AFFORDABLE HOUSING FOR LOWER-MIDDLE INCOME GROUP

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

Bachelor in Architecture

Department of Architecture
BRAC University
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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

The thesis/project titled “Affordable Housing for Lower-Middle Income Group” submitted by Yasir Rahman (18108022) of Summer,2023 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Bachelor of Architecture on 09.09.2023.

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Abstract/ Executive Summary

There is a developing residential area in Ashulia. With the construction of contemporary housing complexes, commercial hubs, educational institutions, and healthcare facilities, the city has seen fast urbanization in recent years. Ashulia's industrial sector employs many individuals who opt to reside in the surrounding districts, which has led to an expanding population and a thriving neighborhood. This project is also designed to cater the need of the thriving population, where the major focus is the people who are going to live there. The housing complex is designed to focus on the economy, culture, and social characteristics of the dwellers. Community development is a major concern for this housing project. Climatic factors are also considered while designing the project. The housing units are divided into different sizes and zones according to the need to maintain a balanced and communal living.

Keywords: Affordable housing, community development, housing complex, climate-responsive house.

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Thanks to Almighty's compassion and favor, my thesis has come to a successful conclusion. Without the support of my parents Mazibur Rahman and Marjia Begum, it was impossible to complete this five-year course. They constantly pushed me to achieve academic success.

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Chapter 1

Introduction

1.1 About Ashulia

Ashulia is a city located in Bangladesh, specifically in the Dhaka Division. It is a rapidly growing industrial and residential area, situated approximately 20 kilometers north of the capital city of Dhaka. Ashulia has emerged as a significant industrial hub in Bangladesh, with numerous garment factories, textile mills, and other manufacturing facilities operating in the area. Ashulia is well-known for its thriving ready-made garments (RMG) industry, which has contributed significantly to the country's economic growth. The RMG industry in Ashulia provides employment opportunities to thousands of workers, making it a vital source of income for the local population.

1.2 Project Background

Ashulia is home to a growing residential community. The city has seen rapid urbanization in recent years, with the development of modern housing complexes, commercial centers, educational institutions, and healthcare facilities. Many people working in the industrial sector in Ashulia choose to live in the nearby areas, resulting in a growing population and a vibrant community. One such industry is Pandughar Ltd.

Pandughar Limited is a prominent manufacturing company based in Bangladesh. It specializes in the production of high-quality, handcrafted textiles and garments. The company was established in 1995 and has since grown to become one of the leading textile manufacturers in the country. The company has implemented various social welfare programs, including education and healthcare initiatives, to benefit its employees and the local community. It has also initiated to build affordable

housing for the lower middle-income group. The project is one of Pandughar LTD's ongoing housing initiatives which has not yet been built. This housing project is designed to cater to the social needs of the middle-income community located in a suburb northwest of Dhaka. There is provision for five-storied walk-up apartments for the located site. The aim is to provide affordable housing for the people who work and are willing to live around the industrial area of Ashulia, Savar.

1.3 Aim and Objectives

Since Ashulia is rapidly growing into an emerging residential area, the project's aim is to establish a dynamic housing complex which can provide safe, decent, and affordable homes that are within the financial reach of middle-income households. The primary aim of this project is to design affordable housing for the middle-income community to promote social and economic inclusivity by ensuring that middle-income households have access to affordable and quality housing. This helps to prevent the middle class from being priced out of decent housing options, which can contribute to social and economic segregation. The objective of this study is to promote stability and upward mobility. Affordable housing can provide middle-income households with the opportunity to build equity, increase their financial security, and improve their quality of life. This can lead to improved health outcomes, educational opportunities, and economic well-being for middle-income households, fostering a sense of community and social cohesion. Moreover, it aims to create sustainable and livable communities through incorporating sustainable and environmentally-friendly features such as energy-efficient appliances, green spaces, and public transportation options, which can promote a healthy and sustainable living environment for residents. Due to the location of the property close to several significant industrial sectors, it can provide middle-income households with access to essential services and opportunities for economic advancement.

1.4 Project Summary

Title of the project: Affordable Housing for Middle-Income Group

Client: Pandughar Limited

Site location: Ashulia, Dhaka, Bangladesh

Site area- **1.7 acre**

Total number of units- **204**

Unit type -3

Approximate Unit Size

Type A- 450 Sqft (1 Bed, 1 Living + dinning, 1 Toilet, 1 kitchen, 1 Veranda)

Type B- 650 Sqft (2 Bed, 1 Living + dinning, 1 Toilet, 1 kitchen, 1 Veranda)

Type C- 550 Sqft (1 Bed, 1 Living + dinning, 1 Toilet, 1 kitchen, 1 Veranda)

Chapter 2

Literature Review

2.1. Definition of Affordable Housing

Affordable housing refers to housing that is priced reasonably and is affordable for low-income or moderate-income households. It is an important aspect of social and economic policy, as it aims to ensure that everyone has access to safe and decent housing, regardless of their income level. Affordable housing can take various forms, including rental housing, homeownership opportunities, and housing cooperatives. It can be provided by the government, non-profit organizations, or private developers, and is often made available through subsidies, tax incentives, or other forms of financial assistance.

One of the main goals of affordable housing is to address the issue of housing affordability, which can be a significant challenge for many households, particularly those with low or moderate incomes. It has numerous benefits for individuals and communities. It helps to reduce homelessness and overcrowding, improves health and well-being, promotes economic stability, and fosters social cohesion. It can also help to revitalize neighborhoods and promote sustainable development by providing opportunities for people to live closer to their places of work or other amenities, reducing commuting times and transportation costs. (NSW, September 24)

However, there are challenges in the provision. The cost of construction, land availability, zoning and regulatory barriers, and lack of funding can be significant obstacles to creating and maintaining affordable housing units. Additionally, the demand for affordable housing often exceeds the available supply, resulting in long waiting lists and limited availability of affordable homes.

2.2 Present condition of Lower middle-income housing

The present condition of lower middle-income housing can vary depending on the specific location and region. However, in general, there are a number of challenges that lower middle-income housing faces, including affordability, quality and availability. In many urban areas, the cost of housing can be a substantial portion of a household's income, leaving little room for other necessities such as food, healthcare, education, and transportation. This can lead to issues such as poor insulation, lack of basic amenities, and higher maintenance costs. There are numerous affordable housing programs which are designed to help bridge the gap between the cost of housing and what households can afford to pay. These programs often involve income restrictions, where eligible households must meet certain income criteria to qualify for affordable housing. The level of affordability is typically determined based on a percentage of the area median income (AMI), which varies depending on the location and local housing market conditions. (S. Shams & M. Mahruf. April 2014).

2.3 Looking Forward to the Future

Affordable housing has been a pressing issue for many countries, and the trend suggests that it will continue to be so in the future. As the population grows, urbanization increases, and income inequality persists, the need for affordable housing will only become more urgent. One potential solution is the increasing popularity of shared housing models. For example, co-housing communities or tiny homes could provide a more affordable and sustainable option for people who do not need a lot of space. Co-living spaces are becoming more common as a way to provide affordable housing options to young professionals and students. These spaces typically offer smaller private living spaces and shared common areas, such as kitchens and living rooms, which can help reduce the cost of housing by spreading out expenses like rent, utilities, and maintenance.

The trend toward sustainable design is also having an impact on affordable housing. Many new affordable housing developments are being designed with a focus on sustainability, using materials that are environmentally friendly and energy-efficient. These homes are not only affordable to operate but can also help reduce the carbon footprint of the building and the community.

2.4 Affordable Housing in Bangladesh

In Bangladesh, housing is a major issue for both middle and low-income people. The demand for affordable housing is increasing day by day due to the rapid growth of population and urbanization. Unfortunately, the housing sector in Bangladesh is not well organized, and the government has not taken enough steps to provide affordable housing for the lower-income population. The middle-income population also faces housing problems in Bangladesh. They cannot afford to buy or rent a decent house because of the high cost of land and construction materials. The limited availability of housing units also makes it difficult for them to find affordable housing options. One of the biggest challenges for low-income people in Bangladesh is the lack of access to formal housing finance. Banks and other financial institutions in the country typically require collateral and have strict lending criteria, making it difficult for low-income individuals to access credit for housing. As a result, they are often forced to live in slums, informal settlements, or overcrowded rented accommodation. The lack of proper infrastructure and services in these areas further exacerbates the problem. For example, slums often lack access to clean water, sanitation facilities, and electricity, and are prone to flooding during the monsoon season. The living conditions in these areas are also hazardous and can lead to health problems, especially for children.

In recent years, the government has taken some steps to address the housing problem in Bangladesh. The National Housing Policy 2016 aims to provide affordable and decent housing for all by 2021. The policy includes various initiatives, such as the establishment of a national

housing fund, tax incentives for private developers, and the creation of a mortgage market. However, these initiatives have not yet had a significant impact on the ground, and more needs to be done to ensure that the housing needs of the middle and low-income population are met. (S. Shams & M. Mahruf. April 2014). Encouragement of self-build houses is can be one of the most effective methods to address the problem of housing affordability. Construction economy, means, methods and cost control are crucial in the housing market for middleclass and lower-class families. Developing simple home plans with optimal use of material to lower costs and minimizing labor costs by efficient use of local materials and tools are highly in demand for the upcoming future.

2.5 Ventilation of Housing

Ventilation plays a crucial role in the design of a housing complex, as it directly affects the quality of life and well-being of the residents. Proper ventilation not only ensures a healthy and comfortable living environment but also helps to improve energy efficiency, reduce indoor air pollutants, and minimize the risk of moisture-related issues. The weather in Dhaka is generally hot and humid throughout the year, with an average temperature of around 25 °C (77 °F). Dhaka's temperature is often hot year-round. During the summer months, the temperature in Dhaka can reach up to 40°C (104°F), making it uncomfortable for many people. Given the hot and humid weather in Dhaka, proper ventilation is essential in housing buildings to ensure the comfort and health of occupants. Making an inside space cooler during the heat is really challenging. Effective cross ventilation can cool down the inside, and natural ventilation eliminates stale indoor air and replaces it with outside air.

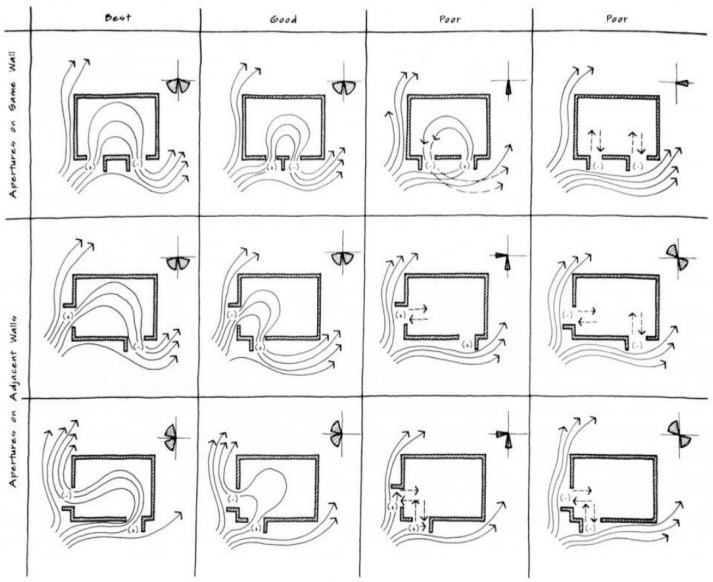


Figure 2.5.1 Quality and Effectiveness of ventilation in different condition

Chapter 3

Site Appraisal

3.1 Background of the site

Ashulia is a suburban area near Dhaka, the capital city of Bangladesh. Nearby areas are Savar, Savar DOHS, and Tongi.

Environmentalists and some non-governmental organizations in Bangladesh have expressed concern over rapid urbanization of Ashulia specially in the context of ongoing real estate development projects in the area. The most affected city around Dhaka is now Ashulia. Most of Ashulia is now owned by the garment factory or land developers. In recent years, it has lost most of its farmland because of the bricks field business.

The new Detail Area Plan of Dhaka (DAP) has proposed Ashulia as Industrial based mixed-use area, which has also emphasized on housing sector.

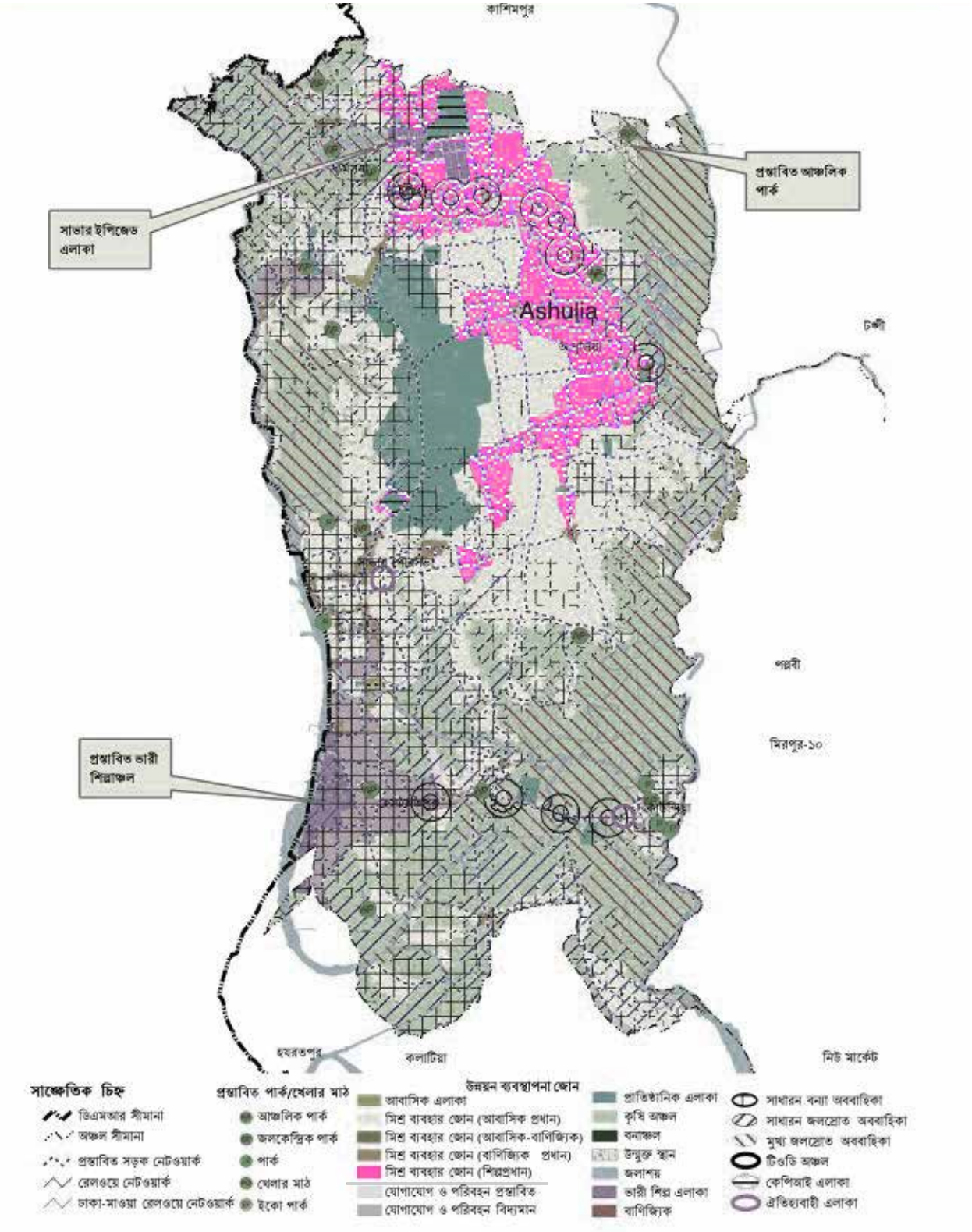
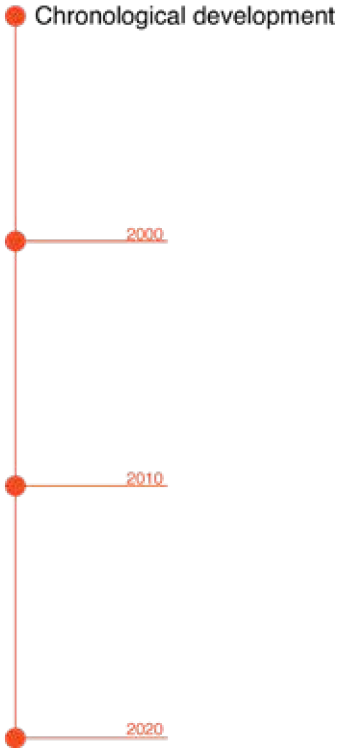


Figure 3.1.1 DAP

(Source: Bangladesh Government.)

3.2 Chronological Development



As the increase of employment opportunity around the area, more people are living here for their works. The chronological development has a clear image how urbanization has stricken the area. More road infrastructure in being made to support the increasing dwellers coming to the town for work expectation.

