A Project Proposal of Resettling the Evicted People from the Bank of the Ichamati River to Hemayetpur, Pabna Municipality.

Course Code: URP 3102
Course Title: Urban Planning Studio

A Project Proposal of Resettling the Evicted People from the Bank of the Ichamati River to Hemayetpur, Pabna Municipality.

Submitted to:

Ferdous Farhana Huq
Assistant Professor, Department of URP, RUET.

Muhaiminul Islam
Lecturer, Department of URP, RUET.

Submitted by:

Group: 14
Md. Ashiqur Rahman (1707041)
Md. Alif-Al-Maruf (1707044)
Antar Banik (1707051)
Md. Shahriar Ahmed (1707055)

3rd year, ODD Semester
Department of Urban & Regional Planning, RUET.

DEPARTMENT OF URBAN AND REGIONAL PLANNING
RAJSHAHI UNIVERSITY OF ENGINEERING AND TECHNOLOGY

Acknowledgement

We would like to thank the Almighty Allah who grant us a long life with good health and guided us to work on the true path. Without His help, this study could not become fulfilled.

Next, the accomplishment of this study which is helped and directed from our honorable teachers, Ferdous Farhana Huq, Assistant Professor, Department of Urban & Regional Planning, Rajshahi University of Engineering & Technology; Muhaiminul Islam, Lecturer, Department of Urban & Regional Planning, Rajshahi University of Engineering & Technology. They were always happy to solve our confusions and encourage us to reach to the final outcome. Without their help this study would not complete.

Finally, we would also thank those who helped us to collect existing data from various sources. We have no valuable words to express our thanks to them. We express respect, acknowledge and love from the core of our heart.

Date: 15 August 2021

Thankfully,

Md. Ashiqur Rahman (1707041)

Md. Alif-Al-Maruf (1707044)

Antar Banik (1707051)

Md. Shahriar Ahmed (1707055)

Abstract

Pabna, a less populous and small city with a municipality area of approximately 27 sq. km. Ichamati, a branch of mighty Padma River passes through the Pabna city. Illegal ribbon development is raised along this river that's why it is getting polluted. So, a framework of resettlement with necessary facilities in a neighborhood is proposed for the evicted people of along river. A layout plan and 3D Modelling is prepared for the selected site which is Hemayetpur, a fringe area of Pabna. The aim of the study is to resettle the evicted people from the riverbank area to Hemayetpur in a self-reliant neighborhood. Existing data is collected through questionnaire survey by taking 90% of confidence level and the riverbank area is found as a polluted distorted and occupied area by local dwellers. Secondary sources of data help to calculate the FAR, set back, height of buildings, and help to review the literature including Nandyavarta pattern or Resettlement Action Plan (RAP) and so on. By using AutoCAD and Sketch up Pro software, 2D layout and 3D modelling are done in 14.2-acre area respectively where plot calculations, variations of buildings play an important role. All the services and facilities are provided with variations and landscapes for enjoying the area for approximately 5000 lower-middle class population. 3D Modelling, calculations of costing, cost recovery and building policies or standards can help the authority with valuable information for the future development of the proposed area.

Keywords: *Evicted, Resettlement, Neighborhood, Nandyavarta Pattern.*

Table of Contents

Tables

Table of figures

Chapter 1: Introduction

1.1 Background:

Resettlement means the settlement or migrate of people in a different or new place where facilities are provided. In everyday life people are enforced to go from one place to another due to various reasons. Because of climate migration or pull or push factor or urbanization people come to their interfaith place and make household for living in illegal or legal places. They sometimes pollute their surroundings by their daily life wastes which is happened for lack of planning knowledge and awareness or negligence of government or not understand the convenience latrine or septic tank and dump their household wastes or bone meal in an appropriate place. Whichever make that place malodorous and the site become distort and deteriorate. For salvation the site, government take a control technique step which is Resettlement. Planning resettlement appropriately with well managed engagement of relevant stakeholders have been shown to gain the trust of local communities, formed more collaborative relationships with governments and been able to minimize disruptions to the business. (Reddy et al 2015).

Pabna municipality lies at the Pabna district in Bangladesh. It is located in 24°01' N and 89°13' E. Area of this place is 27.43 sq. km. It is the west-central part of Bangladesh. Mighty Padma River passes beside the municipality. Ichamati is a branch of Padma which is passes through the municipality. Along the river many legal and illegal infrastructures are built. Inhabitants along the river occupy most of the river land. They live here since long ago. They create a bad influence on environment in these places. They built their shops, houses, latrines etc. along river and consume a portion of land illegally. Solid wastes are thrown in the river instead of dumping in dustbin. According to Water Development Board's feasibility study based on the Cadastral Survey record map of the river, several thousand illegal structures including over 400 concrete buildings have been identified on the river land areas in Pabna town. Around 5000 people are evicted. Several occupiers of the river land have legal documents of the lands. According to the government's Cadastral Survey (CS) records, published in 1922, the nine-km section of the river that flows through Pabna municipality had 88.58 acres of riverbed. But the area dropped to only 54.53 acres as shown in the most recent Bangladesh Survey (BS) record map in 2013 according to the district settlement office. To get a healthy river, dwellers along river have evicted by giving compensation and migrate them in a new place.

A new place will be proposed in the municipality or in the fringe of municipality. Land acquisition and resettlement process will be done according to policies and standards. Public facilities or utilities will be provided for the dwellers so that they can lead a healthy life in a smart environment. An organized design and proposal of the project creates a sustainable and eco-friendly site. Improvement in living condition is one of the main purposes. Collaboration among stakeholders will help to give a successful resettlement program.

1.2 Objective of the study:

1. To resettle the evicted people of the Ichamati river side in a well-planned neighborhood.

1.3Scope of the Study:

A planned residential site is mandatory for better living and makes a planned city. This study covers most of the issues of neighborhood residential area development for evicted people and

designed the area as a lower-middle class residential area. This study maintains the principles of neighborhood planning. This study focuses on providing necessary recreational places, community facilities, and services which are the prime elements to make a neighborhood suitable for living. So, corner shop, Katcha Bazar, park, playground, health complex are provided in the center of the site as people can easily access there. A proper road network is designed for ensuring easy access to all places. Also, enough nursery and primary schools are provided for educational purposes. Moreover, some mosques/temples are provided for religious purposes. In the residential unit, some corner shops are provided. Hence, the design includes all the facilities that a resident requires to enjoy a comfortable, happy, and friendly life. It is believed that this study may help to the Pabna Municipality and local government in future.

1.4. Limitation of the Study:

This study could manage most of the issues of the neighborhood residential area development and Hemayetpur area. But with the lack of time and COVID-19 pandemic situation, our study skips some minor issues that could enrich our planned strategies. Besides, the lack of information about the selected area from secondary data is another limitation of our study. Although the study could not overcome these limitations, all the obtained results still are helpful to have better planning and proposed a well-designed plan in Hemayetpur.

Chapter 02: Literature review

Resettlement

Population migration or resettlement is the movement of a large group of people from one region or place to another, often a form of forced migration imposed by district policy or national authority or international authority. Sometimes the affected population is transferred by force (both legal and illegal) to a distant region or place, perhaps not suited to their way of life, causing them substantial harm. Again, when evicted, the loss of all immovable property and the loss of actual amounts of movable property are implied. Sometimes, compensation is also given to the evicted dwellers. This transfer may be motivated by the more powerful party's desire to make other uses of the land in question or, less Often, by disastrous environmental or economic conditions that require relocation.

Policies**:**

In a number of countries there has been an increase in legislation regulating land access and resettlement however, most countries still have limited applicable laws dealing with only some of the relevant issues, for example compensation, expropriation and building standards. Areas that are often poorly addressed include community engagement, livelihoods, monitoring and evaluation, and reporting. As a result, the reality is that mere compliance with national requirements does not always enable a company to fully address key social risks and challenges. Like; The International Financial Corporation (IFC) standards apply to private-sector clients of the IFC. However, they are generally regarded as the guiding standard in the extractive sector, with the expectation that companies comply with them or model their own corporate standards on them. Often the standards apply because the financial institutions providing project finance are Equator Principles signatories.

Impact Assessment**:**

The environmental and social impact assessment is the means by which companies assess their impacts on people and the environment early in the planning process. The process normally results in the development of an environmental and social management plan and systems to manage identified impacts, both positive and negative. The resettlement action plan can be one of these management plans. However, often the linkages to other plans are not properly established and as result relevant impacts are not properly assessed.

Planning Process**:**

Take steps to avoid and minimize displacement to the extent possible, but carefully consider life-of-project land requirements. Involve social experts in the definition of the project area to identify opportunities for minimizing displacement. Resettlement can be minimized through various measures, including location and design of project infrastructure and the development of guidelines to minimize the areas alienated from agricultural use. Consider innovative approaches to land access and management, e.g. the use of satellite imagery to minimize displacement.

Stakeholder Engagement**:**

Stakeholder engagement is a two-way process of communication and interaction within and between a project and each of its stakeholders. It involves meaningful and multifaceted engagement with both external and internal stakeholders. It is an ongoing process throughout the life of a project. Inform, consultation, involvement, collaboration, and empowering are the main elements in stakeholders engaging.

Resettlement Packages**:**

The resettlement packages and assistance would typically include, cash compensation for assets, including crops and structures, provision of resettlement housing, provision of a resettlement site, allowances to facilitate the moving process, livelihood restoration programs, physical resettlement requires effective identification, design, planning and construction of alternative villages, housing and related facilities.

Restoring sustainable livelihoods:

Some aspects, such as income and other social factors such as education, health, and social cohesion, are required for the restoration of livelihood, which is gaining growing respect. Instead of recognizing and developing social performance criteria, the restoration of livelihood is frequently not appropriately focused and planned. As a result, it is unable to repair or improve livelihoods in a sustainable manner.

Identifying and supporting vulnerable groups:

Landless squatters and tenants are vulnerable households with inadequate labor resources, such as those headed by women and in poor health. Special or "at-risk" groups, according to the International Finance Corporation (IFC, 2012), are "those who, due to their gender, ethnicity, age, physical or mental handicap, economic deprivation, or social standing, may be more diversely affected by displacement than others and it's possible that they won't be able to claim or use relocation aid or other development benefits".

Resettlement Action Plan (New Bohol Airport Construction and Sustainable Environment Protection Project, 2013) was studied and had understood of this plan phases.

Neighborhood Planning:

According to the study "Town Planning" by Rangwala, neighborhood planning is an attempt to form various physical units of residential areas in which people belonging to a particular rank of life settle or stay. It is the intention of a town planner to rejuvenate the valuable idea of neighborhood which has been lost in busy uncontrolled city life. The principle of planning a neighborhood unit are Facilities, Population, Sector, Size, Street system. (Rangwala, 1999)

Residential area planning:

In neighborhood planning, the Residential area is the main concern of any project. Desh Pande has given certain principles that can be used as guides for residential planning such as aspect, prospect, sanitation, flexibility, communication, practical consideration. The main feature of the study on "Almeria Verde Dagupan City at Bolosan district in Almeria, 2011" had road patterns, plotting, open spaces, playground, and community facilities. It is purely a residential

area without having any commercial zone. An easy and well-connected road network is noticed in this city. In the selected site, pure residential areas are planed with this concept. Road patterns are changed according to necessity. For proving well access to each part of the site, roads are placed by giving great concern. Necessary facilities are included within the walking distance. Police box and guard rooms are also included for ensuring the safety of the residents.

Planning Standard:

Planning standards are a set of criteria for determining the scale, location and site requirements of various land uses and facilities. As planning standards and guidelines could affect the allocation of scarce land and financial resources, they should be applied with a degree of flexibility. To this end, some standards are obligatory whilst others are recommendations to guide the developer. The mandatory standards are minimal space requirements or basic considerations that must be satisfied. The discretionary standards are advisory and dependent on other factors. (Town and Country Planning Department, 2011). The overall proportion such as 65% of the total area is considered a residential area, 35% of the total area is community facilities. Space standards for Urban Community Facilities in acres by Population Sizes (Bangladesh Gadget Additional-Tafsil 3) is followed for taking standards.

In planning standards, proper FAR area, setback area and minimum parking requirements are given. For 4 Katha area FAR is 3.50, MGC is 62.5%. For 3 Katha FAR is 3.35, MGC is 65% and for 2 katha FAR is 3.15 and MGC is 67.5%. All types of planning standards are followed by the Imarat Nirman Bidhimala.

Nandyavarta Pattern:

Evicted lower-middle income group housing is inspired by Nandyavarta concept. Nandyavarta is an Ancient Indian City Planning pattern. It can be Square or oblong or rectangle. There can be five, seven sets of streets with a row house on each side. The lanes which are traverse between main roads should have no houses. Small roads are at interval of six or seven rajjus where 1 rajjus= 10 dandas=60 feet. Generally, streets are 3, 4, or 5 dandas wide. In this pattern, different classes/caste of people can live together. But in design, single/detached houses are installed for convenience purposes.

Chapter 3: Study area

The Evicted site: The area is situated in the middle of Pabna city of Pabna district. Several thousands of households situated in the both side of the riverbank of Ichamati river which passed through the middle of Pabna city. For the development of riverbank and other valuable reasons, several thousands of buildings including concrete buildings are evicted so the people become homeless. Some people get their new shelter but most of the people remain homeless and they badly need proper households.

