



ASSESSMENT ON MIRSHARAI UPAZILA DEVELOPMENT PLAN (MUDP)

-Population Projection, Critical review of Laws
& Regulations, Standard Set-up

Submitted To

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Abstract:

This report contains the population projection of Mirshari Upazilla in linear method and cohort method. This report shows the difference of population number by cohort projection method and linear projection method.

It also contains the review of Mirsharai Paurashava and Baroiarhat Paurashava master plan and some related national and sectoral policies, which helps to capture the key policy points of these two Paurashava.

It also includes formulation of planning standard for Mirsharai and Baroiarhat Paurashava, population projection and analysis of various planning standard of Bangladesh has done in this work.

Acknowledgement:

The submission of this report on “Mirsharai Upazila” is a very happy occasion to us.

At first, all praise belongs to almighty Allah, the most merciful, benevolent to man and his action.

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Contents

Abstract:	i
Acknowledgement:	ii
Chapter 1	1
1.1 Introduction:	1
1.2 Background of the study:	1
1.3 Objective:	2
1.4 Study Area:	2
1.5 Limitation:	2
Chapter 2	3
2.1 Methodology	3
2.1.1 Conceptualization	3
2.1.2 Literature Review	3
2.1.3 Formation of Objectives	3
2.1.4 Site Selection	3
2.1.5 Study Area Selection	3
2.1.6 Data Collection	3
2.1.7 Map Collection	4
2.1.8 Findings & Final Report	4
Chapter 3	6
3.1 Literature review:	6
Chapter 4	8
4.1 Population Projection for Mirsharai Upazila	8

4.1.1 Linear Method:	8
4.1.2 Cohort Method:	8
4.2 Population Projection of Mirsharai Upazila:	8
4.2.1 Linear Method formula: ^[7]	8
4.2.2 Population Projection by different growth rate: (Mirsharai Upazila).....	10
4.2.3 Cohort component method:.....	11
4.2.3.1 Population projection of Mirsharai Upazila:.....	12
4.3 Comparison between linear and cohort component method projected population:	15
4.4 Comparison between linear projection and cohort component method:.....	15
4.4.1 Limitation of cohort component projection method:	16
4.4.2 Limitation of linear method:	16
4.5 Conclusion:	16
Chapter 5.....	17
5.1 Review of Previous Plans	17
5.1.1 Final Landuse Plan, Mirsarai Upazila Shahar (1986):.....	17
5.1.2 Assessment:	20
5.1.3 Master Plan of Mirsharai Paurashava (2011-2031).....	21
5.1.4 Master Plan of Baroiarhat Paurashava (2011-2031)	22
5.1.5 Assessment:	23
5.1.6 Comparative Analysis:	24
5.2 Policies Related to Land Use Plan.....	25
5.2.1 National Urbanization Policy:.....	25
5.2.2 Bangladesh Population Policy (2012).....	26
5.2.3 National Agriculture Policy (2013):	26

5.2.4 National Tourism Policy (1992):.....	27
5.2.5 The National Industry Policy (2016):.....	27
5.2.6 Bangladesh Economic Zone Act (2010)	28
5.2.7 National Housing Policy (2016).....	28
5.2.8 Water Act (2013):	29
5.2.9 National Forest Policy (1979):	30
5.2.10 Natural Wetland Preservation Act, (2000)	31
5.3 Flow Chart of Sector Wise Policies and Their Inter Connectivity	31
Chapter 6.....	33
6.1 Comparative Planning Standard for community facilities.....	33
6.2 Assessment of Population & Area for Finding Relation with Paurashava Level Planning Standard:	48
6.3 Population projection with linear method:.....	48
6.4 Number of Existing facilities	51
6.5 FACILITY NEEDED ACCORDING TO PAURASHAVA ACT, 2009.....	57
6.6 FINALYSED PLANNING STANDARD	57
6.7 Walking distance analysis	63
6.8 Demand analysis	64
Chapter 7.....	69
7.1 Conclusion:	69
Reference:	70
Appendix:	71

Chapter 1

1.1 Introduction:

Bangladesh is an over populated country. Day-by-day the number of population is increased. So, when a planning is started for an area, it is mandatory to predict the future population and the growth rate for knowing the future population planners use various method of projection. However, population projection will help to predict the future population. However, it will not help to know the accurate number of population future. On the other hand, to implement any master plan various policies are used. Policy mainly reviewed for showing its implementation on the space or land use. Key sector is also focused when the policy is reviewed. Moreover, planning standard is also reviewed and made to fulfil the need for the people who plays the main role in many master plans.

1.2 Background of the study:

Population projection, planning policy review and planning standard is important to develop an area master plan. Population projection deals with computations of future projection size and characteristics based on assumptions about future trends in fertility, mortality and migration. Town Planning requires a fair idea of future for which planning needs to be done. For this purpose, planners use various methods and tools for “predicting” the future which generally involves population data and population projection as people are the ones who need to be kept in mind and they are the ones for whom planning is done. It forms a framework for a great deal of the subsequent work in devising, testing, evaluating and implementing the plan. Most of the important decisions about major land uses and services are derived from population estimates: the demand for water, power and waste disposal facilities; housing, open spaces and schools; the supply of labour; spending power available for the retail trade, the numbers of private cars to be, etc.

One must realize that a review of planning policy is great sophistication will eventually be used to derive land areas by the application of a standard and that the accuracy or relevance of the standard may be far more important. The evolution and adoptability of planning standards observed influenced by changes in socio-economic and investment aspirations in urban settlements. These standards, also seems to be influencing upgrading of infrastructure facility and utility in view of design, supply,

demand and management in informal settlements. Also, one should recall that the cyclical nature of planning, involving regular reviews, gives the opportunity to revise and improve the master plan as part and parcel of that process. These will be helped to improve the master plan of Mirsharai Upazila.

1.3 Objective:

1. To project the population of Mirsharai Upazila.
2. To review critically Master plan of (2011-2031) and Related laws of Mirsharai and Baroiarhat Paurashava.
3. To fix planning standard of community facilities for Paurashava.

1.4 Study Area:

Mirsharai is an Upazila of Chittagong District. This Upazila contains 16 unions and 2 paurashava. Its area is 482.88 sq.km. Baroiarhat is a Paurashava of Mirsharai Upazila.

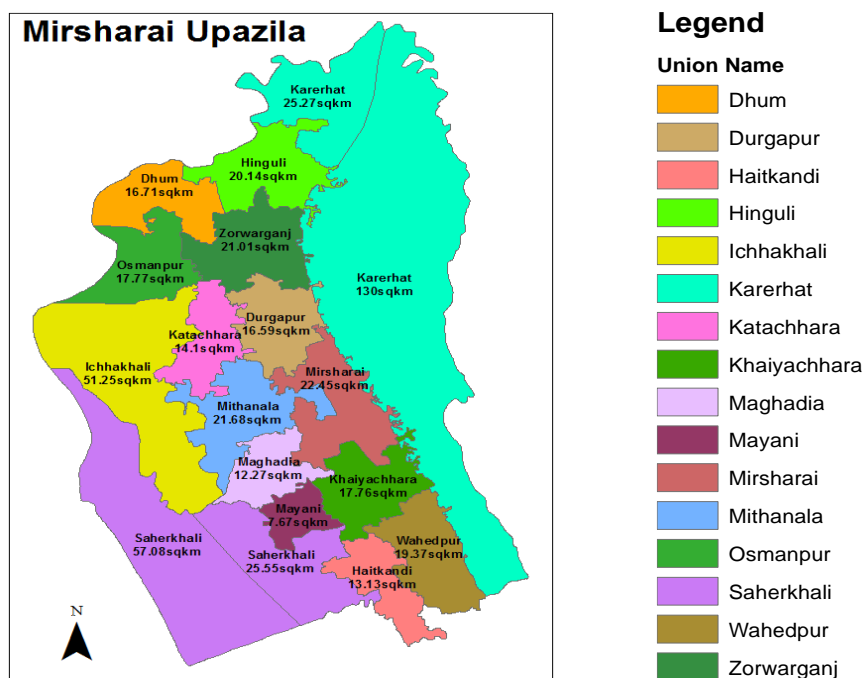


Fig 01: Study area map (Mirsharai Upazilla)

Source: UDD, 2017

1.5 Limitation:

- Time was not enough.
- Resources were not sufficient.
- Lacking of sufficient data.

Chapter 2

2.1 Methodology

There is the methodology of preparing this report. The concept of this study, review of literature, objectives, site selection, data collection process and data analysis process are shown. These are being described below:

2.1.1 Conceptualization

Conceptualization means to be illuminated about an idea or matter that is inventing or contriving for explanation. It encompasses the tasks of developing master plan.

2.1.2 Literature Review

There were several useful books, policies and master plan on development planning. There were also many other important sources containing valuable information and recommendation related to our study.

2.1.3 Formation of Objectives

One of the important tasks of a field study is the formation of the objectives on the basis of the aims of the study.

2.1.4 Site Selection

The site selection is also an important part of a study. In every case, it is seen that the perfectness and the suitability of a study depends upon the site selection.

2.1.5 Study Area Selection

In times of selecting a site for field study the following topics are important

- Location and distance of the area
- Size of the area
- Importance of the area
- Scope of the study in the area

Our study area, Kathalbagan has a very easy access.

2.1.6 Data Collection

We had Secondary data.

Secondary Data

The necessary information about the study as the secondary data are collected from the BBS, related journal, thesis etc.

2.1.7 Map Collection

Maps are very essential part to make a good or suitable report. Maps of a report can help a person to get an idea about the study area. So, for the greater context, we had tried to include map in our report.

2.1.8 Findings & Final Report

Through our study we had tried to find out number of future population by linear method and cohort component method. By these two different methods we find out that the number of population in cohort method is larger than the number of population in cohort method.

By reviewing policies, we have tried to find out the implementation of planning standard and use of land or spaces in a master plan.

Flow chart of Methodology of this study at a glance is shown in the following figure:

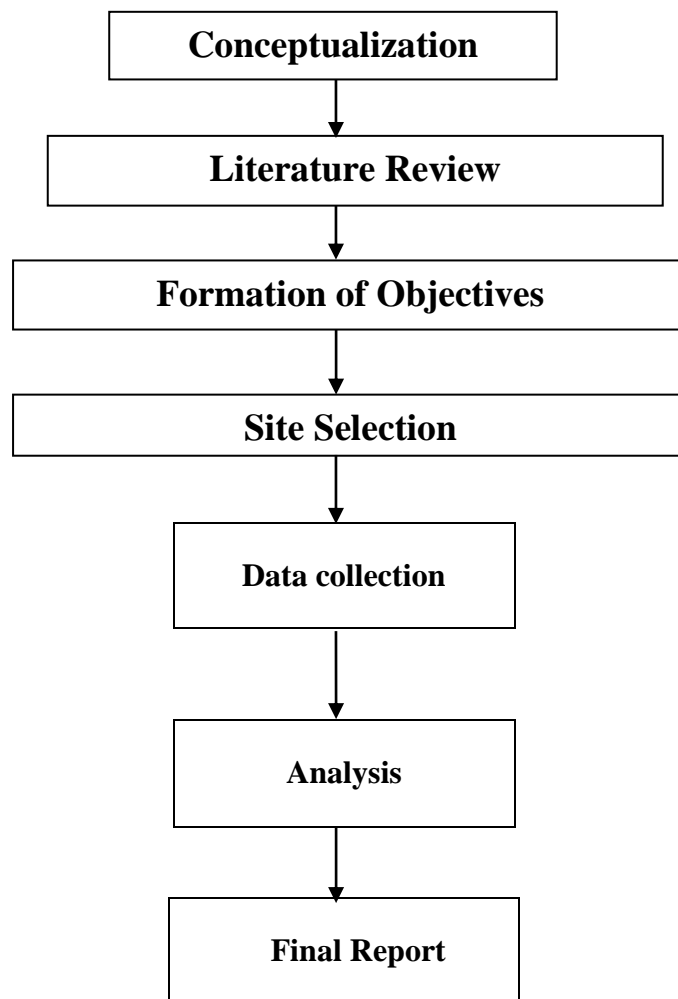


Fig 01: Flow chart of Methodology

Chapter 3

3.1 Literature review:

This literature review is based on studies related to master plan. Many books, policies, acts, master plan, BBS have been studied to have an unclouded idea about the current study. These literatures will be reviewed in this chapter.