Figure 3.2.1 Chronological Development

(Source: Regenerated from google map)

3.3 Climatic Studies

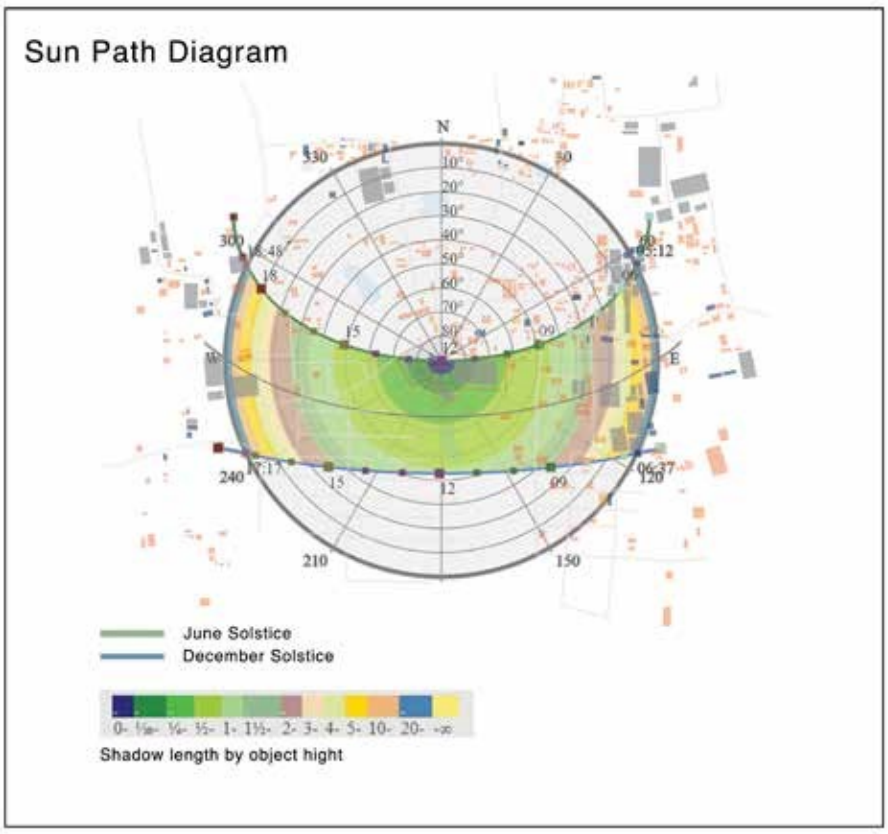
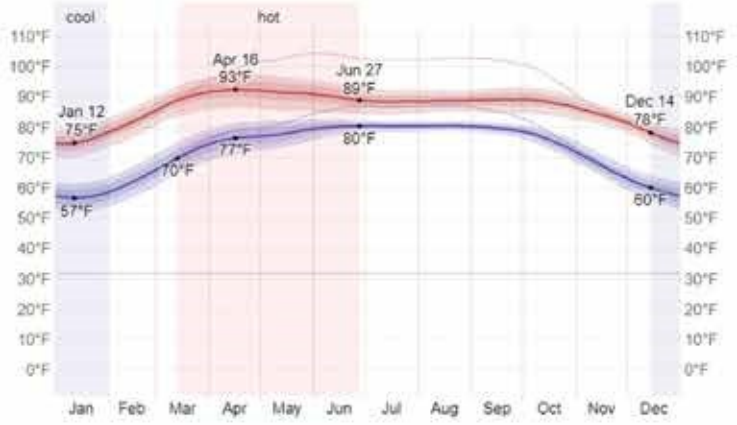


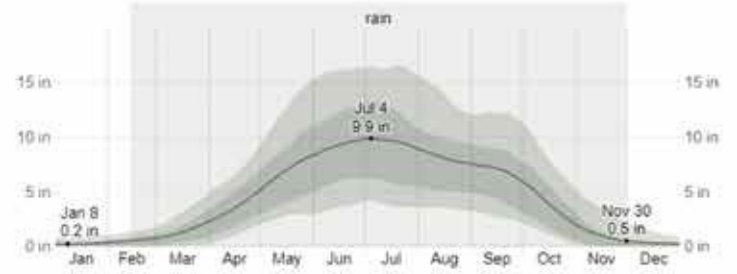
Figure 3.3.1 Sun path Diagram

(Source: Google.)

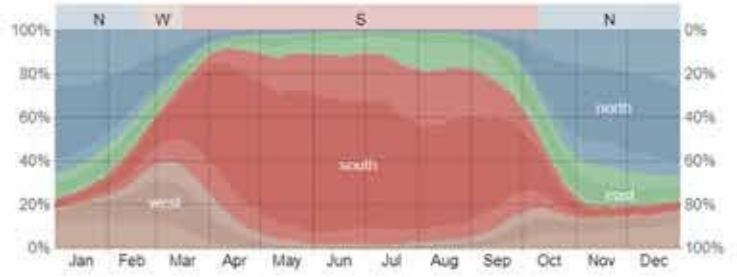
Annual Temperature of Ashulia Savar



Monthly Rainfall



Annual Wind Direction



Hours of Daylight & Twilight of

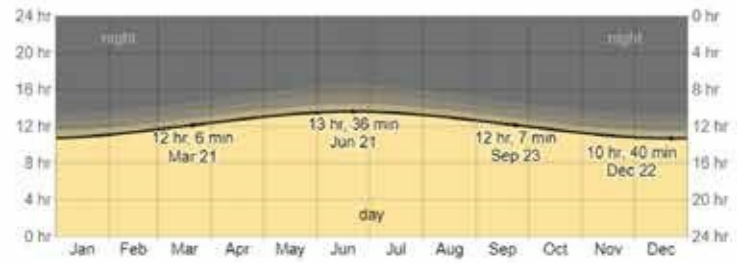
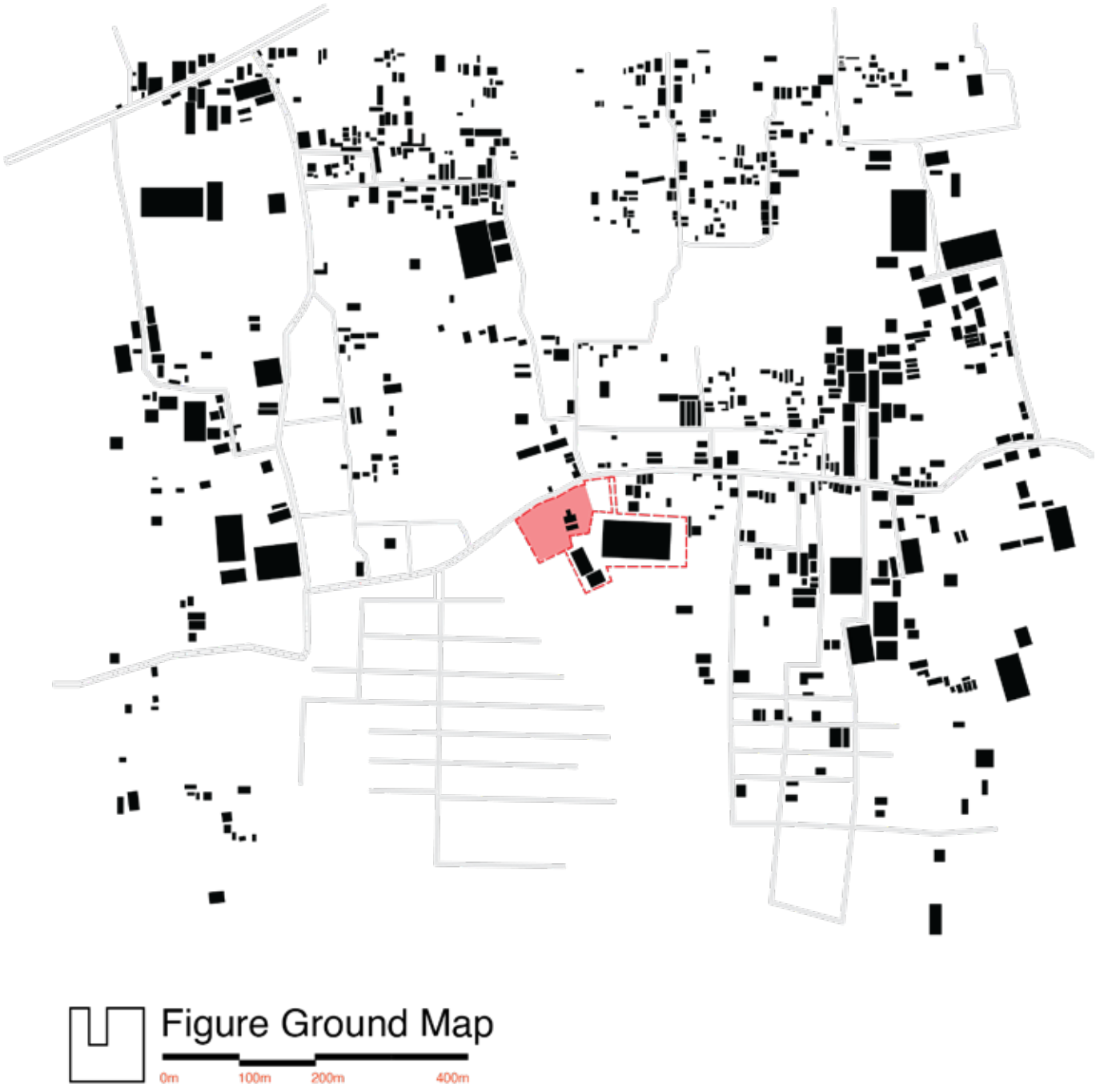
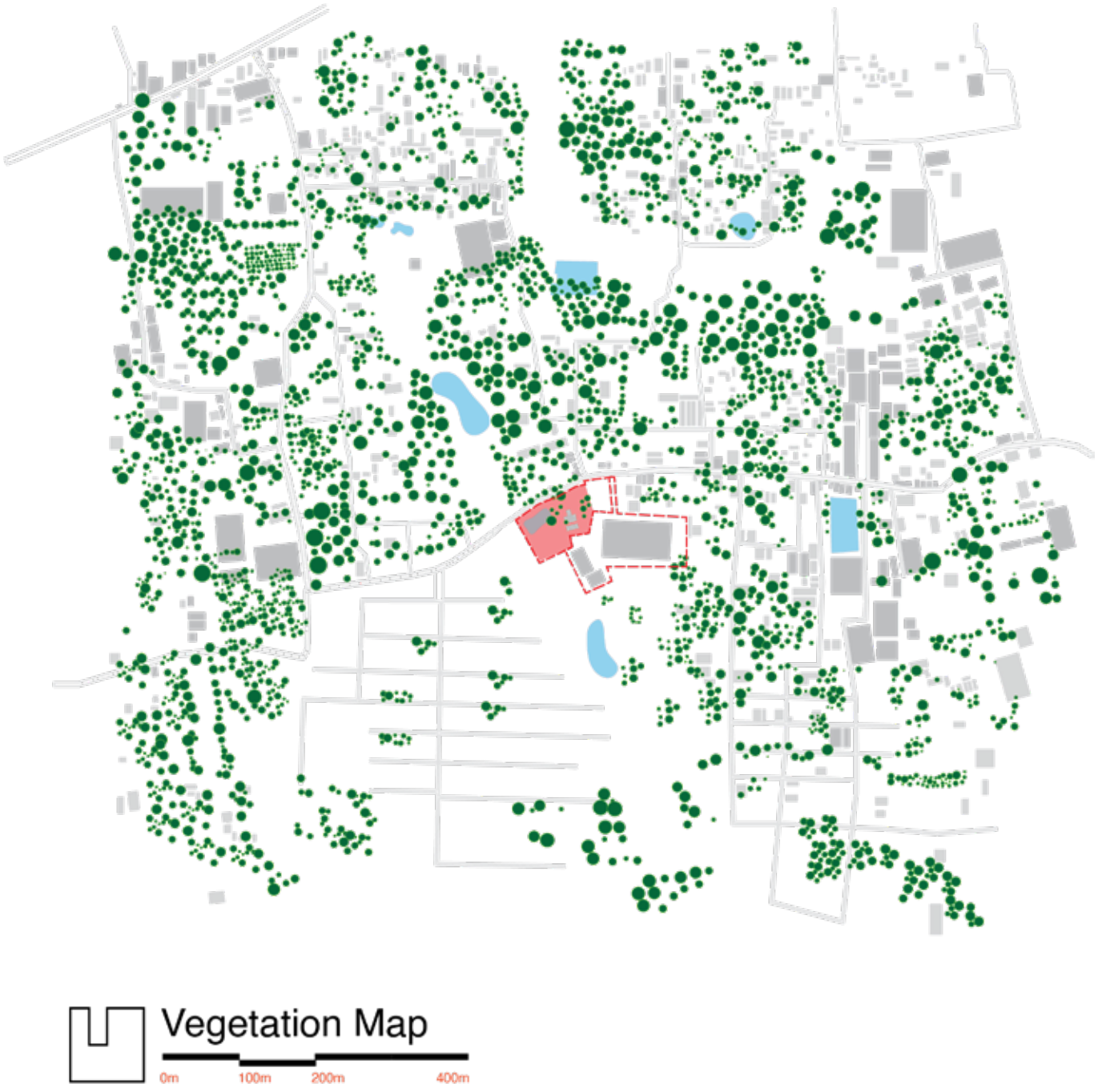


