AFFORDABLE HOUSING FOR LOW-INCOME GROUP

Purbachal, Dhaka

By,

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A thesis submitted to the Department of Architecture in partial fulfillment of the requirements for the degree of Bachelor of Architecture

Department of Architecture

Brac University

September 2023

Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing degree at Brac University.

2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.

3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.

4. I have acknowledged all main sources of help.

Student's Full Name & Signature:

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Approval

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Abstract

Each and every hour around 70 people are coming outside from Dhaka in search of job opportunity. They come to city in hope of having a better lifestyle, but mostly ends up living a miserable life in slums or squatter settlements, which mostly occurs due to less work opportunity and shortage of affordable housing. Recently government has introduced a proposal of multistoried apartment buildings for the slum dwellers, but is it enough for them to have a better lifestyle? Already there are many examples built in the city like the Bhashantek Rehabilitation Project (BRP) which was a failure example of this attempt. So, if we replicate the same thing without acknowledging the real issue behind their suffering, surely the idea of affordable housing will fail again. So, what are the solutions and mechanisms that could be followed to build a sustainable and affordable housing?

This project is about the lower socio income group of people in our society, who plays a great role in all of our lives, The aim of the project is to create a homestead and provide a better lifestyle to this group of people by creating a social housing in the new modern town Purbachal. The goal is to focus on the major issues behind their suffering and provide them a better living environment along with providing economic opportunities and fundamental facilities like education, accommodation, food and recreational amenities.

Keywords: Affordable housing, slums, revenue generate, commercial belt, neighborhood.

Acknowledgement

I would like to begin by expressing my deepest appreciation to my family for supporting me throughout the whole journey of completing my thesis.

My sincerest gratitude to my studio instructors Dr. Mohammad Habib Reza, Mr. Naim Kibria, Mr. Jalal Ahmed and Mr. Zillur Rahman for their valuable feedback and guidance throughout the whole design process. They were always there to help, even during their busy schedule they tried to help whenever I needed suggestions. Furthermore, I am grateful to my seminar II instructors, Dr. Iftekhar Ahmed and Dr. Mohammad Faruk for helping and guiding me to work on this project during the initial stage.

I would like to thanks my best friend Pritom Biswas for being with me through all the hard times of completing this thesis, and constantly supporting me. Also, I am thankful to Sayeeda Ayasha Tasneem, who was my closest friend from the very first year to the end of my undergrad and was always there to support and help me. I am grateful to my senior, Shanila Saifullah for guiding me in the most difficult time. Lastly, I would like to thank my juniors, who helped me during the last fight, Elma Mehtaj, Zannatul Ferdous, Farzana Kamal, Shaifta Morshed, Nishat Jahan toa, Mahdia Ahseen, Reedwan Reshad, Rezaul Alam Rafid and Anika Nawar, to whom I will be forever grateful.

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Chapter 1: Introduction

1.1 Introduction to the Project

This project is about the lower income group of people of our country, the project proposes to create a sustainable platform of living for this community. People migrate to Dhaka from different cities and villages, in search of better living standards and better jobs, start their own businesses, pursue a good quality of education, etc. But due to the present scenario of Dhaka with a huge number of population and insufficient accommodation, the neighborhood is becoming too crowded and rising an unhealthy environment. The lower income group of people living here along with the rural migrants coming to Dhaka finds no place to stay, and as a result, many informal settlements are growing in many parts of Dhaka. They live there with no proper water supply, unhealthy environment, risk of fire hazards and many more issues. Thus, the government planned to develop the surrounding area of Dhaka City in a planned way to establish permanent residential accommodation for various group of people, in order to have a healthy and sustainable living and to reduce the crowd inside the capital. (RAJUK, 2011).

Purbachal New Town is the biggest planned township in Bangladesh. RAJUK intends to plan and develop the area to Ease the tremendous population pressure on Dhaka and introduce an independent, full-fledged township to support the capital city and establish a well-planned and fully functional township near Dhaka. The area is Planned for a total of 1.5 million people. The area covers 6,227.36 acres of land including the approach road (150 acres). In RAJUK's SDG plan for 2030 there is a plan of ensuring access for all the adequate, safe and affordable housing and basic services and upgrade slums. 90 acres of land are allocated in 9 different sites for the lower income group of people in the Purbachal New Town plan, where the main idea is to upgrade the living conditions of the lower income group in context of the future development of the town. By providing them with a healthy lifestyle and better environment, it will not only benefit them, but also, they will serve in the National economy fruitfully and help the Dhaka city to flourish.

1.2 Project rationale

Each day in Dhaka city many people are coming from outside the capital to get a better life style and job opportunities. But due to the dense civilization and high living conditions in the city, we see that they are staying in slums or in a squatter settlement. This affects their lifestyle and sometimes even leads them to commit crime and unhealthy activities. (Anifa, 2018)

Moreover, though we dream of a modern city, but these group of people are a very evident part of our society. Thus, this project of RAJUK in context of future development of the Purbachal New Town, is a great opportunity for the Dhaka dwellers to live their life healthy and in a planned way. As, it will be a planned city, so from the very beginning it is important to incorporate the lower income group of people in the city and provide them better facilities which they deserve.

1.3 Aims and Objectives

The main theme of the project is to focus on the current scenario and plan for a future development of the lower income group community living in Dhaka, as well as the people who are coming to the city in search of job opportunities. This project aims to how we can incorporate them by providing facilities and better living conditions which will perhaps help our economy in a radical way.

- To identify the problems and limitations in the current living condition of the lower income community
- To work according to the outcomes and help in revitalizing their living condition through the project
- To identify why the rural migrants are shifting to the city, and their current living condition
- To provide a common ground for the community for better facilities and opportunities.
- To promote, enrich, nourish and enlighten the audience about the community settlements and how it works and helps in our economy.
- This project aims to educate the audience on the importance of the lower income community of the society.

1.4 Project brief

Projects name: Affordable housing for Low-Income group

Client: RAJUK

Site Location: Purbachal New Town

Site area: 6.9 acres

Built area: 3,27,686 Sqft

Proposed Programs

- Residential Units

  Type A: 520 Sqft (180 Units)- 93,600 sqft

  Type B: 350 Sqft (310 units)- 1,08,500 sqft

  Type C: 200 Sqft (80 units)- 18,400 sqft

- Primary School- 6000 sqft
- Library- 2000 Sqft
- Multipurpose Hall - 5600 Sqft

  (500 people approx.)

- Health care and Day care center- 1550 sqft
- Mosque- 4500 sqft
- Katcha Bazar/ Market- 10,000 Sqft
- Utility Building- 2900 Sqft

Total Built Area: 3,21,763 Sqft (Approx)

Chapter 2: Literature Review

2.1. Understanding Housing

Housing is a shelter or any type of physical structure that protects people who live inside it. Housing complexes are the collective arrangement of houses and apartments, where groups of people live together forming a community. People who live together in a community share similar facilities and form a strong social bond. (Bari, 2022) A proper housing complex or a community-based housing has some basic facilities like proper hygiene maintenance, sanitation, drinking water, etc. and it should be secured for the people living there.

2.1.1 Definition of Housing

Housing refers to houses or building where people stay and live. It is one of the basic primary needs of human rights. Housing can be defined as an instrument of political - cultural stability, economic prosperity, social welfare and participation as well as bondage of its people. A Housing complex refers to multifamily housing where people live together, participate in different activities in a community. People of every income group deserves and has the right to live a quality life and a healthy housing environment is a very important key for that. The character, quality and environment of a housing can improve human behavior and health.

2.1.2 Affordable Housing

Affordable Housing is a concept which deals with effective budgeting and following of techniques which help in reducing the cost construction through the use of locally available materials along with improved skills and technology without sacrificing the strength, performance and life of the structure. There is huge misconception that affordable or low-cost housing is suitable for only substandard works and they are constructed by utilizing cheap building materials of low quality. The fact is that these types of projects are done by proper management of resources. (Barot,

2021) Internationally, housing affordability is defined in multiple ways. One of the most commonly accepted definitions of affordability refers to housing affordability which is taken as a measure of expenditure on housing to income of the household. This is also accepted by the Indian Government, which states "*Affordable housing refers to any housing that meets some form of affordability criterion, which could be income level of the family, size of the dwelling unit or affordability in terms of EMI size or ratio of house price to annual income*" (High Level Task Force on Affordable Housing for All., 2008)

2.2. Urban Population Growth & Density

Bangladesh has become the most densely populated countries of the world. The population increased from 55.2 million in 1961 to 111.45 million in 1991. In 1995 the national population was 119.7 million of which 49.44 percent were females and 50.56 percent were males. (Saquib, 2000) Dhaka is the largest and most dense metropolitan city of Bangladesh. It has a density of 23,234 people per square kilometer within a total area of 300 square kilometers.

Year	Population	Growth Rate (%)	Growth
2030	27,374,000	12.50	3,043,000
2025	24,331,000	15.90	3,342,000
2020	20,989,000	11.10	2,091,000
2017	18,898,000	7.40	1,300,000
2015	17,598,000	19.50	2,400,000
2010	14,731,000	19.50	2,400,000
2005	12,331,000	19.90	2,046,000
2000	10,285,000	23.40	1,953,000
1995	8,332,000	25.80	1,711,000
1990	6,621,000	42.10	1,961,000

Figure 2.2.1: Dhaka Population Projection Data (Urban Area). Source: Bangladesh Bureau of Statistics.

Bangladesh is currently facing huge challenges of rapid urbanization. The rate of growth of urban population is likely to fall to some extent in the future, but would still be quite high. The UN projection for Urban population of Bangladesh for 2030 is 86.5 million. The proportion of urban

population would possibly cross the 50% mark by 2040 and the 60% mark by the year 2050 when the total Urban population would rise above 100 million. (World Population Review, 2017) That city of Dhaka in recent years has emerged as one of the fastest rapid growing cities in the world. The growth rate of Dhaka city population will remain high and it will be the top-ranking mega city with a population of 25 million around the year 2025. Urbanization of Dhaka is closely linked to the rural displacement triggered by the government's structural adjustment policies and concentration of wealth and employment in urban centers. In addition, natural disasters and vulnerabilities through climate change displace millions of populations in the coastal areas who migrate to the city and mostly take shelter in the urban periphery to escape the poverty. (Anifa, 2018) Thus, Dhaka's urban periphery has sprung up as rings of urban poverty in recent decades.

2.3 Housing for Low-Income group in Bangladesh

Low-income communities are struggling to find affordable urban housing in Bangladesh's cities. Millions are heading to cities to tap into economic opportunities, causing booming urban growth. But many of them are facing skyrocketing property prices, a dysfunctional rental market, and limited public housing. Local authorities are falling behind on delivering affordable housing schemes. The outcome: low-income communities pay exorbitant rents to live in slums with poor services and no tenure security. (Wahed, 2015)

Take Dhaka, the world's most crowded city. Over 17.4 million people reside in Dhaka and more are moving in. At least one in every three people live in informal settlements. The situation is rooted in a fragmented housing delivery system: the government meets only 7 percent of the annual housing demand and relies heavily on the private sector to fill in the giant gap.

In the national housing policy, emphasis has been given on 'low-cost housing' - a term which has many connotations and needs clarification. The accent is on housing at lower cost as compared to the prevailing cost levels. The prime objective is to reduce cost and make housing a sustainable and ecofriendly one. As natural disasters like flood and cyclone are common phenomena in context of Bangladesh, this category of affordable housing for low-income group should be durable and should have good living conditions for the dwellers.

The focus should not only be on rural areas but also on slum areas in big cities like Dhaka and Chittagong. Thousands of people are living here with inadequate facilities and unhygienic condition. Surely, by low-cost housing it is meant to achieve 'cost effective' housing for all, particularly for the low-income families so that - to the extent possible - housing is brought within their reach. (Wahed, 2015)

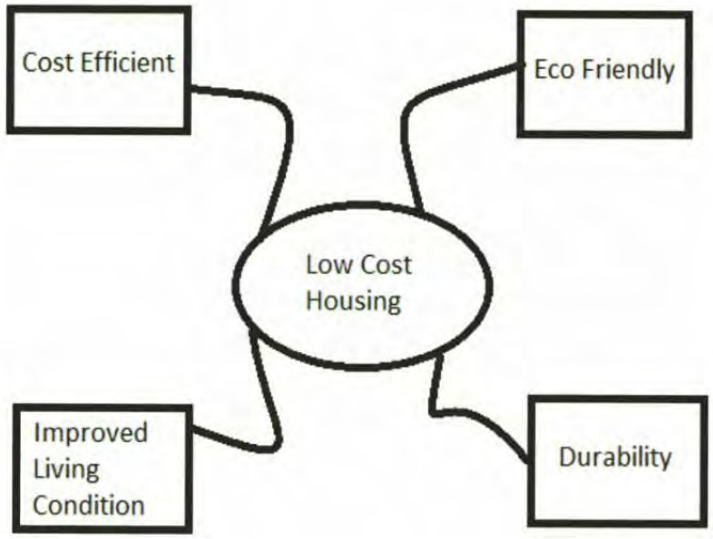


Figure 2.3.1: Diagram showing the characteristics of an Affordable housing for low-income group. Source: (Wahed, 2015)

But low-cost housing should not mean low quality housing, although the cost and quality go together. The total cost of housing, called 'life cycle cost' of housing, taking into consideration the initial capital cost of housing construction and also the recurring cost of maintenance and repair of housing, over a period of its economic service life, should be determined and the most cost-effective housing should be adopted. The availability of land for public housing is very low. In order to house the urban poor, adequate quantities of land must first be made available in order that housing units can be built. This requires forward planning

2.4 Demand for affordable housing in Bangladesh

The demand drivers for affordable housing in Bangladesh are several. First is the progressive urbanization, going hand in hand with a growing urban population, the population in Dhaka increased from 6.6 million in 1970 to 14.7 million in 2010, and is projected to grow to 27.3 million by 2030 (Figure 2.2.1). The consequence of the growing concentration of people in urban spaces is felt in land and housing shortages and congested transit, besides the stress on basic amenities such as water, power, and lung space. (Gopalan, 2015)

According to an assessment by the International Finance Corporation (IFC), the demand for urban affordable housing is estimated to increase from 6 to 10.5 million units by 2030. (Mora, 2021) Bangladesh is struggling to provide adequate housing at a pace that matches its rapid urban growth. Approximately 12 million urban households (69% of Bangladesh's urban population) still reside in informal houses. Meanwhile, the cost of apartments in major cities has become sky high because of land prices and rising cost of construction materials. Based on this study, there is a need to upgrade or build adequate numbers of affordable housing units in the immediate term and additional units in the longer term to meet demands.

2.5 Present condition of affordable housing in Bangladesh

2.5.1 Informal Housing

In Bangladesh, 30 per cent of its total population is living in urban areas and by 2030 the rate of urbanization will be more than 40 per cent. There is a tremendous pressure of influx of people in Dhaka city. Housing is one of the critical issues for rapidly growing city like Dhaka. For the urban poor or the people of low-income group, the city is not a place to live due to the city's inadequate housing, unhygienic environment, high rents and other problems as well. As a result, the rural migrants coming to the city from other areas, and low-income group of people living in the city needs to live in squatter houses or in slum areas. The slum areas or the informal dwellings of the city are not the same as the formal housings.

Informal housing in the current context of Dhaka is built defying minimum standards of housing regulations. Lack of tenure security is a key characteristic of informal settlements. According to (UN-Habitat, 2006), the total urban population in the world exceeded the rural population, indicating that we have passed a significant threshold into an 'urban age'. However, the future growth of the urban population continues to be mainly located in developing countries, or more precisely in their slums. It is estimated that by 2020 the world slum population will reach 1.4 billion (UN-Habitat, 2006, 2007). An estimated 20–40 per cent of all urban HHs in developing countries are living on land to which neither they nor their landlords have legal title (Malpezzi, 1990).

Figure 2.5.1: Images showing the current condition of informal housing for the low-income group. Source: Google

Due to such tenure problem, property transactions are slow or stalled; incentives for new construction and upgrading are depressed; lenders are unwilling to extend credit for property holders without clear title; and property taxation is impeded. (Shams, 2014) These are one of the reasons why the lands occupied by slums are not easy to be upgraded. Many cities have master plans prescribing directions of urban growth, but these plans rarely are realized and languish in metropolitan planning office as irrelevant document (Brennan and Harry, 1989). The problem with these rules is that their implementation is time-consuming and gives opportunities for corruption.

The significant characteristics of informal development are insecurity of tenure and low standard of facilities and infrastructure. Natural gas and electric connection used (90 per cent) in slums possess potential fire hazards (6.1 per cent) and each year over hundreds of people in slums are dislodged by fires (Centre for Urban Studies, 2006). These slums often become a safe shelter for criminals and results in violence centering from uses of drugs. Dhaka's rapid growth, large size, topography, environmental conditions and problems of governance exacerbate already complex land and housing issues for the disadvantaged poor.

Figure 2.5.2: Images showing the informal and unplanned housing. Source: Google

2.5.2 House Form, Building Material and Safety

The dwellers living in the informal settlements or the typical housing solutions for the low-income group in the current context of Dhaka, they can only afford a very little money to build a house. Moreover, the land they build their houses is also unauthorized, that's why their effort to improve the quality of their houses is found to be very meager. The house is built mostly by using many leftover materials on a small area. To make ease for the growth of further units they choose rectilinear geometry for their construction. To minimize the amount of construction material

they don’t raise their room height more than 6-7 feet. Sometimes the walls could be permanent but the roof is built mostly temporary. For the temporary houses, the roofs are sometimes just covered with thatch and polyethene.

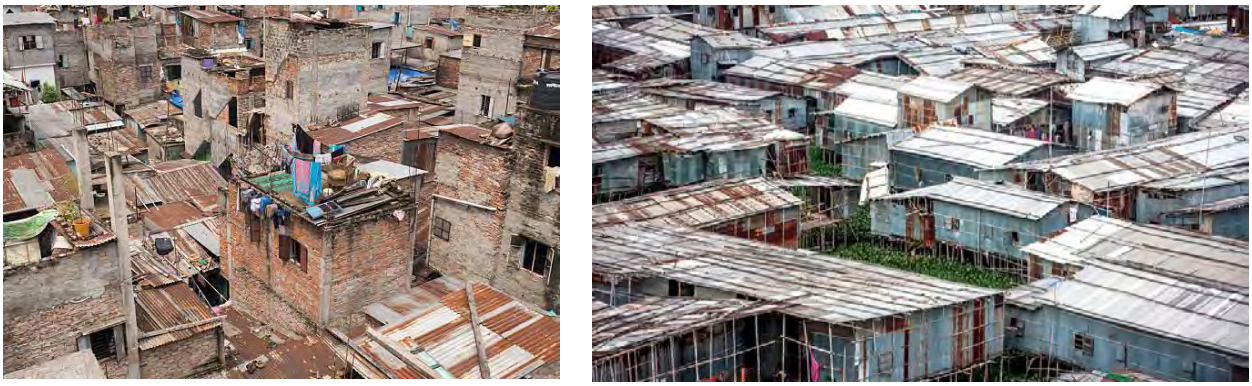


Figure 2.5.3: Images showing the current living condition in temporary housing. Source: Google

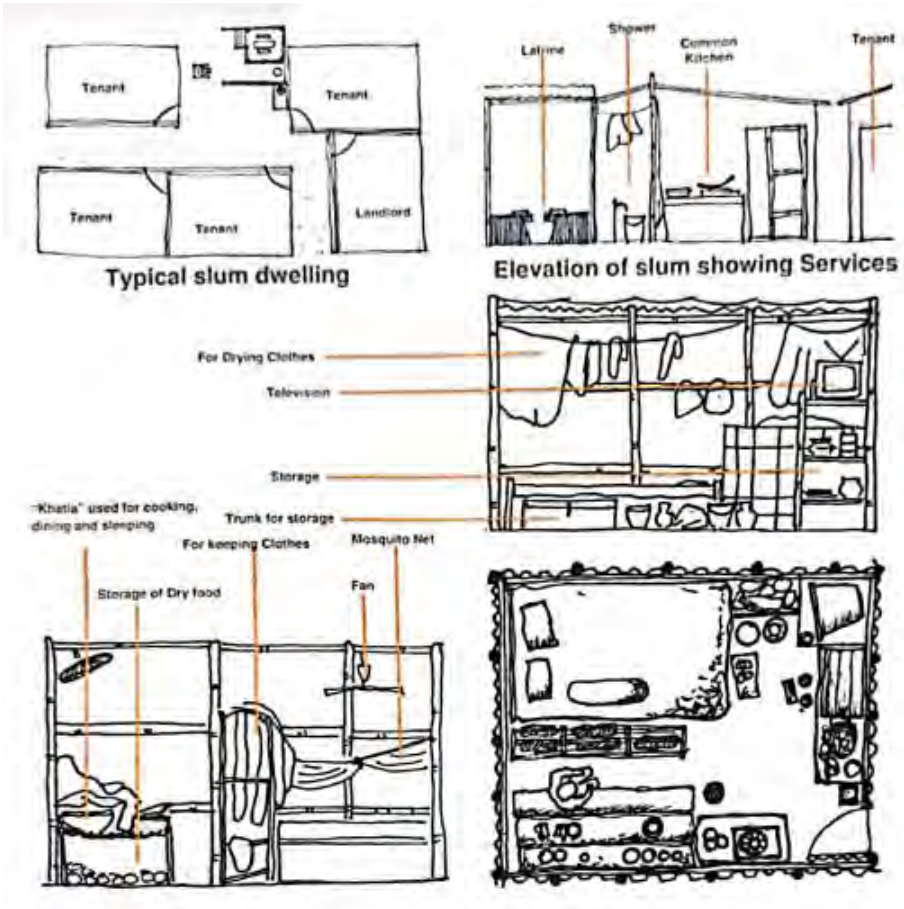


Figure 2.5.4: Typical slum dwellers house in Bhashantek, Dhaka. Source: (Anifa, 2018)

The number of slum dwellers is projected to grow to 8 million over the next decade. With this growth, policymakers including central and local government officials will need to address land and housing as a top priority.

