In this context, the research is carried out in Rajshahi and Bogra districts, which are purposively selected (Maps of Rajshahi and Bogra district has been inserted in appendix-1 and 5 respectively). The district of Bogra is the main manufacturing area for this type of transports while Rajshahi is the place where NCMTs are massively used. Six *Upazillas*, three from each

district, are purposively selected (Maps of six upazillas has been inserted in appendix-2-4 and 6-8).

### **2.3 Determination of Sample Size**

For obtaining a representative sample size, following statistical formula is used for unknown population (Smith, 2013):

$$n = \frac{Z^2 pq}{e^2}$$

Where, n= sample size

Z= confidence level at (1- $\alpha$ ) %

P=estimated population proportion (0.5, this maximizes the sample size)

q= (1-p)

e= error limit  $\alpha$ %

In here, Z= 1.96 at 95% confidence level

p= 0.5 and q= 0.5

e= 0.05

So,

$$n = \frac{(1.96)^2 * 0.5 * 0.5}{(0.05)^2} = 384.16 = 384$$

### **2.4 Selection of the Respondents**

Respondents for this study are the users of the transports (student/teacher, health service taker and farmer), owner driver and drivers of rural transports (CT and NCMT). After determination of total sample size (n) by using stated statistical method, it was purposively distributed equally among the five types of the respondent's. Because of the concentration of the respondents is almost same among the study areas. Accordingly, five types of

respondents were selected for five types of questionnaires. The distribution of the respondents is as follows:

**Table 2: Area-wise Respondents**

Area	Owner/Driver of the NCMT	CT Driver	Farmer	Student/Teacher	Health Service seeker	Total
Dhunot	13	13	13	13	12	64
Sherpur	13	13	13	13	12	64
Shibgonj	13	13	13	13	12	64
Mohanpur	13	13	13	13	12	64
Poba	13	13	13	13	12	64
Puthia	13	13	13	13	12	64
Total	78	78	78	78	72	384

Source: Own Presentation

## 2.5 Questionnaire Development

To substantiate the objectives of the study five different sets of questionnaire were developed in three different steps.

The first step to develop the questionnaire was the pre-piloting of the questionnaires. In this step, researcher has been discussed about the issues of rural transport with the academicians, different transport authorities and transport users in the rural areas. The producers of NCMTs also contributed to develop the questionnaire with the different technical aspects of NCMT.

The second step was for the preparation of draft questionnaire with the help of the knowledge gathered from pre-piloting of the researcher. A set of questionnaire was developed for the pilot survey for further development of the questionnaire. Statistician, transport academician, user and producer of NCMTs were consulted to upgrade the draft questionnaire. Data were collected according to the draft questionnaire from the selected study areas.

Following the pre-testing of the questionnaire, developed by the pre-pilot and pilot-survey, final questionnaire was revised. To make ease and more informative of the information regarding rural transport and rural development from different levels of users and different rural transport drivers, the questionnaire has been formulated into five sets. With the discussion of the above experts, users and providers; the questionnaire has been finalized into five sets. The first set is for the driver and owner-driver of NCMT, the second set is for the driver and owner of the CT, the third one was developed for farmers, forth set of questionnaire is prepared for the educational institute-going pupil, the last set of the questionnaire has been developed to collect data for people who come to take the health service from the local medical center in emergency period through NCMTs. The above five sets of questionnaire helped the researcher to achieve the objectives of this thesis.

## **2.6 The Design of the Questionnaire**

The main objective of the questionnaire was to analyze the role of NCMT in the socio-economic development of the rural areas of Bangladesh. For that, drivers, owner-drivers of existing different kinds of rural transports and users of the rural transport have been interviewed. Accordingly five types of questionnaire were developed to reveal the data which are the reflection of the role of NCMT on the socio-economic aspects of rural livelihood.

The first set of questionnaire is for the driver and the owner driver of NCMT (Appendix-9). It includes the personal and family information of the respondents, details representation of NCMT, investment in NCMT, income, savings and credit related information, family expenditure of the respondents, agricultural development through NCMT, education and health development through NCMT and other usage of NCMT.

The second one is for the driver and owner of the CT (Appendix-10). It includes the personal and family information of respondents, availability and accessibility of CT in the rural areas, time and cost saving characteristics of CT, capability of passenger and goods transportation, income, savings and credit related information and transport related overhead cost related data.

The third questionnaire has been developed to collect data from farmers (Appendix-11) about the necessities of NCMTs in agricultural development. It contains availability and physical accessibility of rural transport existing in the rural areas for agricultural purposes, information about the time and cost saving transport plying on rural roads, other transport related information to develop the agricultural sector.

The fourth questionnaire has been developed to gather the information for educational purposes through rural transport (Appendix-12). It comprises the availability and physical accessibility of rural transport existing in the rural areas to provide the transportation facility to the pupils, teachers and staff. It also includes cost and time saving data of the rural transport available in the study areas. Rural transport and education related other necessary questions have been included in this set of questionnaire.

The fifth questionnaire is for the health service takers (Appendix-13) to congregate data about the rural transport and health service promotion in the study areas. It also includes the information about the availability and the physical accessibility of existing rural transport in the emergency period to carry patients to the medical centre. It also includes the data about the time and cost saving transport facilities in these areas to provide the transport facilities to the rural poor people. Other transport and persona health service taking related questionnaire has been included in this questionnaire.

## **2.7 Sources of Data**

Secondary Data: Conventional transport and its uses related secondary data has been collected from various government and non government organizations. Besides these, various relevant websites are consulted for secondary data.

Primary Data: Primary data have collected from the owner-driver and driver of the NCMTs in the rural areas, and the owner /driver of the conventional transport in the rural areas, users like farmers, educational institution going people and the health service takers in the rural areas.

For these reasons, five stages questionnaire survey in the root level have been conducted. Interview with the key informants selected from the rural areas is the sources of primary data. Organizations involved with the CT and NCMT are also the sources of primary data. From these sources, data has been collected through five sets of structured questionnaire.

## **2.8 Research Approach**

The research approach is exploratory in nature. To conduct the research both qualitative and quantitative data has been used to assess the economic development of the rural areas of Bangladesh by using the NCMT as an intermediate and complementary mode of transport.

## **2.9 Data Analysis and Presentation**

Collected data has been entered into statistical software SPSS. Afterwards, data was cleaned by running and using the frequencies of the variables. The data has then been analyzed by using descriptive statistics and exploratory data analyzing techniques.

## **2.10 Procedures of Validity and Reliability Check**

Researcher has tried to collect the relevant, accurate, unbiased and representative data from the reliable sources. Proper care and caution has been taken during collection of data. Respondents has been selected properly and requested to provide accurate information.

Information provided by the respondents has been checked before leaving the study area as much as possible. Besides, researcher himself has conducted and collected all the information needed through pretested questionnaire.

## **2.11 Conclusion**

The key objective of this chapter was to elaborate the methodological framework used in this study. Accordingly, the methods by which all the levels for analyzing the impact of rural transport particularly NCMT for rural development in Bangladesh have been explained in detail. In early stage, questionnaire has been developed and data has been collected accordingly. The time period of the data collection was from December 2013 to March 2014. Finally maintaining the above procedure, data has been analyzed by using descriptive statistics methods with the statistical software SPSS version 16.

## **CHAPTER THREE**

### **Review of Literature**

#### **3.1 Introduction**

This chapter has analyzed various literatures and earlier studies already conducted in the field of rural transport interventions, their uses and utilities. This is useful in identifying the conceptual and methodological issues relevant for the present study. This chapter also reviews the theory of transport and development in the context of the rural Bangladesh. The main question to be examined in this chapter is how far the theoretical understanding of the role of transport development in the rural economy has evolved. The outcome of this review has provided the basis for the present research which seeks to move forward the agenda of conceptualizing the link between transport development and the rural economy. This review is categorized in six parts: 1) theoretical orthodoxy in transport and development studies, 2) employment and income generation through rural transport, 3) rural transport and agricultural development 4) rural transport condition in Bangladesh 5) rural transport and social development and 6) investment in rural transportation as reviewed below:

#### **3.2 Theoretical Orthodoxy in Transport and Development Studies**

Understanding how transport studies have evolved over time and space will be useful, partly for providing lessons about the past but, more importantly, for a continuing understanding of the link between the past, the present and the future. Many authors have reviewed the evolution of transport studies, most notably from historical perspectives (Hoyle, 1973; Pawson, 1979; Button, 1982; Hart, 1983; Howe, 1984; Hilling, 1996; Howe, 1996; Simon, 1996; Banister and Berechman, 2000; Preston, 2001). In this section, the evolution of transport studies is again reviewed, but in relation to the emergence of the new rural transport

field. The origin of the connection between transport and development studies can be traced to Adam Smith's well-known book *An Inquiry into the Nature and Causes of the Wealth of Nations* in 1776. Smith emphasized the significance of transport networks as 'the greatest of all improvements in the expansion of the market (commerce) from urban to rural areas and subsequently facilitating the division of labor, which in the long run would bring economic expansion for the whole country. In order to ensure that transport can effectively play such a role, increases in production should go hand in hand with provision of transport infrastructure.

....That the erection and maintenance of the public works which facilitate the commerce of any country, such as good roads, bridges, navigable canals etc., must require very different degrees of expense in the different periods of society, is evident without any proof. The expense of making and maintaining the public roads of any country must evidently increase with the annual produce of the land and labor of that country, or with the quantity and weight of the goods which it becomes necessary to fetch and carry upon those roads (Smith, 1776) .

Smith, nonetheless, did not offer any theoretical explanation for the way in which transport improvement is linked with production increases and the economic advance of countries, apart from implying the 'no-doubt and automatic' role of transport in allowing rural regions to be linked economically to urban centers. Nevertheless, that view has been widely accepted as the foundation of modern transport study and has consistently formed the mainspring of transport and development theory right up until today.

Following Smith, many authors have contributed to the development of transport studies, mainly in enriching the understanding that transport networks are crucial in determining the spatial size of production hinterlands and market forelands. Von Thunen

(1826) developed a theory linking transport rates and agricultural land-use. Alfred Weber (1929) established the relationship between transport costs and industrial location. Some authors such as Hoyt (1939), Hoover (1948), Isard (1956) and Greenhut (1956) enriched the work of Weber in linking transport and industrial location. Christaller (1933) constructed a hierarchical system of how transport costs affect urban and rural economic activities. Losch (1954) went into more detail in explaining how transport costs affect the spatial distribution of production. Overall, these economists have provided, within the classical economic framework, further basic theory, mainly developing the argument that an existing transport network influences the location of economic activity. There is a logical break between that statement and the assumption that a change in the transport system will automatically lead to a change in economic activity.

After the Second World War, a new generation of classical economics (well-known as neoclassical economics) was born and provided a strong focus on the role of capital and technology in the economy. From the transport perspective, however, there has been no significant change in the understanding of the role of transport in development between the classical and neo-classical economics. Nevertheless, it is worth noting here that with technology becoming a major strand of the neo-classical model, transport improvements have come to play a more pivotal role in the process of economic growth.

One of the most popular explanations of the connection between transport and economic change in the modernization era was found in the "stages of growth" theory by Walt Rostow. Rostow (1960) believed that transport improvement (through railway construction) was the prime stimulus of economic growth, moving countries from preindustrial to post-industrial societies. In relation to that, he divided the process of economic growth into four

linear stages: (i) pre-industrial, (ii) transitional, (iii) industrial, and (iv) post-industrial. This theory paralleled the core-periphery model established by John Friedmann (1966). In Friedmann's formulation, the process of modern development is initiated from an urban core and hierarchically transferred towards the rural periphery. The process creates a dynamic interaction between the urban core and the rural peripheries, in which transport is a key element. The process, in the long run, produces an integrated rural-urban space and a modern stage of development (Friedmann, 1966).

It is obvious that the principle enunciated by Smith was still relevant in the neoclassical economy era. The theoretical explanation for Smith, which was also applicable to the neo-classical mainstream, can be seen in the work of van Es (1977) and Button (1982). Button (1982) devised a simple demand/supply model, illustrating how improvement in transport extends the market through a reduction in transport costs (Figure 2.1). It is shown that a reduction in transport costs ( $\Delta P$ ) changes the supply price from  $P^S_o$  to  $P^S_1$ .

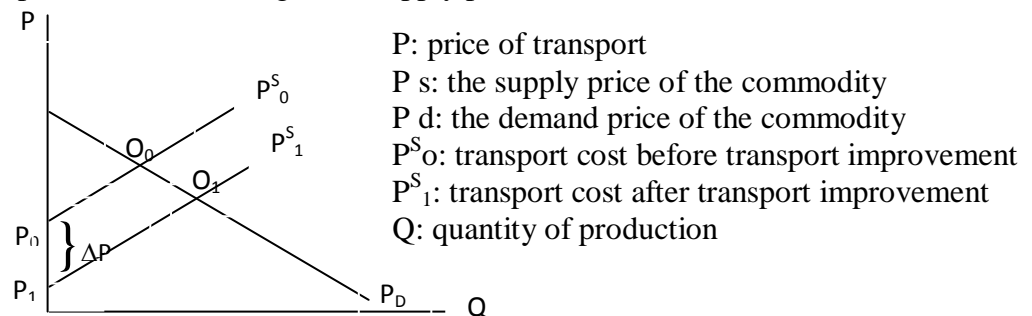


Figure 2. 1: Transport cost and production linkage  
Source: Button (1982: 28)

Given the relationship between price and demand, this moves the optimum point from  $O_0$  to  $O_1$ , which means that with the reduction in transport costs, producers can increase their production. The increase in production is associated with the extension of the market.

The dominant role of neo-classical economics in transport studies has continued until today. Most recently, Banister and Berechman (2000) developed a conceptual framework

linking transport investments and economic development. Although oversimplifying the nature of the transport - development linkage in developing regions, the authors used a macro-economic approach to assess the effects of transport investment on economic growth mainly in developed countries. The authors stated that investments in transport will directly improve network accessibility, but do not necessarily promote economic growth. They argued that, in addition to transport network improvements, environmental concerns, an imperfect labor market, and spatial agglomeration also matter in determining economic growth. According to the authors, a supportive political and institutional environment is a necessary condition for making transport improvements contribute positively to economic development. Up to this point, the review of transport and development theory has been focused on literature dealing with Western Europe and North America. This was what transport study was all about until forty years ago. There have been no transport studies that substantially touched on the nature of transport in Third World countries before 1960 (Hoyle, 1973). The long period of colonialism experienced by most Third World nations is probably the main explanation for the lack of critical transport development studies in these countries. Transport development during the period of colonialism was carried out following the pattern of development in metropolitan countries. More specifically, the pattern of transport development at this time period was mainly to serve the economic and political interests of the colonial regime (Hoyle *et al.*, 1998). Transport was very important for colonial governments as it facilitated the strengthening of political and economic control over the colonial territory. Lord Lugard, for example, argued that "the material development of Africa may be summed up in the one word - transport" (Lugard, 1922 quoted from Hoyle, 1973: 11). Furthermore, it should be noted that, with economic growth being a single objective of development at that time, transport

development was focused on economic development rather than poverty alleviation. Taaffe, Morrill and Gould (1973) examined the process of [colonial] transport network expansion in the economic growth of underdeveloped countries. In the beginning, there were only small ports scattered along the coastline. The process of transport improvements started with connecting those scattered ports to their interior hinterlands which, in the long run, formed interconnections between port cities and inland cities. The process ended with the emergence of high priority "main streets" connecting major port cities and the main city in the interior. But, it was Rimmer (1977) who clearly illustrated the development of the transport system in developing countries from the pre-colonial era to the neo-colonial period. The most significant part of Rimmer's model illustrates how the process of colonialism has changed the indigenous transport system to a system most appropriate to colonial administrative interests. To sum up, mainstream transport studies have long been preoccupied by (neo-) classical economic theory which maintains the unquestionable role of transport in promoting economic growth. The theory that has been widely implemented in the western world was then uncritically imposed on the Third World context. Critical thought arguing (i) that development is more than just simply economic growth, (ii) that transport improvements are dynamically related to development issues, and (iii) about the significance of local or regional context matters in understanding development, was largely ignored. Yet, some authors who persisted with their critique have stimulated the emergence of rural transport studies for developing countries. I will discuss their thoughts in the following sections.

### **3.3 Employment and Income Generation through Rural Transport**

Ganon & Liu (1997) tried to show the role of transport sector operations in alleviating poverty. The authors also examined by the paper that the poverty reduction strategy through transport projects. They said cost reduction of transport improving efficiency and promoting economic growth. According to the research “Poverty and Transport” which has been done by the two authors assisted by the World Bank, generally it is seen, transport project indirectly enhances economic growth steaming from broadly based economic development. Transport is a complementary input to effective delivery of basic services which is most direct poverty targeted interventions such as – schools, health clinics, nutrition programs and social services. The research also focused about the little attention of the distributive impact of the various social groups gain and loses. In this case the proactive role of the transport in assisting the poor has received little attention. The core objective of these researches was to establish a sound framework for identifying, examining and shaping the full potential role of transport operations in reducing poverty. By the discussions of the two authors, poverty reductions have been carried out by the role of transport in perspective two approaches – direct and indirect. They mentioned that people of the areas employed in the job of construction process are the direct approach to employment and institutional development is the indirect approach of employment and income generation.

### **3.4 Rural Transport and Agricultural Development**

Ajiboye and Afolayan (2009) showed that transport is regarded as a crucial factor in improving agricultural productivity. It enhances quality of life of the people, creates market for agricultural produce, facilitates interaction among geographical and economic regions and opened up new areas to economic focus. This paper therefore looks critically at the crucial

role transportation plays in Kolanut production in Nigeria. A total of 100 respondents were randomly selected and interviewed which represent 20% of the registered Kolanut farmers in Remo land, Ogun state with 40% of the respondents from Sagamu local government area and 30% each from Ikenne and Remo North local government areas respectively while the data collected were analyzed using descriptive statistics such as tables of frequencies and percentage distributions. This study revealed that an improved transportation encourages farmers to work harder in the rural areas for increased production, add value to their products, reduce spoilage and wastage, empower the farmers as well as having positive impact on their productivity, income, employment and reduce poverty level in the rural areas since it will be easier to move inputs and workers to farm as well as products to markets and agro-allied industry.

Ajiboye (1995) described a significant role of transport in the structure of food production and marketing and that easy transport to market can make all the difference in the level of rural incomes. From the analysis, it could be deduced that an improved transportation encourages farmers to work harder in the rural areas for increased production, add value to their products, reduce spoilage and wastage, empower the farmers as well as having positive impact on the productivity, income, employment level and reduce poverty level in the rural areas. Finally, transport is also seen as a facilitating factor in the mobilization of the farmers and other allied workers in the overall national development of the nations.

Bhatia (1999) attempts to build a composite index of rural infrastructure state wise and examines the relationship between infrastructure development and levels of production and growth in agriculture.

Guimaraes & Uhl (1997) compared the cost of purchasing and operating different conveyances and determined how transport mode, road quality, distance to market and product value affect the profitability of farming in the eastern Amazonia.

Toney (1992) assesses the role of transport as a factor and constraint in agricultural production and evaluates the effects of transport interventions to alleviate these constraints. Conclusions were drawn by comparing groups of households which are classified into successful, typical and unsuccessful, using agricultural income as an indicator.

For the alleviation of on-farm transport constraints, Airey emphasizes the role of IMT, which are:

- shortening the time required for trips to the fields;
- increasing the efficiency with which loads are carried;
- reducing the effort and drudgery involved in human portage; and
- reducing the pest damage and spoilage at crop harvest time.

In economic terms the benefits of IMT can be considered as releasing latent factors of production, principally land, and increasing the efficiency with which the existing labor endowment is utilized. IMT enables the household to extend the distance over which agriculture is practiced and they release the household's time requirements, which can be used for productive activities. The households are able to expand their agricultural production by bringing more plots under cultivation. For off-farm transport the role of road access combined with transport services and the location of facilities are crucial. IMT plays an important role in improving the speed and efficiency with which households overcome distance and transport the increased volume and weight of crops associated with a higher level of production. Airey

emphasizes the positive role which bicycles may have in off-farm transport, while animal carts are primarily used for production-related transports.

Tarrent (1979) provided two types of reason behind the atrocity of the rural transportation system in Bangladesh have been shown in the study;

- ✓ Economic and
- ✓ Physical.

The author mainly discussed about the physical difficulties which is characterized in the way of high and seasonal rainfall and, very largely flat land, crisscrossed and countless rivers and canals. The embankment of the river became impassible in the wet season as their surface gets cut into by the wheels of the bullock carts.

Firstly, it inhibits the movements of surplus commodities out of the producing areas and thereby reduces the incentives for farmers to adopt new high yielding technologies. Secondly, it delays or prevents the diffusion of these same technologies as fertilizer, fuel, and extension workers are all prevented from easy and cheap circulation in rural areas. This research work concentrates only the objective of movement to market.

The author proved that, improved rural transport provides positive impact on three spheres:

- Income generation;
- Farmers fund development; and
- Farmers actual price receive.

Rural transport development is certainly not the only panacea for all the ills of rural development in Bangladesh. It is generally played an important role to develop rural areas as an intermediate input to development, which are the ultimate findings of the research.

Leaman & Conkling (1975) showed the results of the research confirm the hypothesis that transport costs are inversely associated with degree of specialization and trade. They confirmed the location effects to transport costs, but they provided little evidence of the impact of transport change on the theoretical pattern of agricultural production. One exception is the projections of heady and scolds for the future location of American agriculture, which assumes a declining transport rate curve and a resulting increase in regional specialization. The further discussion said, transport cost may again become a primary location determinant. The research also proved that a prolonged period of falling transport costs is associated with increasing regional specialization of agriculture.

### **3.5 Rural Transport Condition in Developing Countries like Bangladesh**

Barwell *et al.* (1985) showed the poor condition of the rural transport provision in Bangladesh in their research. Planning Commission had estimated 80% of 6800 villages have no access to mechanized transport facilities. For major part of their travel the rural population relies on non-motorized means of transport facilities. The distinctive objectives of the study were focuses on the role and consequences of rural transport improvement in relation to rural development. The study findings argued strongly for the assessment of alternative ways to solve the transport problem. The research has described one element which importance has taken serious consideration – the local transport system, study findings argued that, if attention were focused on this, the local transport system might be able to play its proper role as a complement to the national transport system. In the study period non-motorized transport and in particular shoulder and head loading dominates rural transport. In the reverine part of Bangladesh, simple boats driven by oars and muscle power are the only means of transport.

Non-motorized transport accounts for more than half of freight and passenger movement in Bangladesh. The research understood to have two distinct and complementary elements.

- The national transport system- upon which national attention has been focused and
- The local transport system – which has been generally ignored

Ellis (1996) showed in his Ph.D thesis that rural accessibility planning in developing countries over the last few decades has primarily focused on increasing rural communities' access to rural roads. It has been considered that road building improves access to health, education, markets and employment opportunities, and hence promotes economic development. It is argued in this thesis that accessibility, particularly in Sub-Saharan Africa, has not improved to the desired extent because the problem of mobility, in terms of access to vehicle services, has not been addressed. The provision of rural roads and transport services has been taken as synonymous with each other, but in reality this has not proved to be the case. This thesis attempts to redress that balance by seeking to change the mindset of policy makers to think about mobility and increase the emphasis placed on the promotion of transport services, both motorized and non-motorized.

### **3.6 Rural Transport and Social Development**

Donnges (2001) said people uses local level transport for their social and welfare needs. Rural transport is a subject that is receiving increasingly more attention from development specialists. Over the last decade, the World Bank, ILO and other international organizations concerned with rural development and poverty alleviation have initiated programs and projects to understand better the role that rural transport plays in the local economy and to demonstrate the importance, variety and extent of rural transport. Transport patterns between countries, within a country and between rural and urban areas differ

considerably. Rural transport for the purpose of this article is defined as the movement of people and goods in rural areas by any conceivable means, for any conceivable purpose along any conceivable route. Research work has revealed that rural transport in developing countries has its own very distinct features. It is characterized by people moving themselves and their goods around in rural areas for a variety of subsistence, social and economic purposes. Some of this transport takes place in motorized vehicles along well maintained roads. Much of this transport however takes place in and around the community on foot or on rough roads often with intermediate modes of transport such as bicycles, motorcycles, tricycles or with small boats.

Studies in Ghana (and elsewhere) have established that head porter age takes about two person-days to move one ton-km, using factors of average load size, walking speed per hour, and time for the return trip (without load). Using the minimum wage rate, this amounted to about US\$2 to 2.50 per ton-km. The minimum wage is taken as a proxy for the resource costs (food, expenses, etc.), and for the time and effort involved.

The World Bank (2005) stated that through the paper, more recent studies indicate that where transport is not available, the rural poor experience a shortage of productive time in doing various chores in their daily lives and farming, marketing, and transport activities, and therefore their time should be given a higher monetary value. This is indeed a valid consideration, but not reflected in the price noted above. The estimated rate of US\$2 to 2.50 per ton-km mentioned above was also found to reflect the actual market charges for such operations.

This rate range is found valid for head portage in many developing countries. In Baluchistan (Pakistan), Nepal, and Bhutan, where mule transport is a common form of transport in rural

areas, the actual cost is found to be about US\$3 to 4 per ton-km, including the cost of the mules and the persons walking with them. In Bhutan, a similar rate was found through market inquiries of actual charges levied, and also from indicative tariff rates published by the Royal Government of Bhutan. This rate should be compared with about US\$0.20 per ton-km for trucking operating costs on low-volume roads, which would become applicable after road construction or improvement.

Porter (2005) reflected on the experiences of women and girl children resident in rural areas of sub-Saharan Africa with poor physical accessibility (to services and markets) because of poor roads and inadequate transport (in terms of regularity, reliability and cost). Examples from field research conducted in diverse agro-ecological and cultural contexts in western and southern Africa are used to explore the impacts of relative immobility and poor access to services on women and girls. Three themes are examined in some detail: access to education, access to health services and access to markets. The disadvantages associated with poor physical access to services may be felt by a wide cross-section of population resident in the area concerned, but there is substantial evidence to suggest that the impacts on women and their daughters are particularly severe because of stronger constraints on female mobility. Girl children, for instance, are particularly likely to suffer poor access to education services because of impediments to their school-going mobility, while distance and associated mobility factors may be a critical component in women's access to maternal health services. Access to education and health both have important implications not only in terms of immediate health and educational outcomes, but also for subsequent livelihood opportunities and life chances. For many women, especially those with limited formal education, market trading presents a key livelihood opportunity, but accessing markets tends to be particularly

challenging for women living in remote rural areas. Other potential openings for earning off-farm income – recognized as an important factor for spreading risk and thus insuring against deep poverty - may be similarly restricted by distance and limited mobility. The contribution of low female mobility and broader transport failures to the maintenance of inter-generational cycles of poverty is a major theme of the paper.

Adnan,(n.d) tried to show in his paper of "Rural Transport and Health-A Pakistan Perspective." that development in the rural transport in many developing countries has primarily been focused on building of roads without considering issues pertaining to rural individual decision to travel and their access to basic needs. A developing country such as Pakistan do possesses strategies and policies in order to improve existing conditions related to transport, health, food and education in rural areas, but these strategies and policies are not resulted from any comprehensive integrated rural development program. For instance, within health sector, government has launched health program at national level which include establishment of health centers and appointment of lady health workers under the umbrella of people primary health care initiative. Within transport sector, investments have been made for improvement of unpaved roads and construction of new collector roads that provide access to national highways and motorways. These schemes have been found as fulfilling their partial objectives due to the lack of consideration of issues related to accessibility and affordability of rural individuals in connection with new infrastructure and services. This suggest that for overall improvement of rural areas, a development program which focuses on all aspects of rural life and their issues is required to develop and implement. This is vital for alleviation of poverty from these areas and fulfillment of related millennium development goals. With this background, this article first focuses on understanding the interaction between health and

transport in rural areas through key linking factors “Accessibility” and Affordability. Based on this understanding, some lessons are derived which are then reformulated in the form of possible solutions and recommendations.

Mattson (2010) described the importance of transportation as a vital issue for access to health care, especially in rural areas where travel distances are great and access to alternative modes such as transit is less prevalent. This study estimates the impacts of transportation and geography on utilization of health care services for older adults in rural and small urban areas. Using data collected from a survey, a model was developed based on the Health Behavior Model that considered transportation and distance as factors that could enable or impede health care utilization. Distance and transportation variables were not found to significantly influence the total number of routine or chronic care trips made overall, while emergency care visits were impacted by transportation options. However, additional results showed that those who cannot drive make more trips if someone else in the household can drive; distance and access to transportation impact the likelihood that someone will miss or delay a trip; and difficulty reported in making trips is significantly affected by distance and transportation options. The greatest problems for people using public transportation for health care trips is inconvenient schedules, the need to match transit and medical schedules, and infrequent service.

Ganon and Liu (1997) arose out of a recognition that an articulation of the role of transport sector operations in contributing to poverty reduction did not exist. By and large, transport projects are assessed in terms of reducing transport costs, improving efficiency, and promoting economic growth. The contribution of transport operations to poverty alleviation is

seen, in general, as indirect and stemming from broadly based economic development. Yet, most direct poverty-targeted interventions (schools, health clinics, nutrition programs, and social services) depend on transport as a complementary input for their effective delivery. With few exceptions, the distributive impact of transport projects (i.e., how much various social groups gain and lose) and the potential for transport projects to play a direct proactive role in assisting the poor has received little attention. It is desirable and timely to assess prevailing views of the role of transport projects in poverty alleviation and to take stock of the treatment of poverty issues. Accordingly, a review of recent transport operations was undertaken to comprehend existing practices and to identify innovative approaches. The present paper was prepared against this background. The primary objective is to establish a sound conceptual framework for identifying, examining, and shaping the full potential role of transport operations in reducing poverty. A key finding of the paper is that there is a need to strengthen the direct role of transport interventions in poverty alleviation. This will require building far better knowledge of the transport needs of the poor, and how these needs are best met. In this regard, a set of structured case studies should be designed and undertaken as a follow-up to this paper, with the objective of establishing best practice guidelines to assist task managers in the identification, design, and assessment of transport project components intended to assist the poor.

### **3.7 Investment in Rural Transport**

Walle and Cratty, (2002) critically reviewed past and current practices about how rural road investments are selected. An attempt is then made to develop an operational approach that is grounded in a public economics framework in which efficiency and equity concerns are inseparable, information is incomplete in important ways, and resources are limited. A key

problem addressed is that a potentially important, though unknown, share of the benefits to the poor from rural roads cannot be measured in monetary terms. The proposed method aims to identify places where poverty, inaccessibility and economic potential are high.

Uddin *et al*, (2005) discussed by their paper about the success of the economy depends on the transport facilities available in the country. A lot of ideas, credit systems, banking facilities, leasing facilities have been developed by the vehicle sellers, bankers, leasing organizations, researcher and transport business organizations. But those are related only for the urban transport and heavy vehicles. The authors also tried to point out the prospects of this sector so that it can be one of the vital sources for generating employment.

Banister and Berechman (2003) rose by his books of "Transport investment and economic development" a major concern of all decision makers has been to ensure that there are clear benefits from transport investment proposals. The travel time savings are clear, but the wider economic developments have presented enormous difficulty in terms of both theoretical arguments and empirical evidence. This book reviews the history of the debate and argues that the agenda has changed. Concerns about economic development need to be placed in the new economy and a much wider social and environmental context. These issues are presented together with a major analytical investigation of macroeconomic models, evaluation in transport and micro economic approaches. The final part of the book presents a series of case studies for road, rail and airport investment schemes, particularly focusing on the economic development aspects. This book makes a major contribution to the debate and is directed at researchers, decision makers and students who are interested in the wider economic development impacts of transport investment decisions.

### **3.8 Gaps in the Literature**

The above literature is mainly related to the development of the rural road concern of the developing countries. But there is little literature is in place to reveal the developing strategies and transportation problems of the rural Bangladesh. The reviewed literature has been divided into six parts so that the history of the development through transport can be sorted out clearly. The first part of this chapter reveals the historical background of transport and development as well as the theoretical basis of the thesis. Literatures of the second part have been targeted a little about the employment generation and income earnings by transport in the rural areas. Rather those are related in the field of employment generation through transport infrastructural development projects. But how the vehicles played a role in this sphere are absent in those literature. The third part of this chapter reveals the importance of transport infrastructure for the development of agriculture. That literature sometimes touches the importance of transportation for product marketing and the reduction of transport cost for the agricultural product basically in rural Africa region. Some of those revealed the drudgery of the farmer, time saving and others involve with agricultural development through transport. But how special transport for the agricultural development can be made for the agricultural development and what are the special indicators of transport makes agriculture easy for the agrarian people are absent in those literature. What types of transport are appropriate for agriculture for the rural Bangladesh is non-existent in those literatures.

The fourth part of this section stated about the transport condition in Bangladesh. But those are related only for the conventional transports in the rural areas. Those literatures always tried to show the transport poor infrastructural condition in Bangladesh. But no one contributed in the non conventional transport arena. Though the non conventional motorized

transport in the rural Bangladesh emerged silently and played an important role in every sphere of rural livelihood.

The fifth part of this literature review reveals the importance of transport in the social development particularly in the rural life. This part indicates transport is one of the main tools to access the basic facilities available in the rural areas. It reduces the remoteness of the people live in the far distance from the service provider centers. It is the same to the other section that the literature in this section about the conventional transport available in the rural areas. But what are the indicators of the adequate and appropriate transport for the rural livelihood to access the basic needs like education and health is clearly untouched in those literatures.

The final part of this section discusses the investment scenarios in the rural transport sector. All of the literatures were explained the investment in the transport infrastructural development. How transport infrastructural investment plays a role in the development of the rural area and creates employment generation is the main focus of those literatures. But investment in the rural vehicle and the problems or prospects for the investment in this sector is clearly absent in those literatures. There is no discussion about the sustainable transport investment in the rural areas of Bangladesh.

### **3.9 Conclusion**

The ultimate goal of the literature review of this thesis is to find out the historical support of the rural transport in the development of rural livelihood. To doing so, a number of related literatures were reviewed for that purposes. Most of the literatures discussed about the conventional transport for the development of rural areas. But in Bangladesh there is evidence that lot of NCMTs emerged in the rural areas in absence of the appropriate and adequate

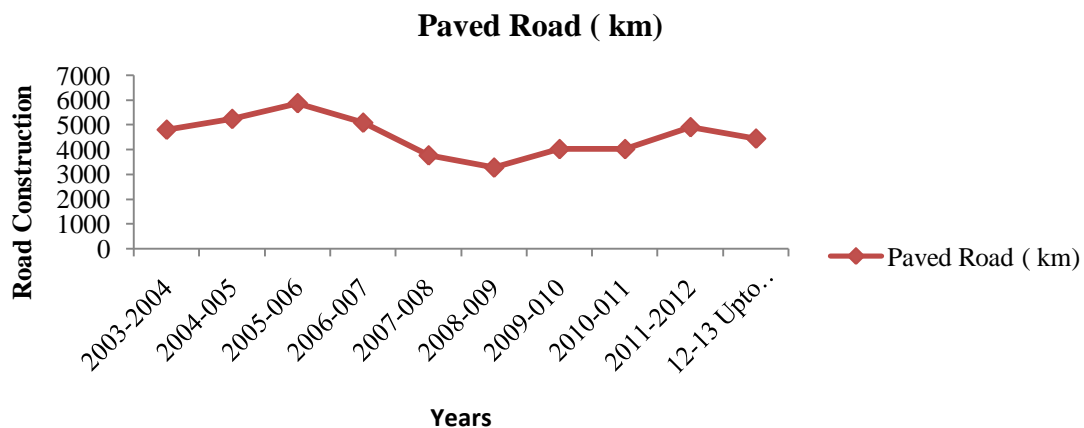
service from the CT. Why the NCMT emerges and what are the basic indicators for appropriate rural transport in the context of rural livelihood is absent in the reviewed literature. Thus the literature review successfully exposes the scope of further research on the role of NCMT in the development of the rural livelihood in Bangladesh. Specifically the findings and the major gaps of earlier studies show the way to move on this arena. Hence this study has set its objectives to reveal the role of NCMT for rural development. Fulfillment of the objectives will hopefully fill up the literature gaps and create new knowledge in the rural development of Bangladesh.

## CHAPTER FOUR

### Overview of Non-Conventional Mechanized Transport

#### 4.1 Introduction

An efficient transportation system is essential to facilitate economic growth in any country. To strengthen rural development, Bangladesh government has also been trying to develop its village roads through Local Government Engineering Department (LGED). Now we have total 71611.78 kms pavement roads and 218414.19 kms earthen road with the total length of 290025.97 kms (LGED, 2013). Figure 4.1 shows the continuous investment in rural road sector to develop the rural transport infrastructure through rural road development (in km) in Bangladesh.



**Figure 4.1: Paved Road Developed by LGED**

Source: B E R -2013

During last three decades Bangladesh government has had a glorious history of developing its roads and highways. It helps the rural poor people in their daily movements. For that the demand of social services is on rise increasingly. The flow of waterways has become alarmingly erratic causing huge siltation in the rivers. As a result inland navigation is

becoming hazardous and waterways shrinking rapidly. This adverse change in waterways is very much evident and visible. NEDECO (1963) shows that 12,000 kms of navigable waterways in 1960s. Another study by IWT master plan-1989 shows about 6000 kms of waterways is navigable. And vessels could negotiate only 3800 kms during low water period. Presently waterways have reduced to about 4500 km of which not more than 2500 kms can be used for navigation in the lean period (MoE&F-2012). Transportation of passenger and goods through three modes of way in Bangladesh has been shown in table 4.1(A). Where land roads is carrying more than that of others. Inland water ways lost its share due to the lack of navigability of the water ways.

**Table 4.1: Modal Share of Three Modes in Total Transport Sector**

Year	Passenger Traffic Pass km (Billion)							Cargo Traffic ton- km (Billion)						
	Total	Road	%	Rail	%	IWW	%	Total	Road	%	Rail	%	IWW	%
1975	17	9.2	54	5.1	30	2.7	16	2.6	0.9	35	0.7	28	1	38
1996	66	52	79	3.9	6	10.1	15	10.7	6.9	64	0.8	7	3	28
2005	111.5	98.4	88	4.2	4	8.9	8	19.6	15.7	80	0.8	4	3	15

Source: MoE&F, 2012

So, the movement of the rural people has increased on the roads instead of the inland water ways. Road transport has become the main way to transport goods and passengers in Bangladesh.

Bangladesh economy needs to grow at a sustained rate of 8 percent per year to achieve the first goal of the MDGs: that of halving the proportion of people living under a dollar a day by 2015. To achieve this growth, the transport sector needs to reduce costs and allocate resources among different modes of transport in a more balanced manner (World Bank, 2009). To achieve those indicators of development, it needs a huge investment in the rural transportation sector through public or private initiatives. Unfortunately, this is not the case in reality which makes a mismatch between transport demand and supply. To address this gap between the

demand and the supply of transport, the local rural people invest their own assets and have made NCMTs with their indigenous knowledge.

To know about the NCMT, it is necessary to collect information about the engagement of rural economic activities and livelihood with NCMT. This chapter is aimed to present the fundamentals of NCMT. This encompasses the description of the types of NCMT, personal information about the owners and drivers of the NCMT, people's dependency on NCMT, route-wise movement system and other general information in the study area. Keeping these issues in mind, data have been collected from six study areas through a questionnaire survey. Data were tabulated in Statistical Package for Social Science (SPSS) (Version-16) software to analyze the above issues. From the analysis, it is expected that the livelihood pattern of the rural people who live their lives with NCMT as a main occupation can be drawn. To know about those issues of the NCMT and usage of that transport, their sizes, and their production processes and about the information of the users, this chapter will significantly help to achieve the objectives of the study. This is relatively a unexplored area of study and there is no information available in document, literature about NCMT in Bangladesh. So it is necessary to have sufficient information about the rural motorized transport. In the following section the fundamentals of NCMT are presented sequentially.