BBS: Collection of age specific number of Mirshari Upazila population of 1991, 2001, 2011. Number of school going population.

Measure Evaluation: Gather information about linear method and cohort method for population projection.

SVRS Report 2016: Collect death rate of year 2016.

National Urbanization Policy: The vision of the law is developing cities and towns through decentralized and effective local government, by identifying positive aspects of urbanization, strengthening them and tackling negative aspects in a planned way, achieving increasing economic growth through planned urbanization, with the participation of local citizens, including local bodies, civil society and backward communities.

Bangladesh Population Policy 2012: The policy aims to manage and develop Bangladesh population in a planned manner for a healthy, happy, prosperous Bangladesh.

National Agriculture Policy (2013): The aims of National Agriculture Policy include ensure sustainable and profitable agricultural production, converting and continuing competitive agriculture through commercialization, creating opportunities for setting up agricultural products and setting new industries based on agriculture etc.

National Tourism Policy (1992): The objectives of the national tourism policy (1992) include extending the foreign exchange earnings by attracting foreign tourists, unveiling an accredited investment field for private capital, take steps for poverty alleviation through the employment of people, the development of the cottage industry and the enrichment and development of the country's culture and heritage.

The National Industry Policy (2016): The objectives of the national industry policy 2016 include ensuring industrial growth through combined effort of Government and Public sector and ensuring income generating job opportunities through Industrialization and to take part in inclusive growth.

Bangladesh Economic Zone Act (2010): The objectives of this policy include economic zone establishment in backward or potential areas thus encouraging fast economic development, industrialization, employment etc.

National Housing Policy (2016): The target of this policy is to provide housing for all sectors of people in a way which is sustainable and it gives directions regarding Political, economic, social, environmental, technical aspect of housing.

Water Act (2013): The act was constructed to make provisions for integrated development, management, abstraction, distribution, use, protection and conservation of water resources.

National Forest Policy 1979: The Government adopted The National Forest Policy recognizing that the development, maintenance and conservation of forests should be adopted in the interest of economic development and preservation of ecological balance in the country.

Wetland Preservation Act, (2000): Without the consent of this act the area which is designated as playground, open space, park and natural wetland, their classification cannot be changed or those cannot be used or cannot be handed over for rental, lease or in any other use purposes. If trees of a park are cut in such a way that it changes the basic characteristics of the park, it would be counted as class change of the park.

Chapter 4

4.1 Population Projection for Mirsharai Upazila

4.1.1 Linear Method:

The linear method assumes that population growth is growing at absolute equal increments per year, decade, or other unit of time. It also assumes that growth will follow a similar pattern in future years.

4.1.2 Cohort Method:

The cohort component population projection method follows the process of demographic change and is viewed as a more reliable projection than those that primarily rely on census data or information that reflects population changes. It also provides the type of information that needed to plan for services to meet the future demands of different segments of the population.

4.2 Population Projection of Mirsharai Upazila:

4.2.1 Linear Method formula: [7]

$$P_{t+n} = P_t(1+r)^n$$

Here,

P_{t+n} = Projected population

P_t = Current year population

r = growth rate

n = year interval

The formula of growth rate “ r ” is

$$r = \sqrt[n]{\frac{P_{t+n}}{P_t}} - 1,$$

Here,

P_{t+n} = Current year population.

P_t = Last year population.

n = Time interval

Growth rate of 2011:

Here,

$$P_{1991}=325712 \text{ [1]}$$

$$P_{2011}=398716 \text{ [1]}$$

$$\begin{aligned}
\text{Growth Rate } r &= \sqrt[n]{\frac{P_{t+n}}{P_t}} - 1 \\
&= \sqrt[20]{\frac{P_{2011}}{P_{1991}}} - 1 \\
&= \sqrt[20]{\frac{398716}{325712}} - 1 \\
&= 0.01
\end{aligned}$$

Population Projection of 2016:

$$\begin{aligned}
\text{Projected population of 2016} &= P_{t+n}(1+r)^n \\
&= 398716(1+0.01)^5 \\
&= 419054
\end{aligned}$$

Population Projection of 2021:

$$\begin{aligned}
\text{Projected population of 2021} &= P_{t+n}(1+r)^n \\
&= 419054(1+0.01)^5 \\
&= 440429
\end{aligned}$$

Population Projection of 2026:

$$\begin{aligned}
\text{Projected population of 2026} &= P_{t+n}(1+r)^n \\
&= 440429(1+0.01)^5 \\
&= 462895
\end{aligned}$$

Population Projection of 2031:

$$\begin{aligned}
\text{Projected Population 2031} &= P_{t+n}(1+r)^n \\
&= 462895 (1+.01)^5
\end{aligned}$$

$$= 486507$$

Population Projection of 2036:

$$\begin{aligned} \text{Projected Population 2036} &= P_{t+n}(1+r)^n \\ &= 486507 (1+.01)^5 \\ &= 511323 \end{aligned}$$

Population Projection of 2041:

$$\begin{aligned} \text{Projected Population 2041} &= P_{t+n}(1+r)^n \\ &= 511323 (1+.01)^5 \\ &= 537405 \end{aligned}$$

There is used High Growth Rate for population projection.

4.2.2 Population Projection by different growth rate: (Mirsharai Upazila)

Year	High 1991-2011 Population: (325712- 398716) Growth rate: .01	Medium 2001-2011 Population: (368950- 398716) Growth rate: .007	Low Assumed growth rate; base year 2011 Growth rate .005
2016	419054	412867	408784
2021	440429	427521	419106
2026	462895	442695	429688
2031	486507	458687	440538
2036	511323	474967	451662
2041	537405	491825	463067

Table 01: Population Projection by different growth rate (High, Medium, and Low).

(Source: Population of 1991, 2001 and 2011 from census)

- In High growth rate 20 years interval is used.
- In Medium growth rate 10 years interval is used.
- In Low growth rate it is assumed from Medium growth rate.

4.2.3 Cohort component method:

Cohort Component Summary Equation:

$$P_{t+n} = \text{Survived population} + \text{Births} + \text{Net migrants}^{[5]}$$

Here,

Survived population = The number of persons alive at the beginning of the age interval.

Birth = Number of births taking place during the projection interval.

Net migrants = Movement of people across political boundaries that are semi-permanent or permanent in nature.

Residual method of migration:

$$\text{Net migrants} = (\text{Population}_{t+n} - \text{Population}_t) - (\text{Births} - \text{Deaths})^{[5]}$$

Population_{t+n} = Current population

Population_t = Last census

4.2.3.1 Population projection of Mirsharai Upazila:

Age group	L_x (Population Mirsharai upazila, year 2011) ^[1]	$n d_x$ (Number of death of Chittagong District, year 2016) ^[8]	$L_x = l_x - n d_x$ (Existing population) ^[6]	Survived population $= L_x * \text{survival rate}$ ^[6]
0-4	40391	250	40141	40141
5-9	47617	50	47567	47567
10-14	48789	50	48739	48739
15-19	42898	30	42868	42868
20-24	37402	70	37332	37332
25-29	33436	100	33336	33336
30-34	25549	150	25399	25399
35-39	23471	200	23271	23271
40-44	21223	250	20973	20973
45-49	16806	300	16506	16506
50-54	15575	440	15135	15135
55-59	10335	510	9825	9825
60-64	12470	750	11720	11720
65-69	6606	830	5776	5776
70	7376	900	6476	6476
Total	389944	4900	385064	385064

Table: 02: Abridged Life Table For Both Sexes Combined.

(Source: Census 2011, SVRS 2016)

I_x : The number of persons alive at the beginning of the age interval

L_x : The total number of person-years in the stationary population for each age interval. It can be viewed as the average population size between birthdays, taking into account the distribution of deaths throughout the year.

${}_n d_x$: The number of persons dying during the age interval.

Age specific number of birth, death and migration is constant for each year population projection.

Formula:

$$\text{Survival Rate} = \frac{5L_x + 5}{5I_x}$$

$$= \frac{(5 \cdot 385064) + 5}{5 \cdot 385064}$$

$$= 1.00$$

Net Migrants = (Population $t+n$ - Population t) - (Births - Deaths)

$$= (398716_{2011} - 368950_{2001}) - (13830 - 32600)$$

$$= 48536$$

N.B. 13830 is total number of birth from year 2011(census) - 2016(SVRS) and 32600 is the total number of death from year 2011(SVRS) - 2016(SVRS). Birth and death number of the year 2012-2015 is assumed.

Projected population of 2016:

$$\text{Population}_{2016} = \text{Survived population} + \text{Births} + \text{Net migrants}$$

$$= 385064 + 13830 + 48536$$

$$= 447430$$

Projected population of 2021:

$$\text{Population}_{2021} = \text{Survived population} + \text{Births} + \text{Net migrants}$$

$$= 447430 + 13830 \text{ (constant)} + 48536 \text{ (constant)}$$

$$= 509796$$

Projected population of 2026:

$$\begin{aligned} \text{Population}_{2026} &= \text{Survived population} + \text{Births} + \text{Net migrants} \\ &= 509796 + 13830 + 48536 \\ &= 572162 \end{aligned}$$

Projected population of 2031:

$$\begin{aligned} \text{Population}_{2031} &= \text{Survived population} + \text{Births} + \text{Net migrants} \\ &= 572162 + 13830 + 48536 \\ &= 634528 \end{aligned}$$

Projected population of 2036:

$$\begin{aligned} \text{Population}_{2036} &= \text{Survived population} + \text{Births} + \text{Net migrants} \\ &= 634528 + 13830 + 48536 \\ &= 696894 \end{aligned}$$

Projected population of 2041:

$$\begin{aligned} \text{Population}_{2041} &= \text{Survived population} + \text{Births} + \text{Net migrants} \\ &= 696894 + 13830 + 48536 \\ &= 759260 \end{aligned}$$

4.1 Process of cohort component method that used for the calculation:

- Age specific population is collected from census 2011 of Mirsharai Upazila and age specific number of death collected from Census of 2011 of Chittagong district.
- Survived population (L_x) calculated by subtracting $n d_x$ from l_x .
- Survival rate is calculated by this formula $= \frac{5L_x + 5}{5L_x}$, survived population calculated by

this formula = (L_x * survival rate), net migrants calculated by this formula =

(population $t+n$ – population t) - (Births - Deaths), projected population calculated by this formula = Survived population + Births + Net migrants.

