

Housing Complex for Government Employees

Kalabagan, Dhaka

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Abstract:

Government of Bangladesh provides housing to the people who work for the government. Rental housing facilities are given to all the public servants from higher officials to employees and they can take advantage these facilities until they reach retirement. Accommodation for the government employees in Dhaka city is very critical as the city is already over populated as well as the living cost is relatively expensive rather than other cities. It's difficult for the employees to hire apartments or houses in suitable place and the prices are variable in different places. The government is planning to ensure housing facilities for their employees to reduce the crisis of accommodation and the aim of the project is to make an environmentally friendly space where people can easily interact with each other and make a healthy relationship among themselves. Providing an efficient, adaptive recreational and open spaces will make a friendly environment which helps to create bondage with each other.

ACKNOWLEDGEMENT

I am grateful to ALLAH for giving me the scope and ability to complete this course. All praise goes to Him, Alhamdulillah.

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Chapter 1: INTRODUCTION

1.1. Background of the project.

1.2. Project brief

1.3. Project introduction

1.4. Problems statement

1.5. Rationale of the project

1.6. Aims and objective

1.0. INTRODUCTION

1.1. Background of the project:

Dhaka is a diverse city located in central Bangladesh along the Buriganga River. Dhaka is the most densely populated and fast growing city in the world. In 2016, the population of Dhaka is 18.237 million. (World population review, 2017) Migration from rural areas to urban cities like Dhaka is a strong reason to the over growth of the population. The settlement pattern of Dhaka city is disorganized and mismanaged.

Dhaka's urban population is growing at an estimated 4.2 percent annually. Every year the population of Dhaka increases by five lakh but the housing increases by 10 thousand which is not sufficient to accommodate the overgrowth population. (World population review, 2017) More people need more houses, employment facilities and other opportunities but few gets proper standard of living and amenities.

Accommodation for the government employees in Dhaka city is very critical as the city is already over populated as well as the living cost is relatively expensive rather than other cities. It's difficult for the employees to hire apartments or houses in suitable place and the prices are variable in different places. Sufficient and secured shelter is a basic human right, so the quality and the environment of the living space make a positive impact on human behavior.

The government is planning to ensure housing facilities for their employees to reduce the crisis of accommodation. Some projects are initiated in various parts of the capital to meet the accommodation demand of the public employees as it is their basic need and constitutional rights.

1.2. Project Brief:

Name of the Project: Housing Complex for Government Employees.

Client: Ministry of Housing and Public Works.

Site Location: Kalabagan, Dhaka.

Site area: 12.66 acres.

PROGRAMS:

- Flat type A 1250sft, total 360 flats= 450,000sft
- Flat type B 1050sft, total 360 flats= 378,000sft
- School = 20,000sft
- Community Centre= 16,000sft
- Mosque= 14,000sft

Total =878,000sft

1.3. Project Introduction:

Housing is one of the three primary needs and is as equally important as food and clothing. It provides shelter, safety and security to its owner. It also provides privacy, promotes health and makes a comfortable zone for living. International human rights law recognizes everyone's right to an adequate standard of living, including adequate housing. 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.

According to the Ministry of Housing and Public Works, 38,244 plots will be developed and 70,377 apartments will be constructed across the country under various projects. Another data provided by the Ministry of Housing and Public Works, there are only 24,000 government residences in the country against around 1.3 million public employees. (The Independent, 2015).

In Dhaka city some housing projects are initiated by Ministry of Housing and Public Works which will be located in Agargaon, Kalabagan, Mirpur and Purbachal area. One of the Housing projects is proposed in PWD Dhanmandi Division, Kalabagan, Dhaka under the management of Public Works Department. The housing complex is for the government officers and employees. The aim of the complex is to make an improved, healthier and environmental friendly place to live, making connections and a better dwelling to celebrate.

1.4. Problems Statement:

The site is surrounded by residential and commercial buildings. The outer buildings are north south oriented to the existing site and the existing site is linier to east west direction, so air flow maybe hampered because of the residential and commercial buildings. Poor condition in drainage system. Water stand in the side of the inner road and this condition would be a great problem in rainy season. There are two entry in the site, one is in the

east side besides green road and another is in the west side besides Mirpur road. The both entries are secured with boundary wall which has a segregation with outer space, so there is no semipublic entity in the site. There is no recreational space inside the site, the site has only one field in the corner of the west side which is in a bad condition. Any kind of water body or pond is absent on the site and in case of any fire emergency that would be a great problem.

1.5. Rationale of the Project:

The proposed site is in the heart of the Dhaka city. The site is surrounded by Dhanmandi and Green road commercial and residential area. Road transportation system is very good and there is easily access to Dhanmandi, Mirpur, Kalabagan, Newmarket, Green road, Framgate etc area. The site is very close to hospital, school, shopping area, offices and Universities. The existing site has proper greenery which has a potential to become an environment friendly place. The site has the potential of becoming a good Housing Complex.

1.6. Aims and Objective:

Social interaction among people has a vital role for any housing complex to make a healthy and strong community space. The aim of the project is to make an environmentally friendly space where people can easily interact with each other and make a healthy relationship among themselves. Providing an efficient, adaptive recreational and open spaces will make a friendly environment which helps to create bondages with each other. Most of the government housing complex has a monotonous looking building which has no relation to surroundings and neither proper inner space nor outer space. The objective of the project is to make a good quality residential housing with proper management and maintenance as well as appropriate ventilation, natural lighting and proper spaces to government employees.

Chapter 2: LITERATURE REVIEW

2.1. Definition of housing

2.2. Urban population growth & density

2.3. History of government housing

2.4. Public housing

2.5. Government housing pattern

2.5.1. General classification

2.6. Distribution of public housing

2.7. Present condition of housing in Bangladesh

2.8. Current trend of housing

2.9. Features of housing

2.9.1. Communal spaces

2.9.2. Ventilation

2.9.3. Lighting

2.9.4. Materials

2.0. LITERATURE REVIEW

2.1. 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. The character, quality and environment of a housing can improve human behavior and health.

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. Dhaka's 2018 population is now estimated at 19,580,000. In 1950, the population of Dhaka was 336,000. Dhaka has a growing rate of 3.62% annually. (World population review, 2017). There are a large number of people living in Dhaka who cannot even manage slums. They used to live in footpaths. According to World Population Review' this continuous growth will lead Dhaka at least 21 million people in 2020 and in 2030, it will be estimated at 27.3milinon people in Dhaka city.

2.3. History of Government Housing:

Government of Bangladesh provides housing to government employee and officers. The concepts of housing as blocks of flats was first initiated by the government and large scale housing settlement was also initiated by government.

The idea of providing housing to the employees initiated in the colonial phase of India as Bangladesh was part of India during that period. In 1911 when the capital was shifted from Calcutta to Delhi, the government officers need housing for their accommodation in Delhi. Many residential buildings were built by British Government that time in Delhi. (Saquib, 2000). After partition of India in 1947, Dhaka became the regional capital of Eastern part of Pakistan. New offices were set up and business communities raised in Dhaka. Due to sudden rush of people residential housing needed for government employees and officers.

The Pakistan Public Works Department built The Motijheel colony in Dhaka and the Agrabad colony in Chittagong for the Government employees. Later, the local Country Government established the Azimpur Colony, Motijheel colony and Eskaton Garden Governmental Housing in Dhaka city. (Afroza, 2000). This trend continuous from then to till now. Government provides rental houses to their employees and officers in different parts of the country during their working period.

The house provided by the government is to be emptied by the employee after retirement which is 58 years of age. At present time various projects are initiated in various parts of the capital to meet the accommodation demand of the public employees as it is their basic need and constitutional rights.

2.4. Public Housing:

In the urban area the Public sector has probably contributed not more than 10% percent of all urban housing activity during the last 40 years. This city contains almost two crore people of which only 15 per cent have their own house. (Afroza, 2000). Nowadays the government is planning to ensure housing facilities for their employee and officers to minimize the accommodation crisis. Nowadays many residential flats are allotted to different class of government employee. Planning Minister AHM Mustafa Kamal said that housing facilities will gradually be ensured for all public servants from Senior Secretary to employees. He also added that 4,000 residential plots under the Uttara Residential Model Town project have been handed over to the allottees. (The independent, 2018).

Initially the government housing were three to four stories high. Azimpur colony, Motijheel AGP colony, Green road colony, Agargaon new colony each have three to four stories height. Recent days According to Public Works departments the government is constructing 448 apartments for the employees of the Bangladesh Parliament Secretariat at Sher-e-Bangla Nagar, 15-storey residential buildings for government employees in Segunbagicha and Mohammadpur areas. Same high-rise apartment buildings will also be initiated in Mirpur-6, Kalabagan, Purbachal and Jhilmil residential park in Keranigang. The aim of public housing is to minimize the ultimate pressure and crisis of accommodation to its employees.

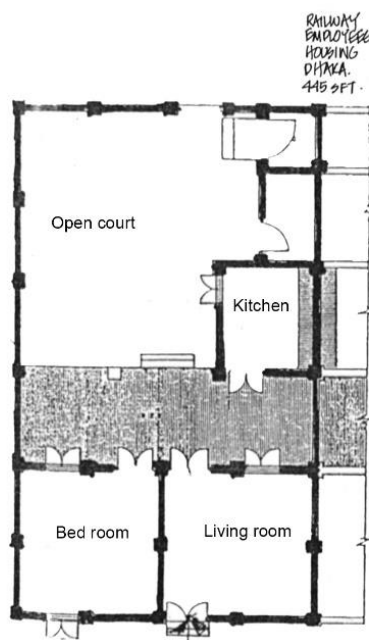
2.5. Government Housing Pattern:

2.5.1. General classification:

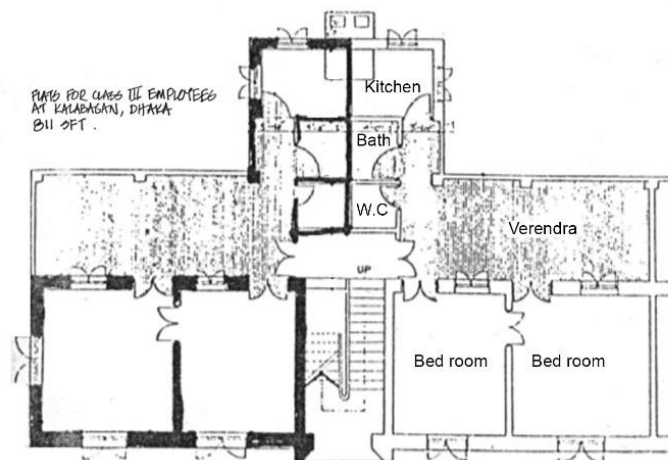
01. Single storey row houses.
02. Multi-storey blocks with each staircase accommodating two units.
03. Multi-storey blocks with each staircase accommodating a number of units.

Single Storey Row Houses:

Single storey row houses basically popular in small cities and towns. Allotted floor area as per square feet depends on different class of employees and officers. (Mallick, 1987).



Example 01: Railway Housing



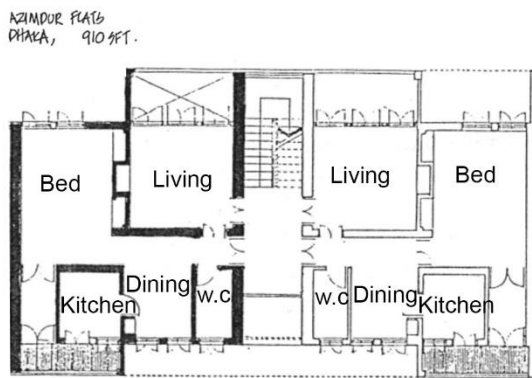
Example 02: Kalabagan Housing (class III),

(Source: Mallick, 1987. A Local Approach to Urban Housing in Bangladesh)

Example 01 is a housing module for lower income employees. This is a prototype of railway employee housing in different parts of Bangladesh. The area of the house is 455sft and another example is Kalabagan housing for Class III government employee. The total area of the house is 811sft.

Multi-Storey Blocks With Each Staircase Accommodating Two Units:

Multi-storey blocks are more popular type of government housing in different parts of Bangladesh. Most of the government housing are combination of three to four storey building. Depending on their sizes they are allocated different class of Government employees.



Example 03, Azimpur Housing



Example 04, Rajarbagh Housing

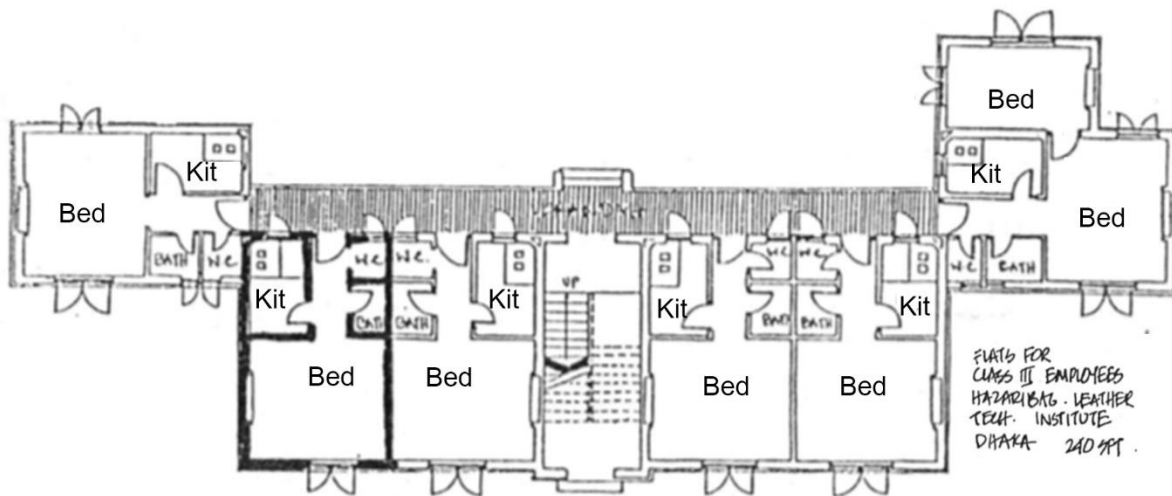
(Source: Mallick, 1987. A Local Approach to Urban Housing in Bangladesh)

Example 03 is Azimpur housing which is one of the old housing complex in Bangladesh. It's a four storey building and from the example the area of the house is 910sft. Another

housing is Rajarbagh housing which is for the government police officer. The area of the house is 913sft.