2.6 Consequences of poor housing on health

Regardless of who the housing is being built for, a comfortable and safe environment is desired for good mental and physical wellbeing. The temperature inside the house, humidity level, adequate ventilation, sufficient lighting etc. is vital factors to be considered. According to Housing and Health Resource, (2015):

Physical health risks:

- Dampness in the house causes increase heart rates and hygiene risks.
- Excess cold can cause infections and hypothermia.
- Excess heat in the house causes dehydration and thermal stress.
- Insufficient light causes eye strain.
- Noises causes sleep disturbance and headaches.

Mental Health risks of poor housing:

- Poorer emotional well-being than people in better areas
- Poorer general mental health
- Depression in women

2.7 Features of housing

Housing is one of the three primary needs and is as equally important as food and clothing. Good-quality housing is a key element for ensuring a healthy and happy living. A good-quality housing depends on social interaction, social participation, proper communication and involvement of its

people. Society, culture and architecture are closely linked together. These 3 factors are the important part for a housing complex (Mahdavinejad, Mashayekhi, Ghaedi, 2012).

2.7.1. Communal spaces

A residential complex consists of many apartment buildings as well as other functional activities like public semi-public activities, open, recreational and gathering spaces. A communal space can create a connection with different type and age of people in a society and make a bondage among them. (Hosssain, 2018)

At present days most of the housing complex and residential flats area has no proper communal or gathering space. Housing is designed such a way where public gathering and open spaces are not present and for this reason nowadays people are more introvert and unsocial. For lack of open spaces children cannot even play.

(a) (b)

Figure 2.7.1: (a) Showing a typical slum area in Dhaka with no open or breathing space. (b) Current scenario of rapid urbanization in Dhaka lacking any breathing space. *Source: Google*

So, a communal space plays an important role in housing complex. Communal space is used by the people of a particular community and should be designed in a way so that it can be easily accessible to anyone in the community. Open space can be in a building roof or terrace. (Hosssain,

2018) Different age and type of people gathered in this communal space and making bondage among them.

Recreational space can be another type of communal space. (Mahdavinejad, Mashayekhi, Ghaedi, 2012). A recreational space has some requirements and it can be in an open or indoor space. Recreational space can be a small garden, a waterbody, sitting areas or indoor games area.

Figure 2.7.2: Images showing a planned communal space or a breathing space for a community. Source: Google

Recreational space can be different for different age and types of people such as children playground area must be more secured and there should be proper sitting areas for parents so that they can look after of their children.

2.7.2. Ventilation

Proper ventilation system is very important for any housing complex. Natural ventilation and the quality of air plays an important role for any residential buildings. The buildings 20 should be oriented such a way so that it can receive more natural ventilation and remove the used air in the opposite direction. Dhaka has a tropical wet and dry climate. The average temperature in Dhaka is 25.9 C. (Climate Dhaka, 2015). During summer season it's very difficult to make inner

space cooler. Proper cross ventilation can make the inner space cooler and natural ventilation removes the used air inside and replaces them with fresh air from outdoors.

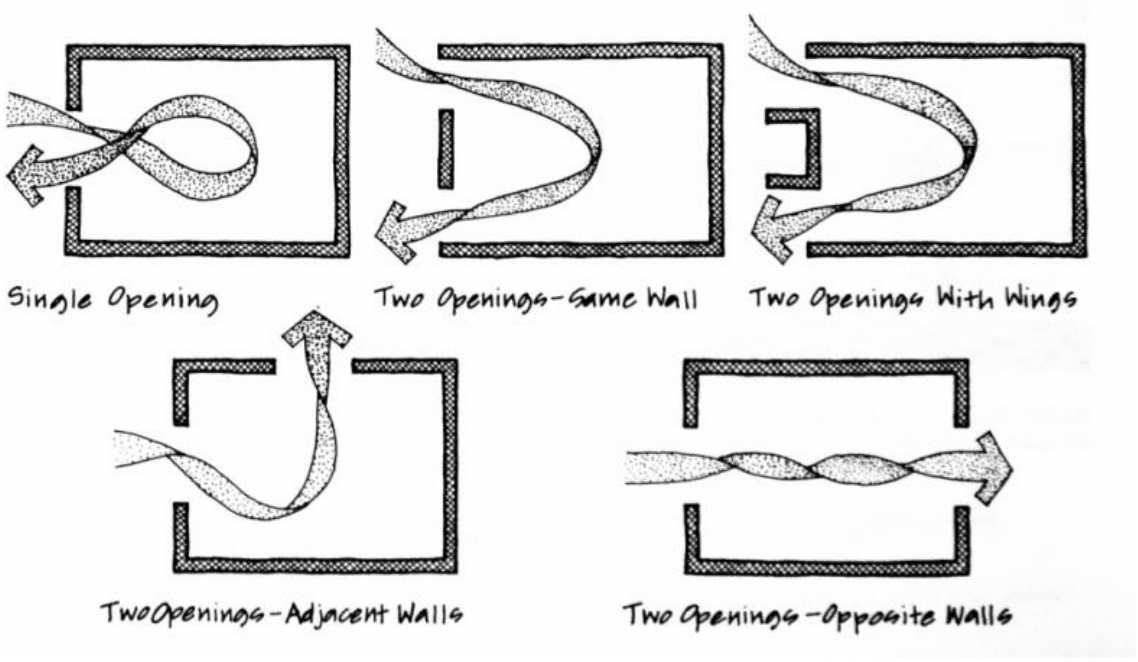


Figure 2.7.3: Figure showing the Quality and Effectiveness of ventilation in different condition. Source: Google

2.7.3 Lighting

Natural lighting is an important factor of housing. Natural lighting plays an important role in human body and mind as well as ensure thermal comfort for the residents in different seasons. Lighting can be ensured through proper openings such as windows, doors etc. Proper lighting depends on the orientation of the opening size and material used in the buildings. Natural light makes a space more dazzling and colorful.

In residential apartments, all the rooms should be oriented such a way so that all rooms get proper natural daylight. Sometimes natural light causes heat gain and glare. For this reason, the openings should be context responsive and the orientation of openings plays an important role to reduce glare and solar gain.

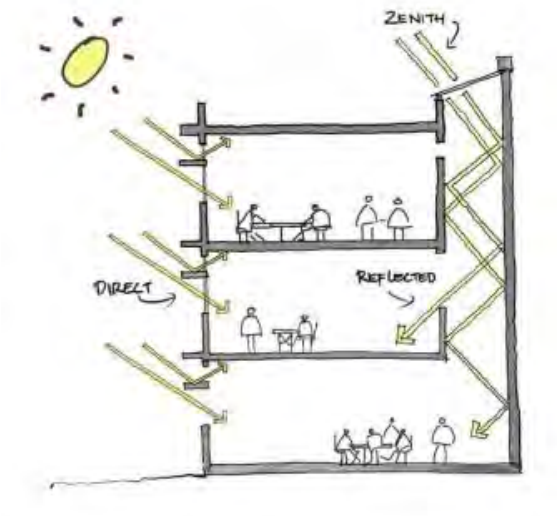


Figure 2.7.4: Figure showing the natural lighting and its effectiveness. Source: Google

2.7.4. Materials

Housing may be constructed with various materials like bricks, reinforced concrete, steel, timber, burnt tiles, wood etc. Some of the materials have limitations such as effectiveness of materials, quality of materials, contextual responsiveness, sound proving etc. So, the selection of materials is very important for a housing complex. Selection of materials both exterior and interior should be contextual responsive as well as proper sustainable stability.

Chapter 3: Site and Context Analysis

3.1 Site Location

The site is located in Purbachal. Purbachal New Town Project is situated at Rupgonj thana of Narayanganj district and Kaligonj thana of Gazipur District in between the Balu river and Shitalakhya river at a distance of 16km from the center point of Dhaka. The township would be linked with 8 lane wide expressway from Airport Road/ Progoti Soroni crossing with a distance of 6.8km. The site is 3km distance from the 300' road, which is connected through the internal roads. Hence, the connection network will be better and easily accessible.

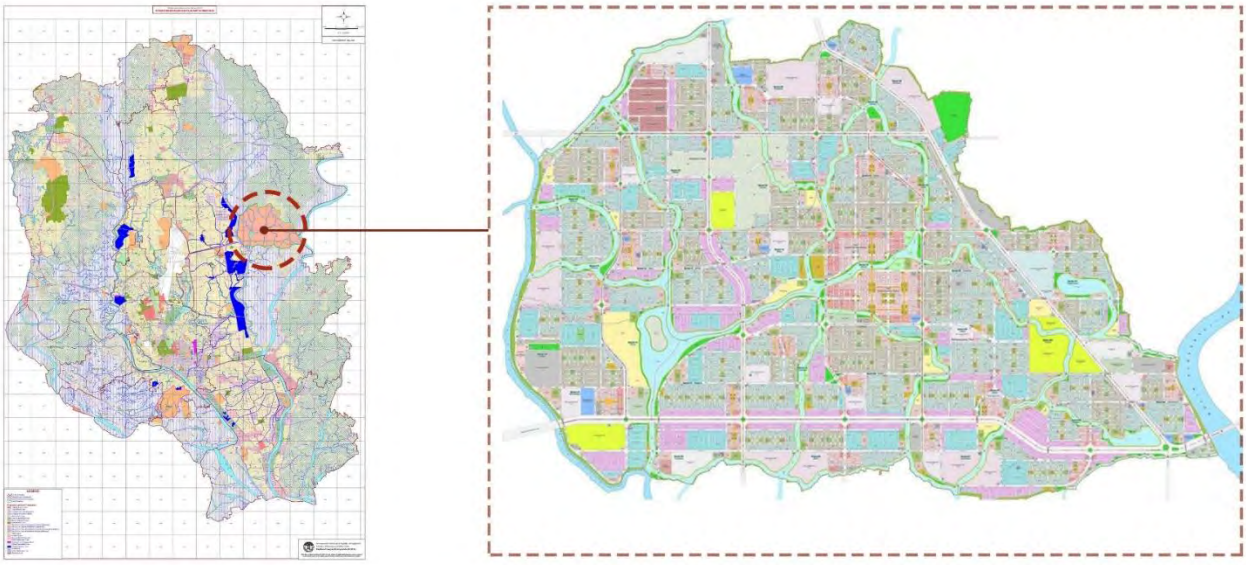


Figure 3.1.1: Purbachal New Town Location, Source: RAJUK

The location of the site is 16.5 km far from the central Dhaka. The distance of the site from the 300ft highway is just about 10-12 mins covering a 4.5km distance.

Figure 3.1.2: Figure expressing the connection between Purbachal and Dhaka City, Source: Author

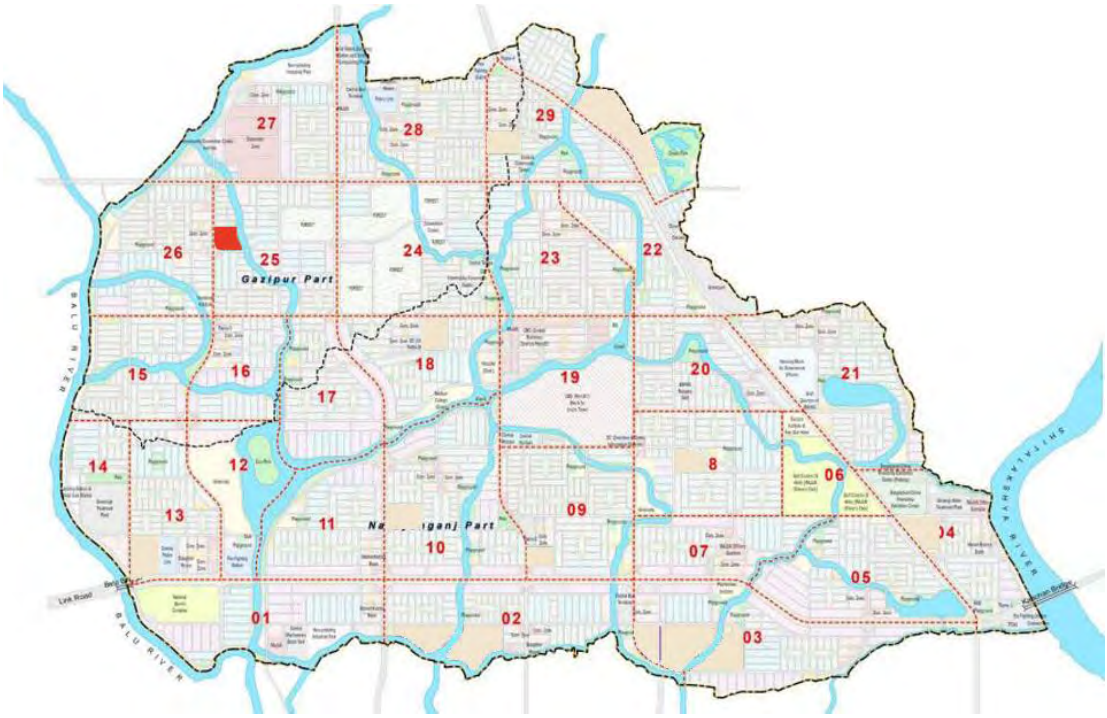


Figure 3.1.3: Purbachal New Model Town Area plan by RAJUK

The red marked portion in the figure 3.1.3 is the site in terms of urban aspects. The roads which run through the site are 100' wide. The site is in the sector 25 of the purbachal new town, where there is a free-flowing lake named "Pankouri" that is on the east side of the site. The lake is connected to the Tongi khal. The site is located right beside a node, thus there are three separate streets on the North, South and West side of the site. There is a bridge over the Pankouri Lake currently under construction, that connects the two sides of the sector 25.

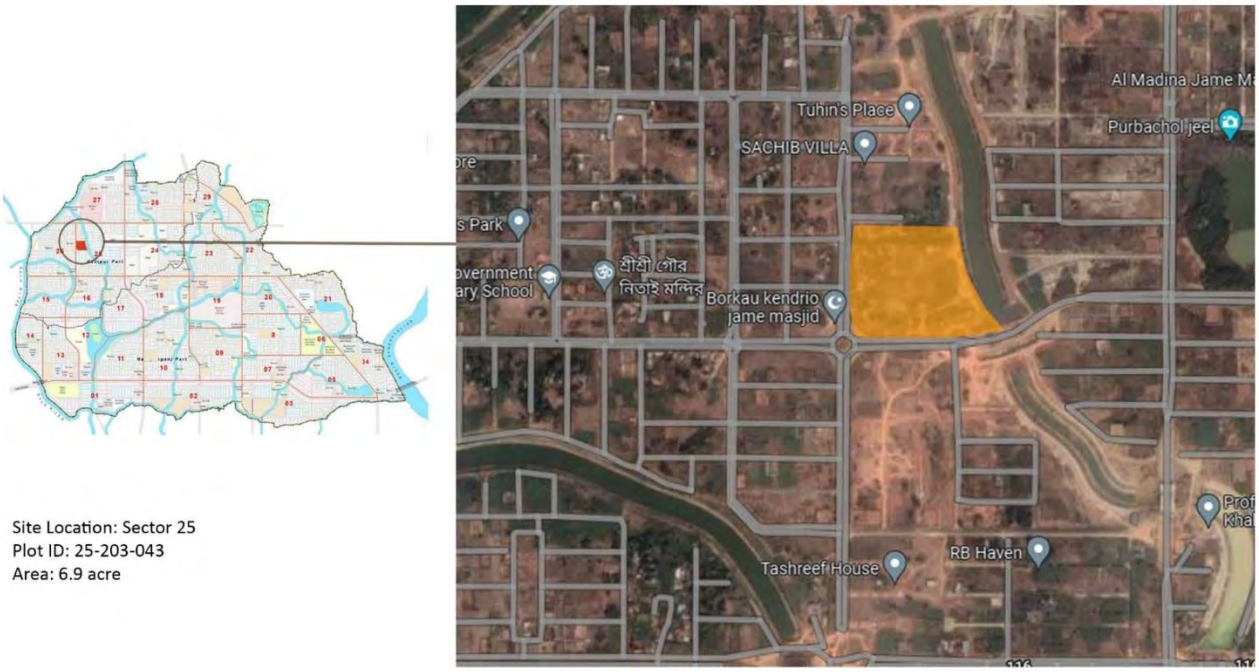


Figure 3.1.4: Figure showing the site location. Source: Google Earth

3.2 Chronological development of the site

According to RAJUK (2011) the revised project implementation period is July 1995 to June 2018. During 2002- 2003 fiscal year development in the Narayanganj part (4500 acres) took place and the Gazipur part (1500 acres) in January 2013.

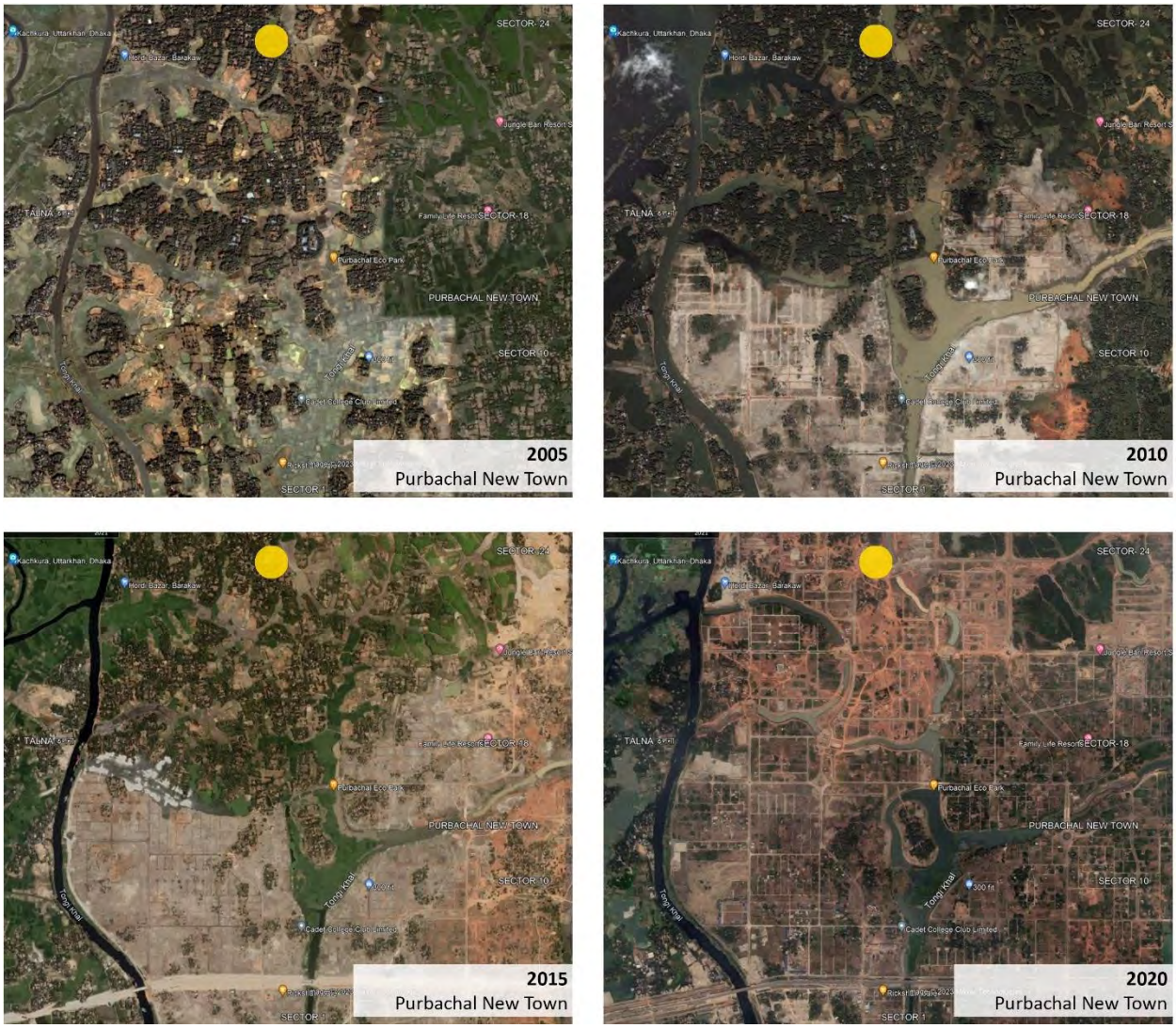


Figure 3.2.1: Figure showing the chronological development of the site. Source: Google Earth

In the figure 3.2.1 the above images show the google images of 2005, 2010, 2015 and 2020. Where it is clear how the development started from early 2000 and drastically increased from 2010 onwards. Source: (Google Earth, 2018)

3.3 Land Use Pattern

From the proposed land use map, the site is located on the corner plot adjacent to a node. There are three streets along the North, South and West periphery of the site. There are residential blocks on the North and South side of the site. Pankouri lake on the East side. Commercial zone and kacha market on the West side of the dedicated site. There are also few institutional and religious blocks at the surroundings of the site as proposed by Rajuk. The proposed land use also includes small clinics and administrative zones, as well as few open green spaces are near the site.