4.3 Comparison between linear and cohort component method projected population:

Year	Projected Population in Linear Method	Projected Population in Cohort Method
2016	419054	447430
2021	440429	509796
2026	462895	572162
2031	486507	634528
2036	511323	696894
2041	537405	759260

Table 03: Comparison between linear and cohort method projected population.

4.4 Comparison between linear projection and cohort component method:

- Cohort component method is used as a projection tool, it assumes the components of demographic change, mortality, fertility, and migration, **will remain constant throughout the projection period** (Source: "Lesson 8: The Cohort Component Population Projection Method"). On the other hand in linear projection method only population and growth rate is used as a component.
- In case of projection result, the number of population of cohort component method is bigger than the number of population in linear projection method. As an example, the projected population of 2031 is 447264 in linear method and 634508 in cohort component method.
- As migrations, births, deaths are used in cohort component method so the projected population number is more accurate than linear projection method. Because in linear projection method only population and growth rate is used for projection.
- Cohort calculation is difficult than linear projection method.

4.4.1 Limitation of cohort component projection method:

- First, it is highly dependent on reliable birth, death and migration data. Thus, it may be difficult to collect the information to apply this tool.
- Second, it assumes that survival and birth rates and estimates of net migration will remain the same throughout the projection period.
- Third, it does not consider the non-demographic factors that influence population growth or decline.

4.4.2 Limitation of linear method:

- In 10 year linear projection first ten year population projection is approximately correct, but next ten year population is comparatively less than before.
- Because only growth rate is taken for projection, the value is not accurate.

Limitation:

- Do not have age specific data of birth, death, migration number from 1998-2015.
- Do not have each year mortality rate of Mirsharai.
- Age specific fertility rate also is not available of Mirsharai.
- Projection of male population of Mirsharai is not possible for the lacking of gender specific fertility and mortality rate.
- Birth and death number from 2012-2015 is assumed because lacking of data.

4.5 Conclusion:

Cohort component method used in this projection because the number of population in this case is more accurate than linear projection method. When making a 10-year projection, it is best to perform two separate projections: a projection for the first 5 years and then a projection for the next 5 years. The result of the first projection is used to perform the second round of the projection. In linear projection method, it is not possible to establish separate projection but is possible in cohort component method. So cohort component method is selected to make accurate projection of future population.

Chapter 5

5.1 Review of Previous Plans

5.1.1 Final Landuse Plan, Mirsarai Upazila Shahar (1986):

Summary: The Government of People's Republic of Bangladesh's decision to imply administrative functions and development features at the Upazilla level of the country. The - could serve the purpose. Therefore, government has established a considerable number of agencies and authorities at upazila centre.

Because of the increased number of agencies and authorities present at the upazilla centre, the landuse change took place, as well as population growth at the centre and in the immediate vicinity. This demanded social infrastructure development together with housing.

The upazila centre became a township where planned management of land, location of services, transportation network was needed. The planning had to serve policy for decentralization of administration and management of spatial consequences at upazila level. This landuse plan came through because of these reasons.

The plan was based on two plans: Land Use Plan and Detailed Design of Central Urban (Shahar) Area

The planning technique were generally the usual physical planning approaches.

The major aspects of upazila planning assignment were

- Study of Hierarchy of settlements
- Preparation of Plans
 - Land Use Plan
 - Civic Area Design

The planning process in Bangladesh was to consider both projection of population and estimate the redistribution of population, so a rational view of the hierarchy of human settlements was done for this plan.

3 types of survey were done for this plan: Reconnaissance survey, Identification of study area, Landuse survey.

Landuse and changing character of township in case of landuse survey and human settlements number and their distribution in the case of study of hierarchy of settlements were done.

Population projection (High, Medium and Low) of study area, catchment area and upazila was done as well as projection of economic development activities under public and private sector for 5 years plan and prospective plan was made.

Detailed Land Use Sections:

- Residential
- Administrative/ Other Offices
- Health
- Education
 - Primary
 - Secondary
 - College and others

- Recreational
- Commercial
- Industrial
- Roads, Access
- Urban Services
- Others: (Mosque, Graveyard, Cemetery etc.)

Priority Concern

The land use plan was thought out of the concentrations of growth points within the zila region. The sectoral development priorities were:

- ✓ Drainage channels within the upazila shahar are to maintained and such activities are to be given priority
- ✓ Investments for the Upazila Shahar should be made in such a way that achievements would generate associated development
- ✓ Basic developments have been proposed in terms of commercial developments and small-scale industries utilising resources of the upazila.
- ✓ The low laying areas within the Shahar areas are to be developed in such a way that there is a tradeoff between costs of development and income in the long run.

The plan was to be implemented in some phases at the interval of 5 year from 1985 to 2000, which relates to the national 5-year development plan.

5.1.2 Assessment:

- **Absent of systematic planning:** The final land use plan was developed through study of hierarchy of settlement and land use plan and civic area design. The process of following hierarchical planning system like Structure plan > Urban Area Plan > Ward Action Plan is absent.
- **Less detailing:** The level of detailing in this plan is lower than detailed area plans at present time.
- **Less classified land use:** The given classification of the land use in the plan is less than there is present, creating a gap in actual land use.
- **Use of traditional physical planning:** The plan follows traditional physical planning approach. The present approach is to follow inclusive planning process with a favour to public participation.
- **Emphasized on small or a partial area:** The plan is designed in a way that the upazila sahar is the focal point for development with a catchment area of 2.5-3 miles with required adjustments.
- **Lack of assessment:** The survey for this plan only includes reconnaissance survey, identification of study area and land use survey. This reduces the assessment quantity and quality of the Plan. More studies could increase the detailing of the plan.
- **No control measures of future growth of industry:** The priority actions of this plan are basic development based on commercial basis and small-scale industries. The plan does not show any indication of control measures for future growth of industries within the upazila.
- **Lack of public opinion:** The plan is based on data derived from reconnaissance survey, identification of study area and land use survey. The surveys are not reflective of the public opinion of the development plan. So, it cannot be said that this plan extensively mirrors the public opinion.
- **No introduction of grid-iron plan:** The urban structure proposed in this plan is to be grid-iron based. There is no explanation on why this structure was proposed and the impact of this urban structure design on future growth is not calculated.

- **Gap in projected population & real population in 2001:** Population projection system for this plan is linear. Migration is estimated for this plan. This leaves place for inaccuracy in planning, creating complication for future development.

Census: 22,986

Projected: low- 15,798 medium-26,418

- **Nonspecific Jurisdiction Area:**The jurisdiction area of this plan is based on catchment areas and attraction point. A capable local government organization like Paurasava was not formed at the time of preparation of the plan. This prevented the plan to be more precise on jurisdiction and development control.
- **Basis of plan:**The plan is a guideline for future development, not an instrument.

5.1.3 Master Plan of Mirsharai Paurashava (2011-2031)

Summary:The Ministry of Local Government, Rural Development & Cooperatives prepared the Master Plan of Mirsharai Paurashava (2011-2031) under the project named Upazila Town Infrastructure Development Project.

Master Plan of Mirsharai Paurashava (2011-2031) aimed to locate upazila headquarters, to promote infrastructural facilities. The main purpose of this master plan was to prepare land use plan. It is a ‘B’ category paurashava.

This master plan systematically was divided on three stages:

- Structure Plan (20 years)
- Urban Area Plan (10 years)
 - Land Use Plan
 - Transportation and Traffic Management Plan
 - Drainage and Environment Management Plan
 - Plan for Urban Services
- Ward Action Plan (5 years)

Before making the master plan some of the important assessments had been done with the help of some criteria. Those are:

- Future Growth
 - Population

- Economic opportunities
- Land Uses (Demand Analysis)
- Housing demand

Some other basic strategic options that influenced future growth like Social, Economic, Environmental, Physical infrastructural development, urban services etc.

Structural plan aimed to develop overall paurashava considering major sectors. It preferred to conserve and protect productive agricultural land, low land, ponds, drainage paths, hilly areas

Urban Area Plan insisted on land use plan along with agriculture land, water body, and urban residential zone. Transportation and traffic management plan consisted of the plan proposal of road circulation of 9.46% lands with the basis of traffic volume projection up to 2031. Preserving natural channel and streams, landfill system for solid waste management and a planned drainage network were emphasized in this proposal on Drainage and Environment Management plan

Ward Action Plan consisted of the proposal of ensuring services to citizen within (1-2) km range; develop neighbourhood market, schools, colleges, small scale industry, super market etc.

5.1.4 Master Plan of Baroiarhat Paurashava (2011-2031)

Despite some numerical dissimilarity, Master Plan of Baroiarhat Paurashava (2011-2031) had very much similarity with the master plan of Mirsharai paurashava in the planning procedure, pre-assessment system, planning laws & regulations etc. It emphasized on rural settlement zone in Land Use Plan where as in Mirsharai Paurashava's Land Use plan emphasized on urban residential zone. In ward action plan, community facilities and services were considered and an agro-based industry was proposed in the Baroiarhat Paurashava master plan.

5.1.5 Assessment:

- **Unclear priority selection process:**When development plan is being selected, the priority basis for development of that plan is not mentioned properly.
- **Don't mention monitoring system:**Monitoring system of on-going development project is not mentioned in the master plan.
- **Depend on linear projected population:** Linear population projection is done for developing the plan, and the plan is based on projected population. Other influence didn't assess.
- **Don't mention migration concept:**Migration technique is not considered in the process of population projection for the development of the master plan, which creates gap in development plan.
- **Don't introduce site development scheme:** as per Paurashava Ordinance Act, 2009, the plan hasn't introduced site development scheme.
- **Environmental assessment:** adverse impact on environment in future will not assess. IEE could be done.
- **Effect of extension:** agricultural land has been reduced in proposed plan. There is no geographical analysis for proposed extension & reduction of agricultural land.
- **Up to bottom approach:** not follow bottom to up approach.
- **Lack of following policy:** no provision of welfare services for elder & poor, no historical survey.

5.1.6 Comparative Analysis:

1. Jurisdiction area: The final land use plan of 1986 was focused on the upazila shahar and its surrounding catchment area of about 2.5-3 miles. Paurasvas were not established at that time.

The Master Plans of Mirsharai Paurashava and Baroiarhat Paurasava is focused on the paurasva areas and the wards under the paurasava.

2. Goal: The Final Land Use Plan of 1986 was Prepared as The Government of Bangladesh wanted to reach the rural people by implying administration and development functions at the upazila level. The plan was formed to facilitate multiple agencies, authorities and organizations at the upazila with a planned structural development.

The Master Plans of Mirsharai Paurashava and Baroiarhat Paurasava are prepared for the improvement of current land use in the paurasavas with a view to facilitate and manage future expansion of the Paurasava land use.

3. Basis: The Final Landuse Plan (1986) of Mirsarai Upazila Shahar was based on Study of Hierarchy of settlements and Preparation of Plans(Land Use Plan and Civic Area Design). This plan followed traditional planning techniques. This approach greatly reduced its ability to connect the people to the planning.

The Master plans of Mirsharai Paurashava and Baroiarhat Paurasava have a better & systematical planning approach.