Figure 3.3.2 Climate analysis

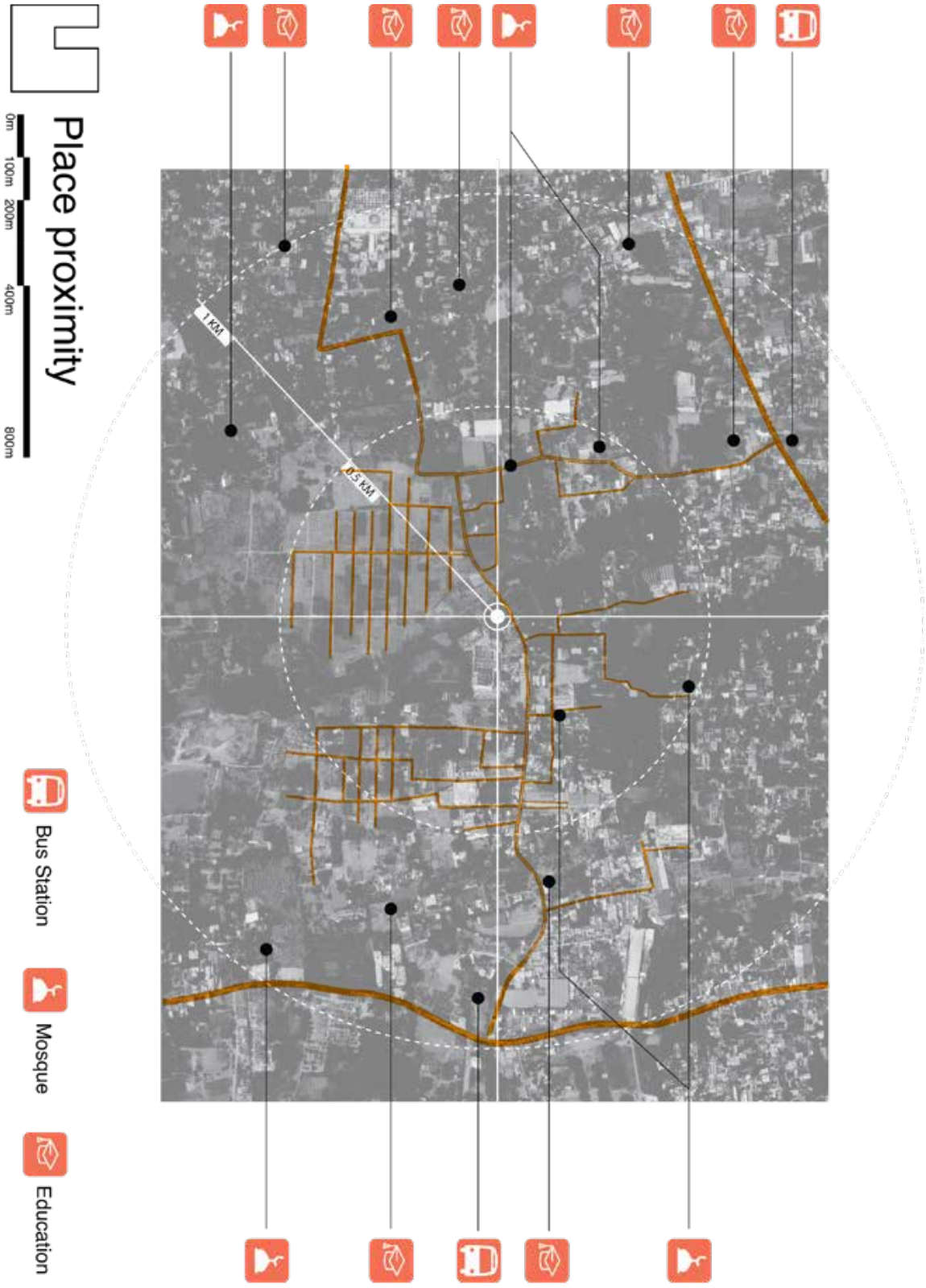
3.4 Morphologic



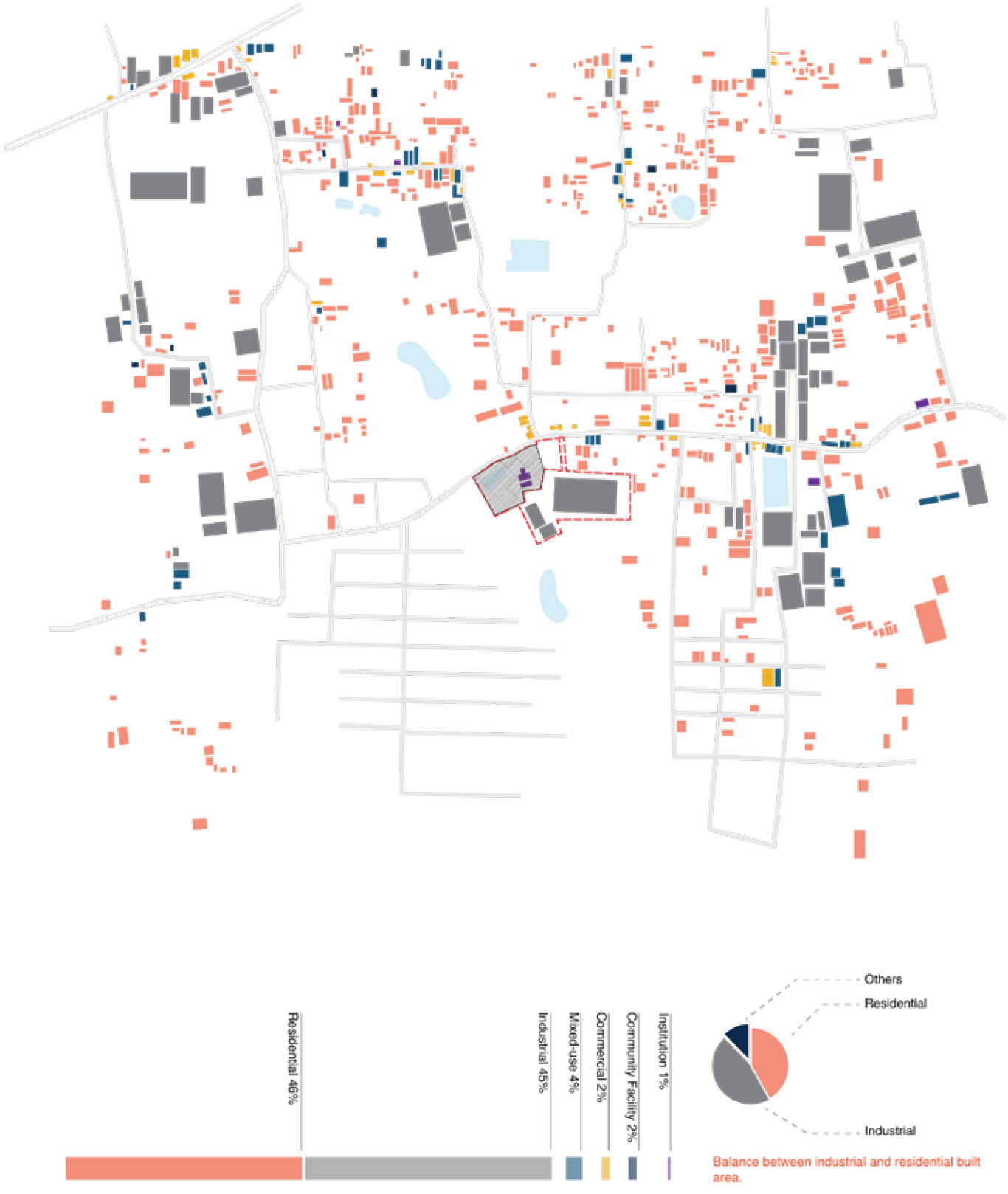
3.5 Vegetation and Water body



3.6 Place proximity



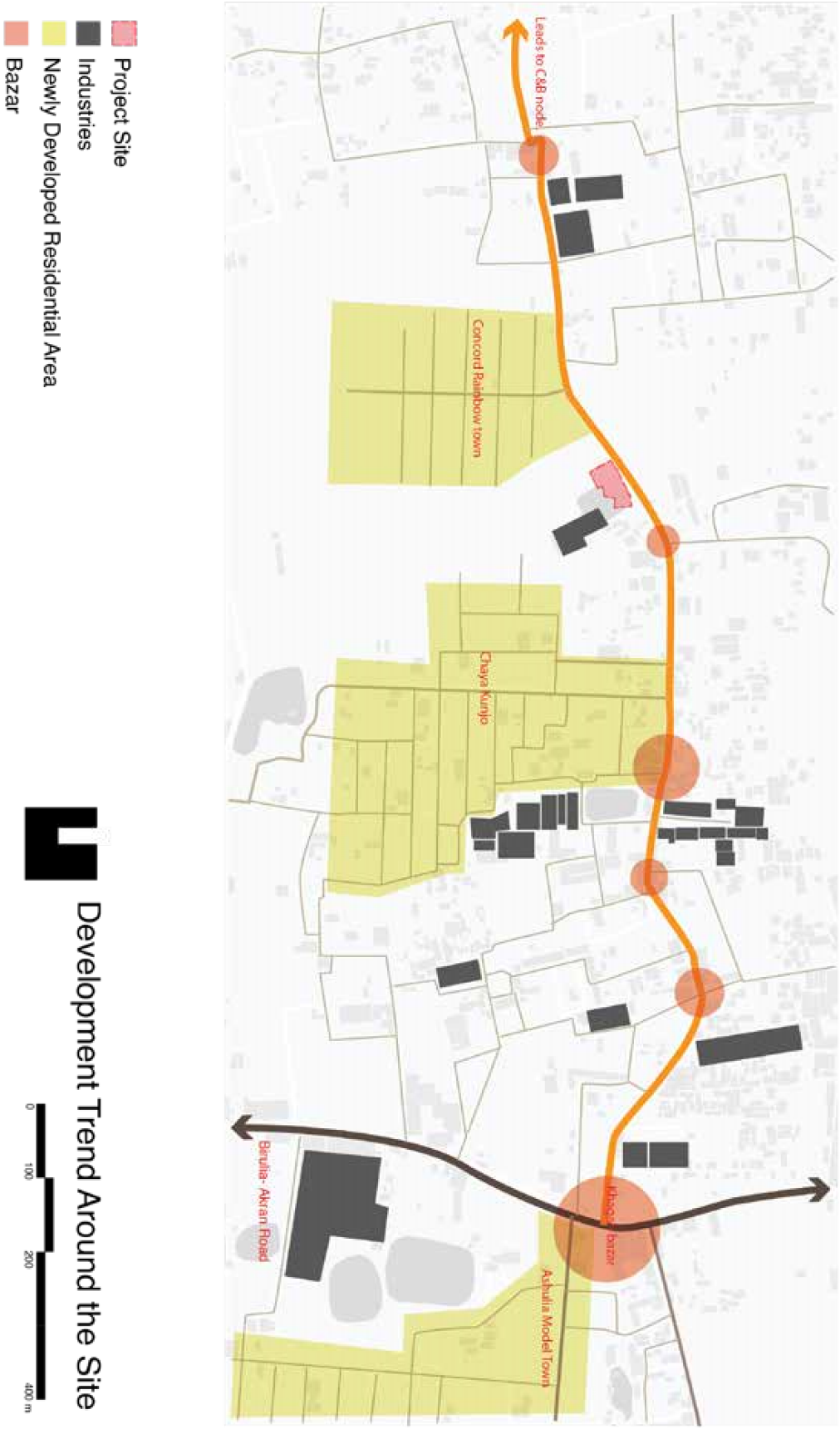
3.7 Building Use Map



3.8 Activity Map

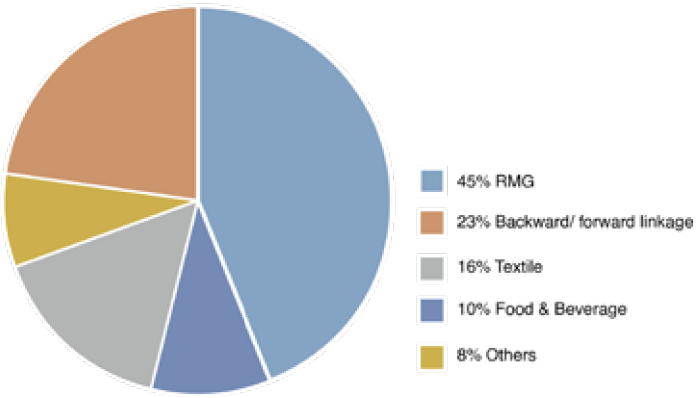
3.9 Transport Network Map

3.10 Development Trend

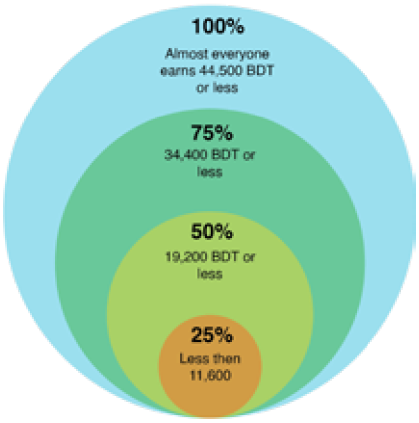


Development Trend Around the Site

Type of Industries



Salary Distribution of Factory and Manufacturing employee



3.11 SWOT Analysis

Strength:

1. Good transportation network & accessibility.
2. Generous amount of educational institutes.
3. Ample opportunity for daily shopping and adequate local bazars.

Weakness:

1. Scarcity of recreational place.
2. Lack of medical center and hospitals.
3. Site is surrounded by industries.
4. Lack of vegetation.
5. Poor waste management system.

Opportunities:

1. Good accessibility makes the site to become a better housing complex.
2. Location of the site has a huge adventive for better job opportunity.
3. The project criteria allows to built a sustainable society.

Threats:

Due to industrialization the location offers ample job opportunity, which attracts more and more opportunity seekers causing rapid urbanization and followed by reduction of green space and vegetation.

Chapter 4

Case Study Appraisal

4.1. Site and surrounding

One kind of social initiatives, Tara Apartment, is targeted towards the Nehru Center's middle class. Along Guru Ravidas Marg Street, which connects to two sizable residential districts in the North and South, is where the project is situated. It is located in a middle-class suburb. Due to the building's shape and restricted height, it generates a volume that is balanced and harmonic with the surrounding structure. More than that, the project is crucial in connecting the nearby park with these other structures.

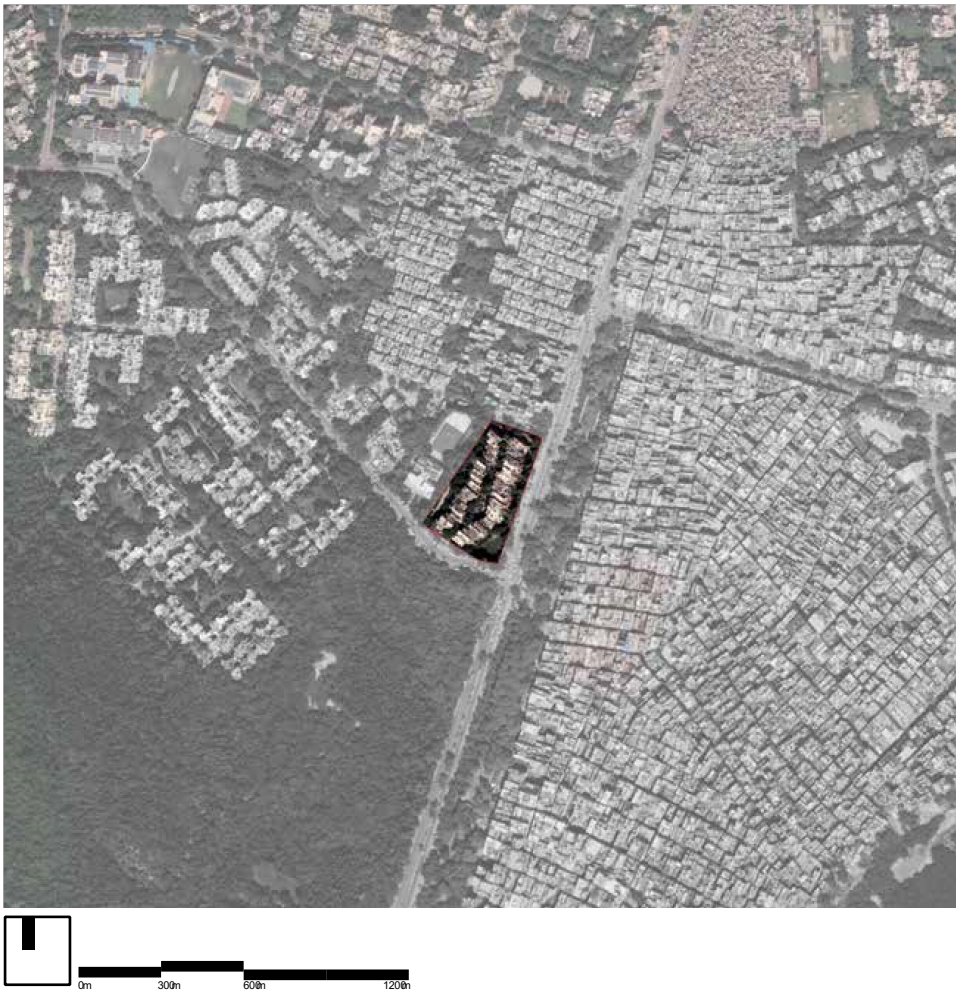


Figure 4.1.1 Site

(Source: Regenerated from google map)

4.1.1 Form and Function

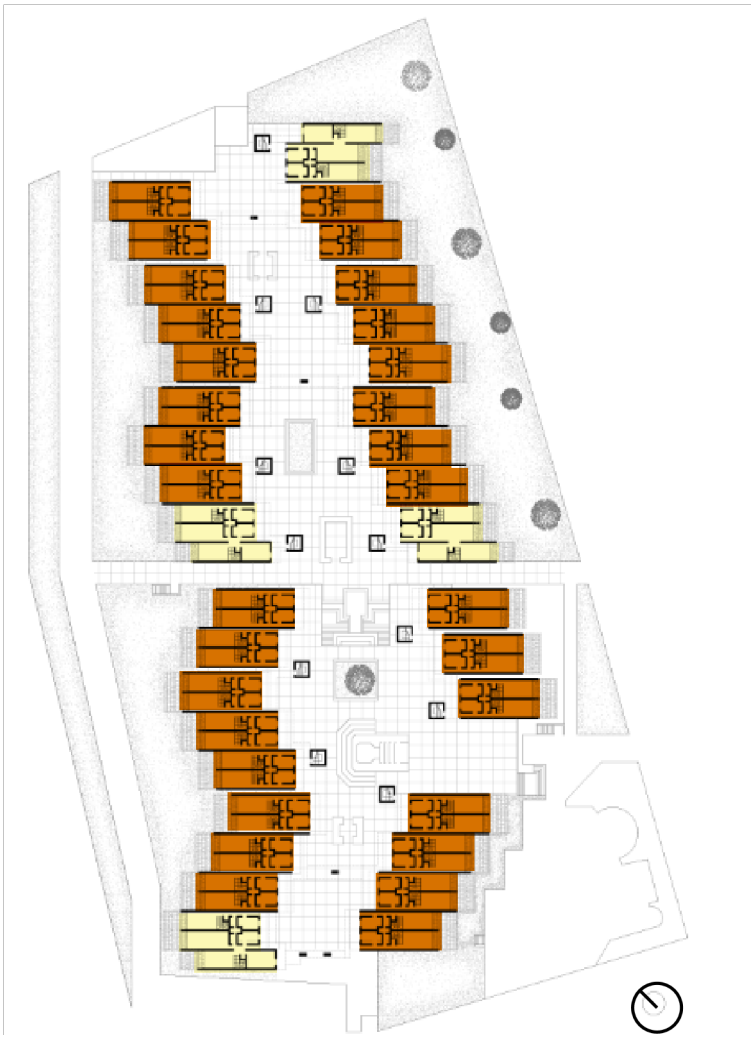
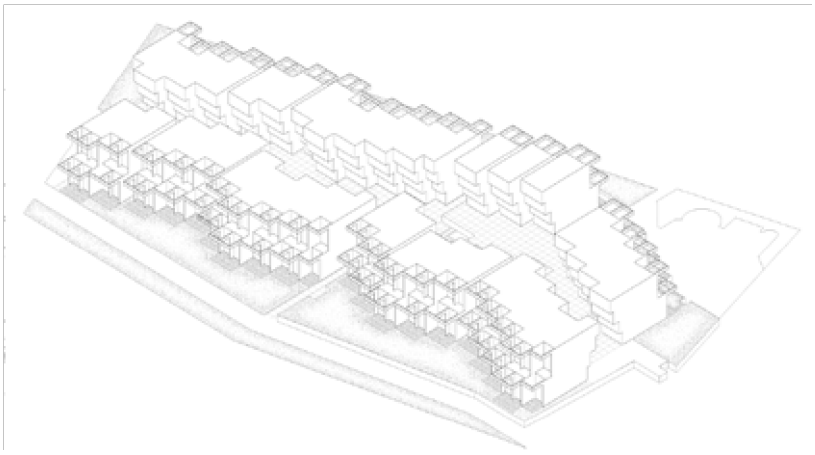


Figure 4.1.1.1 ground floor plan

(Source: Slide share)

The dwelling units are grouped into some small and medium blocks. Some blocks are assembled by two bedrooms flat and some are combined by two- and three-bedroom flats. To avoid noise and dust from the busy roads, the building faces away from the street. These buildings have an Indian feel to them due to their row-staked construction, center garden, large overhangs, and sharp edges. They are also full of light without feeling the effects of the high temperature.