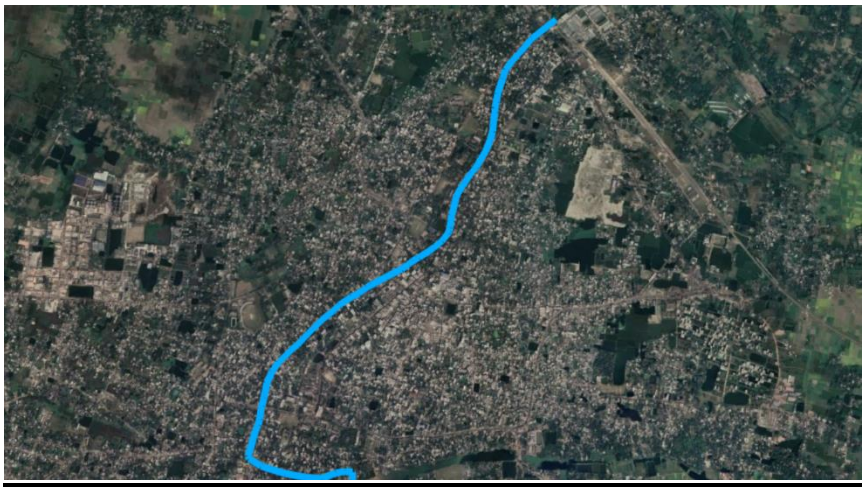

Figure 1: Ichamati River in Pabna District

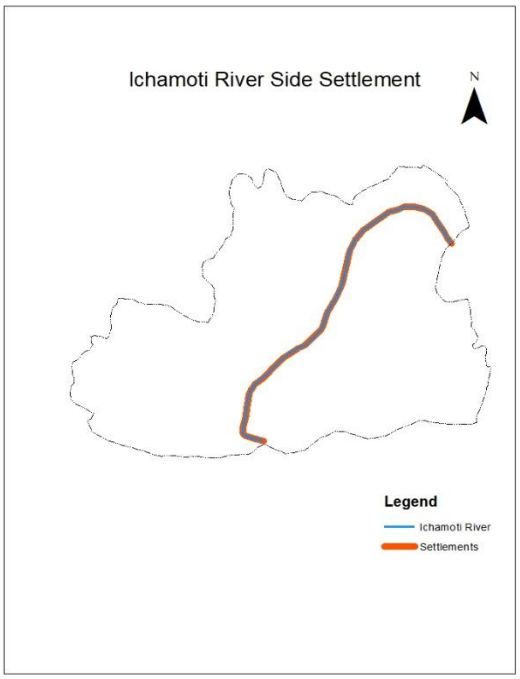

Figure 2: Settlements on the Ichamati River bank area

Location of New Site

The study area is situated in the west side of the of the boundary edge of the Pabna Municipality. The site is under the area named Patkiabari, Hemayetpur which is an area of Pabna Municipality. Around 1.5 kilometer from the CBD. The proposed area is around 14.28 acres for approximately five thousand populations.

The white colored rectangle indicates the chosen area for making neighborhood. There are some strong sides to select the area in urban fringe. This area has a perfect distance from major thoroughfare, accessibility of shops and college, enough drinking water and drainage facility, no undulation in the site is found, it is not far from the CBD, existing environment/context is good, well transportation linkage is remained. This site has some opportunities. There is availability of open space, no industrial zone in this site, no landfill or uncovered dustbin, easy accessibility to highway, no Security systems facility.

Figure 3: New Site for resettlement, Patkiyabari, Pabna Sadar.

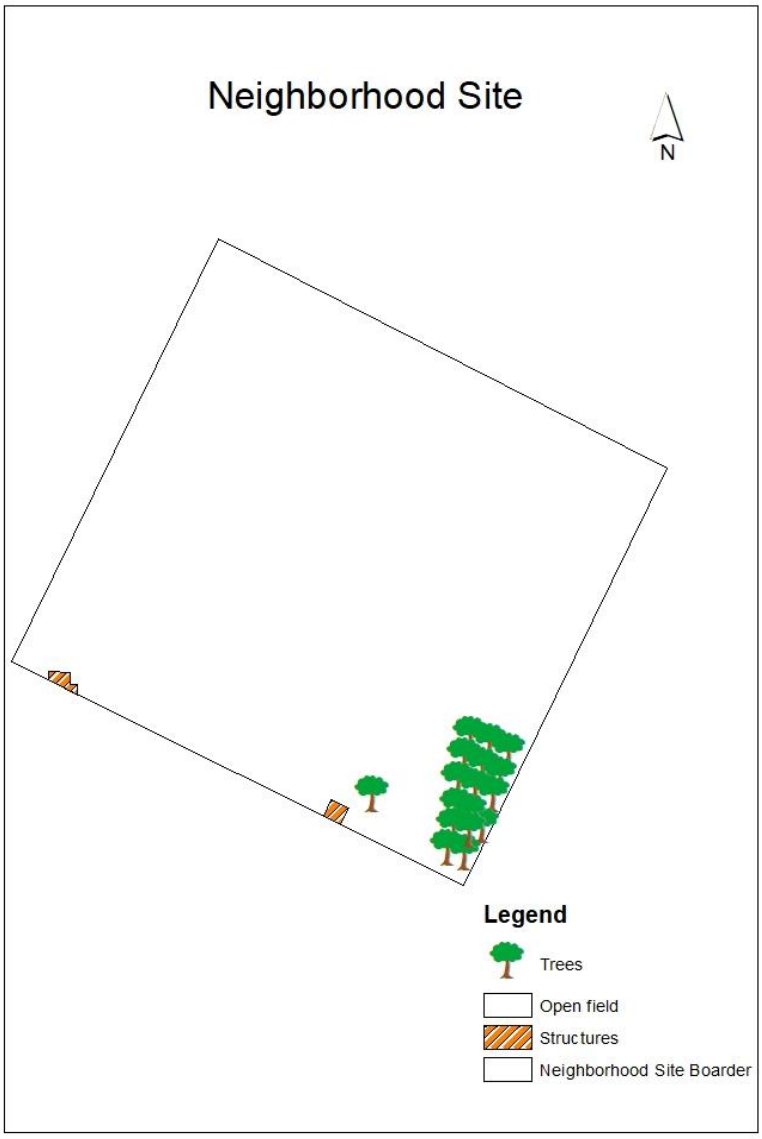

Figure 4: Base map of new site for neighborhood.

Chapter 4 : Methodology

Methodology is one kind of framework of a study. In this chapter, it presents how the study will reach to the end through some processes. It also describes the data collection strategies, choosing a site and the process of designing a neighborhood. The study is done in order to resettle the evicted people from the Ichamati riverside to a well-planned neighborhood. So, a pre-planned framework is followed in order to complete the study. Where the strategies of choosing site, data collection, data analysis, designing processes and other things is included. For the purposes of the study, a study design plays an important role. The study is for the respondents who are living along rivers. A reconnaissance survey is conducted in order to get the information about population, economic classes, and settlements and so on in the river side area.

There are some methods of collecting the data. Some data are collected through questionnaire, physical observation, reconnaissance survey etc. They are mainly primary data. Secondary data is collected from literature review (like theory of resettlement and others), municipality, LGED, and other organizations through internet by using google, Wikipedia or other journals or by gathering from some institution's office.

A well questionnaire is formed to get the primary data from the respondents. The survey collects public opinion or individual characteristics by the use of questionnaire. Stratified sampling method is used in order to collect the information more accurately which is based on the income level, age, gender etc. The sample of the population of the study stood at 68 with the confidence level of 90%.

A coordination schema is formed according to the objectives where some complex and simple variables are included. And then, a questionnaire is designed into many sections by adding demographic or personal information, economic condition data, social or environmental condition data, respondents' desire type or opinion and so on. Likert scale is used for understanding existing services or context. Five-point Likert fashion is placed in the questionnaire which is ranging from 5 to 1. This is a method of collecting qualitative data for quality assessment and converting it to quantitative data. A Focus Group Discussion (FGD) and Key Informant Interview (KII) method is applied for knowing the exact condition and willing of the respondents. Some blank space is placed in the questionnaire in order to gather their open opinion about resettling into a new place and their desires about utility facilities. For more information, recording is also used.

River side settlements map is collected from Google Earth which has shown a haphazard condition of the selected area. After collecting, the data has analyzed through SPSS and Microsoft Excel. Some graphs and plots are formed which are helpful for understanding the output of survey. Experts' opinion is essential for resetting the evicted people. Experts are consulted to learn about resettlement and taking advises. The consultation will help to know how the project will go through and how to engage with stakeholders.

A new area is selected for resetting the evicted people. Google Map is used for choosing the site. By understanding geographical location, access of public services, utilities, community services, distance from workplace etc., this fringe area is taken to resettle. By using GIS tool, a rectangle is used to mark the site in the map and calculate the area of the site and surroundings.

As the site is taken for installing a well-planned neighborhood, so literature review has done to gather the information about Grading, land sub-division principles, C.A Perry's neighborhood theory, National Building Code, Planning standards. These would be followed from different journals, research papers, books, national policies etc.

Planning standards is followed in order to install necessary buildings. Planning standard is divided into some sections and it is called Overall proportion. It is mainly for residential, roads, community services, and urban services etc. categories. After calculation and analyzing the planning standards and other policies, a design is drawn by using AutoCAD software. Some distortions are found in measuring. After a number of corrections, a well-planned neighborhood is formed. After checking and getting recommendations from advisors Sketch up is used for 3D Modelling. Making a project proposal is a lengthy process and without skilled staffs it is impossible to get a well neighborhood.

Chapter 05: Data Analysis of River Side Settlements

5.1 Age of the respondents

This pie chart shows the age of the respondents. It is found in the chart that 73% people of the Ichamati river side area are aged under 40. Here 20% respondents are aged between 31 to 40. And the rest 7% of the respondents are aged greater than 20 and less than 30.

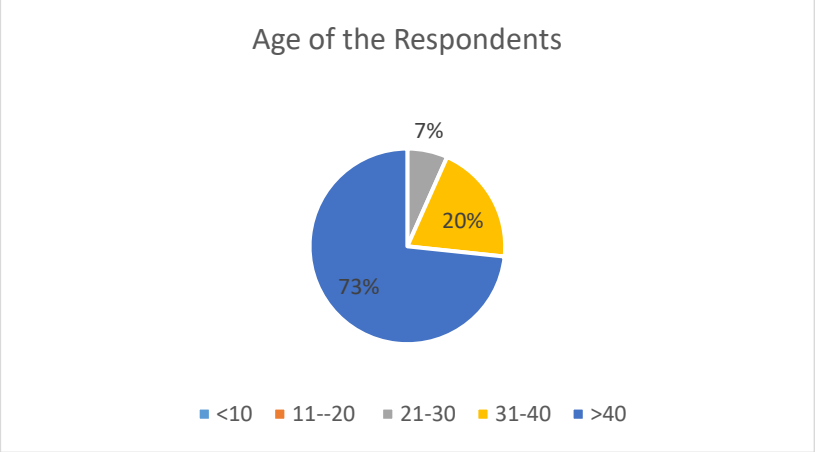

Figure 5: Age of the respondents.

5.2 Existing Amount of land of the people of Ichamati Riverbank area

The given pie chart provides information about land of the respondents. It can be clearly seen that there are various amounts of land. But the chart shows that the majority of the lands are 3 katha plots and about 40 % of the area is consist of 2 katha lands. Here it can be also seen that about 7 % of the lands are consists of 4 katha plots. The respondents of the area are mostly low-income people that's why they prefer 2 katha and 3 katha plots most.

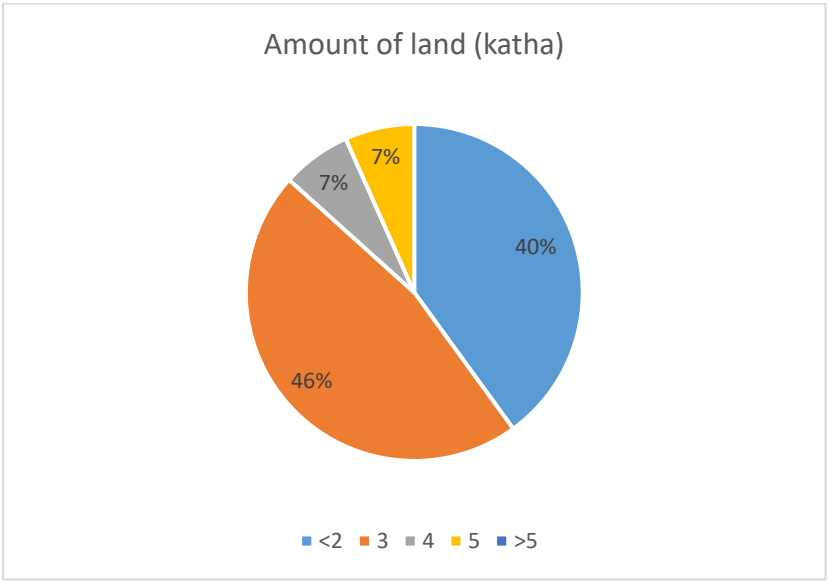

Figure 6: Existing Amount of land of the people of Ichamati Riverbank area.

5.3 Settlement Pattern in the Ichamati Riverside area

The following pie chart shows that the condition of the house of the respondents. It is clearly seen that most of the respondents prefer detached house. A few respondents like grouped house and almost 14 % houses are grouped houses. The rest of the houses are semi-detached and almost 13% houses are semidetached houses.