Multi-Storey Blocks With Each Staircase Accommodating a Number of Units:

This type of flats basically for small families or bachelors. There is common veranda which is the main access to the rooms. Each room contains individual kitchen and toilets and the area of the room is 240sft.



(Source: Mallick, 1987. A Local Approach to Urban Housing in Bangladesh)

2.6. Distribution of Public Housing:

Government has allocated land in different areas of Bangladesh and different types of housing projects are carried out in that plots. According to Public Works Department 38,244 plots will be developed and 70,377 apartments constructed across the country under various projects. There are about 13,000 houses in Dhaka against 200,000

government employees. The government employees have to pay 7.5% of their salary at a rental cost of the house. (The independent, 2018).

There are some criteria to divide the house to government employees. Allotted floor area as per square feet depends on different class of employees and officers.

Residential Space Standards for Government Officers and Employees:

Category of Officers / Employees	Allotable Floor Areas square feet	Type (Categories of flats)
Secretary	4000	Bungalow
	3000	Bungalow
Class I	1750	'F' Type
	1500	'E' Type
	1300	'D' Type
Class II	840	'C' Type
Class III	612	'B' Type
Class IV	519	'A' Type

(Source: Peoples' Needs and Public Housing, Afroza 2000)

2.7. Present Condition of Housing in Bangladesh:

According to various specialists and studies the yearly housing requirement in the city is between 45,000–83,000. All public and private sectors together can only produce 25,000 housing units a year. The percentage of people living in slum and squatter settlements is between 15–45 percent. Every year the population of Dhaka increases by six lakh and 65% population of Dhaka is due to migration. (Afroza, 2000).

Huge migrated people need more accommodation and in consequence the buildings are being made irresponsibly. The owners don't follow the rules and regulation as well as the building codes determined by Rajdhani Unnayn Karttripakkhya (RAJUK). Buildings are being made without having neither contextual impacts nor environmental values. There is no open spaces, no landscaping even don't have any space in front of the building. The characteristics of all buildings are looking similar as like as box pattern and quality of living standard is very poor.



(Current scenario of buildings: source: Dhaka Tribune, Mahmud Hossain Opu)

2.8. Current Trend of Housing:

The world population is increasing day by day. Public housing has become an important issue for governments around the world. Nowadays housing is not just a serious of blocks and concrete anymore. Affordability, availability, sustainable growth,

contextual consideration and environmental issues has become the key issues for any social housing design all over the world. A good-quality housing depends on social interaction, social participation, proper communication and involvement of its people.

A community housing complex must have a Community Hall, Shopping Mall, Ambulance Facility, Child Day Care Facility, School, Library, Elderly Community, and other essential amenities to make a sustainable and healthier housing. (Planning Department, 2015).

A housing complex should have proper standard of living, quality of space both interior and exterior with proper lighting and ventilation system as well as recreational and breathing space. In current days housing in all over the world are more focused on eco-friendly environment, energy consumption, and sustainable impacts on building design. Innovation and public responsive design are more appreciate and have greater acceptances nowadays.



Current Trends of Housing

(Source: <https://www.designisthis.com/blog/en/post/flower-tower-by-edouard-francois>)

2.9. Features of housing:

2.9.1. Communal spaces:

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).

A residential complex consists of many apartment buildings as well as other functional activities like public semi-public activities, open, recreational and gathering spaces. Human are social being and live in a society to become a part of it as well as taken part in different activities because nobody can live alone. A person interacts with their family members, friends and neighbor and become depended with each other. A communal space can create a connection with different type and age of people in a society and make a bondage among them.



Layers of building and lacking of open spaces.
(source:<http://www.theindependentbd.com/arcprint/details/16075/2015-09-17>)

At present days most of the housing complex and residential flats area has no proper communal or gathering space. Housing are 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. 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. A communal space can be shared by both public and private users with proper security. In a housing complex a communal space can be in different types. For an example open space is a form of communal space. An open space provide sufficient air flow and lights. An open space can be a field or a park or small area where people can gather and breathe in the space. Open space can be in a building roof or terrace. Different age and type of people gathered in this communal space and making bondage among them.



Communal Space Inside Linked Hybrid Housing, China

(Source:<https://www.archdaily.com/34302/linked-hybrid-steven-holl-architects/501161ca28ba0d70420005ee-linked-hybrid-steven-holl-architects-photo>)

Recreational space can be another type of communal space. (Mahdavinejad, Mashayekhi, Ghaedi, 2012). A recreational space have 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. 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.



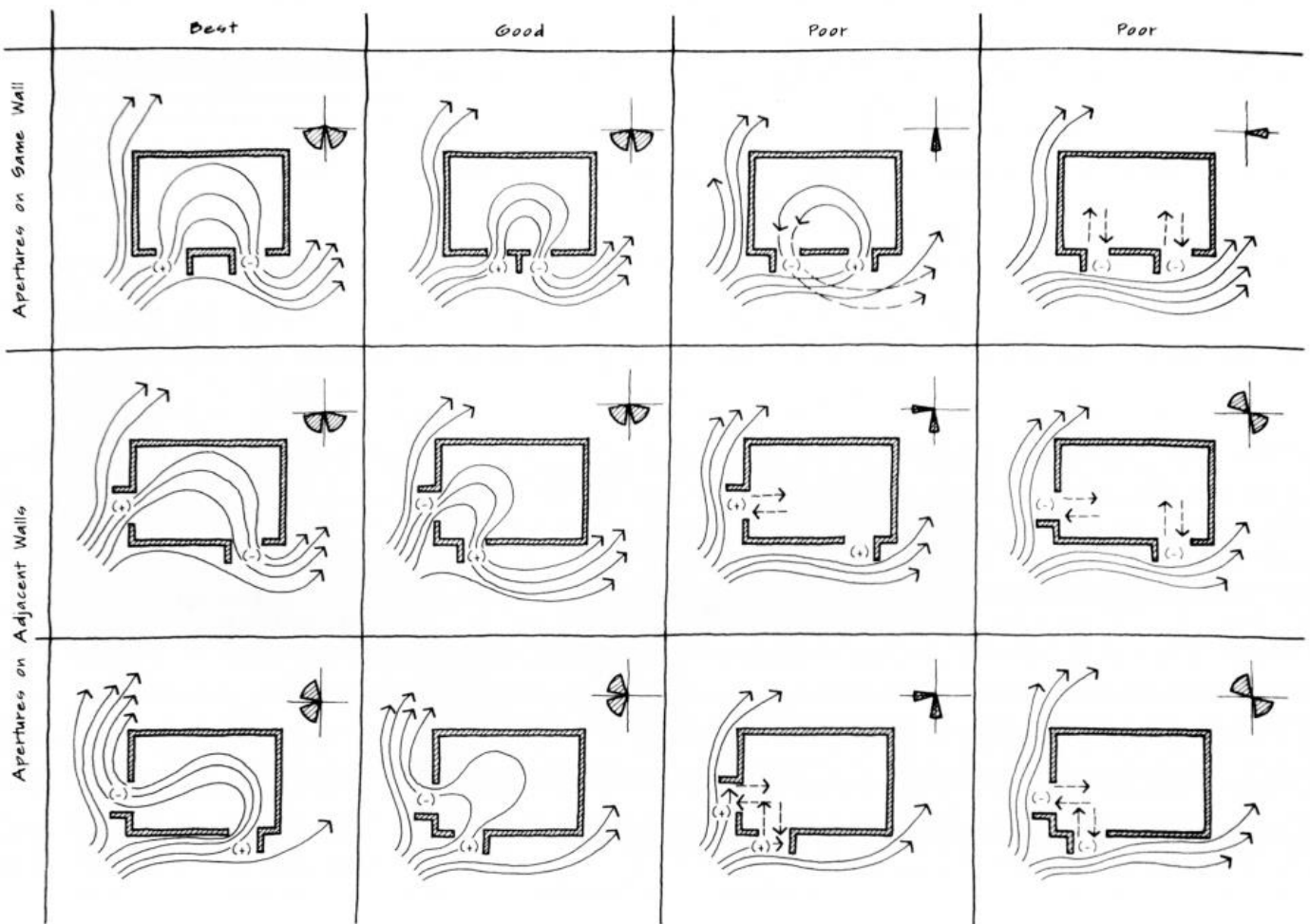
Playground for children and Parents sitting

(Source: <https://www.gabreport.com/station-center-family-housing-wins-2013-uli-global-award>)

2.9.2. 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

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. On average the temperature of Dhaka is always high. 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.

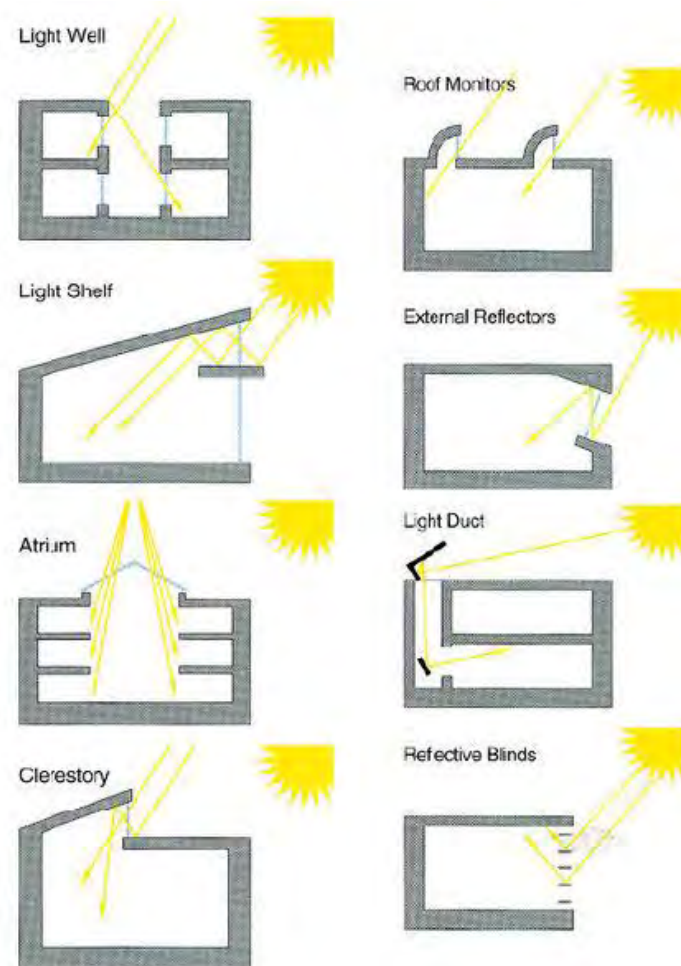


Quality and Effectiveness of ventilation in different condition

(Source: <https://www.slideshare.net/AliviaMondal/natural-ventilation-56377030>)

2.9.3. Lighting:

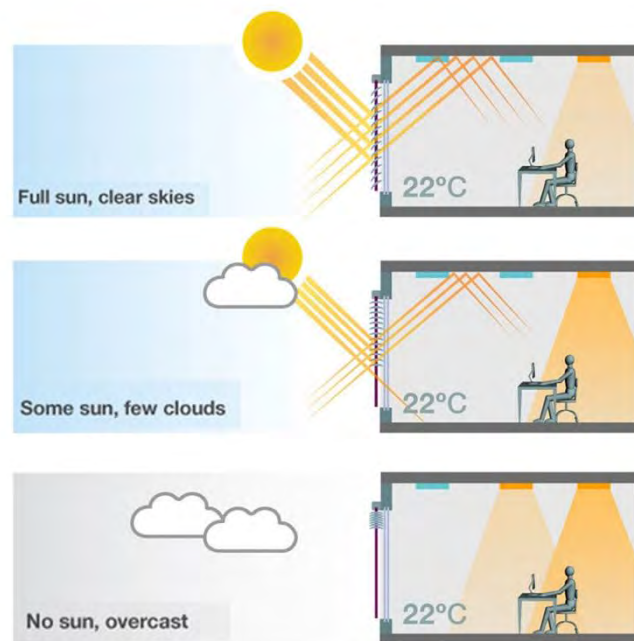
Natural lighting is an important factors of housing. Natural lighting plays an important role in human body and mind as well as ensure thermal comfort for the residents in different seasons. Lighting can be ensure through proper openings such as windows, doors etc. Proper lighting depends on the orientation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



Shading device and techniques

(Source: <https://commons.wikimedia.org/wiki/File:Lighting-techniques.jpg>)

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 these reason the openings should be context responsive and the orientation of openings plays an important role to reduce glare and solar gain.