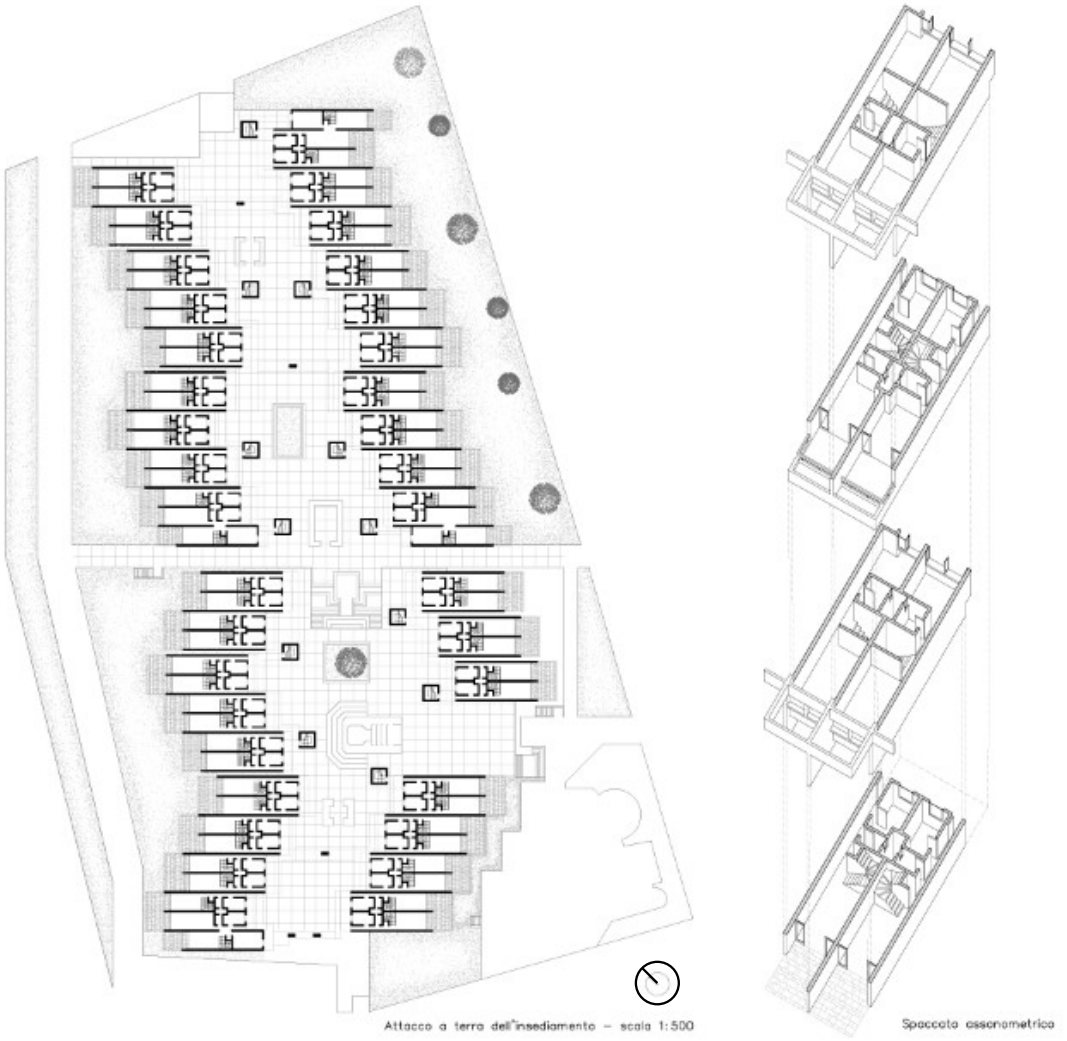
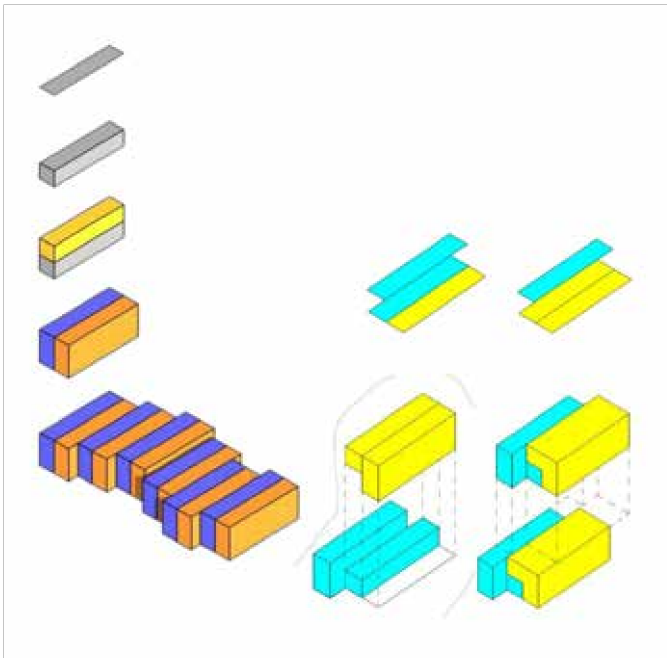


Figure 4.1.1.2 ground floor plan

(Source: Slide share)

The central idea of the Tara Housing Group Project is a novel vernacular typology that involves organizing and stacking individual flats into contiguous blocks. The building effectively protects the private lives of the family within by isolating them from the outside world and offering an inside garden. Additionally, only pedestrians are permitted within the apartment complex, and the parking area is located at the rear of the structure.(Sharma, 2021)

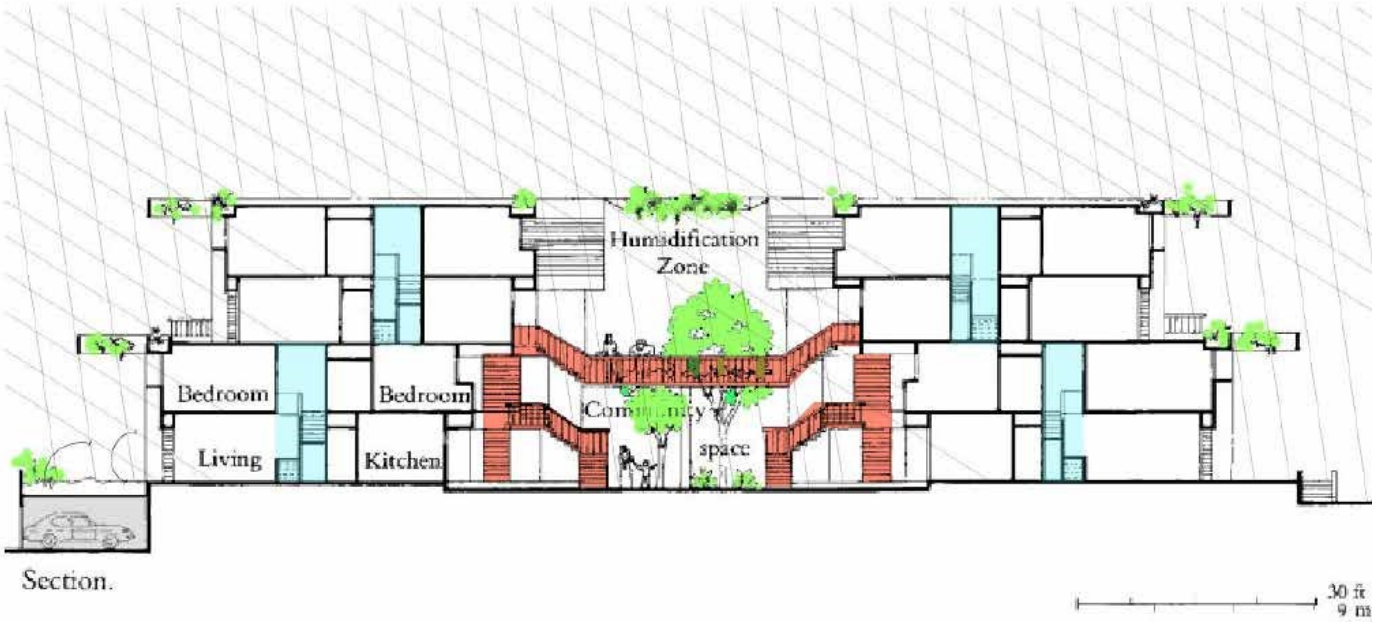


4.1.2 Horizontal and Vertical Circulation

Figure 4.1.2.1 Circulation

(Source: Slide share)

Vertical Circulation

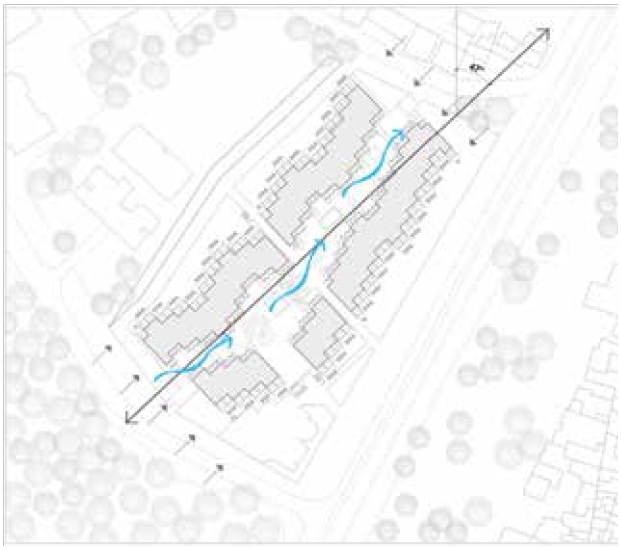


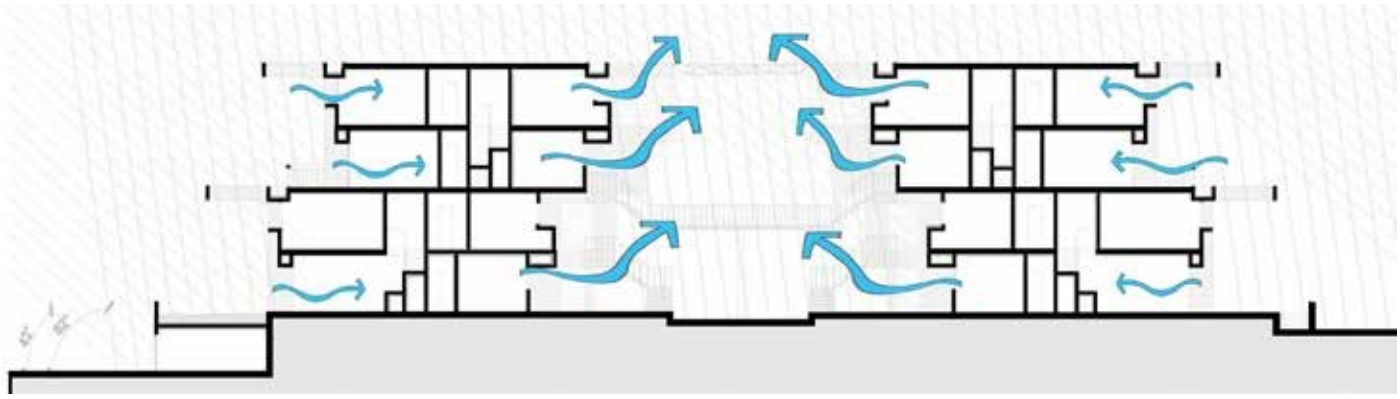
4.1.3 Climatic Consideration

The building mass is designed in a way that it blocks the scorching summer sun and allows soft winter sun to penetrate in to the housing units. And the centralized arrangement of the housing created tunnel effect pushing worm air out of the housing and substituting with fresh cool air.

Figure 4.1.3 Shadow analysis

(Source: Slide share)





4.1.4 Parking

The housing has surface parking with the capacity of 80 Cars. The parking is arranged along the peripheral vehicular road.

Figure 4.1.4.1 parking

(Source: Slide share)

4.1.5 Facade Detail

4.1.6 Current Adaptation

Different dwellers have adapted their housing in various ways depending on their needs, preferences, and circumstances.

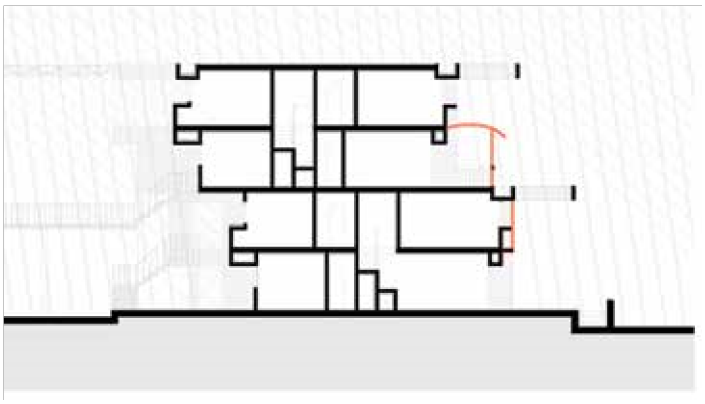


Figure 4.1.6.1 extension

(Source: google street view

4.2 Dhansiri Apartment

Architect: Bashirul Haq Location:

Dhaka, Bangladesh.

Construction Period: 1994- 1997.

Total built area: 115000 sqft.

Program: Social Housing With 160 unites.

Unite type: two BH, One BH.

Client: Dr. S. A. Hafiz.

The Dhansiri residential complex is regarded by many as a masterpiece of architecture. The apartment complex's large central courtyard, which successfully adapts the traditional design of a rural homestead with a courtyard surrounded by living rooms, encourages ample daylight and air. When an architect has fostered other construction and finishing materials like concrete and wood, they may communicate their volumetric understanding of the constructed form through the use of vernacular materials like brick.

Figure 4.2.1. Building photograph

(Source: I. Ahmed)

4.2.1 Site and surrounding

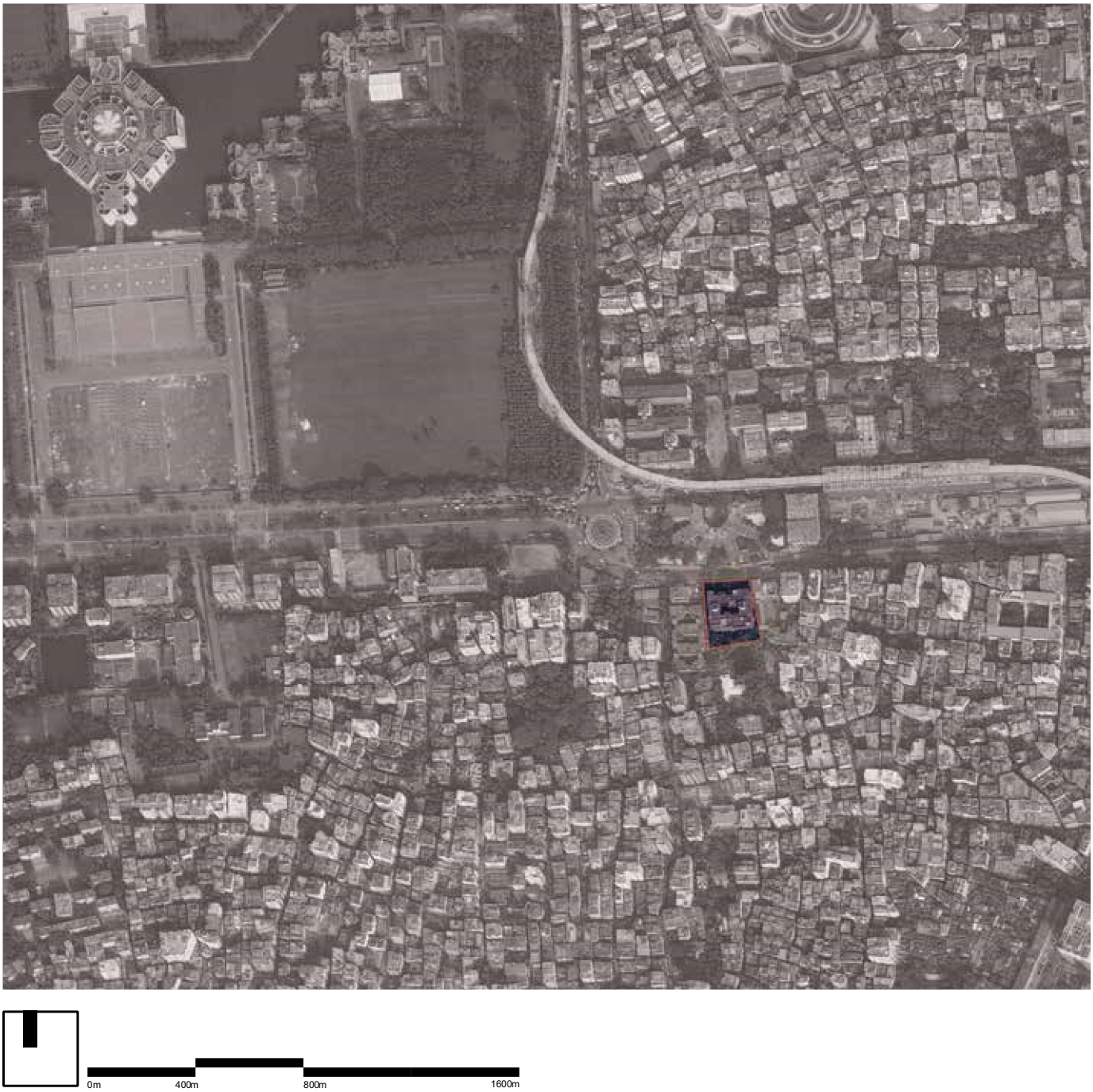


Figure 4.2.1.2. areal view

(Source: google map)