## **4.2 Typology of NCMT**

There are three kinds of NCMT found in the study areas. They are as follows:

### **4.2.1 Framed Body**

Framed body is differentiated by its body structure, according to the knowledge and experience of the respondents. Structurally this kind of NCMT is covered by some rods and irons across the half of the body of NCMT (Appendix-19). This type of NCMTs is covered

with the rods and some steel plates. These kinds of NCMT are very common in all the six study areas. Every kind of goods and people of most walks of life are being transported easily by this transport. It is the reason for the existence of these kinds of transport in all upazilas of the study areas. The concentration of Framed body is highest in Dhunot (nearly 90 percent), while Sherpur, Shibgonj, Paba and Puthia contains nearly about 50 percent of NCMT as Framed body. Mohanpur has the least percent of Framed body among the upazillas. Table 4.2 shows the existence of the three types in number and percent in the study areas.

#### 4.2.2 Plain Body

The second type of NCMT is known as plain body. It looks like just rickshaw-van. A shallow engine is placed on it instead of paddle that's justifies its name as plain body (Appendix-20). This kind of NCMTs is found mostly in Rajshahi district. The drivers and the owner driver of Bogra district are not familiar with this type of transport. Their purposes almost served by the Framed body and Steering type of NCMT.

**Table 4.2: Types of NCMT**

Area	Average per route	Framed Body (%)	Plain Body (%)	Steering (%)	Total (%)
Dhunot	57	90	0	10	100
Sherpur	81	67	0	33	100
Shibgonj	80	78	0	22	100
Mohanpur	71	27	48	24	100
Paba	71	37	40	31	100
Puthia	102	50	45	5	100

Source: Questionnaire survey, 2013-2014

#### 4.2.3 Steering

All of the six study areas contain Steering type of NCMT. It is well known as Steering because of its handling system. This is driven and controlled by a steering (Appendix-21). This type of NCMTs mostly uses high capacity shallow engine, powered by 18 Horse Power

(HP) to 32 HP. This is costly. This type of NCMT contains 4 to 6 gears within it, and a heavy breaking system and other modern technical devices. As it is expensive, it is beyond the capacity of the lower- income people. Those types of transport usually carry heavy loads and people on very few occasions. The Table 4.2 shows the scenario of NCMT with its various types. Average 50 percent of NCMT is known as framed body whereas 45 percent and 5 percent contains Plain body and Steering type respectively.

### **4.3 Conclusion**

Bangladesh has experienced in construction of rural roads and paved ways during the last three decades. Accordingly there should be developing the rural motorized transport. But it is significantly absent in this sphere. In this backdrop the NCMT has been emerged to meet the demand of high moving and available transport. This transport has some physical identities in the purpose of demand. This chapter mainly aimed to provide an account of the different types and NCMT and there percentage in number in the rural areas of Bangladesh particularly in the study areas. Reflection of the way of their moving areas and the daily movement schedule are also presented in this chapter. By doing this, it is found that there are over six thousands NCMTs are moving on the rural road. It has three categories: Framed body, Plain Body and Steering types. Among the typologies, Framed body and Plain body contains the most part of total percentage. The Framed body and Plain body are made by the shallow engine powered by 4-20 horse power. On the other hand, the Steering type which is small in number but it is powered by heavy shallow engine to 12-35 horse power. The NCMT has been kept its existence by developing its mechanical devices day by day. Now it has been proven as the only appropriate transport for the rural poor by the diversified services of its.

## CHAPTER FIVE

### RESULT ANALYSIS AND DISCUSSION

#### 5.1 Socio-Demographic Information about the Driver and Owner driver of the NCMT

This thesis is aimed to analyze the role of the NCMT in the rural economic development. To do that the socio-demographic information is important to analyze which is still now an assumption to the people living outside the rural areas. Based on the above circumstances, this chapter is a step to analyze the age, education and training capabilities of the drivers of the NCMT. There will also be a part for the discussion about the types of occupation, time of involvement with NCMT etc. Why the people are engaged in the NCMT occupation is also discussed here. This section of this chapter also analyzes the people's dependency on it and route-wise movement system and other general observations regarding NCMT. This section of this chapter has been concluded through the discussion of the other diversified uses of NCMT in the rural areas.

##### 5.1.1 Age

It is said in the motor vehicle ordinance, 1993, Chapter Two under the heading of “Licensing of the drivers of motor vehicles” in the Section - 4 is that *“Age limit in connection with driving of motor vehicles- (1) No person under the age of eighteen years shall drive a motor vehicle in any public place. (2) Subject to the provisions of section 15, no person under the age of twenty years shall drive any motor vehicle as a professional driver in any public place.”* Column-1 in Table 5.1 records the range of age of the drivers of the NCMT is from 16 to 55 years. The average age of the people who drive the NCMT in the study area is about 33 years. Mostly agricultural and agro based rural people, who have no or a little education,

drive the NCMT for their livelihood. Those people, with the ability of doing any hard work, are able to drive these vehicles. Besides, the drivers of NCMT have to do the work of loading and unloading, which is laborious. So children and aged people who have no ability to do hard work are not able to drive the NCMT.

### **5.1.2 Education**

The motor vehicle ordinance – 1993 has no clear information regarding the necessity of minimum years of education, though basic education is essential in every spare of human life. It is found that technical education is not a factor for the profession like driving NCMT but the drivers of NCMT have basic education. The survey result shows that, people having from no education to graduate level education (degree level completed) are engaged in it. Column- 2 in Table 5.1 shows the average years of education level of the respondents of the study area. On average they have 5/6 years of education. The present educational status does not have any influence on their profession. As said earlier, the people engaged in NCMT, come from different types of professions. They do not have enough education to get other jobs. NCMT profession is a suitable sector to employ the illiterate people in the rural area; who have no other way of earning to support their family without education. Only 8-10 percent of the respondents in the study area have completed their study up to the Higher Secondary Certificate (HSC) or Graduate level. But they failed to get a job in another sector. Then they come to this sector to get a full time job with their scare resources. Besides, the illiterate and the people with primary education have got the same fate. So education is not a factor to drive it on the road.

### **5.1.3 Training**

Training of driving for the drivers of vehicles and training of drivers about the technical issues regarding vehicles maintenance is important for safety and security for the passenger and drivers. However, almost all the drivers of NCMT have no institutional training to drive NCMT as a professional driver. The people who want to get the job of NCMT, 3/4 days' field practice is enough to drive NCMT or start NCMT occupation according to the opinion of the respondents. Those people don't feel any problem in driving it without any training. Above 80 percent driver respondents of the NCMT have opined they have no institutional training to drive NCMT. Columns- 4 and 5 of Table 5.1 present the respondents training capacity. About 20 percent respondents said they have 3 /4months informal training. These 25 percent respondents are involved with 'Steering' type NCMT which contains 4 to 6 gears within the mechanical devices of the NCMT. Other than that, the rest of the 80 percent NCMTs have no mechanical devices like a car, bus or truck. They move only the rural road, where other conventional transport is rarely seen. In absence of the investment in the rural transport sector, the growing demand of motorized transport is filled up by those NCMT. Only the basic training and basic technical know-how is informed by the seniors in this sector. The drivers are well informed of the traffic system of the rural road network they need. Because of the low density in the rural road traffic, it is not a problem to drive the NCMT in rural road network. Besides the low speed of the NCMT is one of the reasons behind denying any necessity of training to drive a NCMT.

### **5.1.4 Types of Occupation**

The people engaged with NCMT are poor and mostly illiterate in the study areas. They do not have enough money to invest in a large scale economic activity. On the other hand

cultivable land is being fragmented day by day and per capita land is increasingly decreasing. Besides that economic activity and the limited scope of job for the illiterate and poor unemployed people are getting skewed day by day in the rural areas of Bangladesh. Under these circumstances, NCMT profession helps people to live with minimum dignity in the society. Through this profession they maintain their family, children's educational expenses, medical cost and others subsistence cost as well. Almost all of the total respondents said that, the NCMT is their principal occupation. Column- 6 of Table 5.1 presents the occupational status of the respondents in the study area.

**Table 5.1: Socio-demographic Information of the owner of NCMT**

Area	Average age	Average year of Education	Have Training (%)		Type of Occupation (main)%	Average Years of Involvement	Type of Ownership (%)	
			Yes	No			Owner driver	Driver
Dhunot	32	5	23	77	100	10	77	23
Sherpur	38	6	23	77	100	11	85	15
Shibgonj	33	5	23	77	100	8	77	23
Mohanpur	34	5	15	85	100	10	85	15
Poba	33	7	15	85	100	9	85	15
Puthia	30	8	15	85	100	7	85	15
Average	33	6	19	81	100	9	82	18

Source: Questionnaire survey, 2013-2014

### 5.1.5 Years of Engagement

It was found that many new comers are coming in this profession. According to the respondents as a new comer, they have mentioned that there has been no suitable job for him and even do not have enough money to get any job in this competitive market. Besides, in the rural level there is little scope to make a business in informal sector. That is why they are engaged with NCMT profession with their small amount of capital. According to the field survey it is found that free entry, less competition, respondent's physical capability and low

financial capability are the main features to start the driving occupation of NCMT. All these features are favorable to the respondents in the rural level of the study areas.

#### **5.1.6 Occupation before Involvement in NCMT**

It is found that the NCMT driving professionals have come from 15 different kinds of occupations. These are van pullers, rickshaw pullers, cart pushers, agricultural and other labors, masons, carpenters, grill and led workers, petty businesses, construction workers, cycle/rickshaw makers, transport labors, grocery traders, new comers, or students, aqua culturers, employes of shop and hotel, wood traders, CT drivers, garment workers, and different types of illegal activities. It is found that 23% of the NCMT driver migrated from agricultural labors. The reasons are that they fall shortage of liquid money, low wage rate in agricultural field, lack of better income opportunity in agriculture. On the other hand, in the NCMT profession, there are opportunity to earn huge liquid money and better opportunity to earn more than that of agriculture. Seventeen percent of the respondents migrated from van and rickshaw pullers. Their professions were very laborious but they had no opportunity to earn more as per to their labor. NCMT profession is less laborious than that and is a sector to earn more and that employee has the opportunity to take rest as per their requirement.

Thirteen percent have come as newcomer in this NCMT occupation. That person who does not have enough education and has to take the burden of the family comes to the profession of NCMT. According to the respondents, in their villages there is no other occupation to earn as per their family need. Nine percent of the total respondents were the petty businessmen. They have come to the NCMT occupation because they have no enough money to continue their business. Lot of deferred payment on their business compels them to change their businesses. In that case NCMT is the first option to choose the profession in their villages. NCMT

occupation has no system of deferred payment in business. Eight percent of the total respondents have come from the occupation of mason, carpenter, and grill and led worker. In their business there is no growth and improvement rather they fall in physical problem with their business. NCMT occupation does not pose much threat of physical difficulties. Among the total respondents six percent was transport workers and conventional transport drivers. In this profession they did not get subsistence salary but the owner or driver was used to abusing them. NCMT occupation is their personal occupation. Here are no possibilities to suffer from such type of problem. Five percent were grocery traders. Four percent were the employee of shops and hotel, three percent comes from garments workers. Three percent of the total gave up their previous illegal occupation like dacoit, snatcher, smuggling and such type of illegal activities. NCMT occupation has helped them to leave such illegal activities to live their lives with legality and dignity in the society.

#### **5.1.7 Reasons for Involvement in NCMT**

Seventeen percent of the total respondent's expressed that, lack of cash money and lack of opportunity to income enough in other profession are the main reasons to discontinue the previous occupation. NCMT occupation has the opportunity of regularity in earning. These help them to solve their regular financial demand. Ten percent to Fourteen percent respondents said about the reason of freedom in business and less laborious than that of other professions. Nine percent of the total respondents said they have no better income opportunity according to their education and experience in their villages but NCMT occupation has it. Besides NCMT occupations do not need huge investment said 9 percent of the total respondents. They can take rest in any time. In this regard it is comfortable than that of other occupation. With their previous professions, they failed to bear their family expenses with

earned money. But NCMT profession has the opportunity of more income per day. Besides lack of education, lack of capital, risk in business and other crucial matters do not permit them to take another occupation where as NCMT occupation is free from all those kinds of problems. The workers of the hotel and shops have come to livelihood because of abuse from their employer, low income with no increment in their job. But NCMT occupation ensures higher income which depends upon someone's tendencies of hard work. Generally 16-55 years old people are engaged with the driving of NCMT. On an average 33 years old people drive it. That information also has been shown in the Column-1 of Table 5.1.

#### **5.1.8 Types of Ownership of NCMT**

Ownership of the vehicles is a factor to earn more from the NCMT business. To earn more it is a factor of consideration. The owner and driver (both) of the NCMT earn more because there is no participation in their earnings. It is found in the study area almost 80 percent of the total owner are in the both category that is owner-driver. About 20 percent of the respondents are in only driver category. Those types of NCMT contains high powered engine which is expensive. Only the rich people of the rural areas belongs it. The poor have no ability to purchase this type of NCMT. Columns 8 and 9 in Table 5.1 showed the details about the ownership of NCMT in the study area.

#### **5.1.9 Dependency on NCMT**

Within the six study areas it is found that total number of NCMT is just above 6 thousand. Among these over 95% persons is the owner of those NCMT. Column 2 in Table 5.2 shows the total number of NCMT in the study areas. So it can be said almost one NCMT belongs to one household. In the study area, according to respondents' opinion average household consist about 4 members whereas the average household in the country is about 4.4

persons per household and in Rajshahi Division it is 4.1 person per household (BBS, 2011). It is found that 24,990 people depend on NCMT in the study areas. Column 5 in Table 5.2 showed the total number of population directly depends on NCMT in the six study areas.

**Table 5.2: Dependency on NCMT**

<b>Area</b>	<b>No. of NCMT</b>	<b>No. of Owner</b>	<b>Family Member (Average)</b>	<b>Total People Dependent on NCMT</b>	<b>Total School Going Student(No.)</b>
Dhunot	740	670	4	2680	22
Sherpur	1134	1035	5	5175	22
Shibgonj	960	925	4	3700	31
Mohanpur	923	920	4	3680	27
Poba	1065	935	5	4675	28
Puthia	1224	1270	4	5080	24
<b>Total</b>	<b>6046</b>	<b>5755</b>	<b>4</b>	<b>24990</b>	<b>154</b>

Source: Questionnaire survey, 2013-2014

Among the family members of the respondents, it is found total no of 154 school going students have in the study area (Table 5.2 Column 6). Besides, numbers of economic activities introduced in the rural areas centered by NCMT. Those economic activities are enhancing the livelihood pattern of the rural people. Those economic activities can be discussed in two ways. Firstly, forward linkage livelihood activities, it contains the petroleum supply, maker/repairer, spare parts shops etc. in the rural areas. Secondly backward linkage livelihood activities, which are shallow engine supply, body construction, wheel supply and other mechanical device supply. During the field survey, it is found a significant number of people are engaged with such type of activities. Those activities are helping the rural people to enhance their livelihood. The economy of scale is expanding in those activities. Rural economy is growing stronger by diversifying the activities through NCMT.

Farmers of those areas mostly depend on NCMT. According to the driver and owner driver of the NCMT, 26 percent of the total agrarian goods are transported through

conventional transport. Rests of the 74 percents are transported through NCMT. Table 5.3 shows the agricultural commodity transportation by NCMT and CT at a glance in the study area.

**Table 5.3: Transportation of Agricultural Commodity by NCMT and CT (%)**

Area	CT	NCMT	Total
Dhunot	22	78	100
Sherpur	30	70	100
Shibgonj	24	76	100
Mohanpur	25	75	100
Poba	29	71	100
Puthia	28	72	100
Average	26	74	100

Source: Questionnaire survey, 2013-14

Between the study areas, the maximum rural agrarian people of Dhunot and Shibgonj *upazillas* of Bogra district transported their agricultural commodity by the NCMT. On the other hand the agrarian rural people of Sherpur *upazila* of Bogra district, Poba and Puthia *upazillas* of Rajshahi District usages the NCMT in lowest percent in comparison of other study areas. Sherpur, Poba and Puthia *upazillas* is located adjacent to district proper and high ways. The moving of NCMT is restricted by the authority and conventional transport associations within the local areas instead of district road and the high way. That is why the people of Dhunot and Shibgonj *upazillas* used the NCMT in the highest percent.

#### **5.1.10 Route Wise Movement System in the Study Area**

Drivers and respondents of the study area expressed that they travel in an average 50-55 kms daily (Column 2 inTable 5.4). This depends on the capacity of its engine power. NCMTs with 6 to 10 HPs engine move locally within 5 to 15 kms. route with 3 or 4 trips per day. NCMTs with the heavy types of engine like 25-35 HPs move 100 kms to 160 kms per

day. Those move in different way daily and those are not generally used, rather they use it as a reserve transport. On the other hand, NCMT with low HP engine move as a passenger or freight transport within the locality as a general transport. The owner driver or driver of those NCMT drives these transport 75 percent daily in one route. But only the bigger one, which is about 25 percent of the total NCMT, drive in different route daily. All of those drive 7 days in a week. As because of, NCMT profession is their main profession and their family depends on it. About 10 to 12 number of passengers can be carried with the NCMT of 6 to 12 HPs engine. Almost 16 and above passengers could be carry through the NCMT with 15 to 25 HPs engine (Column -7 to 11in Table 5.4).

**Table 5.4: Route Wise Movement System in the Study Area**

Area	Average Daily Travel (in km)	Type of Movement in %				Movement in a week	Trip wise Passenger (%)				Goods per Trip in kg('00)	Longevity of NCMT in year
		Daily	Often	Sometimes	Different		10 to 12	12 to 14	14 to 16	16 and above		
Dhunot	52	77	0	0	23	7	15	0	8	54	31.72	12
Sherpur	55	15	38	8	38	7	38	23	8	0	22.76	14
Shibgonj	53	8	69	0	23	6	23	31	15	15	23.13	14
Mohanpur	55	0	85	0	15	7	8	23	38	15	22.76	15
Poba	51	38	38	0	24	7	8	0	38	23	28.73	19
Puthia	50	8	77	0	15	7	15	38	31	0	18.66	13

Source: Questionnaire Survey, 2013-2014

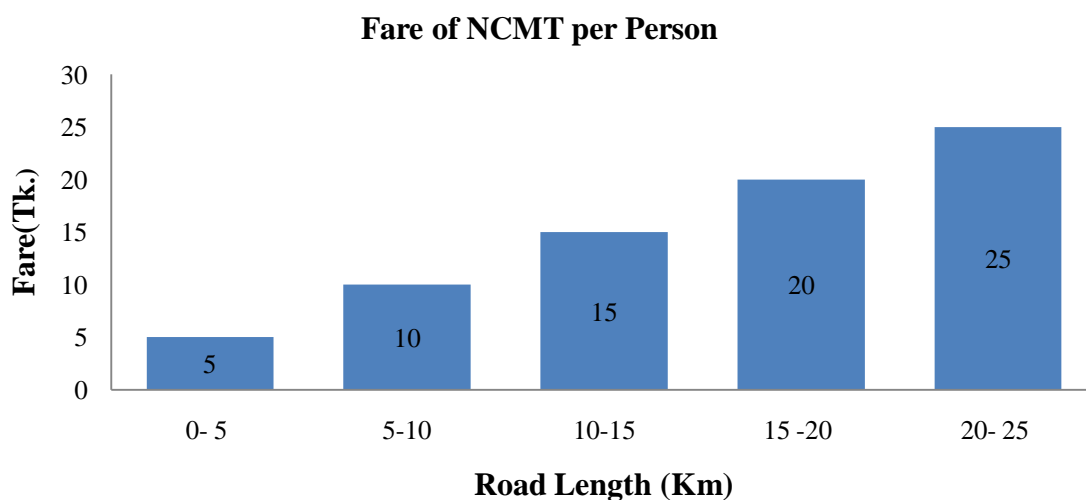
In case of freight transport, NCMTs are able to carry from 187 to 5598 kgs in one trip. This depends on the engine power of the NCMT. Column 12 in Table 5.4 shows the carrying capacity of the NCMT in the study area. According to the respondents, longevity of the NCMT depends upon its use and maintenance. NCMTs are found to run at least 5 years to

highest 25 years. Column 13 in The Table 5.4 shows the validity of the above statement regarding route wise movement system of NCMT.

#### **5.1.11 General Observations**

##### **A) Reservation and General Uses**

As per the observation of the respondents about 71% NCMTs are used as general transport. They carry mostly passengers in some specific routes. They are hardly used as a reserved transport. It depends upon the demand of farmers. They carry goods to *hut*, *bazar*, *chatal* or the wholesale market. Twenty nine percent of the total NCMT is used as reserve transport in the study areas. They are hardly used as a passenger transport. Most of the time those are used as inter-district, inter-*upazilla* carriers to carry high load goods. In case of reservation they transport various kinds of goods such as crop, cattle, poultry, seed and fertilizer, construction material, fish and hatchery, grocery good etc. In the study areas all those are equally transported through NCMT according to the information of the respondents which is shown in the following figure. NCMTs use the Chinese shallow engine with the capacity of 6 to 35 HPs. The fare of the NCMT is not settled by any authority. They themselves settle it through negotiation with passengers. The fare of NCMT system is as follows:



**Figure 5.1: Fare of NCMT Charges in Different Distance**

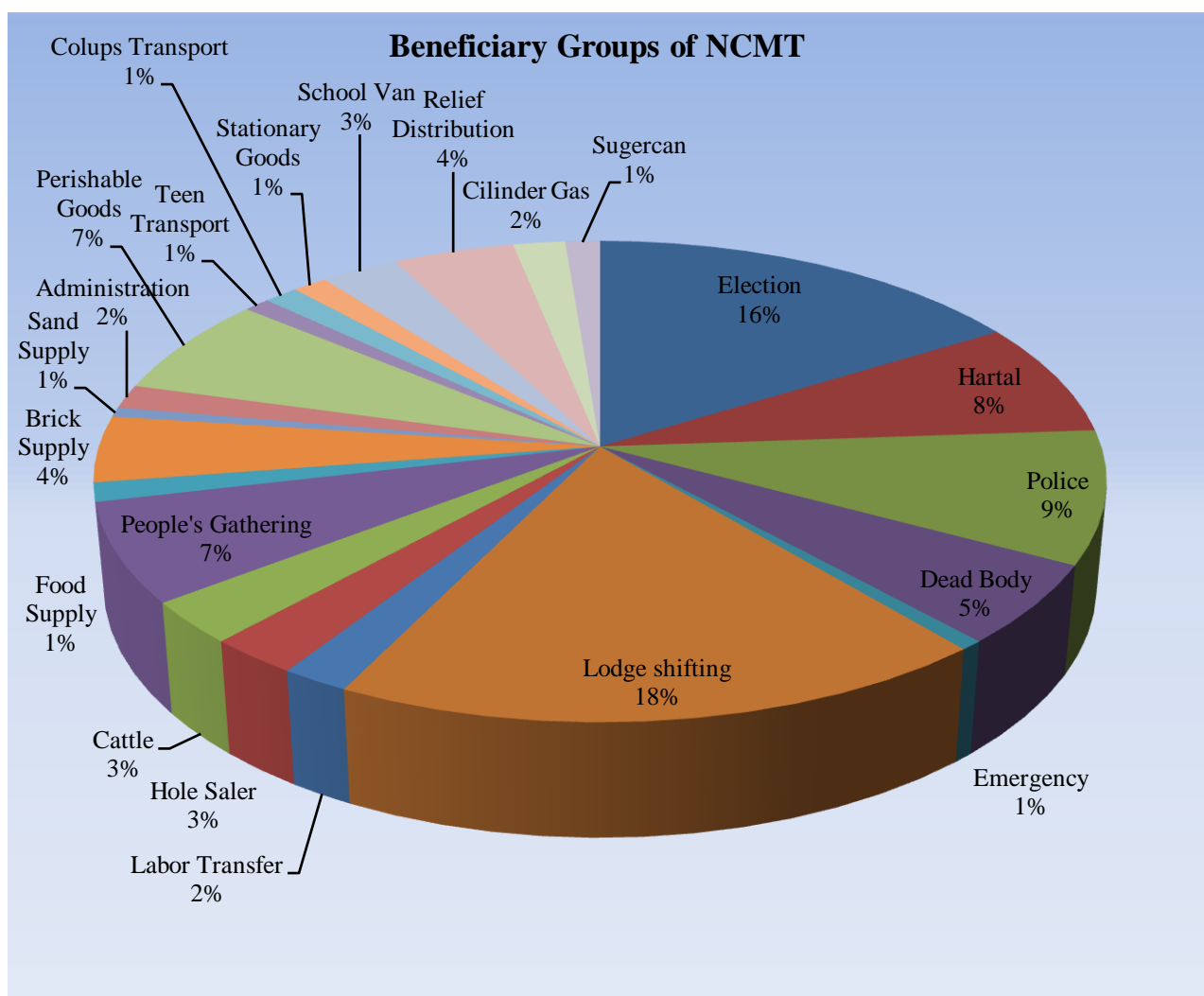
Source: Questionnaire Survey, 2013-2014

Usually those NCMT which are used for transporting passengers have no specific stoppage. They stop it as per the demand of the passenger. The driver of the NCMT felt some physical problems during their driving time which include pain in whole body, little bit fever and tiredness in body.

#### **5.1.12 Other Usage of NCMT: The Life Line of Rural Economic Activities**

NCMTs are used in various kinds of business and work in the rural areas of Bangladesh (Appendix 22-27). Government and non-government organizations in the rural areas of Bangladesh use NCMT in their daily or emergency time. The usage of NCMTs can be divided in three parts firstly, personal usage: People of rural areas of Bangladesh use it in celebration of marriage and other personal celebration. They also use it in any kinds of emergency case. Bangladesh has the experience of huge *hartal* and strike in its political demonstration. During *hartal* all kinds of transport are seen to be closed but NCMT do not close its operation. The political activist considers it out of the scope of *hartal*. In the rural

areas of Bangladesh those types of NCMT are used in case of lodge shifting, even people carry the dead body to the grave yard , the farmer transport their perishable goods from the field to market daily within the shortest possible time. The political person carries the people to the political meetings and demonstration. People use it to transfer bricks from the brick field to their house. Farmers of the Rajshahi district carry their sugarcane to the sugar mills; owners of the brick fields use this transport to bring wood, coal to the brick field. Early in the morning it is seen that NCMTs are used to bring fish to the hole-sale market. Secondly, various non-government organizations use this transport. The gas company carries the cylinder gas from town to the rural area where the pipeline gas is unavailable; the whole seller companies transport their goods to the dealers in rural areas. Recently established kindergarten school in the rural areas used this transport as a school van. Thirdly, the respondents said the local government organizations use NCMTs for different purposes. For example, Police use it in their daily duty during night because of their shortage of transport; during election time local election commissions use it to transport their election goods to the remote areas, local administrations use it to transfer relief goods, local *thana* police use it to carry the dead body to the hospital in case of post mortem. Figure 4.6(A) shows the different kind of benefits of NCMT in the rural areas of Bangladesh.



**Figure 5.2: Beneficiary Groups of NCMT**

Source: Questionnaire survey, 2013-2014

From the figure, 18% of the total respondents opined about the usages of NCMT in the rural areas as to shifting their lodge. Local election commission also uses it in purpose to transfer the election materials to the polling center, 16% respondents opined about this benefit of NCMT and 9% of total respondents respond about the benefit of use of NCMT as to regular night duty in the rural areas for local police. There are no blockages to move the NCMT during *hartal* day in the rural road. Activist of the political party consider the NCMT out of the scope of *hartal*. Political parties also use it in people's gathering. Apart from this, different type of usages of the NCMT is also shown in the above figure.

### **5.1.13 Conclusion**

The provisions of rural roads and transport services have been taken synonymous with each other, but in reality this has not proved to be the case. This section of this chapter attempted to redress NCMT seeking to change the mindset of the policy makers to think about its importance and role in the promotion of transport services in the rural areas of Bangladesh. This section raises the key issues of the transport in the rural areas statistically. People of the rural areas are able to meet the demand of transport. They proved it through the creation of NCMT by their indigenous knowledge. The NCMTs in the study areas are playing an important role to redress their daily transportation need. This section addressed the issues on which NCMTs are playing a vital role. Besides, lots of rural poor people live on it. This section also showed the process of driving NCMT, the livelihood of the owners of the NCMT, people's dependency on NCMT in the rural areas. This section helps to make a critical economic analysis of the role of NCMT including income analysis, investment analysis, and agricultural development through NCMT, role of NCMT in education and health, capital formation through NCMT which will be discussed in the next section. This section has potential to help to make a comparison with conventional transport in the next sections.

## **5.2 Investment in NCMT Sector**

### **5.2.1 Introduction**

The success of the economy highly depends on the transport facilities available within the country. Hence motorized transport is very important due to increasing trend of inter-district and intra-district businesses and to confirm equal development of different region (Khan, Hyder, and Ali, 2005). An adequate and efficient rural road transport is a pre requisite for both initiating and sustaining economic development. Rural road transport involves major market share to total rural transport sector and it needs huge investment. But reality is that there is no formal investment in rural road motorized transport sector. In response, the rural people invest their money and wealth to fill the gap of demand and supply of motorized transport. For this the informal motorized transport such as NCMT has burgeoned throughout the rural areas of Bangladesh. This section of this chapter is a step to describe the total investment in this sector and the other issues related to the investment with the following objectives:

- To make a projection of total investment in this sector;
- To visualize the employment generation through the investment in this sector;
- To compare with other transport exist in the rural areas by some economical issues.

These objectives have been restructured according to the following heading:

- Total investment in NCMT sector
- Total employment and income generation in NCMT sector
- To compare NCMT with other transport by E-Y ratio
- To compare NCMT with other transport by N-I ratio
- Conclusion

### **5.2.2 Total Investment in NCMT Sector**

There are significantly absent of rural transport investment to make rural motorized transport in formal sector. But from the government, there are lots of transport infrastructural investments have been taken place in the rural areas. Therefore there is growing interest in the role of rural transport investments in Bangladesh as a contributor to economic growth, employment generation, livelihood diversification and poverty reduction. People of these rural areas come forward to do the same. Here it is important to note that there is a difference between the investment in formal sector and the investment in NCMT sector. In case of formal investment people has to follow some basic criteria i.e cost benefit analysis, value of the future income, cost of the outlays in the present, IRR and so many economic terminologies. But in case of investment in NCMT sector people do not think about the above criteria, rather they think about the employment generation and the daily income from the NCMT. How they can maximize their daily income is the main target of them. In doing so, people have already been made a huge investment in the study areas in the NCMT sector. Table 5.5 shows the total investment scenario in the study areas.

**Table 5.5: Investment in NCMT Sector**

Area	Number of NCMT	TI <sup>2</sup> per NCMT(100 thousand BDT)	TI in the Area(100 thousand BDT)	TOC <sup>3</sup> (100 thousand BDT)
Dhunat	740	1.52316	1127.141	1.70385
Sherpur	1134	1.17807	1335.9366	1.3645
Shibganj	960	1.48385	1424.5	1.677
Mohanpur	923	1.38471	1278.0916	1.429
Paba	1065	1.44926	1543.4606	2.016
Puthia	1224	1.38237	1692.021	1.2825
Total	6046	-	8401.1508	9.47285

Source: Questionnaire Survey 2013-14

It is evident in the above table that there exist more than six thousand NCMTs in the study areas. The above table also shows the total investment which is over BDT 84 million. The total operating cost is also a considerable amount which is over BDT 9 million. The operating cost includes local *thana* police bribery cost, traffic police bribery cost, local *mastan* (muscle man), municipality cost, chain master cost etc. on the monthly basis in addition to fuel and maintenance cost. The operating cost is also a considerable amount which reflects the unusual costs of this sector.

### 5.2.3 Total Employment and Income Generation in NCMT Sector

The ultimate goal of the investment in NCMT is to generate self employment and to increase the income level of the low income group in the rural areas. To do so, people of the rural areas have employed their savings and other resources in NCMT to live in the society in a better way. People of the study areas have been able to upgrade their economic lives through the investment in NCMT sector. They have found full time employment and created working

<sup>2</sup> Total Investment (TI): Total investment has been calculated by the initial purchasing cost of each NCMT. So TI is calculated by the initial purchasing cost of NCMT multiplied by the Total number of NCMT.

<sup>3</sup> Total Operating Cost (TOC): Operating cost includes maintenance cost of NCMT, fuel cost of NCMT and other costs such as local police, municipality, local *mastan* (muscle man) at transport sector, traffic police, chain master and so on. It has been calculated for one month.

hour in the society. In doing so, unemployment problem in the rural areas has been reduced remarkably. The following table is an illustration of the employment generation and increasing income through NCMT in the study areas.

**Table 5.6: Employment and Income Growth through NCMT**

Area	Total Employment <sup>4</sup> (person/year)	Yearly Working (man-hour)	Monthly Income before involving NCMT (BDT)	Yearly Income before involving (BDT)	Monthly Income after involving NCMT (BDT)	Yearly income after involving NCMT (BDT)	Income Growth (%)
Dhunot	740	450240	3615	43385	12615	151385	349
Sherpur	1134	608580	3231	38769	12769	153231	395
Shibgonj	960	699300	3385	40615	13308	159692	393
Mohanpur	923	618240	3577	42923	16077	192923	449
Poba	1065	628320	3346	40154	12000	144000	359
Puthia	1224	719040	2769	33231	14000	168000	506
Average	-	-	3321	39846	13462	161538	405
Total	6046	3723720	-	-	-	-	-

Source: Questionnaire Survey, 2013-14

It is evident in the above table that there exist more than six thousand NCMTs in the study areas. One person drives and operates one NCMT, so total employment generated in this sector is about six thousand persons per year. These created over 37 million working man-hour yearly in the job market. Besides, the income level of the employed people in NCMT occupation has been increased. Before joining the NCMT occupation they earned yearly average BDT 39846. But after joining NCMT occupation they have been able to increase their yearly income average of BDT 161538 which is over 400 percent higher than that of before joining NCMT occupation.

<sup>4</sup> Total employment: In the study area, one NCMT employed one person. Total employment thus includes the total number of NCMT in each study area.

#### 5.2.4 Comparison with N-I (Employment-Investment) Ratio to other Transports

Total investment and efficiency of employment generation of NCMT is presented and compared with that of the conventional transport in the following sections. Total investment in the study areas and the volume of employment generation by the NCMT are presented in the following Table. Ratio of employment generated and volume of investment is also presented in Table. The N-I ratio indicates the number of yearly employment per one hundred thousand taka investment. The average N-I ratio of NCMT is 0.685, where Puthia concentrates the highest and Paba concentrates the lowest ratio which is reflected in the Table 5.7(B). The Table 5.7, Table 5.7(A) and Table 5.7(B) and Figure 5.3(A) 5.4(B) shows the comparative analysis according to the N-I ratio. Among the NCMTs, Framed body and Plain body types consist of more than 80 percent of total NCMT. So employment generation is highest in Framed body and Plain body type NCMT. If we consider employment generation without Steering type NCMT, we get the N-I ratio is about 1.0343 which is illustrated in the last Table 5.7(B) and Figure 5.3(B)

**Table 5.7: N-I Ratio of CT (CNG)**

Area	Total Employment (person)	TI per CNG (BDT 100 thousand )	TOC per CNG (BDT100 thousand )	TI (BDT100 thousand )	N-I Ratio
Dhunot	216	3.63750	0.09738	785.70000	0.2749
Sherpur	200	3.63750	0.11189	727.50000	0.2749
Shibgonj	206	3.51875	0.11788	724.86250	0.2842
Puthia	50	5.00000	0.09000	250.00000	0.2000
Total	672	-	-	2488.06250	0.2700

Source: Questionnaire Survey, 2013-14

**Table 5.7(A): N-I Ratio of CT (Bus)**

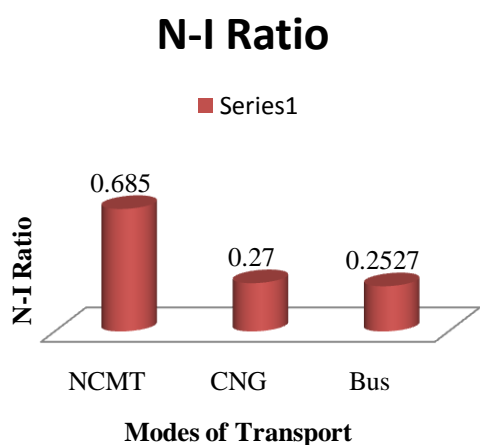
Area	Total Employment (Person)	TI per Bus (BDT100 thousand )	TOC per Bus (BDT100 thousand )	TI (BDT100 thousand )	N-I Ratio
Dhunat	36	12.14567	0.51559	145.74804	0.2470
Sherpur	48	11.66667	0.49166	186.66672	0.2571
Total	84			332.41476	0.2527

Source: Questionnaire Survey, 2013-14

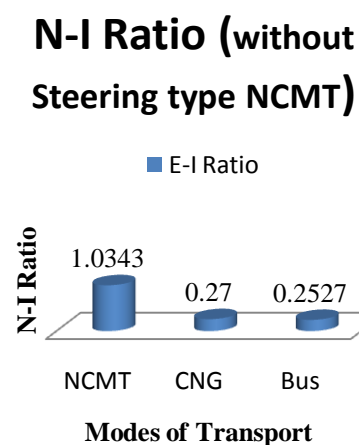
**Table 5.7(B): N-I Ratio of NCMT**

Area	Total Employment (person/year)	TI ( BDT. 100 thousand)	TOC ( BDT. 100 thousand)	N-I Ratio by TI	N-I Ratio by TI (without Steering)
Dhunot	740	1127.14	1.70	0.5944	0.8496
Sherpur	1134	1335.93	1.36	0.7747	1.3736
Shibgonj	960	1424.50	1.67	0.6493	1.3493
Mohanpur	923	1278.09	1.42	0.7198	0.8593
Paba	1065	1543.46	2.01	0.6057	0.8108
Puthia	1224	1692.02	1.28	0.7505	0.9632
Total	6046	8401.15	9.47	0.6850	1.0343

Source: Questionnaire Survey, 2013-14

**Figure 5.3(A):- N-I Ratio of Different Mechanized Rural Transport Mode with NCMT**

Source: Questionnaire Survey, 2013-14

**Figure 5.3(B): N-I Ratio of Different Mechanized Rural Transport Modes with NCMT except Steering Type NCMT**

Source: Questionnaire Survey, 2013-14

Table 5.7 is an account of the performance of the conventional transport called CNG. In the study areas CNG employed nearly 7 hundred persons with BDT 2488 hundred thousand. The N-I ratio is about 0.27, which is lower than that of NCMT. The N-I ratio of bus is also lower than that of NCMT which is shown in the Table 5.7 (A). Figure- 5.3(A) shows the E-I ratios among the different modes of transport where NCMTs concentrates the highest than that of other motorized transport.

### **5.2.5 Conclusion**

The major issues considered in the section of this chapter are to analyze the total investment in the NCMT sector. From the investment, generated by the rural poor people in the NCMT sector, how much employment and income also generated through this investment are also described in this chapter. Besides, comparison between NCMTs and other modes of transport through employment-Investment (N-I) ratio also made to analyze the adequacy and effectiveness of the transports in the context of rural livelihood. To do so, it is found that there is over BDT 8400 hundred thousand already invested by the rural people in the six study areas. By this investment over 6000 people employed in fulltime job and created nearly 40 hundred thousand working man-hour yearly in the job market. The average transitional income of the people involved in NCMT occupation has increased over 400 percent. Only NCMT occupation can employ a person with minimum investment in this sector. From the above discussion the investment in NCMT sector is more effective than that of other transport exists in the rural areas. Based on the investment, the expenditure-income (E-Y) ratio has been reduced remarkably and capital formation by these people has increased at a higher rate than that of the other transports which is a subject matter of the next section.