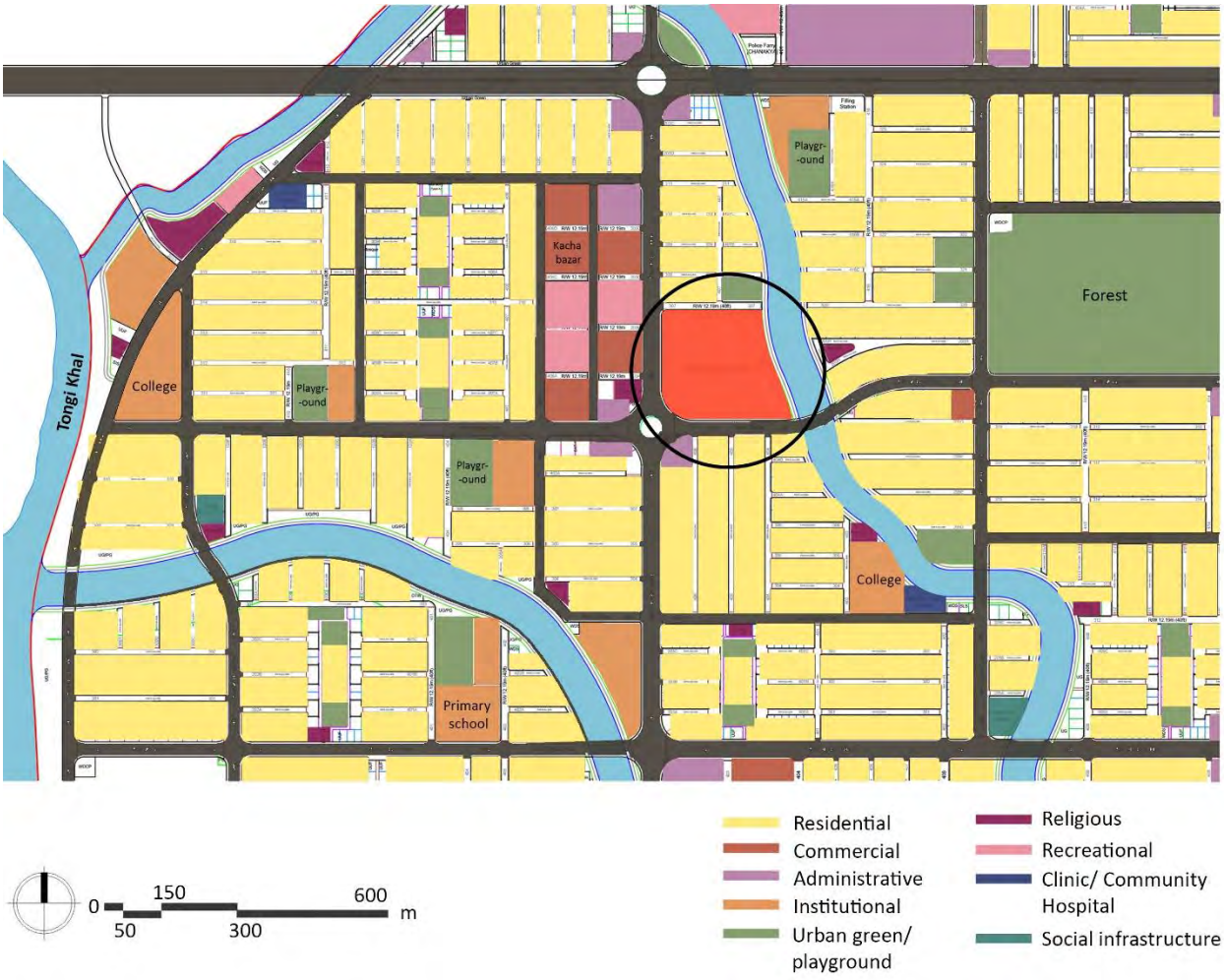


Figure 3.3.1: Proposed Land-use Map. Source: RAJUK (Modified by Author)

From the proposed land-use plan provided by Rajuk, the amenities around the site were analyzed. There are kacha market or bazars within 200m distance from the site. There are few schools and mosques denoted within 400m radius from the site. The neighborhood is mostly residential with the mentioned amenities within the 500-600m radius of the site, there is no proper community gathering space, there is lack of a welfare center and a sufficient community clinic, there is lack of recreational spaces as well.

Figure 3.3.2: Figure showing the proposed amenities within 500m radius from the site. Source: Author

3.4 Road Network

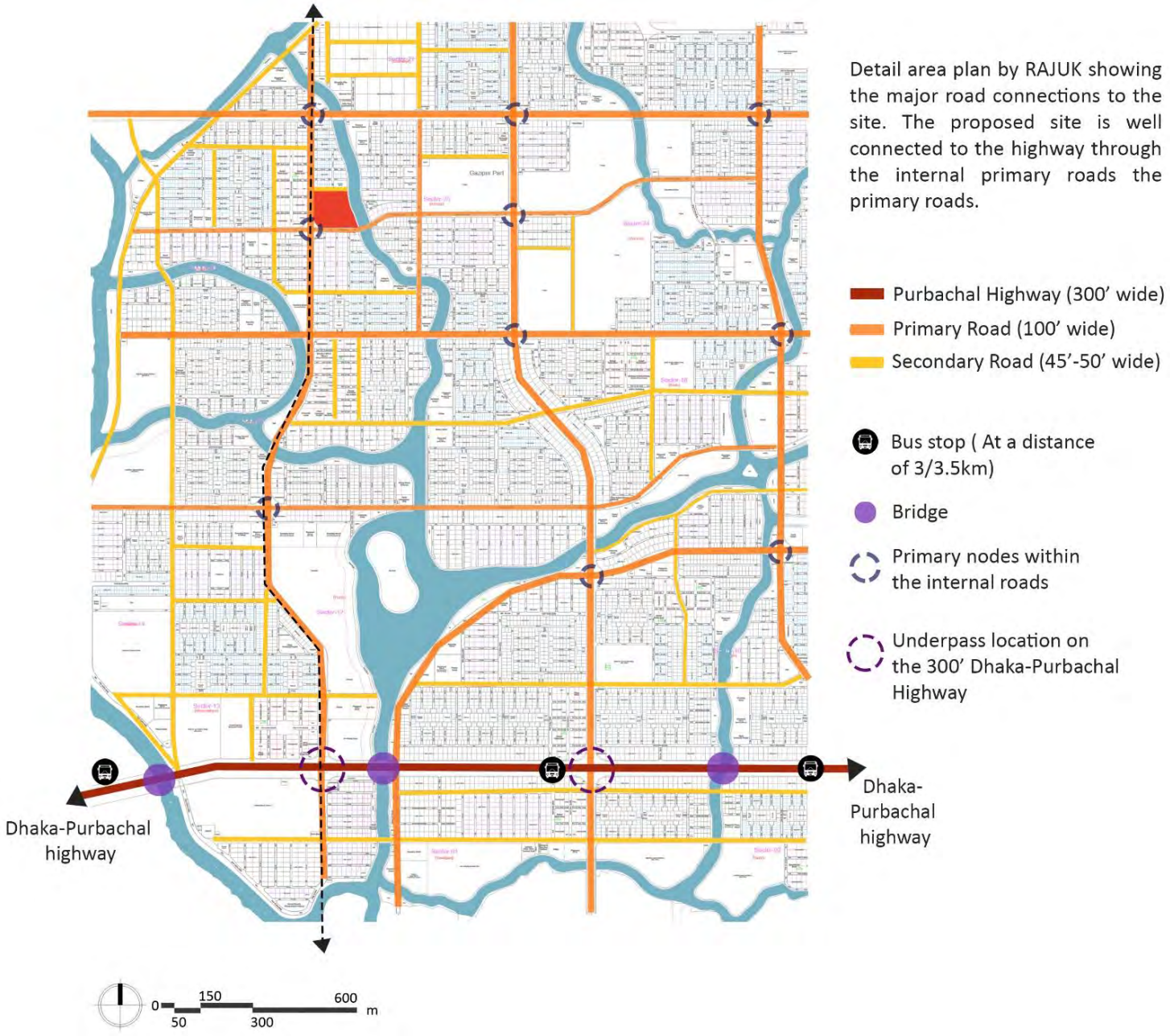


Figure 3.4.1: Figure showing the Road Network and Accessibility to the site and its surroundings, Source: Author

The figure 3.4.1 shows the road network system and the accessibility to the site from its surroundings. The site is located 2.5km North in the residential zone from the Underpass 1 in the Dhaka-Purbachal Highway. Current existing bus stops are on the main highway, that is 3-3.5km distance away from the site. Figure 3.4.2 shows the internal road network around the site, where the site adjacent primary streets are 100' and 75' wide, and the secondary roads are 40'-50' wide depending on the land use. The public space or bazaar areas have 54' wide streets, and the residential zones have 30' wide streets.

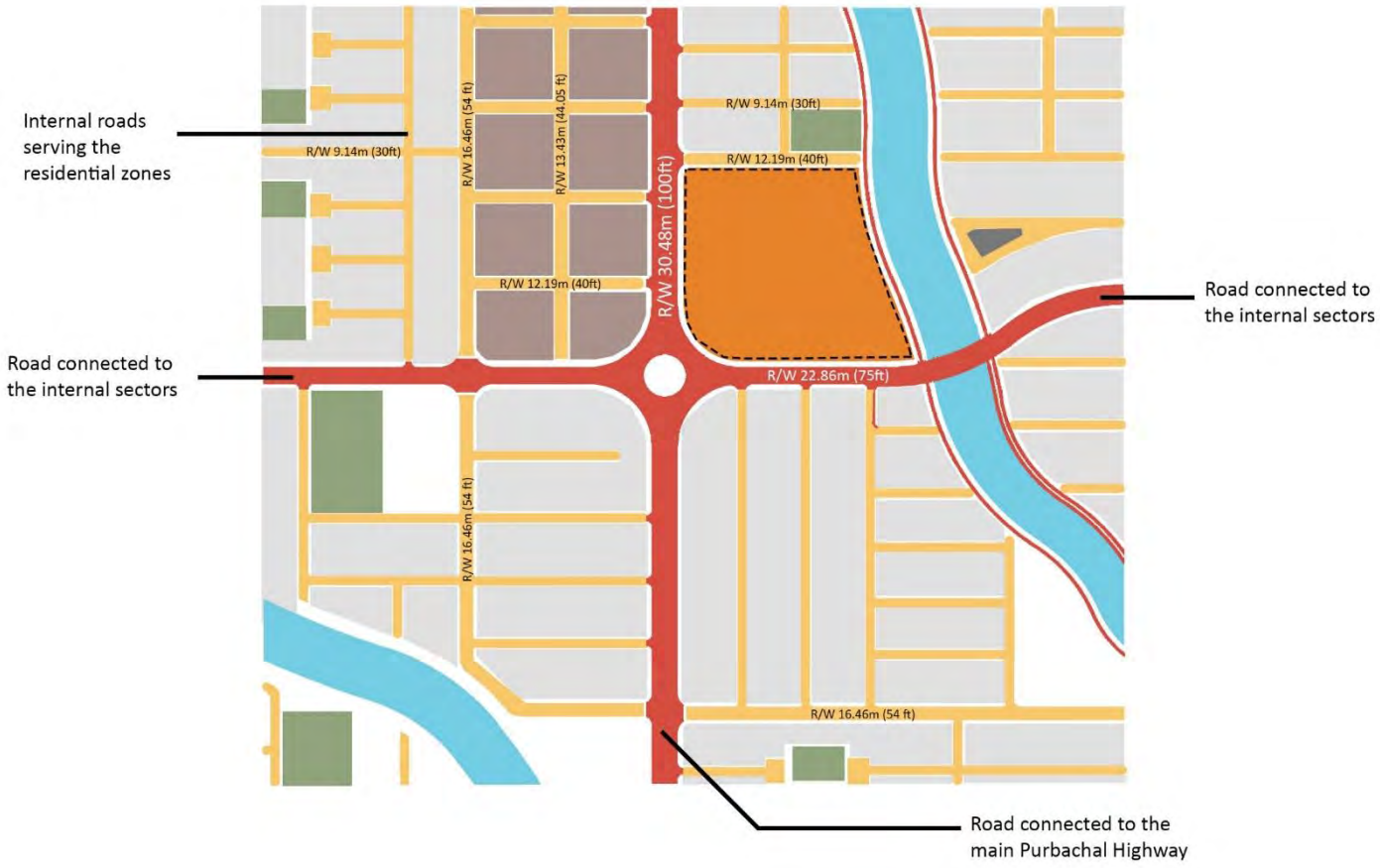


Figure 3.4.2: Internal Road network around the site and its surroundings, Source: Author

3.5 Site Surroundings

There is a bridge over the Pankouri Lake currently under construction, that connects the two sides of the sector 25. There are temporary settlements on site and around the site, where many local families live because of no land or home of their own. There are many families living in the Purbachal area for 30 years, but have no permanent resident or a piece of land. Hence, they live on temporary built houses on the lands owned by RAJUK.

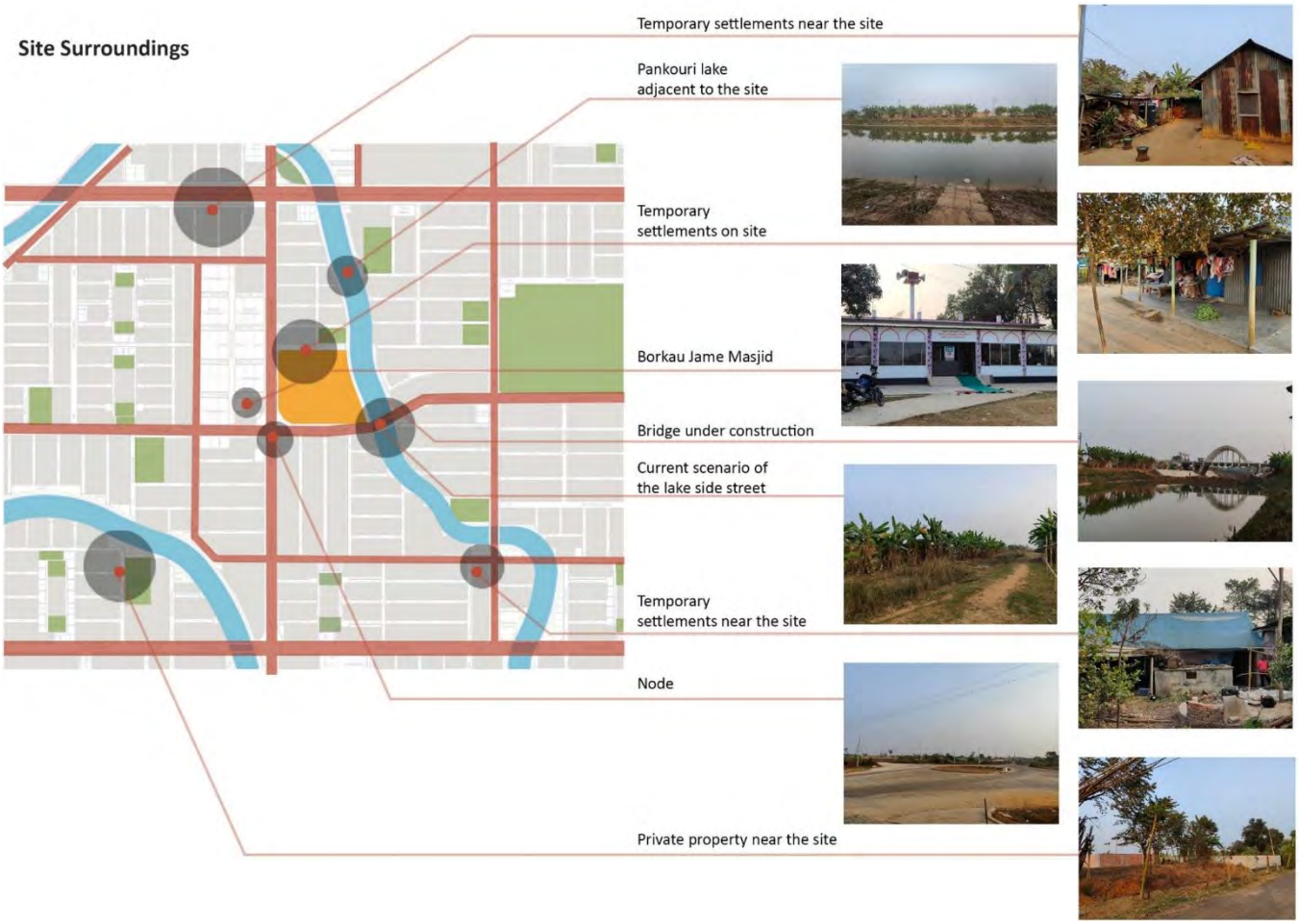


Figure 3.5.1: Current condition of the site and its surroundings, Source: Author

Site Images:

Image 1:

Figure 3.5.2: Temporary settlements built on the proposed site of the project. The local residents live here for lack of their own home or land. Source: Author

Image 2:

Figure 3.5.3: Temporary settlements built on the site adjacent to the proposed site.

Source: Author

The current condition of the site has many temporary settlements, shops and the local people are staying here in a very poor environmental condition. There is a primary node beside the site, a lake on the east. Most of the neighborhood is currently barren land but residential blocks are proposed by the Rajuk on the north. The west side of the site are proposed as bazar and market area, where there is an existing local bazar.

Image 3:

Figure 3.5.4: Images showing the site surroundings and the local amenities. Source: Author

3.6 Climatic Conditions:

Purbachal New Town is very close to the current Dhaka, so the climatic condition of the site is close to almost similar of that of Dhaka. The Dhaka city experiences a hot, wet and humid tropical climate. Under the Köppen climate classification, Dhaka has a tropical wet and dry climate. (Climate of Dhaka,2023)

According to Weather and Climate information for every country around the world (2016) Dhaka city has a tropical climate with a mild winter (October - March), a hot humid summer (March - June) and a humid warm rainy monsoon season (June - October). Thus, while designing any housing complex we have to consider the climatic factors.

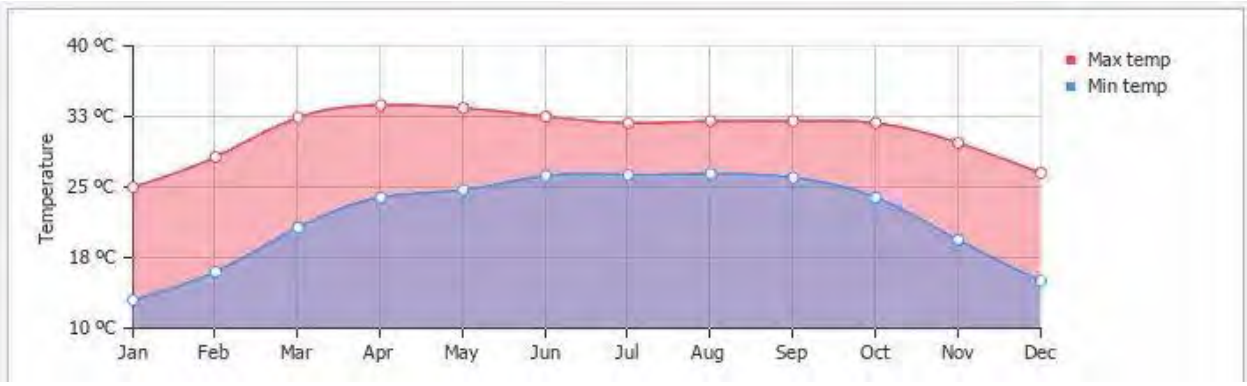


Figure 3.6.1: Shows the average min and max temperature in Dhaka City. (Source: Weather and Climate information for every country around the world, 2016).

On an average January (19°C avg) is the coolest month and June(30°C) being the warmest. High temperature: 34°C, Low temperature: 14°C and Mean temperature: 27°C (2018)

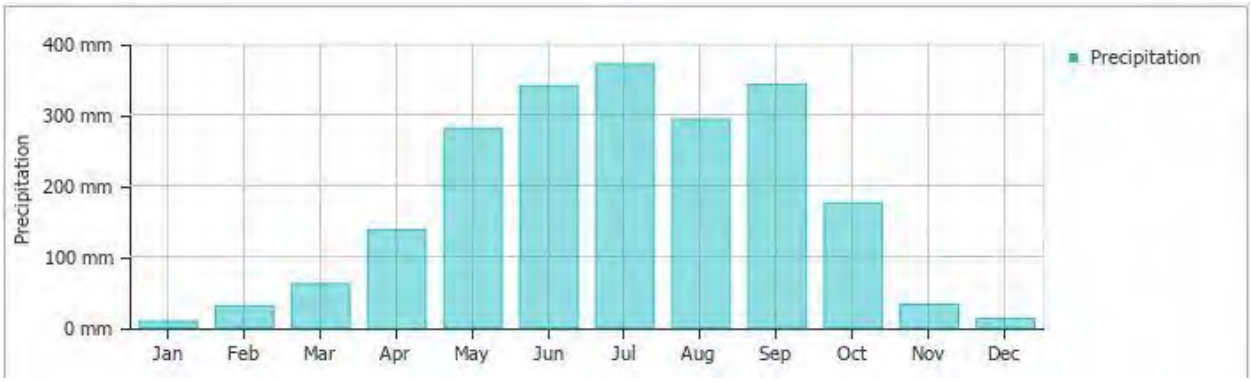


Figure 3.6.2: Shows the average precipitation in Dhaka city. (Source: Weather and Climate information for every country around the world, 2016). Precipitation: 124.4 mm (2018).

Figure 3.6.3: Shows the average rainy days in Dhaka city. (Source: Weather and Climate information for every country around the world, 2016).

The rainy season is between the months of April-October. The wettest month being August (306.5 mm avg) (2018). The amount of rainfall determines the type of material being used in the buildings. Humidity: 71%, determines the factors to be considered to keep the interiors damp proof.

Figure 3.6.4: Shows the average relative humidity in Dhaka city. (Source: Weather and Climate information for every country around the world, 2016).

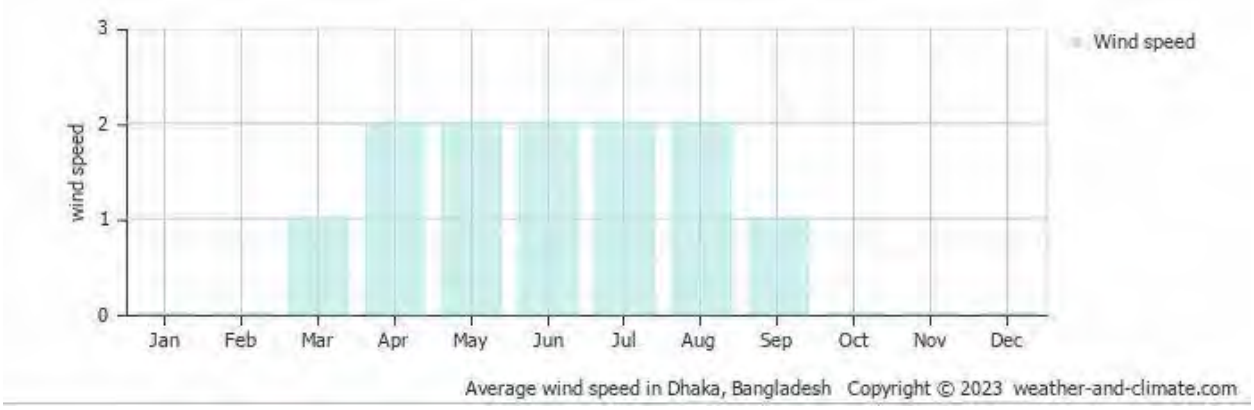


Figure 3.6.5: Shows the average wind speed in Dhaka city. (Source: Weather and Climate information for every country around the world, 2016).