Optimization of natural light and Louvre Technique in the opening

(Source: <https://commons.wikimedia.org/wiki/File:Lighting-techniques.jpg>)

2.9.4. 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 Background of the site:

3.1.1. Geographical

3.1.2. Socio-Cultural

3.1.3. Climate

3.2. Site at a Glance

3.2.1. Location of the site

3.2.2. Site Surroundings

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3.4. Community Facilities

3.4.1. Existing Situations

3.4.2. Walking Distance Parameter

3.5. SWOT Analysis

3.0 SITE AND CONTEXT ANALYSIS

3.1 Background of the site:

3.1.1. Geographical:

Kalabagan is located adjacent to Dhanmondi residential area and Green road. It is situated between 23 ° 44 'to 23 ° 45' north latitudes and 90 ° 22' to 90 ° 23' east longitude. Its area is 1.26 square km and surrounded by Sher-e-Bangla Nagar and Tejgaon thanas on the north, New Market thana on the south, Ramna thana on the east and Dhanmondi thana on the west. (Banglapedia, 2014).

In 2008, Kalabagan Thana was formed with 50 and 51 (partial) wards and 10 mahallas of the Dhanmondi Police Station by the administration of Bangladesh.

Kalabagan Thana:

Thana						
Ward and Union	mahallas	Population		Density (per square km)	Literacy rate (%)	
		City	Village		City	Village
1+1 (Partial)	10	106671	-	84660	76.88	-

(Source: Banglapedia, 2014. [http://bn.banglapedia.org/index.php?title=Kalabagan Thana](http://bn.banglapedia.org/index.php?title=Kalabagan_Thana))

This table shows the Thana area including its population, density and literacy rate.

According to the table 84660 people lives per square kilometer. According to the table there are 10 Mahallas in the Kalabagan area.

Ward and Union				
Ward and Union	Area (square km)	Population		Literacy rate (%)
		male	Female	
Ward no 50	0.65	38898	28295	74.22
Ward no 51 (partial)	0.61	21997	17481	79.54

(Source: Banglapedia, 2014. [http://bn.banglapedia.org/index.php?title=Kalabagan Thana](http://bn.banglapedia.org/index.php?title=Kalabagan_Thana))

Kalabagan area has two wards, one is besides Mirpur road and another is besides Green road area. Both ward is under the administration of Kalabagan thana.

3.1.2. Socio-Cultural:

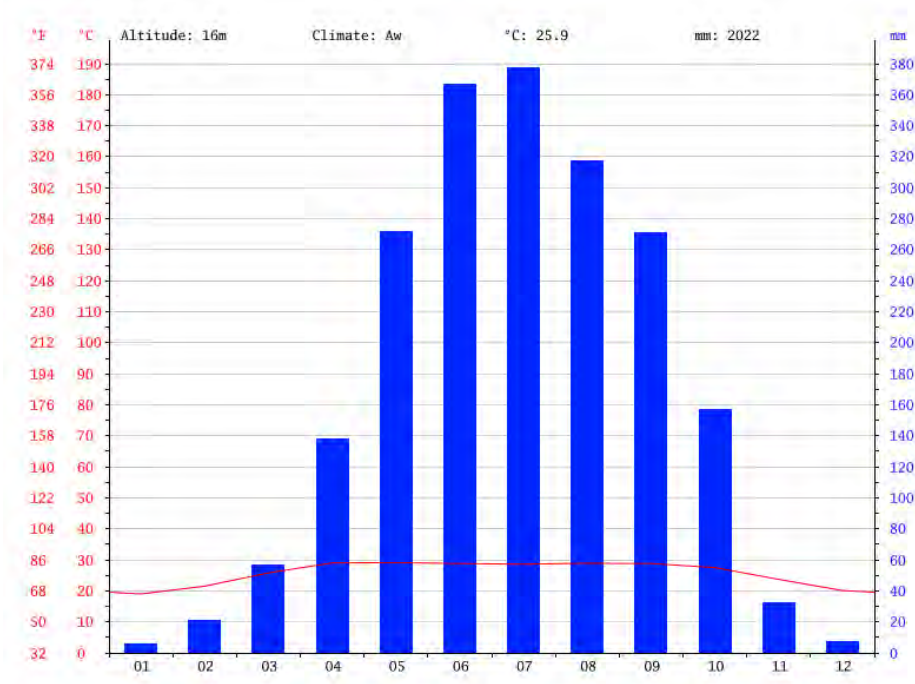
Kalabagan thana has a total population of 106,671 people which includes 60,895 male and 45,776 female. Among the total people there are Muslim 102,084, Hindu 3862, Buddhist 549, and Christian 139. (Banglapedia, 2014). People from different districts live here and the national language is mostly used language here.

The Kalabagan area is basically residential and commercial based area. The area is surrounded by many commercial and mixed entities like shopping malls, hospitals, diagnostic center, educational and residential blocks. There is a playground which is known as Kalabagan cricket ground which has great recreational and cultural values as many different games, different fair like 'Pitha uthshob', 'Boishaki mela', etc have taken part in the field. The field is adjacent to Dhanmaondi Lake and connected by a bridge to the opposite site of Dhanmondi lake area.

3.1.3. Climate:

Dhaka experiences a hot, wet and humid tropical climate. According to the Köppen climate classification, Dhaka has a tropical wet and dry climate. On average the temperature of Dhaka is always high. On average the warmest month is April and the coolest month is January. The average temperature in Dhaka is 25.9 °C. In a year, the average rainfall is 2022 mm. (Climate Dhaka, 2018).

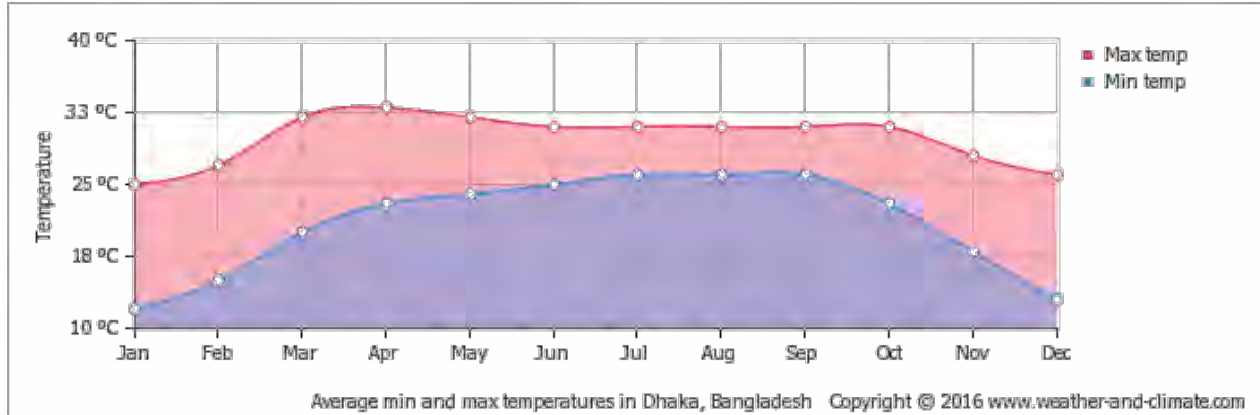
CLIMOGRAPH DHAKA



(Source: Climate Dhaka, 2018. <https://en.climate-data.org/location/1062098/>)

The driest month is January. There is 6 mm of precipitation in January. Most of the precipitation here falls in July, averaging 377 mm. (Climate Dhaka, 2018).

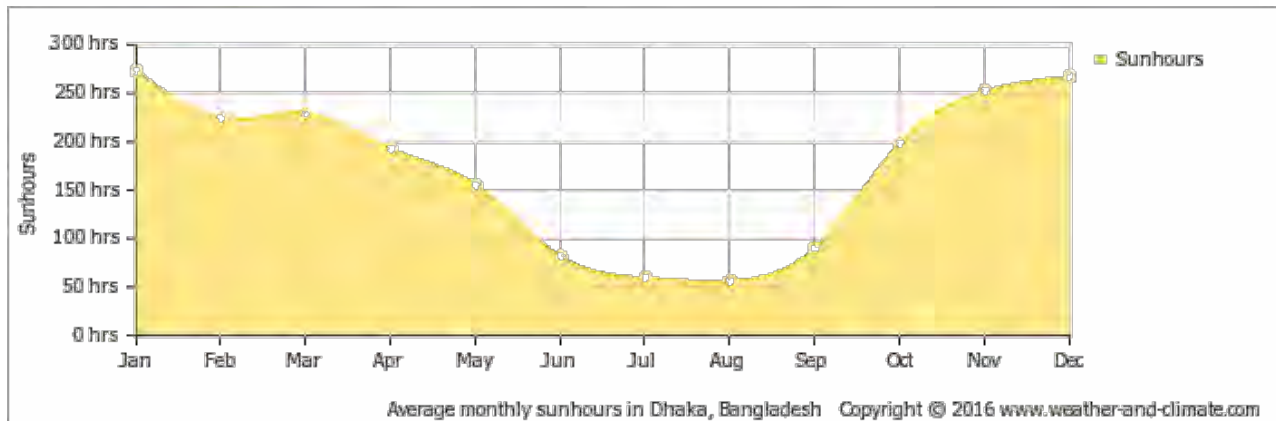
Minimum and Maximum daily temperature.



(Source: Weather and Climate, 2016. <https://weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Dhaka,Bangladesh>).

On average the warmest month is April and the coolest month is January.

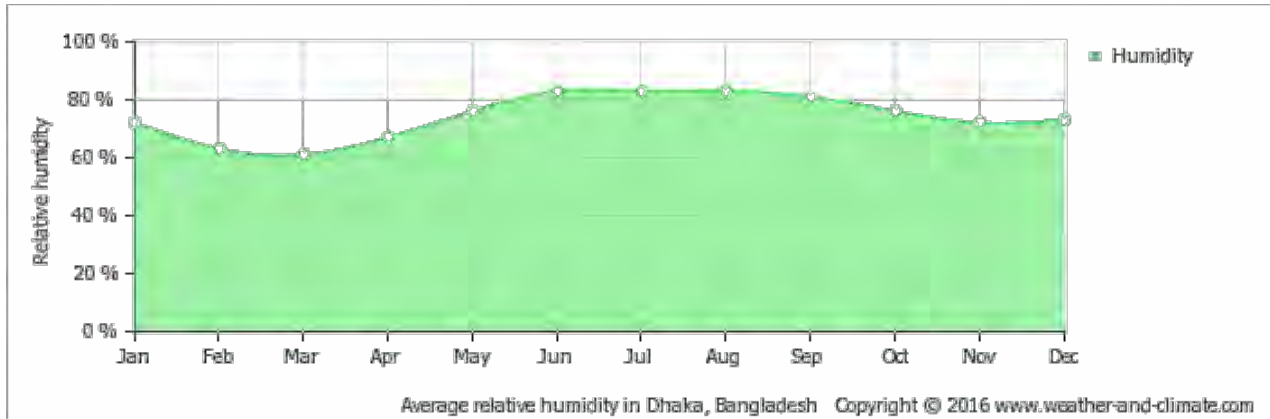
This is the monthly total of sun hours



(Source: Weather and Climate, 2016. <https://weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Dhaka,Bangladesh>).

Mostly sunny in January and cloudy in July.

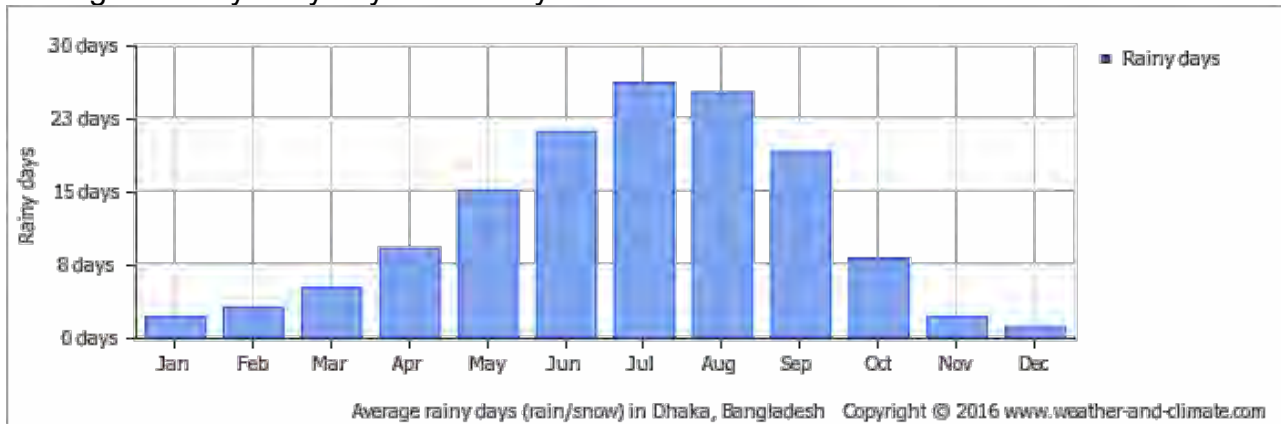
Average humidity of the year.



(Source: Weather and Climate, 2016. <https://weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Dhaka, Bangladesh>).

This is the mean monthly relative humidity. June to August is the most humid month, with 80% relative humidity.

Average monthly rainy days over the year.



(Source: Weather and Climate, 2016. <https://weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Dhaka, Bangladesh>).

This is the number of days each month with rain. Mostly rainy days in the month of July.

3.2. Site at a Glance:

3.2.1. Location of the site:

The site is located in Kalabagan, Dhaka. There are two entrance of the site. One is besides Mirpur road which is in the west side and another is from Green road which is in the east side. The site is surrounded by basically residential and some commercial and educational buildings. The site is linier in east-west direction. The residential and commercial buildings are north south oriented.