## **5.3 Income, Expenditure and Transitional Growth**

### **5.3.1 Introduction**

Personal income is the first and only option for a person's economic and social development. People always try to get employment to earn for their development through their earnings. So it can be said that a person with no employment is the burden of others. Over time it has become axiomatic and part of underlying rationale for income and development. Rural areas always face the problem of acute unemployment and low income, while the agricultural sector is the main source of income. There are little scopes for existing sources of income as well as employment generation in the rural areas. Bangladesh faces the insufficiency of diversified opportunities to generating income and employment in the rural areas. Government has no information about the income earning informal sectors of the rural areas. Among them one is silently acting an important role to improve the life standard of the rural people by creating employment opportunities which is NCMT sector. The NCMT sector is playing proactive role to make higher of their income as well as life standard. The rural people also get benefit anyhow by using that rural transport. The objectives of this section are:

- To describe the income earning opportunities, total income, expenditure and savings propensities;
- To analyze the ability and importance of NCMT through expenditure-income (E-Y) ratio;
- To describe the resource build up through the earning from NCMT;
- To compare the past and present situation of resource buildup of the people engaged in NCMT; and

- To make a comparison between NCMT and other modes of transport moving in the rural areas through E-Y ratio.

The efficiency of this emerging transport sector is important to come out from the predicament of low income trap by creating capital formation. To do so, primary data has been collected from driver and owner of NCMT. Drivers of different types of CT moving in the rural areas are also the respondents in this purpose. This section organized into the following subsections:

Income growth through NCMT, Expenditure- Income (E-Y) ratios of people involve in NCMT, Rate of resource buildup through NCMT, E-Y ratios of people involve in conventional transport in the rural areas, and Conclusion.

### 5.3.2 Income Growth through NCMT

People who are currently engaged in NCMT came from different types of occupation. Income growth is a tool to justify their occupational change. It is a transitional income growth from non-NCMT to NCMT occupation. Table 5.8 shows the transitional income growth of the people engaged in NCMT.

**Table 5.8: Income Growth through NCMT**

Area	Monthly Income before Joining NCMT(BDT)	Average Yearly Income before Joining NCMT (BDT)	Monthly Income after Joining NCMT(BDT)	Yearly Income After joining NCMT (BDT)	Transitional (non NCMT to NCMT) Income growth (%)
Dhunot	3615	43385	12615	151385	349
Sherpur	3231	38769	12769	153231	395
Shibgonj	3385	40615	13308	159692	393
Mohanpur	3577	42923	16077	192923	449
Poba	3346	40154	12000	144000	359
Puthia	2769	33231	14000	168000	506
Average	3321	39846	13462	161538	405

Source: Questionnaire Survey, 2013-2014

People engaged in NCMT had fallen low income trap before joining NCMT. They lived their lives under subsistence level of their income. There were no ways to come out from the vicious cycle of poverty. In such situation, average monthly income was only BDT 3321 before joining NCMT occupation. Among the six areas, Puthia contains the lowest and Dhunat contains the highest average monthly income. They could not manage all their expenditure with this low level of income. From this vulnerable stage of living standard people wanted to come out. NCMT occupation helped them to come out from this poverty trap. And this occupation is one of the suitable occupations for them to come out from the subsistence level of living. At present they earn average BDT 13462 monthly with the NCMT occupation. People of Mohanpur *upazilla* are earning the highest where people of Poba are earning the lowest.

The transitional income growth from non-NCMT to NCMT is about 405%. From this, conclusion can be drawn as: the occupational transformation was the correct decision to come out from the low level income trap. From Table 5.8, we can see drivers of Mohanpur *upazilla* earn the highest among the six *upazillas* as Mohanpur is located far from the centre of the district town (Appendix-2). For this remoteness and long distance from divisional town, the drivers have to move a long road and earned more. Not only that there are no alternative motorized transportation to move faster except NCMT. So people living in Mohanpur *upazilla* have to use NCMT in absence of other modes of motorized transport. Besides the internal connecting paved road constructed by LGED is too narrow to move two truck or bus simultaneously at the same time. NCMT can move fast on these roads easily. So people have to be bound to use the non conventional mechanized transport. On the other hand a few numbers of buses is moving on the internal roads. Buses are time consuming and very

revolting to move with woman and children for its limited seating capacity. In these circumstances, NCMTs are serving people with more comfort and availability. These advantages are the main causes of the highest income of the drivers of NCMT of the Mohanpur *upazila*. Poba *upazilla* is located just adjacent to divisional town of Rajshahi. It has the availability of different kinds of transport to move within the *upazilla*. There are battery-driven three wheeler autos, man driven rickshaw-van, *mishuk*, diesel-driven *tempu* and three wheeler taxis etc. People have the opportunity to alternative use of any kinds of transport. But people who live in the rural areas have to use NCMT to come to district town. The CTs are not willing to go rural areas. Besides the NCMTs of Poba *upazilla* mostly use in the purpose of goods transportation. Farmers and the wholesale sellers transported their perishable goods early in the morning to the town market from the rural areas. In that case there are no alternative of NCMT. So the limitation of passenger transportation and availability of CTs in the *upazilla* of Poba are the reasons of low average monthly income among the six *upazillas*. Although there are some sorts of varieties of income opportunities have among the study areas the rate of transitional income growth through NCMT is very high. This high rate of transitional income growth justified the transformation from non-NCMT to NCMT occupation. Most of the drivers of NCMT were agricultural labor. The trends of earning from agricultural land are reducing gradually; the van and rickshaw pullers' occupation have to face drudgeries. It became impossible to that worker to do the job continuing 4-5 hours. The wage rate is so poor to maintain their family. On the other hand, there is huge demand of faster movement with less fair. In these circumstances NCMT occupation is the only suitable occupation to transform from other occupation in the study areas. The higher average

transitional income growth of the driver of the NCMT justifies the argument of transformation from non-NCMT to NCMT.

### 5.3.3 Expenditure- Income (E-Y) Ratio of the People Involve in NCMT

Changes in expenditure are also a very important tool to measure the changes in economic condition. This is an attempt to measure the changes in expenditure pattern of the people involved in NCMT. Changes in expenditure behavior have a spillover effect over the economy. Besides, changes in expenditure pattern also show the behavioral changes in the economic activities. For that reason it is necessary to reveal the expenditure pattern of the people involve with NCMT in the study areas. Following Table 5.9 shows the above mentioned advantage of the people involve in NCMT.

**Table 5.9: Expenditure-Income (E-Y) Ratio of the people involve in NCMT**

Area	Yearly Expenditure before Joining NCMT(BDT)	Yearly Expenditure after Joining NCMT(BDT)	Transitional (non NCMT to NCMT) Expenditure Growth (%)	Yearly Income before Joining NCMT(BDT)	Yearly Income after Joining NCMT(BDT)	E-Y Ratio before Joining NCMT	E-Y Ratio after Joining NCMT	Changes in E-Y Ratio (%)
Dhunot	36631	92571	153	43385	151385	0.84	0.61	28
Sherpur	38038	99935	163	38769	153231	0.98	0.65	34
Shibgonj	39738	87769	121	40615	159692	0.98	0.55	44
Mohanpur	46631	98331	111	42923	192923	1.09	0.51	53
Poba	35423	90208	155	40154	144000	0.88	0.63	29
Puthia	30277	88928	194	33231	168000	0.91	0.53	42
Average	37790	92957	149	39846	161538	0.95	0.58	39

Source: Questionnaire Survey, 2013-2014

The yearly average changes in transitional expenditure (non-NCMT to NCMT) are 149%. Among them, the people of Mohanpur increase their expenditure about 111% and the people of Puthia increase the highest of 194%. With the average yearly expenditure and average yearly income it is easy to make the E-Y ratio. By E-Y ratio, we mean the propensity to consume of the people involved in NCMT and other transport moving in the rural areas of

Bangladesh. A measure of propensity to save has also been shown by this E-Y ratio. At present it is very important to analyze the hidden reason of emergence of NCMT in the rural areas of Bangladesh. For this E-Y ratio is one of the important tools to prove the efficiency of the NCMT sector as an income earning sector which is already established in the rural economy. Before joining the occupation of NCMT, the E-Y ratio was about 0.95. This mean the rate of capital formation is very low before migrat the occupations. They were in the subsistence level of livelihood. But after joining the occupation of NCMT the E-Y ratio comes in an average 0.58. Rest of the ratio has used for capital formation. The average changes in E-Y ratio are about 39%. So it can be said that the people are able to make positive changes in their economic lives.

#### 5.3.4 Rate of Resource Buildup through NCMT

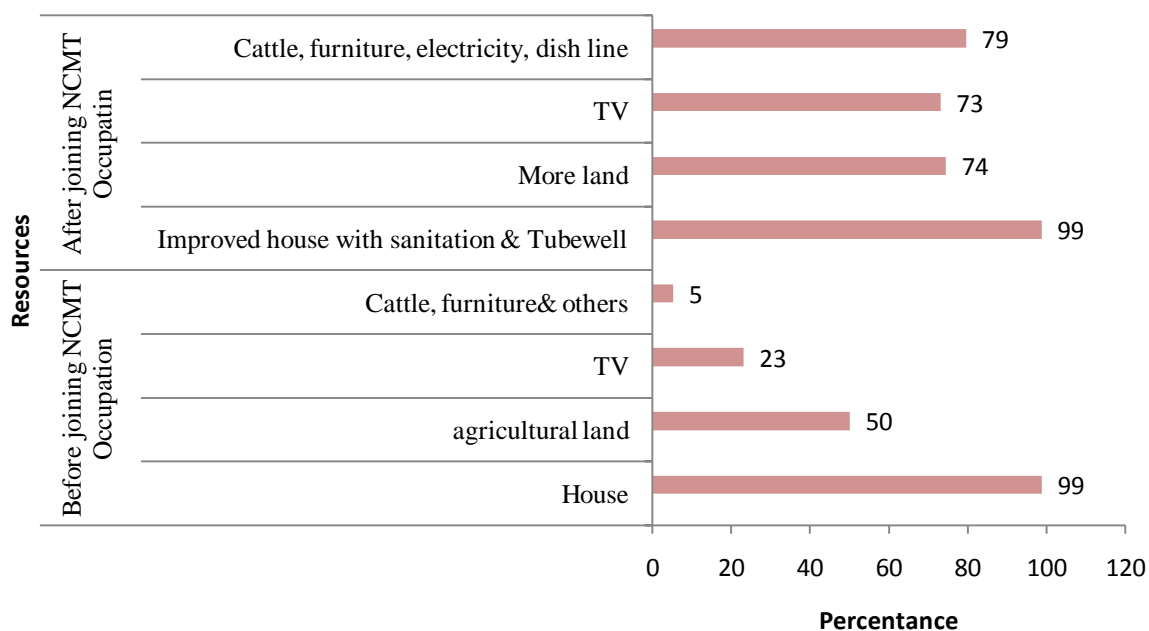
When a group of people have been proficient to develop their economic life, the effect of these uplifting resulted in the total development of the area. This section is an attempt to describe the spillover effect of occupational changes of the people involved in NCMT. Table-5.10 shows the economic, social and cultural development scenarios of the people who lead their lives with NCMT.

**Table 5.10: Rate of Resource Buildup through NCMT (%)**

Area	Before Joining NCMT Occupation				After Joining NCMT Occupation			
	House	Agricultural Land	TV	Cattle, Furniture & Others	Improved House with Sanitation & Tube Well	More Land	TV	Cattle, Furniture & Others
Dhunat	100	54	23	0	100	85	46	85
Sherpur	92	69	0	0	92	62	54	92
Shibgonj	100	31	31	8	100	77	62	85
Mohanpur	100	77	8	8	100	100	100	85
Poba	100	23	62	15	100	54	85	54
Puthia	100	46	15	0	100	69	92	77

Source: Questionnaire Survey, 2013-2014

Almost all the people of the rural areas had their house to live in. The drivers of NCMT of those areas had also a house to live with their family. But the houses were not so good to live in a healthy atmosphere according to the statement of the respondents. But after joining NCMT occupation they are competent to improve their living condition with improved sanitation and a tube well for pure drinking water. Besides, the people involved in NCMT had little land to cultivate. After joining NCMT occupation the people also purchased more land to cultivate. This information shows the economic development of the people involved in NCMT. Figure 5.4 depicts the improvement through NCMT.



**Figure 5.4: Rate of Resource Buildup through NCMT**

Source: Questionnaire Survey, 2013-2014

Less than 25% drivers of NCMT had a television before joining NCMT occupation. It increased up to 73% after joining NCMT occupation. Before joining NCMT they have television with only channel BTV. After joining NCMT, they are culturally developed with the information flow from different satellite channels which helped them to reduce poverty

and isolation with the assistance of up to date information flow. About 80% of the total respondents purchased cattle, necessary furniture for their house, got the electricity facilities etc after joining NCMT occupation. So NCMTs have already made a spillover effect in the rural economy.

### 5.3.5 E-Y Ratio of the People Involved in Conventional Transport in the Rural Areas

E-Y ratio is an important factor for economic development. This ratio for the driver of the conventional transport also measured in this section. In the rural areas of Bangladesh particularly in the study areas there are different kinds of conventional transport. A number of workers have employed in this occupation. It will be clear about the livelihoods of people engaged in CT by the E-Y ratio in the study areas. Among the study areas, Poba has no bus services in the internal roads within the *upazilla*. But rests of the five *upazillas* have the facilities. From the bus worker it is revealed that the E-Y ratio is about 0.96. This is visualized in the Table 5.11.

**Table 5.11: E-Y Ratio of CT ( Bus)**

Area	Average Monthly Income (BDT)	Average Monthly Savings (BDT)	Average Monthly Expenditure (BDT)	Average Yearly Income (BDT)	Average Yearly Expenditure (BDT)	E-Y Ratio
Dhunat	13375	525	12850	160500	154200	0.9607
Sherpur	13667	433	13233	164000	158800	0.9683
Shibgonj	14200	500	13700	170400	164400	0.9648
Mohanpur	12100	440	11660	145200	139920	0.9636
Puthia	14500	680	13820	17400	165840	0.9531
Average	13568	516	13053	131500	156632	0.96

Source: Questionnaire Survey, 2013-2014

The average E-Y ratio describes the lower capability of capital formation of the people engaged in bus driving occupation in the study areas. They are not able to change their life standard through the income earning opportunity by bus. Similarly drivers of the CT's like

diesel-driven *mishuk*, three-wheeler taxi and three-wheeler CNG makes a limited role in capital formation. The E-Y ratio of those workers is about 0.88. Table 5.12 indicates real E-Y ratio of the above mentioned drivers and workers.

**Table 5.12 : E-Y Ratio of CT (CNG & *Mishuk*)**

Area	Average Monthly Income (BDT)	Average Monthly Savings (BDT)	Average Monthly Expenditure (BDT)	Average Yearly Income (BDT)	Average Yearly Expenditure (BDT)	E-Y Ratio
Dhunat	11063	1175	9888	132750	118650	0.9
Sherpur	14286	2143	12143	171429	145714	0.85
Shibgonj	13250	2625	10625	159000	127500	0.81
Mohanpur	9833	717	9117	118000	109400	0.93
Poba	13167	1317	11850	158000	142200	0.91
Puthia	14500	1250	13250	174000	159000	0.9
Average	12683	1538	11146	152197	133744	0.88

Source: Questionnaire Survey, 2013-2014

The drivers of that transport in the study areas of Shibgonj earn more than that of other areas. Availability of CNG is helping to make a surplus from these earnings. Puthia, Poba and Mohanpur have higher concentration than that of other three study areas. So, E-Y ratio in this sector mostly depends on the availability of CNG as well as the availability of cheaper fuel. This played an important role to reduce their E-Y ratio. Battery-driven Chinese three-wheeler is available in the study areas of Mohanpur, Poba and Puthia. The E-Y ratio of the people involve with this transport is about 0.91. They cannot earn more because of some limitations. They are carrying only passengers with limited charging and load capacities. So those people have also a limited role in capital formation. Table 5.13 shows the E-Y ratio of the drivers of those transports in the rural areas.

**Table 5.13: E-Y Ratio of CT ( Battery-driven Auto)**

Area	Average Monthly Income (BDT)	Average Monthly Savings (BDT)	Average Monthly Expenditure (BDT)	Average Yearly Income (BDT)	Average Yearly Expenditure (BDT)	E-Y Ratio
Mohanpur	9833	717	9117	118000	109400	0.9271
Poba	131617	1317	11850	158000	142200	0.9
Puthia	12571	1171	11400	150857	136800	0.9068
Average	51340	1068	10789	142286	129467	0.9113

Source: Questionnaire Survey, 2013-2014

It is the same as other Conventional transport moving in the study areas. They also played a limited role in the development of rural economy.

Man-driven rickshaw-vans are also moving in those areas. But it is non-motorized and time consuming transport. Though it is non- motorized it is moving in the rural areas. And the rickshaw and van pullers did not contribute as NCMT in the rural areas. Table 5.14 shows the E-Y ratio of the rickshaw and van pullers.

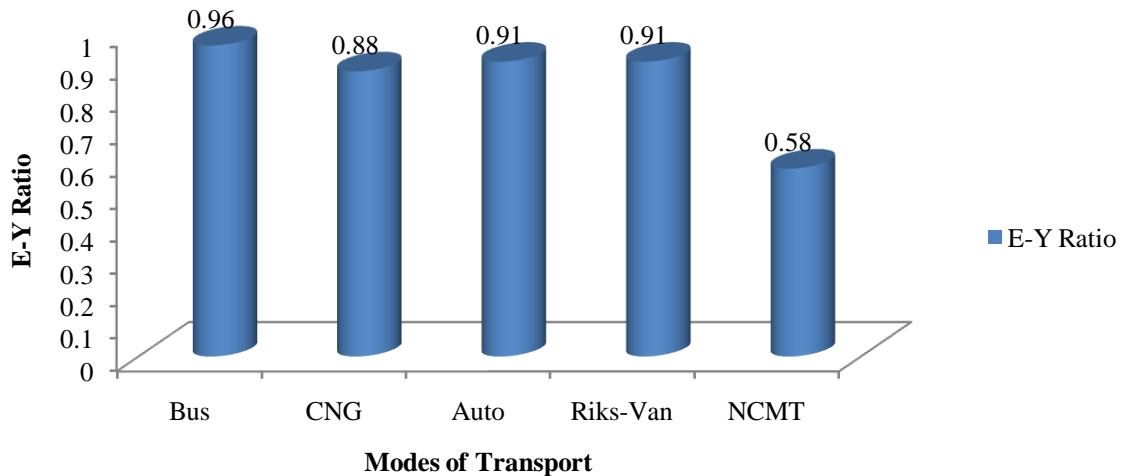
**Table 5.14: E-Y Ratio of CT ( Rickshaw-Van)**

Area	Average Monthly Income (BDT)	Average Monthly Savings (BDT)	Average Monthly Expenditure (BDT)	Average Yearly Income (BDT)	Average Yearly Expenditure (BDT)	E-Y Ratio
Dhunat	4300	520	3780	51600	45360	0.88
Sherpur	5767	507	5260	69200	63120	0.91
Shibgonj	7400	480	6920	88800	83040	0.94
Mohanpur	5571	514	5057	66857	60686	0.91
Poba	7286	800	6486	87429	77829	0.89
Puthia	5833	417	5417	70000	65000	0.93
Average	6026	540	5487	72314	65839	0.91

Source: Questionnaire Survey, 2013-2014

It is almost the same to other means of conventional transport moving in the rural areas of Bangladesh. The usages of rickshaw-van in rural areas are getting low because of its time consuming and limited capacity characteristics. Figure 5.5 shows a comparison among the transport plying in the study areas with E-Y ratio.

**Figure: E-Y Ratios of different modes of transport in the rural areas**



**Figure 5.5: E-Y Ratios of Different Transport Modes**

Source: Questionnaire Survey, 2013-2014

From the above figure we see the effective exp-inc ratio of the people engaged with NCMT, which is about half times lower than that of other transport plying on the rural road.

### 5.3.6 Conclusion

This section was aimed to redress the issues of income, expenditure and capital formation status of the different kinds of people engaged in different transport moving in the rural areas. It is found that, the people engaged in NCMT earn 405% higher than the income before their engagement of the occupation in NCMT. Their expenditure also increased in a significant level which is about 149%. The capital formation of those people is an important finding of this section. From the E-Y ratio it is clear that people engaged in NCMT occupation played a silent and a pioneering role in capital formation in the rural areas. It also found that the other transport occupations have a limited role in this purpose. The NCMT occupation in the rural areas made a spread out effect in the rural economy. Reality is that,

NCMTs have become a virtuous cycle to get-rid of poverty. Now it is necessary to find out the sources of financing in the rural transport sector. The following section will target the credit providers and credit sources in the both of conventional and non-conventional transport sectors.

## **5.4 Access to Credit and Performance in Credit Management**

### **5.4.1 Introduction**

Access to credit is likely to be the only realistic way in which the poor are able to upgrade their technological ability to travel and carry goods through improved mechanized transport. Credit is no longer a financial assistance but rather a payment for the performance of a contract for providing a better transport service. Keeping in mind of this importance of credit, the people involved in NCMT and the credit providers are transacting credit to each other in the rural areas. To meet the emerging demand of the rural motorized transport sector some NGOs came forward with their funding. Rural agrarian landless people come to them and are taking credit to produce NCMT. From this financial assistance the people of the rural areas gets the motorized transport services. But the credit depends on some basic criteria such as savings performance, credit using capacity, demand of credit, appropriate using sector of credit etc. This chapter is an attempt to unfold the story of credit in the sector of NCMT and CT in the rural areas. The performance of the borrowers in the NCMT and CT sector will also be discussed in this section. With the above circumstances the objectives of this section are designed as follows:

- To explore the performance of the people engage in NCMT regarding credit and savings;
- To identify the credit providers to the NCMT sectors;
- To visualize the figure of total credit of NCMT sector in the study areas; and
- To make a comparative assessment between CT and NCMT in the light of access to credit.

Through the analysis of these objectives it will be explicit to the concerned people about the specialties of this sector and the engagement of the people in NCMT and started credit business with the local financial individuals or organizations. The credit performance of people engaged in different CT and NCMT will also be analyzed here. In doing so, drivers and owner-drivers of different CT and NCMT, credit providers in the rural areas were the respondents. Face to face interview with a structured questionnaire has been used to collect the data. This section is composed of the following issues:

- Credit statement of the people engaged in NCMT;
- Savings statement of the people engaged in NCMT;
- Credit providers in the NCMT sector;
- Provided credit and recovery statement;
- Access to credit for CTs;
- Comparative assessment of access to credit; and
- Conclusion.

#### **5.4.2 Credit Statement of People Engaged in NCMT**

Almost all the people in the study areas engaged in NCMT have taken personal credit. With this credit they buy NCMT and make timely repayment from their daily income through NCMT. Though the credit is not enough to buy a NCMT, the people added some money of his own and buy a NCMT. Table 5.15 shows the credit statement of the people engaged in NCMT.

**Table 5.15: Credit Statement of People Engaged in NCMT**

Area	Debtor	Non Debtor	Causes of Credit Others but			
			to Buy NCMT	Others	to Buy NCMT	Others
Dhunat	12(15%)	1(1.28%)	10(13%)	3(4%)	2(3%)	1(1.28%)
Sherpur	12(15%)	1(1.28%)	6(8%)	7(9%)	6(8%)	1(1.28%)
Shibgonj	10(13%)	3(3.85%)	8(10%)	5(6%)	2(3%)	3(4%)
Mohanpur	13(17%)	0(0%)	7(9%)	6(8%)	6(8%)	0(0%)
Paba	13(17%)	0(0%)	12(15%)	1(1.28%)	1(1.28%)	0(0%)
Puthia	12(15%)	1(1.28%)	12(15%)	1(1.28%)	0(0%)	1(1.28%)
Total	72(92%)	6(8%)	55(71%)	23(29%)	17(23%)	6(8%)

Source: Questionnaire Survey, 2013-2014

In the study areas most of the people engaged in NCMT have taken personal credit from different sources. Among them every driver and owner-driver of NCMT of Mohanpur and Paba owe money. Only 8% of the drivers and owner-drivers have no credit. They bought it from their own resources. It can be said that more than 90% drivers are in short of money to buy NCMT. They transform their occupation to NCMT with some cash in hand from their previous occupation. But most of the people directed their livelihood with NCMT have no own resources. They are landless poor people in the areas. They have no institutional education to get a decent job. All of them were day labors in agricultural sector. They are in short of enough money to start a suitable business for their livelihoods. No institution except NGOs gave them money to initiate and run a business. Finding no other ways, the rural poor people came to NGOs. They receive credit from NGOs with collateral but charged higher rate of interest. Almost 72% of the total owner drivers are debtor. They come to this sector in this way. It is an informal and unrecognized sector but emerging. Among the debtors, 71% have confirmed that they obtained credit from NGOs to purchase NCMT. Rests 29% show the other causes to receive the credit. Because of its non-recognition from government some NGOs did not want to give credit to the NCMT sector. More interestingly most of this 29%

bought NCMT for their livelihoods. Debtor knows it but did not say anything. It is reality that NGOs need 100% recovery with interest and the debtor people need starting money to initiate the NCMT business. Only 6% of the debtor people spent their credited money in other purposes. It has been confirmed from both sides that the recovery of the credit is almost 100% in all the study areas. It was also observed that the rural people who are engaged in NCMT are the clients of NGOs. The NGOs are working not only with the credit program, but also with savings program with their clients. In most cases, the savings of the debtor people act as a security to the NGOs. On the other hand the savings can be identified as capital formation of the driver and owner-driver of NCMTs. The following section is an illustration of saving programs of the NGOs created by people involve in NCMT.

#### **5.4.3 Savings Statement of the People Involved in NCMT**

As we know the rural poor people have transform their occupations from 15 different types of occupation to the NCMT sector. This was because that NCMT makes them financially more sustainable. NCMT occupation confirmed it with the higher income earning opportunities. After transformation of their occupations, people not only increase their consumption pattern but also generate a handsome savings. Which is already discussed in the previous section. In this connection, people saved their money in two ways. Firstly, they save their money in the account of NGOs in different basis such as weekly, fortnightly and monthly. They are bound to do that to the NGOs because it is the only precondition to be a member of the NGOs to get a credit. This savings programs continue up to the recovery of the credit. Secondly the people engaged in NCMT save their earnings in a material form. They take the NCMT from the local money lender with the condition that they have to pay or save money in daily or weekly basis to the money lender. After recovery of the contracted amount

the creditor people got the NCMT as his own. But the people of this sector have limited opportunity to save their money in other financial organization except NGOs. The Table 5.16 shows the savings places of the people engaged in NCMT.

**Table 5.16: Savings Statement of the People Involved in NCMT**

Area	NGO	Bank	NCMT Association	Own	Others	Total
Dhunat	12(92%)	1(8%)	0	0	0	13(100%)
Sherpur	9(69%)	0	0	4(31%)	0	13(100%)
Shibgonj	8(62%)	0	0	2(15%)	3(23%)	13(100%)
Mohanpur	12(92%)	0	0	1(8%)	0	13(100%)
Poba	9(69%)	0	0	3(23%)	1(8%)	13(100%)
Puthia	10(77%)	0	1(8%)	2(15%)	0	13(100%)
Total	60(77%)	1(1.28%)	1(1.28%)	12(15.38%)	4(5.13%)	78(100%)

Source: Questionnaire Survey, 2013-2014

All the people engaged in NCMT save their money in the account of different NGOs. Only a few go to Bank and NCMT association to save their money. This does not play a significant role in capital formation. Banks and other financial organizations are not familiar to the illiterate rural poor people involved in NCMT. Besides, the bank is not suitable to them to open an account. A significant number of people save their money in their own houses. They think it is safer than other systems and it is more liquid than others. A few people save their money in other forms such as saving to the neighbors and others family members. But it does not play a vital role to capital formulation in the society. By observing these savings and credit providing sectors of the rural poor people, some formal and informal financial organizations and some individuals are encouraged to start their savings and credit business in the rural areas. The following sub-section shows the different credit providers to the NCMT related people in the study areas.

#### 5.4.4 Credit Providers in the NCMT Sector

Due to huge demand of the initial money to run a business of the poor people in the rural areas some individuals and some financial organization come forward to provide credit with specific conditions. They are friends and neighbors, NGOs, banks, *Mohajon*<sup>5</sup> and other sources. The people engaged in NCMT take credit from different NGOs because these people have limited access to other financial organizations to take credit. Table 5.17 shows the accessibility of credit to the people involved in NCMT.

**Table 5.17: Credit Providers**

Area	Friend	NGO	Bank	<i>Mohajon</i>	Others	Total
Dhunat	0	12(92%)	0	0	1(8%)	13(100%)
Sherpur	0	11(85%)	0	1(8%)	1(8%)	13(100%)
Shibgonj	0	6(46%)	1(8%)	0	6(46%)	13(100%)
Mohanpur	0	13(100%)	0	0	0	13(100%)
Poba	0	13(100%)	0	0	0	13(100%)
Puthia	0	11(85%)	1(8%)	0	1(8%)	13(100%)
Total	0	66(85%)	2(3%)	1(1%)	9(12%)	78(100%)

Source: Questionnaire Survey, 2013-2014

This table reveals that all the people engaged in NCMT are dependent on NGOs in order to obtain credit. Only the people of the Shibgonj *upazilla* are different from other areas. Some mistrust has been played a role not to go to the NGOs for Shibgonj people. Besides, they have other options to get credit such as workshop owners, big farmers and so on. Almost half of the debtor people got their credit from such kind of money lender. Eighty five percent of the total creditor got their starting money from NGOs with high interest rate. They have limited access to government and other non government financial institutions. The process of credit of this government credit and the commercial banks' credit are not congenial to the poor

<sup>5</sup> *Mohajon*- means local money lenders who introduced as a credit provider based on following characteristics: 1. He provides credit with extra fixed amount of money, 2. He provide it in the condition of monthly repayment procedure, 3. Provided money is collateral free, 4. creditor should be the known people to creditor, 5. Basically mohajon or the local money lender is powerful and act as a musclemans in his locality.

people. In this backdrop of banking sector the NGOs make a credit business with high interest rate. Some local opportunist money lenders earn money from this sector with high interest rate charged from the poor people. However, they want to take the facility of the government financial organizations if the conditions of the credit are relaxed. This implies that the commercial financial organizations have the opportunity to earn a lot of benefits from this rural non conventional transport sector. Opportunity of credit business in this sector will be discussed in the following section where the NGOs and the other non-recognized money lenders enjoyed the benefits from the absence of recognized commercial banks in the study areas.

#### 5.4.5 Provided Credit and Its Recovery

As we already mentioned that the total number of NCMT is about 6046 in the study areas. One person operates one NCMT and every NCMT has its own personal credit. Most of them repay the credit on weekly installment basis. The calculated interest rate is very high. Huge amount of money is circulating in this purpose through NGOs. Table 5.18 illustrates the credit and its recovery situation of all the study areas.

**Table 5.18: Total Credit disbursement and Recovery of Credit**

Area	Total NCMT (no.)	Yearly Average Credit/NCMT (BDT)	Average Installment/ NCMT (no.)	Taka/ Installment	Average Repayment /NCMT (BDT)	Average Interest Rate (%)	Total Credit (BDT)	Total Repayment (BDT)
Dhunat	740	50769	35	2585	63969	26	37569060	47337060
Sherpur	1134	56250	50	1413	71275	27	63787500	80825850
Shibgonj	960	50100	42	2100	62320	24	48096000	59827200
Mohanpur	923	60769	46	1662	76162	25	56089787	70297526
Poba	1065	91923	48	2408	113300	23	97897995	120664500
Puthia	1224	75909	46	2055	94509	25	92912616	115679016
Average	-	64287	45	2037	80256	25	-	-
Total	6046	-	-	-	-	-	396352958	494631152

Source: Questionnaire Survey, 2013-2014

According to the respondents it is calculated that average credit per NCMT is over BDT 64,000. They have to repay it by average 45 installments on weekly basis. The installment money is average BDT 2037. Average repayment of credit in one year is about over BDT 80,000. The calculated average interest rate is 25%. In the six study areas the people engaged in NCMT has taken about BDT 400,000 and their money is about BDT 500,000. Huge amount of money is circulated yearly in this sector. So, the NGOs come forward to the credit business with the people engaged in NCMT. Only the easy accessibility is the main reason of the flourishing of credit business of the NGOs. But the conventional transport has no such type of problem with accessibility to credit. The following section illustrates the accessibility of credit for conventional transport moving in the study areas.

#### **5.4.6 Access to Credit for CT (Conventional Transport)**

As we know the rural conventional motorized transports consist of bus, CNG, battery-driven three-wheeler, mini truck, auto tempo and so on. From these, the owners of bus and truck said they have personal credit but mostly from the recognized commercial banks. They have easy access to all the sources of finance in the society. They never went to the *Mohajon*. Table 5.19 illustrates the accessibility of credit for the bus transport moving in the rural areas.

**Table 5.19: Access to Credit for Bus (%)**

Area	Friend	NGO	Bank	<i>Mohajon</i>	Others	Total	Defaulter
Dhunat	0	0	9	0	4	13	9
Sherpur	0	0	13	0	4	17	13
Shibgonj	0	4	17	0	0	22	17
Mohanpur	0	9	13	0	4	26	13
Puthia	0	4	17	0	0	22	17
Total	0	17	70	0	13	100	70

Source: Questionnaire Survey, 2013-2014

Seventy percent of the debtor people in the bus sector are taking credit from the commercial banks. They also have the opportunity to take credit from NGOs. Most of the

owners are influential politically in the society. Among them most of the creditor people are defaulter in repayment of their credit. Those credits are resulted in default credit and banks lose their capital.

We can see the scenario to the other conventional motorized transports moving in the rural areas such as CNG driven three wheelers. The owner of that transport has the accessibility to all the sources of credits. Basically they need medium and small amount of credit. So they have the opportunity to get credit from all the sources. Table 5.20 shows the easy accessibility of credit for the owner of CNG-driven three wheelers.

**Table 5.20: Access to Credit for CNG (%)**

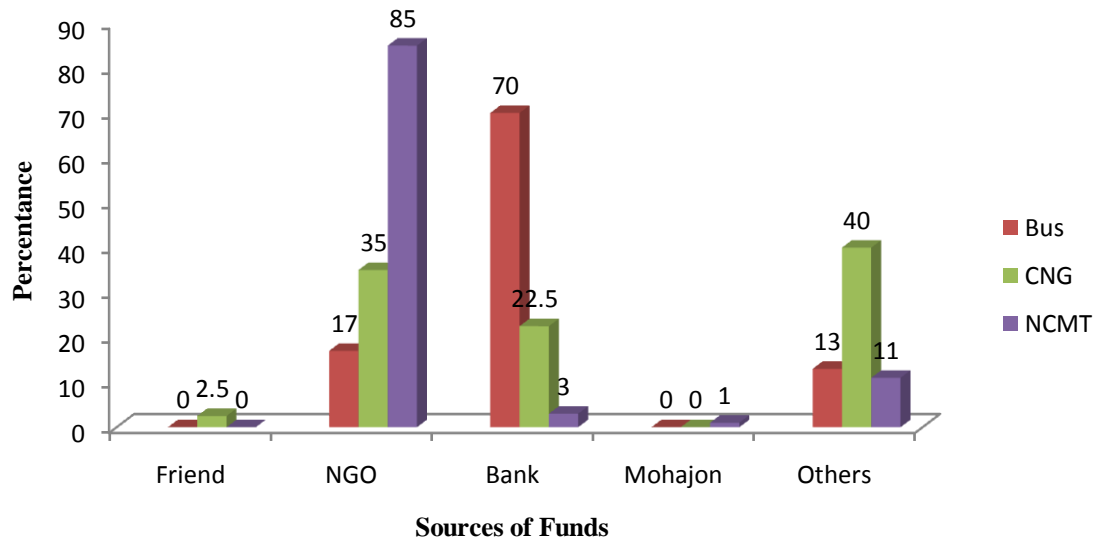
Area	Friend	NGO	Bank	<i>Mohajon</i>	Others	Total	Defaulter
Dhunat	2.5	2.5	10	0	5	20	5
Sherpur	0	5	5	0	10	20	2.5
Shibgonj	0	2.5	5	0	12.5	20	5
Mohanpur	0	10	2.5	0	2.5	15	0
Poba	0	10	0	0	2.5	12.5	0
Puthia	0	2.5	0	0	7.5	12.5	0
Total	2.5	35	22.5	0	40	100	12.5

Source: Questionnaire Survey, 2013-2014

They take credit from three sources: NGOs, bank and other sources including local money lenders, different social welfare associations. Table 5.20 shows that one third of them got credit from NGOs and one third received credit from banks and other sources respectively. From this, conclusion can be drawn that they have easy accessibility to credit from all the sources because of the recognition from the government. But here we can see, there are some default credits in this sector. From the above discussion it is easy to make a comparison between the conventional and non conventional motorized transport running in the rural areas. This comparison is illustrated in the following section.

#### 5.4.7 Comparative Assessment between CT and NCMT Regarding Access to Credit.

From the above discussion we can say that NCMT is the main client of NGOs. Figure 5.6 shows that the accessibility of credit among the motorized transports driving in the study areas.



**Figure 5.6: Comparative Statement of Access to Credit (%)**

Source: Questionnaire Survey, 2013-2014

Bus and CNG have the accessibility of credit from all the financial organizations. But NCMT have only opportunity of credit from the NGOs with higher interest rate. Other conventional transports have opportunity to take credit from all the sectors available in the rural society.

#### 5.4.8 Conclusion

This section was started with the objective to demonstrate the total financial system in the rural motorized transport sector. In doing so, data were collected from the owner and driver from both sectors. According to the respondents who are the owners of the conventional transport, have the accessibility of credit from all the sources existing in the

rural society. On the other hand, the owner drivers of NCMT sector have the only option to get credit which is NGO. Besides they are saving their money to those NGOs which are related to credit. The people take credit in the purpose of buying NCMT and they repay it on a pre-set time basis. A significant number of defaulters were found in the CT sector. Although the rate of interest is very high, there are huge amount of credit is circulated in the NCMT sector with good repayment performance. So, CT sector avails the higher accessibility of credit rather than NCMT from the available financial organizations with the lower rate of interest. On the other hand, NCMT has the only option to get the credit with high rate of interest. Though they borrow the credit with high interest rate, they repay the credit with interest on regular basis. CTs are defaulter in this sphere. With this information the following section will discuss the potentialities of revenue generation of NCMT sector for government as well as for rural economy.

## **5.5 Revenue Generation Potentials**

### **5.5.1 Introduction**

Revenue generation is the primary concern of any government to carry out its regular activities as well as to finance development programs. Although there are other sources, the revenue is mainly collected from tax. But the collection of tax in Bangladesh is not sufficient to keep up the economic activities at the required level. To upraise the economic performance higher tax collection from suitable sources therefore is of utmost importance. But in Bangladesh the collection of tax is significantly lower for a number of reasons including lack of consciousness, honesty, sincerity, regulatory policy, structural reforms and innovation. If these problems can be solved with efficiency the economy can perform at the optimum level. There are no alternatives rather than enhancing the size of tax base. New steps therefore should be included with present efforts to widen the tax base especially through the rising of public awareness and find out the new era of tax from the informal sectors. Those are already established in the economy of Bangladesh. In this sphere emerging rural informal sectors can play a vital role to generate healthy revenue. In this regard, NCMT sector will be an important one for the tax base of Bangladesh economy.