4.2.2 Form and Function

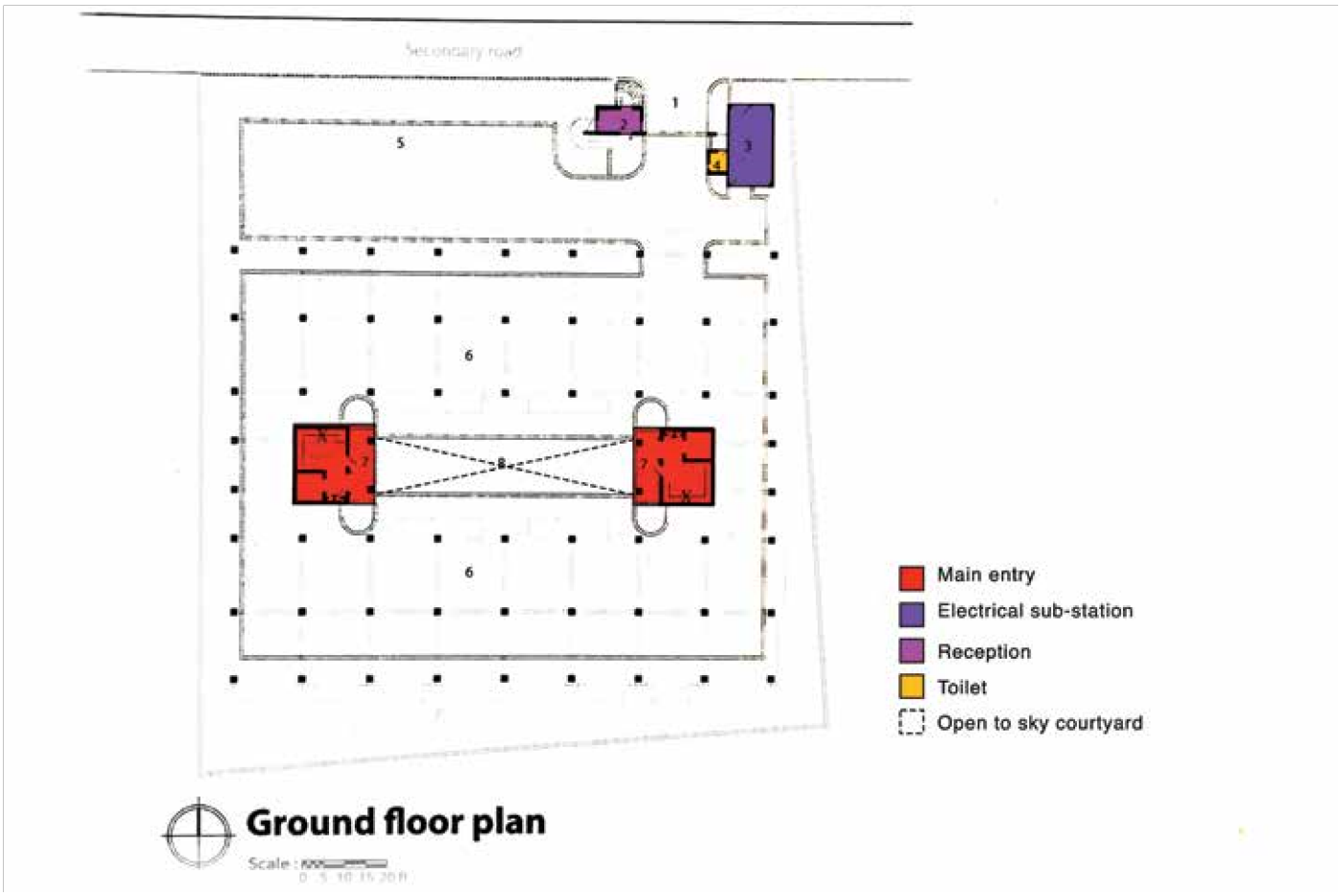
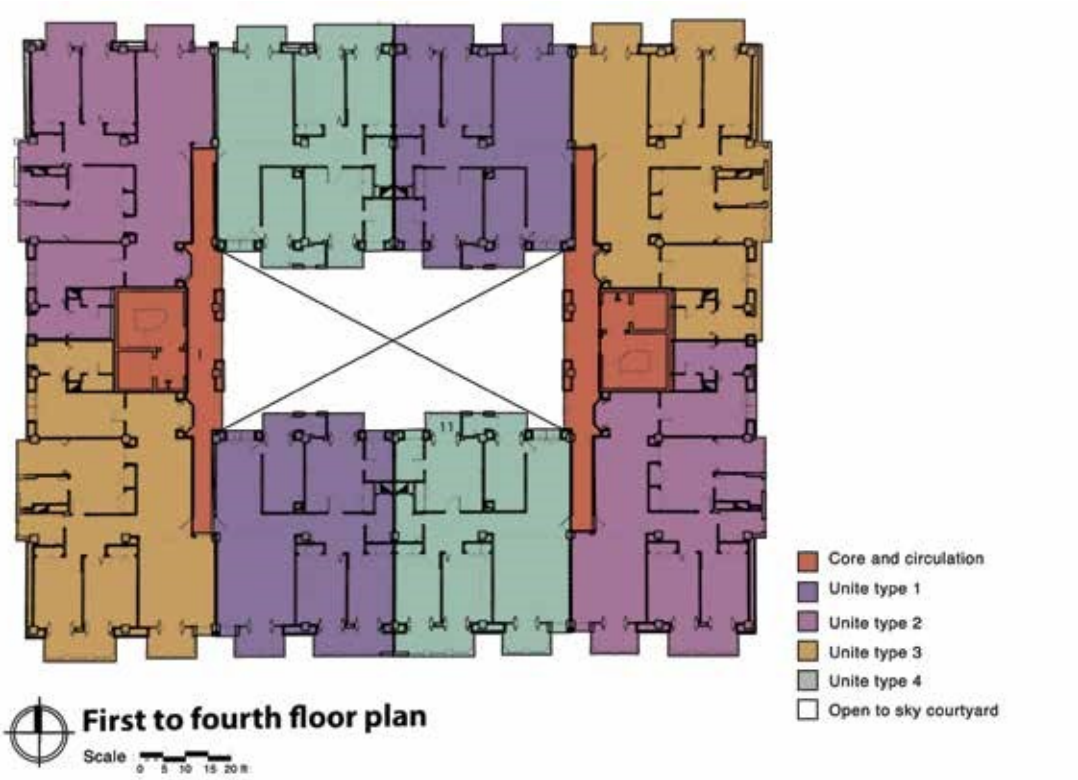
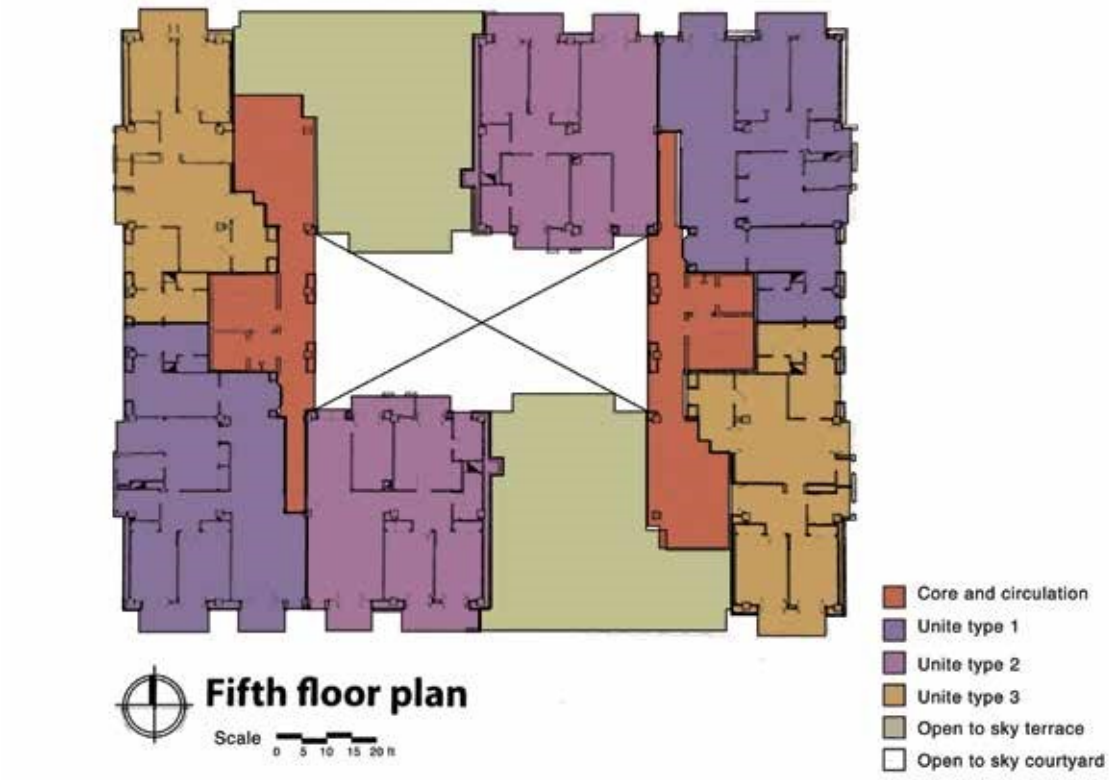


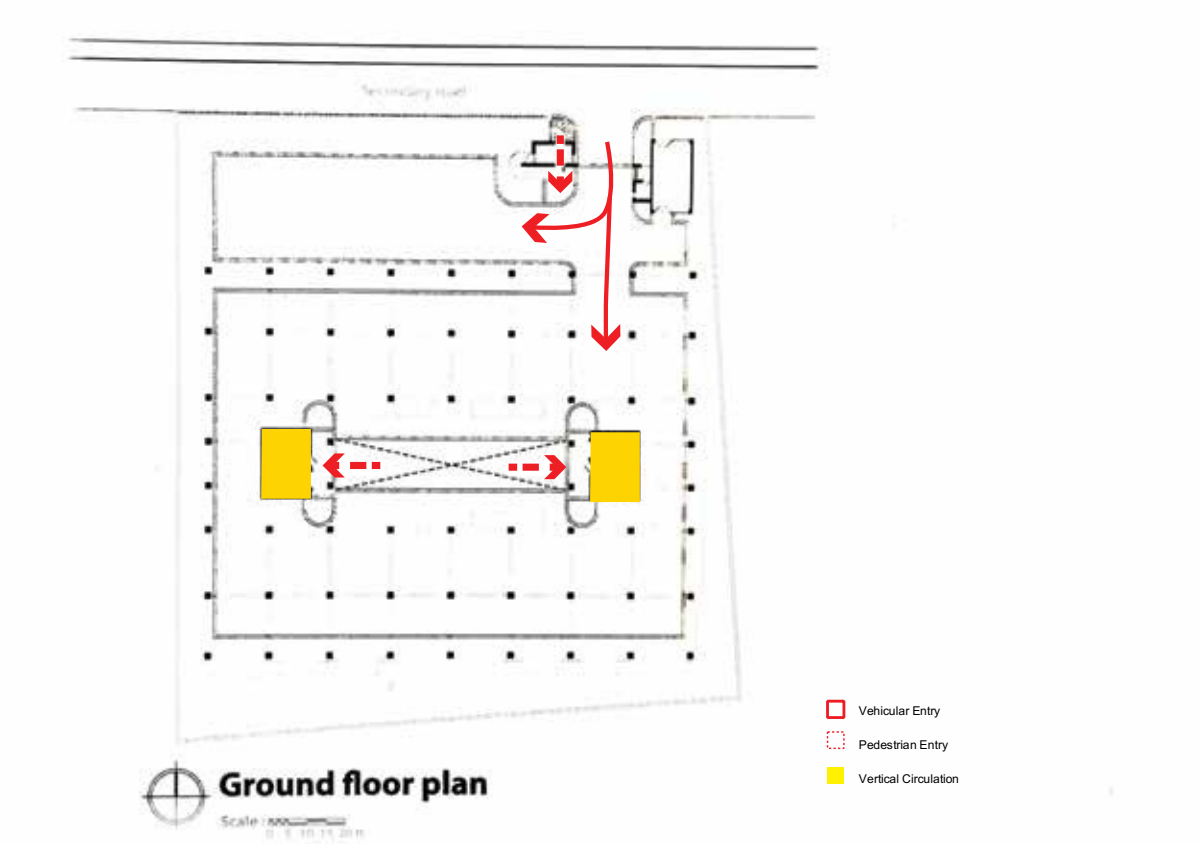
Figure 4.2.2.1 ground floor plan

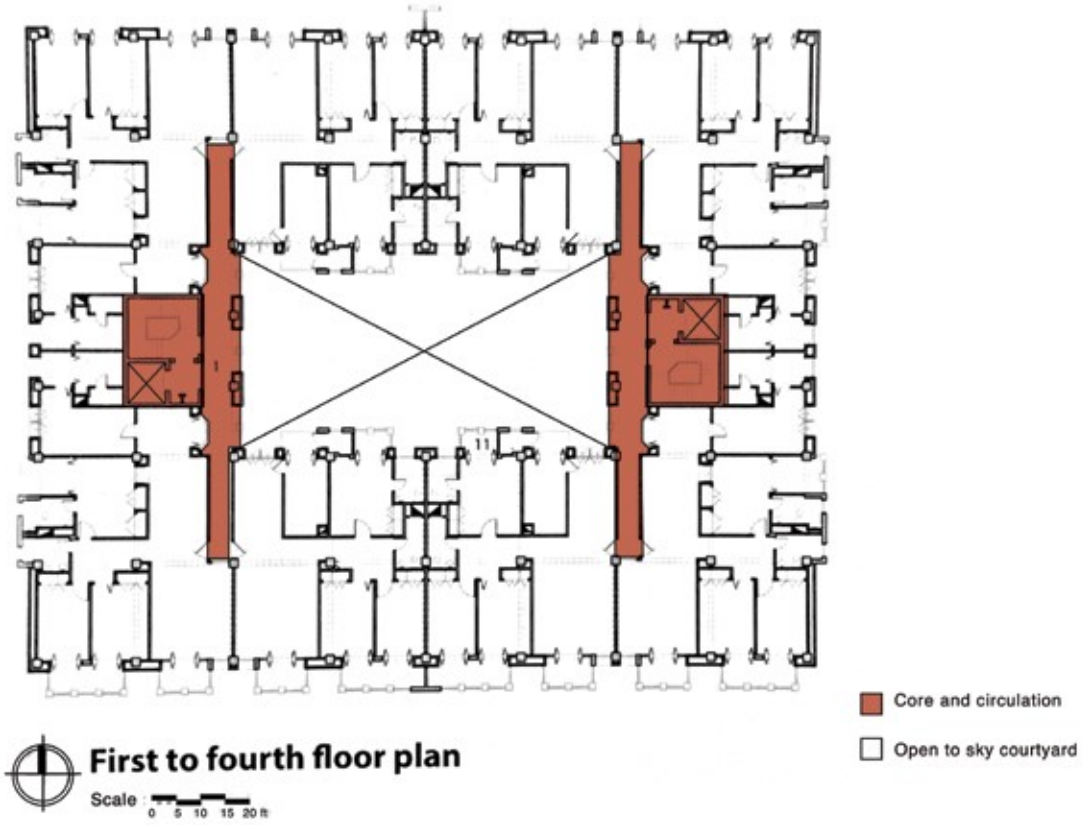
(Source: Iftekhar, A., & Rubaiya, S.)


Core and circulation
Unite type 1
Unite type 2
Unite type 3
Unite type 4
Open to sky courtyard
First to fourth floor plan
Scale
0 5 10 15 20 ft

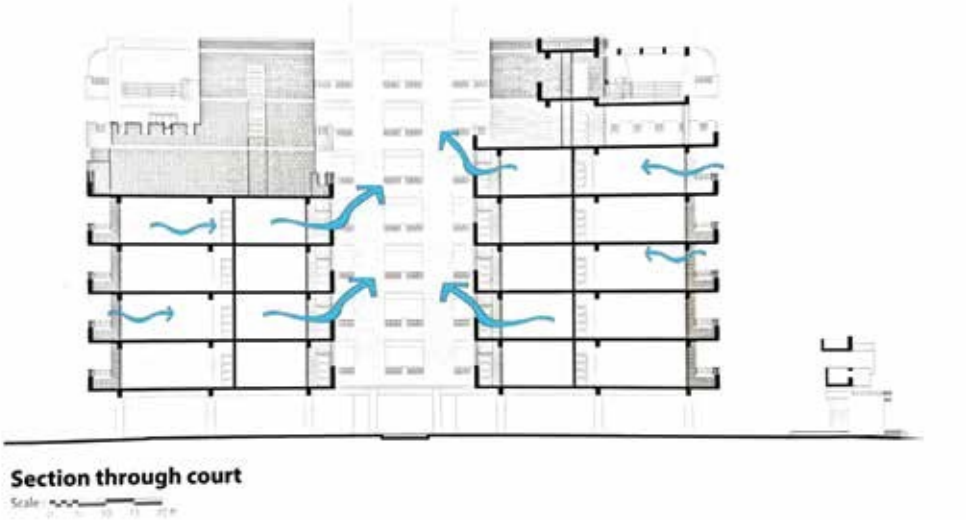

Core and circulation
Unite type 1
Unite type 2
Unite type 3
Open to sky terrace
Open to sky courtyard
Fifth floor plan
Scale
0 5 10 15 20 ft