01.Entrance from Mirpur road
02.Entrance from Green road

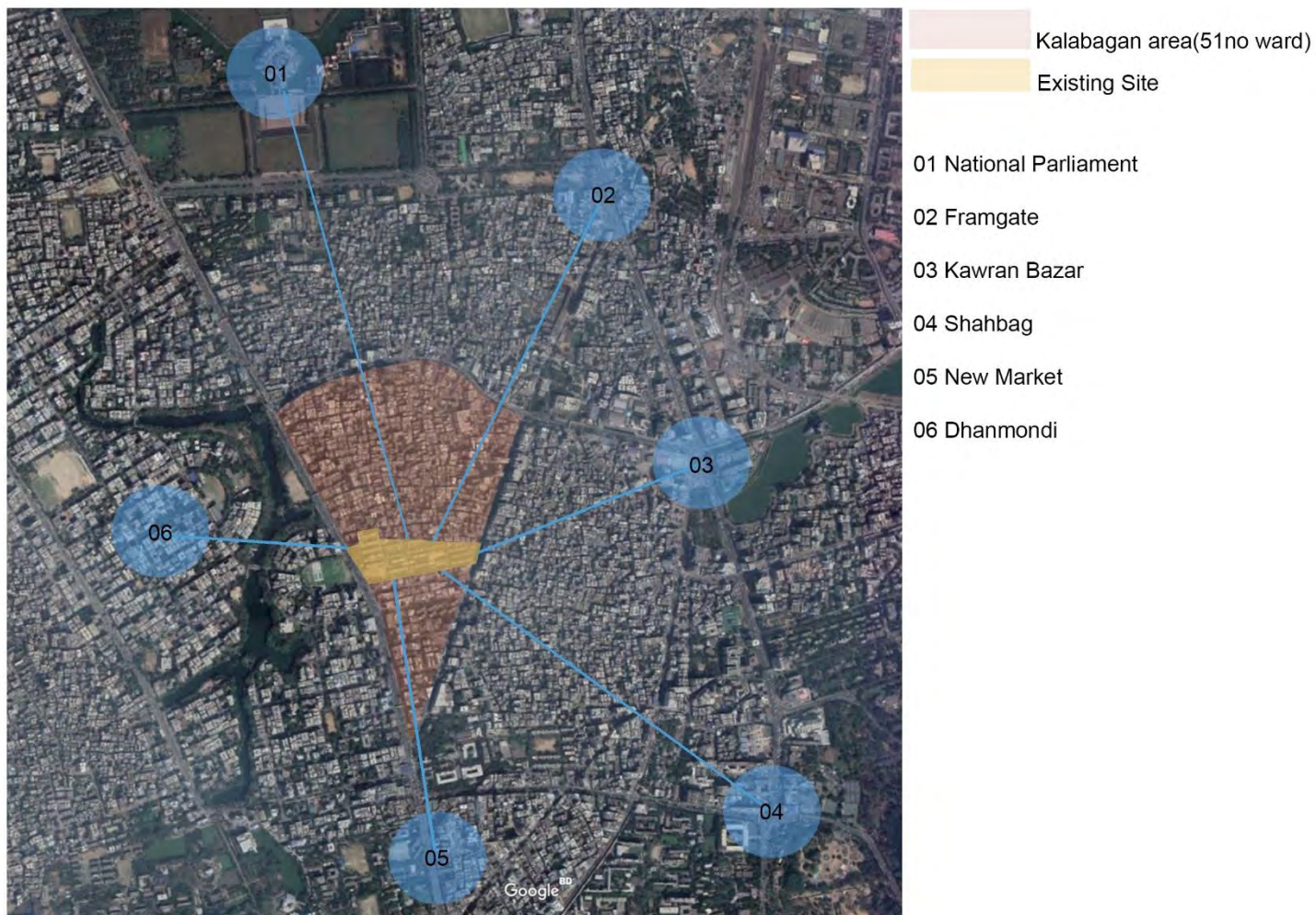
 Existing site

(Location of the site. Source: Google Earth)

Site area: The site is 12.66 acres (551469.6 square feet)

3.2.2. Site Surroundings:

The Kalabagan area is surrounded by Dhanmondi, Framgate, Kawran Bazar, Shahbag, Elephant Road, and New-market area. The Sher-e-Bangla Nagar and Tejgaon thanas on the north, New Market thana on the south, Ramna thana on the east and Dhanmondi thana on the west.



(Site surroundings. Source: Author)

3.2.3. Site Forces:

The site is covered with four storied government employee residences. A harmony of green and buildings at the whole of the site has already been created. The site is located in the Kalabagan area and covered up with small and large green trees.

The greens are located besides the inner pedestrian roadside areas and some open spaces. The major two circulation road has been tied up the site from west and east periphery. These two roads are relatively busier. The north and south part of the site is surrounded by residential and commercial building blocks.



(Site entrance from Green road



Site entrance from Mirpur road Source: Author)

3.2.4. Topography: The Kalabagan area is almost flat area and the existing site is basically flat.

3.2.5: Vegetation:

Though the Kalabagan is mostly hard surface area but the existing site is covered with many small and large trees. It has enough trees to shade the site almost the year.

Various types of trees are not seen here.

3.2.6. Existing site and its surroundings:



Site and Surroundings



04



05



01



06



02



07

(Source: Author)

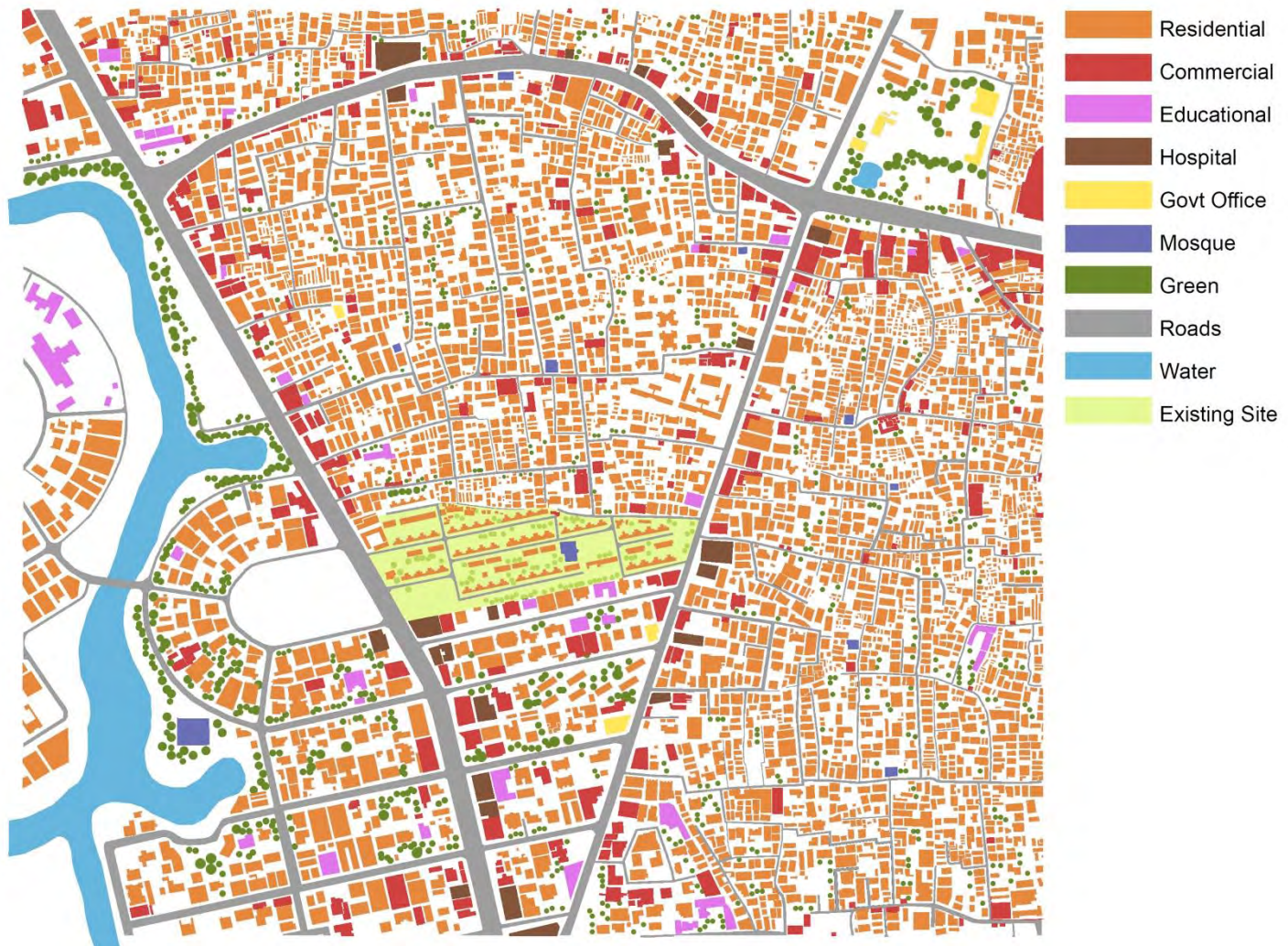


03

(Site surroundings. Source: Author)

3.3. Land Use Pattern

3.3.1. Site Mapping: The Kalabagan area is basically residential area, but surrounded by many commercial, educational and hospital buildings.



(Mapping of the site and surrounding. Source: Author)

The existing site is in the center of Kalabagan area. Commercial buildings and offices, hospitals, school-collage-universities, shopping malls are very proximate to existing site. The Kalabagan area is surrounded by major and secondary road networks.



Residential Blocks



Commercial Blocks



Educational Blocks

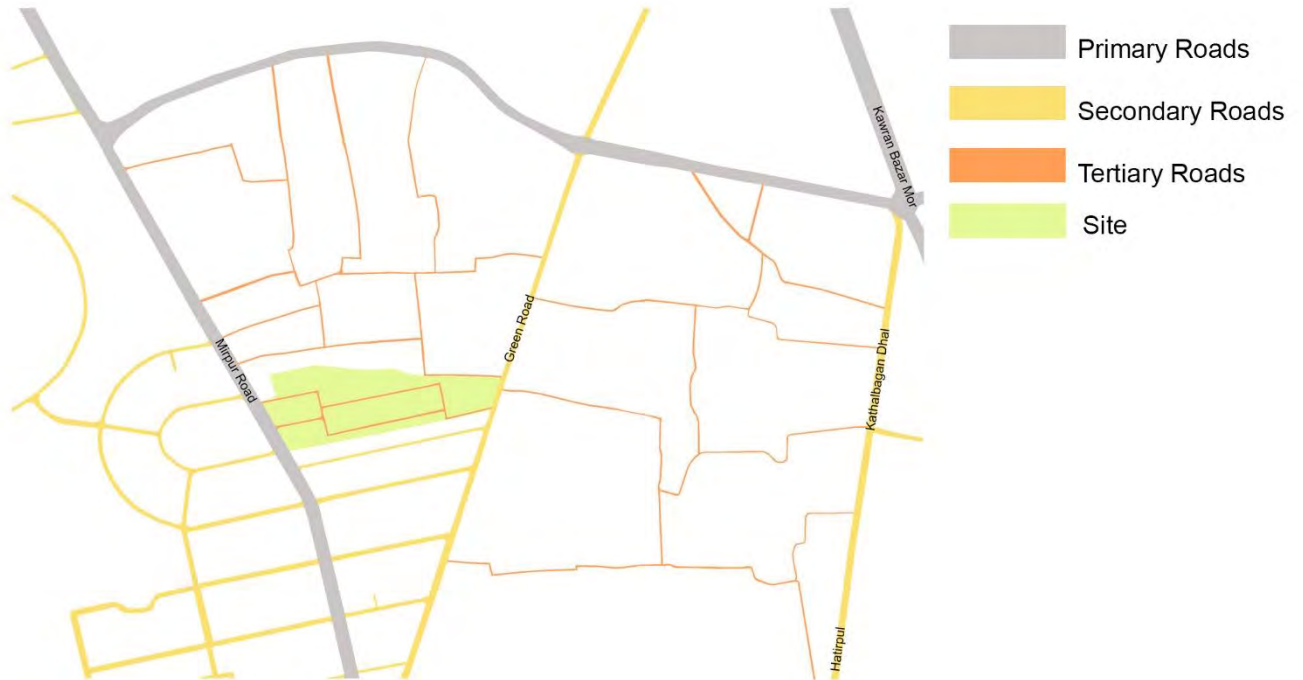


Hospital Blocks

(Mapping of individual building blocks. Source: Author)

Most of the area is covered with residential blocks. The commercial blocks are growing along with roadside area such as Mirpur roadside area, Panthapath roadside area, Green Roadside area .The area is surrounded by many hospitals and diagnostic center. There are many educational institutions which are growing up these areas day by day.