This section is aimed to discuss the revenue generation potentials of NCMT with the specific following objectives:

- To assess the revenue potentials from the NCMT sector;
- To reveal the extent of corruption over the poor people in the rural areas;
- To make a projection of revenue generation potentials through willingness to pay from the owner driver of NCMT; and

- To calculate the total possible revenue based on WTP for institutionalize of the NCMT from this sector.

For these, data has been accommodated by face to face interview of the owner driver of NCMT. To analyze the above objectives this section is organized with the following subsections:

- Daily enforced cost borne by NCMT;
- Yearly unusual cost to *pourashabha*;
- Yearly unusual cost to local police administration;
- Yearly usual cost to chain-master;
- Yearly unusual cost to CT owners association;
- Yearly forced savings to NCMT owners association;
- Willingness to pay(WTP) for license;
- Willingness to pay(WTP) for route permit; and
- Yearly revenue generation potential based on WTP for institutionalize NCMT

which are discussed in the subsequent sections

### **5.5.2 Daily Enforced Cost Borne by NCMT Drivers**

The owner driver has to bear some costs if they ply their transport on the road. This redundant cost is called the enforced cost. People have to pay it to the selected middlemen of the recipient authorities. Although they are to pay it to the agents of the concern unusual authorities, they always try not to pay the extra cost to the outside of the NCMT communities. Unfortunately, they have to pay it, because they have no accreditation from the government to budge on road. Middlemen of local *pauroshabha*, local police station, CT owners association, NCMT association and the the chain master collected the unusual money from the owner

driver of the NCMT. Table 5.21 demonstrates the area wise daily enforced cost borne by NCMT owner driver in BDT.

**Table 5.21: Daily Enforced Cost per NCMT Borne by NCMT Drivers (in BDT)**

Cost	Dhunat	Sherpur	Shibgonj	Mohanpur	Paba	Puthia	Average
Pourashava	10	10	10	15	10	10	11
Police	10	10	10	8	7	10	9
ChainMaster	10	10	10	10	10	10	10
CT owner <i>Samity</i>	5	5	5	5	5	5	5
NCMT <i>Samity</i>	10	15	10	10	10	10	11
Total	45	50	45	48	42	45	46

Source: Questionnaire Survey, 2013-2014

To ply on the road the owner driver is compelled to pay BDT 46, on average, to the concerned unusual authorities. Out of BDT 46, BDT 11 goes to local union/*pourashabha* authority, BDT 9 is charged for police station and local CT owners association charged BDT 5. These are called extra costs which is hidden and collected by some middlemen selected by the concerned unusual authorities. These can be called as external unusual cost for NCMT owner-drivers. They also have to contribute extra BDT 11 for their association in response of their social welfares and BDT 10 has to pay for the proper management of maintaining their serials to ply on road effectively. These two can be called as welfare and management fees as well. Among the daily enforced costs, Sherpur has borne the highest and Paba has borne the lowest shares. The other study areas have borne the same as the average BDT 46.

If we calculate the daily enforced cost for yearly basis, it became a huge amount. This is about BDT 10 million per year. Table 5.22 is an evidence of yearly enforced cost borne by the owner-driver of NCMT.

**Table 5.22: Total Enforced Cost Borne by Owner Driver of NCMT in a Year (BDT)**

Area	Daily Enforced Cost	Monthly Enforced Cost	Yearly Enforced Cost	No. of NCMT	Total Enforced. Cost
Dhunat	45	1350	16200	740	11988000
Sherpur	50	1500	18000	1134	20412000
Shibgonj	45	1350	16200	960	15552000
Mohanpur	48	1440	17280	923	15949440
Poba	42	1260	15120	1065	16102800
Puthia	45	1350	16200	1224	19828800
Total	-	-	-	-	99833040

Source: Questionnaire Survey, 2013-2014

About BDT 10 million is accumulated illegally in the six study areas. Huge corruption takes place in collection and distribution of this unusual money. Among the six study areas, Shibgonj is bearing the lowest where as Sherpur bears the highest cost share. The contributors of this corrupted money do not want to carry the burden at all. Rather they want to contribute to the development of nation through the accreditation of their transport from the concern authority. The cost of local administration for NCMT is explained in the following section.

### **5.5.3 Yearly Unusual Cost to *Paurashabha***

When NCMTs come to the road and use the government land they have to pay for that. The collector of the unusual cost is collecting the money with some remuneration. Although they bear it forcefully, they do not want to give it to the collector. Rather they expressed that they are ready to provide the money to the government in exchange of accreditation institutionally. The huge amount of money is collected for the *paurashabha* annually as evident in Table 5.23.

**Table 5.23: Yearly Unusual Cost to *Pourashabha* (BDT)**

Area	Daily	Monthly	Yearly	No. of NCMT	Total Cost
Dhunat	10	300	3600	740	2664000
Sherpur	10	300	3600	1134	4082400
Shibgonj	10	300	3600	960	3456000
Mohanpur	15	450	5400	923	4984200
Poba	10	300	3600	1065	3834000
Puthia	10	300	3600	1224	4406400
Total	-	-	3900	6046	23579400

Source: Questionnaire Survey, 2013-2014

Each NCMT has paid, on average, BDT 3900 to the middlemen of the *pourashabha*.

Multiplying by the number of NCMT of all the six study areas the amount becomes BDT 23.5 million. Centering this money, corruption takes place in this sector. Similarly, a projection can be made by the unusual money collecting in favor of local police.

#### **5.5.4 Yearly Unusual Cost for the Local Administration (Police and Others)**

Bangladesh police is exercising the authority to implement the law and order in the field level. All kinds of illegal movement of any kinds of transport are controlled by police. Bypassing government rules and regulations a huge number of NCMT emerges in the rural society. But this transport has not yet got the authorization from the government. On the basis of the un-recognition, these transports are termed as illegal. But reality is that, these transports are growing increasingly in the rural areas. The rural people are being benefited by this transport. Continuous production of NCMT bypassing government authorization and consciously ignorance from the police regarding the production of NCMT helped them to ply on roads and flourishing in the rural areas. In this sphere, there are some financial incentives for police from NCMT owner drivers help to come out in the society. According to respondents average BDT 9 per NCMT has to pay daily to ply on road to the police. Some

middlemen have collected the money, appointed by the police. Table 5.24 shows the yearly calculation of these types of extra hidden cost borne by NCMT owner drivers to the police.

**Table 5.24: Yearly Unusual Cost to Local Administration (Police and others in BDT)**

Area	Daily	Monthly	Yearly	No. of NCMT	Total Cost
Dhunat	10	300	3600	740	2664000
Sherpur	10	300	3600	1134	4082400
Shibgonj	10	300	3600	960	3456000
Mohanpur	8	240	2880	923	2658240
Paba	7	210	2520	1065	2683800
Puthia	10	300	3600	1224	4406400
Total	-	-	3300	6046	19951800

Source: Questionnaire Survey, 2013-2014

Among the study areas, Paba bares the lowest cost share, while others have the same. If we calculate for one year the figure comes nearly BDT 20 million. At any rate, it is illegal and corruption takes place centering this money. The transaction of this money is the hidden reason to the development of NCMT in number on the rural road of Bangladesh. But the people engaged in NCMT did not want to pay the money to the police. Somehow they want to come out from this illegal transaction. Rather they want to pay the money to the government authority.

#### **5.5.5 Yearly Usual Cost to the Chain Master**

To maintain the discipline to ply on the road, it is necessary to appoint an administrator. Every mode of transport sector has such type of person who manages the discipline to run the vehicle. To do this, the sector needs some money for the maintaining cost. For that they have to collect money from the members of that sector. Accordingly, NCMT owners association appointed a person to maintain the daily movement systematically to avoid indiscipline on road. This person is known as chain-master. For that every NCMT has to pay some money. This money is useful and a person has been employed for this

purpose. In the study areas, every NCMT pays BDT 10 daily to the chain-master in the purpose of maintaining the serial and discipline. Table 5.25 shows the costs of chain-master in the study region.

**Table 5.25: Yearly Usual cost to Chain master (in BDT)**

Area	Daily	Monthly	Yearly	No. of NCMT	Total Cost
Dhunat	10	300	3600	740	2664000
Sherpur	10	300	3600	1134	4082400
Shibgonj	10	300	3600	960	3456000
Mohanpur	10	300	3600	923	3322800
Poba	10	300	3600	1065	3834000
Puthia	10	300	3600	1224	4406400
Total	-	-	3600	6046	21765600

Source: Questionnaire Survey, 2013-2014

There are several routes in every study area. One chain-master maintains one route. For this purpose, the owner driver of Puthia pays the highest and that of Dhunat pays the lowest usual cost share. It depends on the total route and the number of NCMT existing in the study areas. BDT 21.7 million is usually transacted in a year to maintain the chain of NCMT among the six study areas.

### **5.5.6 Yearly Unusual Cost to CT Owners Association**

In the study areas, there are several types of transport plying on road. Among them conventional transports are moving with the authorization of concern government organization. It is also true that, there are a significant number of conventional unauthorized transports continuing their activities bypassing government rules and regulations. But that is not enough to fulfill the demand of motorized transport in the rural areas. For this reason, NCMT has appeared. This transport has no recognition and authorization to ply on road. By using this opportunity the CT owners association charges BDT 5 per NCMT daily if they want to move on the road. Some selected collectors collect the unusual money in favor of CT

owners' association illegally. The owner-driver of NCMT is bound to pay that money to the collector. Table 5.26 illustrates the huge amount of money transacted illegally from NCMT to CT sector.

**Table 5.26: Yearly Unusual Cost to CT Owners Association (in BDT)**

Area	Daily	Monthly	Yearly	No. of NCMT	Total Cost
Dhunat	5	150	1800	740	1332000
Sherpur	5	150	1800	1134	2041200
Shibgonj	5	150	1800	960	1728000
Mohanpur	5	150	1800	923	1661400
Poba	5	150	1800	1065	1917000
Puthia	5	150	1800	1224	2203200
Total	-	-	1800	6046	10882800

Source: Questionnaire Survey, 2013-2014

In the six study areas BDT 10.8 million paid in one year to the CT owners association.

There is no reason to pay the money to the CT owners association. Centering this un-authorization of NCMTs from the government, this type of corruption has taken place.

### **5.5.7 Yearly Forced Savings to NCMT Owners Association**

The owner-driver and the driver of NCMT are self employed. They have little opportunities in their areas to get help financially from others. Keeping in mind the people engaged in NCMT has been forced to subscribe some money to their own association. They save it with some issues of social security, standard of living in the society, create a unity centering the savings program.

This fund is acting as an element of thinking positively about them. Sometimes it acts as a driving force to them in their productivity. Table 5.27 shows the daily savings status to their associations.

**Table 5.27: Yearly Forced Savings to NCMT Owners Association (in BDT)**

Area	Daily	Monthly	Yearly	No. of NCMT	Total Savings
Dhunat	10	300	3600	740	2664000
Sherpur	10	300	3600	1134	4082400
Shibgonj	10	300	3600	960	3456000
Mohanpur	10	300	3600	923	3322800
Poba	10	300	3600	1065	3834000
Puthia	10	300	3600	1224	4406400
Total	-	-	3600	6046	21765600

Source: Questionnaire Survey, 2013-2014

According to the field survey, all the members of the NCMT association are forcefully paying BDT10 daily to their association. If we estimate this on yearly basis the figure comes to a total of BDT 21.7 million from only the six study areas. This amount of money has been used for the purpose of the welfare of the people engaged in NCMT. Mostly it is used for the purpose of the social security. Centering this fund, unity has been developed among the members of the people who maintain their lives through NCMT. To lead their lives through NCMT, the owner driver and the driver of the NCMT wants to pay to the government in exchange of their legal permission or accreditation from the government authority. The following section provides an account of the willingness to pay by the people engaged in NCMT for institutionalization from the government.

#### **5.5.8 Willingness to Pay (WTP) for License**

The government may regulate either the quality or quantity of rural motorized transport provision by its ability to grant various forms of license to operators, vehicles or services. The system of driving license is also a part of regulating system of government. The owner-driver and the driver of NCMT paid a huge amount of money to the unauthorized people. They pay it vigorously to the selected muscleman of the unauthorized organization. To reduce the corruption against the rural hardworking people, government may initiate

regulatory system through the provision of licensing. In this sphere, concerned people are interested to pay to the government in exchange of the license of their NCMT. To get a license from government authority for their transport the people shows their willingness to pay for that. Table 5.28 shows the WTP for license of a year for the license provided by government.

**Table 5.28: WTP for License (in BDT)**

Area	Daily	Monthly	Yearly	No. of NCMT	Total WTP
Dhunat	7.72	231.6	2779.2	740	2056608
Sherpur	7.54	226.2	2714.4	1134	3078129.6
Shibgonj	8	240	2880	960	2764800
Mohanpur	8.34	250.2	3002.4	923	2771215.2
Poba	7.21	216.3	2595.6	1065	2764314
Puthia	8	240	2880	1224	3525120
Total	-	-	2808.6	6046	16980795.6

Source: Questionnaire Survey, 2013-2014

The people engaged in NCMT are willing to pay for license to the government. The amount is BDT 2806 per NCMT annually for their license of their transport. In this regard the forced payment to the *Paorashabha* should be stopped by government. If we calculate this for one year for the study region, the figure comes to BDT 16.9 million.

#### **5.5.9 WTP for Route Permit**

Route permit is one of the major important instruments to regulate and maintain discipline on road. Route permit is necessary to maintain a systematic traffic management. In this sector there is no route permit to ply on road. So they are moving in different ways and creating traffic congestion. To maintain discipline in this sector, route permit from concern authority should commence urgently. Table 5.29 is an evidence of probable WTP for route permit in the six study areas.

**Table 5.29: WTP for Route Permit (BDT)**

Area	Daily	Monthly	Yearly	No. of NCMT	Total WTP
Dhunat	5.75	172.5	2070	740	1531800
Sherpur	5.82	174.6	2095.2	1134	2375956.8
Shibgonj	5.24	157.2	1886.4	960	1810944
Mohanpur	4.86	145.8	1749.6	923	1614880.8
Poba	4	120	1440	1065	1533600
Puthia	6	180	2160	1224	2643840
Total	-	-	1900.2	6046	11488609.2

Source: Questionnaire Survey, 2013-2014

For route permit, concerned people want to pay daily BDT 5. Average BDT 1900 per NCMT can be collected for the route permit purpose in one year. Government can earn almost BDT 11.4 million from the six study areas only providing the route permit to the NCMT.

#### **5.5.10 Aggregate Revenue Generation Potentials Based on WTP for institutionalization of NCMT**

To collect the revenue, government should find out several formal and informal sources. There is lot of informal sources in Bangladesh still remained unidentified. Among those, NCMT sector is flourishing to meet the demand of motorized transports in the rural areas. They are using rural road. They are also running almost everywhere without any permission or accreditation from concern authority. NCMT sector will be fruitful area to earn more among the informal sectors for government. Table 5.30 is a projection of government earnings in one year from the NCMT sector from the study areas.

**Table 5.30 Revenue Generation Potentials Based on WTP for institutionalization(in BDT)**

Area	Total for License	Total for Route Permit	Total
Dhunat	2056608	1531800	3588408
Sherpur	3078129.6	2375956.8	5454086
Shibgonj	2764800	1810944	4575744
Mohanpur	2771215.2	1614880.8	4386096
Poba	2764314	1533600	4297914
Puthia	3525120	2643840	6168960
Total	16960186.8	11511021.6	28471208

Source: Questionnaire Survey, 2013-2014

Government can use its concern local regulatory body to earn revenue from the NCMT sector. Two ways of earning opportunities are present there. Firstly, revenue collection through providing license to the NCMT and its driver with the condition of proper training and necessary technical education. From that WTP for institutionalization of NCMT is about BDT 16.9 million per annum. Secondly, route permit is another source of earnings for government. WTP for route permit from NCMT sector is about BDT 11.5 million per annum from six study areas. According to the WTP for institutionalization of NCMT, the government can earn about BDT 28.4 million from. As NCMTs are existent all over Bangladesh aside from the hilly areas, there is thus huge revenue generation potential for Bangladesh government from this sector. If government provides these, discipline on rural road transport can be ensured.

#### **5.5.11 Conclusion**

NCMT sector has potential to become an internal source of revenue generation for the government. By which government can optimize its revenue generation. Fostering of this sector properly government can earn a lot of money and at the same time and huge corruption centering this sector will also be stopped. The findings of this section reveal that the people engaged in NCMT are paying BDT 99.8 million in one year forcefully to the unauthorized

person outside the NCMT sector. Among the outsiders local *paurashabha*, local *thana* police and local CT owners association took the huge amount of money. Corruption takes place surrounding this money. NCMT sector is trying to maintain the discipline through the chain-master with its own cost. They are paying a fixed amount of money daily for their welfare fund. Findings conclude that if government permits them to ply on road government can earn yearly BDT 28.4 million per annum from six study areas only. On the other hand, people will achieve their legal mode of earning. If it can be done, huge corruption will be diminished centering the NCMT sector.

## **5.6 Agricultural Development and NCMT**

### **5.6.1 Introduction**

Transport is regarded as a crucial factor in raising agricultural productivity. It creates market for agricultural produce, facilitates interaction among geographical and economic regions, opens up new areas to economic focus and enhances quality of life of the people. Agricultural production is very important to the economy of developing nations as a whole and Bangladesh in particular. It is the major occupation of the inhabitants and people of the country while it provides employment directly or indirectly for most of the rural people in Bangladesh. Despite the fact that Bangladesh is basically an agrarian economy and the majority of the goods to be transported are mostly agricultural products are low-priced, highly perishable. They must be conveyed from their areas of production to their zones of consumption with minimum delay and cost. Improved transportation encourages farmers to work harder in the rural areas for increased production, adds value to their products, reduces spoilage and wastage, empowers the farmers as well as impacts on their productivity, income, employment positively and reduces poverty level in the rural areas since it is easier to move inputs and workers to farm as well as products to markets and agro-allied industry (Ajiboye and Afolayan, 2009). It therefore requires a wide-spread transport net-work to take produce from farm to market correspondingly. Ajiboye (1995) observed that inadequate supply and high cost of food stuff is as a result of inefficient transportation and distribution. Inadequate transport provision leads to the total waste of 25% of the total agricultural foodstuff produced (Olajide, 1972). Transport is one of the important factors that represent the most serious constraint to agricultural products and development (Idachaba, 1980). The role of transport is very crucial in production process which is not complete until the commodity is in the hands

of the final consumers (Adefolalu, 1977). Availability of transport facilities is a critical investment factor that stimulates economic growth through increased accessibility, its efficiency and effectiveness (Ajiboye, 1994). All affects the basic function of production, distribution, marketing and consumption in many ways.

NCMT is playing a crucial role in production, distribution and marketing of agricultural product of the rural areas of Bangladesh over last three decades. It is therefore against the background that an attempt is made in this chapter to examine in depth how the NCMTs of the study areas affect agricultural products as well as farmers' income. To analyze this attempt this section has the following objectives:

- To identify the highest availability of transport modes in the rural areas;
- To assess the physical accessibility of transport modes in the rural areas according to the demand of the farmers;
- To classify the transport modes in the rural areas as a cost saving transport;
- To evaluate the existing transport modes as a time saving for the farmers; and
- To summarize the reasons to choice NCMT as a first option to transport agricultural product in the rural areas of Bangladesh.

To achieve the above objectives three stairs of perception have been taken into consideration. First one is the conception of the drivers of CT. They are doing their business in the rural areas for the purpose of agricultural product transportation. Second one is the drivers of NCMT. These are seen to be the main transport to carry the agricultural product within the rural areas. Finally, the perception of the farmers has been considered about NCMT and CT which are more important in different ways of their daily activities. To do so this section has been organized based on the following issues:

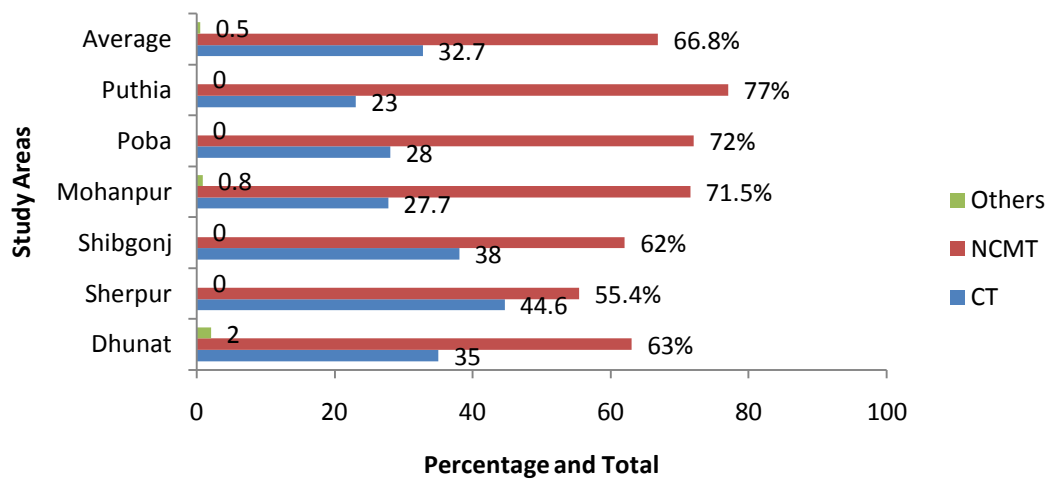
- Perception of the drivers of CT
- Perception of the drivers and owner-drivers of NCMT
- Perception of the farmers

#### **5.6.2 Perception of CT Drivers**

As we know that in the rural areas of Bangladesh, there are several modes of transport. Among those several types of motorized and non motorized transports are plying in the rural areas. These all are known as conventional transport. Mini truck, bus, *tempu*, human-hauler etc are continuing their business as motorized transport. They are serving the agricultural sector as conventional transport. Rickshaw, van, bullock cart, push cart are moving as non-motorized transport and serving the agricultural sector as well. So, perception of CT driver is important about the contribution of transport in agricultural development. Their opinion is explained below.

##### **I. Percentage of existing total transport modes**

There are several types of motorized and non-motorized transport moving in the areas. Among them, the use of NCMT is the highest in percentage and number. Adequate passenger, huge competition and investment factors are the reasons behind this. Besides, motorized transports did not serve as per the increasing demand of motorized transport of the rural agrarian people. Figure 5.7 shows the transport modes existing in the study areas according to the perception of the drivers of the CTs in the study areas.



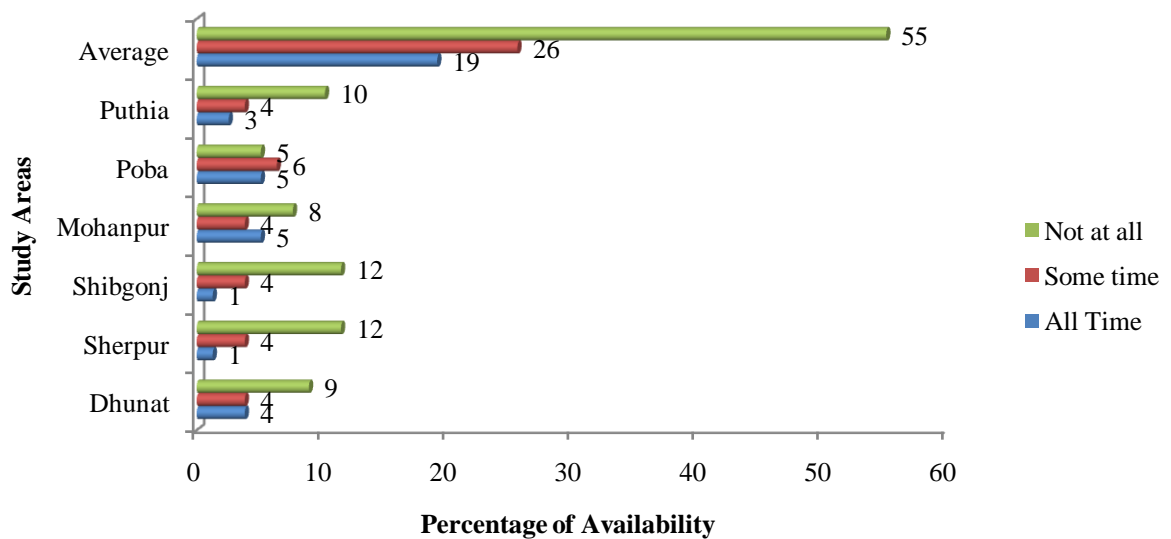
**Figure 5.7: Presence of Total Transport Modes Available in the Study Area**

Source: Questionnaire Survey, 2013-14

Sixty-six percent of rural transports are NCMTs. The share of CTs is far below of NCMT. Among them Puthia contains the highest and Sherpur contains the lowest. It is found in the study areas that, a sub-urban and urban type of area contains the highest number of CT's whereas rural types of area contain the NCMT in highest number.

## II. Availability of CT to agricultural product transportation

In the rural areas there are so many *huts* (local weekly market) , *bazars* (local daily market) and retail markets for selling and purchasing agricultural products. So transport is needed to the seller and buyer to carry their goods in quickest possible time. In this sphere availability of transport modes is very crucial to agricultural development. In the study areas, CTs is not available in most cases. Figure 5.8 shows the availability of CTs in the study region.



**Figure 5.8: Availability of CT to Agricultural Product Transportation**

Source: Questionnaire Survey, 2013-14

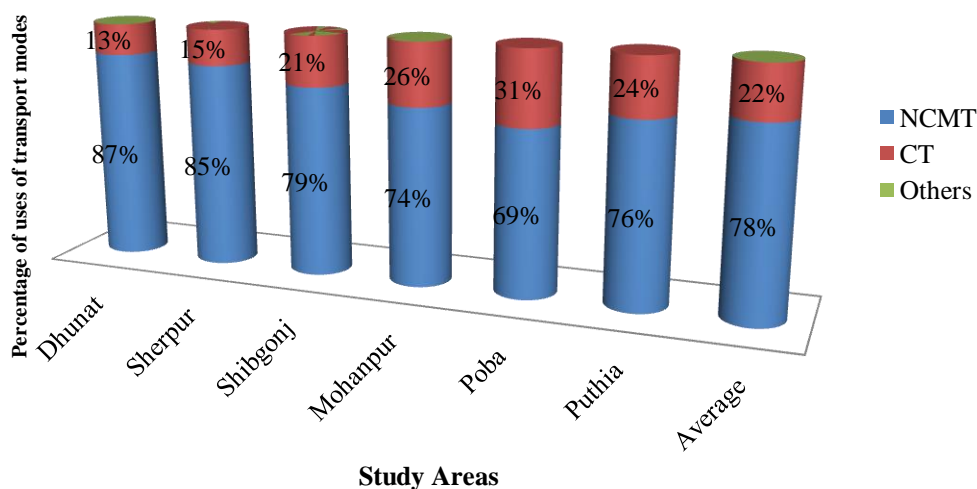
Almost 55% of the respondents opined that CTs are totally unavailable in the areas.

Only 26% respondents said that sometimes CTs are available but these CTs are non-motorized but conventional transport such as rickshaw, van and so on. The rickshaw and van puller said they are available in all times but those are very insignificant in number to carry the agricultural product. Almost the study areas have the same scenario. So it can be said that NCMT filling the gap of the demand of the transport to the agrarian people as well as the buyers of the agricultural product from the rural areas.

### III. Usage of transport modes to agricultural product transportation

Due to problems of unavailability of CT, the agrarian people usage NCMT which are available according to the demand of the farmer. Problem of physical inaccessibility, higher cost, extra labor cost, time consuming are the reasons to use CT's in the rural areas. Based on the above disadvantages the opinion of the driver of CT regarding the usage of CT's in case of

agricultural product transportation is very low through CT. The following figure 5.9 illustrates the extent of using of the CT's in the study region.



**Figure 5.9: Percentage of Usage of Modes of Transport to Agricultural Product Transportation**

Source: Questionnaire Survey, 2013-14

According to the driver of the CT's most of the people used the NCMT in case of agricultural product transportation. Average 78% of the agrarian people in the rural areas are using the NCMT whereas CT' have been used by only 22% farmers. Among the CTs non-motorized transport is sometimes available rather motorized transport.

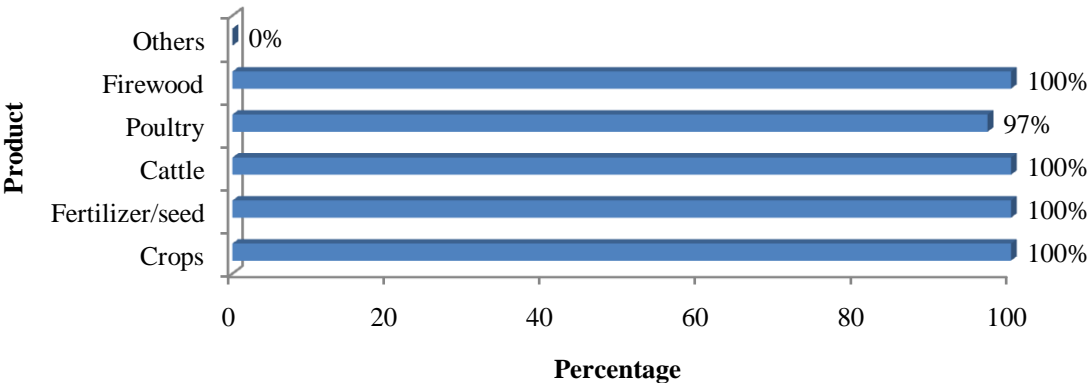
### 5.6.3 Perception of NCMT driver and owner-driver of NCMT

A certain number of people of the rural areas are living with poverty because of unemployment. These unemployed people have fallen into types of socio-economic disadvantageous situation due to lack of their own resources, lack of literacy and employment opportunity within the rural areas. In these circumstances, the unemployed poor people tried to find out a job opportunity within their areas to maintain their lives. On the other hand, demand of faster movement is increasing continuously in these areas. But there is no institutional investment in the sector of rural transport. In this sphere rural unemployed people

came forward with their own resources and creativity to create job opportunities for the people with the invention of NCMTs. This enhances the socio-economic development through the development of the sectors of agriculture, education, health and others in the rural areas of Bangladesh. Though the driver and owner-driver of NCMT play a catalyst role in this sector, their perception is necessary to consider the role of NCMT in the agricultural development of the rural areas.

1) Types of Agricultural Product transported through NCMT

Because of NCMT, there has been a frequent movement of agricultural products in the study region. Besides, urban products come from the urban areas and agricultural product moving from rural to rural and from rural to urban areas. In this sphere, NCMT is the main transport to carry those products within the specific areas. According to the drivers of NCMT, they mainly transport crops, fertilizer, seeds, poultry, firewood, cattle, fish and other agricultural products. Figure 5.10 shows the diversity of transportation of agricultural products through NCMT.



**Figure 5.10: Types of Agricultural Product Transported through NCMT**

Source: Questionnaire Survey, 2013-14

According to the respondents, during the plying on roads, drivers transport all types of agricultural product through NCMT. It is the only suitable transport to carry those products within the rural areas. Cost effectiveness, availability, time saving, physical accessibility are the main factors behind the sole use of these transports. On the other hand, other transports modes existent in the rural areas lack of those advantages.

## 2) Time modes of demand of agricultural product transportation

It is very important to consider the time of agricultural product transportation. The demand of transport for agricultural product transportation depends on when the product is needed to transport in the market or elsewhere according to the farmers' demand. Some farmers transport their produce to the daily market. The activity of those types of markets starts early in the morning. Some markets start at the midday in a week which is called the *hut* day in the rural areas. So according to the time mode of demand, farmers need the transport to carry their products in time to the markets. In this sphere, suitable transport for the farmers is the NCMT. It is always available in the rural areas. On the other hand other motorized transports did not fulfill the farmers' demand as per their necessity. Table 5.31 shows the time mode of demand of farmers in the study areas.

**Table 5.31: Time Mode of Demand per week for Agricultural Product Transportation (%)**

Time	Dhunat	Sherpur	Shibgonj	Mohanpur	Poba	Puthia	Total
Hut Day	5.62	7.30	7.30	4.49	6.74	6.74	38
Daily	2.25	2.25	1.68	6.74	2.81	3.37	19
According to Farmers demand	6.74	7.30	6.74	7.30	7.30	7.30	43
Total	14.61	16.85	15.72	1.59	16.5	17.41	100

Source: Questionnaire Survey, 2013-14

Farmers said among the time modes, 38% of total respondents said they transported their product in *hut* day and 43% of the respondents said they needed the transport in any time

of a week. Nineteen percent respondents opined that it is needed on daily basis. So availability of transport modes in the rural areas is necessary in any time mode of demand to serve the purpose of the farmers. Only the NCMTs in the rural areas have the ability to serve as per the demand of the farmers whereas other vehicles lack the opportunity. In these circumstances, the problems to use of CTs and the opportunities of NCMTs are illustrated in the following sub-sections on the basis of the perception of the drivers and owner-drivers of NCMT.

### 3) Problem to use CTs for agricultural product transportation

There are several types of CTs moving in the rural areas. One type includes bus, truck, *tempu*, battery-driven auto-rickshaw known as motorized and other types manually driven comprises rickshaw, van, bullock cart, push carts are known as non-motorized transport. First category is very much infrequent due to its high investment. Spacious road, parking areas, license of transport and drivers and others government criteria are needed to run those vehicles in the rural road. These criteria are playing the role of unavailability of that transport on the rural roads. Farmers expressed the limitations for use of those transports according to the following Table.

**Table 5.32: Problems to Use CT in Agriculture (%)**

Area	Problems (in %)				Total
	High Cost	No physical accessibility in any where	No availability	Extra Labor cost	
Dhunat	5.05	5.05	5.05	4.66	19.81
Sherpur	5.05	5.05	4.60	3.50	18.20
Shibganj	5.05	4.66	5.05	3.11	17.87
Mohanpur	5.05	3.50	3.50	2.72	14.77
Poba	5.05	5.05	4.28	1.17	15.55
Puthia	5.05	5.05	2.83	1.17	14.10
Total	30.35	28.4	24.90	16.34	100

Source: Questionnaire Survey, 2013-14

The respondents give the opinion about the usage of CTs. 30.35% respondents viewed about the high cost to rent CTs as the major problem. About 28.4% of the respondents treated the physical inaccessibility of CTs in the rural road as well as to the closer places of the product. Over 24% of them opined about the un-availability of the transport and 16% opined about the extra labor cost of CTs. So they want mostly that transport which is free from the above disadvantages.

#### 4) Reasons behind the choice of NCMT

Actually, NCMTs are purchased by the people who lived in the village. There is no driver or owner driver who comes from outside of the village. It is low cost transport and requires no training to drive it. There are established workshops to repair it. All kinds of spare parts are available within the village. These opportunities are present with NCMT. And these are the reasons of availability of NCMT in the rural areas. Besides, some other important reasons are existent into the NCMT. They are summarized in Table 5.33.

**Table 5.33: Reasons Behind the Choice of NCMT (%)**

Area	Reasons (in %)						Total
	Low Cost	Easy to carry any amount of goods	Carry in quickest possible time	Availability	Easy access in any place	No extra labor cost	
Dhunat	3.39	3.39	3.39	3.13	1.82	1.30	16.42
Sherpur	3.39	3.39	3.39	2.87	2.61	2.09	17.74
Shibganj	3.39	3.39	3.39	3.39	2.35	2.09	18
Mohanpur	3.39	3.39	3.39	3.39	2.87	2.09	18.52
Poba	3.39	3.39	3.39	3.13	1.56	1.04	15.9
Puthia	3.39	3.39	3.13	2.09	0.52	0.78	13.3
Total	20.36	20.36	20.08	18.26	11.73	9.39	100

Source: Questionnaire Survey, 2013-14

According to the driver and owner-driver of the NCMT the rural people liked it because it is low cost transport, easy to carry any amount of goods and high mobility transport

within the village. Almost 18.26% of the respondents expressed NCMT is all time available in the village. About 12% of the respondents said NCMTs have the advantage of the physical access to any places in the village and 10% of the respondents said there is no need of extra labor costs to load and unload the goods carried by NCMTs.

#### **5.6.4 Perception of Farmers**

Farmers are the main catalyst of the development of the rural areas. They know better about the main indicators of development of their areas. According to them, transport is the important one among the indicators of rural development. Within the village there exist several types of transports modes. Among those transport modes, NCMT is playing the key role to carry their product. So, the perception of farmers about the transport modes is very important to consider. The following section reveals the importance of NCMT according to farmers' point of view.

##### **1) Modes of transport for agricultural product transportation**

There are several types of modes in the rural areas. We can categorise them into two parts. First one is CT which contains truck, bus, *tempu*, battery-driver three-wheeler etc and NCMT is the other mode of transport which has been invented to meet the demand of motorized transport in the rural areas in absence of CTs. People also carry their products through head loading. Table 5.34 shows the existing transport modes in the rural areas.

**Table 5.34: Modes of Transport for Agricultural Product Transportation (in %)**

Area	CT	Head Loading	NCMT	Others
Dhunat	12	0	13	0
Sherpur	7	0	13	0
Shibganj	13	0	13	0
Mohanpur	9	0	13	0
Poba	13	0	13	0
Puthia	10	0	13	0
Total	64	0	78	0
%	82	0	100	0

Source: Questionnaire Survey, 2013-14

The farmers said they have NCMTs to carry their product in the rural areas. Besides, the conventional motorized transport also plays a key role simultaneously. But at present head loading is absent due to the invention of NCMT. Bullock cart and push cart were also removed from rural areas due to the invention of NCMT.

## 2) Percentage of using of the modes of transport

CTs, head loading, bullock cart, push carts had transported the agricultural products before the invention of NCMT. Due to huge demand of motorized transports and the absence of the investment in this sphere NCMT plays the key role to transport the agricultural products in the study areas. On the other hand, drudgery of workers of bullock cart, pushcarts, van pullers have been reduced through the invention of NCMT. Now it is seen there are no bullock cart, pushcart, and head loading in the rural areas. Table 5.35 shows the usage of transport modes in the rural areas.

**Table 5.35: Percentage of Usage of the Different Modes of Transport (%)**

Area	CT	Head Loading	NCMT	Others
Dhunat	18	0	82	0
Sherpur	12	0	88	0
Shibganj	46	0	54	0
Mohanpur	18	0	82	0
Poba	39	0	61	0
Puthia	12	0	88	0
Average	24	0	76	0

Source: Questionnaire Survey, 2013-14

Almost 76% of total respondents use the NCMT to carry their product. Only 24% of them use CT's to carry agricultural products in the rural areas. Most of the 24% uses non motorized rickshaw and van. So demand of total motorized transportation has been filled up by the NCMT. Head loading and other modes of transport have been reduced due to invention and subsequent use of NCMT.

### 3) Availability of transport modes for agricultural product transportation

According to the time mode of demand, farmers need the transport mostly in any time of the week. Most of them said they need it during the *Hut* day. So at that time which transport is available is very important. If there are no availability of transport mode in that time that transport is no need to farmers. Table 5.36 shows the availability of transport modes in the rural areas.

**Table 5.36: Availability of Transport Modes for Agricultural Product Transportation (%)**

Time	NCMT	Truck	Bus	Tempu	Rick/Van
Alltime	97	0	0	0	63
Sometime	3	9	15	47	32
Not at all	0	91	85	53	5
Total	100	100	100	100	100

Source: Questionnaire Survey, 2013-14

According to the farmers perception, NCMT is all time available in the rural areas. Sixty three percent respondents said rickshaw and van are available in alltime. Truck and bus

has no availability to carry their agricultural product. Sometime they use *tempu* to carry their product. So in this sphere NCMT has the advantages of availability in the study areas in comparison to other modes of transport. It is also important in case of reservation. Most of the days agrarian people want to transport their products to the hut, daily market and the retail market by reserving a NCMT. So availability of transport in case of reservation in anytime is important to farmers. Table 5.37 shows the availability of transport modes in case of reservation for agricultural product transport.