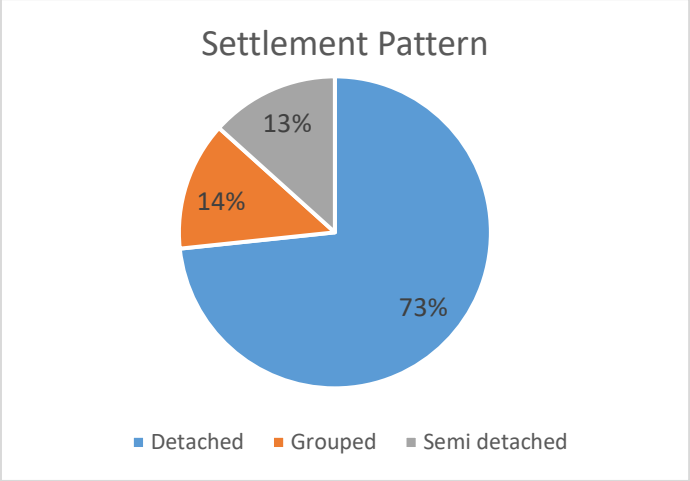

Figure 7: Settlement Pattern in the Ichamati Riverside area

5.4 House type in the Ichamati Riverside area

This chart shows the types of the houses of the respondents. Here it is seen that maximum houses are semi pacca. About 47% houses are semi pacca. On the contrary, 33% of the houses are katcha. As the maximum respondents' houses are illegal, they prefer katcha and semi pacca house. And the rest of the houses about 20% are pacca houses.

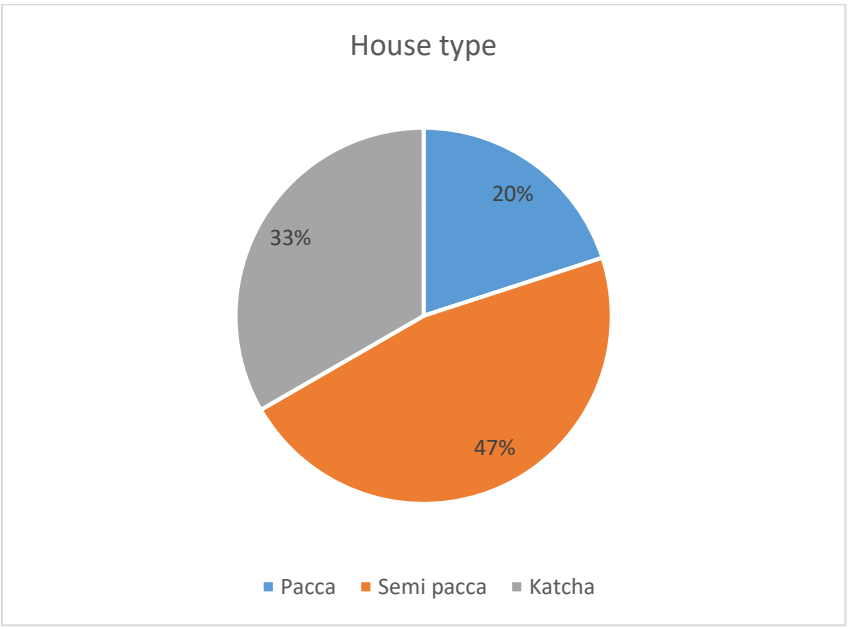

Figure 8: House type in the Ichamati Riverside area

5.5 Building material of the settlements of Ichamati river bank area

This following pie chart shows the structure of the houses of the respondents. Here it is seen that maximum houses are made by brick. About 47% houses are made by brick. On the contrary, 33% of the houses are made by tin. As the maximum respondents' houses are illegal, they prefer tin and concrete house. And the rest of the houses about 20% are made by concrete. It is clearly seen that most of the house are made by brick.

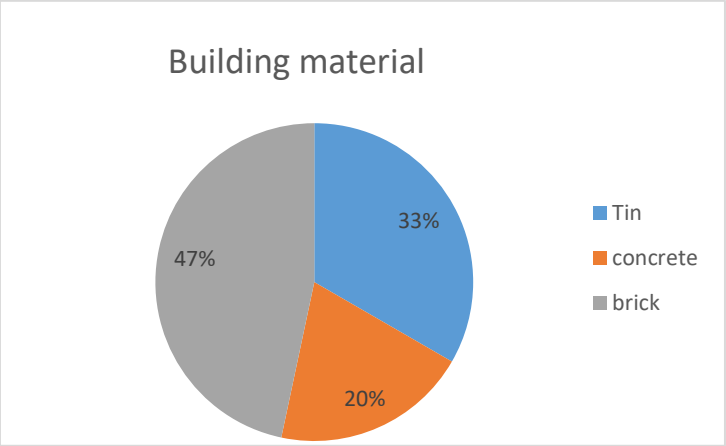

Figure 9: Building material of the settlements of Ichamati river bank area

5.6 Evicted people's willing of land size

This graph shows the willingness of people of getting land in the resettlement project. Here it is seen that about 47% of the people will be satisfied by 3 katha land. Moreover 40% people will be happy by 2 katha. On the other hand, only 13% people want 4 katha for their dwellings. As their income is high, they demand more land for their residents. The low income people just want a land to live with their family members. That's why their ambition is not so high.

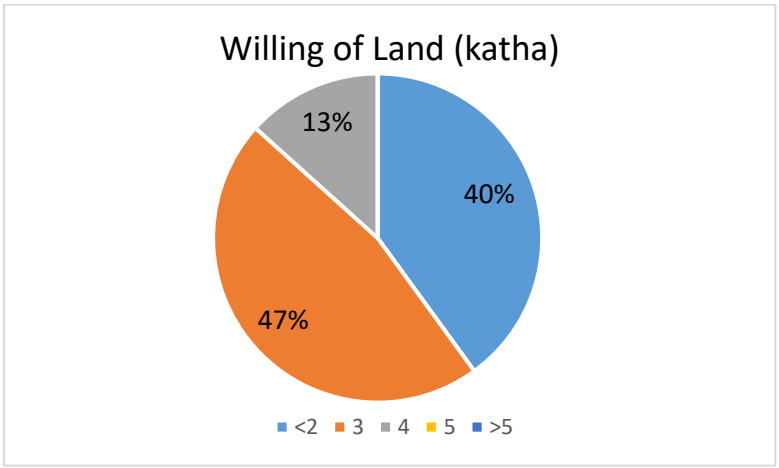

Figure 10: Evicted people's willing of land size

5.7 Peoples willing about the material of their new house:

This graph describes the willingness of people of using house materials in their dwellings. People want to lead a healthy life. Here it is found that about 73% of the people want to build their house by concrete. On the contrary, 27% people will be happy by houses made of tin shades. Most of the People want durable and natural disaster resistant houses for their livings.

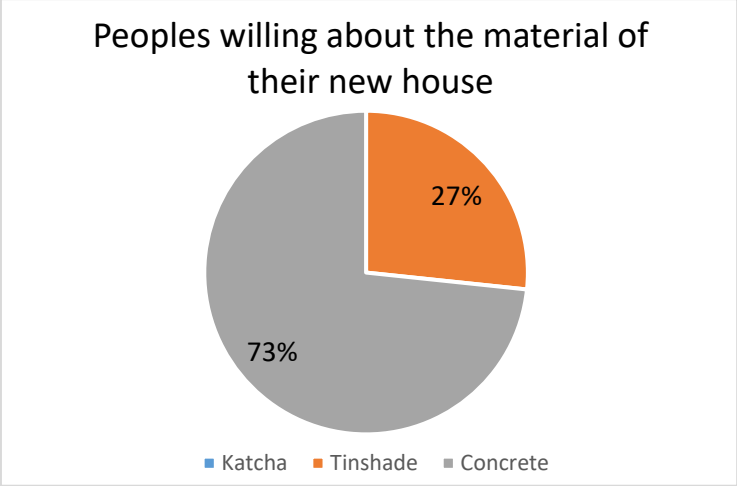

Figure 11: Peoples willing about the material of their new house

5.8 Peoples willing about the type of their new house

This chart shows the willingness of people about the types of the houses. Here, it is found that maximum people want semi-pacca houses for their livings and it is about 73% people. People who live in the katcha houses beside the Ichamati river, they want to live in semi pacca house in the resettlement project. People who have a good amount of income, desire to live in pacca house.

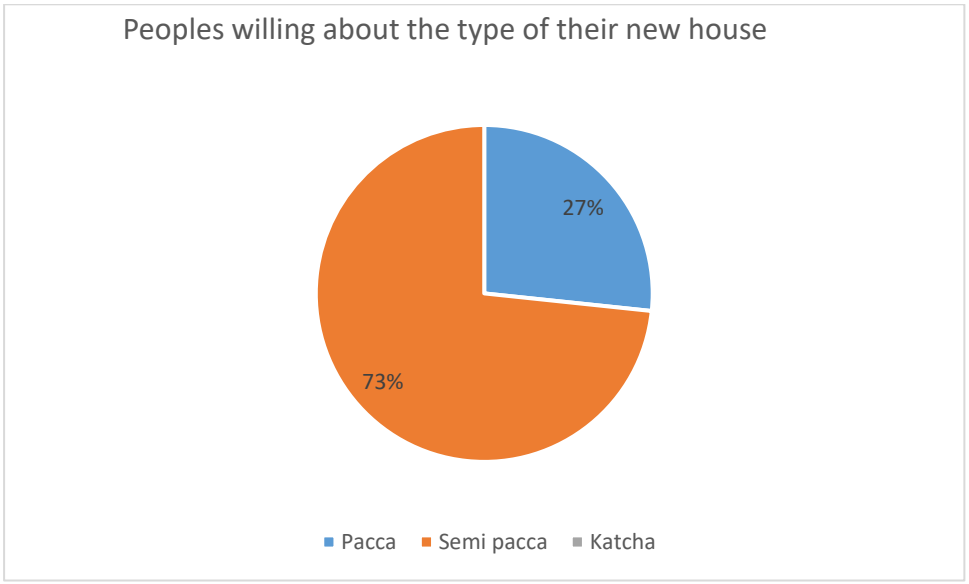

Figure 12: People willing about the type of their new house

5.9 Peoples willing about the pattern of their new house

This chart shows the willingness of people about house pattern in the resettlement project. Almost 87% of the people want detached house. As people want more freedom to customize their property, they want to live in detached houses. On the other hand, very few people express their willingness for grouped house.

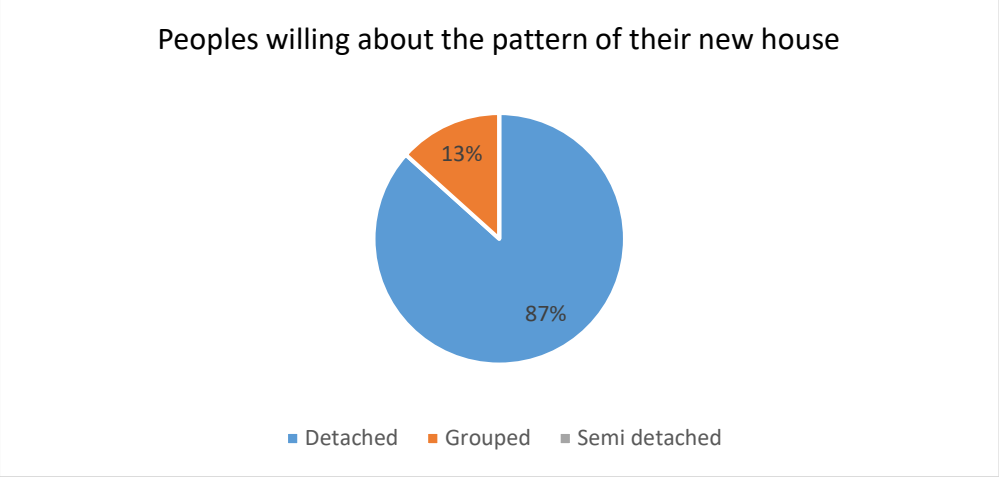

Figure 13: Peoples willing about the pattern of their new house

5.10 Income of the evicted people

The pie chart shows the income range of the evicted people from the Ichamati riverbank area. It is seen that almost 33% of the people's income is between 14000 to 17000 taka. Almost 47% of the respondent's income is more than 14000 so it can be said that the area is more like a lower middle class area. There are also family which has an income of less than 10000 taka and that is almost 27%.