4. Planning process: The Final Landuse Plan (1986) of Mirsarai Upazila Shahar was solely a land use plan for the Upazila shahar. The planning process was relatively simpler from the current Master Plans of Mirsharai Paurashava and Baroiarhat Paurasava which have structured process like Structure Plan, Urban Area Plan and Ward Action Plan.

5. Migration concept: The Final Land Use Plan (1986) of Mirsarai Upazila contained migration data for the upazila. Though the data was speculated.

The Master plans of Mirsharai Paurashava and Baroiarhat Paurasava do not have that data.

6. Assessment: The Final Land Use Plan (1986) of Mirsarai Upazila assessed Study of Hierarchy of settlements, Land Use Plan Civic Area Design.

In the Master plans of Mirsharai Paurashava and Baroiarhat Paurasavaland use, physical feature, topographic, transport, drainage, environmental, socio-economic survey is included.

7. Projection: The Final Land Use Plan (1986) of Mirsarai Upazila projected the population in the sphere of influence, residence population of upazila shahar, migrant labor force, and design population for housing.

In the Master plans of Mirsharai Paurashava and Baroiarhat Paurasava Population projection, demand analysis and housing demand is done.

8. People's participation: The Final Land Use Plan (1986) of Mirsarai Upazila did not include public participation in the planning.

The Master Plans of Mirsharai Paurashava and Baroiarhat Paurasava is done in top to bottom approach.

5.2 Policies Related to Land Use Plan

5.2.1 National Urbanization Policy:

The vision of the law is developing cities and towns through decentralized and effective local government, by identifying positive aspects of urbanization, strengthening them and tackling negative aspects in a planned way, achieving increasing economic growth through planned urbanization, with the participation of local citizens, including local bodies, civil society and backward communities.

Both Mirsharai and Baroiarhat Paurasavas are Semi Urban areas with agriculture being a big part of their economy. The migration of both Paurasavas are high. The development plan for the areas should follow the given guidelines from the policy:

- Preventing migration through coordinated planning and balanced urbanization and maintaining migration properly.

- High density neighborhoods have to be built in a planned manner by ensuring mixed and optimum utilization of land such as office and commercial area with residential area.
- To ensure the access of all the level income people including women, children, disabled people in all facilities and infrastructure
- Involve parks, rivers, canals, shelters, local wetlands, etc. in community planning.
- Conservation of sensitive / risky land resources by minimizing threatening activities for environmentally sensitive areas.
- Safe management of potentially disaster-prone areas through environmental management practices in urban areas.

5.2.2 Bangladesh Population Policy (2012)

The policy aims to manage and develop Bangladesh population in a planned manner for a healthy, happy, prosperous Bangladesh.

In case of Barrihat municipality population, 58.86% of the population is males and 41.14% are females. It is also seen that the maximum number of population is in the age of 26-57 years.

In Mirsarai Municipality, 53.3% of the population and 46.7% of females are women. More in the municipality 36.50% of households surveyed are between 26 and 57 years old.

The development plan for the areas should follow the given guidelines from the policy:

- Providing equal opportunities in health care, nutrition and job opportunities for men and women.
- In working areas of urban and rural areas development of day care centers and other child care facilities.
- To demoralize the development of housing and industries in agricultural lands.
- To decrease the imbalance between citizen advantages in rural and urban areas thus reducing current urbanization trend.
- To fix strategy considering population and environment in terms of social security.

5.2.3 National Agriculture Policy (2013):

The aims of National Agriculture Policy include ensure sustainable and profitable agricultural production, converting and continuing competitive agriculture through commercialization, creating opportunities for setting up agricultural products and setting new industries based on agriculture etc.

Landowners and agricultural laborers in the Barairhat paurasava is 31.9% of total occupation. In case of Mirsharai agriculture is the main source of income of 21.8% in Mirsarai Municipality.

The development plan for the areas will follow the given guidelines from National Agriculture Policy (2013):

- To take steps to provide suitable technical support for the Charland, haor-bower, and water logged areas and coastal areas.
- The use of agricultural land for non-agricultural work will be controlled.
- To encourage modern environment-friendly technologies and infrastructure to be safe and sustainable future.
- To encourage agricultural products-based industries.
- To take steps to increase agricultural land by reclamation of water logged agricultural land, including reclamation of land in coastal areas.

5.2.4 National Tourism Policy (1992):

The objectives of the national tourism policy (1992) include extending the foreign exchange earnings by attracting foreign tourists, unveiling an accredited investment field for private capital, take steps for poverty alleviation through the employment of people, the development of the cottage industry and the enrichment and development of the country's culture and heritage.

The Baroirhat Paurasava has potential for tourism. The development plan for the area will follow the given guidelines from National Tourism Policy (1992):

- In order to improve the communication system on roads to religious or cultural sites priority projects will be undertaken by the concerned departments / agencies.
- Identification and development of special zones / places / islands for foreign tourists.
- In order to make the private sector interested in investing in the tourism industry, settlement of government land may be provided on long-term basis for the approved projects.

5.2.5 The National Industry Policy (2016):

The objectives of the national industry policy 2016 include ensuring industrial growth through combined effort of Government and Public sector and ensuring income generating job opportunities through Industrialization and to take part in inclusive growth.

The economy of the Mirsharai planning area is of agricultural nature, which includes farming, fishery and social forestry. There are industrial and processing activities in the institutional sector, most of which have been developed along the Dhaka-Chittagong road. In case of Baroirhat, the main crops of this region are paddy. Preparation and marketing of bamboo and wood furniture and other products in small industries is the main source of local income.

The development plan for the area will follow the given guidelines from The National Industry Policy (2016):

- Making Small, Medium and Cottage industries the main driving force of industrialization and creating environment of their growth.
- Development of specialized industries through best use of area wise agricultural, wild, natural, marine resources.

- Giving more opportunities to female entrepreneurs.
- Unplanned Industrialization will be discouraged. Unplanned polluting industries will be shifted to Economic Zone gradually. Willing to shift industries will be given special given incentives.
- To develop ancillary industries in areas near economic zone, cottage, small and medium industry based industrial villages will be developed.

5.2.6 Bangladesh Economic Zone Act (2010)

The objectives of this policy include economic zone establishment in backward or potential areas thus encouraging fast economic development, industrialization, employment etc.

The economy of the Mirsharai planning area is of agricultural nature, which includes farming, fishery and social forestry. There are industrial and processing activities in the institutional sector, most of which have been developed along the Dhaka-Chittagong road. In case of Baroirhat, the main crops of this region are paddy. Preparation and marketing of bamboo and wood furniture and other products in small industries is the main source of local income.

The development plan of the Mirsharai and Baroirhat area may follow the given guidelines from Bangladesh Economic Zone Act (2010):

- The government can declare a certain land area Economic Zone by publishing Gazette, but the area under the jurisdiction of City Corporation, Paurasava and Cantonment Board will have to be used to establish Information Technology related economic zone.
- To acquire land for the Economic Zone or Infrastructure for the zone, policies under Acquisition and Requisition of Immovable Property Ordinance 1982 will be used.
- Authority can order to create master plan for the land area Economic Zone which may include Export Processing Area, Domestic Processing Area, Commercial Area and Non-Processing Area.
- Developing backward linkage industry inside or outside the economic zone.
- Economic Zone developed under this law can include small and cottage industries or other types of institutions like agricultural farm.

5.2.7 National Housing Policy (2016)

The target of this policy is to provide housing for all sectors of people in a way which is sustainable and it gives directions regarding Political, economic, social, environmental, technical aspect of housing.

The policy components are:

Planning, Land, Funding, Infrastructure, Human Resource Development, Management of Slums, Rural Housing, Social Housing for Hazard Prone area and Housing for Poor, Women and Elders. The policy does not include housing for high income people.

The study area is a semi urban area with an agriculture driven economy which is a hazard prone area of seasonal storms, cyclone and depression.

The development plan for the area will follow the given guidelines from National Housing Policy:

- It will consider housing for people with low income in rural parts adjacent to developed urban area excluding agricultural and environmentally critical lands.
- Housing projects will be done in accordance with land use determined in detailed area plan. River, Khal or Beel or their parts are forbidden for usage as housing development land.
- In hazard prone parts, strong useful housing materials will be considered for housing development.
- Creating Land Bank with Khas lands in urban areas and in case of rural areas, with Khas land and Bars risen in rivers.
- People will not be displaced for development projects unless it is emergency and for public welfare.

5.2.8_Water Act (2013):

The act was constructed to make provisions for integrated development, management, abstraction, distribution, use, protection and conservation of water resources.

The Mirsharai paurasva has water bodies comprising of 203.15 Acre and Baroiarhat paurasva has water bodies comprising of 45.59 acre.

The development plan of Mirsharai and Baroiarhat will follow the given guidelines from the policy:

Under this Act

- “Water source” means any natural or manmade river, canal, beel, haor, baor, pond, lake, water fall or any other similar water source.
- “Khal” means any passage of inflow and outflow of water.
- Wetland means any land where water remains at the level of surface or close to it which inundates with shallow water from time to time and where grows such plants that may usually grow and survive in marsh land.

- For the convenience of the use of water, every individual shall have easement on any private or public land. Provided that No owner of the land near to bank of any water source shall have any right to its bottom, and foreshore.
 - Here, “foreshore” means any part of land lying in between the low water mark and high-water mark during ordinary spring tide of a year, and in case of river or sea port area as defined in Ports Act 1908, any part of land thereof which is 50 meters extended from the highest level of water to river bank, and in the cases of areas other than river or sea port, any part of land thereof which is 10 meters extended from the highest level of water.
- In violation of any provision of this Act or of any prohibition and condition of any protection order or of any clearance certificate, if any person or appropriate authority makes any construction or carries on land filling activities on water resources which creates impediments in the normal water course or changes the direction of such watercourse; the Executive Committee or 'any officer authorized by it in this behalf, notwithstanding anything contained contrary in any other law for the time being in force, may, to keep such water course natural, issue a removal order such person or authority for removing the infrastructure, or land filling materials or elements thereof, within the time specified in such order.
- No person or organization shall, without the permission of appropriate authority, stop natural flow of any water course or create obstacles to such flow or divert or attempt to divert the direction of any water course by constructing any structure. Whether it is on the bank or not, of any water source, or by filling any water source or by extracting sand or mud from any water source.

5.2.9 National Forest Policy (1979):

The Government adopted The National Forest Policy recognizing that the development, maintenance and conservation of forests should be adopted in the interest of economic development and preservation of ecological balance in the country.

The Baroirahat Paurasava has preserved 147.95 Acres of land as Forest Land for environment and environmental beauty preservation.