**Table 5.37: Availability of Transport Modes in Case of Reservation for Agricultural Product Transportation (%)**

Time	NCMT	Truck	Bus	Tempu	Rick/Van
Alltime	100	2.56	0	0	63
Sometime	0	2.56	7.7	36	35
Not at all	0	94.87	92.3	64	3
Total	100	100	100	100	100

Source: Questionnaire Survey, 2013-14

Farmers opined that NCMT is the only transport which is alltime available in case of reservation to carry agricultural goods. Over 60% of the respondents said rickshaw and van is alltime available for reservation. But it is not motorized. There is no motorized transport except NCMT is alltime available for reservation.

#### 4) Time savings transport in the rural areas

Farmers have to do lots of work to produce and process the product as final goods for consumption. They have to use the daily time to produce and process their product properly. It is also important to carry their product timely to the *hut* or local market. If they fail to attend timely to the market, they are supposed to fall in losses. So in this regard time savings transport is important to farmers. Table 5.38 shows the modes of time savings transport in the rural areas.

**Table 5.38: Time Saving Transport in the Rural Areas (%)**

Modes	a lot of	a few	no time save	waste time	Average time saving through NCMT
NCMT	100	0	0	0	
Truck	0	6.4	79.5	14.1	36%
Bus	0	15.4	75.6	9.0	
Tempu	1.3	39.7	53.8	5.1	
Rick/van	2.6	6.4	82.1	9.0	

Source: Questionnaire Survey, 2013-14

Respondents opined that NCMT is the appropriate transport in case of time saving in comparison to other modes of transport. On the other hand, others modes of transport did not have the advantages of time saving as much as the NCMTs have. Among the transport modes NCMT saves average 36% of their working time in farmers' opinion.

#### 5) Cost saving transport modes

The ultimate goal of farmers is to minimize the cost of production and maximize the profit from their production. In the purpose of maximizing profit through the minimization of cost, transport cost is an important factor. If the farmer did not able to minimize their transport costs it could not be possible to maximize their profit. Farmers have the incentives if they can make profit. Any incentive to farmer has many positive dimentions; ultimately it is turns to rural development. So transport cost is very important in minimizing the cost of production. Table 5.39 shows the cost saving transport in the rural areas.

**Table 5.39: Cost Saving Transport in the Study Areas (%)**

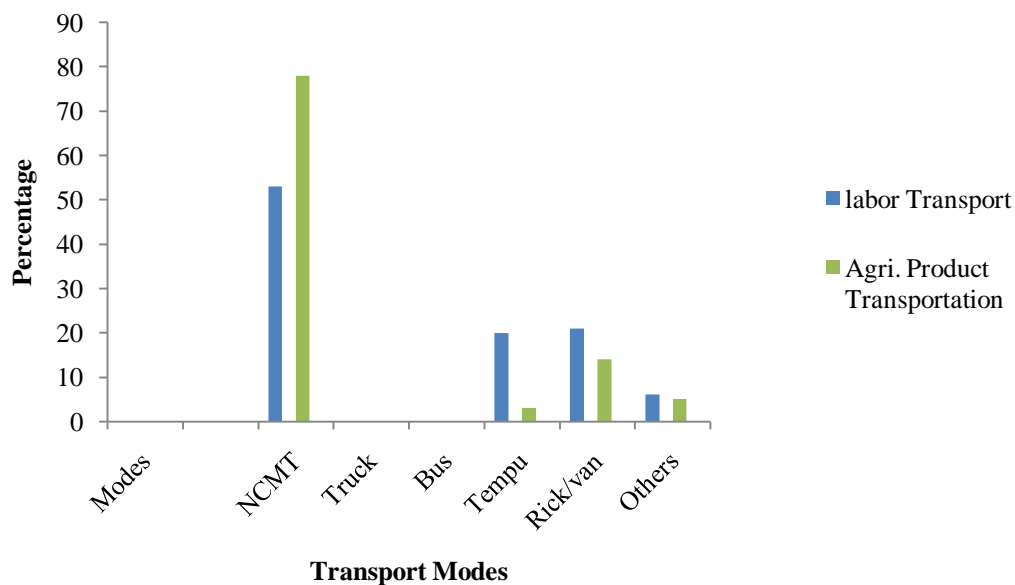
Area	NCMT	Truck	Bus	Tempu	Rick/van	% of cost saving through NCMT
Dhunat	100	0	0	0	0	
Sherpur	100	0	0	0	0	64%
Shibganj	100	0	0	0	0	
Mohanpur	100	0	0	0	0	
Poba	100	0	0	0	0	
Puthia	100	0	0	0	0	

Source: Questionnaire Survey, 2013-14

The respondents opine NCMT is the only transport to minimize their production costs through transporting their product by NCMT. Using NCMT average 64% costs have been saved. So it can be concluded that only NCMT is the cost saving transport in the study areas in comparison to other modes of transport in the study areas.

6) Percentage of usages of transport to go to the farm land far from residence.

In the rural areas it is seen that some farmers have some cultivable land which is far from their residence. In such circumstances, farmers have to carry labor and inputs and products from their own residence to the farm land and vice-versa. In this sphere, transport is needed to carry labor and product. Farmers have to think about the time and cost to carry labor and their product. Farmers of the rural areas, use the different transport modes to carry labor and agricultural product. Among them NCMT is the only transport which serves the farmers purpose in this sphere. Figure 5.11 shows the percentage of using of transport modes to carry labor and agricultural product from the farm land far behind the residence of farmer.



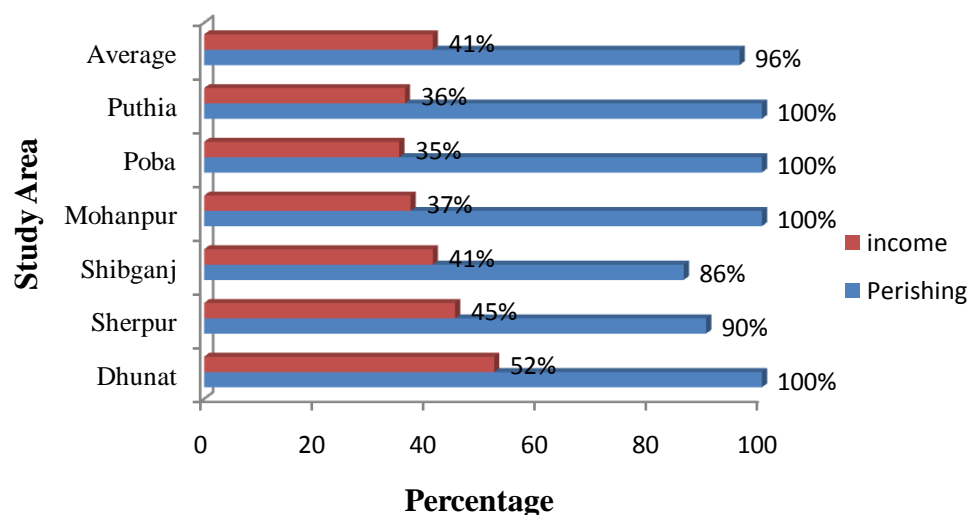
**Figure 5.11: Percentage of Usage of Transport to Go to the Land Far from Residence**  
Source: Questionnaire Survey, 2013-14

Almost all the respondent opined that they use NCMT to carry labor and product to the land far from residence. Cost effectiveness, availability and physical access to anywhere is the advantages of this transport to carry labor and product to the land far distance from residence.

#### 7) Reduces perishing, spoilage and increase income through NCMT

Farmers face the problem of perishing of their product and spoilage during the transportation period. It resulted in reducing of their profit. The farmers need such type of transport which reduces spoilage. NCMTs are necessary which will help to transport the product before the time of perishing.

If it possible to transport the product before perishing and to reduced spoilage, farmers will be able to maximize their profit. That will turn into higher income. Figure 5.12 illustrate the percentages of reducing perishing, spoilage and increases income through NCMT.



**Figure 5.12: Reduces Perishing, Spoilage and Increases Income through NCMT (%)**

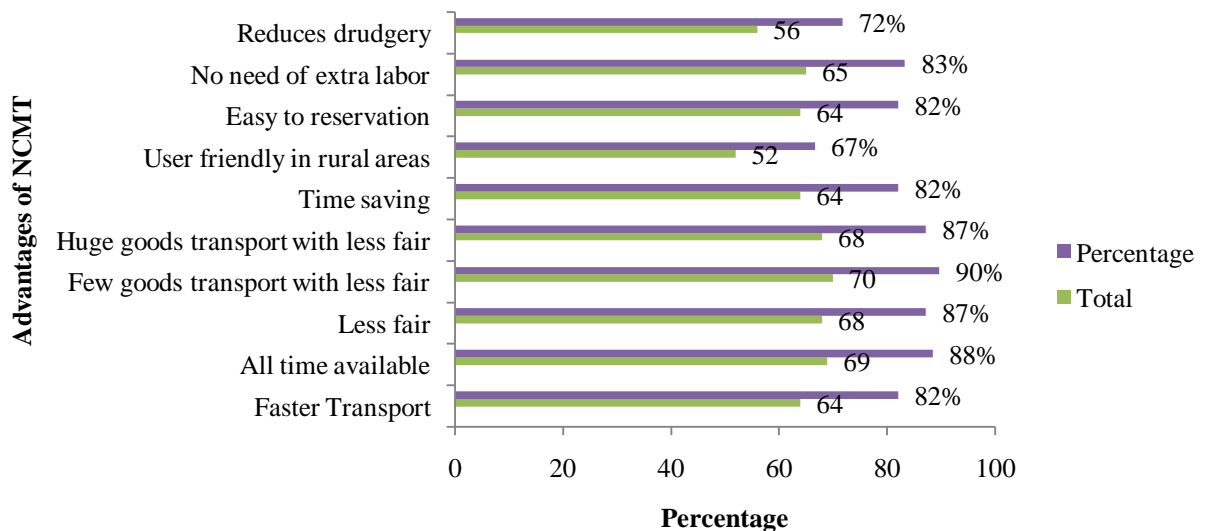
Source: Questionnaire Survey, 2013-14

Perishable goods are transported through NCMT by the farmers in the study areas.

Farmers maximize their profit over 41% through the usage of NCMTs in case of perishable goods.

#### 5.6.5 Reasons to Choose NCMT as a First Option for Agricultural Product Transportation

Farmers have to think a lot of advantages and disadvantages to select a transport mode if they want to minimize their production cost. Keeping in mind the rural people have innovated NCMT with their own resources. By using NCMT, farmers have been able to minimize the transportation cost. They gave the following reasons for the choice of NCMT as a first option to transport the agricultural goods in the village which is depicted in the Figure 5.13.



**Figure 5.13: Reasons to Choose NCMT as a First Option for Agricultural Product Transportation (%)**

Source: Questionnaire Survey, 2013-14

According to farmer's opinion, NCMTs has some advantages for which farmers choose it as a first option to carry their product. Most of farmers said about the advantages of any amount of goods transported with less fair, totally less fair in comparison to others,

alltime avialability, faster transport, not need to extra labor cost, easy for reservation, reducing drudgery, time saving and user-friendly in the rural areas. NCMTs have all those advantages. There is no other transport in the rural areas which contains the above advantages in one transport. So these are the reasons to use the NCMT in most cases of agricultural product transportation in the rural areas.

#### **5.6.6 Conclusion**

Rural areas of Bangladesh have achieved an improved motorized transportation system with the introduction of NCMT. This transport already fulfills the demand of faster movement of the product of farmers. This section started with the aim to identify the usable transport in the rural areas particularly in favor of farmers. To do that, perception of CT drivers, NCMT drivers and farmers have been considered. Findings of this section through the nexus of three perceptions reveal that NCMT have played the key role to agricultural development. The CT's are performing their businesses with high cost, no physical accessibility in anywhere of the rural areas, no availability and needed to extra labor cost. For these advantages of NCMT farmers are denyes to use CTs in the rural areas. From the perception of farmers, it can be drawn that 100% of farmers use it to transport different agricultural products. NCMT's have alltime availablity in the study areas in case ofeither individual movement or the purpose of reservation. This transport is time and money saving. It ultimately increases the income of farmers. Farmers save their product from spoilage and perishing. Farmers have transported their labor to the land far from their residence through NCMT. So low cost, availability of NCMT, time and cost saving, physical accessibility in anywhere, faster than other transport modes are the main reasons to use it as a first option to farmers. No other transport has such type of advantages.

## **5.7 Social Issues and NCMT**

### **5.7.1 Introduction**

It is already evident that rural motorized transport plays an important part in rural development. It provides the means by which local communities can timely access the opportunities and necessities which can enhance their livelihoods. Thus improved transport connects the rural community with education and employment opportunities, health and welfare facilities (Fouracre, 2001) Transport also supports family and community development by providing the necessary access to social gatherings outside or inside of the locality. Through these mechanisms, improved transport can contribute not only to an improved rural economy, but also to a higher degree of social wellbeing within both individual families and the community. No hard-and-fast distinctions can always be drawn between the social benefits and the economic benefits of rural transport. Often these go hand-in-hand; an improved economy is, after all, likely to be of great social benefit to any community, because it will bring in its wake improvements in, for example, education and health care facilities. Conversely, social benefits such as improved access to basic health care and education, lead to economic benefits because they may result in less illness and mortality in the community, which makes greater productivity. In the above context NCMT makes an attention to us whether it is playing a role to the people of the rural areas in the sectors of education and health care. This section is an attempt to make a discussion about the role of NCMT to reach the educational and health care facilities within the study areas according to the perception of the user of NCMT particularly educational institution going students and teachers as well as the health service takers. Driver and owner-driver of NCMT also opined

about the advantages of the NCMT in case of social wellbeing such as education and health.

To do that the section has been organized according to the following subsections.

### **5.7.2 Educational Development**

Perception of NCMT driver, owner driver of NCMT and educational institution going people has been considered regarding the role of NCMT in this sector in the rural areas according to the following sub section.

#### **A. Perception of the People Engaged in NCMT**

As we know about the people directly depend on NCMT in the study areas and the number which is over 24000 and 154 school going children directly depend on the income through NCMT (Table 5.2). They changed their occupation to NCMT, due to the economic insolvency with other occupations. The following sections discuss about the educational development of the people engaged in NCMT.

- Educational expenses borne by the driver and owner driver of NCMT

The people engaged in NCMT had fallen shortage of money to lead their lives with other occupations before their involvement in NCMT. They did not able to bear their children's educational expenses due to inadequate income. For which they had fallen in social problem in absence of minimum literacy in the society. But with the NCMT occupation they have improved their educational status of their children through the increase of income from NCMT. Table 5.40 illustrates the status of educational expenses of the people involved in NCMT.

**Table 5.40: Educational Expenses Borne by the Driver of NCMT**

Area	Monthly Educational Expenses Borne by the People Engaged in NCMT Occupation		Changes in Educational Expenses (%)	Percentage of Respondents Borne Extra Educational Expenses			
	Before Joining NCMT (BDT)	After Joining NCMT (BDT)		Coaching	School Van	Extra Books	Others
Dhunat	269	746	277	77	54	23	8
Sherpur	415	1231	297	69	46	31	62
Shibgonj	400	1485	371	85	31	38	46
Mohanpur	277	1115	403	92	69	31	38
Paba	192	1008	525	69	46	15	38
Puthia	123	708	576	54	31	8	15
Average	279	1049	375	74	46	46	38

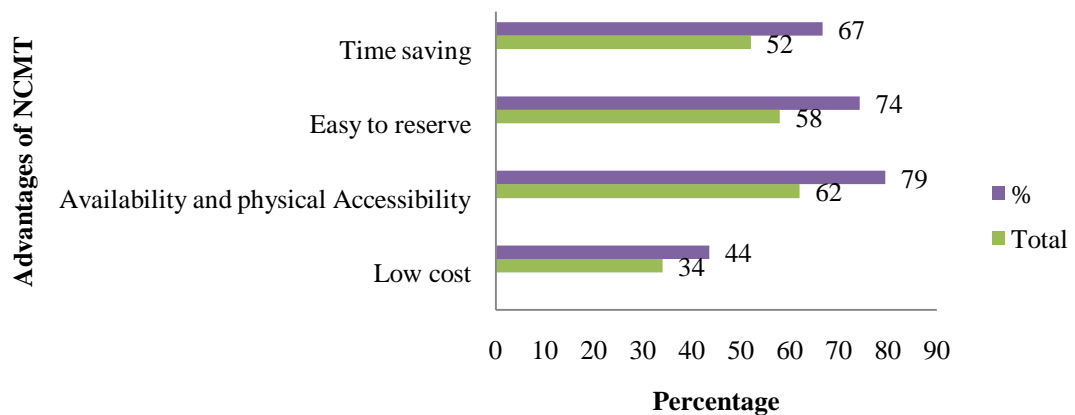
Source: Questionnaire Survey, 2013-14

Before joining NCMT occupation the average monthly spending for education was only BDT 279. People had to involve their children into their occupation or another occupation to earn some money to lead their life before involving NCMT occupation. Besides, distance of educational institution, timing of education and proper transportation are the reasons to the reluctant of education. Among them the people of Puthia and Paba spent the lowest BDT 123 and 192 respectively due to lower income and the people of Sherpur and Shibgonj spent highest BDT 415 and BDT 400 respectively due to the higher income of them. Besides, those areas are located adjacent to the urban areas where educational institution is available to the nearest places of the respondents. After joining NCMT they have been spending monthly average BDT 1049. The children of them are using NCMT to go to school and college. Average increase in educational expenses is about 375%. For which the children of the people engaged in NCMT leave working and have wistfulness for education. Besides, the families have been able to spent extra money for their educational development such as coaching, school van cost, cost for extra books and others. So NCMT occupation changed the

life of education of the children of the people engaged in NCMT. This ultimately goes for the development of the life of rural people and rural development as a whole.

- Reasons behind the choice of NCMT to go to the educational institutions

Attendance level at schools is affected by the lack of access to school – both for pupils and teachers. Teachers are not attracted because of the remoteness and associated difficulties of many poor areas (P. Fouracre, 2001). Besides, in Bangladesh there is a high economic price to be paid for insufficient social facilities especially for the education in the rural areas. Insufficiencies of motorized transport have made the pupil and teacher reluctant to education in the rural areas. In this sphere NCMT playing an important role to regain the higher attendance in the class room of the rural areas. Now it is reality that NCMT is the main transport to carry both pupil and teacher in the rural areas. Figure 5.14 shows the reasons behind the choice of NCMT to go educational institutions.



**Figure 5.14: Reasons to Choose NCMT as a First Option to Go to Educational Institutions**

Source: Questionnaire Survey, 2013-14

According to the respondents of the study areas, low cost, advantages of stopping place in anywhere, availability of transport and easy to reservation are the main advantages of

NCMT to choose it to go to educational institution. Over 65% people respond about the advantages of time saving for them. Some pupil said about the comfort ability to go through NCMT.

## **B. Perception of Educational Institution Going Students and Teachers**

Students and teachers are the main users of rural transport to go to the educational institution. So, it is necessary to consider about the perception of the user going to educational institutions. They are able to make it clear about the advantages and disadvantages of NCMT or others modes of transport used in the rural areas to go to educational institution. The following sub-sections discusses about the perception of the educational institution going students and teachers.

- Existing modes of transport to go to educational institution in the rural areas

There are types of motorized and non-motorized transport exists in the rural areas to go to educational institutions which is located in the far distance to the residence of the rural people. Table 5.41 shows the transport modes exists in the study areas to go to educational institution.

**Table 5.41: Modes of Transport Mostly Used to Go to Educational Institution (%)**

Area	NCMT	Bus	Tempu	CNG	Rikshaw/Van	Others
Dhunat	10.15	0	0	3.90	3.90	0
Sherpur	8.59	0	0.78	6.25	4.68	0
Shibgonj	3.90	0	0.78	2.39	8.59	1.56
Mohanpur	6.25	0.78	1.56	0.78	7.81	0
Paba	8.59	0.78	3.12	0	5.47	0
Puthia	9.37	0	0	0	0	0
%	47	1.56	6.24	13.32	30.45	1.56

Source: Questionnaire Survey, 2013-2014

As we see, there are motorized and non-motorized transport exist in the rural areas to serve in favor of the pupil and teacher. According to the respondents, NCMTs contain the

highest in number and others modes of transport have the lowest shares. They respond about the advantages of NCMT to go to educational institutions which are discussed earlier. So NCMT is the main transport to carry the pupil and teacher.

- Available modes of transport to go to educational institution

Timely availability of transport is very important to make an effective demand of transport in the rural areas. Timely availability of transport saves money and time of the student and teacher. The educational institution going people mostly used those transport which is available in any time in the study areas. Table 5.42 shows the availability of transport modes in the study areas to go to educational institutions.

**Table 5.42: Available Modes of Transport in the Study Areas (%)**

Area	NCMT	Bus	Tempu	CNG	Rickshaw/Van	Others
Dhunat	10.08	0	0	1.68	4.20	0
Sherpur	8.4	0	0.84	3.36	3.36	0
Shibgonj	4.2	0.84	1.68	5.04	6.72	1.68
Mohanpur	8.4	0	1.68	0	3.36	1.68
Paba	8.4	0	4.20	0.84	5.04	1.68
Puthia	10.08	1.68	0	0	0.84	0
%	50	2.52	8.4	10.92	23.52	5.04

Source: Questionnaire Survey, 2013-2014

The users opined that in the study areas NCMT is the only transport which is available all time to students, teachers. These transports help to increase the attendant's level of the students of the educational institution. Fifty percent of the total respondents said NCMT is all time available in the study areas.

- Accessible transport near to residence and easy to reserve

Attendance levels at educational institutions are affected by the lack of access of the proper transport to go to the institutions- both for pupils and teachers. Teachers are not attracted because of the remoteness and associated difficulties of many poor areas. In the rural

areas of Bangladesh the educational institutions are situated mostly far behind to the residence of the pupils as well as the teachers. So service takers and the service providers are not attracted to take and provide the educational services. In this sphere appropriate motorized transport can create an effective educational service for both. But, before the introduction of NCMT, people of the rural areas were suffering from the lack of motorized transport demand. NCMT is easily accessible to the people of the rural areas. They can reach it easily in any time near to the resident of them. Table 5.43 shows the accessibility of transport modes existing in the study areas.

**Table 5.43: Accessible Transport Near to Residence and Easy to Reserve (%)**

Area	NCMT	Bus	Tempu	CNG	Rickshaw/Van	Others
Dhunat	11.5	0	0	0.88	3.53	0
Sherpur	9.73	0	0	5.31	2.65	0
Shibgonj	5.31	0.88	1.77	5.31	3.43	0
Mohanpur	9.73	0	2.65	1.77	2.65	0
Paba	8.84	1.77	4.42	1.77	3.53	0.88
Puthia	11.5	0	0	0	0	0
%	57	2.65	8.84	15	16	0.88

Source: Questionnaire Survey, 2013-2014

Among the respondents most of them said that NCMT is more accessible than that of the transports exists in the rural areas. The respondents of the six study areas also opined that there are no motorized transports except NCMT to serve them as a time and cost saving motorized transport in the rural areas of Bangladesh. Only NCMT is the more accessible to the pupils and the teachers of the study areas.

- Cost saving transport in the study areas

In the rural areas of Bangladesh the educational institutions are situated in the *thana* sadar or in the central places of the villages. But students live scatteredly in those areas. In such situation attendance level depends on the transportation cost along with other costs.

Pupils have selected this vehicle which is cost and time saving to them. Students do not want to wait for a long time to reach a transport which is not cost effective. Because pupils are comes from the poor family. In this sphere an adequate transport service means a motorized transport which is time and cost effective and available in the near of the residence of the student and teachers. NCMT is the cost effective transport among the transport available in the study areas according to the respondents. Table 5.44 shows the cost effectiveness of NCNT among the transport available in the study areas on the way to the educational institutions.

**Table 5.44: Cost Saving Transport in the Rural Areas (%)**

Area	NCMT	Bus	<i>Tempu</i>	CNG	Rikshaw/Van	Others	Reduction of transport cost to go to educational institution through NCMT (%)
Dhunat	11.81	0	0	0	1.81	0	
Sherpur	10.90	0.9	0	0.9	1.81	0	
Shibgonj	6.36	0.9	0.9	5.45	2.72	0.9	
Mohanpur	9.09	5.45	1.81	1.81	1.81	0	
Paba	10.90	0	3.63	0.9	0	0	
Puthia	9.09	9.09	0	0	0	0.9	28
%	58.95	16.34	6.34	9.06	8.15	1.8	

Source: Questionnaire Survey, 2013-2014

According to the respondents NCMT is the adequate means of transport due to its cost effectiveness to the educational institution going peoples. They opined that NCMT reduces their transport cost in comparison to other type of vehicles. Twenty eight percent of their transport cost has been reduced through the use of the NCMT in the study areas.

- Time saving transport in the study areas

Time is an important factor to go to educational institution going people for both pupils and teachers. Pupils are also engaged in their household activities besides their study. So, time saving transport is a most important factor for their education life. At present, no one wants to wait for a transport to go to their expected destination. In the rural areas all time

available motorized transport can get up the demand of the time saving transport. In this regard, NCMT has the availability in the rural areas. Students can reach it in anywhere and anytime on the way to their educational institutions. The other transports prevailing in the rural areas did not fulfill the demand of timely availability in the way of the educational institutions. Table 5.45 illustrates the time saving rate among the transport available in the study areas.

**Table 5.45 : Time Saving Transport in the Rural Areas (%)**

Area	NCMT	Bus	Tempu	CNG	Rickshaw/Van	Others	Percentage of the time saving (minute) to go to educational institution through NCMT (%)
Dhunat	10.83	0	0	8.33	0.83	0	23
Sherpur	10.83	0	0	5.83	0.83	0	
Shibgonj	7.5	0	0	8.33	0.83	0	
Mohanpur	10	1.66	2.5	0.83	3.33	0	
Paba	9.16	0	1.66	0	0.83	5	
Puthia	16.83	0.83	0	0	0	0	
%	59.15	2.49	4.26	24.32	6.65	4.16	

Source: Questionnaire Survey, 2013-14

Fifty nine percent of the total respondents opined that NCMT is more time saving transport among the transport available in the rural areas. They have no need to wait for the NCMT. The respondents opined that 23% of their travel time has been saved through NCMT.

### 5.7.3 Health Care Development

Transportation is a vital issue for accessing to health care, especially in rural areas where travel distances are great and access to alternative modes such as transit is less prevalent (Jeremy Mattson, 2010). This is especially true in rural areas where individuals often have to travel long distances to access health care services. In Bangladesh, the health care centers for 24 hours in a day, where the minimum level of health services is available in the rural areas are situated in the *upazila* sadar. But to reach the facility from the villages of the *upazila*, there have no other medium of transport except NCMT in the emergency period.

Although there are other means of non motorized transport exists in those areas, those are not as much appropriate in the emergency situation. On the other hand, NCMT occupation has made a significant change in the medical expenses of the people live their lives on NCMT. In this regard, perception of the drivers, owner-driver of NCMT and the health service taker has been considered about the contribution of the NCMT in the rural areas as discussed below.

#### **A. Perception of the People Engaged in NCMT**

Before starting the NCMT occupation the people have lived their lives with cronic poverty. They had no enough money to take the minimum level of health care facility from the health care centre available in the *upazila*. NCMT occupation has helped them to increase their income. This helps them to spend more for their health care development. So the perception of the people engaged in NCMT occupation has been considered importantly in the following subsections.

- **Statement of the monthly medical expenses of people engaged in NCMT**

Per capita health care expenditure in the developed countries is US\$1,500 as compared to US\$287 in developing countries. The level of health care spending in Bangladesh is only US\$58 per person is considerably lower than many developing countries (Mosleh U Ahmed, Syed Khairul Islam, Md. Abul Quashem, and Nabil Ahmed, 2005). According to the World Bank, the per capita health care spending of Bangladesh in 2012 was US\$ 26 or BDT 2000 (US\$1=BDT76.92). In these circumstances, before joining NCMT occupation people spend for health care accordingly. Table 5.46 is an illustration of the improvement of healthcare spending of the group of people those are engaged in NCMT occupation in the study areas.

**Table 5.46: Monthly Medical Expenses of the People Engaged in NCMT**

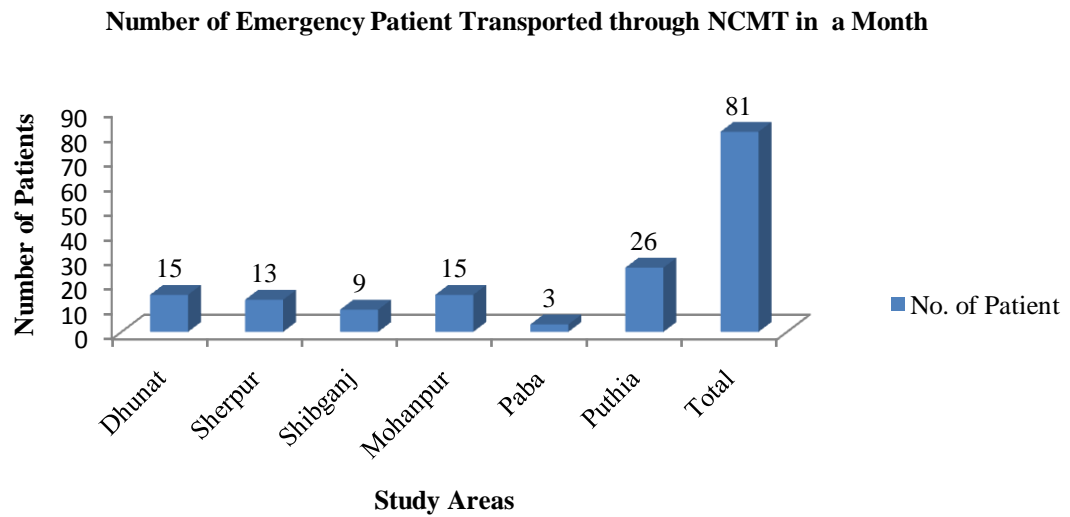
Area	Before Joining NCMT Occupation(BDT)	After Joining NCMT Occupation(BDT)	Percentage Changes in Medical Expenses
Dhunat	212	662	212
Sherpur	238	715	200
Shibgonj	146	612	319
Mohanpur	154	415	169
Paba	300	577	92
Puthia	131	438	234
Average	197	570	190

Source: Questionnaire Survey, 2013-14

Before joining NCMT occupation, the average yearly healthcare spending of the respondents was BDT 2364 in the study areas. Among the areas Shibgonj contains the lowest and Paba contains the highest expenditure. But this has been increased significantly after joining NCMT occupation. After joining NCMT occupation the average yearly healthcare spending of the respondents is BDT 6840 which increased up to 190% as compare to the period before joining NCMT occupation. So NCMT occupation helps to enhance the physical development of a group of people in the rural areas. It ultimately contributes to the speed of rural development.

- Monthly emergency patient transportation

Timely access of health care facility is important for the emergency patient. For that appropriate and adequate means of transport is needed. In Bangladesh the rural areas have been suffering from the lack of appropriate medium of transport for emergency patient transportation. Emergence of NCMT has contributed significantly for the demand of appropriate emergency patient transportation. There is no alternative way to transport the emergency patient to the medical centers without NCMT from the remote areas. Figure 5.15 shows the monthly emergency patient transportation scenario of the research areas.



**Figure 5.15: Emergency Patient Transportation through NCMT in One Month**

Source: Questionnaire Survey, 2013-2014

Total 81 number of patient has been transported to the medical center through NCMT in one month in the study areas. Among those the NCMT of the Puthia has transported the highest 32% of total patient and Paba transported the lowest of 3.7%. Paba is situated just adjacent to the divisional headquarter where the medium of transports to carry the patient are available for emergency patient transportation. So NCMT contributes in the remote region where other means of transport is significantly inadequate.

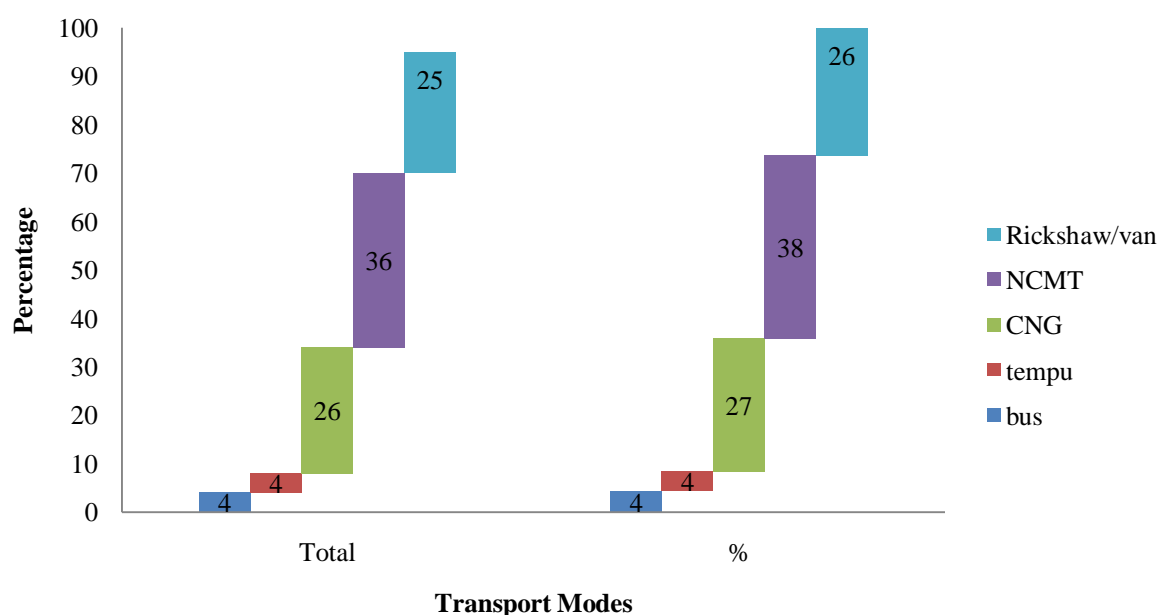
## **B. Perception of the Health Service Takers**

In this section opinion of the respondents have been considered who had come to the health center through NCMT. The diversified opinions of the health service takers have been structured under to the following subsections.

- Availability of transport modes in emergency period in the study areas

Access to transportation is critically important for utilization of health care services. While long travel distance makes trips to medical care burdensome, lack of transportation

makes those trips impossible. In rural areas where travel distances are longer and access to alternative modes such as transit is less prevalent, transportation becomes a vital issue for access to health care (Jeremy Mattson, 2005). In these circumstances rural Bangladesh has been suffering from the availability of adequate means of transportation in case of emergency patient transport. After introducing NCMT the people have the opportunity to reach at the hospital within shortest possible time in emergency period. The respondents opined about the availability of motorized transport as depicted in Figure 5.16.



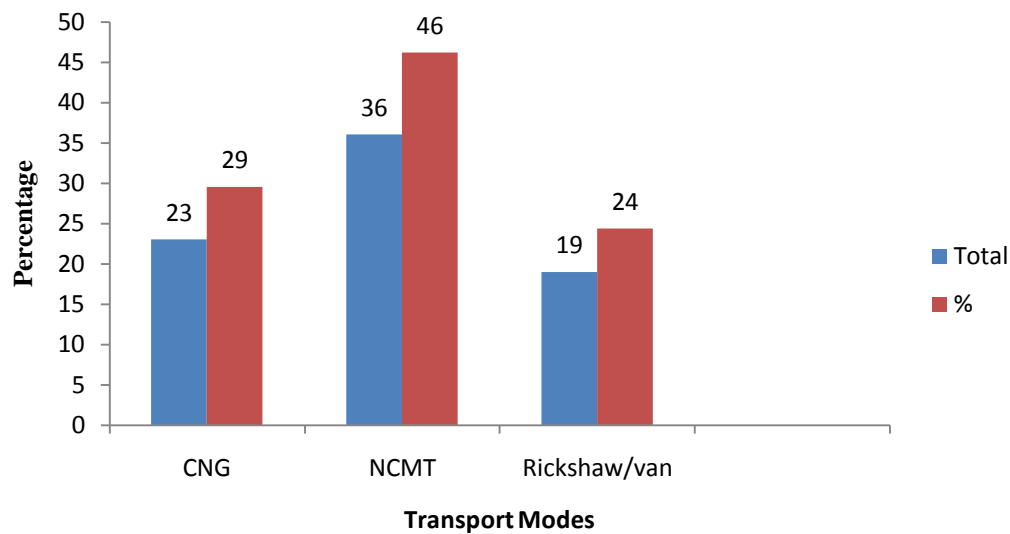
**Figure 5.16: Available Transport Modes in Emergency Period**

Source: Questionnaire Survey, 2013-2014

NCMT plays a vital role to access the health care facility with its availability in emergency time. Among the transports prevailing in the rural areas the NCMT is more available than that of others vehicles according to the respondents. 38% of total respondents said about the graceful availability of NCMT for emergency patient transportation in the study areas.

- Easy physical accessibility of the transport modes from the residence to the medical centre

Physical accessibility of transport modes to carry the patient from his residence to medical center is another important factor to access the health care facility in the rural areas in emergency period. In the rural areas people lives scatterdly and the residences are situated mostly far from the roads. So, physical accessibility of transport modes to carry emergency and serious patient is important to choose a transport modes. In this sphere, NCMT has the advantage of the physical accessibility to the residence of the patient in the study areas. Figure 5.17 shows the physical accessibility of the transport in the study areas.



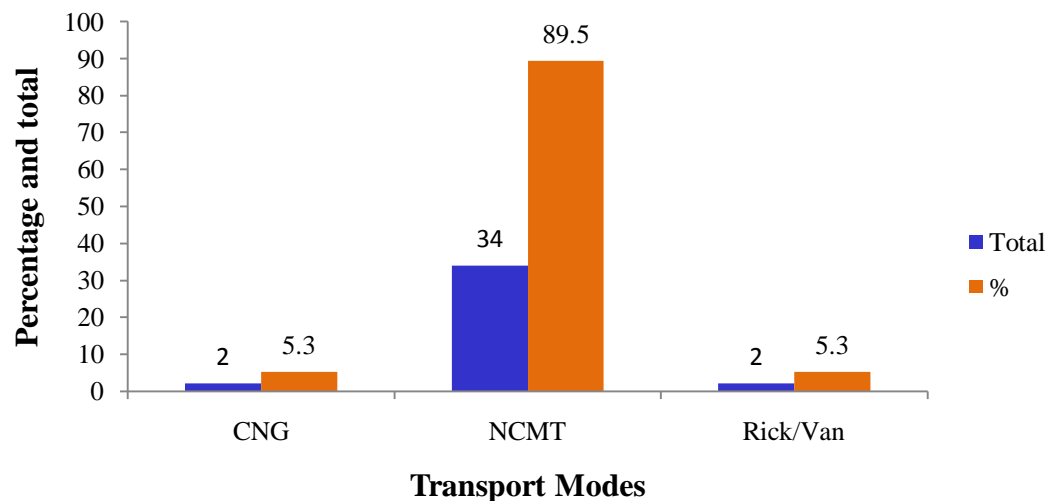
**Figure 5.17: Physical Accessibility of Transport Modes (%)**

Source: Questionnaire Survey, 2013-2014

Only CNG, Rickshaw-van and NCMT have the physical accessibility to the residence of the patient in the study areas. Among them 46% respondents opined in favor of NCMT about the higher physical accessibility of it. The other has the physical accessibility but those are not as much as available transport to the patient in emergency time.