4.2.3 Horizontal and Vertical Circulation

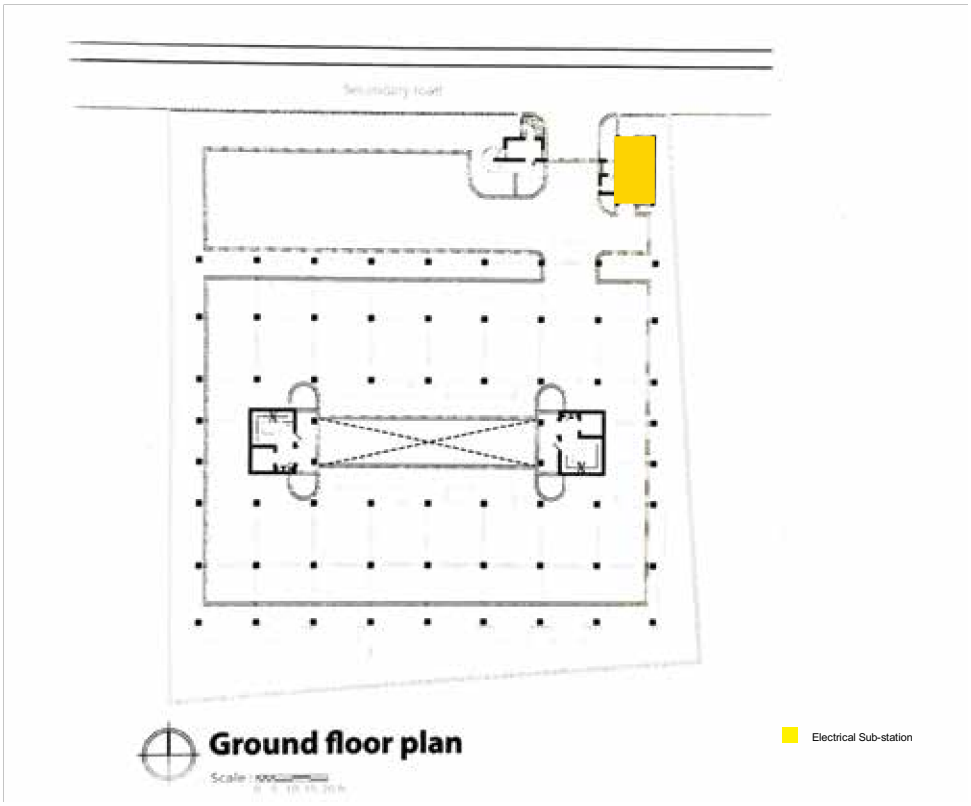




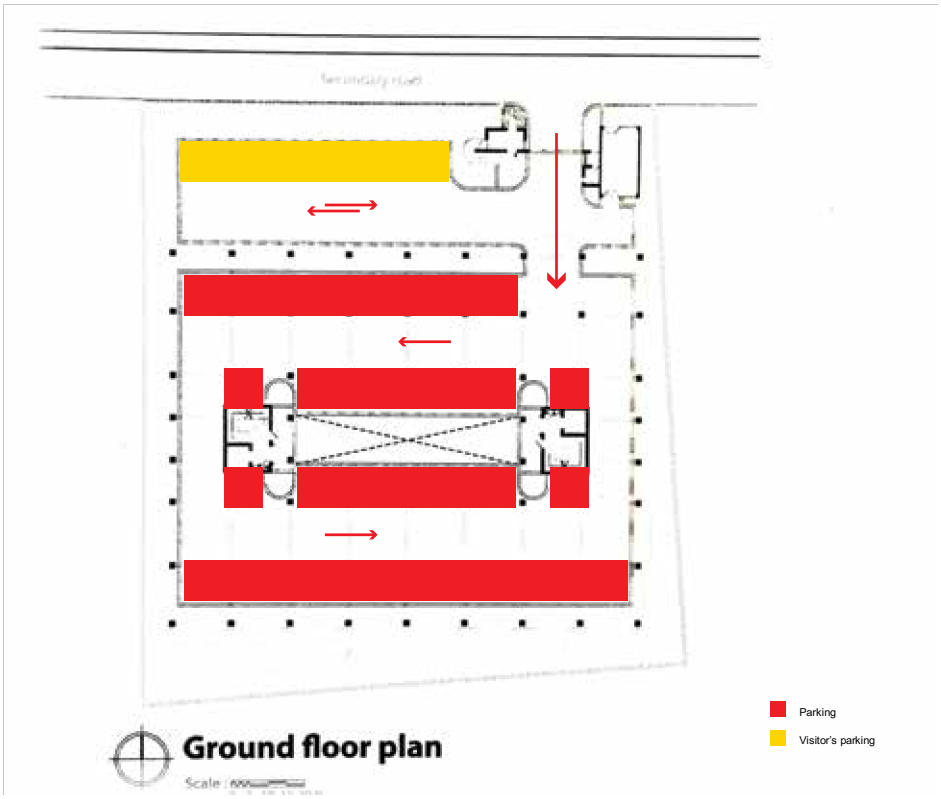
4.2.3 Climatic Consideration



4.2.5 Energy System

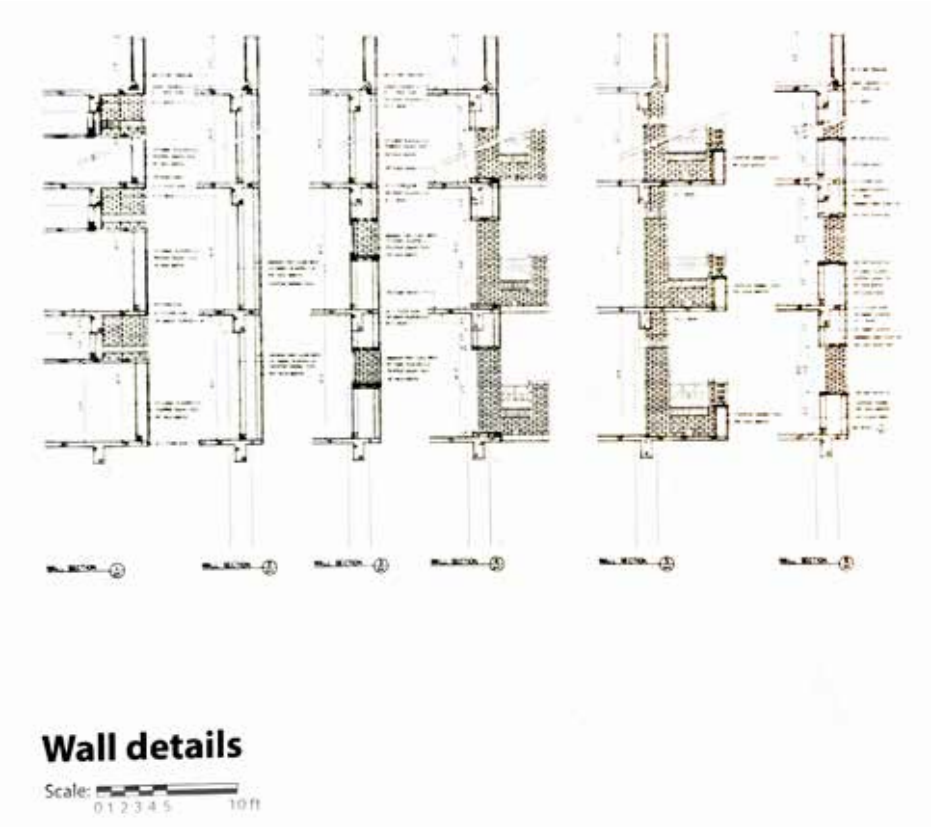


4.2.6 Parking



4.2.7 Facade Detail

4.2.8 Design Detailing and Features



4.2.10 Current Adaptation

Figure 4.2.10.1 ground floor plan

(Source: google map.

Chapter 5

Program Development

5.1 Proposed Program from client

Site area- 1.47 acre

Total number of units- 204

Unit type -3

Approximate Unit Size

Type A- 450 Sqft (1 Bed, 1 Living + dinning, 1 Toilet, 1 kitchen, 1 Veranda)

Type B- 650 Sqft (2 Bed, 1 Living + dinning, 1 Toilet, 1 kitchen, 1 Veranda)

Type C- 550 Sqft (1 Bed, 1 Living + dinning, 1 Toilet, 1 kitchen, 1 Veranda)

Total built area: 120000 Sqft

5.2 Rationale of the programs

The client-provided program list only included the number of units and their approximative square footage. However, the housing development should include necessary features that will improve user comfort and guarantee a better environment. Given the security concerns, the housing complex should have a number of amenities, such as a security

guard room, a school, a mosque, a community center, and residential units. A few adjustments were made to the program list taking into account user needs as well as the site's environment.

A significant number of individuals will be able to stay in the facility. The complex needs a program that emphasizes education. There would be little distance for students to commute to school. 500 pupils at a time will have access to educational facilities at this institution. Around the location, there are a few other colleges and institutions. Therefore, elementary school is sufficient for this site. Students who are older than 11 and younger than 19 are mature enough to travel independently and distant from home.

Muslims make up the majority of Bangladesh's population. Muslims offer five daily prayers, with Jummah being one of the most significant. One of the most important amenities that must be present in a home is a mosque. Although there are already two mosques close by, the large number of residents in the housing complex necessitates the construction of a third mosque inside the complex. For prayer, locals wouldn't have far to travel.

A sizable population would reside inside the housing complex, creating a community. A community hall is necessary to foster a strong sense of community among the residents. Inside the community, people can gather to celebrate a variety of events. They won't have to travel very far to get to the complex as a consequence, which will be inexpensive as well.

5.3 Maximum ground coverage

Affordable Housing for middle-income Group Asulia, Savar		
SI. NO	**FEATURES**	**AREA/ NUMBER/ FUNCTION**
1	Land Area	1.47 Acre
2	MGC	31680 (50%)
3	Total Dwelling Units	204
4	Dwelling Units per Acre	139
5	Net Density	485 per Acre
6	Dwelling Unit Type	3
7	Dwelling Unit Size A	450 SQft
8	Dwelling Unit Size B	650 SQft
9	Dwelling Unit Size C	550 SQft
10	Amenities	Community Hall Mosque Community Clinic Learning Center
11	Services	Departmental store laundry Security Room Power Sub Station
12	Parking	26 (1 Parking for 8 units)

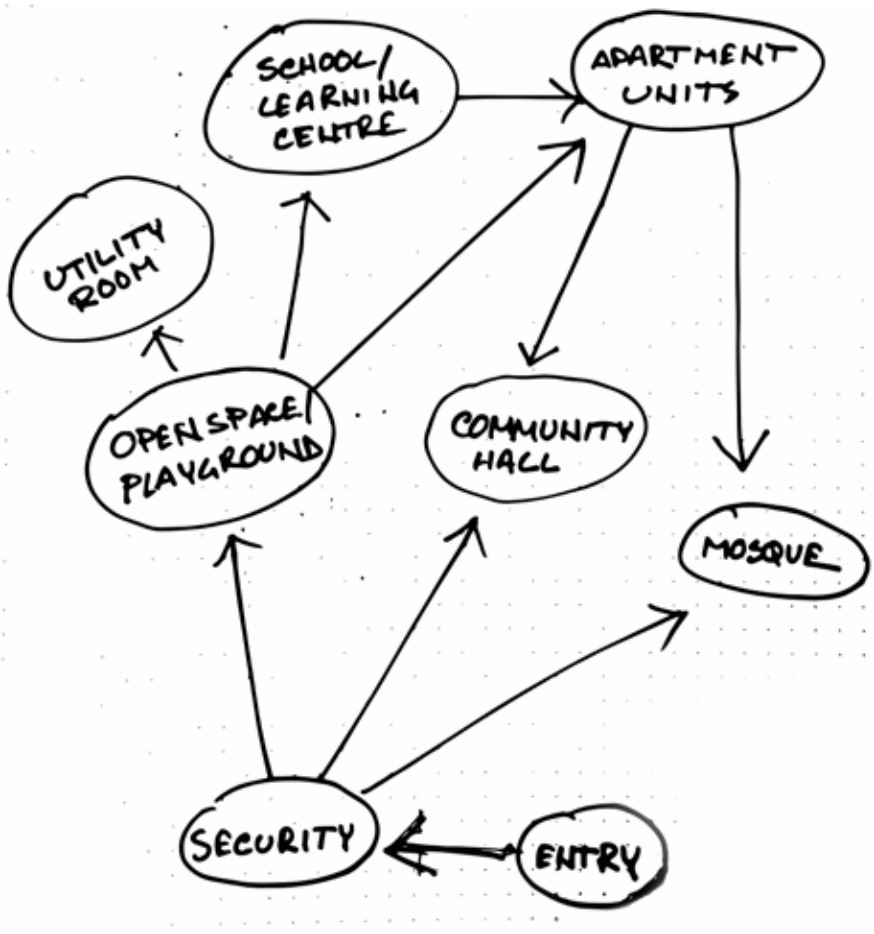
5.4 Program development

Dwelling Unit							
SI.NO	**TYPE**	**QUANTITY**	**USER**	**NET AREA**	**UNIT**	**TOTAL AREA**	**REFERENCE**
1	**A, 1BH**	**68**	**3**	**450**	**SQft**	**30600**	Client
1.1	Bed Room	1	2 or3	124	SQft	124	Time Saver Standards
1.2	Toilet	1	1	34	SQft	34	Neufert
1.3	Kitchen	1	2	38.7	SQft	38.7	Neufert
1.4	Dining + Living	1	4	260	SQft	260	Time Saver Standards
2	**B, 2BH**	**100**	**4**	**650**	**SQft**	**65000**	Client
2.1	Bed Room	2	2 or3	124	SQft	248	Time Saver Standards
2.2	Toilet	1	1	34	SQft	34	Neufert
2.3	Kitchen	1	2	77	SQft	77	Neufert
2.4	Dining + Living	1	4	260	SQft	260	Time Saver Standards
2.5	Veranda	1	2	34	SQft	34	Neufert
3	**C, 1BH**	**36**	**3**	**550**	**SQft**	**1980**	Client
3.1	Bed Room	1	2 or3	124	SQft	124	Time Saver Standards
3.2	Toilet	1	1	34	SQft	34	Neufert
3.3	Kitchen	1	2	38.7	SQft	38.7	Neufert
3.4	Dining + Living	1	4	260	SQft	260	Time Saver Standards
3.5	Veranda	1	2	34	SQft	34	Neufert
					Total	**115400**	
						150020	With 30% circulation

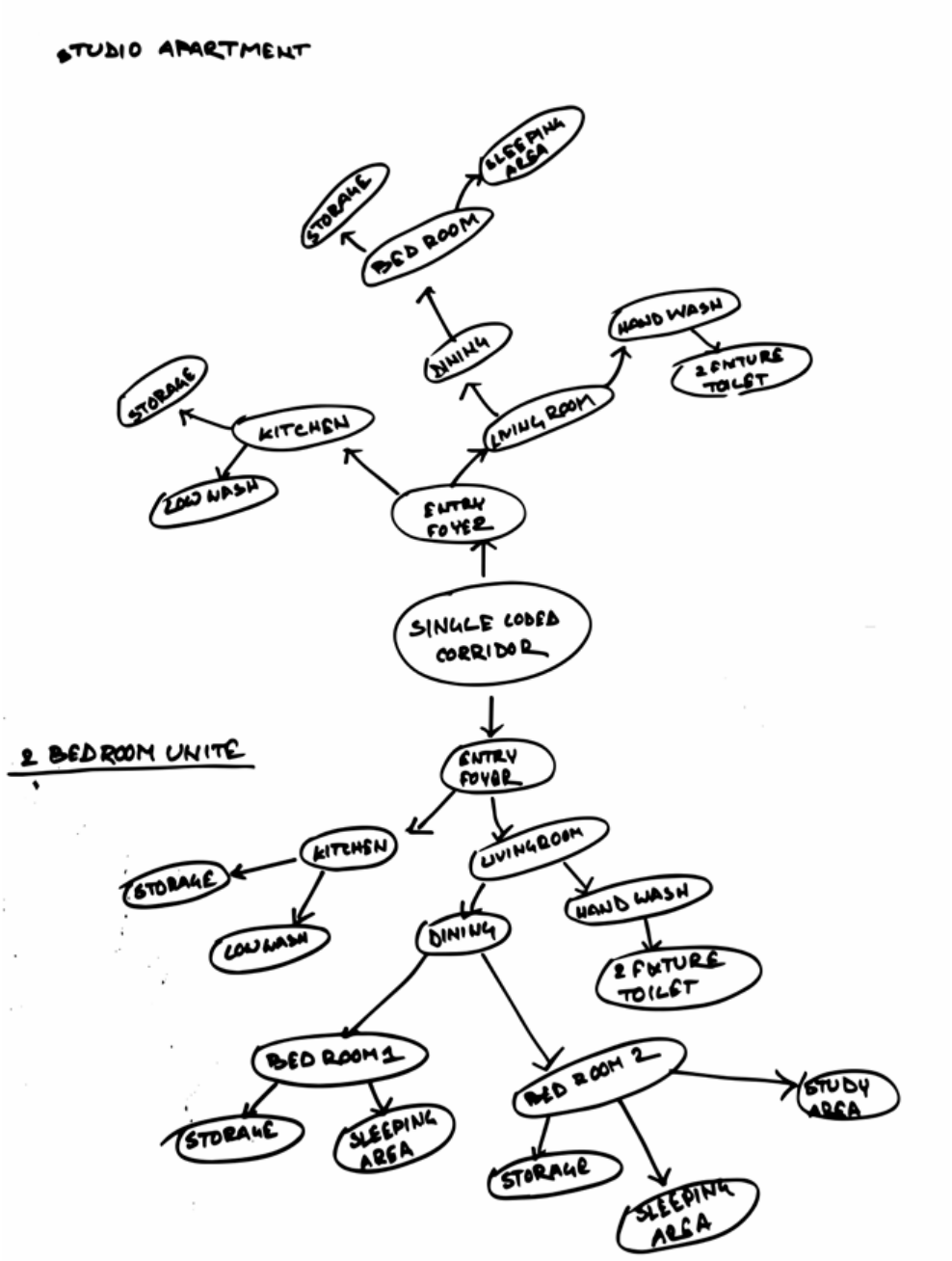
Amenities							
SI.NO	**TYPE**	**QUANTITY**	**USER**	**NET AREA**	**UNIT**	**TOTAL AREA**	**REFERENCE**
1	**Community Hall**	**1**	**300**		**SQft**	**2904**	PPA
1.1	Event space	1	300	7.5	SQft	2260	BNBC
1.2	Toilet	4	4	34	SQft	136	Neufert
1.3	Kitchen	1		100	SQft	100	Neufert
1.4	Service room	1		284	SQft	284	Time Saver Standards
1.5	Store room	1		124	SQft	124	
2	**MOSQUE**	**1**	**150**		**SQft**	**1385**	PPA
2.1	Prayer Space	1	150	7.5	SQft	1125	BNBC
2.2	Toilet	4	4	34	SQft	136	Neufert
2.3	Store room	1		124	SQft	124	
3	**Community Clinic**	**1**			**SQft**	**179**	
3.1	Waiting area	1	4	16	SQft	64	BNBC
3.2	Doctors Chamber	1	2	107.5	SQft	115	BNBC
4	**Learning Center**	**1**	**50**		**SQft**	**1486**	
4.1	Library	1	50		SQft	800	Time Saver Standards
4.2	Childrens Day Care	1			SQft	550	Time Saver Standards
4.3	Toilet	4	4	34	SQft	136	Neufert
					Total	**5954**	
						7740	With 30% circulation

Services							
SI.NO	**TYPE**	**QUANTITY**	**USER**	**NET AREA**	**UNIT**	**TOTAL AREA**	**REFERENCE**
1	Retail Shop	2		150	SQft	300	
2	Laundry	1			SQft	350	Time Saver Standards
3	Security Room	2	4	144	SQft	288	
4	Power Station	1			SQft		
					Total	**938**	
						1219	With 30% circulation
Parking							
SI.NO	**TYPE**	**QUANTITY**	**USER**	**NET AREA**	**UNIT**	**TOTAL AREA**	**REFERENCE**
1	Parking	26	204	128	SQft	3328	BNBC
					Total	**3328**	
						4326	With 30% circulation

5.4.1 Functional Flow of the Programs



5.4.2 Functional Flow of the units



Chapter 6

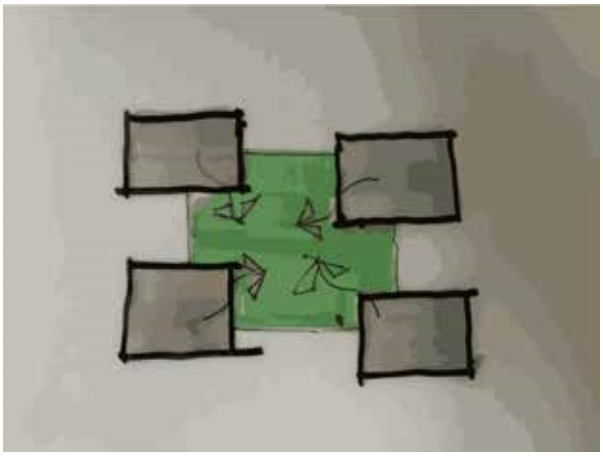
Concept and Design development

6.1 Concept development

Designing an affordable housing complex for lower middle-income group requires careful planning and attention to details. Among many the most important part is insuring sustainable development of the community. This can be achieved by increasing social interaction and Incorporating community spaces: Include community spaces such as parks, playgrounds, and gathering areas to encourage social interaction and create a sense of community.