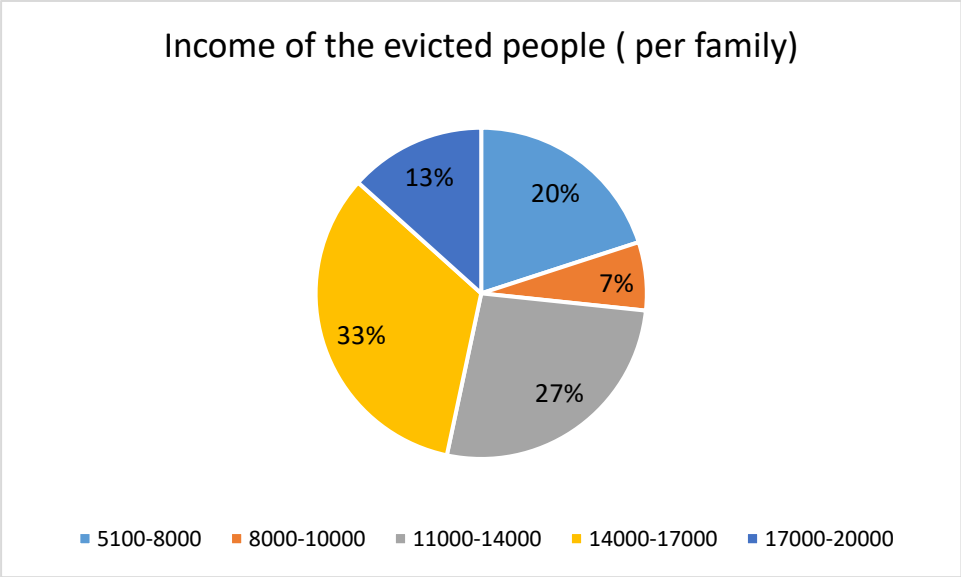

Figure 14: Income of the evicted people

5.11 Satisfaction level of the evicted people about the utility facility of their present area
Electricity

The pie chart shows the opinion of the people about the electric facility. It is seen that almost 27% of the people think the electricity facility is poor because of too much unnecessary load shedding and 73% of the people think it is acceptable. But as 27% people are not satisfied so it can be said that the electricity problem should be make in count and electricity facility should be improved.

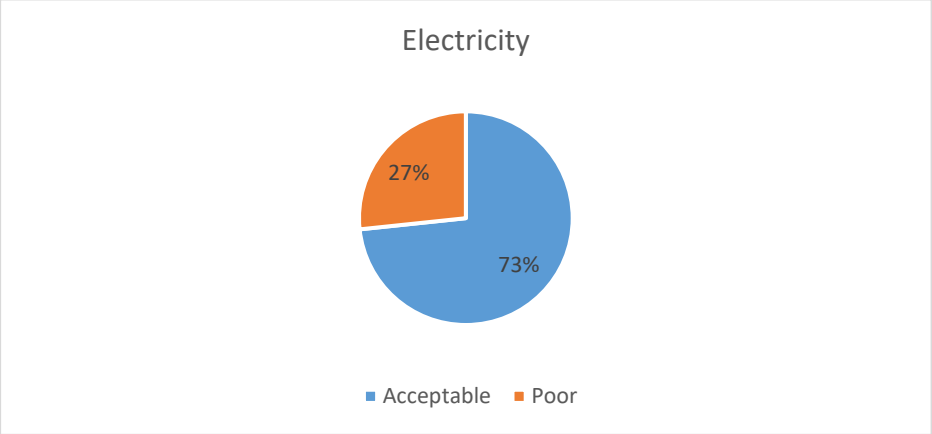

Figure 15: Satisfaction level about the utility facility (electricity)

5.12Drainage

The pie chart shows the opinion of the evicted people from the Ichamati riverbank about the drainage facility. It is seen that no people is satisfied with the drainage system. 53% of the people think the drainage system is poor and rest of the people think the drainage system is very poor. As there is no well water flow and so the drain is blocked and during rain the dust overflowed and made the road unsuitable to use.

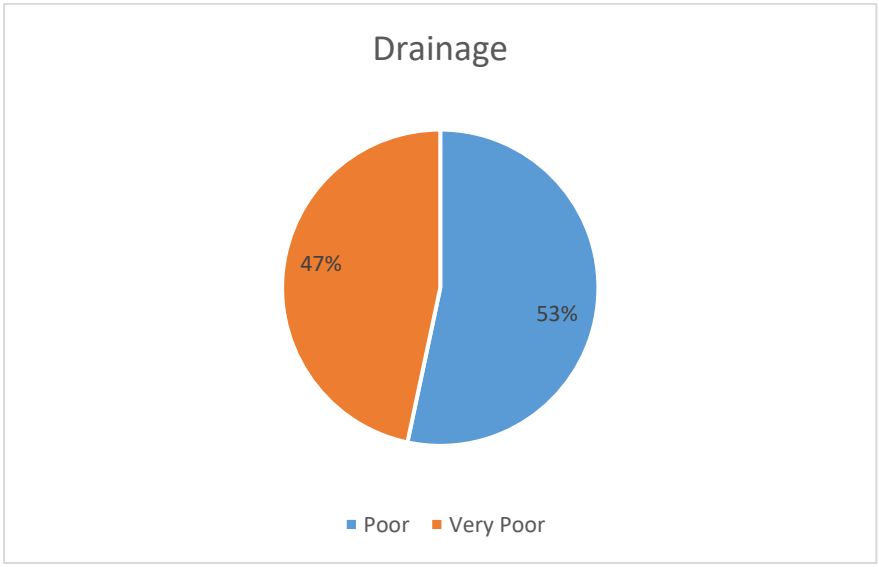

Figure 16: Satisfaction level about the utility facility (drainage)

5.13Sewerage

The pie chart shows the opinion of the evicted people about the sewerage system they use to live in. It is seen that almost two third of the respondents think the sewerage system is very poor. And 13% of the people think it is poor. So it can be said that almost 80% of the people are not satisfied with the sewerage system which is a big problem for them.

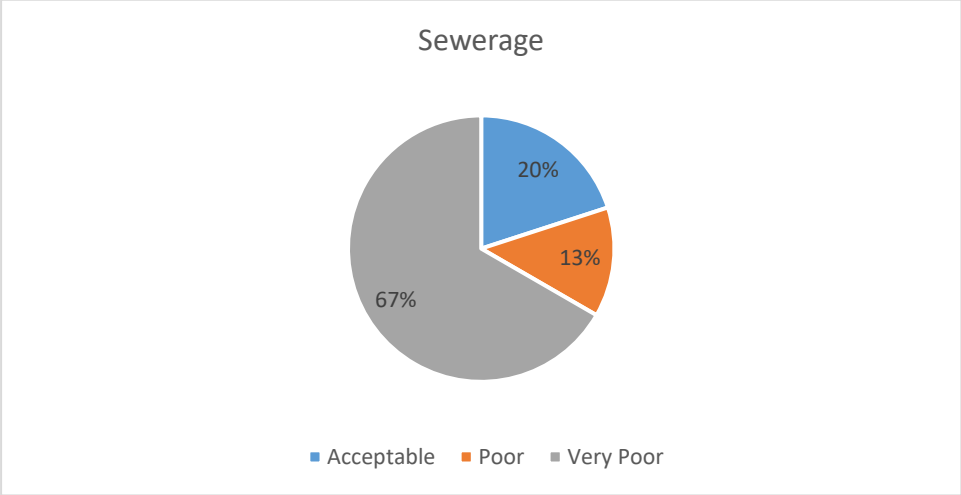

Figure 17: Satisfaction level about the utility facility (Sewerage)

5.14Transport

The pie chart shows the opinion of the people about the transport facility of the Ichamati riverbank area. It is seen that almost all the people think the transport system is good enough for them. So they are satisfied with the transport facility they got.

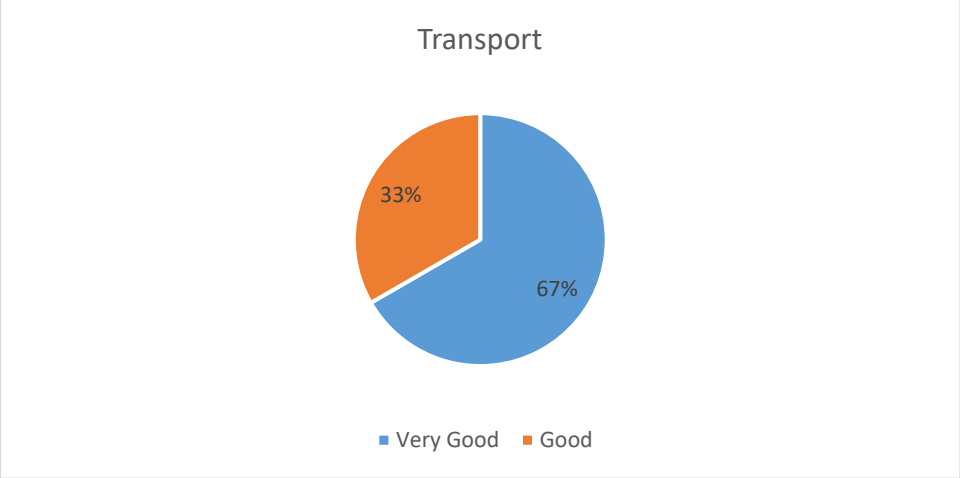

Figure 18: Satisfaction level about the utility facility (Transport)

5.15Environment

The pie chart shows the opinion the evicted people about the environment of the Ichamati riverbank area where they used to live. It is good to see that they were quite happy with the environment as 73% of the people think the environment is acceptable. So it can be said that almost 100% of the people are satisfied with the environment of the evicted area.

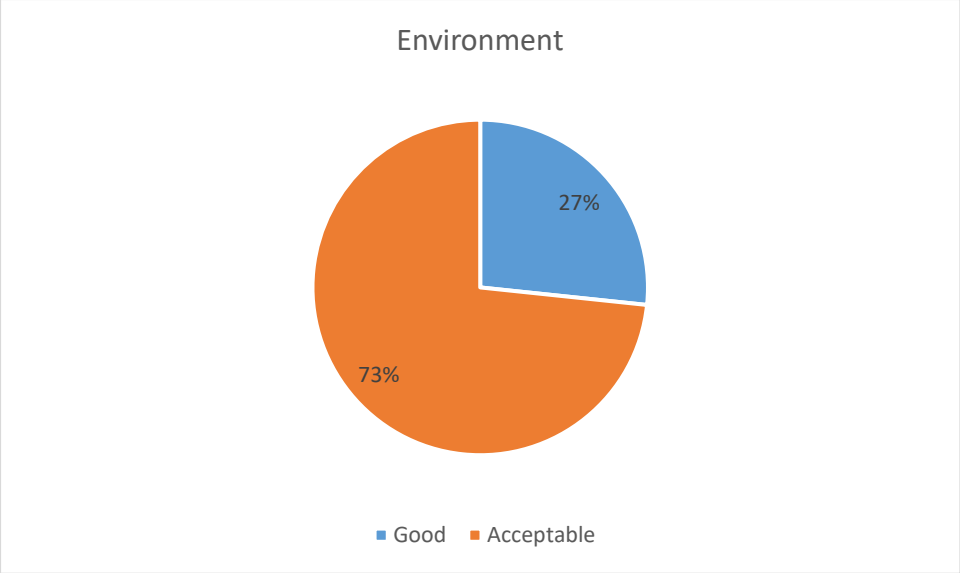

Figure 19: Satisfaction level about the utility facility (environment).

Chapter 06: Design Analysis

6.1: Design Analysis for 2D Modelling

2D design for site development

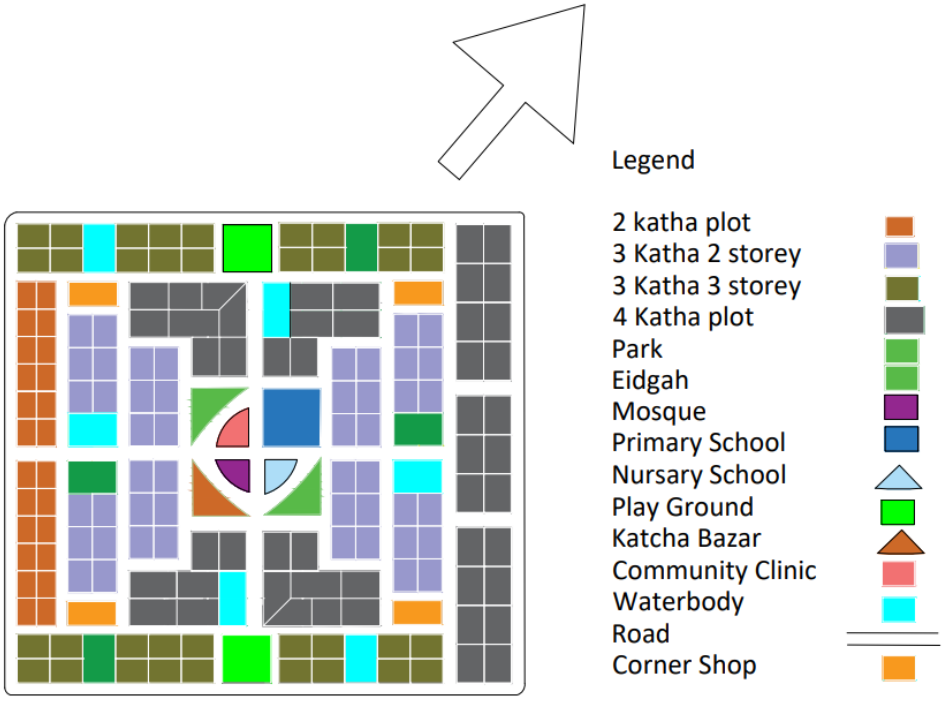

Figure 20: 2D model of the new neighborhood

A 2D map of the neighborhood is prepared in AutoCAD software which design is inspired by an old design called 'Nandyavarta'. The design is a modified one from Nandyavarta where the design has a symmetrical balance in it. The design is generally a symmetric one and it can be divided by 4 similar like parts.

The area of the neighborhood is around 14.2 acres where 9.282 acre is used for residential housing purpose and rest is used for roads, community facilities and so on.