- Cost saving transport to emergency patient transportation

As we know the economic condition of the rural people who are living their lives under the subsistence level. They are not able to bear any burden of extra cost. So transport cost for getting health care facility treated as extra burden to them. In this situation, to access the health care facility, low cost transport is more preferable to them. The respondents also termed NCMT as a low cost transport to get access to the health care facilities in the study areas in compare with others transport. Figure 5.18 shows the comparative costs scenario of the transport available in the study areas for the purpose of patient transportation.



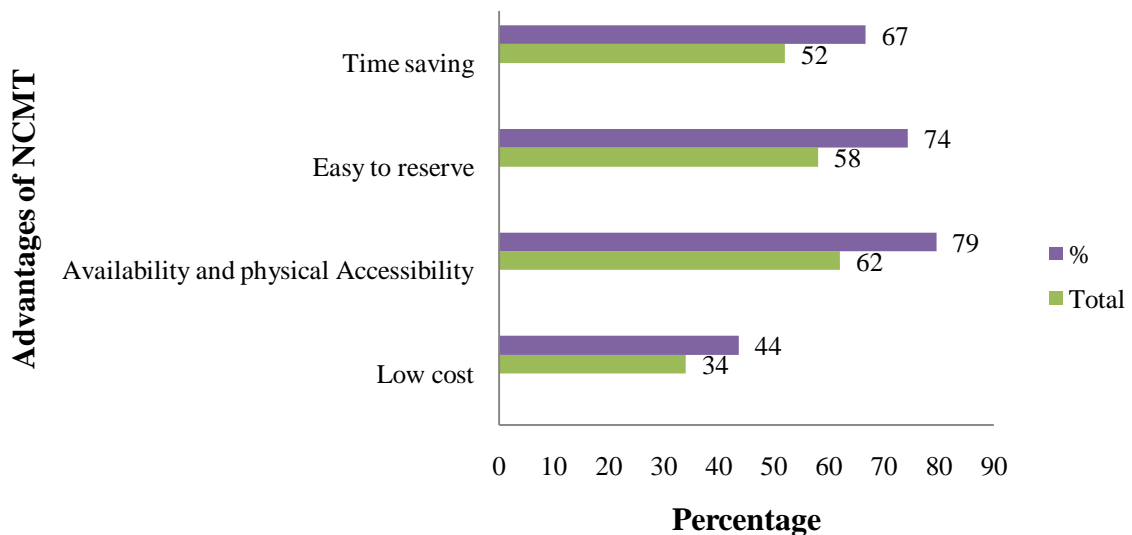
**Figure 5.18: Opinion of the Respondents about Low Cost Transport in the Study Areas (%)**

Source: Questionnaire Survey, 2013-14

Nearly 90% of the respondents termed NCMT as a low cost transport for the study areas in the purpose of patient transportation.

#### 5.7.4 Reasons to Choose NCMT as a First Option to Patient Transportation in Rural Areas

Analyzing from the previous sub-sections, some points can be drawn about the NCMTs. People choose it as a first option to patient transportation in the study areas due to some specific advantages. It is low cost transport, available and has physical accessibility to the residence of the patient; though it is available it is easy to reserve in any time and in absence of other motorized transport in emergency time, NCMT has the advantages of the quick transportation capability in the rural areas. Figure 5.19 shows the advantages of NCMT.



**Figure 5.19: Respondents Opinion to Choose NCMT as a First Option**

Source: Questionnaire Survey, 2013-14

Most of the respondents opined about the advantages of graceful availability and physical accessibility of NCMT and the advantages of reservation. 67% of the total respondents said about the advantages of time saving and 44% of them opined about the opportunity of low cost transport for patient transportation.

### **5.7.5 Conclusion**

The main effect of rural transport development is to bring the market to the farm gate of the rural household. It also facilitates access to education and health facilities. Appropriate means of transport can be used on rural paths, are often a useful means to eliminate the length of travelling time for all basic needs. The aim of this section was explore the economic role of NCMT in terms of its contribution in health, education, income generation, poverty alleviation etc. which is contributing in the sector of social development particularly in the sector of education and health. To do that perception of the NCMT driver and owner driver and educational institution going students, teachers and health service takers has been considered. Findings of this section through the nexus of the perceptions reveal that there are limited alternatives of NCMT to carry the pupils and the teachers as well. It reduces the distance of traveling by some advantages. Besides, it helps the rural poor to access the existing health care facilities in emergency period. In this sphere, access to efficient, affordable and safe transport in rural areas is limited and directly impacts upon the ability of individuals to seek timely health services. There are ample reasons to choose NCMT as a first option in the purpose of social service like education and health. Those NCMTs are available and have the advantages of physical accessibility in anywhere of the villages, it is time and cost saving in compare to other transport prevailing in the study areas. By contributing to those sectors it is ultimately contributing to the rural development as a whole.

## **CHAPTER SIX**

### **Challenges of NCMT**

#### **6.1 Introduction**

As we discovered there are two types of transport in the rural areas of Bangladesh: CTs and NCMTs. Between the two types, the CTs are operating in different modes and those are not available all times for the different purposes of the rural inhabitants. Among them, motorized and non-motorized transports are giving service to the rural people. Most of the non-motorized transports have lost its utilities to the rural people due to disadvantages of their time-consuming nature and very high hiring cost. Besides, those are serving with drudgery. The other part of CTs is motorized transport. But these are very few in number in the rural areas to serve the increasing demand of the motorized transport. They are costly and have no physical accessibility to anywhere in the remote villages. The CTs of the rural areas are also not available in all time for the purpose of the residents of the rural areas. Besides, the motorized CT is costly to purchase so that the people of the rural areas cannot buy it. So, investment in CT is very low in the rural areas of Bangladesh. On the other hand, the demand of the motorized transport is increasing rapidly. People of the rural areas demanded the higher mobility of their products. Based on the above disadvantages of the CTs, the people of the rural areas came forward to meet the demand of the motorized transport through the innovation of NCMT. Now the NCMT is the major transport in the rural areas to meet the diversified purpose. It has the availability and physical accessibility to anywhere in the rural areas. Besides cost effectiveness and time saving criteria have given an extra benefit to the agrarian people. There are many people employed in the NCMT occupation and they are directly dependent on it. The people engaged in NCMT have improved their livelihoods

through the NCMT occupation. Huge investment has already taken place centering the NCMT. The NCMT has been produced by the technical knowledge of the people with almost no education. So, there is possibility to technical inefficiency in the process of the production of this transport. NCMTs have diversified advantages but they are not well-engineered and designed. So, they are facing different kinds of challenges to survive in the rural society. This chapter is an attempt to describe the challenges faced by NCMT in the society. These challenges will be discussed in this chapter under different ideas.

#### A. Challenges based on technical inefficiency

NCMT has been produced in the rural workshop by the people who have no technical knowledge. So, these transports are growing with the lacking of physical inefficiency. Based on these technical disadvantages it has to face the following challenges:

- Resistance from the different pressure groups;
- Technological incompetences;
- Road mishaps; and
- Environmental pollution.

#### B. Challenges based on the illiteracy and lack of consciousness of the drivers of NCMT

The drivers of the NCMT mostly come from the occupation where there was no need of education. They are typically illiterate and have no technical knowhow to drive a motorized transport. Therefore they have to confront the following challenges:

- Training of the drivers;
- Traffic congestion; and
- Land use for parking.

The above challenges make the social and political difficulties in the society so that some collusion takes place in different parts of Bangladesh.

## **6.2 Resistance from Different Pressure Groups**

In the rural roads of Bangladesh both the CT and NCMT are plying on the same roads. Among them, NCMT is higher in number. The conventional transports are facing the shortage of passenger to carry. People also do not want to waste their time during travel. If people want to save their time and money they have to use NCMT to reach their destinations. In these circumstances, the CTs lost their transport business in the rural road in competition with NCMT. But the NCMT has no legal permission from the road transport authority to ply on roads. Based on this background the people engaged in CT appealed to the authority to ban the NCMT. Sometimes in this country we are facing huge transport strike called by the CT owners association to seek the order of banning the movement of NCMT on the highways and the regional ways. The conventional transport leaders said the plying of these unauthorized vehicles were increasing on the roads every day, posing risks of accidents and inflicting huge financial losses to the bus owners. The conventional transport owners and workers also demanded immediate ban on the production of these engine-run vehicles. On the other hand, three-wheeler owners' association demanded that they would continue plying of vehicles as per a circular of the Ministry of Communications issued on 11 September, 2011. According to the decision of the 20th meeting of Bangladesh Road Security Council, the circular allowed the diesel-run three-wheelers to ply on the roads except for highways. In these circumstances collusion between those groups takes place regularly. Besides, the drivers of NCMT have to pay money to the local police, local government institutions to ply on roads. Centering this transport, a huge amount of money has been circulated illegally among the concern

government officials and local *mastans*. The people engaged in NCMT are to pay the money on a regular basis. Otherwise they will not be able to operate the vehicle on the roads.

### **6.3 Technological Incompetence**

The motorized transport should have a well engineered technology before plying on roads. However, in Bangladesh this seems to be relaxed in the sphere of motorized transport. The motorized transports which are plying on the rural road are not well enough to move to carry the passengers and goods as well. This is a duty of concerned law enforcing agency to justify the fitness of the transport before plying on road. But it seems to be very relaxed in this case. Taking the opportunity of the relaxed implementation of existing law people of the rural areas invented the NCMT in the rural areas to fulfill the increasing demand of motorized transport. On the other hand, illegal beneficiaries of the concerned authority help them to ply on road. Though NCMT is not well engineered at the growing stage of it, now it is continuously improving its technological capacity. Still now the development of this transport depends upon the local led worker or the people who have no formal literacy to develop a vehicle. It is terrible but seeking a technological support from the concerned people or the institutions.

### **6.4 Road Mishap**

Rapid traffic in association with a number of other factors such as increased numbers of pedestrians, widespread undisciplined rural road user behavior, mixed traffic conditions and inadequate rural vehicle maintenance, poor rural road conditions and absence of road marking have all contributed significantly to the rise in traffic accidents in Bangladesh. Besides the mix of transport technologies especially old and new transport technologies, highlighted by the shared use of road space by fast moving motorized vehicles with slow-

moving human-powered and sometimes animal-drawn vehicles seen in the roads of Bangladesh. In addition to the traffic conflict, road congestion and road safety problems commonly ascribed to those conditions. There are many causes of increasing road accidents; rapid growth in population, motorization, urbanization and lack of investment in road safety are the main causes. Violation of traffic laws by the drivers and pedestrian, unplanned roads and highways, incompetent traffic system; faulty vehicles on road are also the possible explanations of increasing road accident in recent years. Accidents are also taking place in the country almost every day due to the movement of unauthorized 'Nasimon' and 'Karimon' like vehicles. A study on "Road Traffic Accident (RTA) by 'Nasimon' and 'Karimon'-A Study in Faridpur Medical College Hospital (FMCH)" by Jahangir *et al* (2012) revealed that 12% of total RTA in Faridpur district victims who attended FMCH is due to the accident of this locally made vehicle. Though it supposed that the accident held in the rural areas mostly for the reason of NCMTs operation. There has no strong evidence and statistics in favor of the statement argued by the different pressure group. Some accidents have taken place in the rural areas or in the highways crossing the rural areas. But the investigation report did not come to the light. There is little evident that accident has happened due to the NCMT operation in the road. If the accident happened due to the NCMT the degree of fatality is becoming higher.

It is reality that the drivers of NCMT have no formal or technological training to ply on road. But the accident that occurs happened in the rural areas through NCMT is not yet investigated whether it is due to the fault of this transport or the drivers of it.

## **6.5 Environmental Pollution**

The NCMTs are simple three-wheelers, powered by single cylinder engines. These are small engines, typically producing less than 35 HP, originally designed for stationary

agricultural machinery. Such engines were initially used in irrigation for running Low Lift Pumps (LLP) and Shallow Tube Wells (STW) in rural Bangladesh. Most single cylinder engines are usually driven by diesel. Most of the engines used now are imported from China, but lots of small industries have developed locally which manufacture many spare parts of these engines. Now a days, these low horsepower diesel engines are using in NCMT sector in rural Bangladesh because of its simple technology. Usually, diesel engine is more efficient than gasoline engine. Single cylinder diesel engines are also easier to maintain, and can operate satisfactorily on poor quality fuels. Moreover, with minimal mechanical skill, people can deal with the problems of the injection pump. Due to its simple technology and other advantages, people have started to use these engines to propel thousands of locally built three-wheelers. Besides, the diesel fuel is the largest imported energy resource for Bangladesh. Only a small portion of country's diesel requirement is met by refining imported crude oil at the only refinery of the country. The remaining diesel needs to be imported as a finished product. High fuel price, unstable energy market and uncertainty of energy security require Bangladesh to judicious use of diesel.

These single cylinder engines are very inefficient, especially in mobile applications, and produce large amounts of pollutants. Despite the potentially significant impacts on the ambient environment, there are no studies regarding emission measurements of single cylinder diesel engines. However, it is obvious that the emissions are usually higher in these engines because of its design. Fuel is exchanged through ports located in the cylinder, usually opposite each other. A fresh fuel-air mixture compressed in the crankcase enters through the intake opening, while exhaust gases exit through the exhaust port. While both the intake and exhaust ports are open, some of the fresh fuel-air mixture (as much as 15-40%) escapes

through the exhaust port which is called “scavenging losses”. These “scavenging losses” contain a high level of unburned fuel and lubricant, which increases emissions of hydrocarbons and other volatile organic compounds (VOCs). Some of the incompletely burned lubricant and heavier portions of gasoline are emitted as small oil droplets, which in turn increase visible smoke and particulate emissions.

The age and poor maintenance of many of these NCMTs increase emissions well above any applicable standards. In addition, many drivers use lubricants of poor quality leading to different problems in engine. Many NCMT drivers in Bangladesh use widely available straight mineral oil or recycled four-stroke engine oil rather than the specially formulated engine oil recommended by engine manufacturers. These oils build up in the engine and increasing emissions. Drivers also use excessive quantities of lubricant. Some drivers may simply lack knowledge about the correct amount of lubricant to add and the adverse effects of using too much. Others believe that adding extra lubricant increases fuel economy and provides greater protection to the engine. In reality this practice provides little or no benefit to drivers, but significantly increases the level of emissions and reduces the quality of ambient air. Furthermore, adulteration of gasoline with kerosene is widespread in Bangladesh because of the large difference in the retail price of the two types of fuels. This practice increases emissions because kerosene has a higher boiling point than gasoline and is therefore more difficult to burn. As a result more deposits build up in the engine and damage the engine over time, and more unburned hydrocarbons, VOCs and particulates are emitted in the exhaust gas.

## **6.6 Training of the Drivers of NCMT**

Driving of the motorized transport is important for both the passengers and driver. Every authorized transport has driver with driving license from the concern authority. But in the study areas, the drivers of the NCMT have no need of any driving training to drive the transport in the rural areas. The people who want to drive the transport take a practice for one or two weeks then drive it on the road. But the Steering types NCMT has needed to drive training because it contains three to four gears in its mechanical devices. Most of the driver of the Steering type NCMT comes from the occupation of the conventional motorized driver. This type of NCMT is few in number. So it can be said that the driver of the NCMT has no institutional training. For that they do not know the technical knowhow of the mechanical devices. Without training of the motorized transport it should not permitted to ply on road. It is a big challenge to make them efficient with proper institutional training.

## **6.7 Traffic Congestion**

Sometimes it is seen that there are no transport in the rural areas without NCMT. Among the transport modes, NCMT is huge in number in the rural areas. It creates over crowd on the road and sometimes creating massive traffic congestion on the road. Due to the traffic congestion on road the other modes of transport felt difficulties to ply on road. Sometimes there occurs accident due to the traffic congestion. In Bangladesh there is no separate way for high mobility and low mobility transports. All of them move on a single way with the other non motorized transport. So traffic congestion has become a daily concern.

## **6.8 Land Use for Parking**

Every legal transport has a fixed place for parking in the areas. This has ensured by the local government so that they can start their service from a fixed place. Due to reducing traffic

congestion the local government has taken the remedies of those stations. But the NCMT is not yet acceptable to the transport authority. They use the road for their parking. By doing this they are creating traffic hazards for the people as well as for the other transports existing in the rural areas.

## **6.9 Conclusion**

Though the NCMT of the rural areas has played a critical role to enhance the economic and the social livelihood of the rural people, they are not out of challenge. It has some sorts of disadvantages. Among them training of the driver, technological inefficiency, air pollution and sound pollution hazard are the main factors for the creation of those disadvantages. Based on the disadvantages the different opposition groups try to make pressure on the authority to ban it. But those problems are the common problems for all types of motorized transport.

## **CHAPTER SEVEN**

### **Summary of Findings, Policy Implications and direction for Further Research**

#### **7.1 Introduction**

This study was aimed to analyze the role of NCMT in the economic development of rural Bangladesh. To achieve the overall objective, some specific objectives have been formulated which are to describe the structure of NCMT in terms of modes and usage, it also promised to make a comparison between NCMT and CT on socio-economic activities to establish the superiority of NCMT in speeding up the rural development effort. Based on the usages and utilities of NCMT, this study also analyzes the influence of NCMT to promote the rural development in particular. To do so, data were collected with five sets of structured questionnaire involving five types of respondents. Total number of respondents was 384, among them drivers and owner driver of NCMT were 78, driver of CT was 78, 78 farmers have been interviewed, educational institution going people were 78 and 72 number of respondents were health service taker. Descriptive statistics has been used to analyze the data by using the statistical software, SPSS version 16. The findings of this research can be summarized into five major segments:

- Income and employment generation through investment in NCMT sector;
- Credit sources and capital formation of NCMT sector;
- Revenue generation potentials of NCMT;
- Agricultural development through NCMT; and
- Social development through NCMT.

Keeping these segments into mind this chapter is organized as follows. Section 7.2 summarized the major findings based on above major parts; Section 7.3 shows policy

implications based on the findings; the contribution of this research to the literature is explained in Section 7.4 and Section 7.5 presents further research directions.

## **7.2 Summary of Findings**

This section briefly sets out the major findings based on the objectives of this study.

### ***Objective one***

*To explore the overall structure of NCMT in terms of modes and its usages.*

The findings for this objective have two parts. The first have concerned with the modes of the newly introduced rural transport in Bangladesh NCMT. It contains three types: Framed body, Plain body and Steering types. Among them, only five percent are steering type and other two share percentage which is 50%. Generally 16-55 years old people drive these vehicles. Eighty percent of the total owner is both categories that are owner driver. Those driver and owner driver drive it round the days in a week because this is the only sources of income of those people. Over 24000 people directly depend on it in the six study areas. Seventy four percent of total agrarian goods are transported through NCMT. It is easy to reserve the vehicles in any time and has the advantages of easy accessibility to anywhere in the rural areas. It is found that there are 23 types of diversified usage of that transport in the rural society. Among them, 18% of the respondents opined about the usages in the purpose of shifting the residence, 16% opined about the usage of election duty. Besides, agricultural, political gathering, marriage ceremony, police duty and other usage have been found according to the respondents. So, NCMT is considered as the life line of rural economy.

### ***Objective two***

*To make a comparison between NCMT and CT in terms of their influences on the growth of rural economic activities.*

The first part of the findings under the objective two is showing that over 6000 NCMTs exist in the six study areas. About BDT 84.01 million has already been invested in NCMT sector. Most of the money has been invested by the rural poor from their own resources. Through this investment 3723,720 working man-hours have been created yearly in the job market. Over 6000 people are employed in this sector. They have to borrow money from the NGOs working in the rural areas with high interest rate. 92% of the total drivers and owner drivers are creditors. The employment-investment (N-I) ratio is 1.03 which is higher than any other transport (bus is 0.25 and CNG contains 0.27) plying on the rural roads. After joining NCMT occupations the drivers and the owner-drivers have been proficient to change their livelihoods in an improved manner. All drivers and owner drivers have been able to improve their houses with sanitation and tube-well, they purchase more agricultural land, cattle, furniture and connected with electricity and cable TV connection. Transitional savings growth is about 45%. NCMT has been playing a catalyst role in rural agricultural development. The advantages of availability, physical accessibility, time saving and cost saving characteristics of NCMT help farmers to avail the motorized transport facilities with an improved and effective manner. On the other hand, the people engaged in CTs are unchanged in their daily livelihood and still struggling with acute poverty.

The second part of the research objective two was to explore the role of NCMT to promote income generating activities and social development. People came from 15 different kinds of occupation to the NCMT occupation. The transformation of the occupation proved the better decision of them by improving their daily income through NCMT. Besides, the transitional expenditure growth increases 149%. Among the driver and owner driver, 77% save their money in the NGOs, where they borrowed the money to start the NCMT business.

In the six study areas about BDT 3963 hundred thousand has been disbursed for credit in NCMT sector with 25% interest rate. This sector has no accessibility to the formal banking sector to get credit. The people live their lives through CT have no change of their incomes; they are living hand to mouth. They have access to credit from the formal financial institutions with comparatively lower interest rate.

If the NCMT gets the legal recognition from the government authority, government could be able to earn a lot of revenue from this sector. The findings of this thesis also present the revenue generation potential through WTP for institutionalization of the driver and owner-driver of NCMT. WTP shows BDT 28.4 million yearly could be earned from six study areas as revenue for the government from the NCMT sector.

***Objective three***

*To investigate the effects of NCMT on rural income generating activities and human resource development*

The drivers and the owner drivers of NCMT have been able to earn more money than that of before joining NCMT occupation. The transitional income growth was average 405%. Expenditure-income (E-Y) ratio is comparatively lower than that of other transports plying on the rural road. The occupational change of the driver and owner driver was effective so that they could be able to expend more money to the educational and health service purpose. Students, teachers and health service taking people are using it due to the advantages of any time availability, at any places accessibility, time and cost saving features. Besides, this transport is helping the rural poor in their social gathering with its appropriateness in the rural social system.

### 7.3 Policy Implication

This study has explained the emergence of NCMT in the rural areas as a new mechanized transport and the role of this transport in the rural development efforts. In doing so, some economic analyses have been done and the results are reported in Chapters 4 to 6 and summarized in Section 7.2. Based on these results following, policy recommendations have been made to enhance the role of NCMT in rural development. This section is concerned with the objective four of this thesis.

#### ***Objective four***

*To devise some policy suggestions to strengthen the increasing role of NCMT*

Following the above findings it is observed that NCMT is a newly emerged transport in the rural areas bypassing government rules and regulation. Though it is not legal according to the existing transport regulation, it has a lot of utilities to the rural people. In the above circumstances, policy recommendation can be made in two tiers.

- Aggregate level

NCMTs are growing rapidly in the rural areas. So, a regulatory body is needed to control this sector. In this regard, government can start a rural transport authority. Otherwise the present undisciplined rural transport sector will be a problematic for the rural economy. Keep in mind of the above circumstances, the following policy recommendation can be made at the aggregate level:

#### I. Private investment policy for rural transport sector

Separate privatization policy and private investment policy in the rural transport sector should be introduced in the existing transport policy so that the total investment in this sector accounted in a formal way.

II. Strategic rules and regulations regarding rural transport

It will help to make effective investment in NCMT sector. Strategic rules also needed for proposed rural transport.

III. Local motorized transportation authority can be made

In Bangladesh there is no effective transport authority in the *upazilla* level. So, BRTA can expand its operation up to the *upazilla* level.

IV. Local government institutions should take step to legalize the NCMT

A huge number of NCMT already exists in the rural areas. These should come under some rules and regulations. For this existing local government authority can take steps to legalize NCMTs.

V. Policy initiatives

In the mean time, NCMTs already established as an informal sector of rural economy. So, policy initiative is necessary to regularize it.

VI. Government should take initiative through policy making and its implementation of foreign aid in rural motorized transportation sector

VII. It is necessary to emphasize the holistic development rather than partial development

For overall development of rural transport sector, development initiative is needed for road construction and vehicle improvement simultaneously. But, we see that, rapid road construction taking place rather than motorized vehicle improvement. In this regard, to fulfill the demand of motorized transport, investment also needed in this vehicle improvement sector under a holistic development process.

VIII. Political commitment is important to implement the policy regarding rural transport.

IX. Government should establish institutional framework for implementation of rural transport policies;

X. Policy should be reformed into two parts : rural and urban

Existing transport policy needs to be restructured. Urban part of it does regulate urban transports and rural parts for rural transport.

XI. Participatory and bottom-up procedure should follow to reform the policy regarding rural transport particularly in case of the emergence of NCMT all over the country.

- Micro level

Still now the NCMTs are being produced by the rural people in the local workshops.

Though the makers have a little technical knowhow they are continuously producing NCMTs with lower class engineering technology. In the mean time there are established local associations based on the NCMT. To improve the present situation the people involved in it and the users of NCMT should take some initiatives. Based on the above facts following micro level policy propositions can be drawn:

- I. To drive the NCMT more safely local NCMT association should introduce a guideline.
- II. Initially NCMT associations can also start a training program on safe driving and the technological preface for the new comer
- III. Motivational program for the drivers of NCMT needs to be also introduced to reduce the accident rate

- IV. Users should comply with the existing rules and regulations of rural transport. So, awareness development program can be introduced in the rural areas for the user of NCMT.

#### **7.4 Contribution of this research**

As we know the NCMT is initiated in rural areas avoiding the government rules and regulation. And now it becomes the main transport in the rural areas by which rural people have the advantages of the motorized transport facility. But there is no information about the transport and the people involved in it. New knowledge has been gathered by this thesis in the following way.

- Socio-demographic data has been collected regarding the driver and the owner driver of the transport. It provided new information of the people involved in an informal sector of our rural economy.
- There has been taken place a huge investment in this sector which has not yet accounted. Based on this investment employment and income generation is going on through this NCMT. This investment and income generation is contributing to our GDP. By adding NCMTs contribution GDP volume will get increased.
- Bangladesh agriculture is improving gradually. In this improving effort, lots of indicators are playing positive role. This research also finds out the catalyst role of NCMT in the agricultural development effort which is a new era of knowledge in this regard.
- Transport plays an important role in the development of education and health service promotion. There is no evidence in Bangladesh about the educational and health

service promotion through rural transport. This research has provided a new literature of educational and health development through rural transport in Bangladesh.

## **7.5 Further research direction**

This research has been conducted based on the data collected from six *upazillas* of Rajshahi and Bogra districts. A new research can be conducted to have updated information of this sector of the country.

Economic analysis of the role of NCMT in rural Bangladesh has been conducted through this research. It covers the socio economic dimensions of the role of NCMT in the development effort of rural Bangladesh. An econometric analysis could also be done to find out the specific contribution of NCMT by a specific indicator of the rural development.

The NCMT is not yet engineered. So accident can occur any time by this technological inefficiency. To make it well-engineered, it is needed a research on the upgradation of NCMT on rural perspective.

As we know the NCMT is driven by the shallow engine which is not produced to drive a motorized transport. It is driven by diesel and two stroke engine by which the fuel does not burn as appropriate as for the friendly environment. So further research can also be carried out on how low cost environment friendly engine can be incorporated instead of shallow engine.

Financing system in NCMT sector is still informal and out of account of the government. So, research for investment, revenue collection, credit system for this sector could be a solution to regularize the NCMT sector as formal ones in the economy.

There is no rural transport policy in Bangladesh. In the existing transport regulations there is no space for the rural non-conventional transport direction. But emergence of NCMT

demands rural transport policy for rural development. So research should be carried out to form a rural transport policy in Bangladesh.

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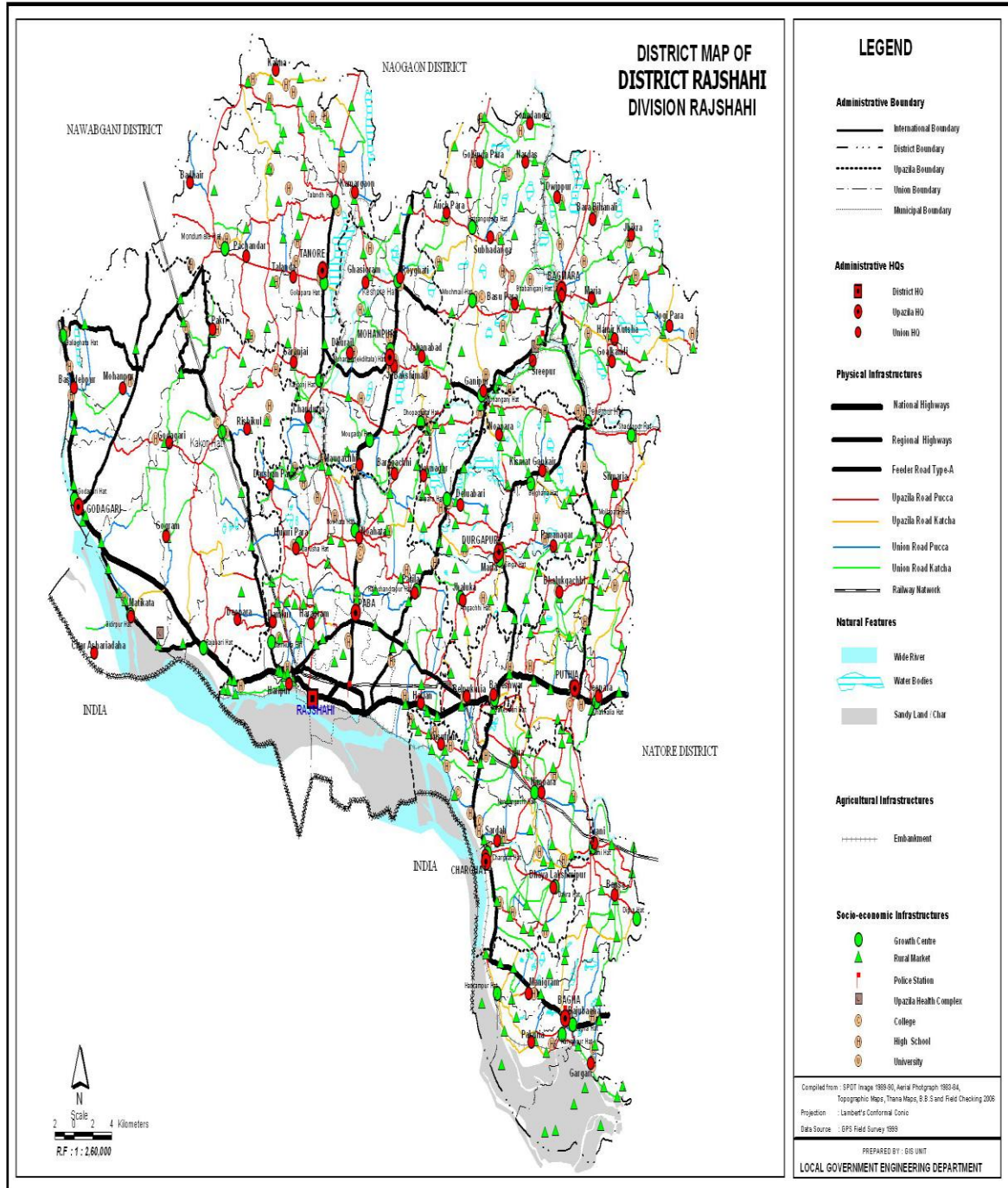
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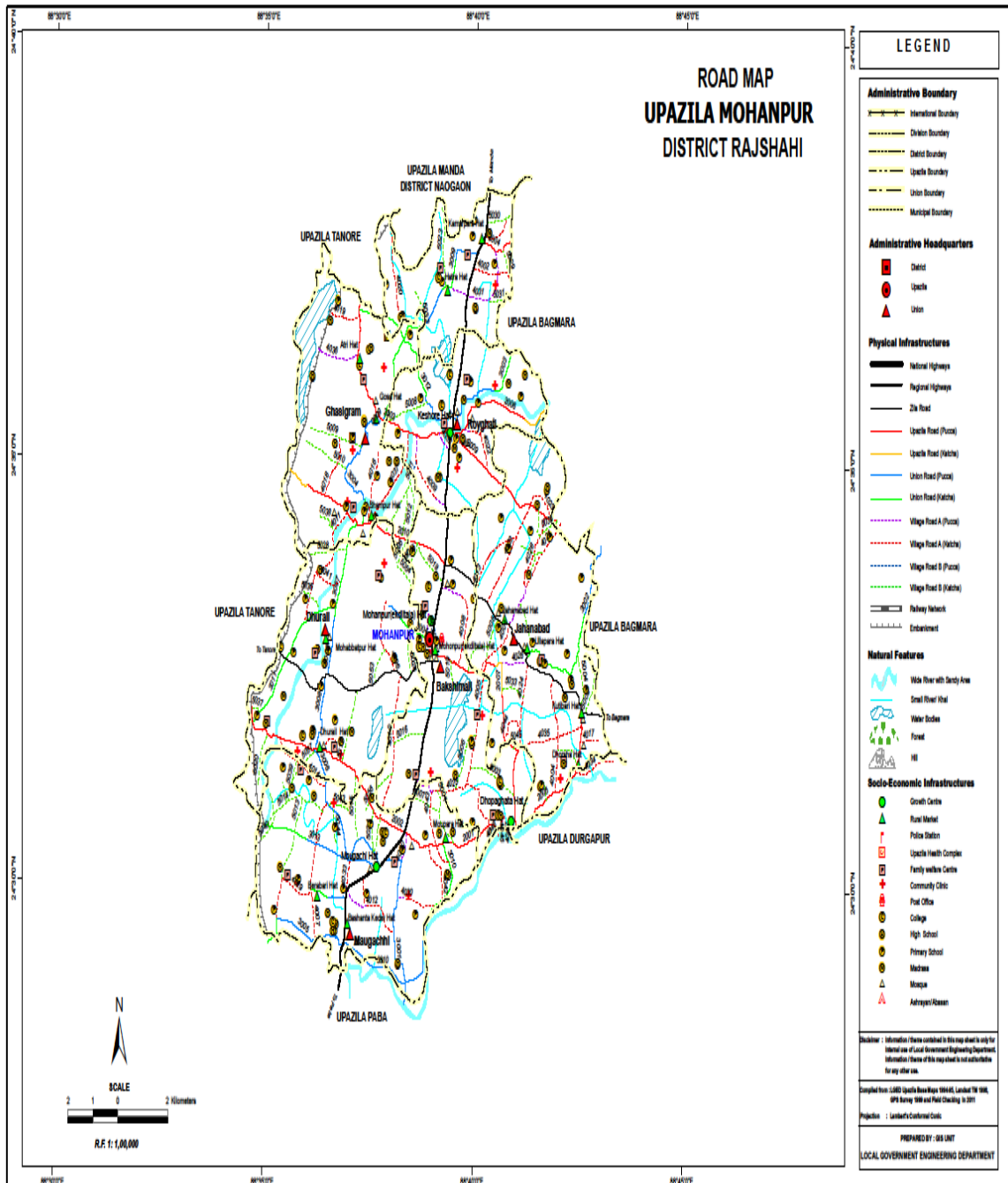
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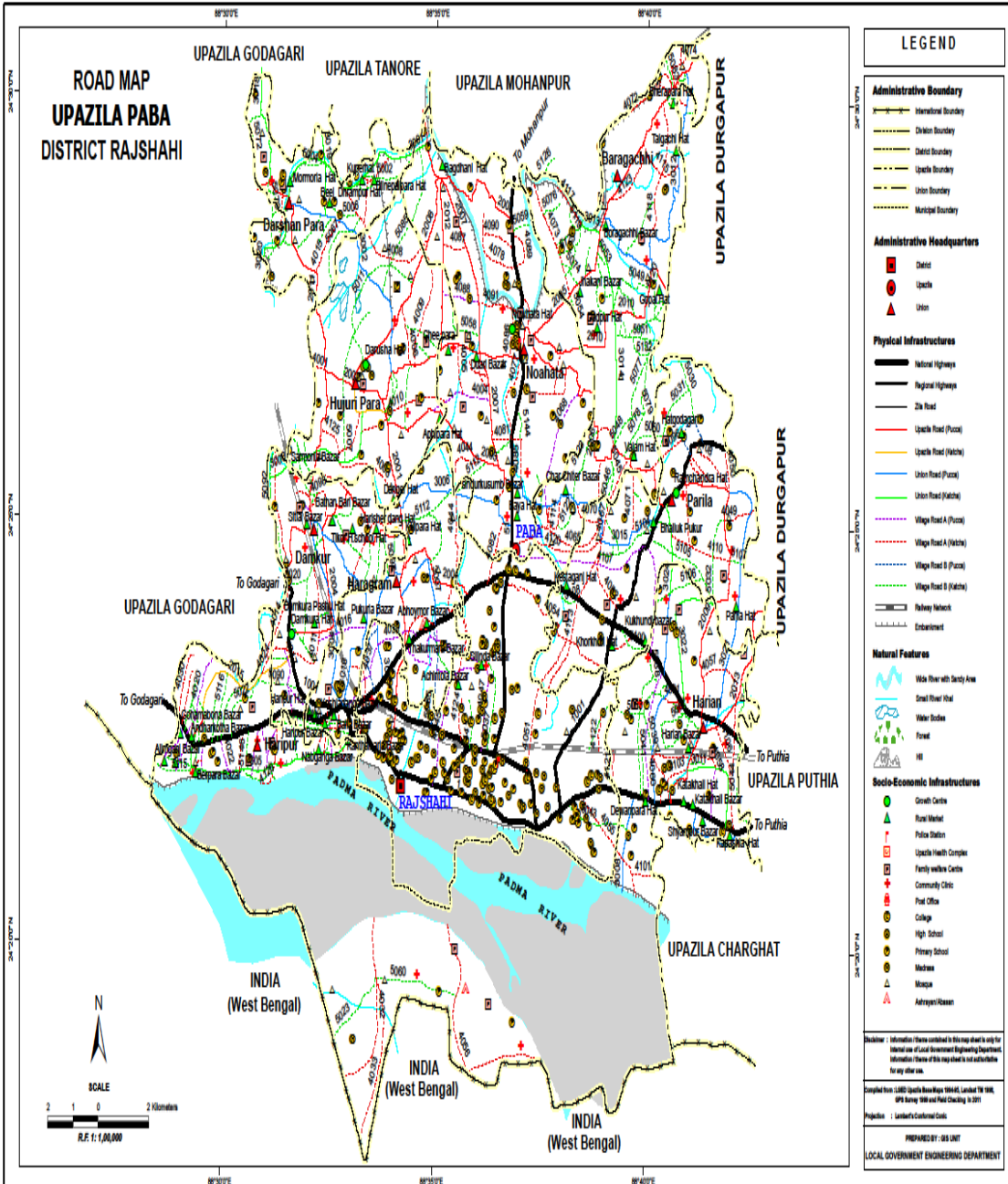
## Appendix 1- Map of Rajshahi District