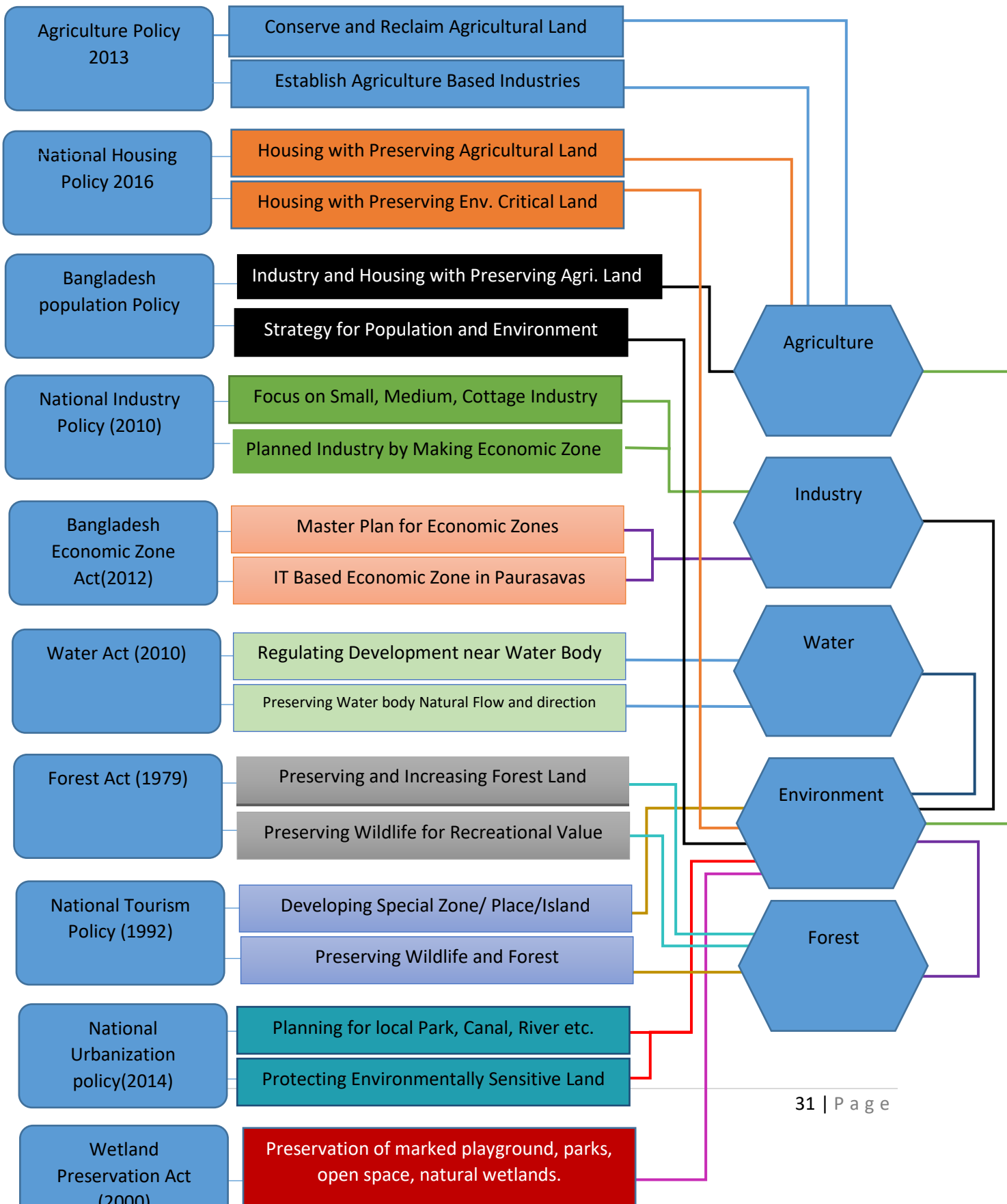
The development plan will follow the given guideline from National Forest Policy (1979):

- All forest land in the country shall be carefully preserved and scientifically managed for qualitative improvement.
- Tree and timber wealth shall be increased by large scale planting through mass participation and optimum extraction of forest produce shall be undertaken to meet national requirement.
- Steps shall be taken for conservation of forests for protection of natural environment and preservation of wildlife and for full utilization of recreational potentialities of forests.

5.2.10 Natural Wetland Preservation Act, (2000)

Except the condition of this Act playfield, open space, park and natural water bodies which are marked cannot be used another way, it cannot be rented, leased or cannot be handover any other use If trees of a park are cut in such a way that it changes the basic

5.3 Flow Chart of Sector Wise Policies and Their Inter Connectivity



The National Agricultural Policy (2013) puts emphasis on conserving agricultural lands and controlling non-agricultural usage of agricultural lands. Establishing agro-product based industries and reclamation of agricultural land.

Bangladesh Population Policy mentions policy for demoralizing housing and industrial development on agricultural lands.

Housing Policy (2013) mentions housing for people in rural and urban areas excluding agricultural and environmentally critical Lands.

These policies emphasis on conservation of agriculture as well as environment.

National Industry Policy 2016 describes cottage, small and medium industries as the main focus of industrialization. Unplanned industries to be moved in Economic Zone.

Bangladesh Economic Zone Act (2012) urges to create economic zones around the country. The zones will have master plan for their land use. Backward linkage industries will be provided for the industries in economic zone.

These policies describe the guideline for industrial development of the country in a planned manner. The policies mention ways to make the industries more environment friendly, although the focus lies on industry development. So, they have main focus on Industry sector.

Forest Act (1979) declares all forest land in the country is to be protected. It also puts emphasis on preserving natural environment and wildlife.

National Tourism Policy (1992) gives guidelines about flourishing the tourism industry in our country. It urges to preserve forests and wildlife for their recreational value. It suggests to develop special zone/area/island for foreign tourists.

The Forest law and tourism policy are interconnected. The forest act dictates to preserve and expand forest and wildlife to reduce environment degradation and the tourism policy also include policy on forest and wildlife for their recreational value.

Water act (2010) gives guidelines for preserving water bodies and water sources. It defines various types of water body and regulates development around them.

Wetland Preservation Act (2000) was introduced to protect parks, open space, playground, natural wetlands marked by Paurasava or other Municipal authorities. It is forbidden by this law to change the use classification of these marked places.

National Urbanization Policy (2014) includes policies, which says to do planning for local park, river, canal etc. Preservation of environmentally critical lands is also included in the policy.

The policies mention above directly connect to different sectors. They are: Agriculture, Industry, Water, Environment and Forest. The Agriculture, Industry, Water and Forest sector all work to preserve the environment through different guidelines. So, these policies are based in different sectors, while sharing a common base of environment protection.

Chapter 6

6.1 Comparative Planning Standard for community facilities

There are some planning standards from various development authorities, rules & projects that are considered for comparison & that are shown in below in tabular form. Those development authorities, rules & projects that are considered are given below:

- 1. Private Residential Land Development Project Rules, 2004**
- 2. DMDP (1995) and DAP (2010) for Dhaka City**
- 3. Neighbourhood in Dhaka City**
- 4. RMDP, 2004**
- 5. KMDP, 2000**
- 6. Barishal, 2010**
- 7. Sylhet, 2010**
- 8. Chittagong City**
- 9. Rangpur City Corporation**
- 10. The District Towns Infrastructure Development Project (DTIDP)**
- 11. Upazila Towns Infrastructure Development Project (UTIDP)**
- 12. UDD**
- 13. LGED**
- 14. Purbachal New Town Project**
- 15. Mirsharai & Baroiarhat Master Plan, 2011-2031**
- 16. Time-Saver Standards for Housing & Residential Development**

There are 5 types of broad categorical facilities that are selected for comparing planning standards among above mentioned development authorities, rules & projects. Those categories are given below:

- 1. Education**
- 2. Health**
- 3. Recreation**
- 4. Socio-cultural**
- 5. Services**

Now, the tables are given below showing the comparative planning standard for community facilities in Bangladesh:

Planning standard

(in Acre/1000 popⁿ)

Type	PRLDR, 2004	DMDP, 1995 & DAP, 2010	Neighbourhood (DAP) (Minimum)	RMDP, 2004	KMDP, 2000	Barisal, 2010	Sylhet, 2010	Chittagong city, 2006	Rangpur City Corporation (Minimum)	DTIDP, 2004	UTIDP, 2008	UDD	LGED	Purbachal	Mirsharai & Baroiarhat master plan, 2011-2031	Time-Saver Standard (Minimum)
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EDUCATION

(Area in Acre & 'F' for facility)

Nursery	.08 (1F/ 2500 Pop ⁿ , Area: .2)	-	-	-	-	-	-	-	.1 (1F/ 2000 Pop ⁿ , Area: .2)	.08 (1F/ 5000 Pop ⁿ , Area: .4)	.05 (1F/ 10000 Pop ⁿ , Area: .5)	-	-	-	.05 (1F/ 10000 Pop ⁿ , Area: .5)	.05 (max walking distance: .125mile)
primary	.08	.067	.16	.25	.15	.14	.2	-	.67	.15	.4	.4	.4	-	.4	4.67 (max

	(1F/ 2500 Pop ⁿ , Area: .3)	(1F/ 15000 Pop ⁿ , Area: 1)	(2F/ 12500 Pop ⁿ , Area: 1/F)	(1F/ 4000 Pop ⁿ , Area: 1)	(1F/ 3400 Pop ⁿ , Area: .5)	(1F/ 7000 Pop ⁿ , Area: 1)	(1F/ 5000 Pop ⁿ , Area: 1)		(1F/ 1500 Pop ⁿ , Area: 1)	(1F/ 2000 Pop ⁿ , Area: .3)	(1F/ 5000 Pop ⁿ , Area: 2)	(1F/ 5000 Pop ⁿ , Area: 2)	(1F/ 5000 Pop ⁿ , Area: 2)		(1F/ 5000 Pop ⁿ , Area: 2)	walking distance: .5mile)
Secondary	.1 (1F/ 10000 Pop ⁿ , Area: 1.2)	1 (1F/ 20000 Pop ⁿ , Area: 2)	.12 (1F/ 12500 Pop ⁿ , Area: 1.5/F)	.33 (1F/ 6000 Pop ⁿ , Area: 2)	.3 (1F/ 5000 Pop ⁿ , Area: 1.5)	.25 (1F/ 8000 Pop ⁿ , Area: 2)	.12 (1F/ 25000 Pop ⁿ , Area: 3)	-	.3 (1F/ 5000 Pop ⁿ , Area: 1.5)	-	.25 (1F/ 20000 Pop ⁿ , Area: 5)	.25 (1F/ 20000 Pop ⁿ , Area: 5)	.25 (1F/ 20000 Pop ⁿ , Area: 5)	-	.25 (1F/ 20000 Pop ⁿ , Area: 5)	1.8 (max walking distance: .75mile)
college	.08 (1F/ 15000 Pop ⁿ , Area: 1.2)	.067 (1F/ 30000 Pop ⁿ , Area: 2)	-	.33 (1F/ 6000 Pop ⁿ , Area: 2)	.3 (1F/ 5000 Pop ⁿ , Area: 1.5)	.25 (1F/ 8000 Pop ⁿ , Area: 2)	.12 (1F/ 25000 Pop ⁿ , Area: 3)	-	.2 (1F/ 15000 Pop ⁿ , Area: 3)	-	.5 (1F/ 20000 Pop ⁿ , Area: 10)	.25 (1F/ 20000 Pop ⁿ , Area: 5)	.25 (1F/ 20000 Pop ⁿ , Area: 5)	-	.5 (1F/ 20000 Pop ⁿ , Area: 10)	-
madrasa	-	.04	-	-	-	-	.25	-	-	.05	-	.25	.25	-	-	-

		(1F/ 25000 Pop ⁿ , Area: 1)					(1F/ 8000 Pop ⁿ , Area: 2)			(1F/ 20000 Pop ⁿ , Area: 1)						
Degree college	-	-	-	.33	.28	-	-	-	-	.13	-	-	-	-	-	-
				(1F/ 30000 Pop ⁿ , Area: 10)	(1F/ 36000 Pop ⁿ , Area: 10)					(1F/ 15000 Pop ⁿ , Area: 2)						
Technical	-	-	-	-	-	-	-	-	.13	-	-	-	-	-	-	-
									(1F/ 15000 Pop ⁿ , Area: 2)							