Here, in this design different sizes of plots are used. The size of the plots are 2 Katha, 3 Katha and 4 Katha. In this design there are 44 number of 2 Katha plots, 100 number of 3 Katha plots and 50 number of 4 Katha plots. 2 Katha plots are used for one storied tin shade buildings, 4 Katha plots are used for three storied buildings and forty-four 3 Katha building is used for 2 storied building and 56 plots are used for 3 storied building.

There are two types of roads in this neighborhood. The minor access road is16 feet wide and the width of the access road is 12 feet which will give access to every single house.

A central primary school and nursery school is placed in the design which are in walking distance from every part of the neighborhood.

A mosque, health clinic, katcha bazar is also placed in the central area of the neighborhood. There are 4 places for corner shops or small markets in the neighborhood which includes a mosque for each one.

There are two parks in this neighborhood for the residents for refreshment. A lot of green fields and waterbodies are placed in this neighborhood in order to make the neighborhood eco-friendly.

Space Standards for Urban Community Facilities in acres by Population size

Community Facilities	Area (acre)	Area (sq. m)
Education		
nursery	.4	1618.7424
Primary	.6	2428.1136
Health		
Health center	.075	303.5142
Community center/mosque	.2	809.3712
Recreation		
Play ground	.9625 = approx. 1	4046.856
Park	.9625 = approx. 1	4046.856
Commercial		
Corner shop/Kacha bazar/Market	.3	1214.0568
Roads		
Residential Roads	1.7	6879.6552
T. Area	5.2	21043
Net Residential area	9.08	36745.4525
Gross residential area	14.28	57789.1037
Population per acre	**350 people**	

Table 1: Space Standards for Urban Community Facilities in Acres by Population size

Plot information

Plot type	No of plots	Stored	Unit	Buildup area (sq. ft.)
2 katha	24	1	1	648
3 katha	56	2	2	980
3 katha	44	3	3	980
4 katha	50	3	4	1259

Table 2: Plot information

Parking

Parking would be three types one is on street parking, off street parking and peripheral parking scheme. Off street parking is used in different types of building's basement, ground floor, side of the road, behind the buildings, side of the entrance, in front of the buildings etc. On street parking is used beside the parks or open spaces, in zigzag portion, side of the road, on road etc. Parking for lessening the jam, nuisances of dust, noise and accidents. In the plan, only off-street parking could be provided in some community services building.

Off Street Parking: From Imarat Nirman Bidhimala, an off-street Planning Standards is found. According to variance of vehicles like general vehicles or cars, Bus or trucks, Bikes, Teller van parking standard is made. Necessary parking will be installed in the site by following the parking standard.

One general car or vehicle covers (2.4 * 4.6) m^2 = 11.04 m^2. But for many cars, the width of the car is reduced and this is 2.3 m. and per one bike (1*2) m^2 = 2 m^2 is provided.

Parking Standards**:**

Type of vehicle	Parking length (m)	Parking width (m)	Moving radius (m)	External radiuses (m)
Each general car	4.6	2.4	-	-
Each bus/track	10	3.6	8.7	12.8m
Each bike	2	1	-	-

Table 3: Parking Standards

NB. When many vehicles are placed then parking width of general car would 2.3m.

Area of the general car parking = (4.6 * 2.3) sq. m = 10.58 sq. m.

6.2: Design Analysis for 3D Modelling

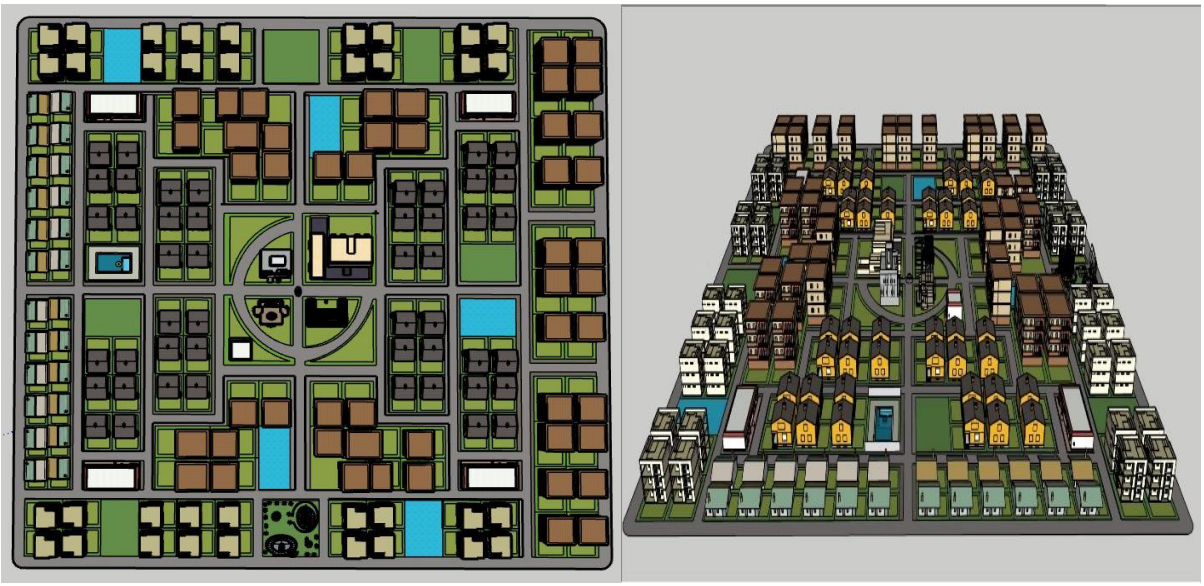

Figure 21: 3D model of the new neighborhood

6.2.1 Introduction

The supply of enough housing in any Neighborhood Development Plan is desired and may be achieved through a variety of methods and procedures. Poor people were not permitted to live in nice homes after the Industrial Revolution. According to Human Rights, everyone has the right to housing, which is the third most important necessity for humans. It is a smallest unit from where the Neighborhood Planning emerges. It must be located and planned with amenities, conveniences, health, and social life of the community.

When a Planner wants to design a Neighborhood Planning, he designs it according to the client's or government's requirement with collecting the existing data and the suggested income group or class group. The good housing reflects the normal welfare of the community. But the bad housing reflects some contradictions like immortality, crime and diseases.

For removing or reducing unnatural life style or unhealthy life problems or psychological problems, there is an important function for the citizens is to develop the maximum opportunities with sufficient play fields, parks etc. beside the housing or public buildings. To maintain these buildings there are some planning standards and building bye-laws, or space standards. There are some important features and amenities are surrounded with the housing and other buildings which are placed in the proper place. Walking distance is important of a Neighborhood Planning. Generally, 5 to 10 minutes walking distance is found in planning. Ventilation and height variations help to circulate air and sun light. Roads with appropriately accessible of buildings and each facility reduce the congestion and make the area more flexible. Ponds and swimming pools are provided for swimming and infiltration of extra water in ground water flow. All these elements help to get a functional and aesthetically pleasing housing planning.

6.2.2 Housing

A house should be pukka, semi-pukka, and katcha. House is a place where can take rest, cook food and sleep with another advantages like shop or working place. One can bring his routine work at home which is found from office, can finish it at night. Day by day we are reaching in a modern life with smart home which requires many facilities. A house is part and parcel of human's life where he spends ¾ parts of his life.

It is the site where some factors should be affirmed.

- Distance from the workplace
- Contour of land in relation to building costs
- Access of parks and playgrounds
- Transport facilities with proper roads
- Location with respect to institutional and public buildings
- Wind velocity and direction
- Accessibility of utilities like water, electricity and waste disposal

The proposed layout plan would fulfill the requirements of the residential buildings. A smart residential building satisfies the requirements of its inhabitants in the best possible manner. There are some requirements which would maintain as follows-

1) **Location**: The residential buildings are ensured freedom from nuisances like noise, dust, smoke and smell is guaranteed. Hemayetpur is approximately 5 km far from the CBD of Pabna. It is place which is used as fringe or commuter zone. People of lower-middle income group should go to the CBD (Central Business District) or their workplace in day and come home in night for sleeping and gives time to family and neighbors. It is free from urban congestion and traffic jam. To mitigate temperatures tress and others vegetation should surround the site. All housing buildings should get facilities of markets, schools, health center etc.
2) **Height**: The height of the buildings are in proportion with the width of road or street. Floor Area Ratio (FAR), Set Back and Light Plane theory are provided for determining the height of the buildings. These help to variance the housing buildings. The plots variation in single storey to 4 storey. This helps to get proper natural and artificial beauty and sunlight. 2 katha, 3 katha and 4 katha plots are used for the housing buildings.
   Floor Area Ratio and Set Back has taken from the Imarat Nirman Bidhimala for getting appropriate buildable site. Maximum Ground Coverage (MGC) is shown in percentage. Through MGC, FAR and plots size, storied of buildings has found. Generally, for buildings, height for per floor is 3.3 meters or nearly 11 feet.
3) **Orientation**: The housing buildings should be oriented and arranged with respect to rain, sun and wind. The entrance of the selected site is from East side. For the design all type of orientations is found such as East facing, West facing, North facing and South facing. 2 katha plots are for single or detached family. All the facings or orientations have different significance. Some orientations are discussing below.

    - **North-facing housing**: Building rooms receive indirect sunlight for the most of the day and direct sunlight for a portion of the day, resulting in well-lit dwelling. Because the sun is indirect, the temperature in the structures is kept at a

comfortable level. Advantage of north-facing apartment is that since the building's exterior will not receive direct sunlight excessively, it will make the paint last longer and retain the aesthetics.

- **South-facing housing**: When it comes to picking house orientation, a south-facing housing complex is another popular option. Because any building facing south in Bangladesh receives frequent cross breezes and has a comfortable interior with plenty of light and ventilation. This is especially beneficial during summer days when temperatures can get very high. Building's interior will have cool temperature and it will save the electricity bill. A good architectural design will ensure most of the building's bedrooms, common spaces are south-oriented.

- **East-facing housing**: The advantage of an east-facing apartment is that it receives maximum direct sunlight throughout the day. The downside is that the front side of the buildings can get unbearably hot during summer. This is especially aggravating if the building's floor design includes beds on the front side, causing residents to be rudely awakened by the sun rising in the east, accompanied with flushing on summer mornings. However, east-facing apartment can provide you with the much-required warmth during cold winter days.

- **West-facing housing**: These types of structures should be avoided unless skilled architects can be found. It will be exposed to direct sunshine in the afternoons and can get extremely hot in the summer. The only benefit of a west-facing apartment is that residents on the top level can see the wide sky and enjoy spectacular sunset views from their balconies.

According to these benefits of orientations the buildings are placed.

4) **Parks:** Generally, the buildings are placed near to play fields and parks. It is accessible for the children to reach the parks without crossing major roads. In the plan, few pieces of lands are preserved for developing the parks and playgrounds in future. A high-class residential neighborhood development planning is incomplete without the setting of parks and playgrounds in the proper place. According to size and location of playgrounds, there are setting playgrounds which depend on the age group. Density of population, width of streets, housing density are the factors to take under consideration.

5) **Privacy**: Buildings are afforded to give maximum privacy to its users. It is desirable to provide the structures of privacy in design of a building even at the sacrifice of some architectural need. Trees are used to increase privacy to the buildings. In housing unit, some different type of trees would be placed by owners which help to reduce noise, harm from balls etc. for privacy purposes.

6) **Security**: The building affords safety and security against theft and fire. Police patrolling are placed different places. Fire station with a great area is placed to solve the security problems. But if the inhabitants of the site do offences or crimes due to their psychological problems for their monotonous life or work or they are influenced

by the sky culture or other unsocial activities, this security system may face in contradiction. There should be ensured that a strong room should contain for the storage of the valuable things of each inhabitant.

7) **Space**: The floor space and the total cubical components of the buildings are in proportion with the number of persons likely to use the building. According to a standard, the floor area and the cubical contents per member is at least 4.65 m^2 and 8.5 m^3. It is very necessary to implement the space standards so that a man can easily move and do his work and get pleasant. The human scale is making the buildings more effective as well as functional. Golden ratio which is commonly found in nature, is maintained in the planning or design so that the elements can get aesthetics and human get pleasant to their eyes.

8) **Ventilation**: The building variation is the main factor to provide ventilation to the buildings. Building's height variations don't resist the sun light and reduce the rigidity or congestion and increase the compaction to the buildings. Wind from the north and south is the main source of provision of ventilation. So, in north and south side of the site, lower storey and variations of height of buildings are provided. Each room get enough convenience according to orientations which give light and air. The area of windows and ventilators excluding frames would be at least one-tenth of the floor area of room.

9) **Utility Services**: It's also the main focus of the residential Neighborhood development planning. Without the proper design the plan must fail. Electricity water, drainage facilities, waste disposal system are provided at any costs.

6.2.2.1 Residential Buildings

2 Katha plot

Figure 22: Residential Building (2 Katha Plot)

2 Katha plot is for detached houses. There are 24 plots in the design which means 48 katha is used for single housing purpose. Set back (front, sides, rear) is maintained so that a gap between two plots and to get a self-reliance of the plot. These plots contain 120 persons where family member is five in ach family.

FAR	MGC in %	Set Back in Meter		
		Front	Rear	Side
3.15	67.5	1.50 m	1.00 m	.80 m

3Katha Plot

Figure 23: Residential Building (3 Katha Plot) a) 2 Storey Building (source: Authors' Drawing) b) 3 *storey Building (*source: Authors' Drawing*)*

3 katha plot is divided into for two types of buildings. They are two storey building and three storey building. These types of detached houses have variation in height, materials, family members, and plot numbers etc. 44 plots take 132 katha which have three storey buildings with 1056 persons. On the other hand, 56 plots take 168 katha which contain two storey building with two units and total population is 1680. Again, these plots contain nearly 2736 persons in total.