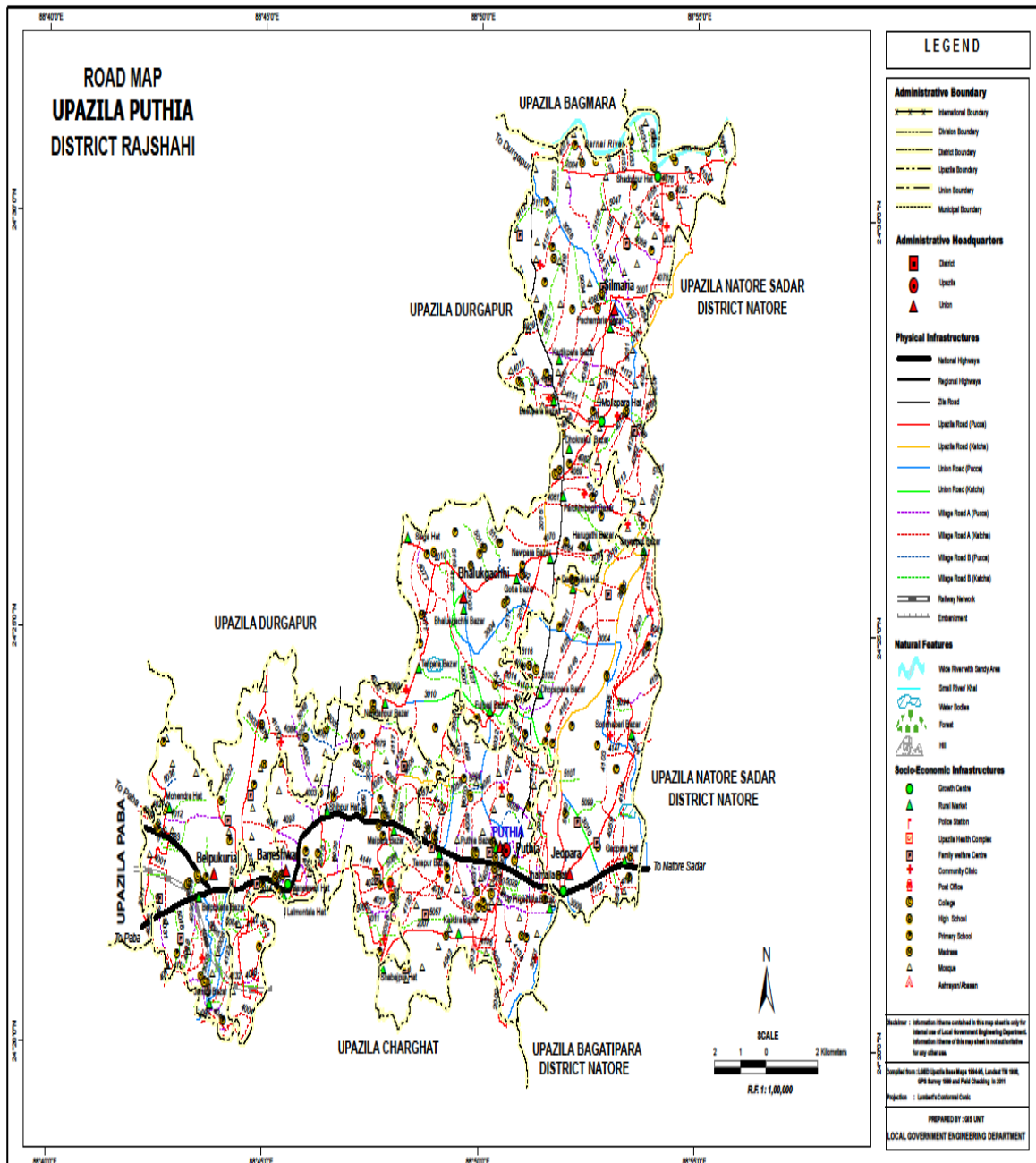
## Appendix 2- Road Map of Mohanpur Upazilla



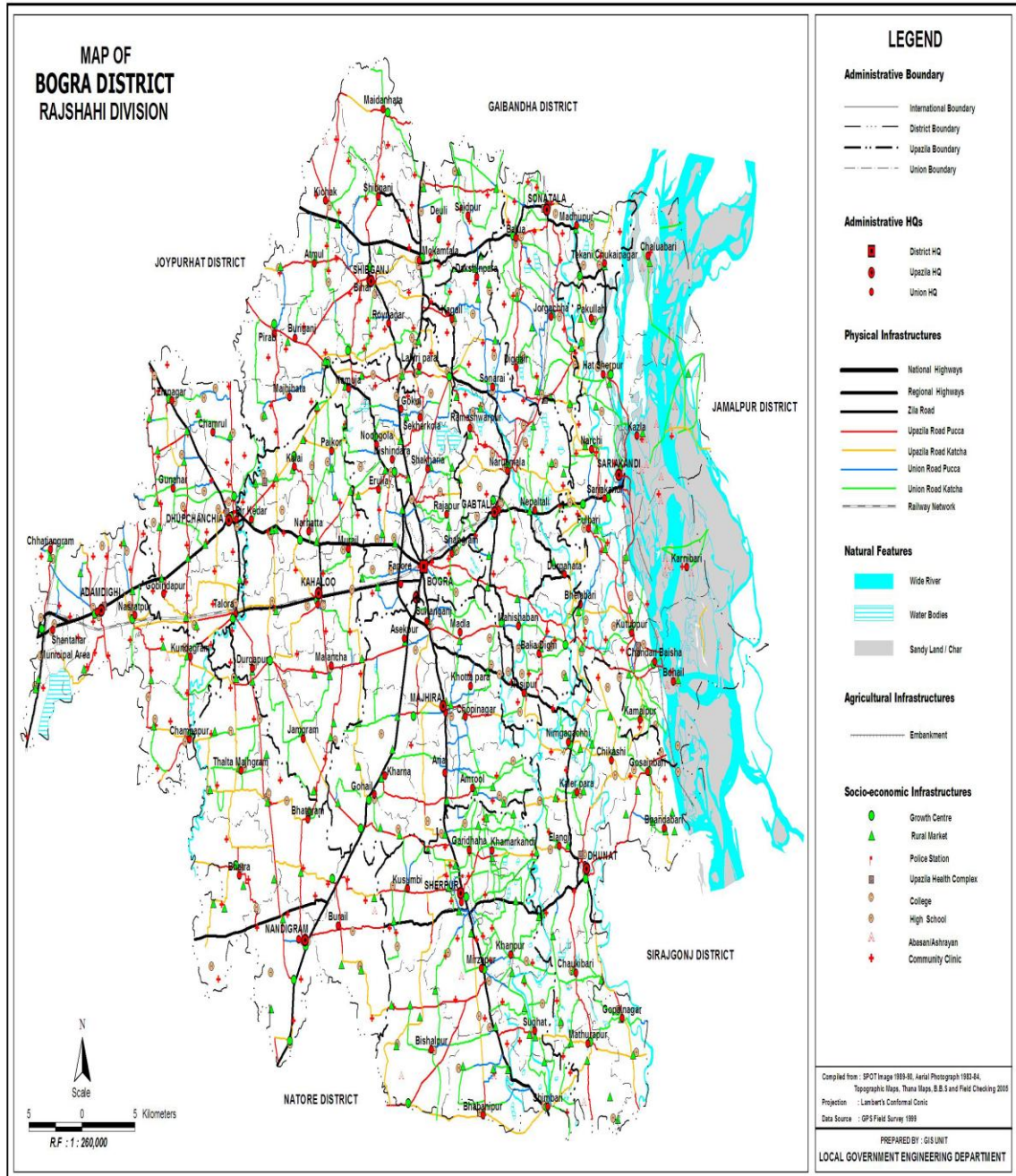
### **Appendix 3- Road Map of Paba Upazilla**



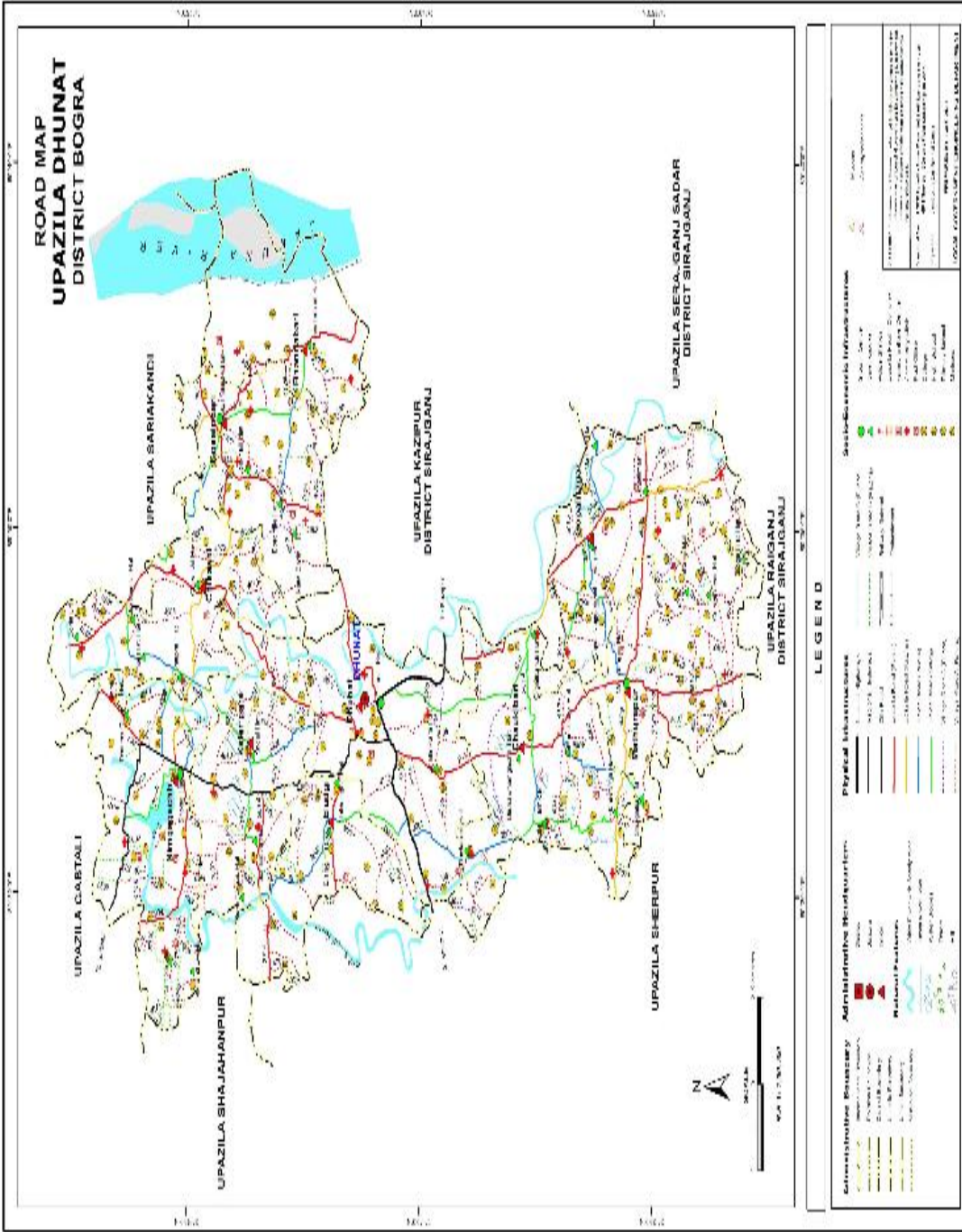
## Appendix 4- Road Map of Puthia Upazilla



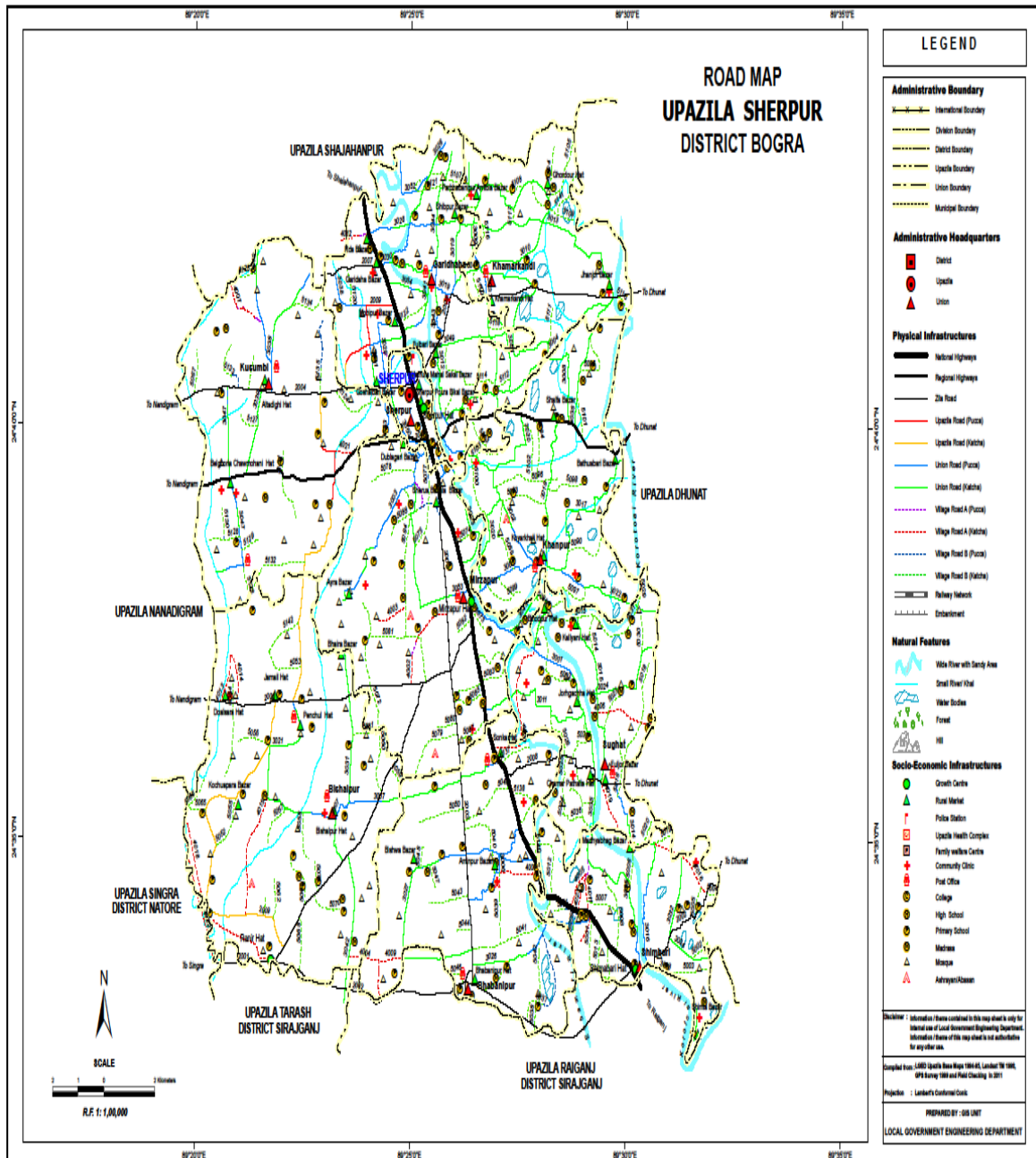
## Appendix 5- Map of Bogra District



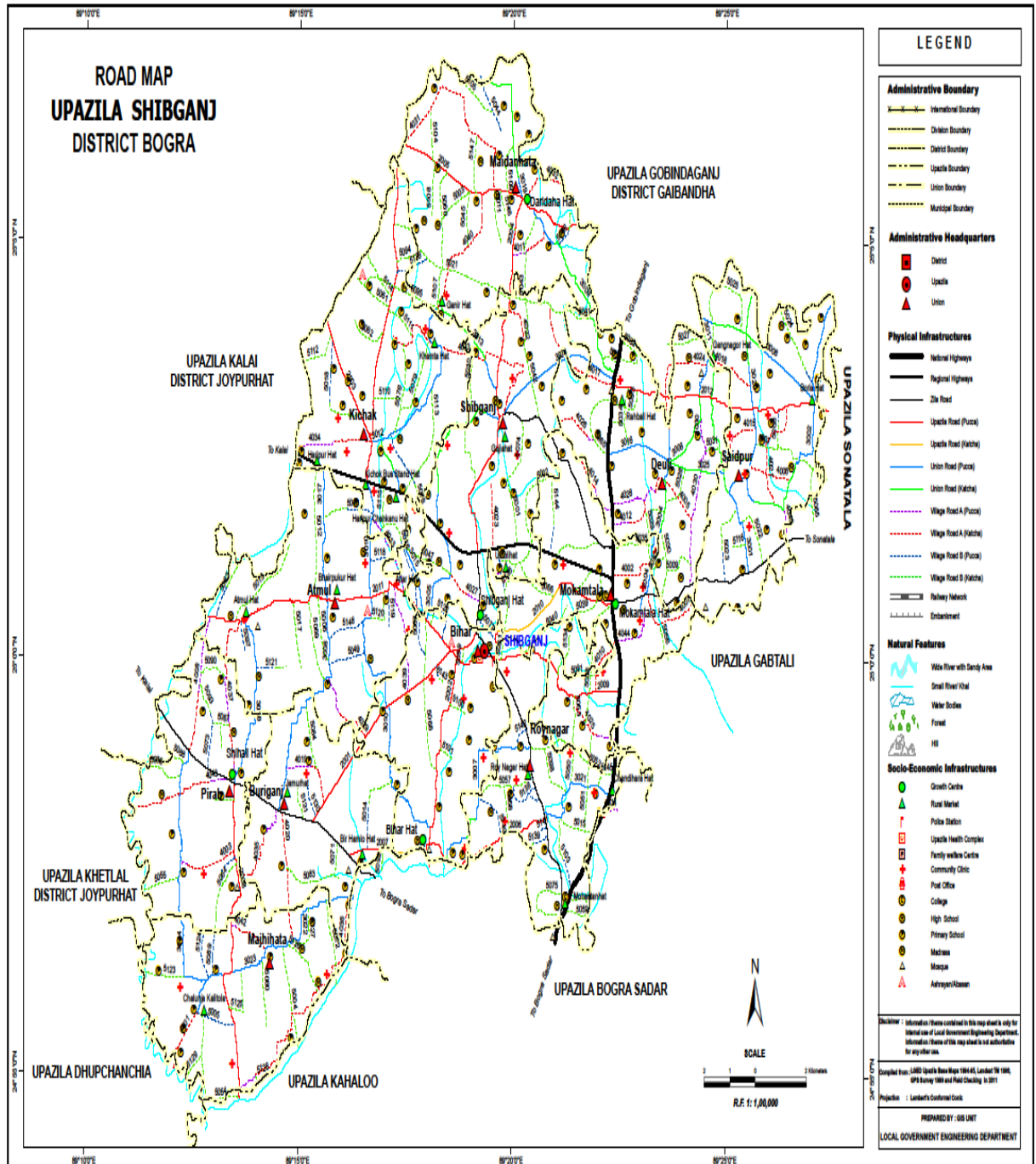
## Appendix 6- Road Map of Dhunat Upazilla



## Appendix 7 - Road Map of Sherpur Upazilla



## Appendix 8 - Road Map of Shibgonj Upazilla



## Appendix 9- Questionnaire for NCMT Driver

### Research Questionnaire on An Economic Analysis of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.

আসসালামুআলাইকুম। আমি মোঃ নাসির উদ্দিন গনি, এম ফিল গবেষক, ইনিস্টিটিউট অব বাংলাদেশ স্টাডিজ, রাজশাহী বিশ্ববিদ্যালয়, রাজশাহী। আমি “ An Economic Analysis of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.” শিরোনামে একটি গবেষণা করছি। এ গবেষণার জন্য তথ্য সংগ্রহের উদ্দেশ্যে আমি আপনার নিকট উপস্থিত হয়েছি। আপনার দেয়া তথ্য শুধুমাত্র আমার শিক্ষা বিষয়ক গবেষণার কাজে ব্যবহার করা হবে। এ বিষয়ে আমি আপনার সহযোগিতা কামনা করছি।				
তথ্য দাতার নামঃ		পেশাঃ	মালিক/ ড্রাইভার	
গ্রামঃ		উপজেলাঃ	জেলাঃ	

দয়া করে নিচের প্রশ্ন গুলোর উত্তর দিন।

#### প্রশ্ন-১ঃ ব্যক্তিগত তথ্য

বয়স	শিক্ষাগত যোগ্যতা	প্রশিক্ষণ		পেশার ধরন		আপনি কতদিন যাবৎ এ পেশায় যুক্ত	এ পেশায় আসার আগে কোন পেশায় ছিলেন	এ পেশায় আসার কারন কি	পরিবারের কতজন এ পেশার সঙ্গে যুক্ত	সাধারণত কোন বয়সী লোকজন এটা চালায়
		আছে	নাই	মূল	সহায়ক					

পরিবারের সদস্য সংখ্যা	সন্তান সংখ্যা			স্কুল/কলেজগামী সন্তান সংখ্যা	পরিবারের অন্য সদস্য আয় করেন কি	তারা কি আপনাকে সহায়তা করে	হ্যাঁ হলে খরচের কত অংশ শেয়ার করে
	ছেলে	মেয়ে	মোট				
					১. হ্যাঁ ২. না	১. হ্যাঁ ২. না	

#### প্রশ্ন-২ঃ NCMT এর সার্বিক চিত্র

২.১- আপনি যে রুটে চলাচল করেন সে রুটে কতগুলো NCMT আছে?

২.২- আপনার জানামতে আপনার এলাকায় কি কি ধরনের NCMT আছে ?

১. খাচা	২. প্লেন বডি	৩. স্টিয়ারিং	৪. অন্যান্য লিখুন.. ..... .
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২.৩- আপনি যে রুটে চলাচল করেন সেখানে প্রকারভেদগুলোর মধ্যে কোনটির পরিমাণ শতকরা কত বলে আপনার ধারণা

খাচা-            %	প্লেন বডি-            %	স্টিয়ারিং-            %	অন্যান্য-            %
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২.৪- আপনি যে রুটে চলাচল করেন সে রুটে দৈনিক গড়ে কতগুলো NCMT চলাচল করে?... .. টি

২.৫- আপনি যে রুটে চলাচল করেন সে রুটে NCMT এর মালিক কতজন আছেন?... ..জন

২.৬- যে রুটে চলাচল করেন তার দূরত্ব কত?... .. কি.মি.

২.৭- প্রতিদিন কত ট্রিপ চলাচল করেন?... .. ট্রিপ

২.৮- প্রতিদিন কি একই রুটে চলাচল করেন?

১. প্রতি দিনই  
একরুটে চালাই

২. প্রায়ই এক  
রুটে চালাই

৩. মাঝে মাঝে  
এক রুটে চালাই

৪. একএকদিন ভিন্ন  
ভিন্ন রুটে চালাই

২.৯- সপ্তাহের কতদিন NCMT চালান?

২.১০- নিম্নের কোন ধরনে বেশী হারে চালানো হয়?

% সাধারণ পরিবহন  % রিজার্ভ  % ব্যক্তিগত  % অন্যান্য ... ..

২.১১- রিজার্ভ হলে সাধারণত কি কি কাজে শতকরা বেশী রিজার্ভ করা হয়?

% মালামাল পরিবহন  % পারিবারিক অনুষ্ঠান  % সামাজিক/রাজনৈতিক সমাবেশ  % অন্যান্য ..

২.১২ - কোন ধরনের মালামাল পরিবহন করেন

১. শস্যাদি ২. গবাদী পশু ৩. পোল্ট্রি ৪. সারবীজ ও কীটনাশক ৫. নির্মাণ সামগ্রী ৬. মৎস্য ও হ্যাচারী ৭. অন্যান্য ... ..

..

২.১৩- আপনার জানামতে NCMT এর ইঞ্জিন এর ক্ষমতা কত হতে কত পর্যন্ত আছে? ১. সর্বনিম্ন  ২. সর্বোচ্চ

২.১৪- আপনার NCMT এর ইঞ্জিন ক্ষমতা কত?... .. HP

২.১৫- আপনি কি কি পরিবহন  ১. যাত্রী  ২. মালামাল  ৩. উভয়ই  করেন?

২.১৬- যদি যাত্রী পরিবহন করেন তবে দৈনিক ট্রিপপ্রতি কত যাত্রী পরিবহন করেন?

৪ থেকে ৬  ৬ থেকে ৮  ৮ থেকে ১০  ১০ থেকে ১২  ১২ থেকে ১৪  ১৪ থেকে ১৬  এর বেশী

২.১৭- যদি মালামাল পরিবহন করেন তবে এক ট্রিপে কি পরিমাণ পরিবহন করেন? ... ..

২.১৮- আপনার NCMT এর আয়ুষ্কাল কত? ... .. বছর

২.১৯- NCMT কেন্দ্রিক কোন সমিতি আপনার এলাকাতে আছে? ১. আছে  ২. নাই

২.২০- সমিতির সদস্য কত জন?... .. জন

২.২১- এ রুটে আর কি কি ধরনের যানবাহন চলাচল করে?

বাস  সি এন জি  রিক্সা  ভ্যান  ট্রাক  টেলা  অন্যান্য ... ..

২.২২- সাধারণত মোট যাত্রীর শতকরা কত অংশ এ যান ব্যবহার করে?

২০-৩০%  ৩০-৪০%  ৪০-৫০%  ৫০-৬০%  ৬০-৭০%  এর উর্দে

### প্রশ্নঃ৩- NCMT তে বিনিয়োগ সম্পর্কিত তথ্য

৩.১- আপনার কতগুলো NCMT আছে?... .. টি

৩.২- আপনার তৈরী করতে কত টাকা ব্যয় হয়েছে?... .. টাকা

৩.৩- আপনার NCMT এর মাসিক গড় মেরামত খরচ কত?... .. টাকা

৩.৪- মাসিক গড় জ্বালানী খরচ কত?... .. টাকা

৩.৫- মাসিক অন্যান্য খরচ কত?... .. টাকা

**প্রশ্নঃ৪- NCMT - হতে সঞ্চয়/আয়/ ঋন সম্পর্কিত তথ্য**

৪.১- এ পেশায় আসার আগে আপনার মাসিক নীট আয় কত ছিল?... .. টাকা

৪.২- বর্তমানে আপনার নীট মাসিক আয় কত?... .. টাকা

৪.৩ - এ পেশায় আসার আগে আপনার মাসিক সঞ্চয় কত ছিল? . . . . . টাকা

৪.৪ - বর্তমানে আপনার নীট মাসিক সঞ্চয় কত? . . . . . টাকা

৪.৫- কোথায় সঞ্চয় করেন?

৪.৬- ঋন গ্রহন করেছেন কি?

৪.৭- কি কারনে ঋন গ্রহন করেছেন?

৪.৮- কোন কোন প্রতিষ্ঠান হতে ঋন গ্রহন করেছেন?

৪.৯- কত টাকা ঋন গ্রহন করেছেন? . . . . . টাকা

৪.১০- কত কিস্তিতে ঋন পরিশোধ করতে হবে? . . . . . টি

৪.১১ - কিস্তির ধরন কি?

৪.১২- প্রতি কিস্তিতে কত টাকা শোধ করতে হয়? . . . . . টাকা

৪.১৩- কিস্তি খেলাপী হয়েছেন কি?

৪.১৪. ভাড়ার হার কি অনুমোদিত কর্তৃপক্ষ দ্বারা নির্ধারিত হয়?

৪.১৫. ভাড়ার হার কেমন?

≥ ৫ কি.মি	৫ - ১০ কি.মি	১০ - ১৫ কি.মি	১৫ - ২০ কি.মি	২০- ২৫ কি.মি	২৫ কি.মি ≤

৪.১৬. কতক্ষন পরপর এই রুটে NCMT পাওয়া যায়?

≥ ৫ মি	৫ - ১০ মি	১০ - ১৫.মি	১৫ - ২০.মি	২০- ২৫.মি	২৫.মি ≤

৪.১৭. নির্দিষ্টস্থানে যাত্রী উঠা নামা করে নাকি যেকোন স্থানেই যাত্রী উঠানামা করেন?

১. নির্দিষ্ট স্থানে	২. যেকোন স্থানে	৩. অন্যান্য
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ক্র. নং	ব্যয় খাত	টাকা
১	ভরণপোষণ	
২	শিক্ষা/স্বাস্থ্য	
৩	মোবাইল	
৪	বিনোদন	
৫	অন্যান্য	
	মোট	

#### প্রশ্নঃ ৫- পারিবারিক ব্যয় সংক্রান্ত তথ্য

৫.১- এ পেশায় আসার আগে মাসিক পারিবারিক ব্যয় কত ছিল? ... .. টাকা

৫.২- বর্তমানে মাসিক পারিবারিক ব্যয়কত?

৫.৩- এ পেশায় আসার আগে আপনার কি কি সম্পদ ছিল? ১. বাড়ী ২. কৃষিজমি ৩. টিভি ৪. অন্যান্য... ..

৫.৪- এ পেশায় আসার পর কি কি সম্পদ ক্রয় করেছেন? ১. বাড়ী ২. কৃষিজমি ৩. টিভি ৪. অন্যান্য... ..

#### প্রশ্নঃ ৬- কৃষি উন্নয়ন সম্পর্কিত তথ্য

৬.১- কৃষি পন্য পরিবহন করেন কি? ১. হ্যাঁ ২. না

৬.২- যদি হ্যাঁ হয় তবে কি কি কৃষি পন্য পরিবহন করেন?

১. শস্যাদী	২. সার/বীজ	৩. গবাদী পশু	৪. হাসমুরগী	৫. জ্বালানী ও কাঠ	৬. অন্যান্য
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৬.৩ - কখন এ সকল পন্য পরিবহন করেন?

১. হাটের দিনে	২. প্রতিদিন	৩. কৃষকের চাহিদা অনুযায়ী বিশেষ দিন	৪. অন্যান্য. ... ..
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৬.৪- আপনার এলাকায় কৃষিপন্য পরিবহনে নিম্নের যানবাহনের মধ্যে শতকরা বেশী ব্যবহৃত হয় কোনটি?

ক্র. নং	পরিবহনের মাধ্যম	কোনটি বেশী	শতকরা পরিমাণ
১	CT		%
২	NCMT		%
৩	HL		%
৪	অন্যান্য		%

৬.৫- এ যানে কৃষিপন্য পরিবহনের কারন কি কি?

.....

... ..

৬.৬ - অন্য কোন কোন ক্ষেত্রে কৃষিতে এ যান ব্যবহৃত হয়?

... ..

৬.৬ - কৃষিতে অন্য যান(CT) ব্যবহারে অসুবিধা কি কি?

## ৭. - শিক্ষা ও স্বাস্থ্য সম্পর্কিত তথ্য

৭.১- আপনার মাসে শিক্ষা ব্যয় কত? ... .. টাকা

৭.২- এ পেশায় আসার আগে শিক্ষা ব্যয় কত ছিল? ... .. টাকা

৭.৩- শিক্ষার জন্য অতিরিক্ত ব্যয় করেন কি? ☐ ১. হ্যাঁ ☐ ২. না

৭.৪- কি কি অতিরিক্ত ব্যয় করেন

☐ ১. কোচিং ☐ ২. স্কুল বাস/ভ্যান ☐ ৩. অন্যান্য বই ☐ ৪. অন্যান্য... ..

৭.৫- আপনার সন্তান শিক্ষাপ্রতিষ্ঠানে যেতে সাধারণত কোন যান ব্যবহার করে?

☐ ১. CT ☐ ২. NCMT ☐ ৩. পদব্রজে ☐ ৪. অন্যান্য... ..

৭.৬- স্কুল কলেজের ছাত্র শিক্ষক ও অন্যান্য শিক্ষাসংশ্লিষ্ট ব্যক্তিরা আপনার এ যান ব্যবহার করে কি? ☐ ১. হ্যাঁ ☐ ২. না

৭.৭- শিক্ষা প্রতিষ্ঠানে যেতে এযান ব্যবহার করার কারন কি বলে আপনার মনে হয়?

১. ভাড়া কম ২. যেকোন স্থান হতে উঠা নামা করা যায় ৩. সবসময় পাওয়া যায় ৪. যেকোন সময় রিজার্ভ করা যায়  
৫. আরামদায়ক ৬. অন্যান্য... ..

৭.৮- জরুরী স্বাস্থ্যসেবা গ্রহনকারীকে নিয়ে হাসপাতালে গিয়েছেন কখনোও? ☐ ১. হ্যাঁ ☐ ২. না

৭.৯- এ মাসে এরকম রোগী পরিবহন করেছেন কি? ☐ ১. হ্যাঁ ☐ ২. না

৭.১০- করলে কতটি করেছেন? ... .. জন

৭.১১- জরুরী অবস্থায় কেন লোকজন এযান ব্যবহার করে?

১. জরুরী প্রয়োজনে নিকটে এ যানই সবসময় পাওয়া যায় ২. ভাড়া কম ৩. দ্রুততম সময়ে হাসপাতালে পৌছা যায়  
৪. গঠনগত দিক দিয়ে রোগী পরিবহন এই যানেই সুবিধাজনক ৫. অন্যান্য... ..

৭.১২- সাধারণ চিকিৎসা সেবা নিতে কোথায় যান?

☐ ১. স্থানীয় স্বাস্থ্য কেন্দ্র ☐ ২. উপজেলা হাসপাতাল ☐ ৩. জেলা সদর ☐ ৪. অন্যান্য... ..

৭.১৩. কি ভাবে যান

☐ ১. CT ☐ ২. NCMT ☐ ৩. পদব্রজে ☐ ৪. অন্যান্য

৭.১৪- মাসিক স্বাস্থ্য খরচ কত?.. .. টাকা

৭.১৫ - এ পেশায় আসার আগে স্বাস্থ্য খরচ কত ছিল?... .. টাকা

৭.১৬ - এ যান চালানোর ফলে আপনি কি কি শারীরিক সমস্যা অনুভব করেন?

১. শরীর ব্যথা ২. কানে কম শোনা ৩. জ্বর জ্বর ভাব ৪. শরীরে ক্লান্তি আসে ৫. অন্যান্য.. ..

৮. অন্যান্য ব্যবহার

৮.১. অন্য আর কি কি ক্ষেত্রে এ যান ব্যবহৃত হয়ে থাকে

ক.

খ.

গ.

ঘ.

## **Appendix 10- Questionnaire for NCMT Driver (English Version)**

### Research Questionnaire on An Economic Analysis of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.

Assalamu Alaikum. This is Md. Nasir Uddin Gani, Ph. D. Fellow, Institute of Bangladesh Studies, Rajshahi University, doing a research titled “An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh. To conduct this study I need your earnest help. It is assured that the information provided will be used only for academic purpose and will be confidential.				
Name of the respondent	Name of the respondent	Name of the respondent	Name of the respondent	
Village		Upazilla	Zilla	

Please answer the following questions:

#### Q1. Personal Information

Age	Educational Qualifications	Type of profession		Traininig		Age	Educational Qualifications	Traininig	Duration of being in this profession	What is your previous profession
		Main	Supplementary	Yes	No					

Familial information									
No. of Family Members	No. of Children			School/college going children	Does any other family member earn?		Do they help you in family expenditure?		How much do they contribute to family expenditure(%)?
	Son	Daughter	Total		1. yes	2. no	1. yes	2. no	

#### **Q-2: Existence NCMT picture in the rural areas**

2.1- How much NCMT is in the route where you move daily?

2.2- According to your knowledge what types of NCMT is in your village ?

1. Framed Body	2. Plain Body	3. Steering type	4. Others please write....
----------------	---------------	------------------	----------------------------

2.3- What type of NCMT concentrates more in the route where you move daily?

Framed Body.... %	Plain Body %	Steering %	Others %
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2.4- How much NCMT ply on average in the rote where you move daily?.. . . . . Nos

2.5- How much NCMT owner is in the route where you move daily?.. . . . .Nos

2.6- What is the distance of the route where you move?.. . . . . Kms.

2.7- How much trip you can make in a day ?.. ... Trip

2.8- Do you move daily in the same route ?

1. Daily in the same route

2. Apparently in the same route

3. Sometimes

4. different day different route

2.9- How much day you drive in a week?? ... days

2.10- নিম্নের কোন ধরনে বেশী হারে চালানো হয়?

General transport

%

Reserve

%

Personal

%

Others

%

2.11- If it reserve, in what purpose it is used mostly?

Goods transport

%

Family program

%

Social and political gathering

%

Others

%

2.12 - Which types of goods you carry through NCMT

1. Crops

2. Cattle

3. Poultry

4. Fertilizer/seed/insecticide

5. construction materials

6. Fisheries

7. others

2.13- What is range of engine power of NCMT according to your knowledge ?1.Highest

2.Lowest

2.14What is the engine power of your NCMT?.. ... HP

2.15- What thing you transport?

1. Passenger

2. Goods

3. Both

2.16- If passenger, how much in one trip?

4-6

6-8

8-10

10-12

12-14

14-16

more than that

2.17- If goods, how much in one trip? .. ... Kg

2.18- What is the longevity of your NCMT? .. ... Years

2.19- Is there any association centering NCMT?

1. yes

2. No

2.20- If yes what is the number of the members?.. ... Nos

2.21- What type of other vehicles ply in this route?

Bus

CNG

Rickshaw

Van

Mishuk

Pushcart

Others

2.22- What percentage of total passenger use NCMT?

20 -30%

30-40%

40-50%

50- 60%

60-70%

more than that

### Q.3- Information about investment in NCMT

3.1- How much NCMT you have?.. ... Nos.

3.2- What is the making cost of your NCMT?.. ... Taka

3.3- What is monthly maintenance cost of NCMT?.. ... Taka

3.4- What is the average monthly fuel cost of your NCMT?... .. Taka

3.5- What is the monthly other cost of your NCMT? .. .. Taka

**Q. 4- Savings/Income/ Credit related information of NCMT**

4.1- What was the monthly previous income before joining NCMT occupation?... .. Taka

4.2- What is your present net monthly income? .. .. Tk.

4.3 - What was your monthly savings before joining NCMT occupation? .. .. Taka

4.4 - What is your present net monthly savings? .. .. Taka

4.5- Where you save?

4.6- Do you have credit?

4.7- Reason behind taking Credit?

4.8 From which institution you have taken credit?

4.9- How much money you have taken as credit? .. .. Taka

4.10- How much installment to repay the credit? .. .. Nos.

4.11 - Types of installment?

4.12- How much taka repay per installment? .. .. Taka

4.13- Are defaulter to repay any installment

4.14. Is there any authority imposing rate of fare?

4.15. What is the rate of fare?

≥ 5 km	5 - 10 km	10 -15 km	15 -20 km	20- 25 km	25 km ≤

4.16. In what inter-bell the NCMTs are available?

≥ 5 M	5 - 10 M	10 -15.M	15 -20.M	20- 25.M	25.M ≤

4.17. What is the stopping position in passenger transportation?

**Q. 5- Information about family expenditure**

5.1- What was the family expenditure cost before joining NCMT occupation? .. .. . Taka

5.2- What is your present monthly family cost? .. .. . Taka

5.3- What was your wealth before joining NCMT occupation?

2. House	2. Agri. Land	3. TV	4. Others
----------	---------------	-------	-----------

5.4- What wealth you bought after joining NCMT occupation?

2. House	Agri. Land	3. TV	4. Others
----------	------------	-------	-----------

## Q. 6- Information about agricultural development through NCMT

6.1- Do you transport agricultural product? 1. Yes 2. NO

6.2- If yes, what types of agri product you transport?

1. Crops	3. fertil/seed	4. cattle	5. poultry	5. Fuel & wood	6. others
----------	----------------	-----------	------------	----------------	-----------

6.3 - When you transport the agricultural goods?

1. In Hut day 2. Daily 3. According to the farmers demand 4. Others

6.4- Which one is mostly usage in transportation to agricultural product?

Sl.	Modes of vehices	Which one is more	Percentage
1	CT		%
2	NCMT		%
3	HL		%
4	Others		%

6.5- What are the reasons to carry agricultural product through NCMT?

6.6 - What are the other usage of NCMT in agriculture?

6.6 - What are the disadvantages to carry agricultural product in agriculture?

## 7. Education and health related information

7.1- What is your monthly educational expenses? .. .. . Taka

7.2.- What was your educational expenses before joining NCMT occupation? .. .. Taka

7.3- Have you bear extra educational expenses? 1. Yes 2. No

7.4Types of extra educational expenses you bear

1.Coachin	2.School van	3. other books	4. others
-----------	--------------	----------------	-----------

7.5- Which vehicles used to go to educational institution by your son/daughter?