The windiest month being April (6 km/h avg) Wind: 4 km/h (2018) This factor has to be taken into consideration for high rises being built in the city.

3.7 SWOT Analysis

- Site is located quite close to Dhaka city
- Currently no permanent structures around, so the site could be manipulated as per necessities
- Sufficient green space so possibility of a good environment

- No existing Urban life or features or any site forces to analyse and predict accordingly
- The site currently has temporary settlements of the local people and

- Site is located in a new and barren development that holds the strength in controlling the urban sprawl that shall direct to a new visualisation of the township

- Urban development could disrupt the present landscape and harm the environment if not addressed with proper design
- Land encroachment

Chapter 4: Case Study

The Belapur Incremental Housing and The Aranya Community Housing are social and affordable housing designed by keeping the concept of community involvement, affordability, sustainability and few other strategies of housing. Different aspects of the project would be briefly analysed with these two international projects. Lastly, the Bhasantek Rehabilitation Project (BRP) was studied as a local project, that can be an example of a failed project and guide us to understand the reasons of its failure and consider while planning.

4.1: Belapur Incremental Housing

Figure 4.1.1: Belapur Incremental Housing, New Mumbai, India. Source: Google

Architect: Charles Correa

Year of Construction: 1983-1986

Location: Belapur, New Mumbai, India

Climatic Zone: Tropical Climate. The average annual temperature is 27°C. the temperature is moderated by the proximity of the sea and do not undergo significant changes during the course of the year. The coldest month is January with the average temperature of 23.9°C.

This Project by Architect Charles Correa, located on six hectares of land about 2km of the city center of New Bombay, attempts to demonstrate how high densities (500 persons per hectare, including open spaces, school etc.) can be easily achieved within the context of a low-rise typology. The site plan is generated by a hierarchy of community spaces, starting with a small shared courtyard 8mx8m around which seven houses are grouped, each of these houses is on its own piece of land, so that the families can have the crucial advantage of open-to -sky spaces (to augment the covered areas). Furthermore, they do not share any party-walls with their neighbor+ which makes these houses truly incremental, since each family can extend their own house independently.

Figure 4.1.2: First image shows the human scale design increases community interaction. The second image shows a cluster, showing individual houses with the sanitary facilities along the same walls. Source: Google

These houses cover almost the entire social spectrum from squatter families to the upper income brackets-yet, in order to maintain the fundamental principal of equity, the sites themselves vary in size only marginally (from 45 sqm to 70 sqm), The form and plan of these houses are very simple, so that they can be built and extended by horizontal masons and craftsmen- thus generating employment in the Bazaar Sector of the urban community (i.e. exactly where they needed for the urban migrants).

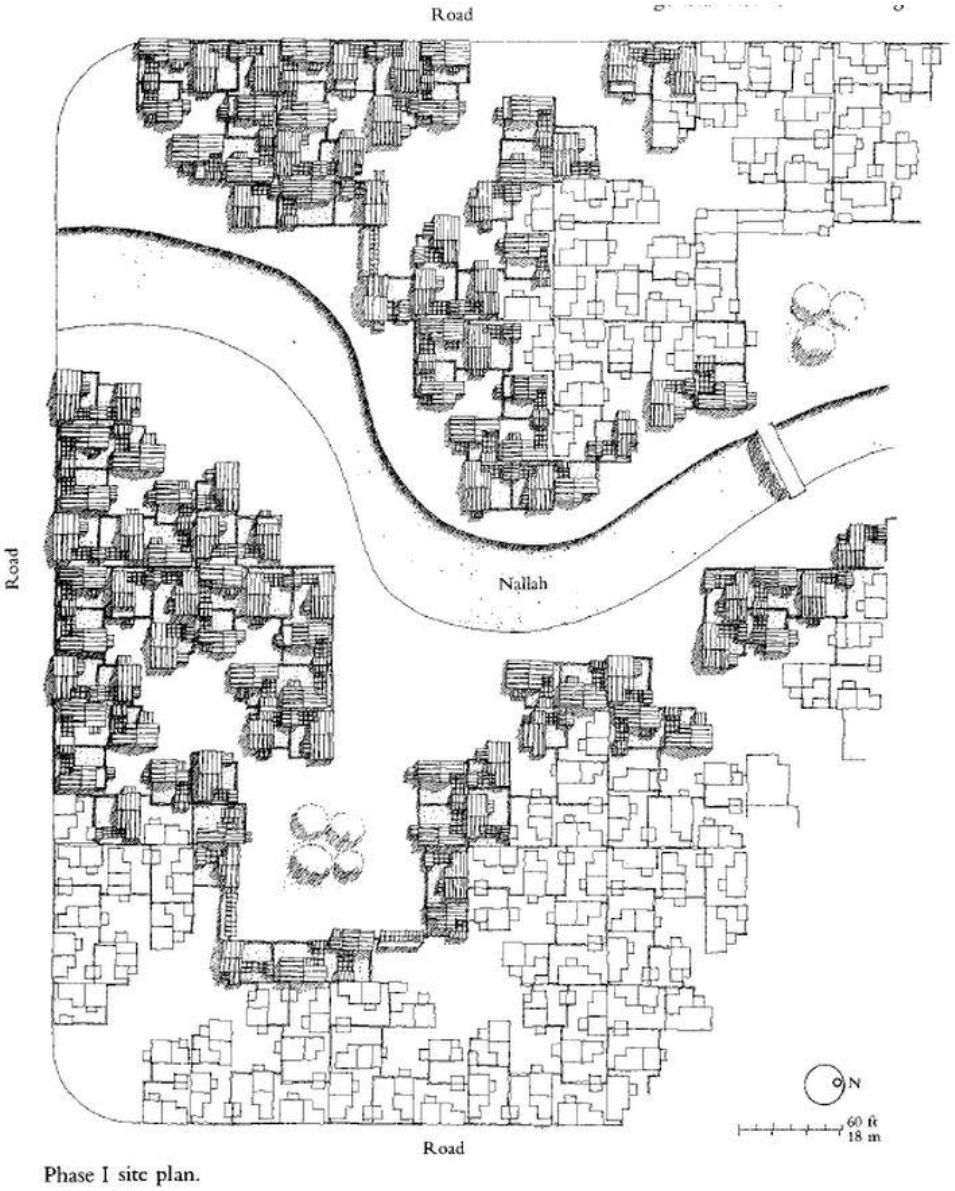


Figure 4.1.3: Master Plan of Phase 1. Source: (Charles Correa, 1987)

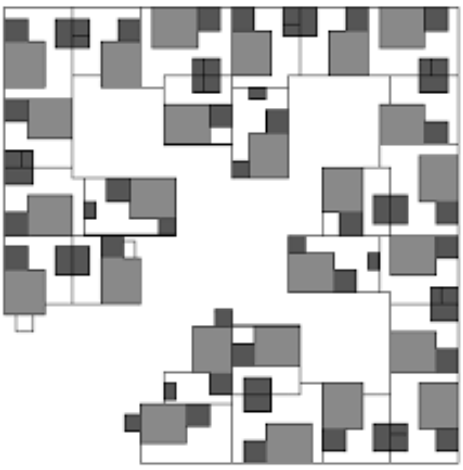


Figure 4.1.4: Built and open space relationship of a cluster. (Charles Correa, 1987)

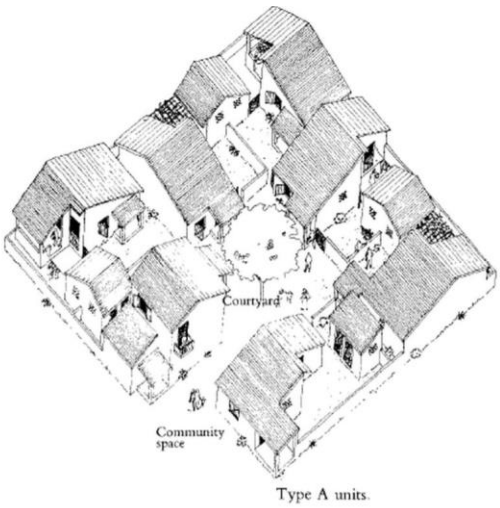


Figure 4.1.5: Axonometric drawing of a cluster. (Charles Correa, 1987)

The site plan shown in figure 4.1.3 is generated by a hierarchy of community spaces, starting with a small shared courtyard 8mx8m around which seven houses are grouped. The footprint of each plan varies from 45 sqm to 70 sqm. The form and plan of these houses are very simple, so that they can be built and extended by horizontal masons and craftsmen.

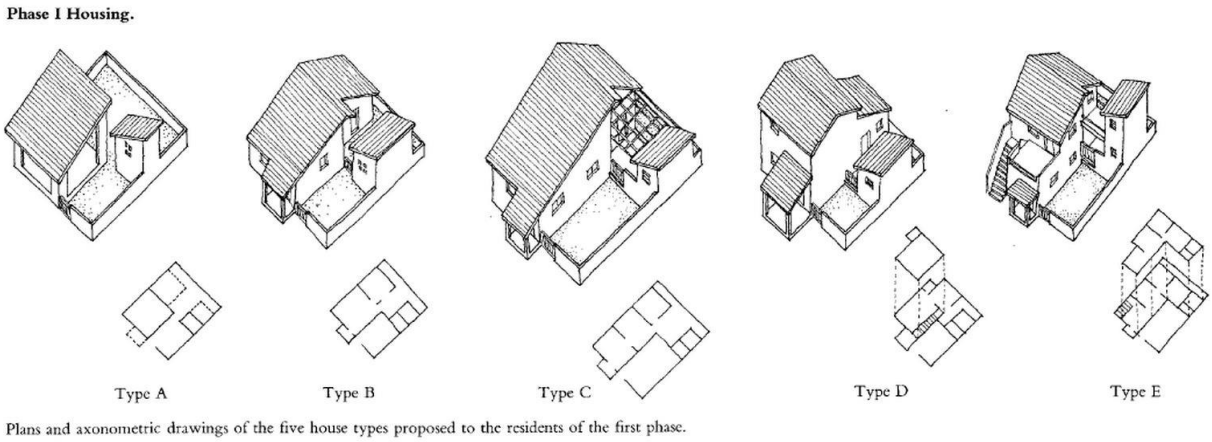


Figure 4.1.6: Different unit types designed for families with varied affordability. (Charles Correa, 1987)

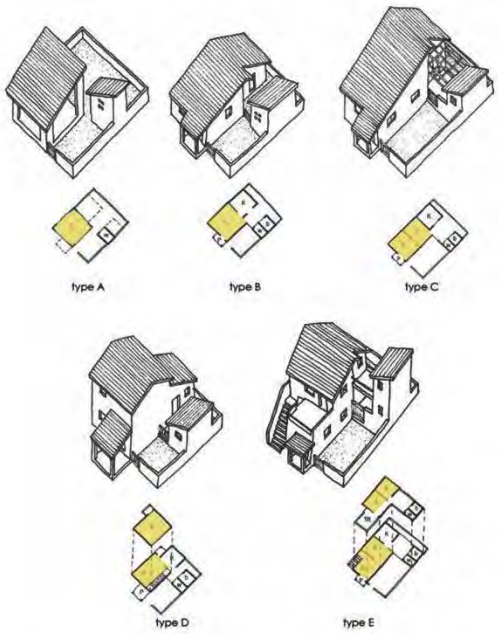
The Module:

- The project demonstrates how high-density housing (500 people per hector) can be achieved in a low-rise typology, while including open to sky services like schools that the community requires.
- The overriding principle is to give each unit its own site to allow for expansion. (Incrementality)
- The footprint of each plan varies little in size (from 45sqm to 70sqm) maintaining equity in the community.
- The village was produced with the idea that the residents were going to alter it in many ways, making it truly their own home, therefore homes are free standing, so residents can add on to them as their families grow and differently priced appeal to a wide variety of income levels.

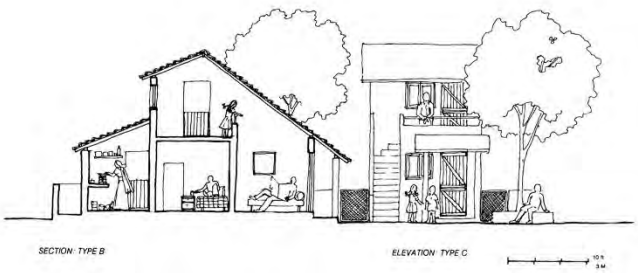
Analysis of the hierarchy of open spaces in the planning.

Source: modified by author

Phase II Site plan.



Different unit types for families with varied affordability



The low-rise high-density scheme utilizes a cluster arrangement around small community space. At the smaller scale, seven units are grouped around an intimate courtyard of about 8x8 meters. Three of the clusters combine to form a larger module of 21 houses surrounding an open space of 12x12 meters. Three such modules interlock to define the next scale of community space approximately 20x20 meters. The spatial hierarchy continues until the neighborhood spaces are formed where schools and other public-use facilities are located.

Figure 4.1.7: Images of Belapur housing with a view of hills in the background. Source: Google

Later changes in Belapur housing

Belapur housing has changed with time, whether or not the changes made by the inhabitants added to the scheme's vigor is to be judged. Most of the houses have been remodeled or destroyed and rebuilt. According to a study carried out in 2008 by two bloggers Rahul Srivastava and Matias Echanova, some inhabitants said some aspects of the design were impractical (e.g. the toilets were detached from the house). Some clusters of houses became mini-gated-communities while others became mini-slums. No one was in charge of maintaining the common open spaces at the center of each cluster of houses, so maintaining and cleaning of those spaces became a problem. These spaces do not fall under any jurisdiction; not private nor public. Perhaps, the dispute between neighbors is a part of the pluralistic designs of creating a community. However, according to the two visitors, these were not much serious problem and the community people managed to solve it themselves. The Belapur housing is one of the few architects designed housings allowed people to modify their houses freely, whether with a paintbrush or mortar. (Srivastava, 2008)

Figure 4.1.8: Images of Belapur housing in 2008, after many modifications done by the resident. Source: Google

4.2: Aranya Community Housing

Figure 4.2.1: Images of Aranya Community Housing, Indore, India. Source: Google

Architect: B.V Doshi, Vastu Shilpa Foundation

Year of Construction: 1989

Location: Aranya Nagar, Indore, India

Aranya, 6 kilometres from Indore, houses a total population of 60,000 in 6500 dwellings, on a net planning area of 85 hectares. The master plan, prepared by the Vastu-Shilpa Foundation in 1983, is designed around a central spine comprising the business district. Six sectors, each with populations of 7000-12,000, lie to the east and west of the spine and are diagonally bisected by linear parks. Ten houses, each with a courtyard at the back, form a cluster that opens onto a street. Internal streets and squares are paved. Septic tanks are provided for each group of twenty houses, and electricity and water are available throughout. The site plan accommodates and integrates a variety of income groups. The poorest are located in the middle of each of the six sectors, while the better off obtain plots along the peripheries of each sector and the central spine.

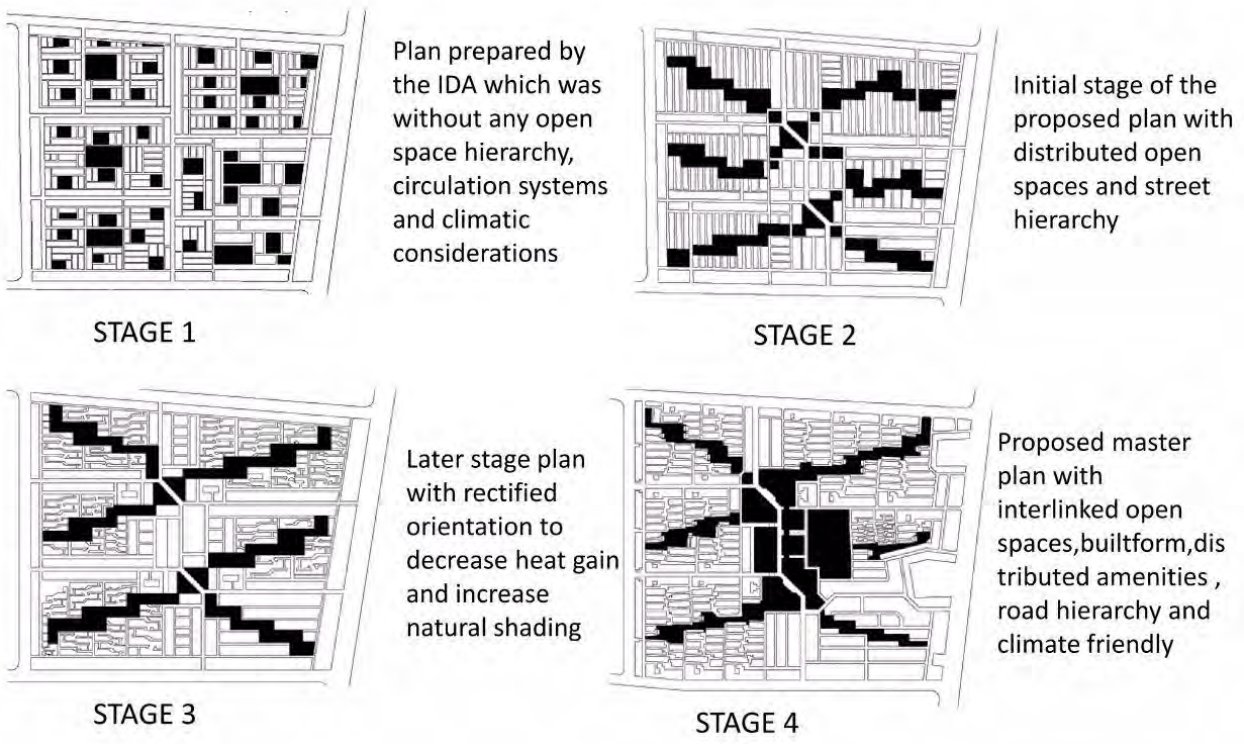


Figure 4.2.2: Site plan of Aranya Community Housing at different stages Source: (Ahmed, 2018)

- Ten houses, each with a courtyard at the back, form a cluster that opens onto a street. Internal streets and squares are paved.

- Septic tanks are provided for each group of twenty houses, and electricity and water are available throughout.

- The site plan accommodates and integrates a variety of income groups.

- The poorest are located in the middle of each of the six sectors.

- While the better off obtain plots along the peripheries of each sector and the central spine.

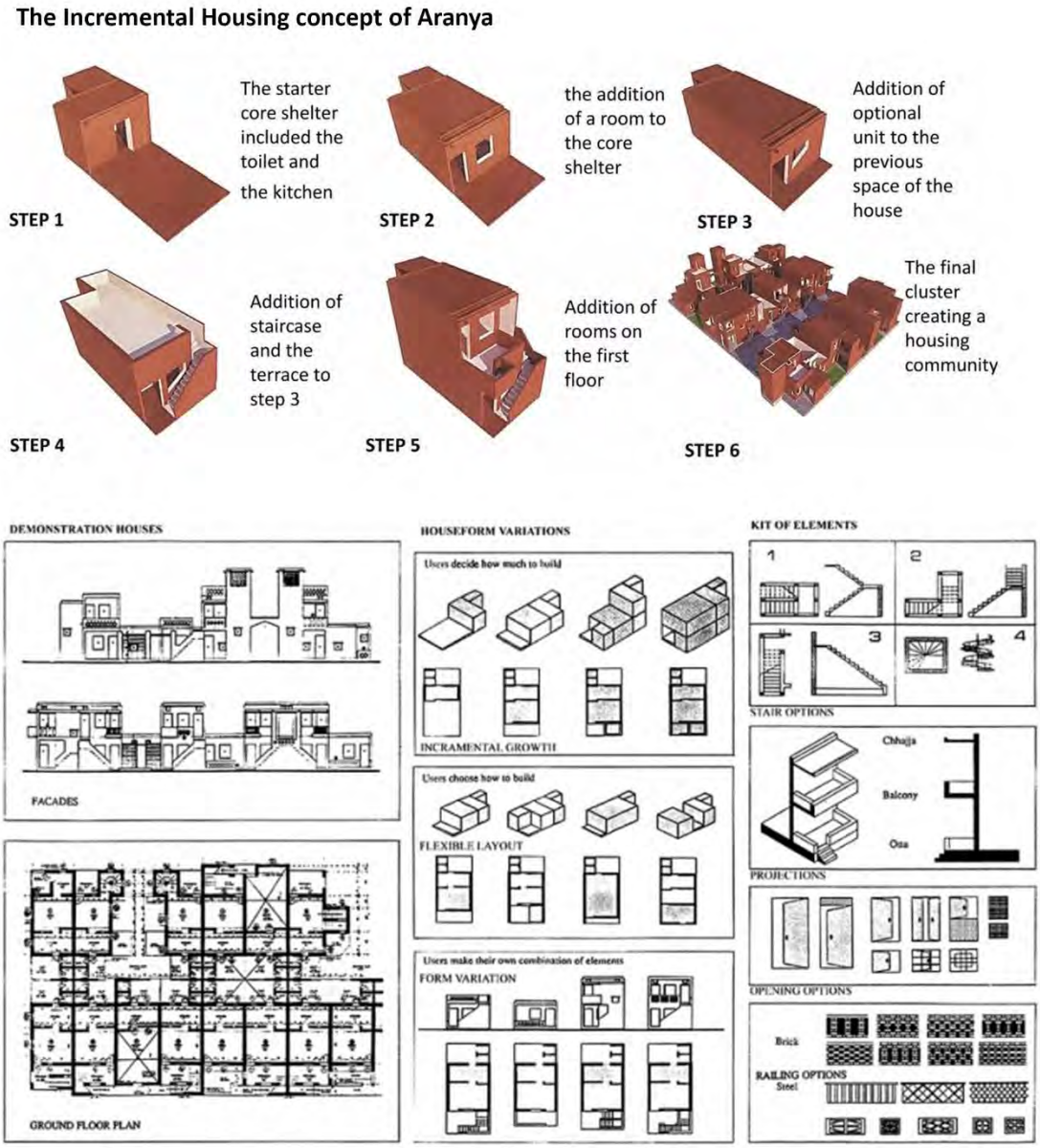


Figure 4.2.3: Figure showing the incrementality concept of the project. Source: (Ahmed, 2018)