FAR	MGC in %	Set Back in Meter		
		Front	Rear	Side
2.75	65	1.5 m	1.00 m	1.00 m

4 Katha Plot

Figure 24: Residential Building (4 Katha Plot)

4 katha plots contain 2400 population. This type of plots has three storied building. Building materials, heights, family members, units are different from other plots building. One building contains four members in one unit and 48 persons in total.

FAR	MGC in %	Set Back in Meter		
		Front	Rear	Side
3.50	62.5	1.50 m	1.50 m	1.00 m

6.2.2.2 Grid Iron pattern in Nandyavarta: It is a pattern which is the natural creator of straight roads with an intersection of four directions. It looks like chessboard and it is called 'Chequered Board' pattern. It provides easy utility connection. This pattern easy to draw in the proposed plan and also easy to implement. That's why grid iron is taken for lower-middle class people. It is called a common and traditional pattern because this pattern is used from the beginning of settlement. It can be drawn on board with appropriate services.

Figure 25: Grid Iron Pattern

6.2.3 Community Facilities

6.2.3.1 Roads:

The road systems of a town or neighborhood are admired. If the roads aren't well-designed, a well-planned neighborhood is ruined. Roads are extremely important in the development of a neighborhood. The infrastructure of roadways with public facilities has an impact on an area's efficiency. Roads provide drainage, and footpaths, among other things.

Roads also provide the advantages to serve air and light to the properties situated on their edges, to serve space for laying the public utility services like drainage pipes, water lines, electric cables, telephone lines, dish cable lines, internet service lines, gas lines etc., to facilitate the communication of human and materials between the various centers of the neighborhood.

Orientation of road of the proposed plan is east to west and north to south with approximately 45-degree angle. Straight roads are installed for easy drainage facilities and footpath.

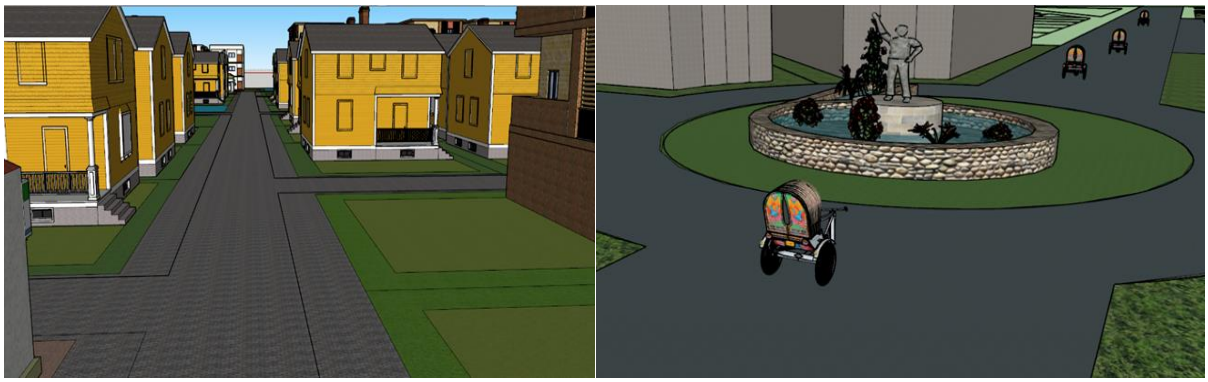

Figure 26:Access roads (left) Major access road (right)

Two types of roads have provided in the proposed design. They are access road with 12 feet and major access road with 16 feet. Access roads carry traffic from buildings to the major access roads, collector roads carry traffic to the major road and vice versa. If the site isn't proper planned, then it is impossible to maintain the hierarchy of roads.
Footpath is made of concrete and neatly dressed stone kerns. Pedestrian ways are used for accessing each individual shops, houses or other public buildings. Traffic island is used for architectural aesthetics by providing fountains, monuments etc.
Road consumes nearly 1.7 acre according to the Space Standards. Most of the roads are straight. But sometimes it is seen that irregular shape is found due to place other facilities. Pervious and impervious materials in roads are placed so that rain water can infiltrate and meet in the ground water level. That's why storm water or rain water couldn't create water logging in this site.

6.2.3.2 Corner Shop:

Figure 27: Corner shop

MGC and FAR is maintained for this development. These plots are used as small shops with multi-storied buildings so that they provide large numbers of population. These shops fulfill the daily necessaries of the inhabitants. Owner of these is lived in this neighborhood but the staffs and labors are from the low-class neighborhood. They work here for their livelihood.

There are four corner shops. Each corner shop consumes 5 katha.

According to Imarat Nirman Bidhimala, shops have FAR, MGC and has minimum set back. Total area of the 5 katha shops is 1214.05 sq. m. There is almost four 5 katha plots for serving the inhabitants. With the necessary parking of total parking area is 402.04 m². These plots might be used as small shops with multi-storied buildings so that they provide large numbers of population. The following table is for each corner shops.

FAR	MGC in %	Set Back in meter		
3.00	60.0	Front	Rear	Side
		1.50	2.00	1.25

6.2.3.3 Health center

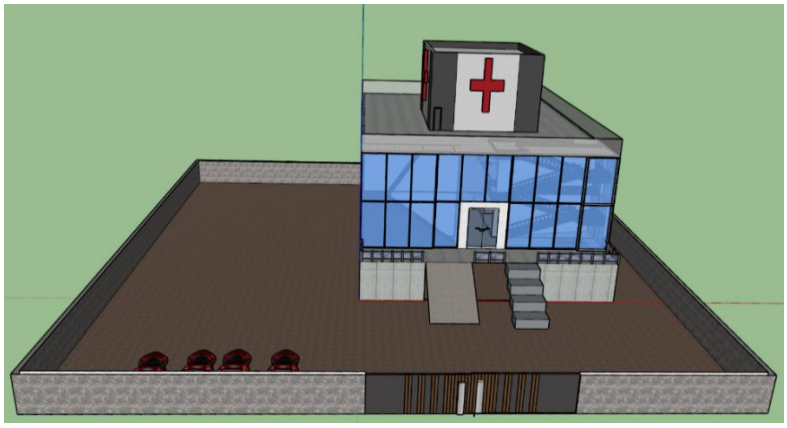

Figure 28:Small health center

Health center will be able to provide overnight care and will have competent physicians and associated health providers on site, as well as staff nurses and other care providers, available 24 hours a day, seven days a week. This clinic will help the people to get proper treatment. Health center takes 303.52 sq. m for one building. These types of buildings serve the people primary treatment within a short time.

FAR	MGC in %	Set Back in meter		
3.25	60.0	Front	Rear	Side
		1.50	2.00	1.25

6.2.3.4 Central Market

Figure 29: Central Market

Community shops, mega shops, supermarkets, Central bazar play an important role in the neighborhood. They fulfill the daily necessaries of the inhabitants.

Marketplace of the area will allow members of the community to purchase and sell goods and services. People will be able to sell and buy their products by these market places. Market will be divided into four blocks. There will be an open space in the middle of the marketplace. It *is* situated almost middle of the neighborhood.

6.2.3.5 Mosque

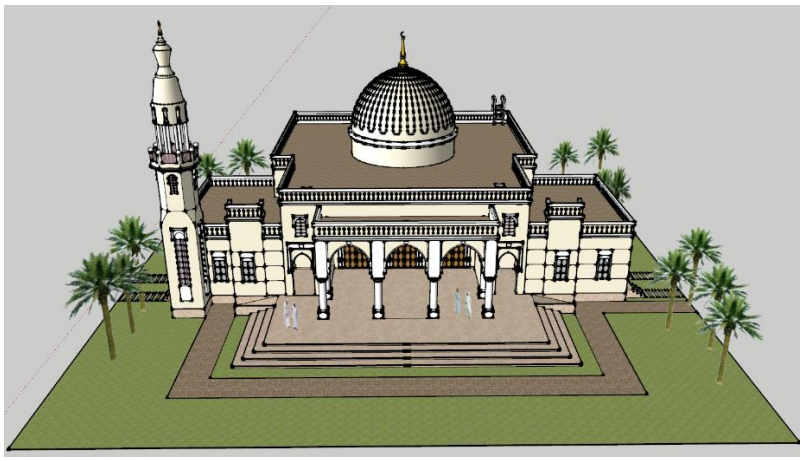

Figure 30: Central Mosque

Mosque in the area take 809.38 sq. m which is found from planning standards. Most of the residents of the evicted area are Muslims. Mosques are the heart and soul of Islamic culture. These are used for prayers, activities during Islam's holiest month of Ramadan, educational and informational centers, social welfare institutions, and dispute resolution. The imam is the mosque's religious leader and the one who leads the prayers. 20 car parking with 211.6 m² parking area for the plot. Setback is for maintaining the space between adjacent plots. Multi-storey and 3.5 FAR to get ventilation and protection from hazard or fire.

FAR	MGC in %	Set Back in meter		
3.50	50.0	Front	Rear	Side
		1.50	2.00	1.25

6.2.3.6 Educational Institution

Nursery school

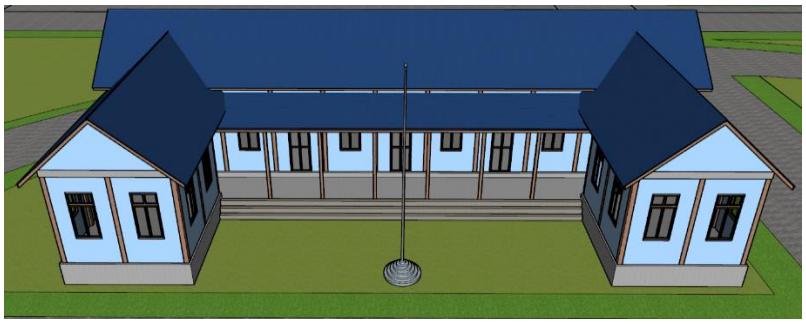

Figure 31:: Nursery school

A nursery school is built for children. The school is the society's backbone. The children of this community will get their primary education from this institution. Moreover, the school also helps to the community by employing local teachers. The school is situated in the center of the area. It's tin shade building. A nursery school will take 1618.75 sq. m area for the neighborhood. Usually, for a small area a nursery should be placed. Nursery school is placed with the primary school.

FAR	MGC in %	Set Back in meter		
3.50	50.0	Front	Rear	Side
		1.5	2.00	1.50

Primary School

Figure 32: Primary school

According to Clarence A. Perry, a primary school should be placed for five thousand populations in a walking distance. A primary school is proposed for the juvenile of the neighborhood. This school take 0.6-acre area with necessary facilities. It will improve student's attitudes and behaviors in addition to performing the academic functions of increasing knowledge and career preparation. It will also help the process of community

development. This will be a 2 storied building with multiple classrooms. There will be a library for students and others facility for the students which are needed.

FAR	MGC in %	Set Back in meter		
4.00	50.0	Front	Rear	Side
		1.50	2.00	1.50

6.2.3.7 Open space

Open space is any open piece of land that is undeveloped (has no buildings or other built structures) and is accessible to the public. EPA describes, open space can include:

- Green space (land that is partly or completely covered with grass, trees, shrubs, or other vegetation). Green space includes parks, community gardens, and cemeteries. Schoolyards
- Playgrounds (including different types of court)
- Public seating areas
- Public plazas
- Vacant lots

(EPA- Environmental Protection Agency, England)

Open space provides recreational areas for residents and helps to enhance the beauty and environmental quality of neighborhoods. But with this broad range of recreational sites comes an equally broad range of environmental issues. Just as in any other land uses, the way parks are managed can have good or bad environmental impacts, from pesticide runoff, siltation from overused hiking and logging trails, and destruction of habitat.

Small Park:

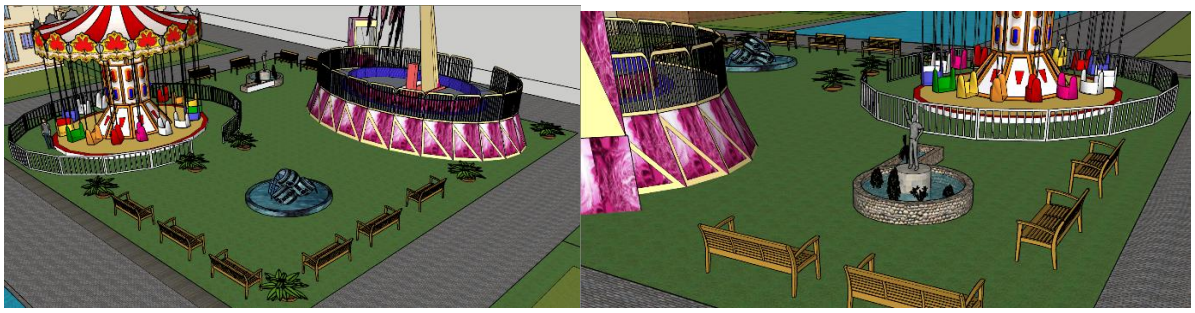

Figure 33: Park in the neighborhood

With other facilities, parks are also important to establish and maintain the quality of life in a community. These Park will provide the community with inherent environmental, aesthetic, and recreational benefits. These Park will also create economic benefit for government, agency and stakeholders involved in this project. These Park will be divided into two parts.