Table 04: Comparative Planning Standard for Educational Institutions

Source: Developing planning standard for community facilities: A study in the context of urban areas in Bangladesh (Thesis), Time Saver Standard, Mirsharai & Baroiarhat Paurashava Master Plan (2011-2031)

Planning standard

(in Acre/1000 popⁿ)

Type	PRLDR, 2004	DMDP, 1995 & DAP, 2010	Neighbourhood (DAP) (Minimum)	RMDP, 2004	KMDP, 2000	Barishal, 2010	Sylhet, 2010	Chittagong city, 2006	Rangpur City Corporation (Minimum)	DTIDP, 2004	UTIDP, 2008	UDD	LGED	Purbachal	Mirsharai & Baroiarhat master plan, 2011-2031	Time-Saver Standard (Minimum)
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HEALTH

(Area in Acre & 'F' for facility)

Small clinic/ Clinic/ Health centre	.04 (1F/ 15000 pop ⁿ , area: .6)	-	-	-	-	-	-	-	.06 (1F/ 5000 pop ⁿ , area: .3)	.12 (1F/ 5000 pop ⁿ , area: .6)	.2 (1F/ 5000 pop ⁿ , area: 1)	.2 (1F/ 5000 pop ⁿ , area: 1)	.2 (1F/ 5000 pop ⁿ , area: 1)	-	.2 (1F/ 5000 Pop ⁿ , Area: 1)	-
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Hospital	.04	-	-	-	-	-	-	-	.04 max	.04	-	.25	.25	.06	-	-
	(1F/ 100000 pop ⁿ , area: 4)								(1F/ 250000 pop ⁿ , area: 10)	(1F/ 100000 pop ⁿ , area: 4)		(1F/ 20000 pop ⁿ , area: 5)	(1F/ 20000 pop ⁿ , area: 5)			

Table 05: Comparative Planning Standard for Health Facilities

Source: Developing planning standard for community facilities: A study in the context of urban areas in Bangladesh (Thesis), Time Saver Standard, Mirsharai & Baroiarhat Paurashava Master Plan (2011-2031)

Planning standard

(in Acre/1000 popⁿ)

Type	PRLDR, 2004	DMDP, 1995 & DAP, 2010	Neighbour- hood (DAP) (Minimum)	RMDP, 2004	KMDP, 2000	Barishal, 2010	Sylhet, 2010	Chittagong city, 2006	Rangpur City Corporation (Minimum)	DTIDP, 2004	UTIDP, 2008	UDD	LGED	Purbachal	Mirsharai & Baroiarhat master plan, 2011-2031	Time- Saver Standard (Minimum)
RECREATION																
(Area in Acre & 'F' for facility)																
Playlot	-	-	-	-	-	-	-	-	.5 (1F/ 200 pop ⁿ , Area: .1)	-	-	-	-	-	-	.5 (service radius: .25 mile)

Playground	.08 (1F/ 2500 popⁿ, Area: .5)	-	.16 (2F/ 12500 popⁿ, Area: 1/F)	-	-	-	.08 (1F/ 25000 popⁿ, Area: 2)	-	.5 (1F/ 30000 popⁿ, Area: 1.5)	.08 (1F/ 25000 popⁿ, Area: 2)	.15 (1F/ 20000 popⁿ, Area: 3)	.15 (1F/ 20000 popⁿ, Area: 3)	.15 (1F/ 20000 popⁿ, Area: 3)	.07	.15 (1F/ 20000 Popⁿ, Area: 3)	2 (service radius: .5 mile)
Park/ Eco park	.12 (1F/ 2500 popⁿ, Area: .5)	.16 (1F/ 25000 popⁿ, Area: 4)	.024 (1F/ 12500 popⁿ, Area: .3)	1.5 (1F/ 1000 popⁿ, Area: 1.5)	2 (1F/ 1000 popⁿ, Area: 2)	1 (1F/ 1000 popⁿ, Area: 1)	.12 (1F/ 25000 popⁿ, Area: 3)	-	-	.2 (1F/ 10000 popⁿ, Area: 2)	1 (1F/ 1000 popⁿ, Area: 1)	1 (1F/ 1000 popⁿ, Area: 1)	1 (1F/ 1000 popⁿ, Area: 1)	.01	1 (1F/ 1000 popⁿ, Area: 1)	-

Neighbour- Hood park	-	-	-	-	-	-	-	.2 (1F/ 5000 pop ⁿ , Area: 1)	.33 (1F/ 1500 pop ⁿ , Area: .5)	.2 (1F/ 10000 pop ⁿ , Area: 2)	1 (1F/ 1000 pop ⁿ , Area: 1)	-	-	.04 (play lot)	1 (1F/ 1000 pop ⁿ , Area: 1)	2 (service radius: .5 mile)
City park	-	-	-	-	-	-	-	.5 (1F/ 10000 pop ⁿ , Area: 5)	-	-	-	-	-	-	-	-
Regional park	-	-	-	-	-	-	-	.25 (1F/ 20000 pop ⁿ , Area: 5)	-	-	-	-	-	-	-	-
Cinema hall	-	-	-	-	-	-	-	-	.012	.02	.05	.025	.025	-	.05	-

									(1F/ 25000 pop ⁿ , Area: .3)	(1F/ 25000 pop ⁿ , Area: .5)	(1F/ 20000 pop ⁿ , Area: 1)	(1F/ 20000 pop ⁿ , Area: .5)	(1F/ 20000 pop ⁿ , Area: .5)		(1F/ 20000 pop ⁿ , Area: 1)	
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Table 06: Comparative Planning Standard for Recreational Facilities

Source: Developing planning standard for community facilities: A study in the context of urban areas in Bangladesh (Thesis), Time Saver Standard, Mirsharai & Baroiarhat Paurashava Master Plan (2011-2031)

**Planning standard
(in Acre/1000 popⁿ)**

Type	PRLDR, 2004	DMDP, 1995 & DAP, 2010	Neighbourhood (DAP) (Minimum)	RMDP, 2004	KMDP, 2000	Barishal, 2010	Sylhet, 2010	Chittagong city, 2006	Rangpur City Corporation (Minimum)	DTIDP, 2004	UTIDP, 2008	UDD	LGED	Purbachal	Mirsharai & Baroiarhat master plan, 2011-2031	Time-Saver Standard (Minimum)
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SOCIO-CULTURAL

(Area in Acre & 'F' for facility)

Mosque	.04	.05	.032	-	-	-	-	-	.13	.01	.025	.025	.025	.026	.025	2.5
	(1F/ 2500 pop ⁿ , Area: .1)	(1F/ 6000 pop ⁿ , Area: .3)	(2F/ 12500 pop ⁿ , Area: .2/F)						(1F/ 1500 pop ⁿ , Area: .2)	(1F/ 10000 pop ⁿ , Area: .1)	(1F/ 20000 pop ⁿ , Area: .5)	(1F/ 20000 pop ⁿ , Area: .5)	(1F/ 20000 pop ⁿ , Area: .5)		(1F/ 20000 pop ⁿ , Area: .5)	

Community centre	.04 (1F/ 2500 popⁿ, Area: .1)	(1F/ ward, Area: .3)	.026 (1F/ 12500 popⁿ, Area: .33)	(1F/ neighbourhood, Area: .3)	-	(1F/ ward, Area: .3)	.015 (1F/ 20000 popⁿ, Area: .3)	-	.03 (Desired) (1F/ 50000 popⁿ, Area: .5)	.05 (1F/ 20000 popⁿ, Area: 1)	.05 (1F/ 20000 popⁿ, Area: 1)	.05 (1F/ 20000 popⁿ, Area: 1)	.05 (1F/ 20000 popⁿ, Area: 1)	-	.05 (1F/ 20000 popⁿ, Area: 1)	-
Graveyard	-	(1F/ ward, Area: 2)	-	.1 (1F/ 50000 popⁿ, Area: 5)	-	-	.25 (1F/ 20000 popⁿ, Area: 5)	-	.1 (1F/ 30000 popⁿ, Area: 3)	.25 (1F/ 20000 popⁿ, Area: 5)	.05 (1F/ 20000 popⁿ, Area: 1)	.03 (1F/ 20000 popⁿ, Area: .6)	.03 (1F/ 20000 popⁿ, Area: .6)	.21	.05 (1F/ 20000 popⁿ, Area: 1)	-

Eidgah	-	-	-	-	-	-	-	-	-	.025	.05	.025	.025	.004	.05	-
										(1F/ 20000 pop ⁿ , Area: .5)	(1F/ 20000 pop ⁿ , Area: 1)	(1F/ 20000 pop ⁿ , Area: .5)	(1F/ 20000 pop ⁿ , Area: .5)		(1F/ 20000 pop ⁿ , Area: 1)	

Table 07: Comparative Planning Standard for Socio-Cultural Facilities

Source: Developing planning standard for community facilities: A study in the context of urban areas in Bangladesh (Thesis), Time Saver Standard, Mirsharai & Baroiarhat Paurashava Master Plan (2011-2031)

Planning standard (in Acre/1000 pop ⁿ)																
Type	PRLDR, 2004	DMDP, 1995 & DAP, 2010	Neighbour- hood (DAP) (Minimum)	RMDP, 2004	KMDP, 2000	Barishal, 2010	Sylhet, 2010	Chittagong city, 2006	Rangpur City Corporation (Minimum)	DTIDP, 2004	UTIDP, 2008	UDD	LGED	Purbachal	Mirsharai & Baroiarhat master plan, 2011- 2031	Time- Saver Standard (Minimum)
Services (Area in Acre & 'F' for facility)																
Post office	-	.003 (1F/ 35000 pop ⁿ , Area: .1)	.0004 (1F/ 12500 pop ⁿ , Area: .005)	.025 (1F/ 20000 pop ⁿ , Area: .5)	-	-	.0025 (1F/ 20000 pop ⁿ , Area: .05)	-	-	.02 (1F/ 20000 pop ⁿ , Area: .4)	.025 (1F/ 20000 pop ⁿ , Area: .5)	.025 (1F/ 20000 pop ⁿ , Area: .5)	.025 (1F/ 20000 pop ⁿ , Area: .5)	-	.025 (1F/ 20000 pop ⁿ , Area: .5)	-
Bus terminal	-	-	-	-	-	-	-	-	-	.03 (1F/ 100000 pop ⁿ , Area: 3)	.05 (1F/ 20000 pop ⁿ , Area: 1)	.05 (1F/ 20000 pop ⁿ , Area: 1)	.05 (1F/ 20000 pop ⁿ , Area: 1)	-	.05 (1F/ 20000 pop ⁿ , Area: 1)	-
Fire station	-	(1F/ 4 wards, Area: 1)	-	-	-	-	-	-	-	50 decimal for "A" Category; 30 decimal for "B" Category (Minimum)	.05 (1F/ 20000 pop ⁿ , Area: 1)	.05 (1F/ 20000 pop ⁿ , Area: 1)	.05 (1F/ 20000 pop ⁿ , Area: 1)	.02	.05 (1F/ 20000 pop ⁿ , Area: 1)	-