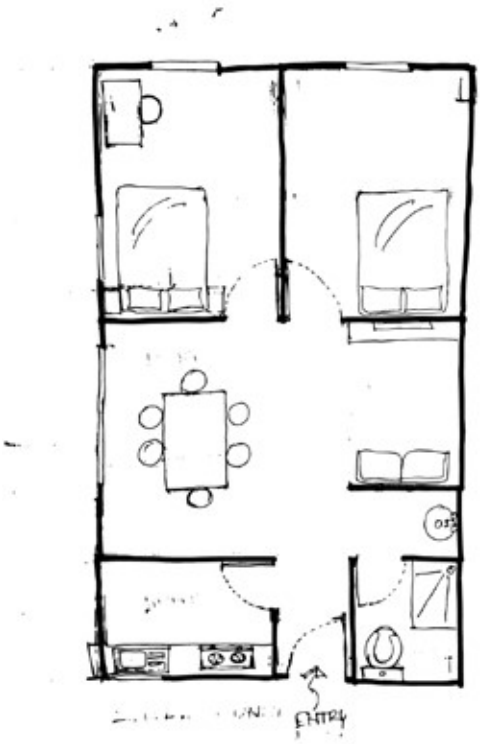
CHAKKA

6.2 Form Development

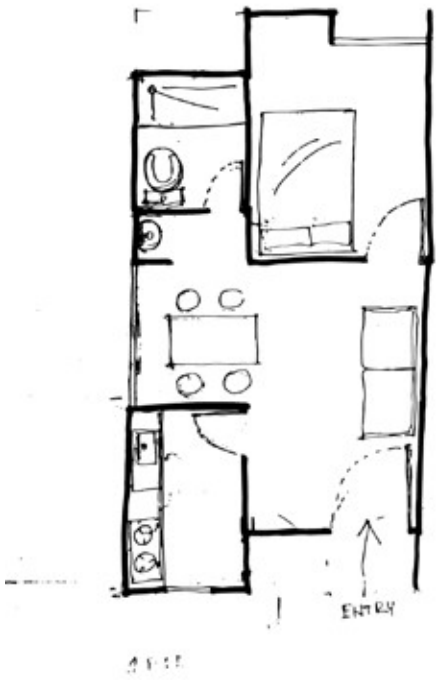


All the Community functions such as community hall, mosque, learning centers are arranged around the central open space so that they are easily accessible from all over the housing complex. And all the clusters are arranged around a courtyard and this courtyards will be arranged around the central space.

6.2.1 Phase 1.



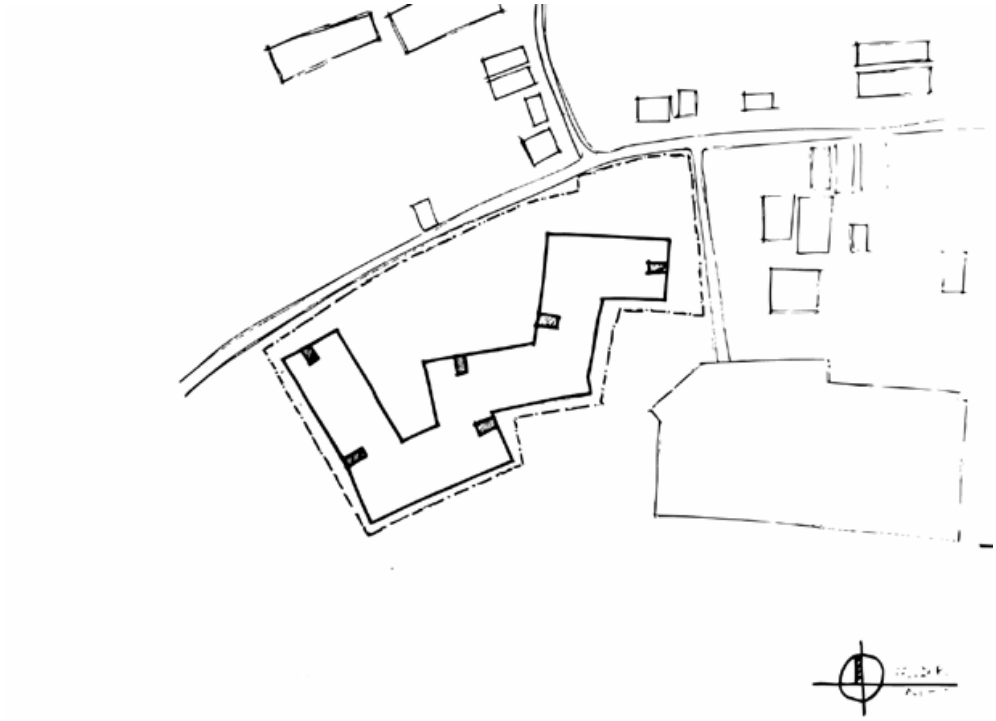
2 Bed Room Unit

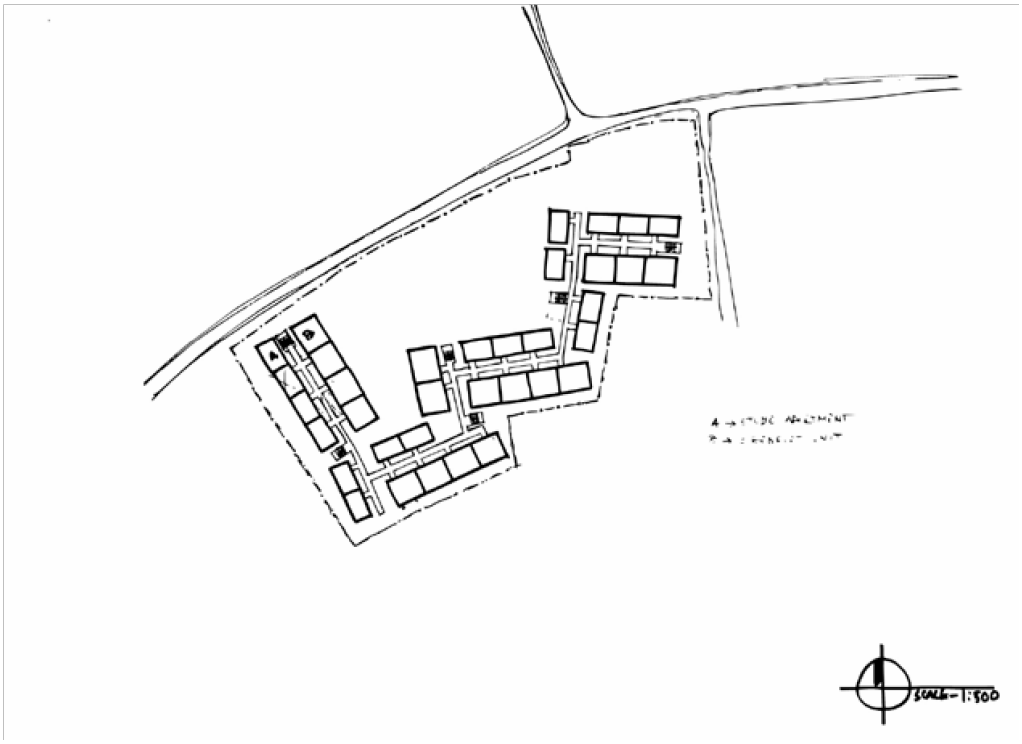


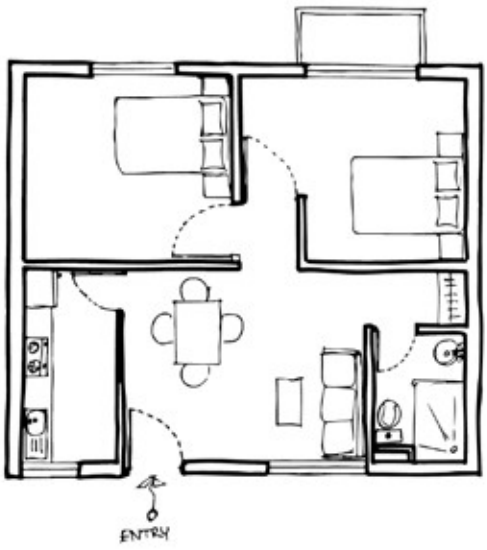
Studio Apartment

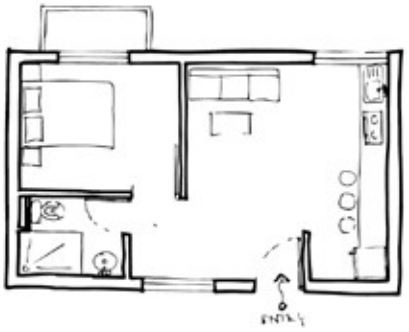
The massing was thought out to create cluster of unites, which came up visually appealing. But the main problem was because of the shifting organization not all the units were receiving adequate day light and lack of proper ventilation.

6.2.2 Phase 2.

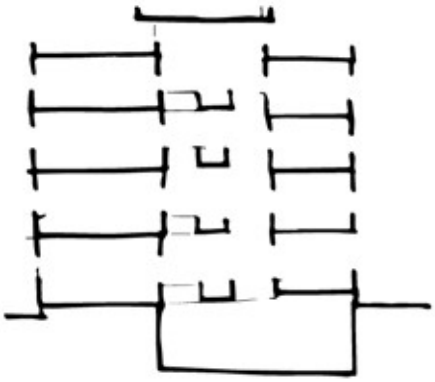




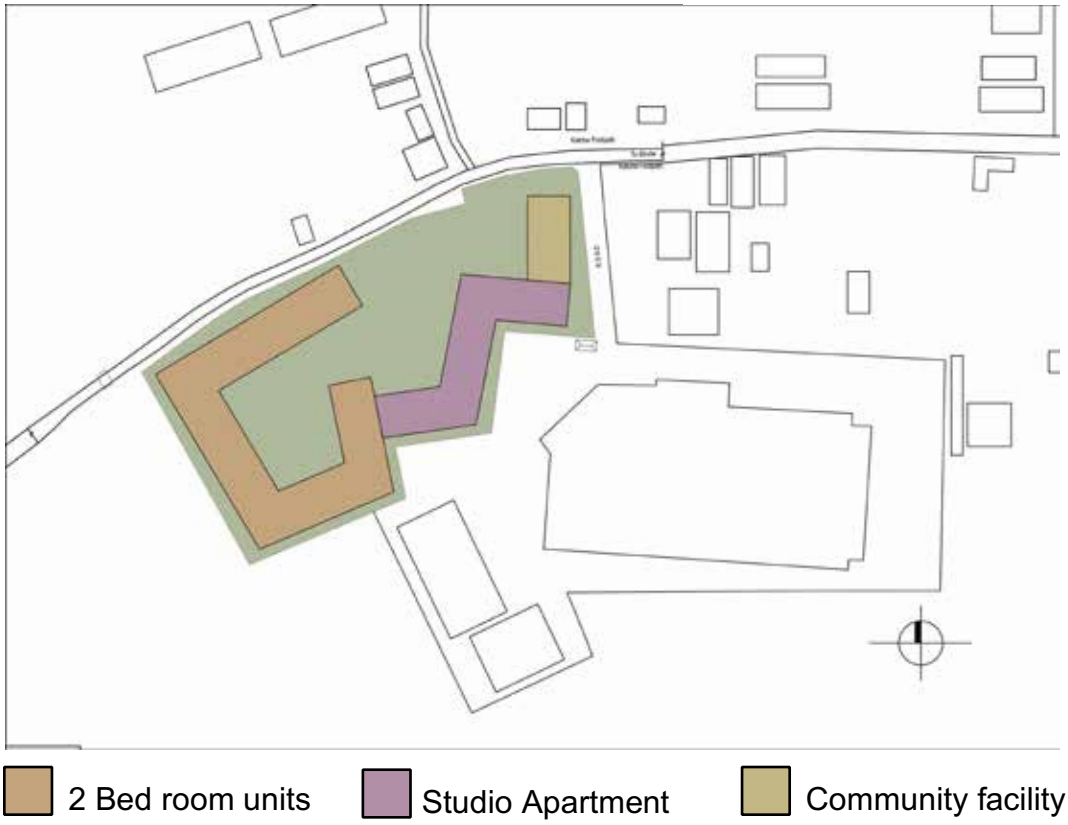

ENTRY

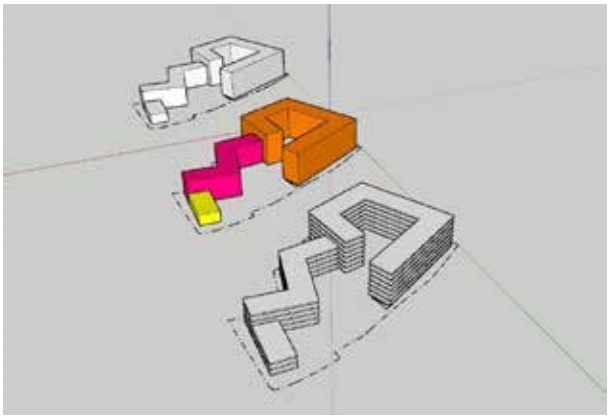


To achieve required density by the client, double loaded corridor principle was tried out. The main problem of this design solution is that the corridor becomes mundane and hardly gets day light. Which also affects the quality of the dwelling units.



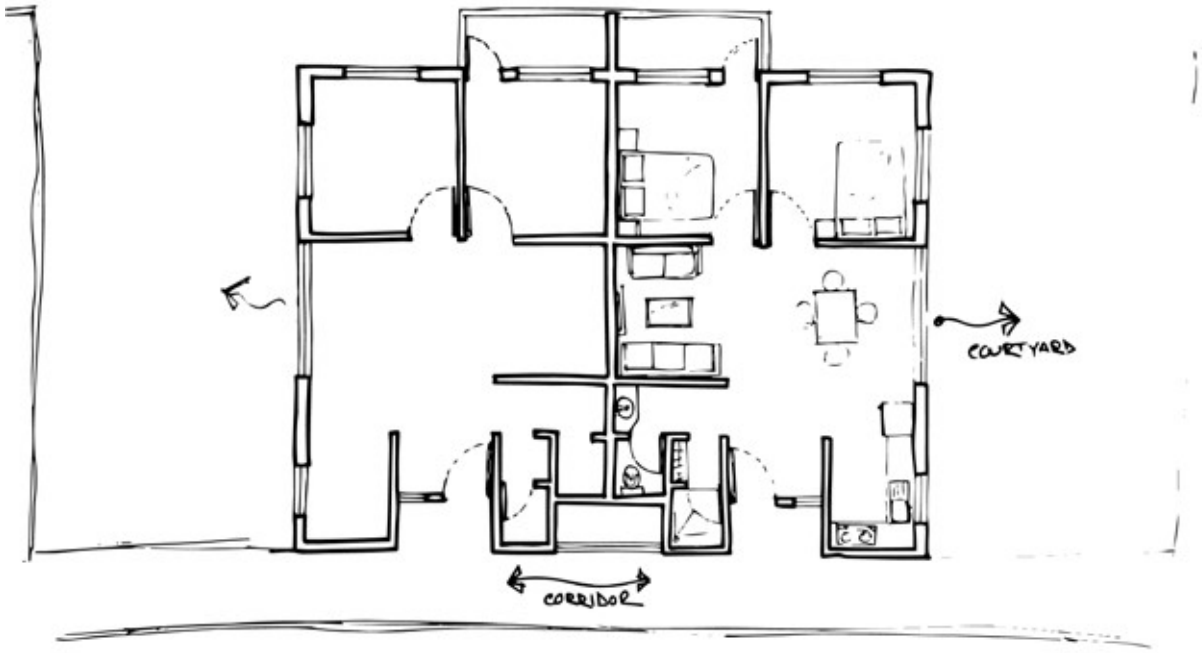
6.2.3 Phase 3.





In phase 3 residential units are arranged in a linear configuration along a single corridor or hallway, with each unit having windows or balconies facing the outside of the building. It may improve natural light and ventilation: By having windows or balconies on 2 side of the unites directly outer surface of the building, natural light and ventilation can be maximized. This can help reduce energy consumption for lighting and cooling.

In this layout every 2 units will have a shared courtyard, increasing the opportunity to gardening at their courtyard.



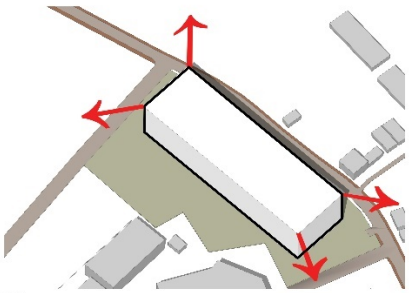
++6

6.3 Final Phase

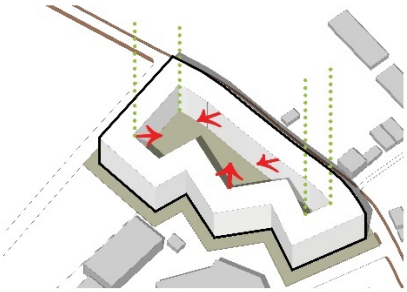
6.3.1 Form Derivation

Here the design developed with the idea of reducing ground coverage as much as possible to create open field wich later on turned into a courtyard space. Two entries have been created to increse accessibility. Set back from the industry has given the site a buffer

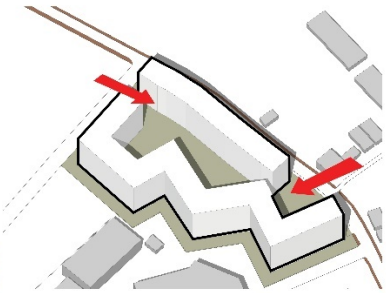
zone towards the residence. Due to climatic considerations, the building's shape changed over time before achieving its final form.