Playground:

Figure 34: Playground

There are four playgrounds in this plan. There should be a playground within 400 m to 800 m. As, this area has a 350 person per acre, a densely build-up area, a playground is needed within a quarter mile. Again, as the proposed site might not allow heavy traffic, there are no industry or rail roads in the proposed layout plan so playgrounds are placed beside roads. Trees are considered for screening and protecting the house from noise, harms and so on.

Incidental Open Space:

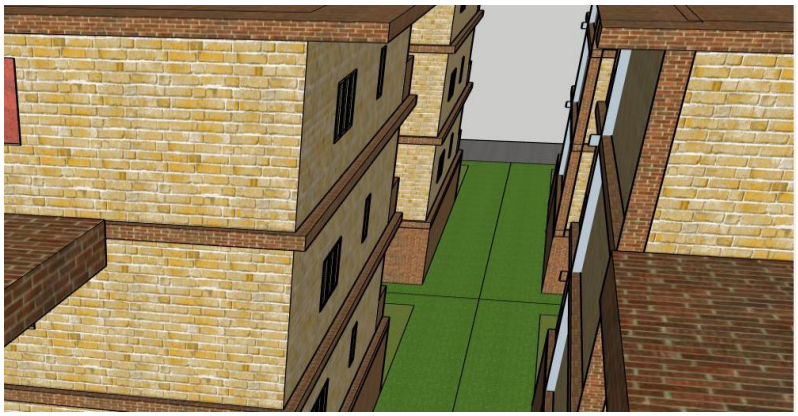

Figure 35:Incidental open space

Design should take into account the issues that each piece of such land faces in order to maximize its effectiveness.
For example, in some areas, screen shelter plants may be required to provide privacy to neigh boring houses or to provide shade to exposed footpaths.

6.2.3.8 Water body

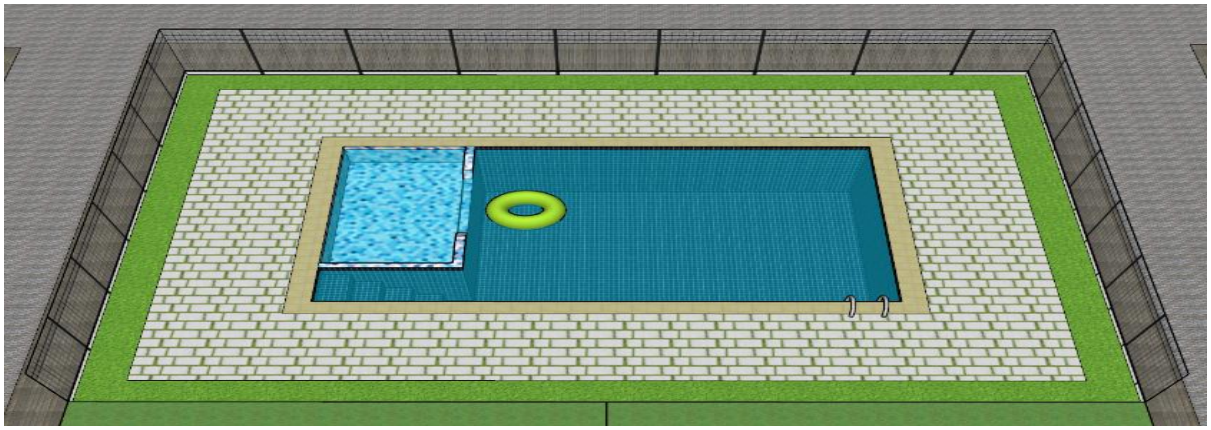

Figure 36: Water body

There are also 6 water bodies which will make the area more eco-friendly. These water bodies take six to eight katha in the neighborhood. People of this community will use water reservoirs for various purposes. It gives an opportunity to the respondents so that they can practice easily. Swimming helps to make a healthy life. It helps to growth of human.

6.2.3.9 Dustbin

The provision of dustbins would also be made for collection of various types of refuse and provision of disposal units should be located at places where they don't cause any type of nuisances to the public. Mainly, these dustbins can be remained beside their houses. These help to decline messy environment and smelly condition. The dustbins are divided into two parts. One for the organic materials such as vegetables, meal bones, surplus food, the things which are broken or fallen accidentally etc. And on the other hand, it is inorganic materials like polymers, polyester, polythene, chemical elements, plastics, poly vinyl chloride etc. It is done for dividing two materials. Organic material is for compost insecticides but the aseptic materials is for recovering and recycling. 3R program is applied by this proposed plan.

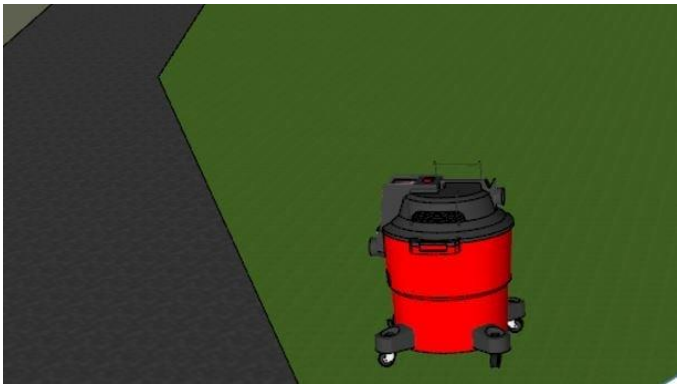

Figure 37: Dustbin

3.2.3.10 Drainage:

In a planning, drainage, sewage play an extraordinary role. If the drainage and sewage are good then the neighborhood is good. So different type of drains can be placed beside roads in the proposed plan. Rectangular surface drains, U/V shaped, semi-circular shaped drains can be placed. Generally rectangular shaped is used for easily deposited and good velocity. Drains can be helped to collect storm water, domestic water from various parts. Sometimes grading of land can be used as water runoff so that they can go to the drain.

3.2.3.11 Sewage and Garbage:

Sewage indicates the liquid waste from the community. Sullage, latrines, urinals, stables etc. need a good sewage system. Otherwise, a good neighborhood development could not make. Garbage indicates dry refuse like leaves, decayed fruits, paper pieces, grass, meal bone, vegetables etc. For dumping these, dustbins are placed in the plan.

6.3: Cost estimation of the project

6.3.1 Cost estimation for residential buildings

Plot type	**Area (sq. ft.)**	**Storied**	**Unit**	**Total cost for one building**	**Total cost (taka)**
2 katha	648	1	1	864255	20744515
3 katha	980	2	3	2927372	163932832
3 katha	980	3	2	5331056	234566464
4 katha	1259	3	4	6121483	306074150
				Total	**705382661 = 705.38 million taka**

Table 4: Cost estimation of residential building

6.3.2 Cost estimation for Earth filling

3 feet height should be filled.

So, Area needed to be filled = Total area- (Mosque + School + Road)

=14.2-(1+.2+1.7) acre

=11.3 acre

=492228 sq. ft.

Volume = 492228*3= 1476684 cubic feet= 41808 sq. m

Total cost for earth filling = 41808*114 taka= 4766194 taka =4.77 million taka

6.3.3 Cost estimation for Community center

Total area: 0.2 acre= 8712 sq. feet= 809.37 sq. m

Buildup area= 485.622

Cost = 485.622*2*1670.51 = 1619900 taka = 1.6 million

6.3.4 Cost estimation for Road

Type of work	Area (sq. m)	Cost per sq. m (taka)	Total cost (taka)
Earthwork in road embankment	6879.66*1.016= 6989.73	111	775860
Single layer brick flat soiling	6879.66	368	2531714
Premixed Bituminous carpeting with stone chips	6879.66	626	4306667
Providing bituminous painting	6879.66	104	715484
		Total cost	8329725 taka=8.3 million taka

Table 5: Cost estimation of road

So, total cost for this project= around 720.05 million taka

6.4: Cost recovery of the project

In Bangladesh recently many renowned organizations are doing resettlement programs greatly. 'JICA' is one of them. This resettlement program will be organized by Government of Bangladesh. The fund will be provided by GOB (Government of Bangladesh). All land acquisition, compensation, relocation and resettlement will be done by GOB. The executing agency will bear the timely allocation of the funds needed to implement the resettlement plan.

The residents will give only the cost of the residential building of the project in some steps. They will give a certain amount of money in the starting and they have an opportunity to pay the rest of the money in the next 12 years by installment. After 12 years or after paying the total installment, the land and the building will be their property. That means a permanent shelter for the evicted people with a good environment and great facility and accessibility.

Residents of different plot	Storied	Unit	Amount to be paid	First Pay	Installment for 12 year (per year)
2 katha	1	1	864255	200000	55354
3 katha	2	2	487896	200000	23992
3 katha	3	3	888510	250000	53210
4 katha	3	4	510124	200000	25843

Table 6: Installment need to pay by per family

Chapter 7: Possible Outcome:

Some major outcomes are expected to come after the implementation of this resettlement program:

- A well-planned neighborhood will be formed.
- Necessary facilities can be found which will make the area self-sufficient.
- This will solve their problems including drainage, sewerage and so on because the new area is a well-planned neighborhood with maximum type of utility facilities.
- The livelihoods and standards of living will be improved.
- Improved living conditions among the affected persons through the provision of proper housing with proper security.
- Increase job opportunity and labor resources.
- Proper road network for ensuring easy accessibility.
- Sufficient number of katcha bazar, corner shops, and clinic are provided in the site as people can easily access there.
- Enough educational institutions are provided for educational purposes.
- Some religious places are provided so that they can use these places for their religious purposes.
- Safe drinking water distribution system will be found here and comprehensive sewerage system is also located here which were a big problem for them in the previous households.
- Here in this area good electric lines with consistent power supply, street lighting, so that the can move on the road with more safety and conveniently.
- Good communications systems.
- Enough parks and open spaces are provided so that people can enjoy their leisure time and make them refresh for further purpose.

Chapter 08: Conclusion

The study mainly focused on relocation and neighborhood development. This area is planned as a lower-middle class residential area. All kinds of facilities such as community facilities, easy road network, daily necessities, mosques, police box, parks, clinics, etc. are provided to enrich functionality. The implementation of the plan will make the area more developed and comfortable for a suitable living for the citizen of the area. Besides, the implementation of the plan will protect the environment and reduce all kinds of pollution. These things will solve the problems of the evicted people. This new neighborhood will provide good quality water for drinking and other purposes as well as well drainage and sewerage system which was a big problem for the people and most importantly a permanent shelter to live. After implementation, it will be a complete neighborhood area with a nice aesthetic view practically.

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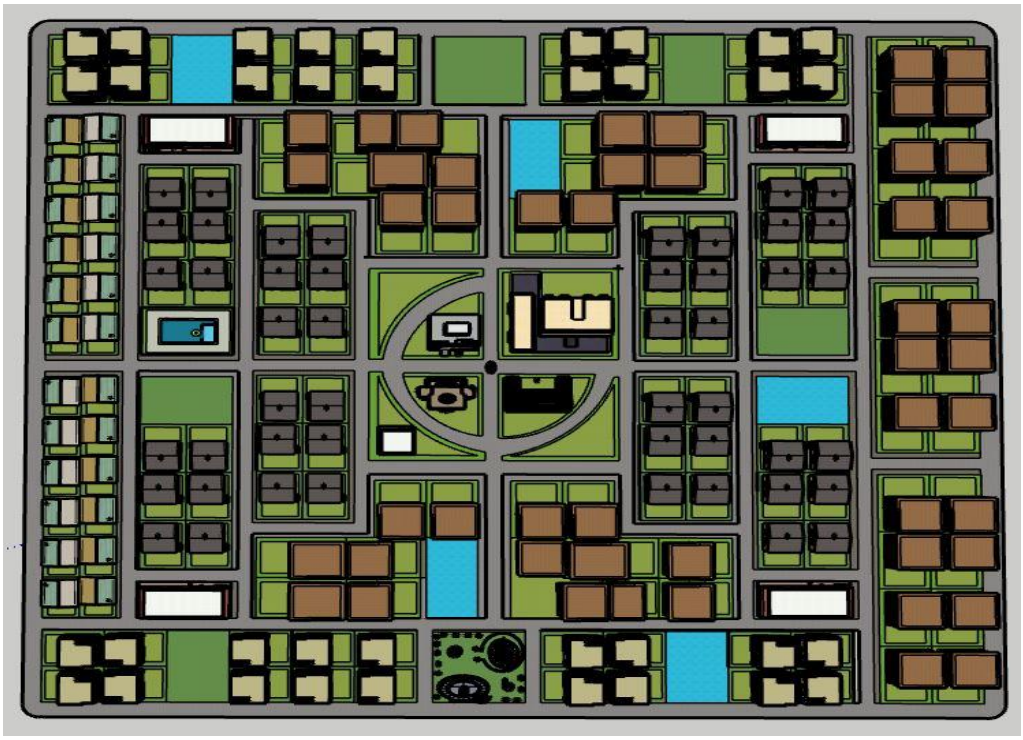
Appendix

Figure 38: Ichamati River

Figure 39: Eviction Process by Govt.