Housing Typology for EWS Group

- The house consists of a verandah, 2 rooms, kitchen and the main service core that is the toilet and the bathroom.
- The types only differ by the number of floors and the types of the stairs

Figure 4.2.4: Figure showing the plans of the housing typology for EWS group. Source: (Ahmed, 2018)

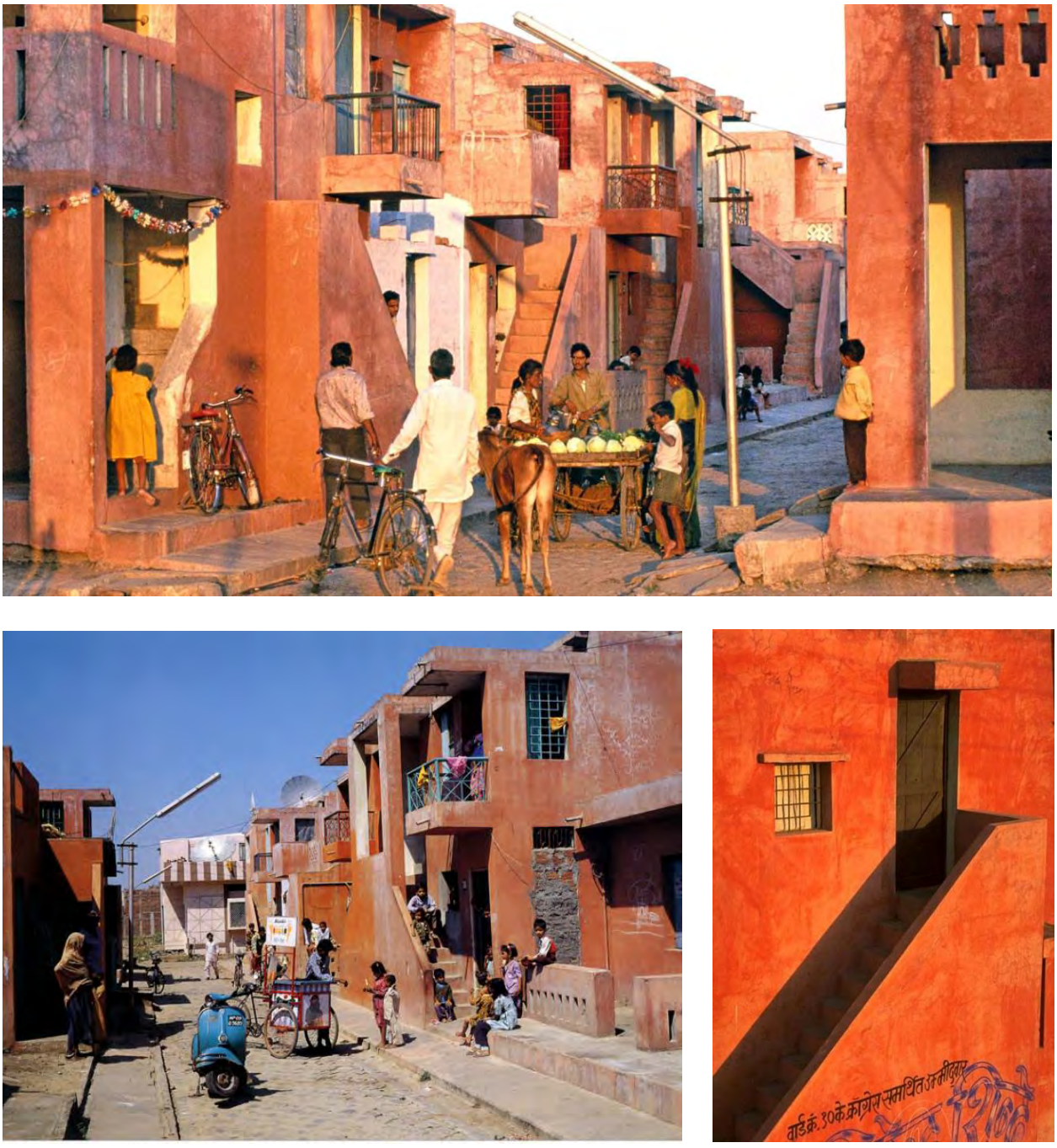


Figure 4.2.5: Images of Aranya Community Housing. Source:Google

Figure 4.2.6: Images of Aranya Community Housing. Source:Google

Climatic Considerations

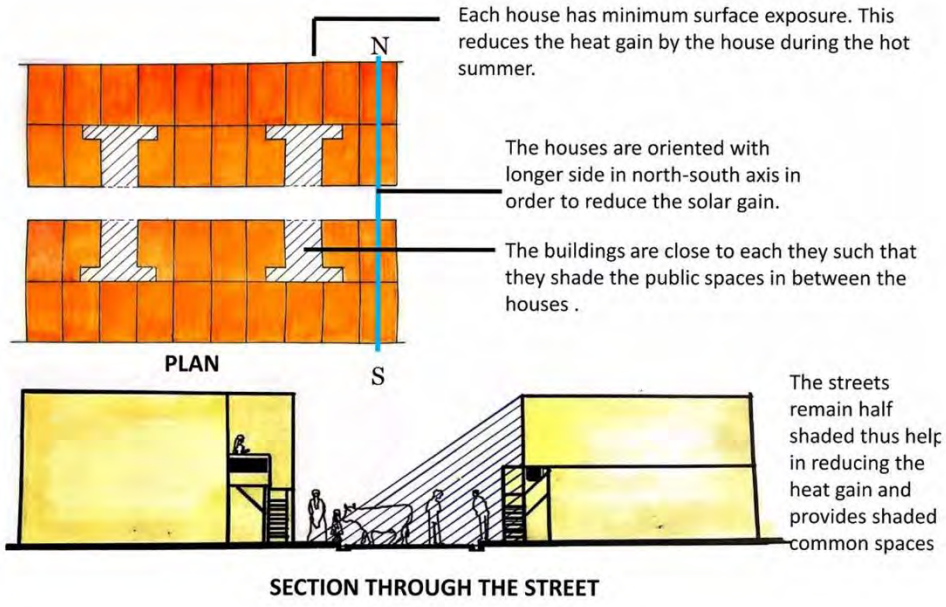


Figure 4.2.7: Figure showing the climatic considerations through a section. Source: (Ahmed, 2018)

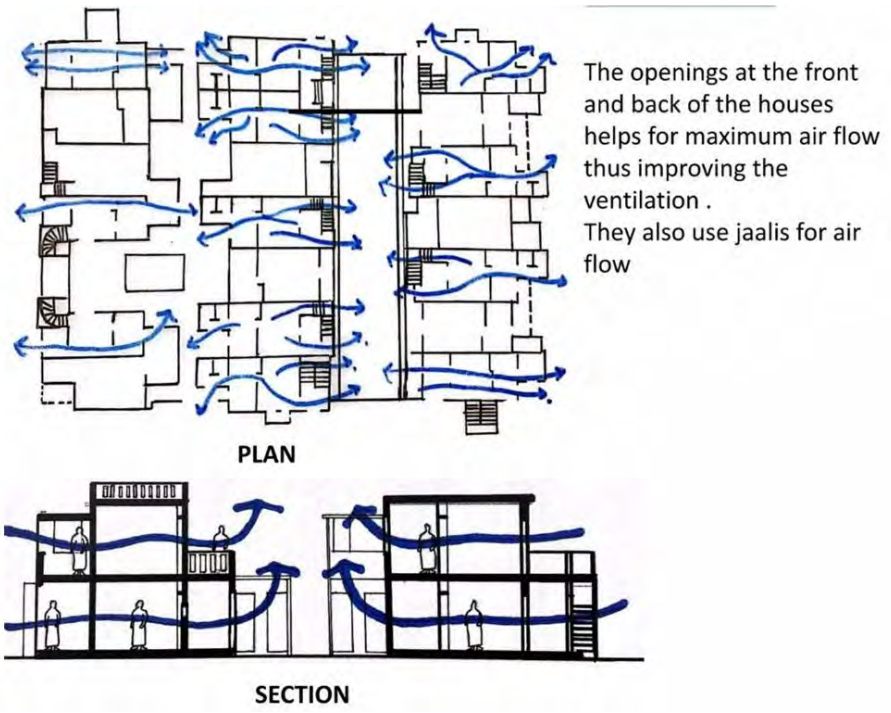


Figure 4.2.8: Figure showing the climatic considerations through a section. Source: (Ahmed, 2018)

Findings

- Flexible Layout of the houses
- The street network is hierarchal, hence helps to divide the sectores more effectively
- The vehicular and pedestrian movement don't intersect
- The site has public spaces thus provides the scope of socio-cultural activities
- The street outside the houses can get congested due to the extention of activities into the streets

4.3 Bhashantek Rehabilitation Project

Figure 4.3.1: Image of demolishing the Bhashantek slum. Source: Google

Year of Construction: 2005
Location: Mirpur 14

Objectives

- Housing for 79,120 people and number of units is 15,000 spreads over 49.5 acres of land.
- The project was started in 2005
- The aim of the project was to rehabilitee the slum dwellers of Bhashantek and as well as other slum areas in Dhaka city.

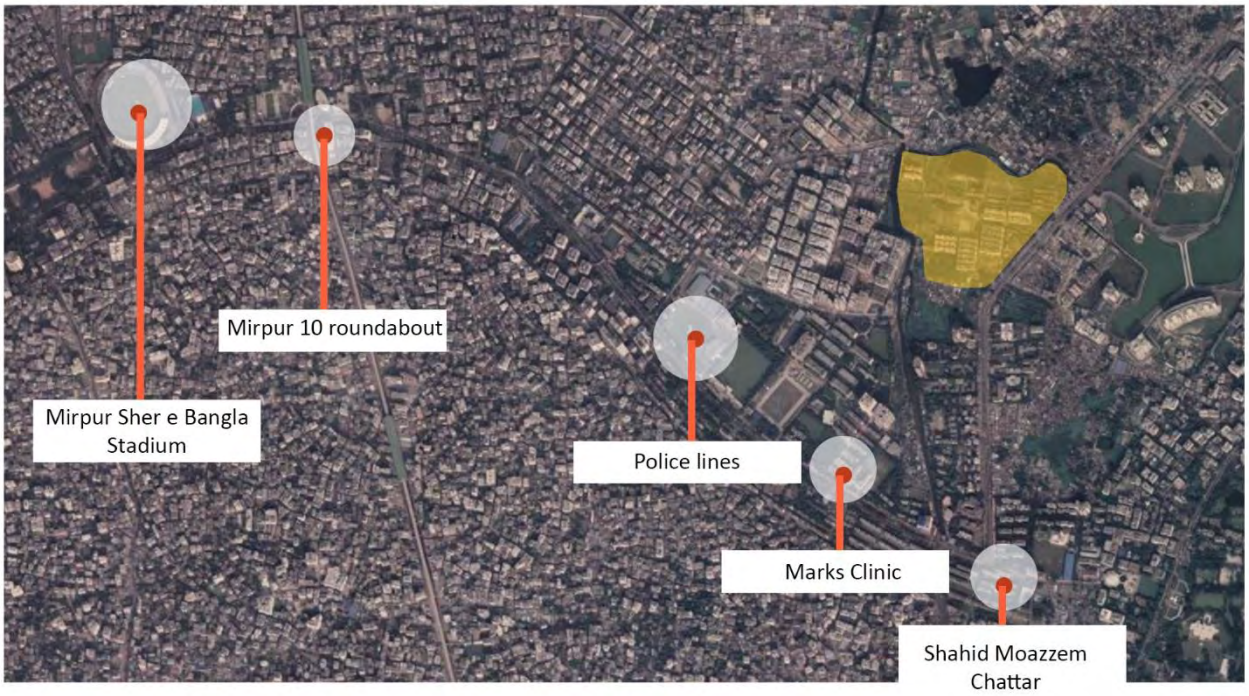


Figure 4.3.2: Location map of Bhashantek Rehabilitation Project. Source: Author

Site History

Chronological history of site

Figure 4.3.3: Chronological history of the site of Bhashantek Rehabilitation Project. Source: Author

The project started in early 2005, before that the site used to be a massive slum area, that was called the Bhashantek Slum. The figure 4.3.3 shows the history of the site how the slum was gradually demolished and the BRP was established.

Government took initiative in 1997 to rehabilitate the slumd wellers. The site was provided by the government and it is 47.9 acres. The project was started in 2005 and the total number of flats where 15024. Two types of building were there, Type A for garments worker and slum dwellers and Type B For lower income and class 3/4 employees.

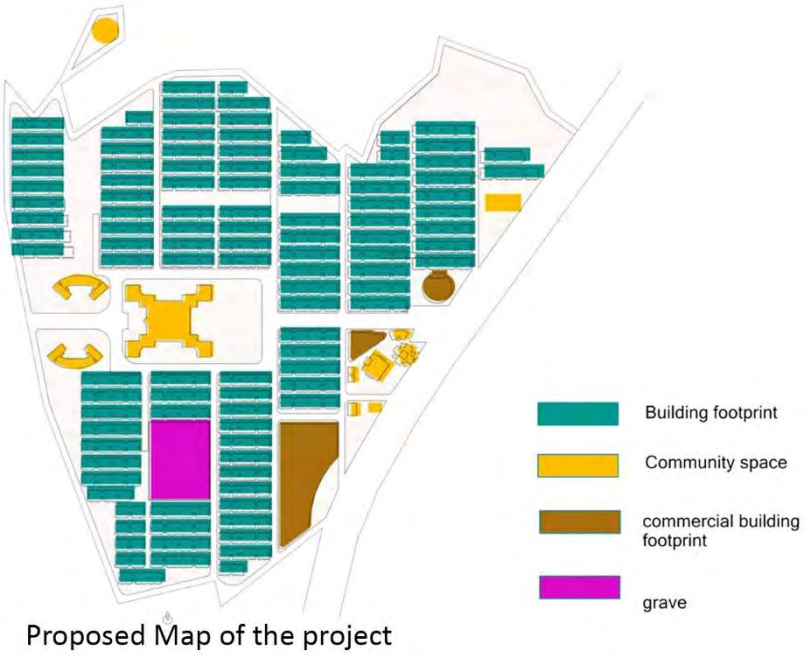


Figure 4.3.4: Proposed Master Plan of the BRP. Source: (Ahmed S. , 2017)

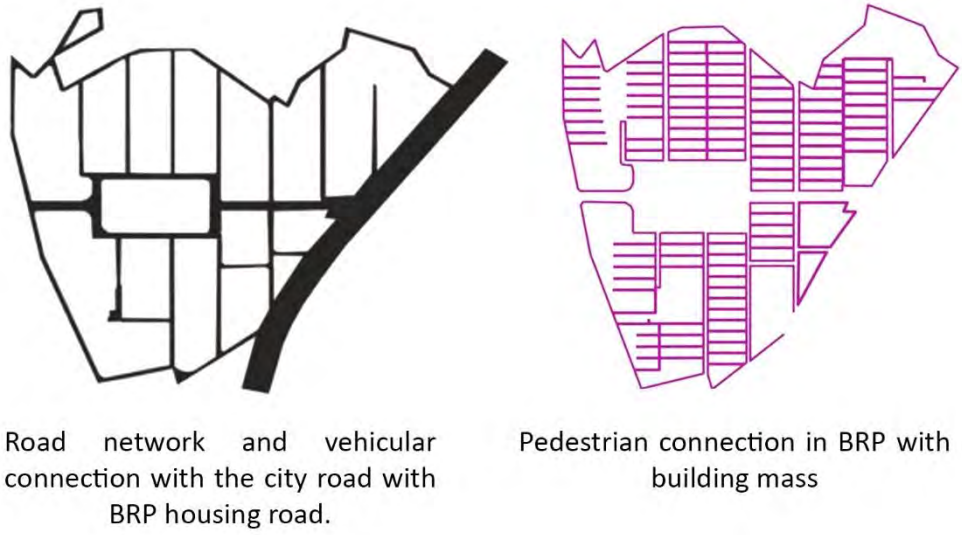
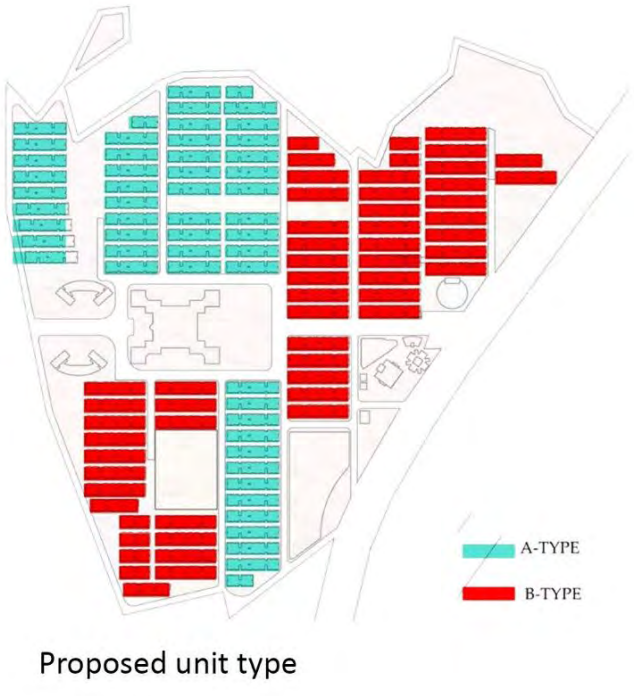


Figure 4.3.5: Road network and accessibility map of BRP. Source: (Ahmed S. , 2017)



Type A

- For garments worker and slum dwellers
- Units in each building:24x6 = 144
- Area per unit: 215 sqft

Type B

- For lower income and class 3/4 employees
-Unit in each building: 16x6=96
- Area per unit: 395

Figure 4.3.6: Proposed unit type of BRP. Source: (Ahmed S. , 2017)

In the reality the flats were not allocated according to the plan. The project was executed by a private company. Due to corruption the flats were sold at a higher rate as fixed initially. Type A flats were supposed to be sold at 2 lakhs whereas it was sold at 2 lakh 80 thousand. Type B flats were sold at 7 to 8 lakhs, but it was supposed to be only 3 lakhs. (Anifa, 2018)

The government in 2009 cancelled the license of the private company because of irregularities and gave the projects to National Housing Authority. The flats were unfortunately sold to rich and powerful individuals who then rent it out to others. The proposed market site was never completed and is currently being used as a playground. Most of the buildings are incomplete due to corruption, the community facilities are still under construction. A graveyard and mosque are present while the central Eidgah is a very interactive place for the residents.

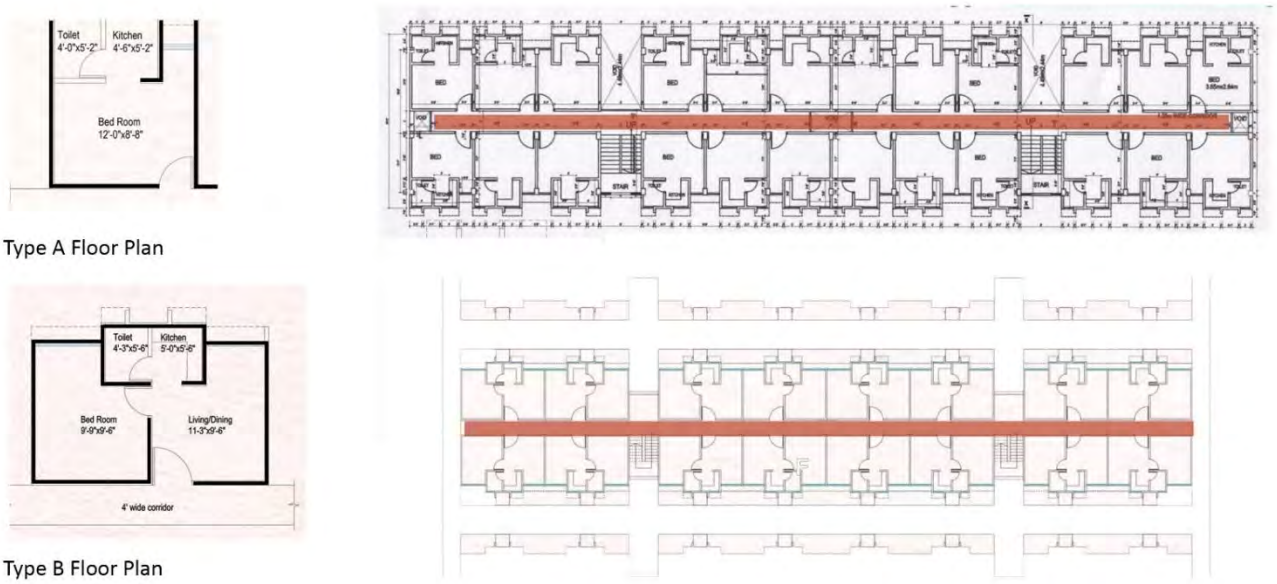


Figure 4.3.7: Floor plan of two building type with detail unit plan of BRP. Source: (Ahmed S. , 2017)

Type A building

- 6 buildings completed
- 52 proposed buildings
- 12 buildings are under construction
- 4 to 6 members per flat 215 square feet per unit

This type of building was allocated for garment workers and slum dwellers. However, except them, tenants from different income group live here. The rent is around taka 7000, it contains only one room and one kitchen and one bathroom. Moreover, the access of bathroom is from the kitchen. A typical family residing in type A unit consists of a father, mother, son, daughter, grandfather and grandmother.

Most of the type A buildings do not have gas lines, they cook using cylinders and those living on the ground floors cook on the corridors. There are 24 units in each floor and each building is 6 storied. (Anifa, 2018)

Type B building

- 12 buildings completed
- 57 proposed buildings
- 14 buildings are under construction

- 4 to 6 members per flat
- 395 square feet per unit

This type of building was allocated for class 3 and 4 employees. As mentioned above these were also not sold to them, and now the average rent is from 7000 taka to 9000 taka. In contrast to type A this unit has two rooms and is allocated for a family size from 4 to 6 members. However, it has been observed that an individual bought more than one flats and rented out the rest. Sometimes a single unit is leased to more than one individual and each of them pays an average of 5000 taka. This way a lot of earning comes from buying more than one flat at Bhashantek. A lot of police, army officials and high-class government officials bought flats from this project even though it was not made for them. (Anifa, 2018)

Corridors

Both the building types contain corridors and they are used for various purposes such as drying, clothes, storage, sewing and even cooking. These corridors are dark and are narrow as 4 feet wide.