1. CT	2. NCMT	3.by foot	4. others...
-------	---------	-----------	--------------

7.6- The other people involve in educational institution use it ? 1. yes 2. No

7.7- What are the reasons to use it to go to educational institution?

1. Less fair 2. Advantages of stopping in any where 3. All time available 4. Advantages of reservation in any time 5. Comfortable 6. Others .. ..

7.8- Do you ever carry any emergency patient? 1. Yes 2. No

7.9- How much in one month? 1. Yes 2. No

7.10- How much? .. .. No.

7.11- Why the people use it in emergency time?

1. It is available in emergency time 2. less fare 3. It consume less time to go to hospital 4. Structurally it has the advantages to carry patient 5. Others .. ..

7.12- Where you go to take health service?

1. Local health complex 2. Upazilla hospital 3. District hospital 4. Others.. ..

7.13. Which modes do you use?

১. CT	২. NCMT	৩. By foot	4. Others
-------	---------	------------	-----------

7.14- What is your monthly health expenses?.. .. Taka

7.15 - What was your monthly medical expense before joining NCMT occupation?.. .. Taka

7.16 - What physical problems you faces to drive it ?

1. Physical Pain 2. Short of hearing 3. feverish 4. tiring 5. Others .. ..

## 8. Other usage

8.1. What are the other usage of this transport?

## Appendix 11- Questionnaire for CT Driver

### Research Questionnaire on An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.

আসসালামুআলাইকুম। আমি মোঃ নাসির উদ্দিন গনি, পিএইচ ডি গবেষক, ইনিস্টিটিউট অব বাংলাদেশ স্টাডিজ, রাজশাহী বিশ্ববিদ্যালয়, রাজশাহী। আমি “ An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.” শিরোনামে একটি গবেষণা করছি। এ গবেষণার জন্য তথ্য সংগ্রহের উদ্দেশ্যে আমি আপনার নিকট উপস্থিত হয়েছি। আপনার দেয়া তথ্য শুধুমাত্র আমার শিক্ষা বিষয়ক গবেষণার কাজে ব্যবহার করা হবে। এ বিষয়ে আমি আপনার সহযোগিতা কামনা করছি।			
তথ্য দাতার নামঃ		পেশাঃ	CT এর মালিক/ ড্রাইভার
গ্রামঃ	উপজেলাঃ	জেলাঃ	

দয়া করে নিচের প্রশ্ন গুলোর উত্তর দিন।

প্রশ্ন-১ঃ ব্যক্তিগত তথ্য

বয়স	শিক্ষাগত যোগ্যতা	পেশার ধরন		প্রশিক্ষণ		আপনি কতদিন যাবৎ এ পেশায় যুক্ত	এ পেশায় আসার আগে কোন পেশায় ছিলেন	এ পেশায় আসার কারণ কি
		মূল	সহায়ক	আছে	নাই			

পারিবারিক তথ্য									
পরিবারের সদস্য সংখ্যা	সন্তান সংখ্যা			স্কুল/কলেজগামী সন্তান সংখ্যা	পরিবারের অন্য সদস্য আয় করেন কি	তারা কি আপনাকে পারিবারিক ব্যয়ে সহায়তা করে		পারিবারিক ব্যয় এর কত অংশ (%)	
	ছেলে	মেয়ে	মোট			১. হ্যাঁ	২. না		
						১. হ্যাঁ	২. না		

### Availability

২.১-আপনি যে রুটে চলাচল করেন সে রুটে কি কি ধরনের যানবাহন আছে?

CT

NCMT

অন্যান্য

২.২- প্রকারভেদগুলোর মধ্যে কোন ধরনের যানবাহন শতকরা কত ভাগ আছে বলে আপনার মনে হয়?

CT-    %

NCMT-    %

অন্যান্য-    %

২.৩- আপনি যে রুটে চলাচল করেন সে রুটে কতগুলো CT আছে?

২.৪ - আপনি যে রুটে চলাচল করেন সে রুটে CT এর মালিক কতজন আছেন?

২.৫. কতক্ষণ পরপর এই রুটে CT পাওয়া যায়?

≥ ৫ মি	৫ - ১০ মি	১০ -১৫.মি	১৫ -২০.মি	২০- ২৫.মি	২৫.মি ≤

২.৬. কৃষি পণ্য পরিবহন করার ক্ষেত্রে আপনার যানবাহনের প্রাপ্তির সময়কাল কেমন

১. সবসময়

২. মাঝে মাঝে

৩. একদম নয়

২.৭. আপনার জানামতে কোনখানে শতকরা কতটুকু কৃষিপণ্য পরিবহন করা হয়

NCMT    %

CT    %

অন্যান্য    %

২.৮. যে কোন সময় চাইলেই কি আপনার যান পাওয়া যায়? ১. হ্যাঁ ২. না

### Accessibility

২.৯. যাত্রী উঠা নামা করার ক্ষেত্রে কোন নিয়ম অনুসরণ করেন? ১. নির্দিষ্ট স্থানে ২. যে কোন স্থানে

২.১০. যে কোন স্থানে যেমন ফসলের মাঠ এবং বাড়ী হতে বাজার পর্যন্ত আপনার যান চলে?

### Time saving

২.১১. কোন যানে মানুষ বা পন্য পরিবহনে কম সময় লাগে

২.১২ নির্দিষ্ট দূরত্বে যেতে আপনার যানবাহনের কত সময় লাগে ?

২.১৩ একই দূরত্বে NCMT তে যেতে সময় লাগে কেমন?

### Cost Saving

২.১৪ ভাড়ার হার কত?

≥ ৫ কি.মি	৫ - ১০ কি.মি	১০ - ১৫ কি.মি	১৫ - ২০ কি.মি	২০ - ২৫ কি.মি	২৫ কি.মি ≤

২.১৫. কোন যানে খরচ বেশী হয়?

২.১৬ - যে রুটে চলাচল করেন তার দূরত্ব?

### যাত্রী ও মালামাল পরিবহন ক্ষমতা

২.১৭- দৈনিক কত ঘন্টা কাজ করেন-

২.১৮- সপ্তাহের কতদিন CT চালান?

২.১৯- আপনি কি কি পরিবহন করেন? 

১. যাত্রী	২. মালামাল	৩. যাত্রী ও মালামাল	৪. অন্যান্য -----
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২.২০ - যদি যাত্রী পরিবহন করেন তবে দৈনিক ট্রিপপ্রতি কত যাত্রী পরিবহন করেন?

২.২১- যদি মালামাল পরিবহন করেন তবে এক ট্রিপে কি পরিমাণ পরিবহন করেন?

২.২২ - আপনার CT এর আয়ুষ্কাল কত?

### আয় ও সঞ্চয়

২.২৩ - CT কেন্দ্রিক কোন সমিতি আপনার এলাকাতে আছে?

২.২৪- সমিতির সদস্য কত জন?

২.২৫ - বর্তমানে আপনার নীট মাসিক আয় কত?

২.২৬ - বর্তমানে আপনার নীট মাসিক সঞ্চয় কত?

ঋণ গ্রহণ ও পরিশোধ

২.২৭- পরিবহন ক্রয় করার জন্য কোন ঋণ গ্রহণ করেছেন কি?

১. হ্যাঁ

২. না

২.২৮ - কোন কোন প্রতিষ্ঠান হতে ঋণ গ্রহণ করেছেন?

১. বন্ধু/আত্মীয়

২. এনজিও

৩. ব্যাংক

৪. মহাজন

৫. অন্যান্য

২.২৯- কত টাকা ঋণ গ্রহণ করেছেন

-----টাকা

২.৩০- কত কিস্তিতে ঋণ পরিশোধ করতে হবে?

----- কিস্তি

২.৩১- প্রতি কিস্তিতে কত টাকা শোধ করতে হয়।

----- টাকা

২.৩২- কিস্তি খেলাপী হয়েছেন কি?

১. হ্যাঁ

২. না

যানবাহন সংক্রান্ত ব্যয়

২.৩৩ - আপনার CT তৈরী করতে কত টাকা ব্যয় হয়েছে?

-----টাকা

২.৩৪- আপনার CT এর মাসিক গড় মেরামত খরচ কত?

-----টাকা

২.৩৫- মাসিক গড় জ্বালানী খরচ কত?

-----টাকা

২.৩৬- মাসিক অন্যান্য খরচ কত?

-----টাকা

২.৩৭ - আপনার CT তে নিয়োজিত কর্মচারীর সংখ্যা কত?-----জন

২.৩৮- কর্মচারীর মাসিক বেতন কত?

-----টাকা

২.৩৯- ভাড়ার কি কোন নির্দিষ্ট হার কোন প্রতিষ্ঠান দ্বারা নির্ধারিত করা আছে কি?

১. হ্যাঁ

২. না

২.৪০- যদি হয় তাহলে কোন প্রতিষ্ঠান দ্বারা নির্ধারিত হয়?

## **Appendix 12- Questionnaire for CT Driver (English Version)**

Research Questionnaire on  
An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the  
Development of Rural Bangladesh.

Assalamu Alaikum. This is Md. Nasir Uddin Gani, Ph. D. Fellow, Institute of Bangladesh Studies, Rajshahi University, doing a research titled “An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh. To conduct this study I need your earnest help. It is assured that the information provided will be used only for academic purpose and will be confidential.					
Name of the respondent				Occupation	Owner/driver/both of CT
Village		Upazilla		Zilla	

Please answer the following questions:

### Q1. Personal Information

Age	Educational Qualifications	Type of profession		Traininig		Duration of being in this profession	What is your previous profession	Reason behind coming to this profession
		Main	Supplementary	Yes	No			

Familial information										
No. of Family Members	No. of Children			School/college going children	Does any other family member earn?		Do they help you in family expenditure?		How much do they contribute to family expenditure(%)?	
	Son	Daughter	Total		1. yes	2. no	1. yes	2. no		

### **Availability**

2.1- Which transports are available in the route you use?

2.2- Percentage of those transports----

<input type="text" value="CT- %"/>	<input type="text" value="NCMT- %"/>	<input type="text" value="Others %"/>
------------------------------------	--------------------------------------	---------------------------------------

2.3- How many CTs are available in your used route?

2.4 - How many owners of CTs are there in your used route?

2.5. How frequently are the CTs available?

≥ 5 minutes	5 - 10 minutes	10 -15 minutes	15 -20 minutes	20- 25. minutes	25. minutes ≤

2.6. How frequently are the vehicles available for agricultural transportation?

<input type="text" value="1. Always"/>	<input type="text" value="2.Sometimes"/>	<input type="text" value="3.Never"/>
--	--	--------------------------------------

2.7. To which percentage do these transports carry agricultural produce

NCMT %	CT %	Others %
--------	------	----------

2.8. do you get your desired transport any time ? 1. Yes 2. No

### Accessibility

2.9. Do you follow rules for getting the passengers down/loading?

1. particular place

2 anywhere

2.10. Do you have any transport from crop fields and home to market?

Yes

No

### Time saving

2.11. Which transports are time saving for human transporting?

NCMT

CT

2.12 how much time does your transport take to destination?

----- hrs

2.13 how long does NCMT take to the same destination?

----- hrs

### Cost Saving

2.14 what is the fare?

$\geq 5$ km	5 - 10 km	10 -15 km	15 -20 km	20- 25 km	25 km $\leq$

2.15. Which transport is costlier?

NCMT

CT

2.16 The distance of your route? ----- km

### Trafficking and Transport Capacity:

2.17- How many hours do your work per day?

-----hrs

2.18-How many days do you run your CT?

-----hrs

2.19- You carry?

1. Passengers	2. Goods	3. Both Passenger and goods	4. others
---------------	----------	-----------------------------	-----------

2.20 If you carry passengers, how many do you carry per trip?

-----

2.21- If you carry goods, how much do you carry per trip/

----- kg

2.22 What is the life time of your CT/?

---Years

### Income and Savings

2.23 – Is there any CT-based cooperation society?

1. yes

2. No

2.24- How many members are there in the Cooperation Society?

-----

2.25 - What is your net monthly income at present??

2.26 – what is your net monthly savings at present??

### Loans and Repayment

2.27- Have you taken any loan for buying the vehicle?

2.28 – Which institutions have you taken loans from?

2.29- What is the amount of the loan?

2.30- How many installments do you need to repay the loan?

2.31- What is the installment rate?

2.32- Have you ever defaulted any installment?

### Transport Related cost

2.33 what was the making cost of your CT?

2.34- what is the monthly repairing cost?

2.35- what is the monthly fuel consumption??

2.36- Other related costs-

2.37 – how many workers are involved in your CT?-----persons

2.38- How much is the expenditure for the employers?

2.39- Is there any authority imposing rate of fare?

### Appendix 13- Questionnaire for User (Farmer)

#### Research Questionnaire on An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.

আসসালামুআলাইকুম। আমি মোঃ নাসির উদ্দিন গনি, পিএইচ ডি গবেষক, ইনিস্টিটিউট অব বাংলাদেশ স্টাডিজ, রাজশাহী বিশ্ববিদ্যালয়, রাজশাহী। আমি “ An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.” শিরোনামে একটি গবেষণা করছি। এ গবেষণার জন্য তথ্য সংগ্রহের উদ্দেশ্যে আমি আপনার নিকট উপস্থিত হয়েছি। আপনার দেয়া তথ্য শুধুমাত্র আমার শিক্ষা বিষয়ক গবেষণার কাজে ব্যবহার করা হবে। এ বিষয়ে আমি আপনার সহযোগিতা কামনা করছি।

তথ্য দাতার নামঃ		পেশাঃ	কৃষক
গ্রামঃ		উপজেলাঃ	জেলাঃ

দয়া করে নিচের প্রশ্ন গুলোর উত্তর দিন।

প্রশ্ন-১ঃ NCMT এর সার্বিক চিত্র

ব্যক্তিগত তথ্য						
বয়স	শিক্ষাগত যোগ্যতা(বছর)	পরিবারের মোট সদস্য সংখ্যা		সন্তান সংখ্যা		পরিবারের NCMT ব্যবহারকারীর সংখ্যা
				ছেলে	মেয়ে	

#### Availability

প্রশ্ন ১.১-কৃষিপণ্য কোথায় বিক্রি করেন? ১. বাড়ীতে ২. স্থানীয় বাজারে ৩. উপজেলা সদরের বাজারে ৪. বিভিন্ন হাটে

১.২- পণ্য হাটে বাজারে কিভাবে নিয়ে যান? ১. CT তে ২. মাথায় ৩. NCMT তে ৪. উভয়ই

১.৩- এগুলোর মধ্যে কোন যান শতকরা কত টুকু ব্যবহার করেন।

১. CT - % ২. মাথায়- % ৩. NCMT- % ৪. অন্যান্য - %

১.৪ আপনার এলাকায় কৃষিপণ্য পরিবহনে যানবাহনের প্রাপ্যতার উপর মন্তব্য করুন

	১. সবসময় পাওয়া যায়	২. মাঝেমাঝে পাওয়া যায়	৩. পাওয়া যায় না
NCMT			
ট্রাক			
বাস			
টেম্পু			
রিক্সা ও ভ্যান			

১.৫. রিজার্ভ নিতে চাইলে যানবাহনগুলোর প্রাপ্যতার উপর মন্তব্য করুন

	১. সবসময়	২. মাঝেমাঝে	৩. পাওয়া যায় না
NCMT			
ট্রাক			
বাস			
টেম্পু			
রিক্সা ও ভ্যান			

#### Accessibility

১.৬. ফসলের মাঠে ও বাড়ি হতে হাট বাজারে যেতে কোন যান কি মাত্রায় পাওয়া যায়

	১. সবসময়	২. মাঝেমাঝে	৩. পাওয়া যায় না
NCMT			
ট্রাক			
বাস			
টেম্পু			
রিক্সা ও ভ্যান			

#### Time saving

১.৭. যাতায়াতের ক্ষেত্রে বিভিন্ন যানবাহনের সময় সাশ্রয়ের ধরন কিরূপ

	১.অনেক সময় সাশ্রয় হয়	২. অল্পসময় সাশ্রয় হয়	৩.সময় সাশ্রয় হয় না	৪.সময় আরও নষ্ট হয়
NCMT				
ট্রাক				
বাস				
টেম্পু				
রিক্সা ও ভ্যান				

১.৮. NCMTএর তুলনায় অন্য গাড়ীতে সময় কেমন লাগে

	১.বেশী	২.একইসময়	৩.কম
NCMT			
ট্রাক			
বাস			
টেম্পু			
রিক্সা ও ভ্যান			

১.৯. যদি NCMT তে সময় সাশ্রয় হয় তবে তা কি পরিমাণে? ----- ঘন্টা

### Cost Saving

১.১০. কোন যানবাহন খরচ সাশ্রয়ী

১. NCMT ২. ট্রাক ৩. বাস ৪. টেম্পু ৫. রিক্সা ও ভ্যান

১.১১. যদি NCMT হয় তাহলে কি পরিমাণ খরচ সাশ্রয় হয়? ----- টাকা

১.১২. NCMTএর তুলনায় অন্য গাড়ীর ভাড়ার হার কেমন

	১.বেশী	২.একইরকম	৩.কম
ট্রাক			
বাস			
টেম্পু			
রিক্সা ও ভ্যান			

### Others

১.১৩. আপনার কি বাসস্থান হতে অনেক দূরবর্তী স্থানে কৃষি জমি আছে? ১. হ্যাঁ ২. না

১.১৪. দূরবর্তী কৃষিজমিতে কৃষি কাজের জন্য যাতায়াতের মাধ্যম হিসেবে শতকরা কোন যানবাহনটি বেশী ব্যবহার করেন?

১. NCMT-----%	২. ট্রাক-----%	৩. বাস-----%	৪.টেম্পু-----%	৫. রিক্সা ও ভ্যান-----%
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১.১৫. দূরবর্তী কৃষি জমি হতে ফসল পরিবহন করতে শতকরা কোন যানবাহনটি বেশী ব্যবহার করেন?

১. NCMT-----%	২.ট্রাক-----%	৩.বাস-----%	৪.টেম্পু-----%	৫.রিক্সা ও ভ্যান-----%
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১.১৬. যদি NCMT এর ব্যবহার বেশী হয় তাহলে এর কারন বলুন?

১.১৭. কোন যানবাহন শারীরিক পরিশ্রম কমাতে সাহায্য করে?

১. NCMT	২.ট্রাক	৩.বাস	৪.টেম্পু	৫.রিক্সা ও ভ্যান
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১.১৮. এ যানবাহন ব্যবহারের ফলে আপনার কৃষিপন্য নষ্ট হওয়া বা পচনের সম্ভাবনা হওয়া থেকে রক্ষা করে কি? ১. হ্যাঁ ২. না

১.১৯. এ যানবাহন ব্যবহার করে আপনার আয় কি হারে বৃদ্ধি পেয়েছে?-----%

১.২০. সার বীজ, কীটনাশক ইত্যাদি পরিবহনে সাধারণত কোন যানবাহন ব্যবহার করেন?

১. NCMT-----%	২. ট্রাক-----%	৩. বাস-----%	৪.টেম্পু-----%	৫. রিক্সা ও ভ্যান-----%
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১.২১. কৃষিক্ষমিক পরিবহনে কোনযানবাহন ব্যবহার করেন

১. NCMT-----%	২. ট্রাক-----%	৩. বাস-----%	৪.টেম্পু-----%	৫. রিক্সা ও ভ্যান-----%
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১.২২. কৃষিতে আর কি কি ভাবে এ যান ব্যবহার হয়?

## **Appendix 14- Questionnaire for User (Farmer) (English Version)**

### Research Questionnaire on

### An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.

Assalamu Alaikum. This is Md. Nasir Uddin Gani, Ph. D. Fellow, Institute of Bangladesh Studies, Rajshahi University, doing a research titled “An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh. To conduct this study I need your earnest help. It is assured that the information provided will be used only for academic purpose and will be confidential.

Name of the Respondent		Occupation	Farmer
Village	Upazilla	District	

Please answer the following questions:

Question-1: Overall picture of NCMT

Personal Information								
Age	Educational Qualifications (in years)	Number of Family Members			No. of Children		No. of School/College going Children	No. of NCMT Users of the Family
					Sons	Daughters		

### **Availability**

Q-1.1-Where do you sell your agricultural products? 1. At home, 2. Local Market, 3. Upazilla Sadar Market ,4.

Different Weekly Markets

1.2-How do you transport your produce to market? 1. By CT 2. Over Head 3. By NCMT 4. All of them

1.3- which transport is used (in percentage)

1. CT - % 2. Over head % 3. NCMT- % 4. Others %

1.4 Please comment on the availability of transports for agricultural transportation in your area-

Modes	2. Always available	2.Sometimes Available	3. Not Available
NCMT			
Trucks			
Buses			
Tempos			
Rickshaws and Vans			

2.5. Comment on the availability of transports for “reserve”

Modes	1.Always available	2.Sometimes Available	3. Not Available
NCMT			
Trucks			
Buses			
Tempos			
Rickshaws and Vans			

### **Accessibility**

1.6.Which transports are available for going to crop field and to market-

Modes	1.Always available	2.Sometimes Available	3. Not Available
NCMT			
Trucks			
Buses			
Tempos			
Rickshaws and Vans			

**Time saving**

১.১১. What is the pattern of time saving for different transport types

Modes	1. saves much time	2. saves little time	3. not time-saving	4. Rather spoils time
NCMT				
Trucks				
Buses				
Tempos				
Rickshaws and Vans				

১.১২. Time consumption of other transports in comparison to NCMT-

Modes	1. Higher	2. consuming same time	3. less
NCMT			
Trucks			
Buses			
Tempos			
Rickshaws and Vans			

১.১৩. If NCMT is time saving, how much of time is saved (in hours)?

**Cost Saving**

১.১৪. Which transport is cost-saving

2. NCMT 2. Trucks 3. Buses 4. Tempos 5. Rickshaws and Vans

1.11. If NCMT is cost-saving, how much does it save (in tk.)

1.12. What is the fare pattern of transports compared to NCMT-

Modes	1. higher	2. same	3. less
Trucks			
Buses			
Tempos			
Rickshaws and Vans			

**Others**

2.13. Is your arable land situated far from your residence? 1. Yes 2. No

2.14. Which transport do you use to go to your agricultural fields?

১. NCMT-----%	২. Trucks-----%	৩. Buses----%	৪. Tempos----%	৫. Rickshaws and Vans--%
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2.15. Which transports are used for carrying crops from fields situated far from house?

1. NCMT-----%	2. Trucks-----%	3. Buses----%	4. Tempos----%	5. Rickshaws and Vans--%
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2.16. If NCMT is used more, what are the reasons behind?

2.17. Which transport helps minimize physical labor?

1. NCMT	2. Trucks	3. Buses	4. Tempos	5. Rickshaws and Vans
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2.18. Does the use of NCMT protect agricultural produce from being spoiled? 1. Yes 2. No

2.19. How much of your income has increased by dint of using NCMT?--- -----%

2.20. Which transport do usually use to carry fertilizer, seeds, pesticides etc.?

1. NCMT-----%	2. Trucks-----%	3. Buses----%	4. Tempos----%	5. Rickshaws and Vans--%
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2.21. Which transport is used to carry agricultural labors?

1. NCMT-----%	2. Trucks-----%	3. Buses----%	4. Tempos----%	5. Rickshaws and Vans--%
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2.22. For which agricultural purposes is this transport used further?

## **Appendix 15- Questionnaire for User (Student and Teacher)**

### Research Questionnaire on

### An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.

আসসালামুআলাইকুম। আমি মোঃ নাসির উদ্দিন গনি, পিএইচ ডি গবেষক, ইনিস্টিটিউট অব বাংলাদেশ স্টাডিজ, রাজশাহী বিশ্ববিদ্যালয়, রাজশাহী। আমি “An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.” শিরোনামে একটি গবেষণা করছি। এ গবেষণার জন্য তথ্য সংগ্রহের উদ্দেশ্যে আমি আপনার নিকট উপস্থিত হয়েছি। আপনার দেয়া তথ্য শুধুমাত্র আমার শিক্ষা বিষয়ক গবেষণার কাজে ব্যবহার করা হবে। এ বিষয়ে আমি আপনার সহযোগিতা কামনা করছি।				
তথ্য দাতার নামঃ		পেশাঃ	ছাত্র/শিক্ষক/শিক্ষা সংশ্লিষ্ট ব্যক্তি	
গ্রামঃ		উপজেলাঃ	জেলাঃ	

দয়া করে নিচের প্রশ্ন গুলোর উত্তর দিন।

প্রশ্ন-১ঃ

ব্যক্তিগত তথ্য						
বয়স	শিক্ষাগত যোগ্যতা	বাড়ি হতে প্রতিষ্ঠানের দূরত্ব	নিজ বাড়ীর অন্য সদস্য এ যান ব্যবহার করে কি	হ্যাঁ হলে কত জন	দৃষ্টিনার সম্মুখীন হয়েছেন কি	হ্যাঁ হলে কত বার

প্রশ্ন-২

### **Availability**

২.১- শিক্ষা প্রতিষ্ঠানে যেতে কোন কোন যান ব্যবহার করেন।

১. NCMT    ২. বাস    ৩. টেম্পু    ৪. সিএনজি    ৫. রিক্সাওভ্যান    ৬. অন্যান্য

২.২ কোন যান সবসময় পাওয়া যায়

১. NCMT    ২. বাস    ৩. টেম্পু    ৪. সিএনজি    ৫. রিক্সাওভ্যান    ৬. অন্যান্য

### **Accessibility**

২.৩ বাড়ী হতে বের হতেই কোন যানবাহন সহজলভ্য?

১. NCMT    ২. বাস    ৩. টেম্পু    ৪. সিএনজি    ৫. রিক্সাওভ্যান    ৬. অন্যান্য

২.৬ শিক্ষাপ্রতিষ্ঠানে যেতে সহজে রিজার্ভ করা যায় কোন যান বাহন?

১. NCMT    ২. বাস    ৩. টেম্পু    ৪. সিএনজি    ৫. রিক্সাওভ্যান    ৬. অন্যান্য

### **Cost Saving**

২.৪ তুলনামূলকভাবে ভাড়া কম লাগে কোন যান বাহনে

১. NCMT    ২. বাস    ৩. টেম্পু    ৪. সিএনজি    ৫. রিক্সাওভ্যান    ৬. অন্যান্য

২.৯- এ যানের কারনে শিক্ষা ব্যয় পরিবর্তন হয়েছে কি? ১. হ্যাঁ ২. ই

২.৯.১. যদি হ্যাঁ হয় তাহলে ১. বেগেছে ২. কমেছে ৩. অপরিবর্তিত

২.৯.১ (ক). যদি কমে তাহলে তা শতকরা কত কমেছে?-----%

### **Time Saving**

২.৫ শিক্ষাপ্রতিষ্ঠানে যেতে সময় কম লাগে কোন যান বাহনে?

১. NCMT      ২. বাস      ৩. টেম্পু      ৪. সিএনজি      ৫. রিক্সাওভ্যান      ৬. অন্যান্য

২.১১ নির্দিষ্ট দূরত্বে NCMT তে যেতে কত সময় কম লাগে?-----ঘন্টা

২.১২. NCMT বাদে অন্য যানবাহনে যেতে রাস্তায় অপেক্ষা করতে হয় কি? ১. হ্যাঁ ২. না ৩. মাঝে মাঝে

২.১২.১. যদি হ্যাঁ হয় তাহলে অপেক্ষার ধরণ কিরূপ ১. সবসময় ২. মাঝেমাঝে ৩. কমসময় অপেক্ষা করতে হয়

২.১৩. NCMT তে যেতে রাস্তায় অপেক্ষা করতে হয় কি? ১. হ্যাঁ ২. না

২.১৩.১. যদি হ্যাঁ হয় তাহলে অপেক্ষার ধরণ কিরূপ ১. সবসময় ২. মাঝেমাঝে ৩. কমসময় অপেক্ষা করতে হয়

২.১৪. NCMT তে যানবাহনে গেলে সময় সাশ্রয় হয় কি? ১. হ্যাঁ ২. না

২.১৪.১. হ্যাঁ হলে দৈনিক কত সময় সাশ্রয় হয়? -----ঘন্টা

২.১৫.- আপনি কি নিয়মিত শিক্ষাপ্রতিষ্ঠানে আসেন? ১. হ্যাঁ ২. না

২.১৬. এ যানবাহনের কারনে আপনার শিক্ষা ক্ষেত্রে সময় সাশ্রয় হয় কি? ১. হ্যাঁ ২. না

২.১৭. হলে সে সময় দিয়ে আপনার শিক্ষার ক্ষেত্রে কি উপকার হয়

২.৮ - শিক্ষা প্রতিষ্ঠানে যেতে এ যানের সুবিধা কিকি?

২.১৮ - অন্য আর কিভাবে শিক্ষার উন্নয়নে এ যান ব্যবহৃত হয়ে আসছে?

.. .. .

## **Appendix 16- Questionnaire for User (Student and Teacher)**

Research Questionnaire on  
An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the  
Development of Rural Bangladesh.

Assalamu Alaikum. This is Md. Nasir Uddin Gani, Ph. D. Fellow, Institute of Bangladesh Studies, Rajshahi University, doing a research titled "An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh. To conduct this study I need your earnest help. It is assured that the information provided will be used only for academic purpose and will be confidential.			
Name of the Respondent		Occupation	Student/teacher/education related person
Village		Upazilla:	District:

Please answer the following questions

Q 1.

Personal Information						
Age	Educational Qualifications	Distance between home and institution	Does any other of the family use the transport?	If yes, how many ?	Have you ever experienced any accident?	If yes, how many times?

Q 2.

### **Availability**

2.1- which transports do you use to go to the educational institution?|

1. NCMT   2. Bus   3. Tempo   4.CNG   5. Rickshaw and Van   6. Others

2.2 which transports are available always

1. NCMT   2. Bus   3. Tempo   4.CNG   5. Rickshaw and Van   6. Others

### **Accessibility**

2.3 Which transports are easily available just outside house?

1. NCMT   2. Bus   3. Tempo   4.CNG   5. Rickshaw and Van   6. Others

2.6 Which transport can easily be reserved to go to the educational institutions?

1. NCMT   2. Bus   3. Tempo   4.CNG   5. Rickshaw and Van   6. Others

### **Cost Saving**

2.4 which transports are comparatively cheap?

1. NCMT   2. Bus   3. Tempo   4.CNG   5. Rickshaw and Van   6. Others

2.9- Has there been any change in the cost due to using this transport? 1. Yes 2. No

2.9.1. If yes, 1. increased 2. decreased 3. unchanged

2.9.1 (K). If decreased, how much ?-----%

**Time Saving**

2.5 Which transports takes the least time to go to your educational institutions?

1. NCMT 2. Bus 3. Tempo 4.CNG 5. Rickshaw and Van 6. Others

2.11 How much time does NCMT save in specific distance?-----hrs.

2.12.Do you have to wait while using other transports other than NCMT? 1. Yes 2. No 3. Sometimes

2.12.1. if yes, how often? 1. Always 2. Sometimes 3. Wait less

2.13. do you have to wait while using NCMT? 1. Yes 2. No

2.13. if yes, how often? 1. Always 2. Sometimes 3. Wait less

2.14. does NCMT save time? 1. Yes 2. No

2.14.1. if yes how much ? -----hrs.

2.15.- Do you regularly go to the educational institutions ? 1. Yes 2. No

2.16. Can you save any academic time due to using NCMT? 1. Yes 2. No

2.17.If yes, how does this saved time contribute to your academic matters?

2.8 - What advantages does it provide in academic case?

2.18 - in which other ways does this transport contribute to your academic life?

.. .. .

## **Appendix 17- Questionnaire for User (Health Service Taker)**

Research Questionnaire on  
An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the  
Development of Rural Bangladesh.

আসসালামুআলাইকুম। আমি মোঃ নাসির উদ্দিন গনি, পিএইচ ডি গবেষক, ইনিস্টিটিউট অব বাংলাদেশ স্টাডিজ, রাজশাহী বিশ্ববিদ্যালয়, রাজশাহী। আমি “ An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Development of Rural Bangladesh.” শিরোনামে একটি গবেষণা করছি। এ গবেষণার জন্য তথ্য সংগ্রহের উদ্দেশ্যে আমি আপনার নিকট উপস্থিত হয়েছি। আপনার দেয়া তথ্য শুধুমাত্র আমার শিক্ষা বিষয়ক গবেষণার কাজে ব্যবহার করা হবে। এ বিষয়ে আমি আপনার সহযোগিতা কামনা করছি।

তথ্য দাতার নামঃ		পরিচিতিঃ	স্বাস্থ্যসেবা গ্রহন কারী
গ্রামঃ		উপজেলাঃ	জেলাঃ

দয়া করে নিচের প্রশ্ন গুলোর উত্তর দিন।

প্রশ্ন-১ঃ NCMT এর মাধ্যমে জনগনের স্বাস্থ্য সেবার সহায়তার উন্নয়ন

ব্যক্তিগত তথ্য								
বয়স	শিক্ষাগত যোগ্যতা	পরিবারের সদস্য সংখ্যা কত জন	আপনার এলাকায় স্বাস্থ্যসেবাদানকারী প্রতিষ্ঠান কি কি আছে	জরুরী অবস্থায় কোন যান ব্যবহার করেন		আপনার বাড়ি হতে হাসপাতাল কত দূর	হাসপাতালে যেতে কোন যান ব্যবহার করেন	
				CT	NCMT	-----কি.মি	CT	NCMT

### **Availability**

১.১. আপনার এলাকায় রোগী পরিবহনে সক্ষম এমন কি কি ধরনের যানবাহন রয়েছে?

১.বাস	২.টেক্সু	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অগ্যান্য
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১.২. হাসপাতালে আসতে কোন যানবাহন সবসময় পাওয়া যায়?

১.বাস	২.টেক্সু	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অগ্যান্য
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১.৩. কোন যানবাহন পেতে বেশী কষ্ট করতে হয় না?

১.বাস	২.টেক্সু	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অগ্যান্য
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১.৪. জরুরী রোগী পরিবহনে কোন যানবাহন সহজেই পাওয়া যায়?

১.বাস	২.টেক্সু	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অগ্যান্য
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### **Accessibility**

১.৫. আপনার বাড়ি হতে হাসপাতাল পর্যন্ত রোগী পরিবহনে সক্ষম কোন যানবাহন?

১.বাস	২.টেক্সু	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অগ্যান্য
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১.৬. গ্রামীন রাস্তায় রোগী পরিবহনে সক্ষম কোন যানবাহন বলে আপনি মনে করেন?

১.বাস	২.টেক্সু	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অগ্যান্য
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১.৭. স্বল্পদূরত্বে প্রাপ্য এমন যানবাহন কোনটি?

১.বাস	২.টেক্সু	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অগ্যান্য
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১.৮. হাসপাতাল হতে রোগী বাড়ি পর্যন্ত কোন যানবাহনে নিয়ে আসেন?

১.বাস	২.টেক্স	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অপ্যান্য
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### Time Saving

১.৯. রোগী পরিবহনে সময়ক্ষেপন কম হয় এমন যানবাহন কোনটি?

১.বাস	২.টেক্স	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অপ্যান্য
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১.১০. সময় মত পাওয়া যায় এমন যানবাহন কোনটি?

১.বাস	২.টেক্স	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অপ্যান্য
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১.১১. জরুরী প্রয়োজনে কোন যানবাহন পেতে বেশী দূরত্বে যেতে হয় না ?

১.বাস	২.টেক্স	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অপ্যান্য
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১.১২. জরুরী প্রয়োজনে কোন যানবাহন ডাকলেই পাওয়া যায়?

১.বাস	২.টেক্স	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অপ্যান্য
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### Cost Saving

১.১৩. কোন যানবাহনে হাসপাতালে যেতে খরচ কম হয়?

১.বাস	২.টেক্স	৩.সিএনজি	৪.NCMT	৫.রিক্সাও ভ্যান	৬.অপ্যান্য
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১.১৪. খরচ কম হলে কত টাকা খরচ কমে? -----টাকা

### Others

১.১৫. NCMT এর সুবিধা কি

১.১৬. এ যানের অসুবিধা কি?

১.১৭. এ যানের কারণে চিকিৎসা সেবায় কি সুবিধা হয়েছে ?

## **Appendix 18- Questionnaire for User (Health Service Taker)(English Version)**

Research Questionnaire on  
An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the  
Development of Rural Bangladesh.

Assalamu Alaikum. This is Md. Nasir Uddin Gani, Ph. D. Fellow, Institute of Bangladesh Studies, Rajshahi University, doing a research titled “An Economic Analysis of the Role of Non-Conventional Mechanized Transportation in the Economic Development of Rural Bangladesh. To conduct this study I need your earnest help. It is assured that the information provided will be used only for academic purpose and will be confidential.				
Name of the Respondent			Occupation	Health Service Taker
Village		Upazilla	District	

Please answer the following questions.

Q-1. Development of people health services through NCMT

Personal Information								
Age	Educational Qualifications	Number of Family member	Is there any health service provider institution in your village?	Which transport use in emergency time?		Distance between hospital and your home	Which transport use to go to hospital?	
				CT	NCMT	-----Kms	CT	NCMT

### **Availability**

1.18. Which vehicles able to transport patients are available in your village?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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1.2. Which vehicles are available to go to hospital?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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1.3 Which vehicles are less painful to reach

1.Bus	2.Temp	3.CNG	4.NCMT	5.Rickshaw/van	6.Othe
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1.4 Which transport is easy to reach in emergency patient transportation?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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### **Accessibility**

1.4 Which vehicles are able to transport patient from your residence to hospital?

1.Bus	2.Temp	3.CNG	4.NCMT	5.Rickshaw	6.Others
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1.5 Which vehicles are able to ply on rural road?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw	6.Others
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1.6 Which vehicles are available to reach in short distance?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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1.7 To carry the patient from hospital to resident which vehicle you use ?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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### **Time Saving**

1.8 Which vehicles are less time consuming to carry patient?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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1.9 Which vehicles are timely available?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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1.10 In emergency time which vehicles are available within shorter distance?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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1.11 In emergency time which vehicle woner or driver is available in the village?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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### **Cost Saving**

1.12 Which vehicles is less expensive to rent to go to hospital?

1.Bus	2.Tempu	3.CNG	4.NCMT	5.Rickshaw/van	6.Others
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1.13 If less, how much? -----Tk.

### **Others**

1.14. What are the advantages of NCMT

1.15 What are the disadvantages of NCMT

1.16 In case of health service providing, how the NCMT playing a role in the villages?

**Appendix 19 - Photograph of Framed Body type NCMT**



**Appendix 20 - Photograph of Plain Body type NCMT**



**Appendix 21 - Photograph of Steering type NCMT**



## **Appendix 22 - Photograph of Different Usage of NCMT**



Transporting Poultry



Transporting Cattle



Transporting Cattle



Transporting Cattle

## **Appendix 23 - Photograph of Different Usage of NCMT**



Transporting Vegetable



Transporting Onion



Transporting Cabbage



Transporting Fish

## **Appendix 24 - Photograph of Different Usage of NCMT**



Transporting Straw



Transporting Fuel made by cow-dung



Transporting Jute



Transporting Sugarcane

## **Appendix 25 - Photograph of Different Usage of NCMT**



Transporting Fertilizer



Transporting Paddy Plant



Transporting Passenger



Transporting Water Tank

## **Appendix 26- Photograph of Different Usage of NCMT**



Transporting Election Materials



Transporting Police



Transporting Village Security Force



Transporting Sanitary Materials

## **Appendix 27- Photograph of Different Usage of NCMT**



**Transporting Patient**



**Transporting Brick**



**Transporting Construction Materials**



**Transporting Whole-sale Materials**