Table 08: Comparative Planning Standard for Services

Source: Developing planning standard for community facilities: A study in the context of urban areas in Bangladesh (Thesis), Time Saver Standard, Mirsharai & Baroiarhat Paurashava Master Plan (2011-2031)

6.2 Assessment of Population & Area for Finding Relation with Paurashava Level Planning Standard:

Plan or Authority	Population	Area
Mirsharai Paurashava	16218	1895.49 Acre
Baroiarhat Paurashava	11602	526. 08 Acre
PRLDR, 2004	3500	10 Acre
DMDP	1751925	533994 Acre
DAP (Neighbourhood)	12500	50 Acre
RMDP	878500	23890 Acre
KMDP	294255	90755 Acre
Rangpur City Corporation	120000	50677 Acre
Purbachal	-	6150 Acre
DTIDP & UTIDP	Paurashava Level	
UDD & LGED	Upazila Level	

*Green= Considered & Yellow= Related to Considered

Table 09: Finding the related Plan or Authority with population & area to Paurashava level

Source: Internet

6.3 Population projection with linear method:

Linear Method formula:

$$P_{t+n} = P_t(1+r)^n$$

Here,

P_{t+n} = Projected population

P_t = Current year population

r = growth rate (.01)

n = year interval

Mirsharai Upazila						
2011	2016	2021	2026	2031	2036	2041
398716	419055	440431	462897	486509	511326	537409
Mirsharai Paurashava						
2011	2016	2021	2026	2031	2036	2041
16218	17045	17915	18829	19789	20798	21859
Baroiarhat Paurashava						
2011	2016	2021	2026	2031	2036	2041
11602	12194	12816	13470	14157	14879	15638

Table 10: Population Projection of Total Population

Source: BBS

Age group	Mirsharai Upazila						
	2011	2016	2021	2026	2031	2036	2041
(3-5)	27136	28520	29975	31504	33111	34800	36575
(6-10)	49574	52103	54761	57554	60490	63575	66818
(11-14)	37340	39245	41247	43351	45562	47886	50329
(15-19)	42898	45086	45998	47631	49322	51073	52886
(20-24)	37402	39310	38730	38730	38730	38730	38730
(25-29)	33436	35142	36934	38818	40798	42879	45067
Total	227786	239405	247644	257588	268013	278944	290405
Age	Mirsharai Paurashava						

group	2011	2016	2021	2026	2031	2036	2041
(3-5)	1029	1081	1137	1195	1256	1320	1387
(6-10)	1931	2030	2133	2242	2356	2476	2603
(11-14)	1469	1544	1623	1705	1792	1884	1980
(15-19)	1796	1888	1984	2085	2191	2303	2421
(20-24)	1573	1653	1738	1826	1919	2017	2120
(25-29)	1415	1487	1563	1643	1727	1815	1907
Total	9213	9683	10177	10696	11242	11815	12418
Baroiarhat Paurashava							
Age group	2011	2016	2021	2026	2031	2036	2041
(3-5)	794	835	877	922	969	1018	1070
(6-10)	1400	1471	1546	1625	1708	1795	1887
(11-14)	1059	1113	1170	1229	1292	1358	1427
(15-19)	1269	1334	1402	1473	1548	1627	1710
(20-24)	1327	1395	1466	1541	1619	1702	1789
(25-29)	1072	1127	1184	1245	1308	1375	1445
Total	6921	7274	7645	8035	8445	8876	9328

Table 11: Population Projection of School-Going Population

Source: BBS

6.4 Number of Existing facilities

Facilities		Number of existing Facilities
EDUCATION	Nursery	-
	Primary	183
	Nursery+ Primary	-
	Secondary (1-10)	48
	College (1-12)	-
	College (11-12)	6
	Madrasa	27
	Degree College or	-

	Technical	
Health	Small clinic/ Clinic/Health centre	1
	Hospital	14
Recreation	Playlot	-
	Playground	-
	Park/ Eco park	-
	Neighbourhood park	-
	Cinema hall	-
Socio-Culture	Mosque	520
	Community centre	-
	Graveyard	-
	Eidgah	-
Service	Post office	30
	Bus terminal	-
	Fire station	-

	Bazar	33

Table 12: Number of Existing Facilities Mirsharai Upazila

Source: Internet

Facilities		Number of existing Facilities
EDUCATION	Nursery	1
	Primary	6
	Nursery+ Primary	
	Secondary (1-10)	3
	College (1-12)	1
	College (11-12)	1

	Madrasa	12
	Degree College or Technical	-
Health	Small clinic/ Clinic/Health centre	3
	Hospital	2
Recreation	Playlot	-
	Playground	-
	Park/ Eco park	-
	Neighbourhood park	-
	Cinema hall	-
Socio-Culture	Mosque	23
	Community centre	-
	Graveyard	-
	Eidgah	5
	Post office	-

Service		
	Bus terminal	-
	Fire station	-
	Bazar	2

Table 13: Number of Existing Facilities Mirsharai Paurashava

Source: Internet

Facilities		Number of existing Facilities
EDUCATION	Nursery	-
	Primary	5
	Nursery+ Primary	-
	Secondary (1-10)	3
	College (1-12)	-
	College (11-12)	-
	Madrasa	3
	Degree College or	1

	Technical	
Health	Small clinic/ Clinic/Health centre	1
	Hospital	2
Recreation	Playlot	-
	Playground	-
	Park/ Eco park	-
	Neighbourhood park	-
	Cinema hall	-
Socio-Culture	Mosque	11
	Community centre	-
	Graveyard	12
	Eidgah	-
Service	Post office	-
	Bus terminal	1
	Fire station	-
	Bazar	2

Table 14: Number of Existing Facilities Baroiarhat Paurashava

Source: Internet

6.5 FACILITY NEEDED ACCORDING TO PAURASHAVA ACT, 2009

According to Paurashava Act, 2009, some of the facilities have to be in the Paurashava area.

Those are given below:

1. Bus stand,
2. Katcha bazar,
3. Primary school,
4. Clinic,
5. Fire services,
6. Graveyard,
7. Playground,
8. Park etc.

6.6 FINALYSED PLANNING STANDARD

To set-up planning standard for Mirsharai & Baroiarhat Paurashava, some of the consideration have been keep in mind, such as, 'Minimum Land for Optimum Population', 'Existing Facilities' etc.

Planning standards are fixed up with the help of assessment of other planning standard used for various plan or authorities. Those planning standards that are finalised for Mirsharai & Baroiarhat Paurashava are given below:

Planning standard (EDUCATION)		Comments
Nursery	<ul style="list-style-type: none"> • .1 Acre/1000popⁿ • 1F/2000 Popⁿ, • Total Area: .2 Acre • Distance from home= .5 km 	Adopt from Rangpur City Corporation and PRLDR
Primary	<ul style="list-style-type: none"> • .15 Acre/1000popⁿ • 1F/2000 Popⁿ, • Total Area: .3 Acre • School Building= 3000 sq. ft. or .07 Acre • Playlot= .2 Acre • Distance from home= .5 km 	Adopt from Directorate of Primary Education Rangpur City Corporation and DTIDP 2004
Nursery+ Primary	<ul style="list-style-type: none"> • .15 Acre/1000popⁿ • 1F/2000 Popⁿ, • School Building= 4000 (3000+1000) sq. ft. or .09 Acre • Total Area: .3 Acre • Playlot= .2 Acre 	Adopt from Directorate of Primary Education, PRLDR, DTIDP 2004 and Rangpur City Corporation

	<ul style="list-style-type: none"> Distance from home= .5 km 	
Secondary (1-10)	<ul style="list-style-type: none"> .24 Acre/1000popⁿ 1F/5000 Popⁿ, School Building= 9000 sq. ft. or .2 Acre Total Area: 1.2 Acre Playground= 1 Acre Distance from home= 1.5 km 	Adopt from Rangpur City Corporation, PRLDR, KMDP 2000, Directorate of Primary Education
College (1-12)	<ul style="list-style-type: none"> .1 Acre/1000popⁿ 1F/15000 Popⁿ, School Building= 15000 sq. ft. or .35 Acre Total Area: 1.5 Acre Playground= 1 Acre Distance from home= 1.5 km 	Adopt from Directorate of Primary Education, PRLDR and Rangpur City Corporation
College (11-12)	<ul style="list-style-type: none"> .125 Acre/1000popⁿ 1F/8000 Popⁿ, School Building= 6000 sq. ft. or .14 Acre Total Area: 1 Acre 	Adopt from Directorate of Primary Education, Barishal 2010 and Rangpur City Corporation

	<ul style="list-style-type: none"> • Playground= .8 Acre • Distance from home= 3 km 	
Madrasa	<ul style="list-style-type: none"> • .15 Acre/1000popⁿ • 1F/10000 Popⁿ, • Total Area: 1.5 Acre • Distance from home= 1.5 km 	Adopt from DAP 2010, Sylhet 2010 and Rangpur City Corporation
Degree College or Technical	<ul style="list-style-type: none"> • .13 Acre/1000popⁿ • 1F/15000 Popⁿ, • Total Area: 2 Acre • Distance from home= 3 km 	Adopt from Rangpur City Corporation and DTIDP 2004

Table 15: Planning Standard for Mirsharai & Baroiarhat Paurashava (Education)

Planning standard (Health)	Comments

Small clinic/ Clinic/Health centre	<ul style="list-style-type: none"> • .04 acre/ 1000 popⁿ • 1F/ 7500 popⁿ, • Total area: .3 acre • Distance from home= 1 km 	Adopt from PRLDR and Rangpur City Corporation
Hospital/ Upzilla Health Complex	<ul style="list-style-type: none"> • .2 acre/ 1000 popⁿ • 1F/ 20000 popⁿ, • Total area 4 acre 	Adopt from UDD and PRLDR

Table 16: Planning Standard for Mirsharai & Baroiarhat Paurashava (Health Facilities)

Planning standard		Comments
(Recreation)		
Playlot	<ul style="list-style-type: none"> • .5 acre/ 1000 popⁿ • 1F/200 popⁿ, • Total area: .1 acre 	Adopt from Rangpur City Corporation
Playground	<ul style="list-style-type: none"> • .08 acre/ 1000 popⁿ • 1F/12500 popⁿ, • Total Area: 1 acre • Distance from home=0.5 km 	Adopt from Sylhet, 2010
Park/ Eco park	<ul style="list-style-type: none"> • .1 acre/ 1000 popⁿ • 1F/10000 popⁿ, • Total Area: 1 acre • Distance from home= 1 km 	Adopt from PRLDR and Chittagong City 2006

Neighbourhood park	<ul style="list-style-type: none"> • .2 acre/ 1000 popⁿ • 1F/2500 popⁿ, • Area: .5 acre • Distance from home=0.5 km 	Adopt from Chittagong City 2006
Cinema hall	<ul style="list-style-type: none"> • .025 acre/ 1000 popⁿ • 1F/20000 popⁿ • Area: .5 acre 	Adopt from UDD

Table 17: Planning Standard for Mirsharai & Baroiarhat Paurashava (Recreational Facilities)