3.3.2. Site Communication Way:

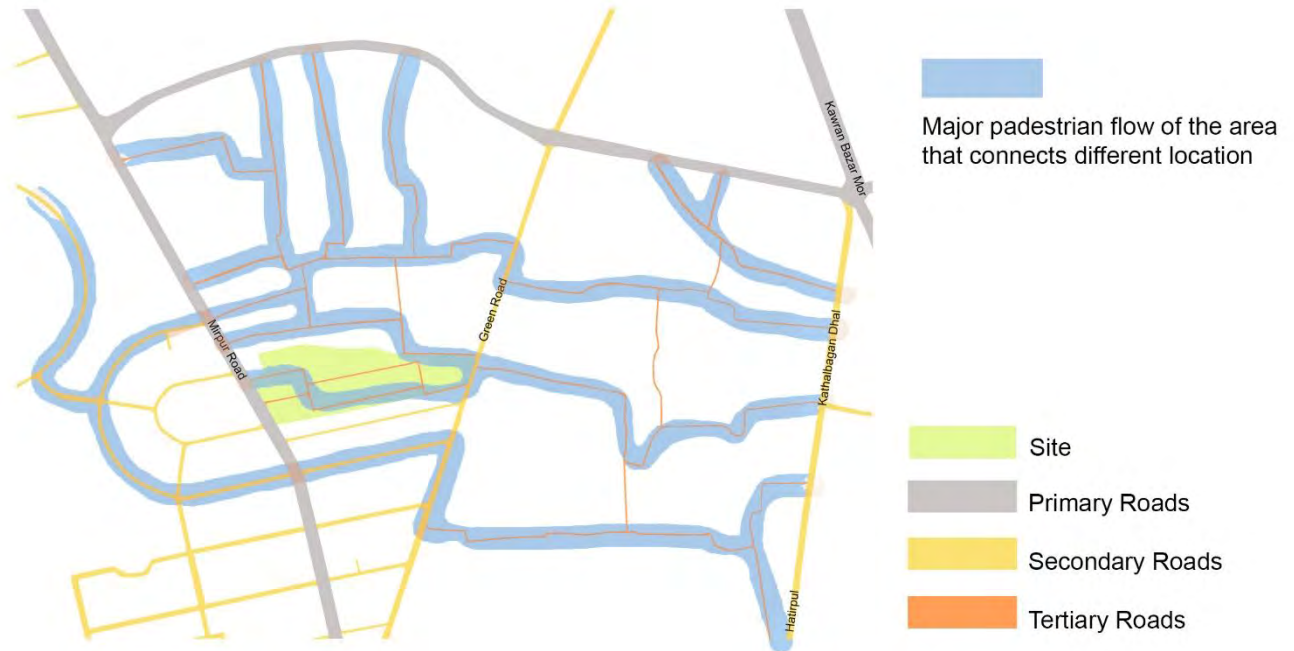


(Site communication way. Source: Author)

The site is surrounded by one primary road from the west side which is Mirpur road and from the east side there is a secondary road which is Green road. There are many tertiary roads which connects different location in a shortest way. Some people additionally utilized the existing site road network from Green road side to Mirpur road or Mirpur road to Green road for shortest distance.

Kalabagan is a very traffic congested area. Primary and secondary roads are often blocked by vehicles like buses, cars, CNG and rickshaws. The tertiary roads are very narrow in some places where only rickshaws or private car or CNG can rarely pass through.

3.3.3. Pedestrian flow and connectivity with roads:

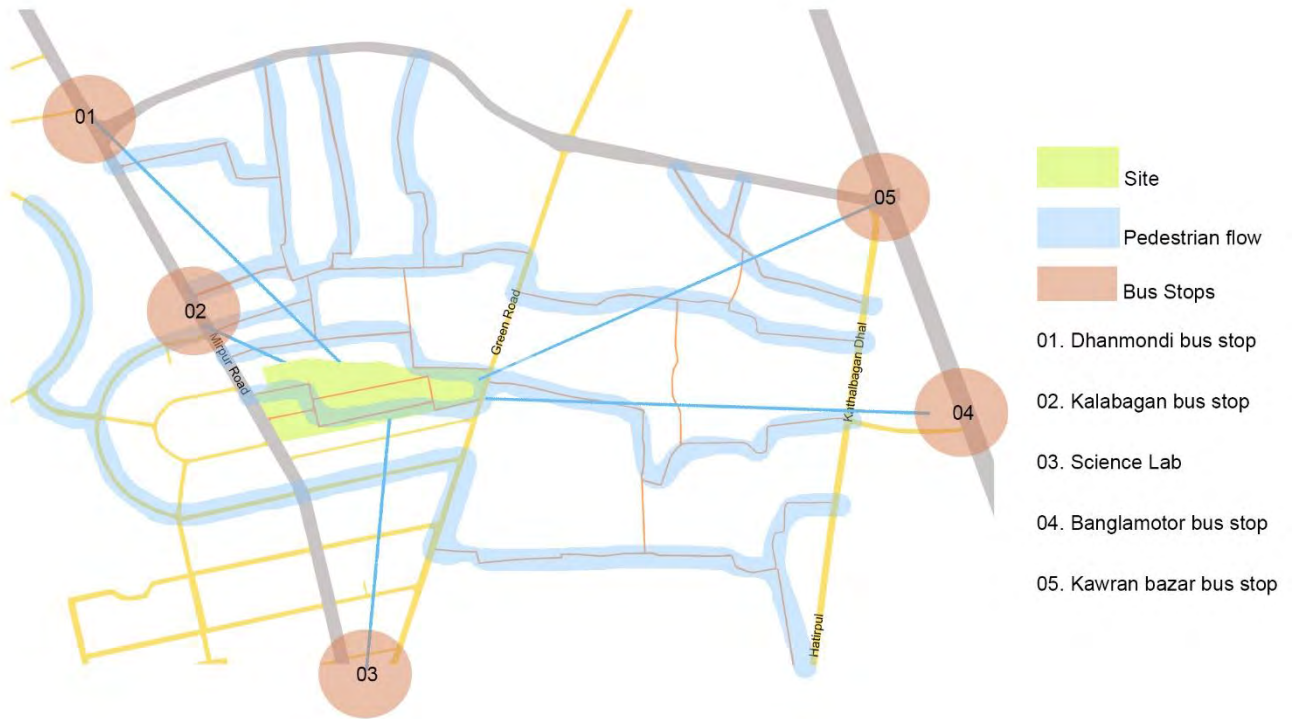


(Pedestrian flow and circulation of the area. Source: Author)

This circulation shows how pedestrian use the roads to reach their dedicated destination from different place to place in a shortest way. These are the most common connecting tertiary roads that people used most every day. This circulation connected in different locations like Panthapath road in the north, New-market in the south, Kathalagan Dhal in the east and Dhanmondi in the west.

Most of the secondary and primary roads have footpaths and majority of this footpaths are occupied by vendors. Tertiary roads have no footpaths.

3.3.4. Walkability to bus stands from site:



(Pedestrian connectivity with Bus stops in different locations. Source: Author)

This public circulation additionally connected to bus stops in different location such as Kalabagan bus stand, Science Lab, Dhanmondi 32 bus stand, Panthapath Bus stand, Kawran Bazar bus stops and Bangla Motor Bus stops.

3.3.5. Traffic Congestion:

The Kalabagan area is a very traffic congested area. Mirpur road is the most used road network here. This is the only major road network from Mirpur to Azimpur area. Many local buses from different location such as Savar, Gabtoli, Abdullahpur, and Uttara meet

this road network as well as huge number of cars, cng, rickshaws are another reason of traffic congestion. There is no bus routes from green road. Only private cars, cng, leguna and rickshaws are allowed to this route.



(Most traffic congested points of the area. Source: Author)

3.4. Community Facilities:

3.4.1. Existing Situations:

The existing site has a proper community facilities such as commercial, educational, hospitals, recreational, mosque etc. The commercial part serve as public or private offices, shopping malls, grocery shops, super shops, salon, restaurants etc. There are some school, college and universities in this area which have a shortest walking distance

to reach. Two major hospitals are very adjacent to the site. There are also many diagnostic center and dispensaries located in this area.

The existing site has a permanent 'Kacha-Bazar' which is located on the edge of the west side and this bazar starts from 7am to till 2pm. Outside of the site there is an another 'Kacha Bazar' which have a dedicated place and located in Kathalbagan area. The Kalabagan thana area has only these two dedicated bazars. Temporary vendors occupied footpaths, secondary and tertiary roads illegally and sell vegetables, fish, meat etc.

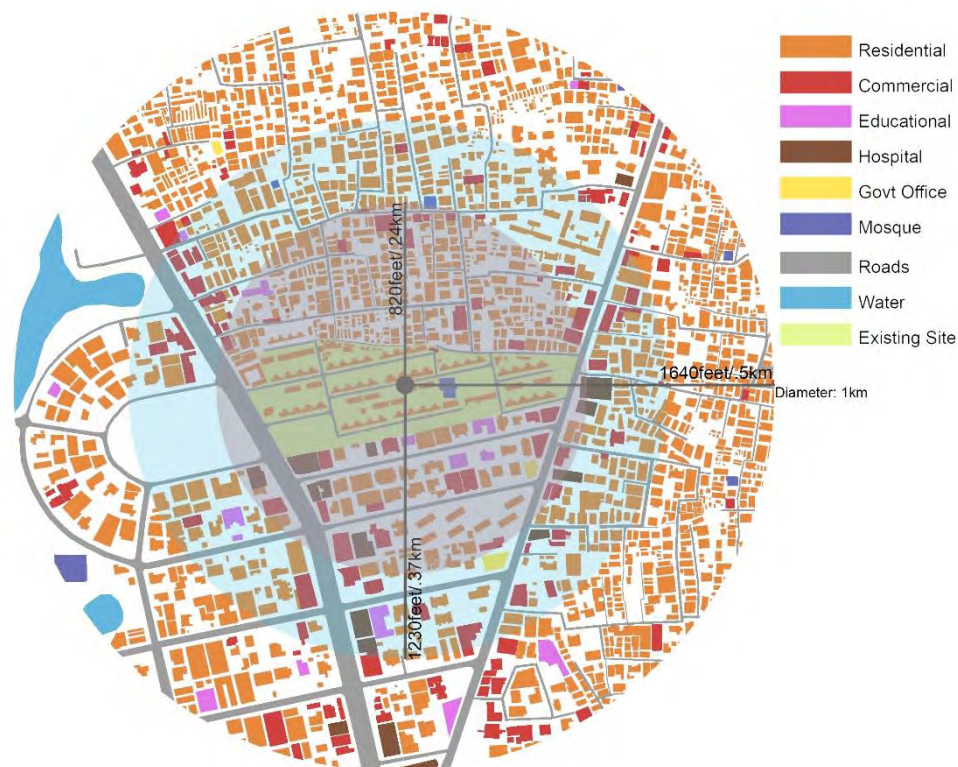


('Kacha Bazar' and temporary vendor's location. Source: Author)

3.4.2. Walking Distance Parameter:

The 'Five Minute Walk' is a standard which is described as the average distance that a pedestrian is willing to walk rather choosing to drive. There is a parameter which represents $\frac{1}{4}$ mile distance is equivalent to a five minutes' walk. The average walking speed of a human is at approximately 3 miles per hour, which translates to $\frac{1}{4}$ of a mile in five minutes. (Aep, 2016).

The existing site is surrounded by many residential, commercial, educational and hospitals blocks. Among them school, college, universities, mosque, shops, private and public offices, gathering open space etc are considered to be in tolerable walking distance. A five minutes' walk can cover up 1320 feet distance.



(Distance of amenities from site. Source: Author)

3.5. SWOT Analysis:

Strength:

01. Proper transportation system, easily accessible.
02. Public amenities in short distance.
03. Many educational institutions and hospitals.
04. Enough shopping malls and departmental stores.
05. Existing site is enough green.

Weakness:

01. Surroundings are mostly hard surfaces
02. Lack of open spaces.
03. Traffic congested areas.
04. Some places and roads are not safe during the night.

Opportunities:

01. The site can be developed into a good housing complex for its easy access.
02. Become a breathing space for private, public and semi-public entities.

Threats:

01. The site is surrounded by building blocks in north-south orientation, proper air flow will hampered.
02. Surrounded by two major road networks and that will cause heavy sound pollution.

Chapter 4: PROGRAM DEVELOPMENT

4.1. Proposed Programs from Client

4.2. Rationale of the Programs

4.3. Maximum Ground Coverage

4.4. Program Layout

4.5. Interrelationship of Programs

4.5.1. Functional Flow

4.5.2. Zoning

4.0. PROGRAM DEVELOPMENT:

4.1. Proposed Programs from Client:

01. Flat type 'A'=1500sft per flat

Four Units per floor = 6000sft

Total floor 13X 6000sft = 78,000sft

Total type 'A' 04 buildings 4X 78,000sft= 312,000sft

02. Flat type 'B'=1200sft per flat

Four Units per floor = 4800sft

Total floor 13X 4800sft = 62,400sft

Total type 'B' 03 buildings 3X 62,400sft= 187,000sft

03. Flat type 'C'=1000sft per flat

Four Units per floor = 4000sft

Total floor 13X4000sft = 52,000sft

Total type 'C' 03 buildings 3X 52,000sft= 156,000sft

04. School:

Play to Class five: Per class 25-35 students and each class have two section.

Per Classroom (Kg-5) = $25 \times 32 = 800$ sft

Total 12classrooms= $12 \times 800 = 9600$ sft

Per Classroom (Play-Nursery) = $20 \times 25 = 500$ sft

Total 2 classrooms (no section) = $2 \times 500 = 1000$ sft

Multipurpose= 3000 sft

Admin+ others= 2000 sft

Total $20,000$ sft with 30% circulation

05. Mosque and Madrasa:

Prayer Hall for 1000people= 9000 sft

Office+ toilet+ store with 30% circulation= 2700 sft

Total $11,700$ sft

06. Community Hall:

Multipurpose hall for 1000people = $12,000$ sft

Admin+ toilet+ Kitchen+ store= 1500 sft

Total $17,500$ sft with 30% circulation

07. Grocery shops and laundry: 500sft

08. Utility building:

Substation room, store, office = 3000sft

09. Guard Rooms: 300sft

4.2. Rationale of the Programs:

Housing is one of the three primary needs and is as equally important as food and clothing. It provides shelter, safety and security to its owner as well as provides privacy, and a healthy comfortable zone for living. Ministry of Housing and Public Works, proposed a list of programs that includes residential apartments, school, mosque, utility building and security guard rooms.