40 A.

40 B.



40 C.

Figure 40: A, B and C indicates 3D modlling of the proposed site in different direction

Figure 41: Footpath

Figure 42: Access Road

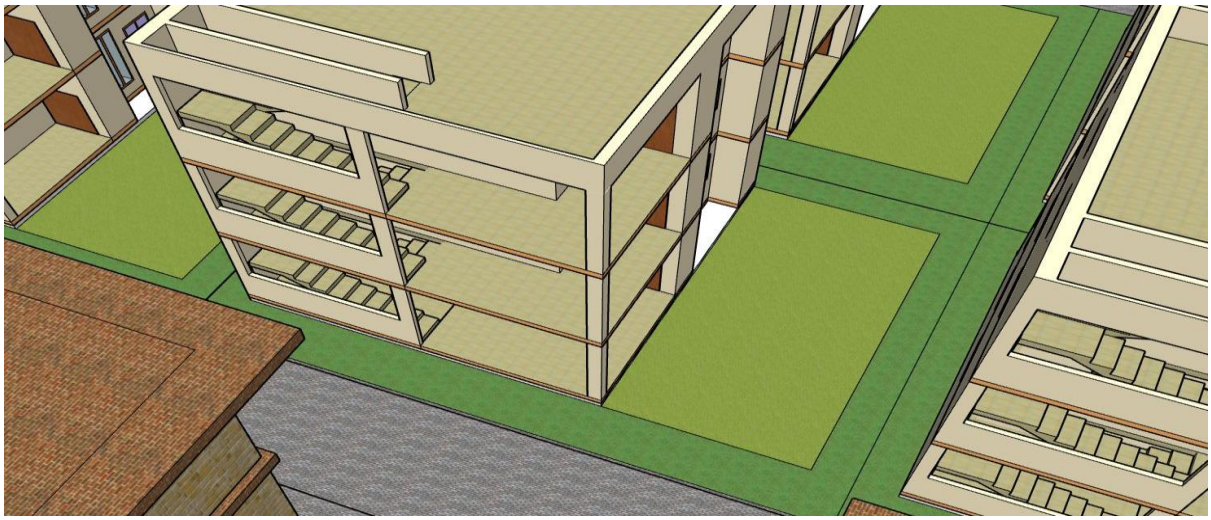


Figure 43: Place should be used as Parking

44 A

44 B

Figure 44: A, B for Housing

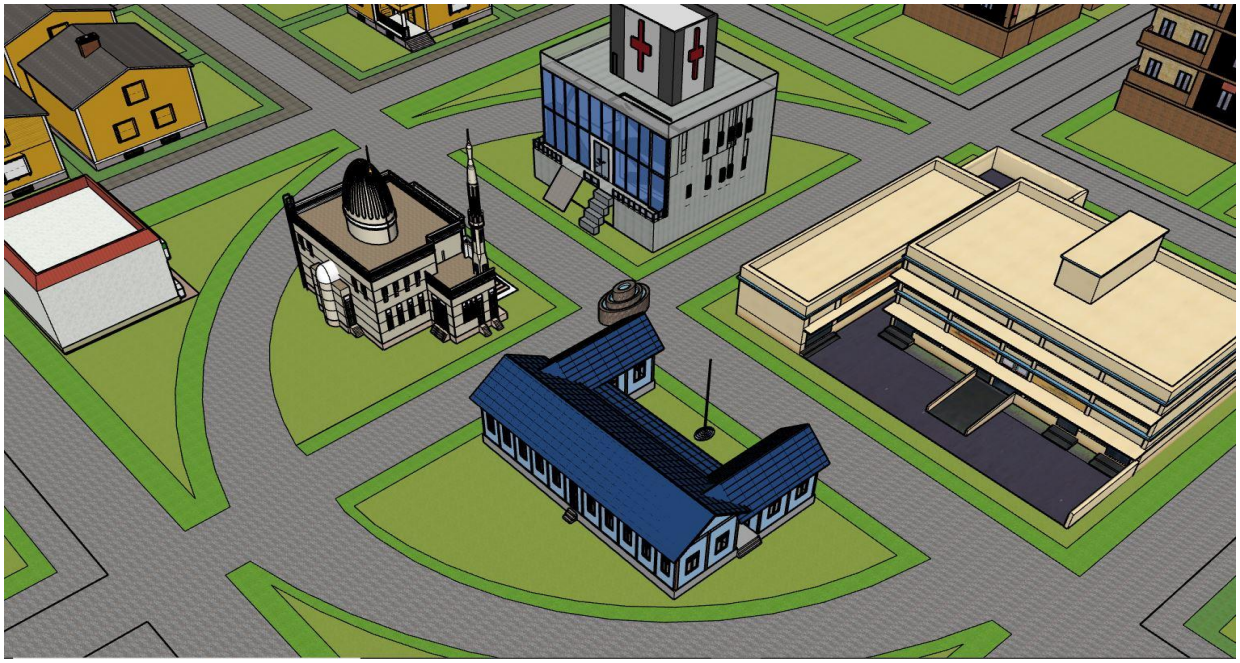


Figure 45: Center of the Neighborhood

Coordination Schema

Objectives	Complex variable	Simple variable	Data Type	Data Source	Collection method
To resettle the evicted people of the Ichamati river side in a well-planned neighborhood	Demographic Information	1. Name 2. Age 3. Gender 4. Religion 5. Family Member	Qualitative	Primary	Questionnaire
	Resettle the evicted people	1. Income 2. Occupation 3. Expenses 4. Economic condition 5. Household Type 6. Amount of evicted Land 7. Economic loss 8. Distance from Work place	Qualitative and Quantitative	Primary	Questionnaire
	Plan a neighborhood	1. Site Characteristics 2. Geography 3. Land Subdivision Principles 4. Planning Techniques 5. National Building code	Quantitative	Primary & Secondary	Physical observation and Literature review
To provide necessary facilities and make the area self-sufficient	Existing Utilities in the selected site	1. Water 2. Electricity 3. Drainage 4. Waste Disposal System 5. Sewage 6. Gas	Quantitative	Primary, Secondary	Physical observation & LGD, Municipality
	Existing Facility	1. Transport 2. Open Space 3. Religious place 4. Market 5. Recreational Place 6. Educational Institutions 7. Medical Services 8. Community facilities	Quantitative	Primary	Physical observation
	Make the area self sufficient	1. Existing working opportunity 2. Administration 3. Environment 4. Road connectivity 5. Utility & facility	Quantitative	Primary	Physical observation

Questionnaire

A Project Proposal of Resettling the Evicted People from The Bank of The Ichamati River to Hemayetpur, Pabna Municipality.

(All the information will be kept confidential and will be used for only academic purposes only)

SL No.: …… **Name:** ……

1. **Demographic Information:**

Age	**Gender**	**Family member**		**Earning Member**	**Family member aged <12**	**Religion**
		Male	**Female**			
a) <10 b) 11-20 c) 21-30 d) 31-40 e) >40	a) Male b) Female	a) 1 b) 2 c) 3 d) 4 e) >4	a) 1 b) 2 c) 3 d) 4 e) >4	a) 1 b) 2 c) 3 d) >4	a) 1 b) 2 c) 3 d) >4	a) Islam b) Hindu c) Buddhist d)Christian e)Others

2. **Economic Information:**

Occupation	**Income (monthly) (taka)**	**Expenditure (monthly)(taka)**	**Economic loss due to Eviction (taka)**	**Distance from Workplace (km)**
a) Service holder b) Businessman c) Day labor d) Salesman e) Others	a) <5000 b) 5100-8000 c) 8000-10000 d) 11000-14000 e) 14000-17000 f) 17000-20000 g) >20000	a) <5000 b) 5100-8000 c) 8000-10000 d) 11000-14000 e) 14000-17000 f) 17000-20000 g) >20000		1. <1 2. 2 3. 3 4. >3

3. **Evicted Land Information:**

Amount of Land	**House Type**	**Material**	**Housing Pattern**	**No of Store**	**Duration of living (years)**
a) <2 katha b) 3 katha c) 4 katha d) 5 katha e) >5 katha	a) Pacca b) Semi pacca c) Katcha	a) Tin b) Concrete c) Bricks d) others	a) detached b) Grouped c)Semi detached	a) 1 b) 2 c) 3 d) >3	a) <2 b) 2-6 c) 7-10 d) >10

4. Existing Facility

a) Primary school	g) Park
b) Hospital	h) Parking
c) Clinic	i) Open Space
d) Health care	j) other……..
e) High school	
f) College	

5. What is your opinion about existing utility facilities?

5(Very Good) 4(Good) 3 (Acceptable) 2(Poor) 1(Very Poor)

I.	Water Supply	1__2__3__4__5
II.	Electricity	1__2__3__4__5
III.	Drainage	1__2__3__4__5
IV.	Sewerage	1__2__3__4__5
V.	Transportation	1__2__3__4__5
VI.	Gas Supply	1__2__3__4__5
VII.	Air Condition	1__2__3__4__5
VIII.	Environment	1__2__3__4__5

6. Do you face any problems? a) yes b) no

If yes, then

I. What type of problem(s) you face?

II. What type of problem(s) should be removed?

7. Are you willing to resettle? a) yes b) no

If yes, then your desire,

Utility / Facilities	House type	Rooms	Material	Pattern	Distance from workplace
	a) Pacca b) Semi c) pacca-Katcha	a)1 b)2 c)3 d)>3	a) Tin b) Concrete c) Bricks d) others	a) detached b) Grouped c)Semi detached	a) <1 b) 2 c) 3 d) >3

8. Desire of the respondents about their new neighborhood:

Cost Estimation in Details

2 Katha plot building cost:

Total Build up area = 648 sq. ft.

For 1 floor= 12123 tk. per sq. m

Extra Cost for M.W = 785 tk. per sq. m

Rooftop = 2135 per sq. m

RCC tank = 4 tk. per sq. m

Sanitary & water = 690 per sq. m

Internal electricity= 1513 per sq. m

Total cost for one building = 864255 taka

Total 2 Katha plot cost= 864255*24 =20744515

3 katha 2 storied:

Total Build up area =980 sq. ft.

1^{st} floor = 13123 per sq. m

Extra= 785 per sq. m

2^{nd} floor = 13320 per sq. m

Extra= 588 per sq. m

Rooftop = 2135 per sq. m

RCC tank = 4 tk. per sq. m

Sanitary & water = 690/5 per sq. m

Internal electricity= 1513/5 per sq. m

Stair & Veranda = 3273/5 per sq. m

Total cost for one building=2927372

Total cost = 2927372*56=163932832

3 katha 3 storied:

Total Build up area = 980 sq. ft.

Foundation= 210.79 per sq. ft.

Ground floor = 13829 per sq. m

Extra = 981 per sq. m

1st floor = 13123 per sq. m

Extra= 785 per sq. m

2nd floor = 13320 per sq. m

Extra= 588 per sq. m

Rooftop = 2135 per sq. m

RCC tank = 4 tk. per sq. m

Sanitary & water = 690/5 per sq. m

Internal electricity= 1513/5 per sq. m

Stair & Veranda = 3273/5 per sq. m

Total cost for one building= 5331056 tk.

Total cost = 5331056*44 =234566464

4 katha plot:

Total Build up area = 1259 sq. ft.

Foundation= 210.79 per sq. ft.

Ground floor = 13829 per sq. m

Extra = 981 per sq. m

1st floor = 13123 per sq. m

Extra= 785 per sq. m

2nd floor = 13320 per sq. m

Extra= 588 per sq. m

Rooftop = 2135 per sq. m

RCC tank = 4 tk. per sq. m

Sanitary & water = 690/5 per sq. m

Internal electricity= 1513/5 per sq. m

Stair & Veranda = 3273/5 per sq. m

Total cost for one building= 6121483

Total cost = 6121483*50=306074150

2 Katha plot building cost:

Total Build up area = 648 sq. ft.

For 1 floor= 12123 tk. per sq. m

Extra Cost for M.W = 785 tk. per sq. m

Rooftop = 2135 per sq. m

RCC tank = 4 tk. per sq. m

Sanitary & water = 690 per sq. m

Internal electricity= 1513 per sq. m

Total cost for one building = 992931 taka

Total 2 Katha plot cost= 922931*24 =22150344

3 katha 2 storied:

Total Build up area =980 sq. ft.

1st floor = 13123 per sq. m

Extra= 785 per sq. m

2nd floor = 13320 per sq. m

Extra= 588 per sq. m

Rooftop = 2135 per sq. m

RCC tank = 4 tk. per sq. m

Sanitary & water = 690/5 per sq. m

Internal electricity= 1513/5 per sq. m

Stair & Veranda = 3273/5 per sq. m

Total cost for one building=2927372

Total cost = 2927372*56=163932832

3 katha 3 storied:

Total Build up area = 980 sq. ft.

Foundation= 210.79 per sq. ft.

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1st floor = 13123 per sq. m

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Internal electricity= 1513/5 per sq. m

Stair & Veranda = 3273/5 per sq. m

Total cost for one building= 5331056 tk.

Total cost = 5331056*44 =234566464

4 katha plot:

Total Build up area = 1259 sq. ft.

Foundation= 210.79 per sq. ft

Ground floor = 13829 per sq. m

Extra = 981 per sq. m

1st floor = 13123 per sq. m

Extra= 785 per sq. m

2nd floor = 13320 per sq. m

Extra= 588 per sq. m

Rooftop = 2135 per sq. m

RCC tank = 4 tk. per sq. m

Sanitary & water = 690/5 per sq. m

Internal electricity= 1513/5 per sq. m

Stair & Veranda = 3273/5 per sq. m

Total cost for one building= 6121483

Total cost = 6121483*50=306074150