Planning standard (Service)		Comments
Post office	<ul style="list-style-type: none"> • .0025 acre/ 1000 popⁿ • 1F/ 20000 popⁿ, • Total Area: .05 acre 	Adopt from Sylhet, 2010
Bus terminal	<ul style="list-style-type: none"> • .05 acre/ 1000 popⁿ • 1F/ 20000 popⁿ • Total Area:1 acre 	Adopt from UDD
Fire station	<ul style="list-style-type: none"> • .05 acre/ 1000 popⁿ • 1F/ 20000 popⁿ • Total Area:1 acre • Distance from residential area 10 km 	Adopt from UDD

Bazar	<ul style="list-style-type: none"> • .03 acre/ 1000 popⁿ • 1F/ 10000 popⁿ • Total Area:.3 acre • Distance from residential area 1.5 km 	Adopt from DTIDP 2004
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Table 18: Planning Standard for Mirsharai &Baroiarhat Paurashava (Services)

Planning standard (Socio-Culture)		Comments
Mosque	<ul style="list-style-type: none"> • .02 acre/ 1000 popⁿ • 1F/5000 popⁿ, • Total Area: .1 acre • Distance from home= .5 km 	Adopt from DTIDP,2004 and Rangpur City Corporation
Community centre	<ul style="list-style-type: none"> • .015 acre/ 1000 popⁿ • 1F/20000 popⁿ, • Total Area: .3 acre 	Adopt from Sylhet, 2010
Graveyard	<ul style="list-style-type: none"> • .03 acre/ 1000 popⁿ • 1F/10000 popⁿ, • Total Area: .3 acre 	Adopt from UDD
Eidgah	<ul style="list-style-type: none"> • .025 acre/ 1000 popⁿ • 1F/20000 popⁿ, • Total Area: .5 acre 	Adopt from UDD

Table 19: Planning Standard for Mirsharai &Baroiarhat Paurashava (Socio-Cultural Facilities)

6.7 Walking distance analysis

The finalised standard for Paurashava is compared with the standard of Bhandaria Paurashava made by UDD in 2013 and Time Saver Standard. The table showing below will helps to understand the comparative results for walking distance.

Criteria	UDD,2013 (Bhandaria Paurashava)	Time Saver Standard	Finalised standard for Paurashava
	Walking distance (km)		
Primary School	0.25-0.5	.4-.8	.5
High School	0.5-0.75	1.60	1.5
College/University	0.5-1	30-45 min	1.5-3.0
Kacha Bazar	0.25-0.50	-	1.5
Clinic	0.25	-	1
General Hospital	0.5	45 min	
Park	0.5-0.75	-	1
Playground	0.25	30 min	.5
Religious	-	1.6	.5

Table 20: Walking Distance Analysis

Source: Bhandaria Paurashava, Time Saver Standard

6.8 Demand analysis

In this analytical part, the below table shows the number of additional facilities according to the finalised planning standard for Mirsharai & Baroiarhat Paurashava with the consideration of projected population up to 2041. The existing facilities also analysed for counting the final output.

Facilities		Number of existing Facilities	Standard (acre/pop ⁿ per Facility)	Year						
				2011	2016	2021	2026	2031	2036	2041
				Population						
				16218	17045	17915	18829	19789	20798	21859
				Demand (Facility needed)						
EDUCATION	Nursery	1	.2/2000	8.11	8.52	8.96	9.41	9.89	10.40	10.93
	Primary	6	.3/2000	8.11	8.52	8.96	9.41	9.89	10.40	10.93
	Nursery+ Primary		.3/2000	8.11	8.52	8.96	9.41	9.89	10.40	10.93
	Secondary (1-10)	3	1.2/5000	3.24	3.41	3.58	3.77	3.96	4.16	4.37
	College (1-12)	1	1.5/15000	1.08	1.14	1.19	1.26	1.32	1.39	1.46
	College (11-12)	1	1/8000	2.03	2.13	2.24	2.35	2.47	2.60	2.73
	Madrasa	12	1.5/100	1.62	1.70	1.79	1.88	1.98	2.08	2.19

			00							
	Degree College or Technical		2/15000	1.08	1.14	1.19	1.26	1.32	1.39	1.46
Health										
	Small clinic/ Clinic/Health centre	3	.3/7500	1.55	1.63	1.71	1.80	1.89	1.98	2.09
	Hospital	2	4/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
Recreation										
	Playlot		.1/200	58.01	60.97	64.08	67.35	70.78	74.39	78.19
	Playground		1/12500	0.93	0.98	1.03	1.08	1.13	1.19	1.25
	Park/ Eco park		1/10000	1.16	1.22	1.28	1.35	1.42	1.49	1.56
	Neighbourhood park		.5/2500	4.64	4.88	5.13	5.39	5.66	5.95	6.26
	Cinema hall		.5/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
Socio-Culture										
	Mosque	23	.1/5000	2.32	2.44	2.56	2.69	2.83	2.98	3.13
	Community centre		.3/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78

	Graveyard		.3/1000 0	1.16	1.22	1.28	1.35	1.42	1.49	1.56
	Eidgah	5	.5/2000 0	0.58	0.61	0.64	0.67	0.71	0.74	0.78
Service										
	Post office		0.05/20 000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
	Bus terminal		1/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
	Fire station		1/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
	Bazar	2	0.3/100 00	1.16	1.22	1.28	1.35	1.42	1.49	1.56

Table 21: Demand Analysis for Mirsharai Paurashava

Facilities	Number of existing Facilities	Standard (acre/pop ⁿ per Facility)	Year							
			2011	2016	2021	2026	2031	2036	2041	
			Population							
			11602	12194	12816	13470	14157	14879	15638	
			Demand (Facility needed)							
EDUCATION	Nursery	-	.2/2000	5.80	6.10	6.41	6.73	7.08	7.44	7.82
	Primary	5	.3/2000	5.80	6.10	6.41	6.73	7.08	7.44	7.82
	Nursery+ Primary	-	.3/2000	5.80	6.10	6.41	6.73	7.08	7.44	7.82
	Secondary (1-10)	3	1.2/5000	2.32	2.44	2.56	2.69	2.83	2.98	3.13
	College (1-12)	-	1.5/15000	0.77	0.81	0.85	0.90	0.94	0.99	1.04
	College	-	1/8000	1.45	1.52	1.60	1.68	1.77	1.85	1.95

	(11-12)									
	Madrasa	3	1.5/10000	1.16	1.22	1.28	1.35	1.42	1.49	1.56
	Degree College or Technical	1	2/15000	0.77	0.81	0.85	0.90	0.94	0.99	1.04
Health	Small clinic/ Clinic/Health centre	1	.3/7500	1.55	1.63	1.71	1.80	1.89	1.98	2.09
	Hospital	2	4/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
Recreation	Playlot	-	.1/200	58.01	60.97	64.08	67.35	70.78	74.39	78.19
	Playground	-	1/12500	0.93	0.98	1.03	1.08	1.13	1.19	1.25
	Park/ Eco park	-	1/10000	1.16	1.22	1.28	1.35	1.42	1.49	1.56
	Neighbourhood park	-	.5/2500	4.64	4.88	5.13	5.39	5.66	5.95	6.26
	Cinema hall	-	.5/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
Socio-Culture	Mosque	11	.1/5000	2.32	2.44	2.56	2.69	2.83	2.98	3.13
	Community centre	-	.3/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
	Graveyard	12	.3/10000	1.16	1.22	1.28	1.35	1.42	1.49	1.56
	Eidgah	-	.5/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
Service	Post office	-	0.05/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
	Bus terminal	1	1/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
	Fire station	-	1/20000	0.58	0.61	0.64	0.67	0.71	0.74	0.78
	Bazar	2	0.3/10000	1.16	1.22	1.28	1.35	1.42	1.49	1.56

Table 22: Demand Analysis for Baroiarhat Paurashava

Chapter 7

7.1 Conclusion:

This report includes population projection in mirsharai upazila and difference between two projections method. Review of mirsharai paurashava and baroiarhat paurashava master plan and various national and sectoral policies to find out the key sectoral points of Mirsharai Upazila. Formulation of planning standard of community facilities which can make impacts on Mirsharai Upazila Development Plan (MUDP). These activities will help to formulate a better and inclusive further MUDP in future.

Reference:

- Bangladesh Census Bureau. “Bangladesh Census 2011”, “Bangladesh Census 1991”, Bangladesh Bureau of Statistics, 4 December, 2017. ^[1]
- Bangladesh Census Bureau. “Chittagong Division Census 2011”, Bangladesh Bureau of Statistics, 4 December, 2017. ^[2]
- Bangladesh Census Bureau. “Chittagong Community Series 2016”, Bangladesh Bureau of Statistics, 4 December, 2017. ^[3]
- Bangladesh Census Bureau. “Fertility Differentials in Bangladesh: Trends and Determinates: Population Monograph: Volume- 14”, Bangladesh Bureau of Statistics, 4 December, 2017. ^[4]
- "Lesson 8: The Cohort Component Population Projection Method." *Lesson 8: The Cohort Component Population Projection Method — MEASURE Evaluation*. N.p., n.d. Web. 9 Dec. 2017. <<https://www.measureevaluation.org/resources/training/online-courses-and-resources/non-certificate-courses-and-mini-tutorials/population-analysis-for-planners/lesson-8>>. ^[5]
- "Lesson 7: Overview of life tables and survival rates." *Lesson 7: Overview of life table and survival rates Method — MEASURE Evaluation*. N.p., n.d. Web. 9 Dec. 2017. <<https://www.measureevaluation.org/resources/training/online-courses-and-resources/non-certificate-courses-and-mini-tutorials/population-analysis-for-planners/lesson-7>>. ^[6]
- "Lesson 6:" *Lesson 6: Method — MEASURE Evaluation*. N.p., n.d. Web. 9 Dec. 2017. <<https://www.measureevaluation.org/resources/training/online-courses-and-resources/non-certificate-courses-and-mini-tutorials/population-analysis-for-planners/lesson-6>>. ^[7]
- National Institution of Population Research and Training(Bangladesh), Bangladesh Sample Vital Statistics 2016 (May 2017), Bangladesh Demographic and Health Survey, Dhaka, Maryland, NIPORT. ^[8]
- National Urbanization Policy, § 3, 5, *et seq.* (2014).
- Bangladesh Population Policy , § 5.7, 5.11 *et seq.* (2012).
- National Agriculture Policy , § 5, 11, 13 *et seq.* (2013).
- National Tourism Policy , § 5.6.1, 10, 23.5 *et seq.* (1992).
- The National Industry Policy , § 2.4, 6 *et seq.* (2016).
- Bangladesh Economic Zone Act , § 5, 6, 7, 15, 19 *et seq.* (2010).
- National Housing Policy, § 4.2.1, 4.2.2, 4.8, *et seq.* (2016).
- Farooque, M. (1997). Law and custom on forests in Bangladesh, issues and remedies (p. 11). Dhaka: Bangladesh Environmental Lawyers Association.
- Natural Wetland Preservation Act, § 5 (2000).
- ‘Developing planning standard for community facilities: A study in the context of urban areas in Bangladesh’, Khan, A. M. 2016.

Appendix:

- Appendix-I: Population census of Mirsharai Upazila census 2011 from census 2011.
- Appendix-II: Death number of Chittagong zila from SVRS, 2016.
- Appendix- III: Total number of Mirsharai Upazila 2001 and 2011 from census.
- Appendix- IV: Birth number of Chittagong from SVRS, 2016 and census, 2011.