Figure 4.3.8: Image showing the existing condition of BRP. Source: Google Earth

Reasons for suffering

- No lift
- Narrow aisles
- Not cost efficient
- Lack of community Bonding
- Ownership and rent issues
- The building and unit plans are arranged in such a way where north south opening is less, so there is a lack of proper sunlight and ventilation. Narrow corridors of 4' is connecting both sides which remains dark most of the time. This is a big reason of why people cannot live here properly.

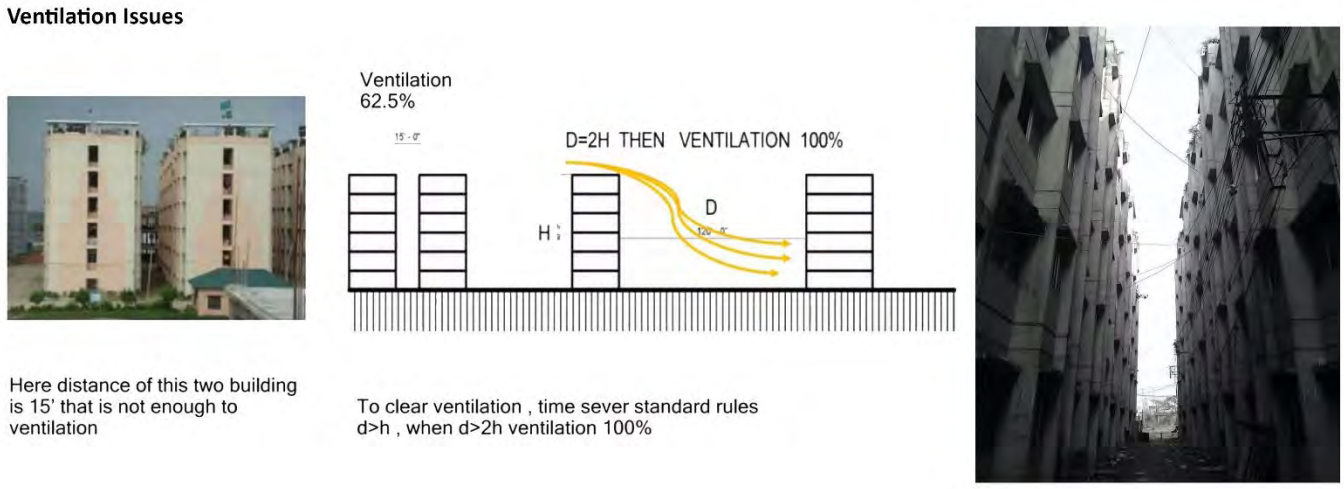


Figure 4.3.9: Figure showing the ventilation issue and narrow dark aisle of the BRP. Source: Google

Such "development" in pursuit of a techno-ideological spectacle, without a sense of equitable well-being, is empty and is particularly threatening to informal settlements due to land value. Even when the state operates with the best of intentions and provides off-site resettlement, it has proven to be disastrous in Bangladesh, as exemplified by the Bhashantek Rehabilitation Project. (Shafique, 2019)

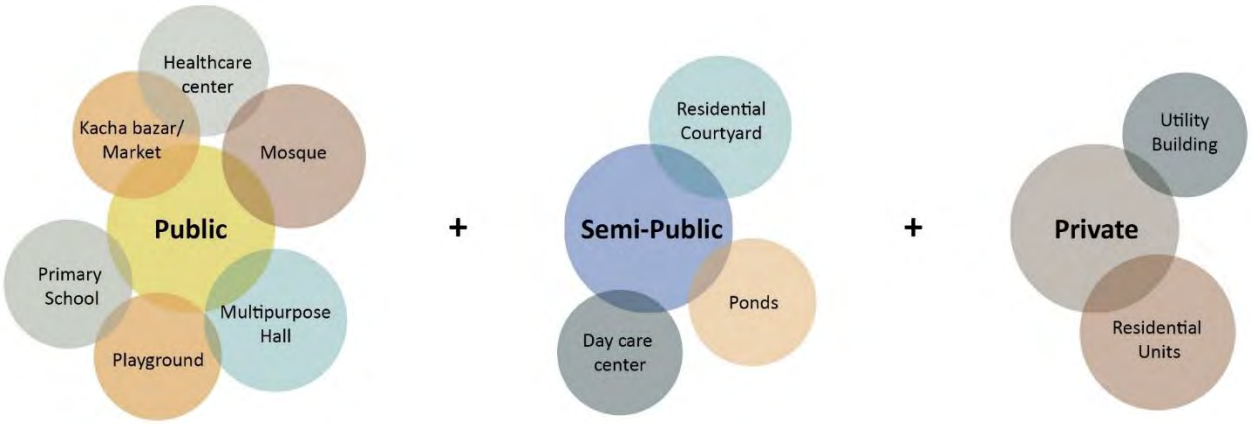
Chapter 5: Program Appraisal

5.1 Program Rationale

This project is proposed to provide a healthy, sustainable, social and affordable place for living for the low-income group of people. The basic understanding of the programmatic requirements of the projects could be gathered from the programs given by client (RAJUK). Here, a few programs were added and few given program areas were modified for the success of the project. The programs with detailed information were analysed here and they are categorized into three groups- Public zone, Semi-public zone and private zone. Thus, the two economies can merge, and the people who lives nearby can also come and see their lifestyle. To merge the barrier and create a new era is the main concept.

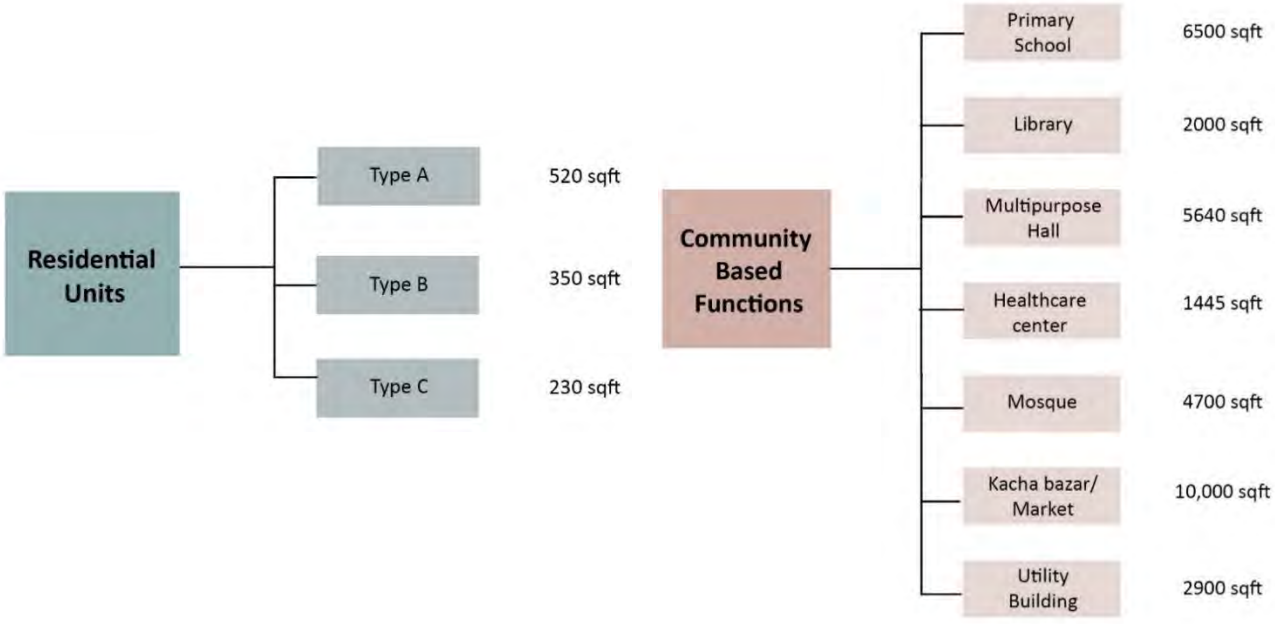
5.2 Functional flow and Program Analysis

Functions provided by the clients as well as few added functions are categorized into three groups and the respective functions under these groups are the Residential units, Primary school, Multipurpose Hall, Healthcare center, Mosque, Katcha bazar/ Market, Playground, Day care center and Utility building. The public zones are designed for the community there, where people nearby can come and visit. The bazar space is a public space that would open to the all where people can sell the products like vegetables they produce from their land, or other products as well. Basically, the functions are proposed in such a way that both the people and environment can be benefitted equally and to create a better interaction within the community and outside the community as well.



5.3 Square feet and area for program

The area for the program is analysed in detail by dividing the programs into two type- Residential units and Community based Programs. There are 3 types of residential units proposed by the client, which was further analysed in detail.

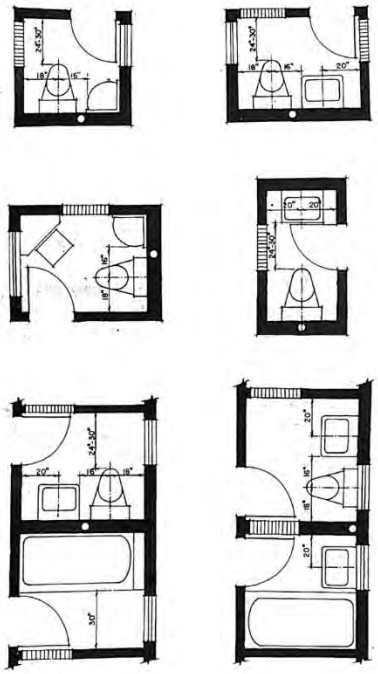


Residential Units					
Type and No. of Units	Fucntional Activities	Area required per room (sqft)	User	No. of Elements	Area (Sq ft)
Type A: 520 Sq ft (180 Units)	Bedroom	120	2	2	240
	Living/ Dining area	195	3-4 person	1	195
	Kitchen	30	1-2 person	1	30
	Storage	15	1	1	15
	Shower space	20	1	1	20
	Toilet/WC	20	1	1	20
				Total area of 1 unit	520
				Total area of 180 units	93600
				30% circulation	28080
				Total area of 520 sqft apartments (185 units)	**121680**

Type B: 350 Sq ft (310 Units)	**Type 1 of 350 sqft**				
	Bedroom	75	1-2 person	2	150
	Living/ Dining	122	2-3 person	1	122
	Shared Kitchen	30	1-2 person	1	30
	Shower space	20	1	1	20
	Shared Toilet	20	1	1	20
	storage	15	1	1	15
				Total area	357
	Type 2 of 330 sqft				
	Bedroom/Living/Dining	255	2-3 person	1	255
	Shared Kitchen	30	1-2 person	1	30
	Shower space	20	1	1	20
	Shared Toilet	30	1	1	30
	storage	15	1	1	15
				Total area of 1 unit	350
				Total area of 310 units	110670
				30% circulation	33201
				Total area of 350 sqft apartments (310 units)	**143871**

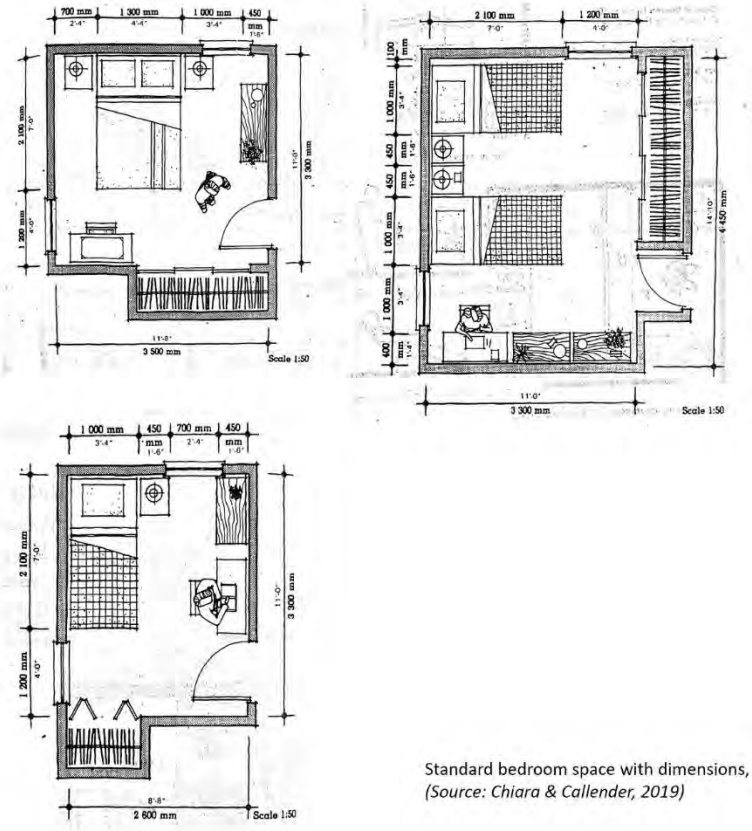
Type C: 230 Sq ft (80 Units)	Bedroom/Living/Dining	215	2	1	215
	storage	15	1	1	15
	Shared Community Kitchen	-			
	Shared Community Toilet				
				Total area of 1 unit	230
				Total area of 80 units	18400
				30% circulation	5520
				Total area of 230 sqft apartments (200 units)	**23920**
				Total area of residential units	**289471**

Standard Toilet Layouts



Standard toilet space with dimensions,
(Source: Chiara & Callender, 2019)

Standard Bedroom Layouts



Standard bedroom space with dimensions,
(Source: Chiara & Callender, 2019)

Community based Functions					
Type and No. of Units	**Fucntional Activities**	**Area required per room (sqft)**	**User**	**No. of Elements**	**Area (Sq ft)**
Primary School (6500 sqft)	Class rooms	350	15 per classroom	10	3500
	Headmaster's room + Toilet	150	1	1	150
	Teacher's Room + Toilet	300	8	1	300
	Meeting Room	550	10	1	550
	Toilet (Male)	165	3 WC/toilet	2	330
	Toilet (Female)	155	3 WC/toilet	2	310
				30% circulation	1542
Total area					**6682**

Library	Reading zone Indoor games Admin Toilet	2000	-	-	**2000**
Multipurpose Hall (For 500 people approx)	Main Hall	3000	450-500 person	1	3000
	Preperation room	1200	-	1	1200
	Other facilities	800	-	1	800
	Toilet (Male)	165	2 WC/toilet	2	330
	Toilet (Female)	155	3 WC/toilet	2	310
Total area					**5640**

Health care and Day care center	Waiting Room	180	8-10 person	1	180
	Medical Facilities	150	2	1	150
	Doctor's room	120	2	2	240
	Day care	300	8-10 children	1	300
	Toilets	90	2WC/toilet	2	180
	Storage	40		2	80
				30% circulation	315
Total area					**1445**
Mosque (For 500 people)	Male praying space (90% of the total user)	3600	450	1	3600
	Female praying space (10% of the total user)	400	50	1	400
	Ablution space (4 sqft/person)	200	50	1	200
	Toilet (Male)	310	5 WC/toilet	1	310
	Toilet (Female)	125	2 WC/toilet	1	125
				30% circulation	273
Total area					**4635**

Katcha bazar/ Market		10000		1	10000
Utility building	Substation	2000		1	2000
	Equipment rooms	150		1	150
	Office	100		1	100
				30% circulation	675
Total area					**2925**
Total area of Community based Functions					**32292**
TOTAL BUILT AREA					**321763**

	Area In sqft (Approx values)
Total site area = 6.9 Acres	300564
Green Space (30% of the site)	90169.2
Water body (10% of site)	30056.4
Roads and internal hard surface (20% of site)	60112.8
Total= 60% of the 6.9 acre site area	180338.4
So, desigining a built space of Maximum Ground Coverage (MGC) = 40% of the site; (300564-180338.4) Sqft	**120225.6**

Chapter 6: Conceptual Stage and Design Development

6.1 Introduction

The initial work of the concept development process started by the study of the existing condition of lower income group of people living in Dhaka. The rural migrants shifting to the city are also living in the existing informal settlement area or in squatter houses. The study starts by analysing why they are migrating towards the urban regions and what are they facing after migration.

6.2 Analysing the present condition

In the capital city of Bangladesh; Dhaka, it receives 70 persons rural migrants hourly. (Anifa, 2018). Out of the total 20million people residing in Dhaka, 8.5 million are rural migrants. They are coming to Dhaka in search of a better lifestyle and work opportunity, but in reality, they end up their life in misery due to the immense housing problem in Dhaka, and so scope for job opportunities.

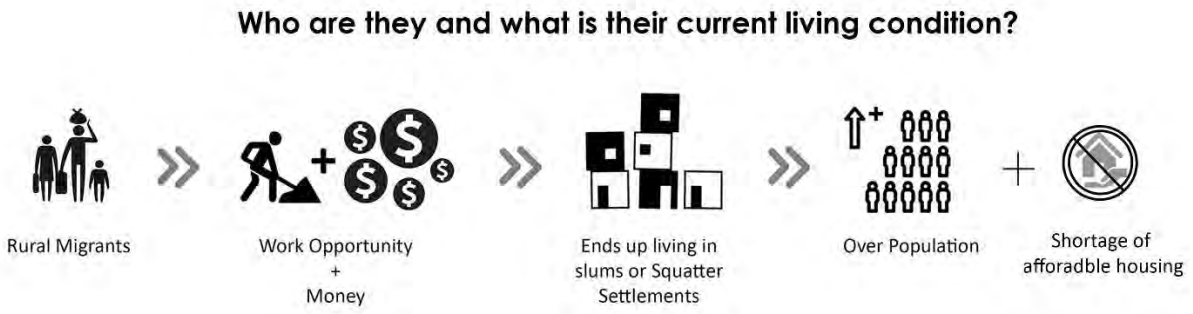


Figure 6.2.1: Figure showing why people are shifting towards the urban life and what they are facing in reality. Source: Author

Most of the informal settlements in Dhaka are found adjacent to the waterbodies and rail line, as it is easier to create temporary and informal settlements on waterbodies since it is not claimed by others. Moreover, they can be built on stilts.

Figure 6.2.2: Figure showing a typical informal settlement built adjacent to a waterbody in Dhaka. Source: Author

Figure 6.2.3: Figure showing what are they facing living in such environments. Source: Author

Similarly, the land adjacent to the rail line also belongs to the government and is usually not. claimed by others. The surrounding context of existing informal settlements are mostly mixed use, industries or factories, since the workers in the factories and offices live there.

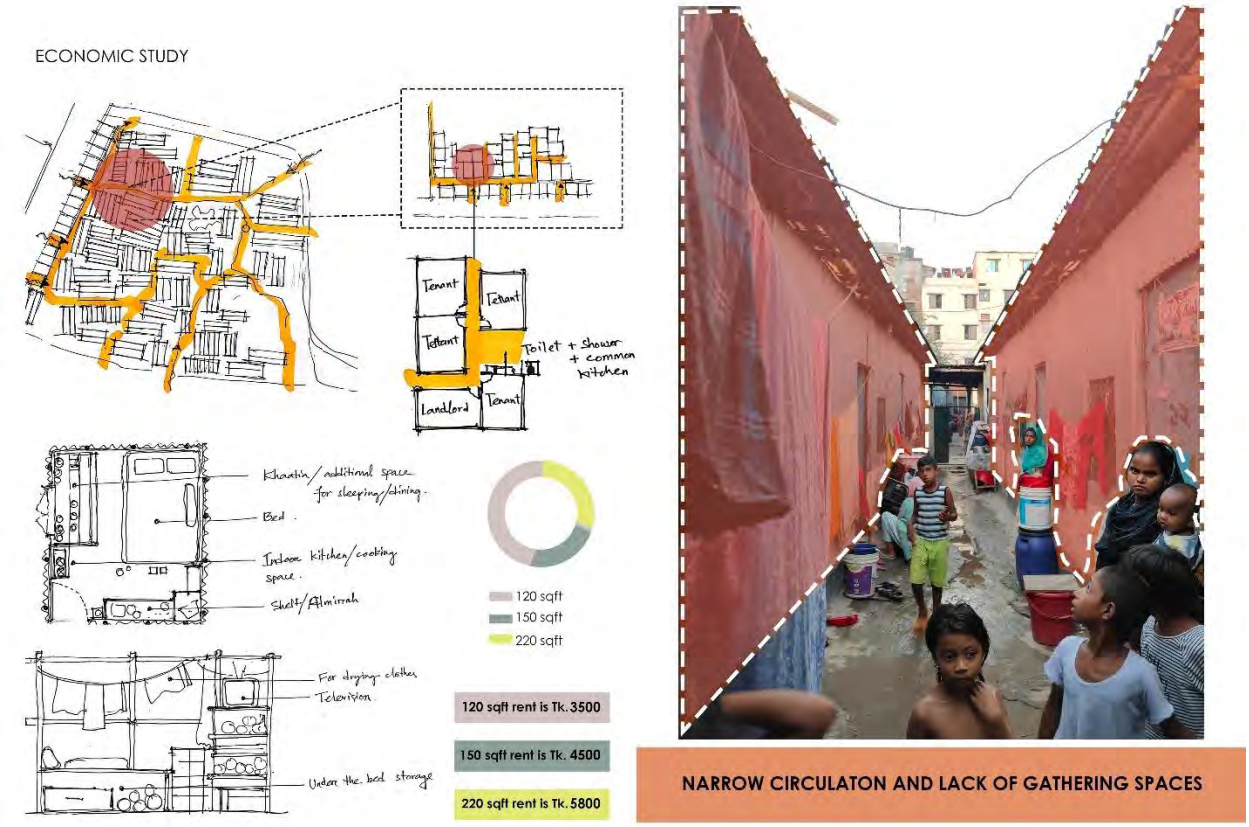


Figure 6.2.4: Figure showing the narrow alleys which is the only circulation and gathering space in their current living space. Source: Author

The amount of rent these group of people are paying in the current context of Dhaka, is a lot compared to the space and living condition they are getting in return. The analysis shown through figure 6.2.4 and 6.2.5 shows their current living condition and their sufferings. There is lack of enough circulation and no gathering spaces for the people as well as no play space for the children. Major reason behind their suffering is their less scope of earning and income generation, as well as shortage of affordable housing in the city.