Residential Flats:

Total 10 residential buildings are proposed by Ministry of Housing and Public Works and each building contains 52 flats. Residential flats are divided into three types, 1500sft, 1200sft and 1000sft. Allotted flats will be distributed according to different classes of government officers and employees. Approximately 520 families will be accommodate in this housing complex.

School:

The housing complex will accommodate large number of people and a school is an important function of a housing. Approximately 520 families will be accommodate in this

complex so an elementary school is needed in this housing complex because secondary school, college and universities are very near to the existing site.

Mosque:

Majority of the citizen of Bangladesh are Muslim. Muslims pray five times a day and 'Jumma' is one of the most important prayers for Muslims. A mosque is needed inside the housing to accommodate the large number of people in the housing complex and residents would not have to travel far for praying.

Community Hall:

A good-quality housing depends on social interaction, social participation, proper communication and involvement of its people and for this reason a community hall is needed in this complex. People can celebrate different types of occasion, program and they won't need to travel far from the complex and this will also be efficient economically.

Shops:

Grocery shops and laundry service inside the housing complex is essential because the complex will accommodate large number of people and this people need proper shops and laundry services for their daily life routine.

Utility Buildings: Substation rooms, equipment room, office and guard room is necessary to maintain and secure the whole housing complex.

Bazar:

A bazar is needed in this housing complex to minimize the need of its residents because the 51 no word of Kalabagan area has no dedicated bazar and people have to go far for

this reason. A bazar can fulfill the need of its residents and its surrounded community as well as keeps a community vibrant and lively as it satisfies people's need and create bondage among people.

4.3. Maximum Ground Coverage

Site Area, A = 12.66acres = 551469sft

Minimum Width of road inside the site = 12m= 39.37feet

FAR for residential area = 5.5

MGC = 50% of Area = 275,734.5sft

Total Build Area, TBA = FAR X Site Area = 5.5 X551469 = 3,033,079.5sft

With 30% Circulation =3,033,079.5 + (3,033,079.5 X 30/100) = 3,943,003.35sft

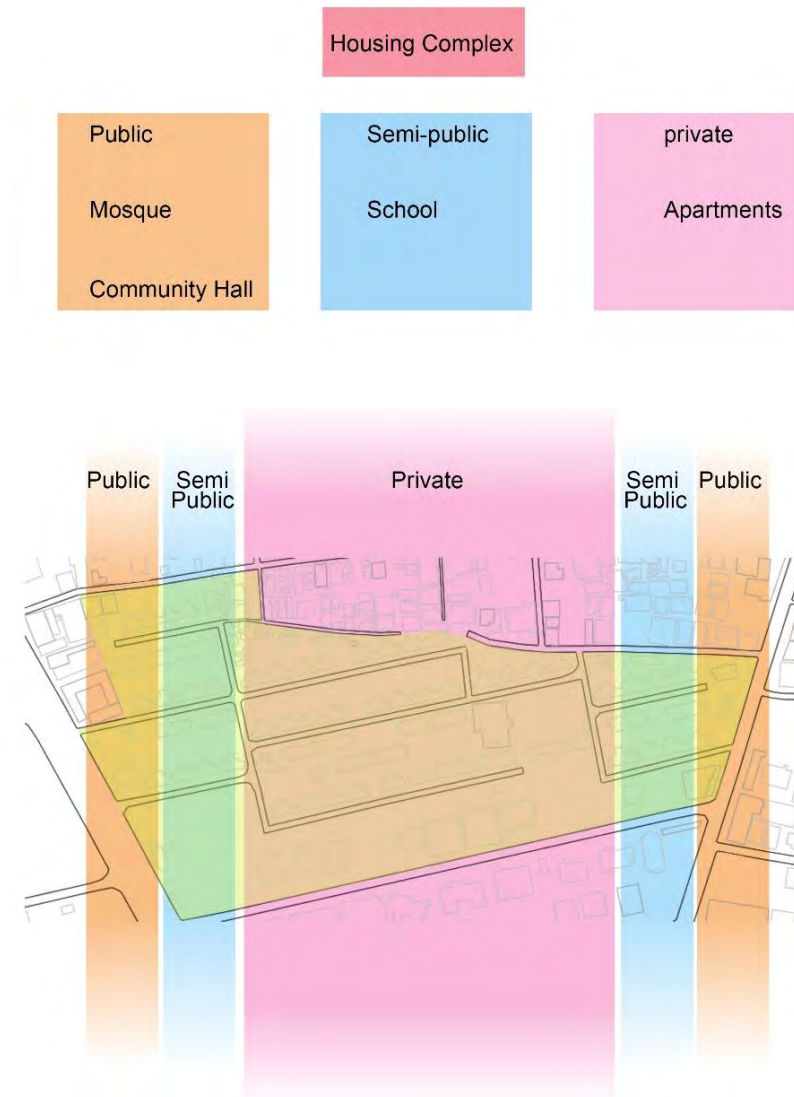
Setback for the site:

Front: 1.50m = 5.0ft

Back: 3m = 10ft

Side: 3m = 10ft

4.4. Program Layout:

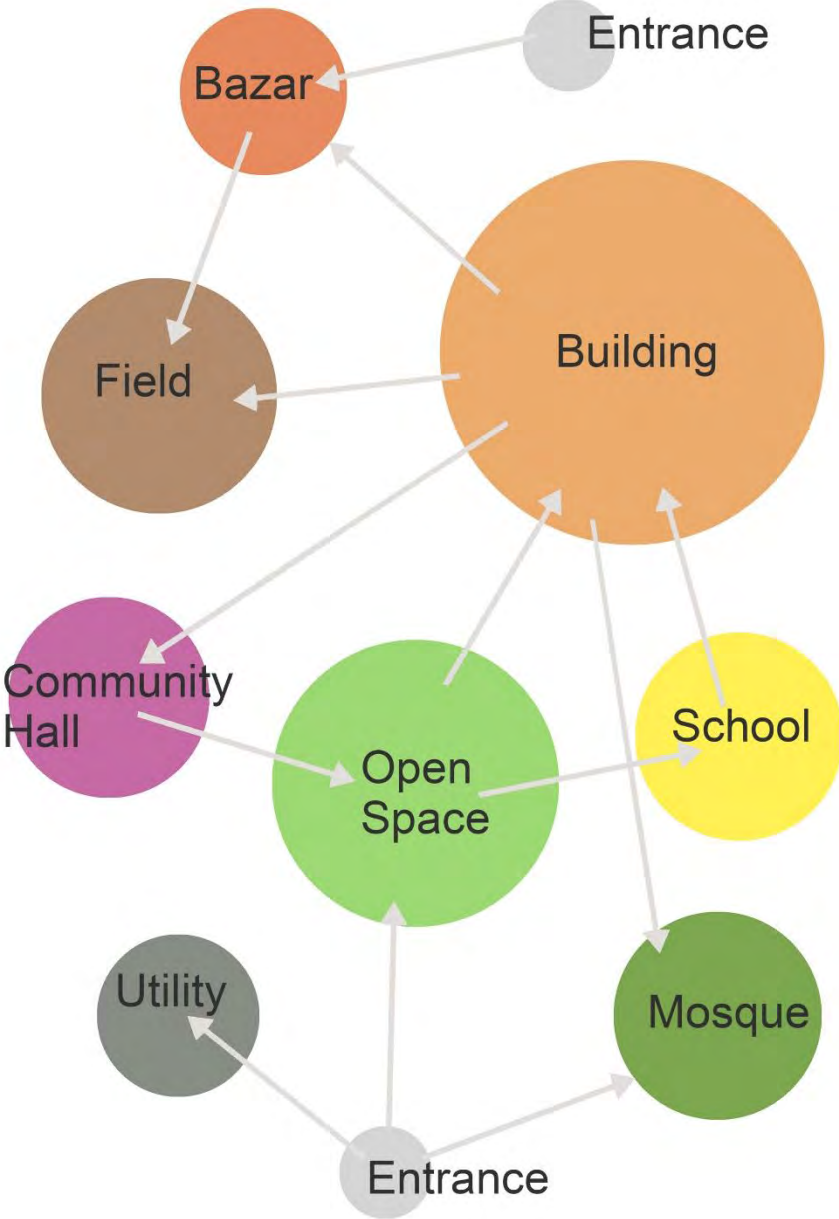


(Program layout diagram. Source: Author)

The site is linear to east-west direction and the public functions should be in the edges of the site and the semi-public functions should be easily accessible and secured. The private area and open spaces should be in the central space of the site.

4.5. Interrelationship of Programs

4.5.1. Functional Flow:



(Functional Flow of Programs. Source: Author)

4.5.2. Zoning:

The site is surrounded by mostly residential building blocks. The residential buildings are facing to north south orientation and there is a scope to make a connections between the residents of the surrounded area.

There should be a public access to east west direction so people can pass through from Green road side to Kalabagan area. Central place should be defined with more public and semi-public entities.



(Zoning. Source: Author)



Chapter 5: CASE STUDY

5.1. Linked Hybrid

5.1.1. Project Introduction

5.1.2. Project Analysis

5.2. Vertical Forest

5.2.1. Project Introduction

5.2.2. Project Analysis

5.0. CASE STUDY

5.1. Linked Hybrid

5.1.1. Project Introduction

Architects: Steven Holl Architects

Location: Beijing, China

Client: Modern Green Development Co., Ltd. Beijing

Area: 721,784.7sft

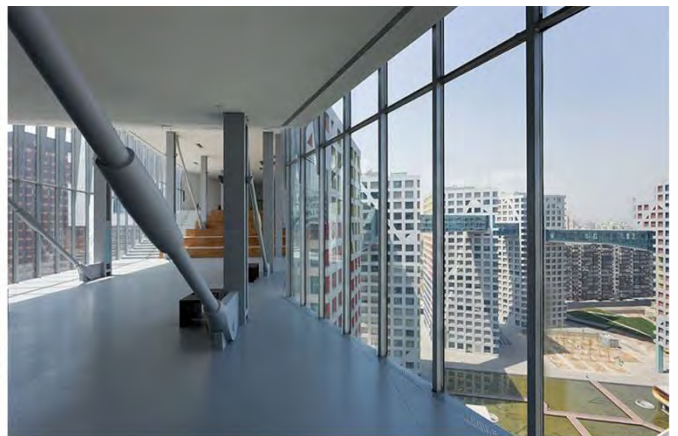
Project Completion Year: 2009

Program: 750 apartments, public green space, commercial zones, hotel, cinematheque, kindergarten, Montessori school, underground parking.



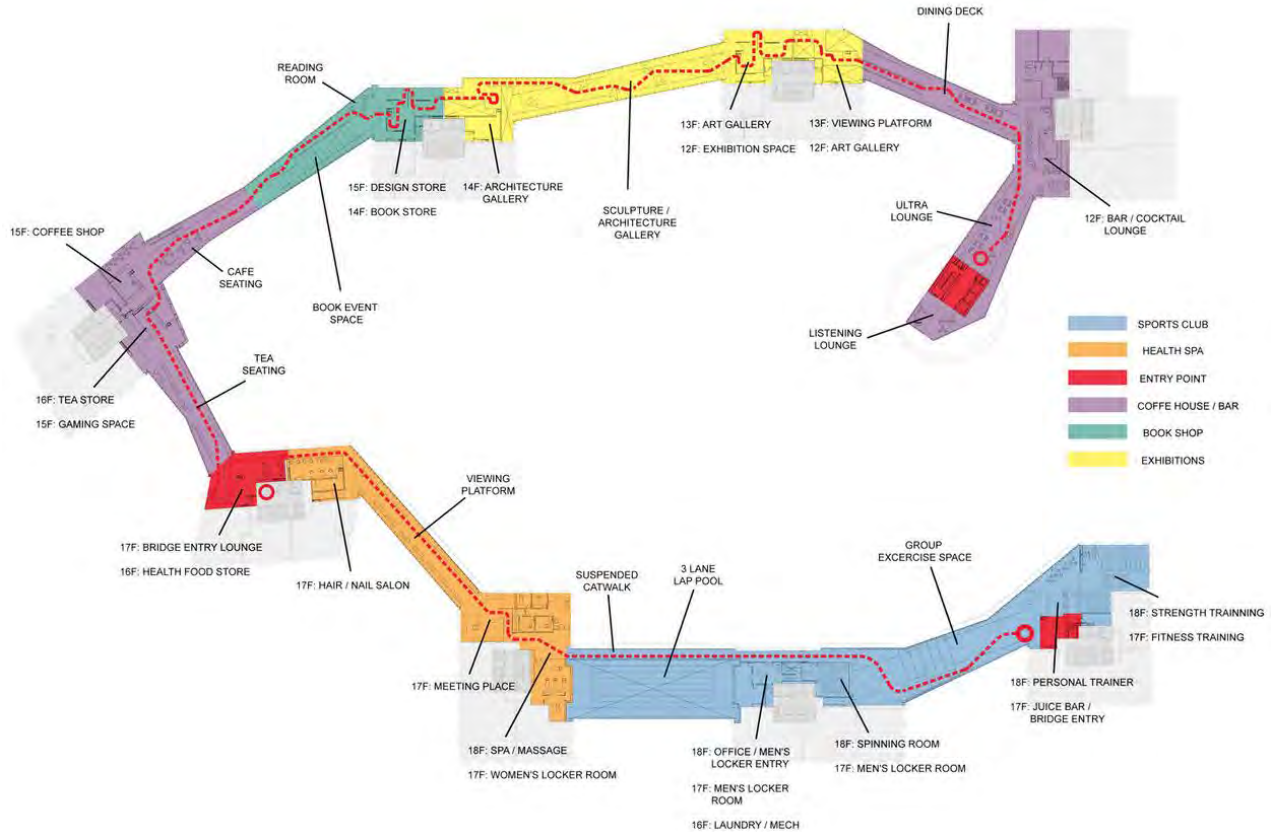
(Linked Hybrid Complex. Source: <https://www.archdaily.com/34302/linked-hybrid-steven-holl-architects>)

Linked Hybrid tended to create a porous urban space, which would be inviting and accessible by public from all around the site. Linked Hybrid is a housing complex which has eight residential blocks interlocking with bridges. (ArchDaily, 2009). This project has an interactive relationship between public and private spaces like residential, commercial, educational and recreational. The project introduced many open passages that make it an open city within the city. The ground floor has many public functions like small scale shops, restaurant, hotel, school, kindergarten, and cinema. There are many open passages in the ground level both for residence and visitors. In addition to that, there is a large pond at the center of the complex which is surrounded by some public functions like school, cinema, roof garden, public sitting and hotel.