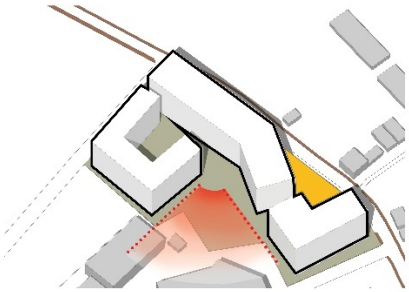
Mass



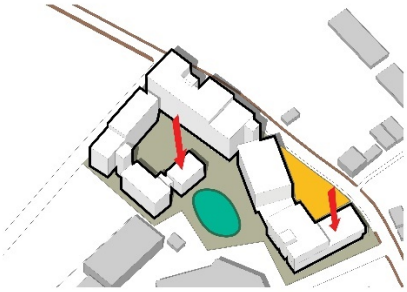
Inner Courtyard



Access points



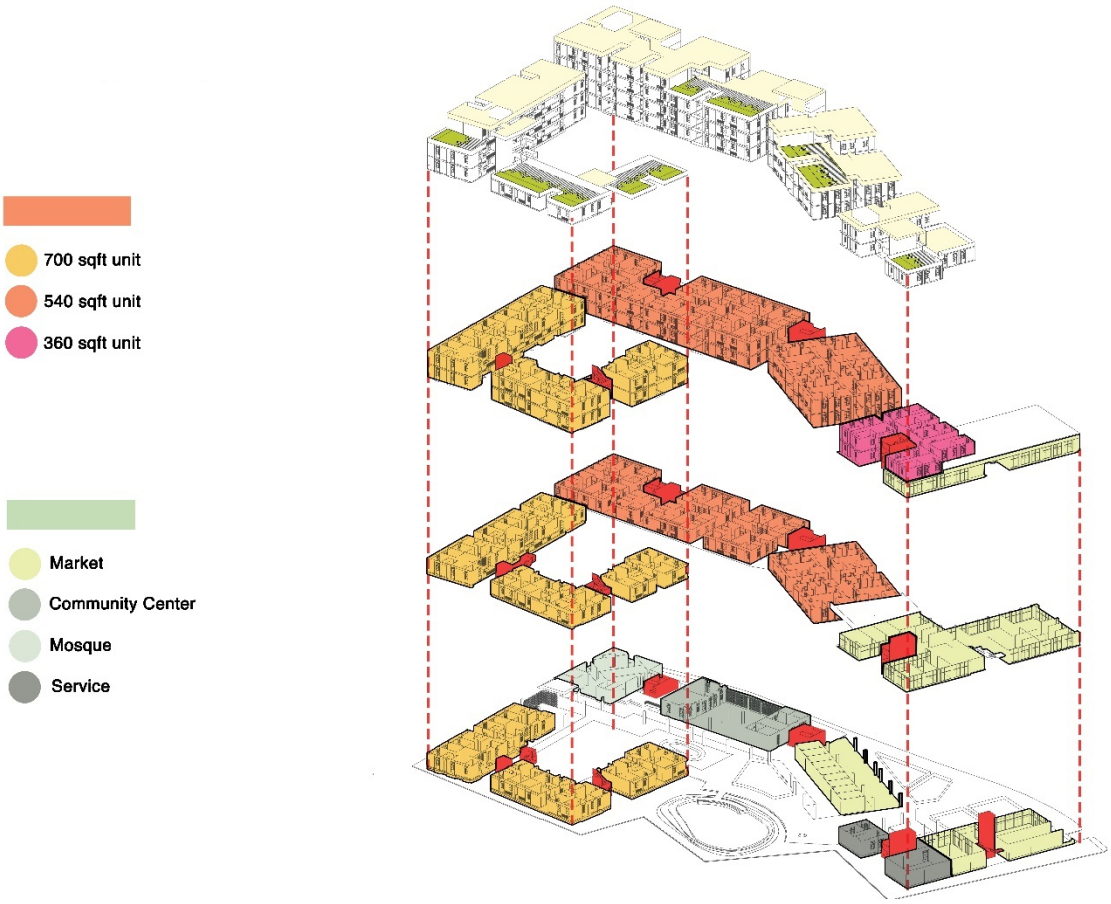
Public Plaza & Buffer zone



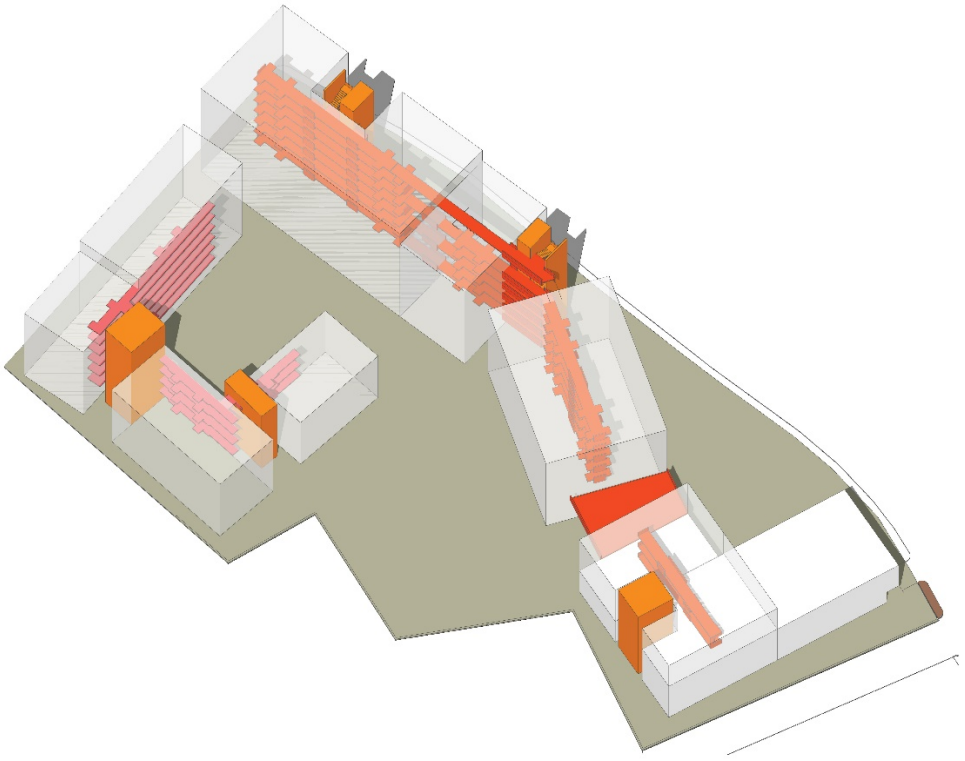
Climate Consideration

6.3.2 Design Development

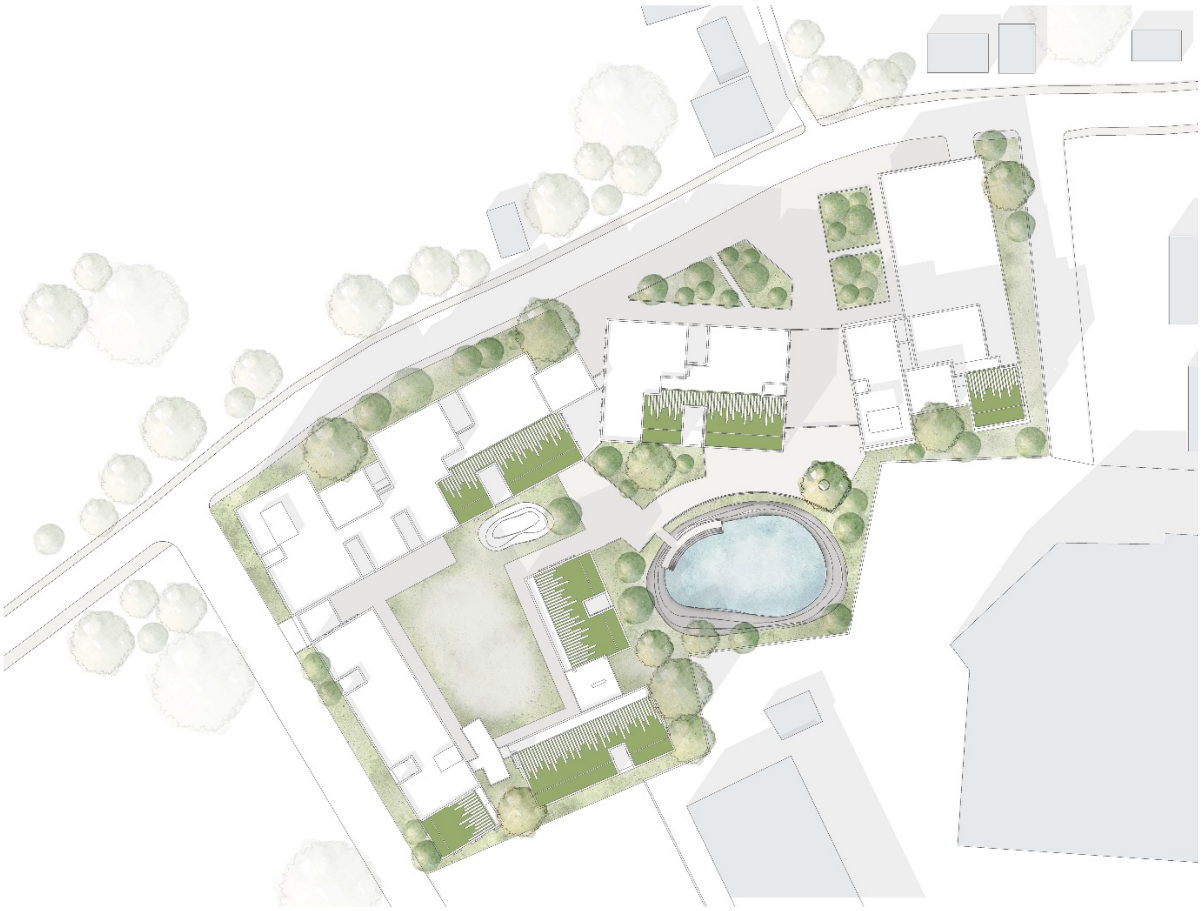
6.3.2.1 Axonometric View



6.3.2.2 Circulation Diagram



6.3.2.3 Top View



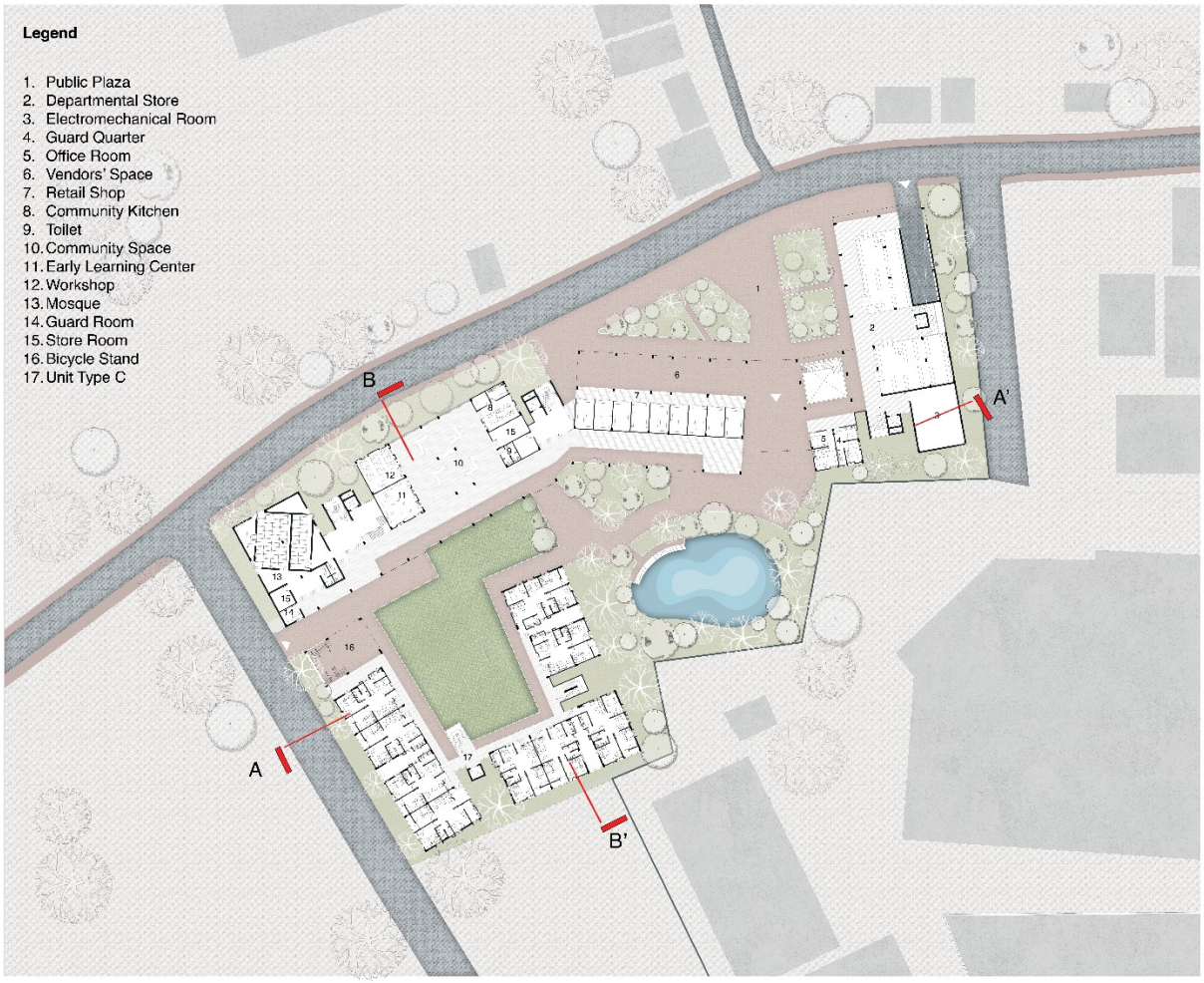
Top View

Scale: 1:350

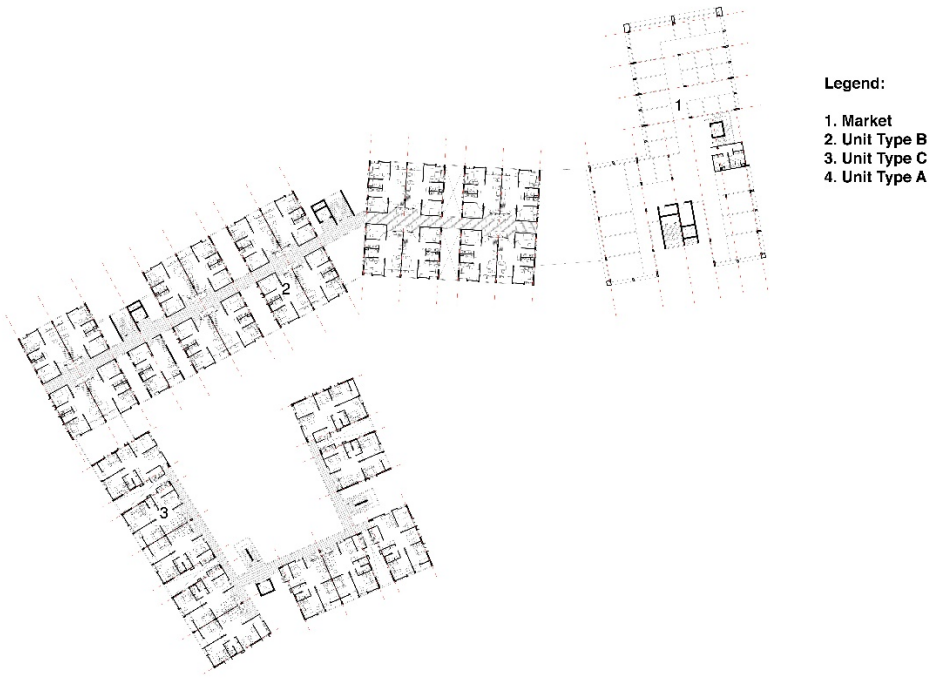
6.3.2.4 Axonometric View of Ground Floor

6.3.3 Design Development

6.3.3.1 Architectural Drawings



Ground Floor Plan
Scale- 1:200



Legend:

1. Market
2. Unit Type B
3. Unit Type C
4. Unit Type A

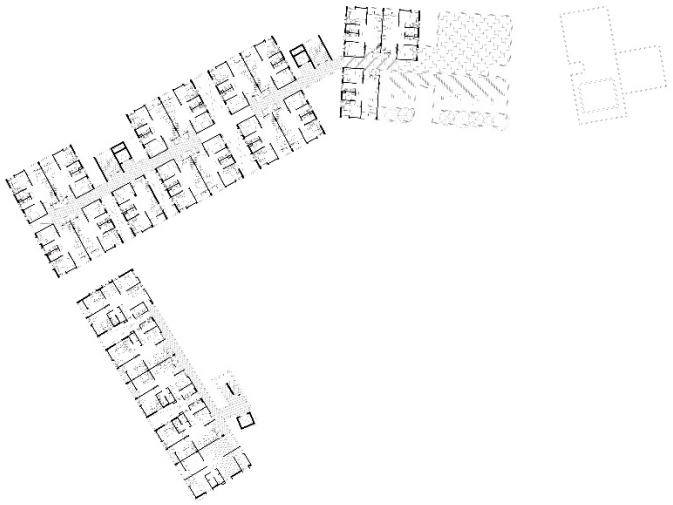
First Floor Plan

Scale- 1:200

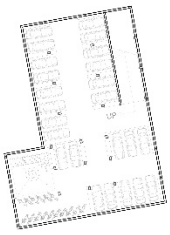
Second Floor Plan

Scale- 1:200

Third Floor Plan
Scale- 1:200



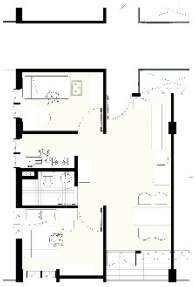
Sixth Floor Plan
Scale- 1:200



Basement Plan
Scale- 1:200

Blow Up Plan:

Unit C: 65 SQM



Unit B: 50

Unit A: 33 SQM

Section CC'

Section AA'

Scale 1:200

Section BB'

Scale- 1: 200

North Elevation
Scale- 1: 200

West Elevation
Scale- 1: 200

6.3.4 Renders


1


2


3

6.3.5 Fact Sheet

SL NO	FEATURES	AREA/ NUMBER/ FUNCTION
1	Site Area	1.7 Acre
2	Foot Print Area	3187 sqm
3	Total Built Area	16229 sqm
4	Density (People Per Acre)	300 PPA
5	Total Dwelling Unit	209
6	Unit Type	3
7	Dwelling Unit A (33.4 sqm)	24
8	Dwelling Unit B (50 sqm)	129
9	Dwelling Unit C (65 sqm)	56
10	Commercial Space	1550 sqm
11	Amenities	1. Mosque 2. Community Center 3. Early Learning center
12	Structural System	RCC Frame Structure

Chapter 7

Conclusion

To sum up this project will play a significant role to cater the growing need of housing around Ashulia. The project can be an example to the city to become a better livable place. This project underscores the profound impact of thoughtful architectural design on the lives of individuals and communities. It demonstrates that affordable housing need not compromise on aesthetics, functionality, or sustainability. In fact, these elements can enhance the well-being of residents and contribute to the broader urban fabric.

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