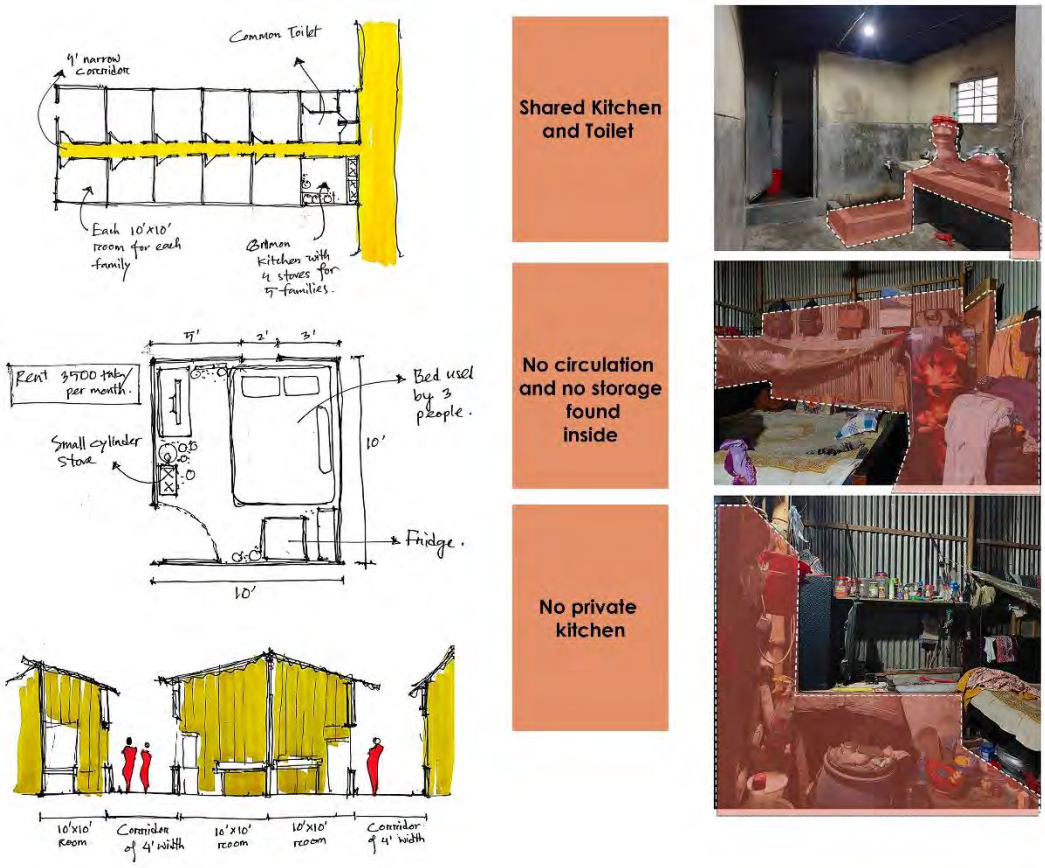
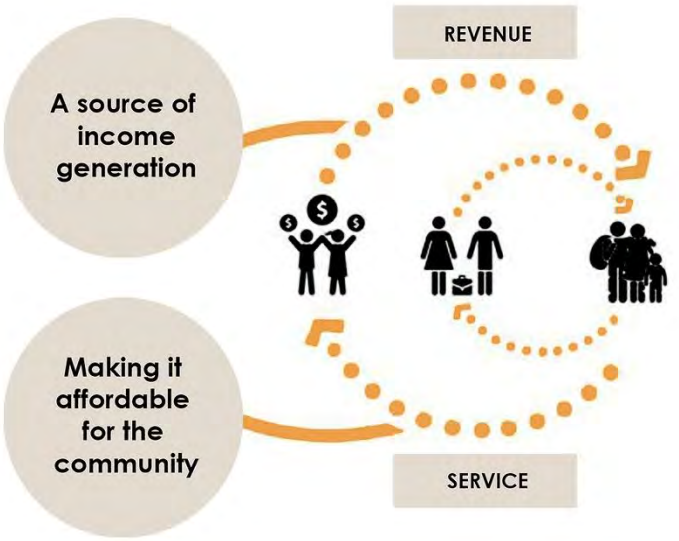


Figure 6.2.5: Figure showing the shared utility spaces that has no circulation and no storage facilities. Source: Author

6.3 Concept Development

The main idea of this project is to focus on the economic development of the lower income community. The aim was to create a platform and opportunity for the community through which they can generate a revenue and have a better living environment and a better lifestyle in an affordable way.



Secondary focus was to create interactive public spaces, children play spaces and connect the neighbourhood to the community through different spaces. The spaces like uthan, bazaar, bot tola, ghaatpar, playfields, melar maath- those are very common to this group of people, the project aims to connect the community through these spaces.

উঠান

বাজার

ঘাটপাড়

বট তলা

Figure 6.3.1: Conceptual sketches showing the social gathering spaces as an interactive space. Source: Author

6.4 Design consideration

The design is approached by introducing a commercial belt through the site, that connects the neighborhood to the community as well as creates a scope for income generation of the community. In figure 6.4.1, it shows the possibility of the proposed commercial zone to spread along the primary roads around the site. The predicted land use map shows the probable extension of the commercial zones, that has direct impact on the site. Addressing this issue, a commercial belt was introduced through the site which is shown in step by step in figure 6.4.2. A waterfront view was also developed in order to create a public plaza along the lake.

According to the contextual analysis and conceptual thoughts, a festive and active thoroughfare was created throughout the site that helps to generate the economic condition of the community, through which they can afford the space. Moreover, this public thoroughfare also connects the surrounding neighborhood to this community and creates a bond through spaces.

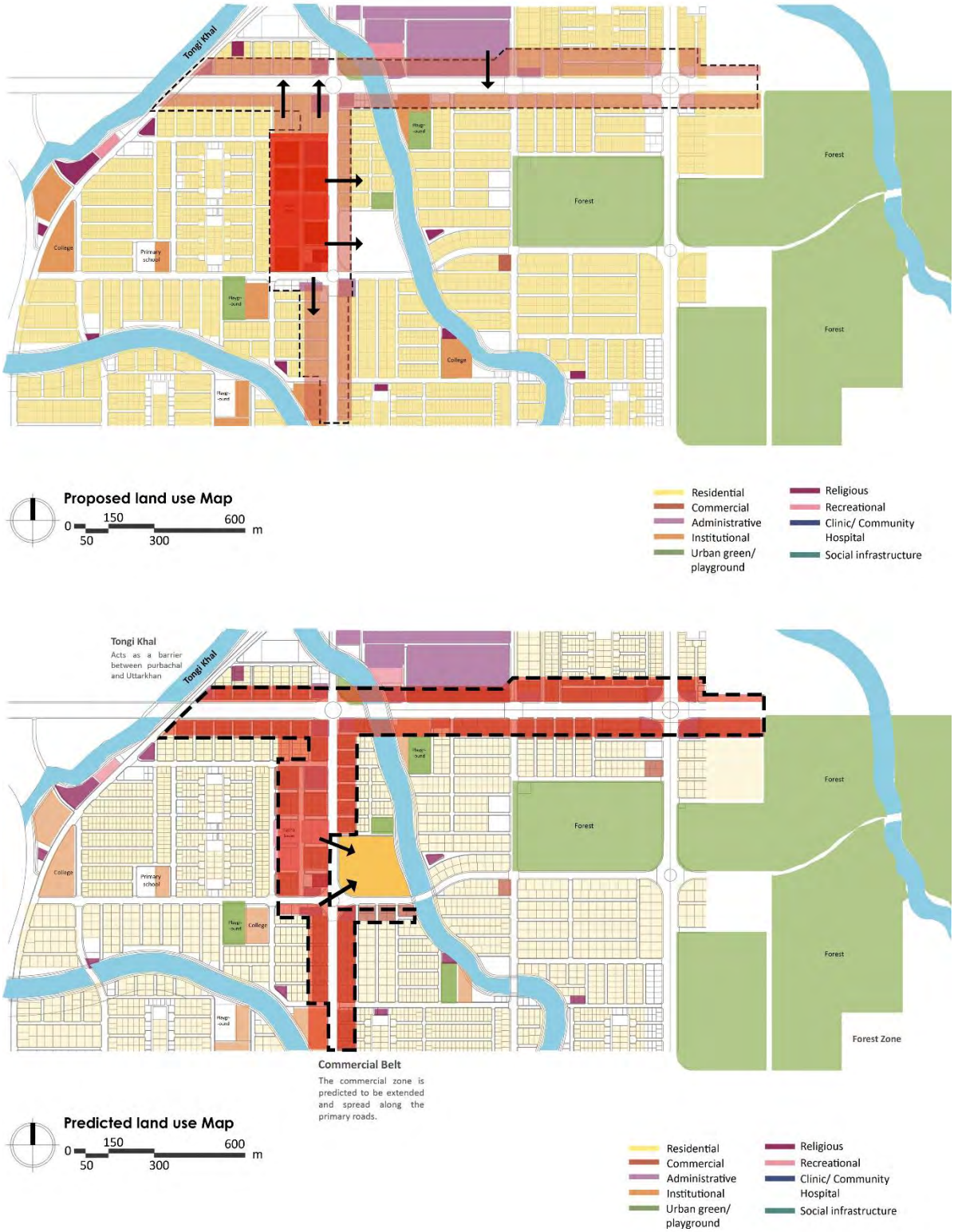


Figure 6.4.1: The proposed and predicted land use map showing the probable extension of the commercial zone along the primary streets. Source: Author

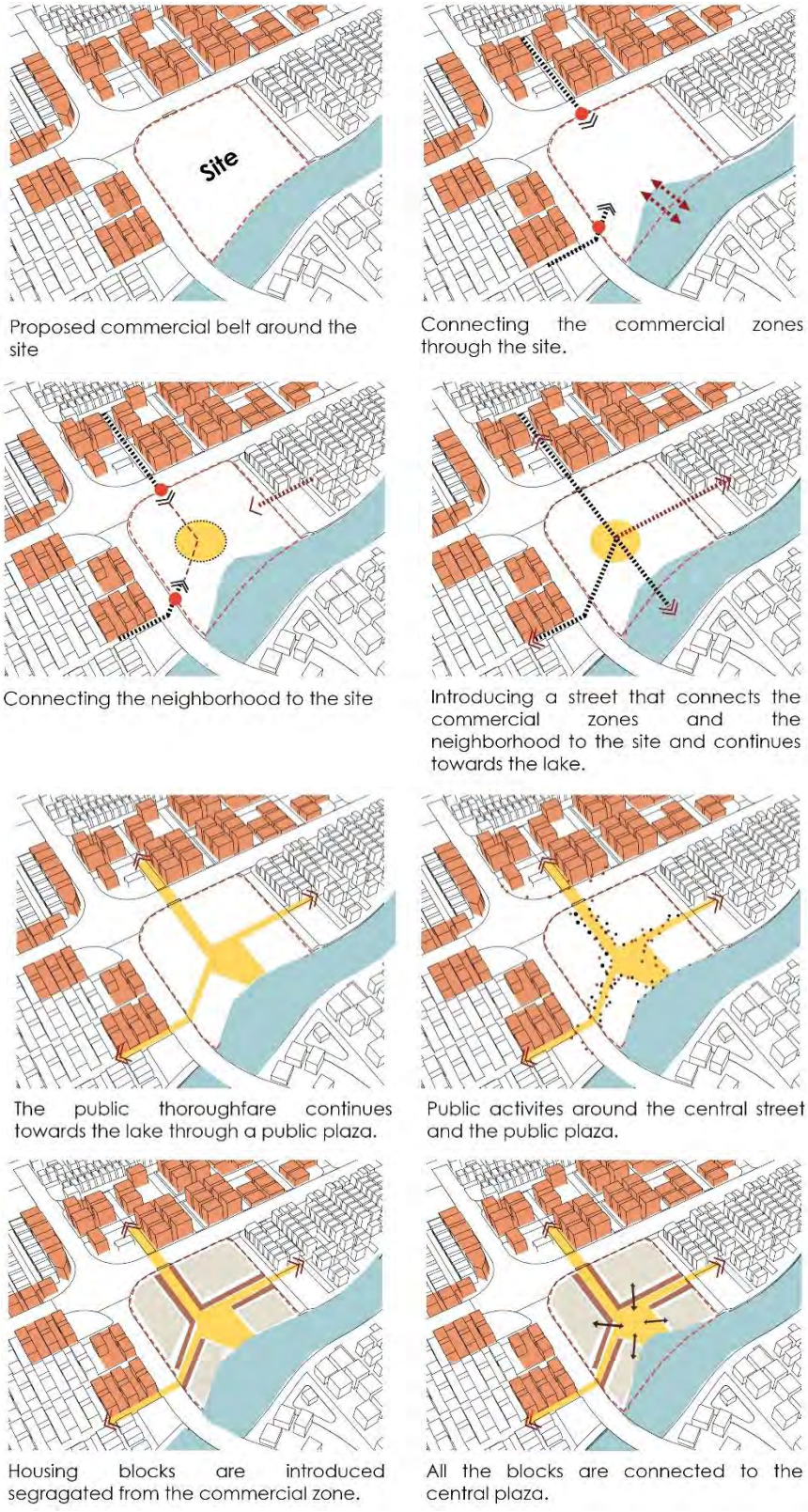


Figure 6.4.2: The conceptual stages of introducing a public thoroughfare is shown through this diagram.

Source: Author

6.5 Form generation

The housing complex has three main components: **the commercial zone** (market, grocery stores, food courts) and the **community facilities** (school, mosque, day care, indoor games) at the lower levels, and **the residential zone** at the upper levels of the complex.

The design process initially started by introducing a public street, that has access from three sides of the site. The periphery of the street mostly consists of shops, food courts and grocery stores. The street divides the site into 4 separate zones. The integrated housing blocks are later formed by creating central courtyards with public functions in the lower level, and residential zone in the upper levels.

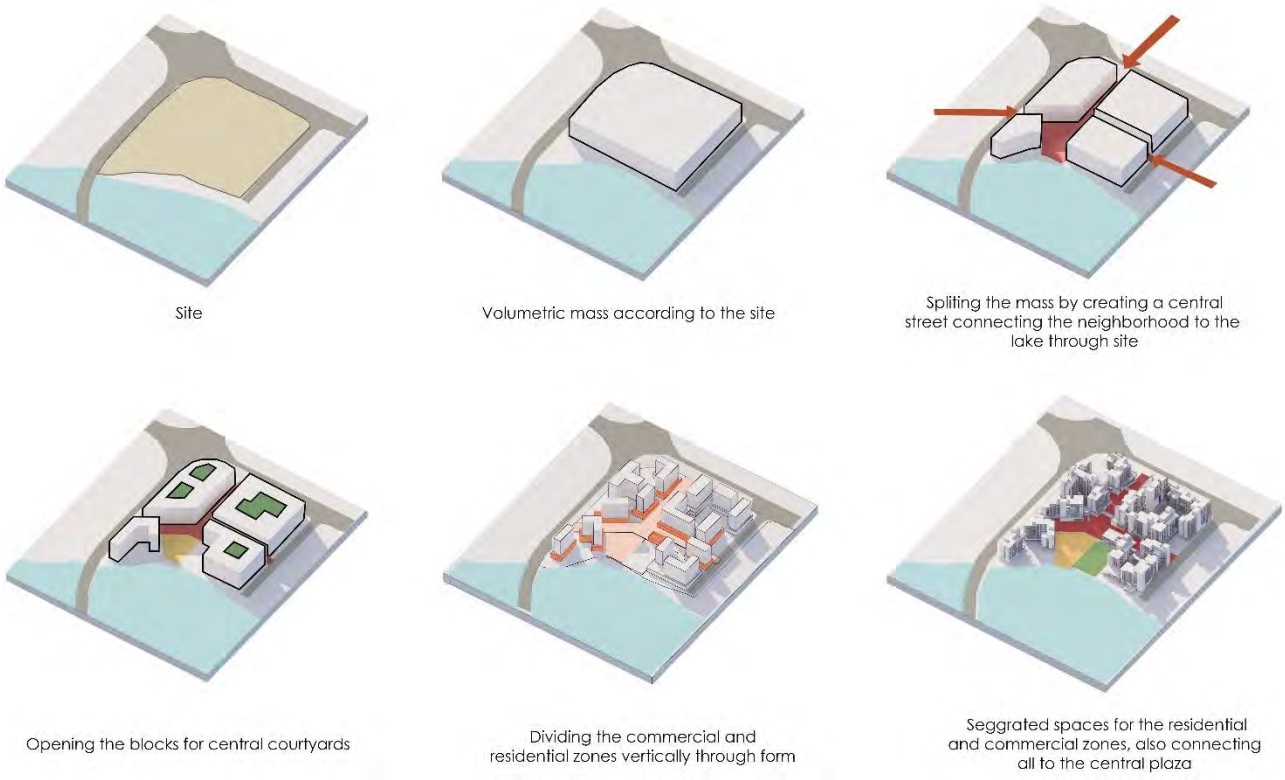


Figure 6.5.1: Diagram showing the phases of form derivation. Source: Author

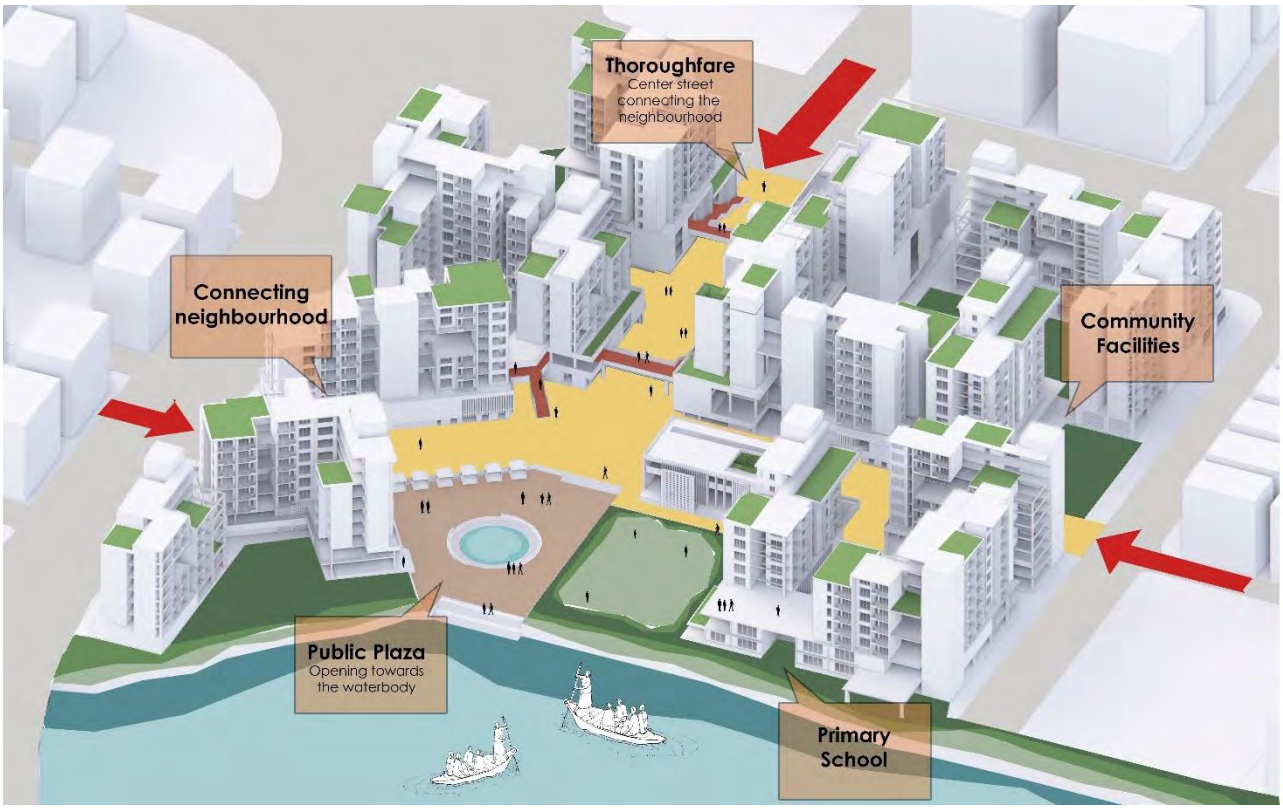


Figure 6.5.2: Diagram showing the overall form generation and connectivity through the site. Source: Author

6.6 Design Phase

The design of this affordable housing complex is more of a mixed-use typology, where the public and commercial zones are introduced in the aim of income generation and economic development of the community. The initial planning was done with the idea of keeping the commercial zones communal spaces interactive. The housing clusters are thought to create a central courtyard in order to bind the spaces. The integrated housing complex is designed in a courtyard-based form, that also includes the community spaces like school, community hall, utility building, for the community and the neighborhood. There are open fields those can work as children play space and breathing space as well as gathering space, the complex also includes lake side activities and internal pathways.