(Source: <https://www.archdaily.com/34302/linked-hybrid-steven-holl-architects>)

From the 18th floor there are multi-functional series of sky bridges which contains some public functions like a swimming pool, a fitness room, a cafe and a gallery.



Interlocking Bridge functions in different floors

(Source: <https://www.archdaily.com/34302/linked-hybrid-stein-holl-architects>)

There is a geo thermal well in the site which provides cooling in summer and heating in winter. Linked Hybrid is considered one of the largest green residential projects in the world which a Gold LEED certification. The water in the whole project is recycled. An estimated 220,000 liters of gray water from all apartment units will be recycled each day and the recycled water used for landscaping and green roof irrigation, toilet flushing, and pond water. (Turner, 2009). The windows of the building are low-e coated glass which

reduce solar gain as well as high-performance building envelope and integrated slab heating and cooling system. In the project there is a technique in ventilation system which is called displacement ventilation in which the air is below desired temperature in a room is released from the floor. The cooler air displaces the warmer air and make a fresh breathing environment.

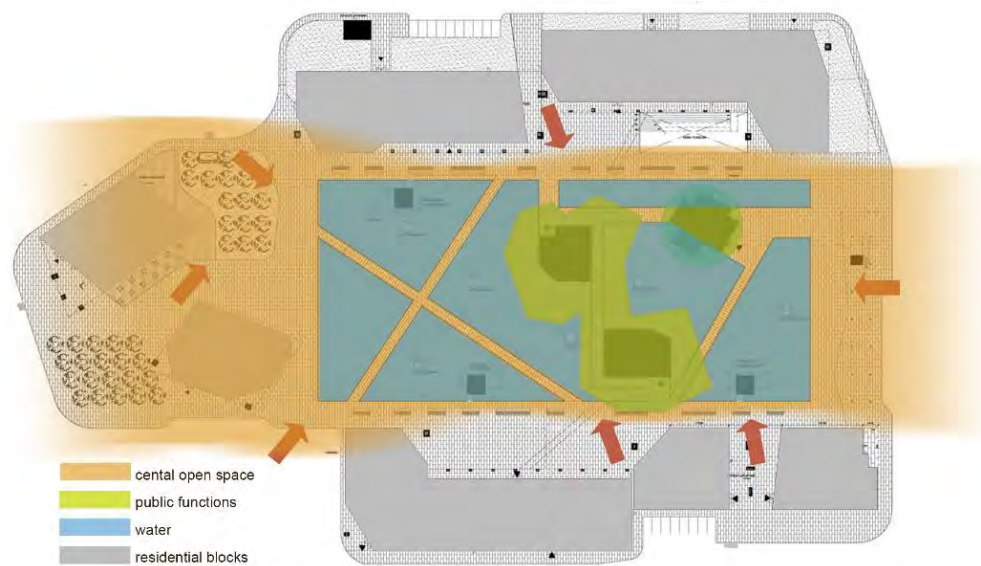


Source:: <https://www.archdaily.com/34302/linked-hybrid-steven-holl-architects>

5.1.2. Project Analysis:

The important part of this housing complex is it has an integrated public, semi-public and private entities. A good-quality housing depends on social interaction, social participation, proper communication and involvement of its people, so the project has a potential to become a good community housing. There are many public functions in the ground floor which create a bond between its residence and visitors. Social interaction between people is very important for healthy growth of human mind.

In this project the center of the site is more open and all public functions are integrated there so this openness and ecofriendly environment is another important part of the project. The presence of these communal spaces makes the project lively and enhances strong bond among the community people which is very important for any successful housing projects. This project has a potential to be a good example of my own project in Kalabagan, Dhaka.



Zoning of the site. Source: Author

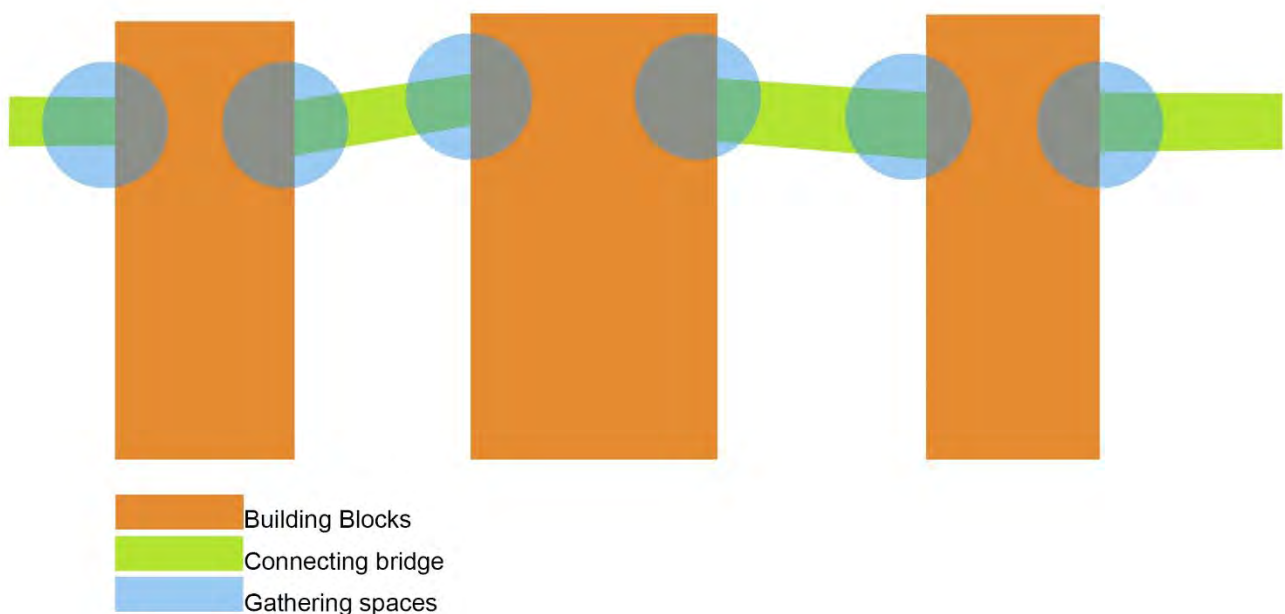
Both residents and visitors can access to the site from different entries. It has multiple access in all directions along with proper security system. The central space is more public and integrated with some public functions which make the place more lively and adaptable to all age of people. The site is more connected to its surroundings and welcome other community people which makes it a good housing complex.



Site Connectivity. Source: Author

The quality of space, standard of living and bondages among residents and other community people can be introduced to my own housing project in Kalabagan to achieve a sustainable and eco-friendly housing complex.

Another important part of these project is that, it provides different type of functions for almost all age group of people. Different part serves different age of people where they easily spend their leisure. The interlocking bridge connected other residential blocks and serve some common functions in where people from different buildings get together and make connections which helps to create bondage among the residence. This idea of gathering spaces can be done in my housing project in Kalabagan, Dhaka.



(Building Connectivity and Gathering space. Source: Author)

Finally, Linked Hybrid is a sustainable and energy efficient project, which encouraged the efficient use of spaces as well as materials. The selection of materials both in exterior and interior, ventilation, recycling and energy consumption as well as quality of space is necessary for creating a healthy and comfortable environment inside a housing complex.

5.2. VERTICAL FOREST

5.2.1. Project Introduction

Architects: Boeri studio

Location: Milan, Italy.

Client: HINES Italia Srl

Area: 131233.6sft

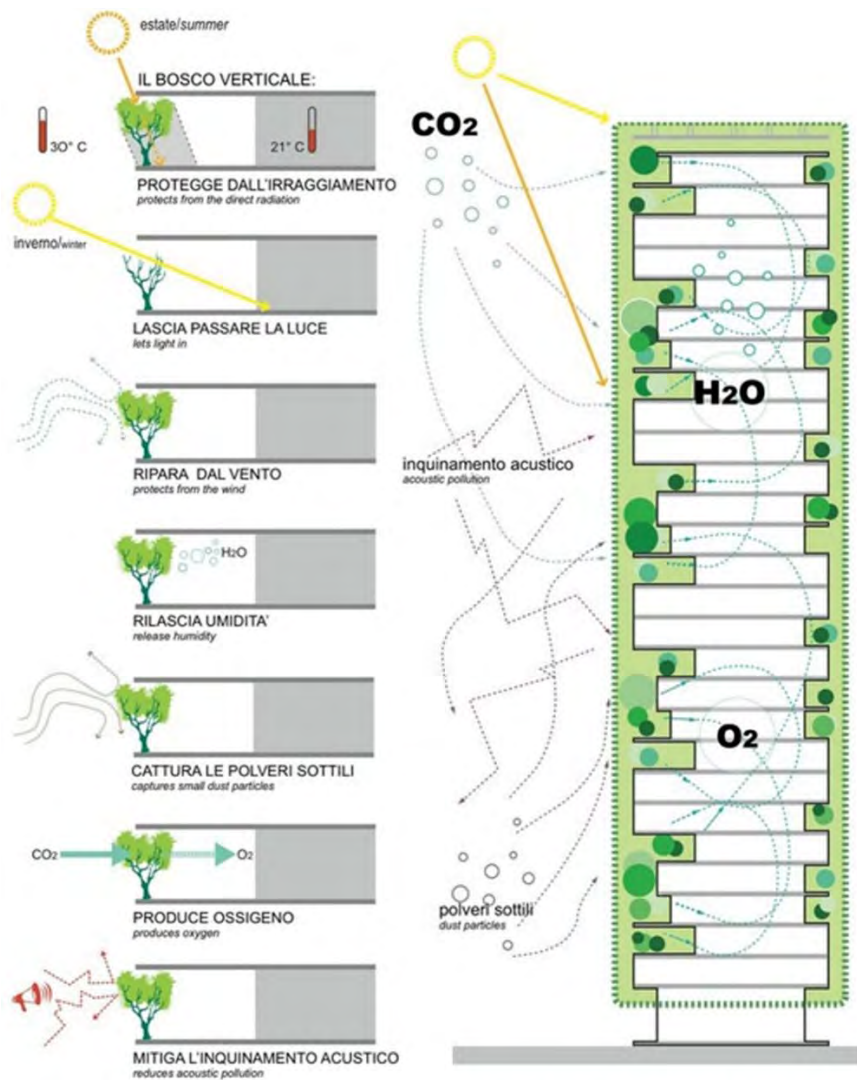
Project Completion Year: 2014

Program: Apartments, Gym, Parking, Public green space.



(Source: <https://www.archdaily.com/777498/bosco-verticale-stefano-boeri-architetti>)

The Vertical Forest project aims to build high-density tower blocks with trees within the city. Vertical Forest is a model for a sustainable residential building which makes an ecofriendly environment, produce oxygen as well as minimize carbon dioxide. The Vertical Forest housing complex consisting of two residential towers of 110 and 76 m height and will be able to hold 480 big and medium size trees, 250 small size trees, 11,000 groundcover plants and 5,000 shrubs which is equivalent of a hectare of forest. (Frearson, 2014).



(Source: <https://www.archdaily.com/777498/bosco-verticale-stefano-boeri-architetti>)

Benefits of Vertical Vegetation

The Vertical Forest increases biodiversity and it helps to create urban ecosystem where various kind of vegetation will make an ecofriendly and healthy living. Vertical forest helps to make a micro-climate which produce oxygen, humidity, absorbs CO2 and protects against radiation and noise pollution. Vertical Forest is an anti-sprawl measure which aims to control and reduce urban expansion and each tower of the Vertical Forest is equivalent to an area of urban sprawl of family houses and buildings of up to 50,000 square meters. (Frearson, 2014). Different sizes of trees plays an important role in this project. Trees protect the building from direct radiation and capture dust from the air as well as produce oxygen. It also reduces acoustic pollution and carbon dioxide.