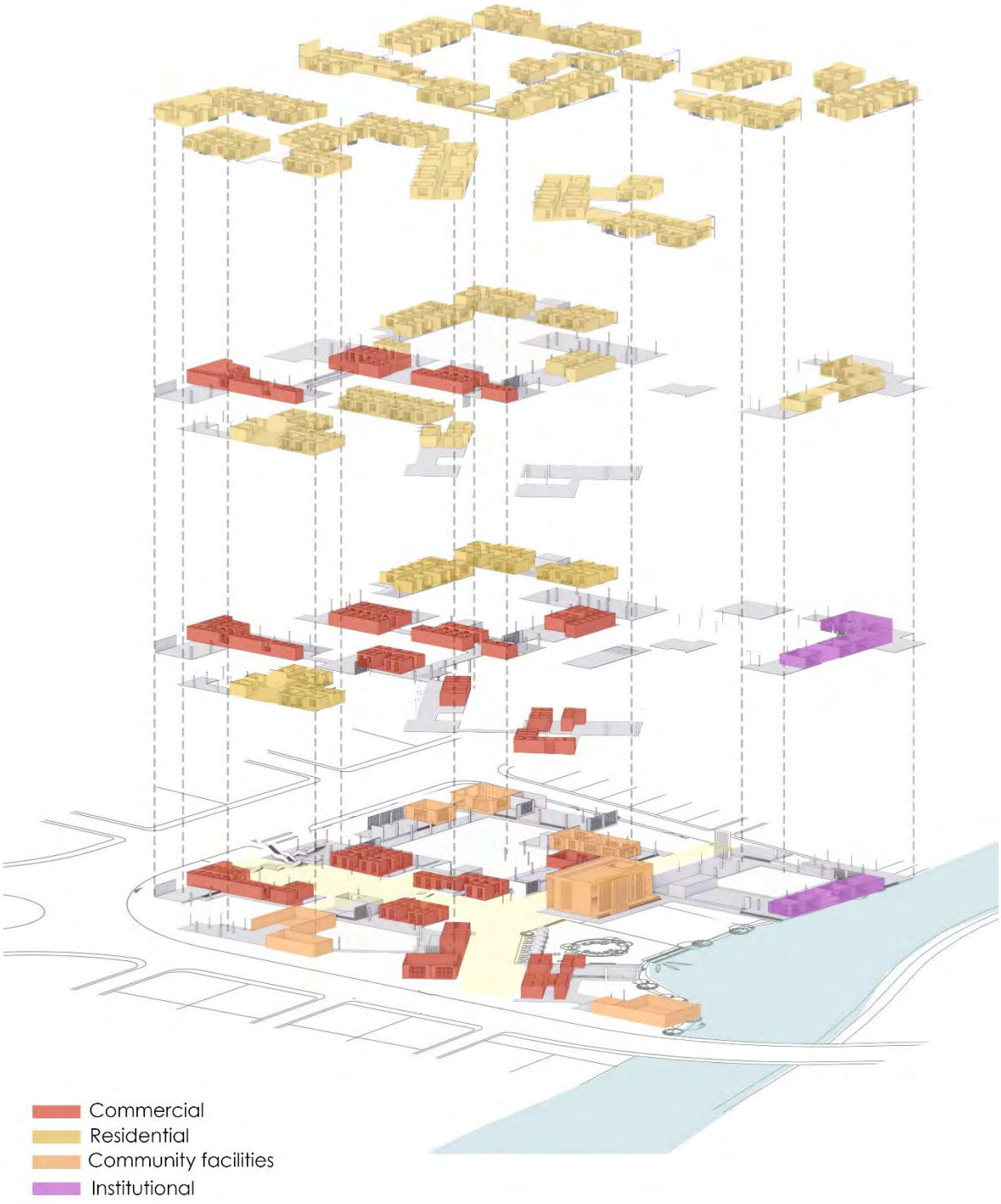


Figure 6.6.1: Diagram showing the functional distribution of the project. Source: Author

Figure 6.6.2: Site plan. Source: Author

Figure 6.6.3: Ground Floor plan. Source: Author

Figure 6.6.4: First Floor plan. Source: Author

Figure 6.6.5: Second Floor plan. Source: Author

Figure 6.6.6: Third Floor plan. Source: Author

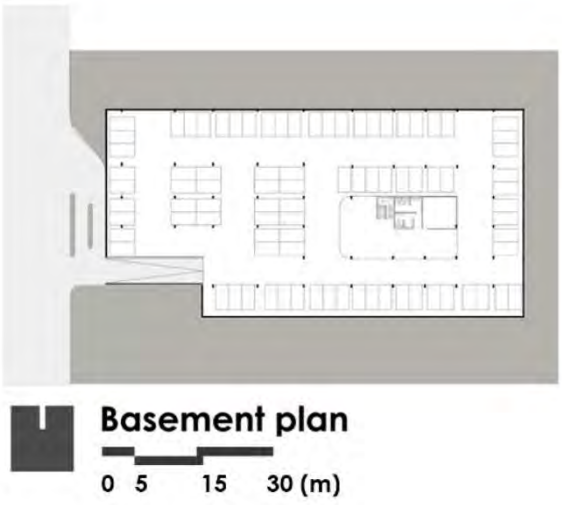


Figure 6.6.7: Basement Floor plan. Source: Author

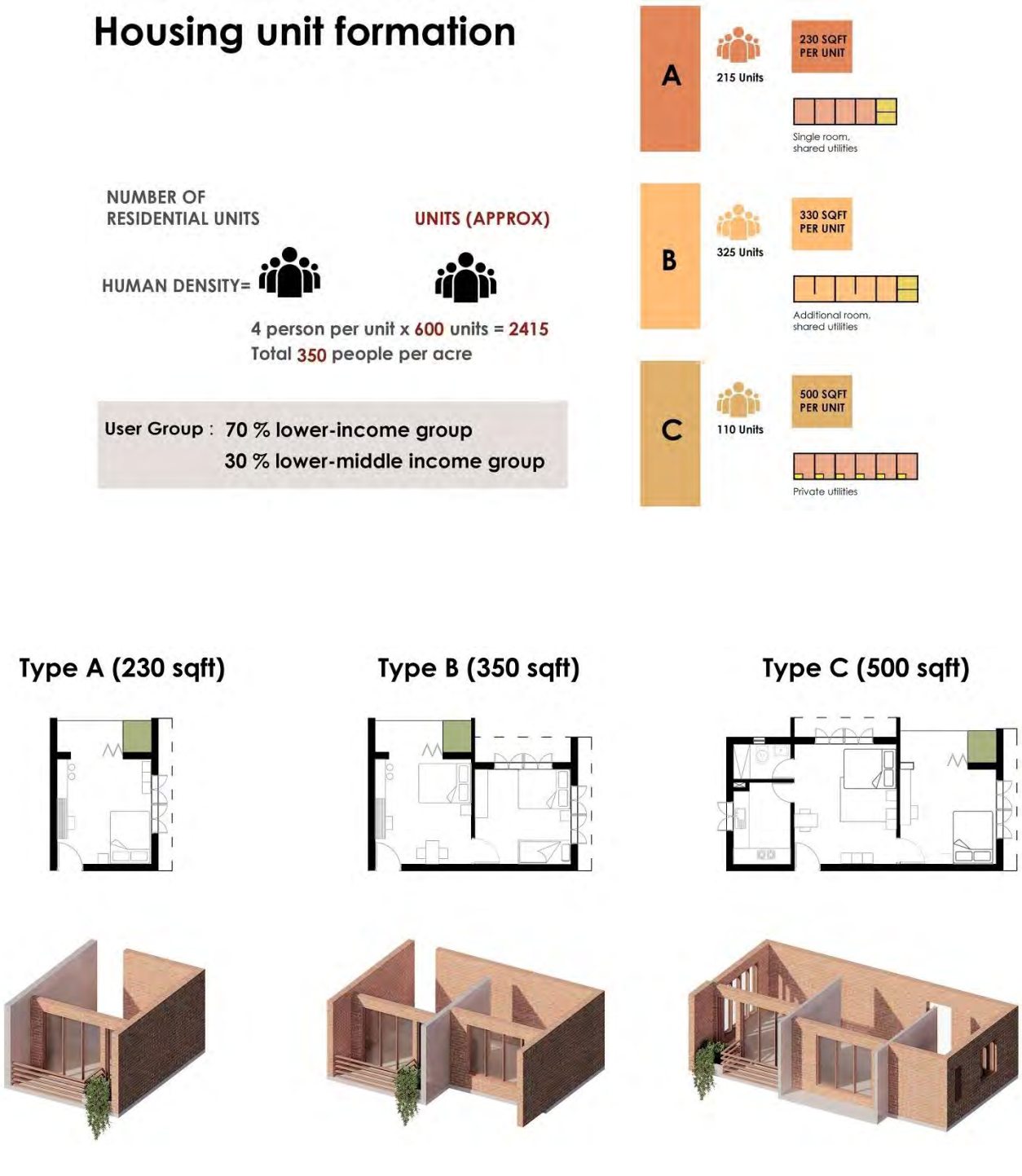


Figure 6.6.8: Figure showing the housing unit typology and plan. Source: Author

The housing units were designed in thought of affordability of spaces. The major two types of units are 230 sqft and 350 sqft, which both has shared utility spaces. By sharing a space, the costing of the space is being shared which as a result becomes affordable for them. A common toilet and a common kitchen are designed in each floor of the cluster (figure 6.6.10) which helps to create more interaction as well as splits the cost of the space. Third type of unit is 500 sqft that has a private utility space, where the unit is designed for an extended family, where people can live according to their affordable range and ability.

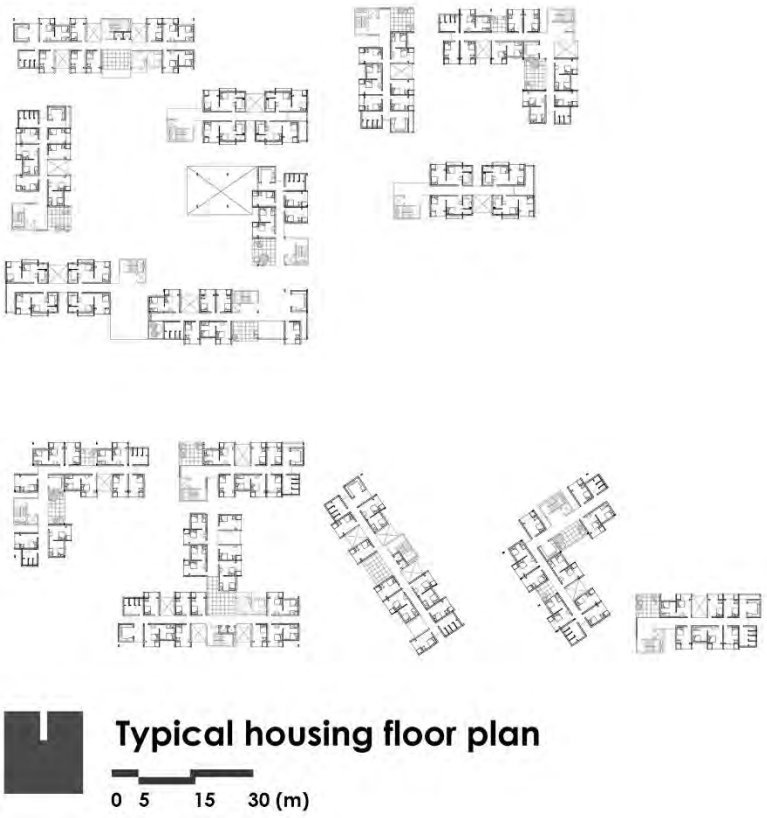
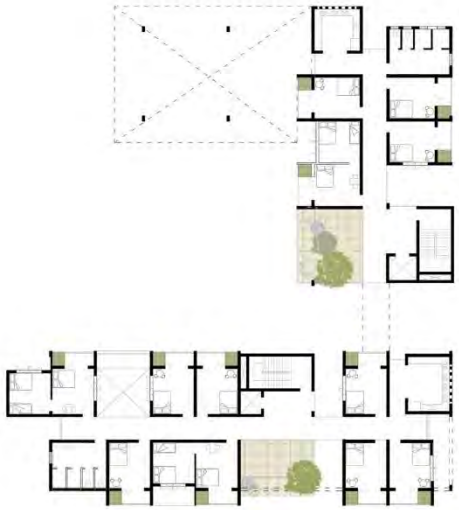


Figure 6.6.9: Typical Housing Floor plan. Source: Author

Cluster type 1

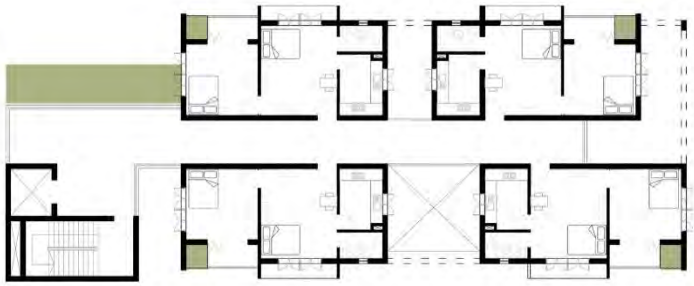


Typical floor plan

Intermidiate floor plan

Intermidiate floor plan

Cluster type 2



Cluster type 3

Figure 6.6.10: Figure showing the floor plans of three types of housing cluster. Source: Author

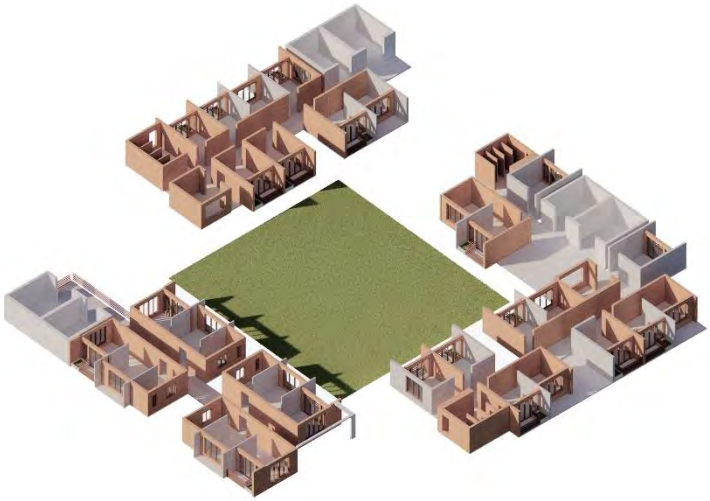


Figure 6.6.11: Axonometric view of a cluster. Source: Author

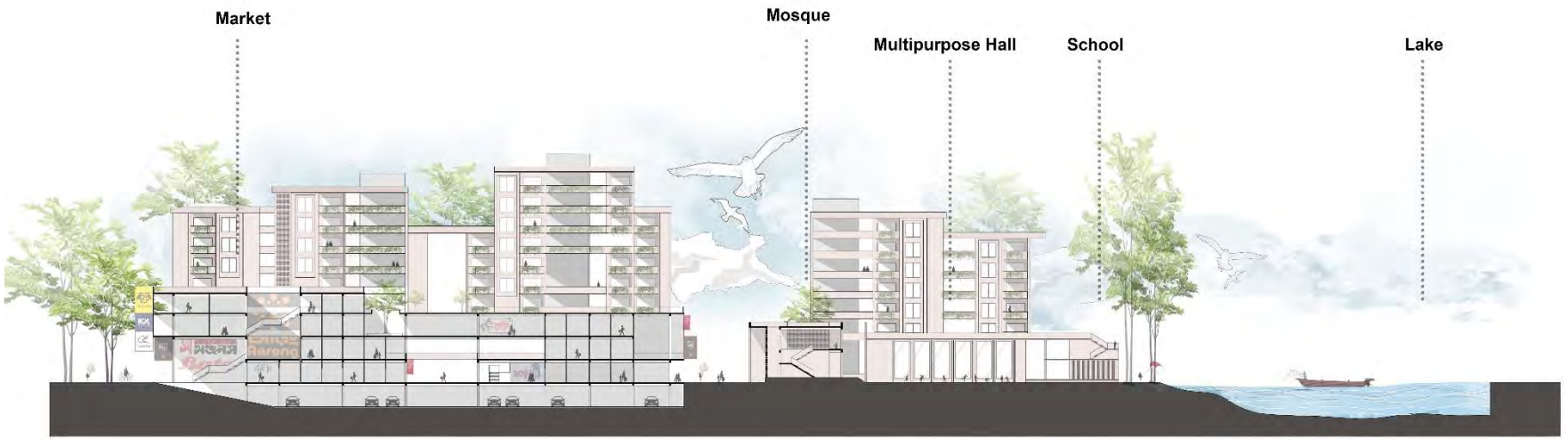


Figure 6.6.12: Section AA'. Source: Author

Figure 6.6.13: Section BB'. Source: Author

Spot Section of the Market

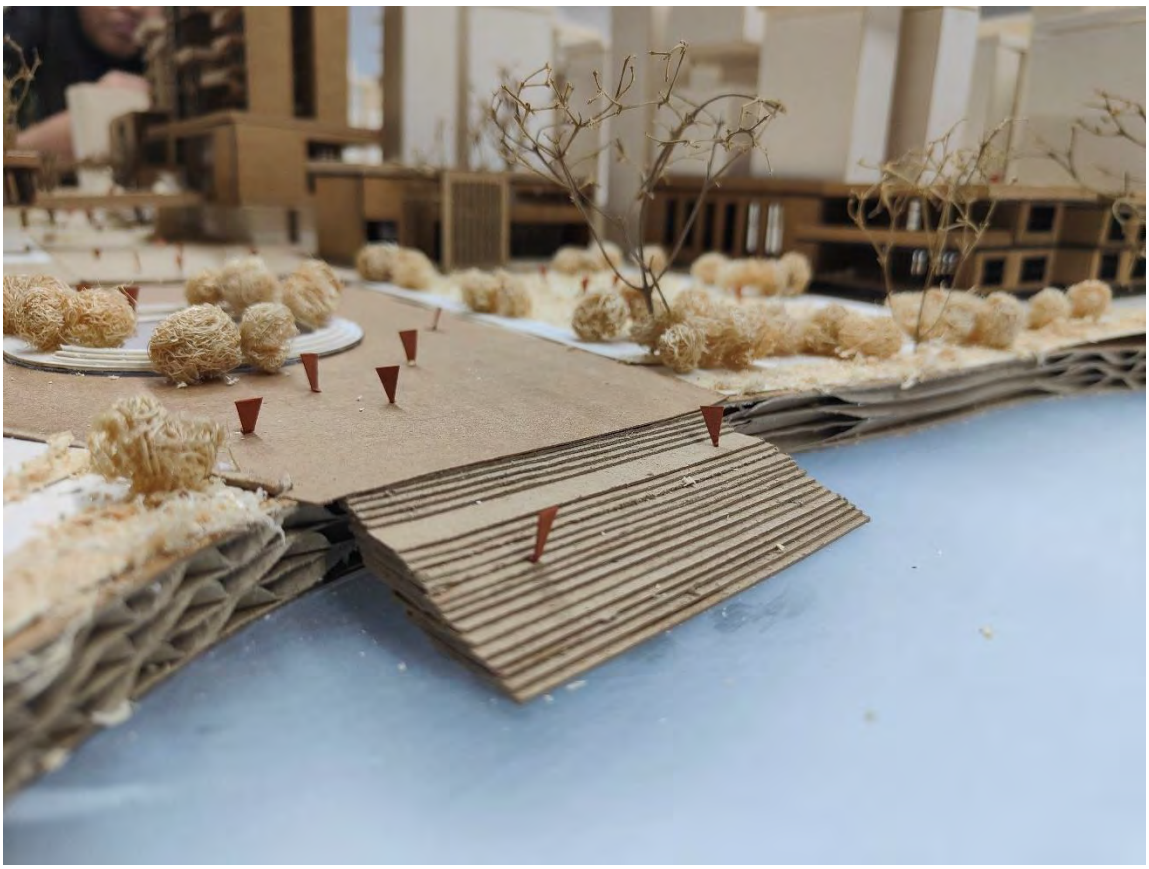
Spot section of the school through public plaza

Figure 6.6.14: South Elevation. Source: Author

Figure 6.6.15: Front Elevation. Source: Author

6.7 3D Visualizations

Source: Author



Chapter 7: Conclusion

This project is dedicated to all the people who belong to this group of the society, who comes to the city with the hope of getting an opportunity, but ends up in a horrible condition. They are a very big part of our society; without them we are nothing. The project aims to make a space affordable through strategic solutions, even though the area has a high land price, it aims in revitalizing the overall growth of this people, in a new developing city. The design is an interpretation of a social housing and patterns, that has a major focus on the economic development of the community. The design intervention of commercial and residential zone in a same complex can help to generate revenue for the community, which would allow them to get an opportunity and have a better lifestyle than the current situation. It serves as a welfare opportunity for the lower income group, in broader aspect, it serves for the whole society.

References

Charles Correa. (1987). *New York, Concept Media Ltd* .

Ahmed, k. (2018). Aranya low cost housing-BV Doshi. *https://www.slideshare.net/kushaAhmed/aranya-low-cost-housingbv-doshi*.

Ahmed, S. (2017). Case Study on Housing. *https://www.slideshare.net/shabbirtg/case-stydy-on-housing-80871700*.

Anifa, J. N. (2018). তাহাদের গল্প. *Submitted in partial fulfillment of the requirements for the degree of Bachelor of Architecture Department of Architecture, BRAC University*.

Bari, T. (2022). Highrise Apartment Complx, Purbachal new Town. *In the parkial fulfillment of the requirements For the degree of Bachelor of Architecture Department of Architecture, BRAC University*.

Barot, P. (2021). Low Cost housing and human behaviour towards low cost housing. *Research Gate*.

Gopalan, K. (2015). Affordable housing: An academic perspective on policy and practice in India. *Article in Press*.

Harry, E. B. (1989). Asian megacity characteristics, problems, and policies. *International Regional Science Review, 12(2), 117–129.*

High Level Task Force on Affordable Housing for All. (2008). *Report of the High Level Task Force on Affordable Housing for All. New Delhi: Government of India*.

Hosssain, M. Z. (2018). Housing Complex for Government Employees, Kalabagan, Dhaka. *Submitted in partial fulfillment of the requirements For the degree of Bachelor of Architecture, Department of Architecture, BRAC University*.

Housing and Health Resource. (2015). *Physical health – key issues*.

Mahdavinejad M., M. M. (2012). Designing communal spaces in residential complexes.

Malpezzi, S. (1990). Urban housing and financial markets: Some international comparisons. . *Urban Studies, 27(6), 971–1022.*

Mora, A. G. (2021). Why Bangladesh needs affordable housing. *Dhaka Tribune*.

Saquib, M. (2000). Housing for Employees of Government and Private Companies.

Shafique, T. (2019). Dhaka in a development vs slum rights debate. *Asia Times*.

Shams, S. (2014). Housing Problems for Middle and Low Income People in Bangladesh: Challenges of Dhaka Megacity . *ResearchGate*.

Srivastava, R. E. (2008). httptAanru.airds.org2008/09/a*aftist-villag*stand*in- mumbabylonl.

UN-Habitat. (2006). State of the world's cities. *The millennium development goals and urban sustainability: 30 years of shaping the habitat agenda. London: Earthscan.*

Wahed, M. A. (2015). Low cost housing in Bangladesh. *The Daily Star*.

Wikipedia. (2014). Purbachal New Town Project.

World Population Review. (2017). *Dhaka Population. Citation in text*.