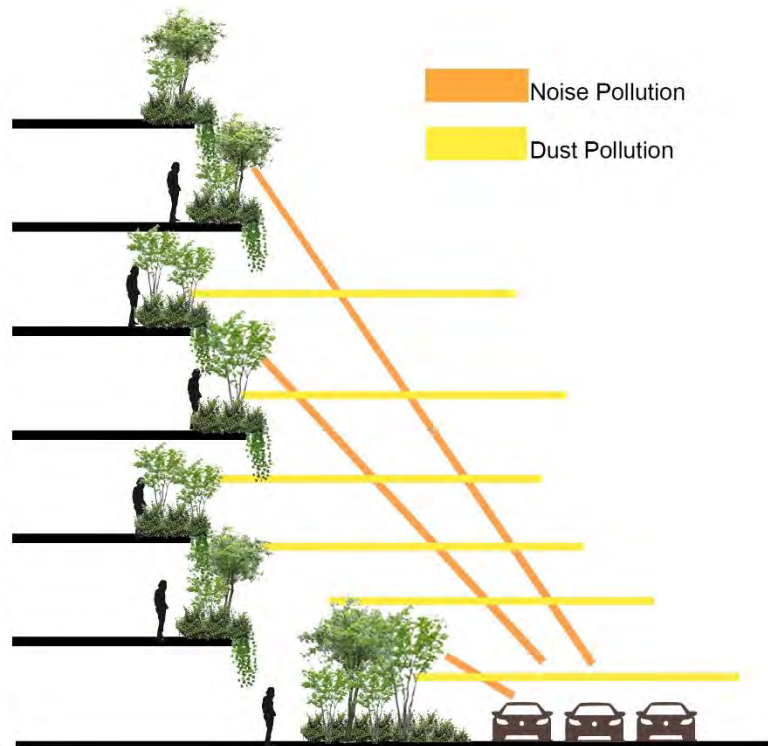
Source:<https://www.archdaily.com/777498/bosco-verticale-stefano-boeri-architetti>

Watering System and Vegetation

5.2.2. Project Analysis:

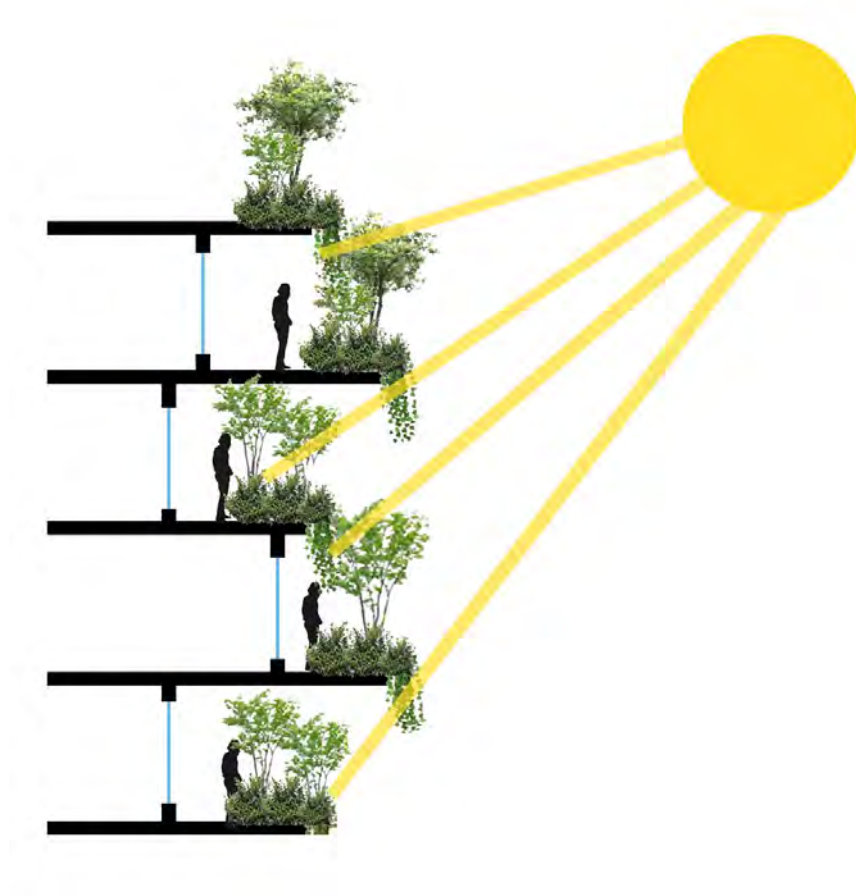
To create a new standard of sustainable housing, vertical vegetation plays a very important role in this case. Nowadays most of the cities are overpopulated as people migrated from different places to city and more people need more accommodation and other facilities. Trees are now very rare in cities as most of the spaces are hard surface which is made of cement concrete. Vertical forest can be a new standard of urban vegetation which helps to reduce noise, dust, carbon dioxide, solar radiation and produce oxygen, release humidity and make a healthy and ecofriendly living.

In Dhaka city, noise and dust pollution is a great problem. Vertical vegetation can create a barrier to reduce the noise, dust and particles. Vegetation can produce fresh air and oxygen which leads a healthy and happy life.



(Barrier to noise and dust pollution. Source: Author)

Another important thing is that, vertical vegetation can reduce direct solar heat gain. Dhaka has a tropical wet and dry climate and during the summer season buildings are getting warmer for direct heat gain. In this case, vertical vegetation can save buildings surface from direct heat gain and also save extra energy consumption to cool the inner environment.



(Barrier to solar heat gain and keeps inner space cold. Source: Author)

Chapter 06: CONCEPTUAL STAGE AND DESIGN DEVELOPMENT

6.1 Introduction

6.2 Conceptual Development

6.3 Design Decisions

6.4 Architectural Drawings

6.5 Site Elevation

6.6 Section of Cluster

6.7 Spot Sections

6.8 Rendered Images

6.9 Model Images

6.1 Introduction

Housing is one of the three primary needs and is as equally important as food and clothing. It provides shelter, safety and security to its owner. It also provides privacy, promotes health and makes a comfortable zone for living. Social interaction among people has a vital role for any housing complex to make a healthy and strong community space. The aim of the project is to make an environmentally friendly space where people can easily interact with each other and make a healthy relationship among themselves. Providing an efficient, adaptive recreational and open spaces will make a friendly environment which helps to create bondages with each other.

6.2 Conceptual Development

The idea of this project was to promote social interaction among people. As the project is located in the key point of Dhaka city so there is a potential to create a bondages between public and private housing. In our country almost all of the public housing are segregated from other community. There is a gap between public and private housing and this project's aim is to address the gap between public and private based community housing. To minimize the gap, public housing should be integrated with other community.



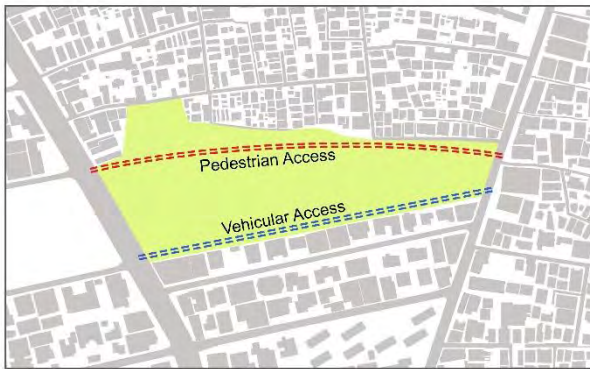
(Integration with other communities) Source: Author

On the other hand, to make a community there should be three things which can help to create a better community. Those are interaction, sharing facilities and better understanding among the communities. A housing should be a community and to make a community performing better different communal spaces like open field, parks, courtyards, plaza which can plays an important role to make a better community.

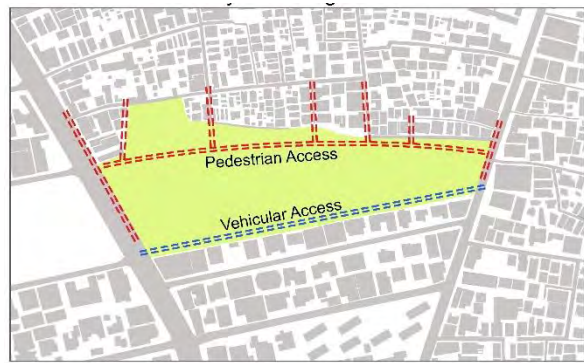


(For a better community) Source: Author

6.3 Design Decisions:



Proposed pedestrian and vehicular Access



Pedestrian Connectivity with Neighborhood

Source: Author

Proposed Space For Neighborhood



Proposed Space For Residents



Proposed Mosque, School and Bazar

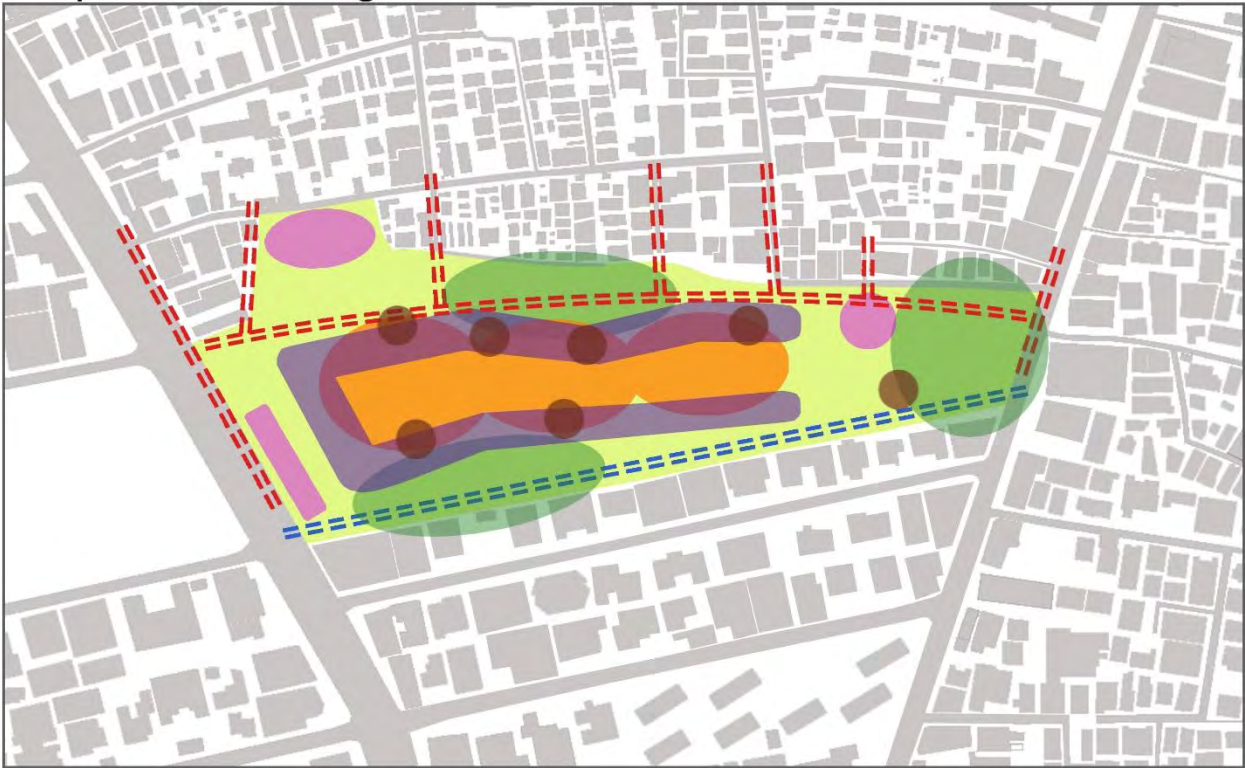


Proposed Space For Different Age Groups of People



Source: Author

Proposed Building Mass



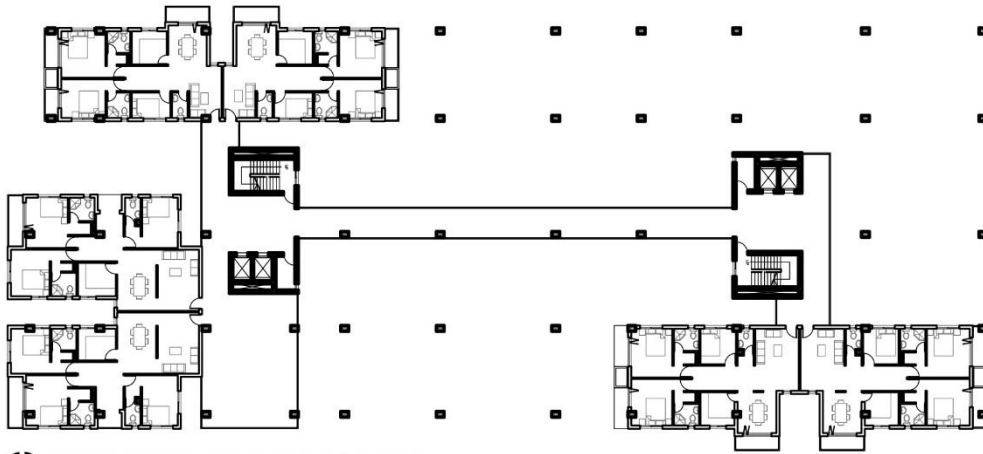
Source: Author

6.4 Architectural Drawings



- 01. Football Field
- 02. Mosque
- 03. Indoor Games
- 04. Boys Club
- 05. Gym
- 06. Community Library
- 07. Ladies Club
- 08. Indoor Games
- 09. Citizens Corner
- 10. School
- 11. Pond

Plan of a Cluster



● SECOND FLOOR PLAN
SCALE: 1/32"=1'-0"



● THIRD FLOOR PLAN
SCALE: 1/32"=1'-0"



● TYPICAL FLOOR PLAN
SCALE: 1/32"=1'-0" Source: Author

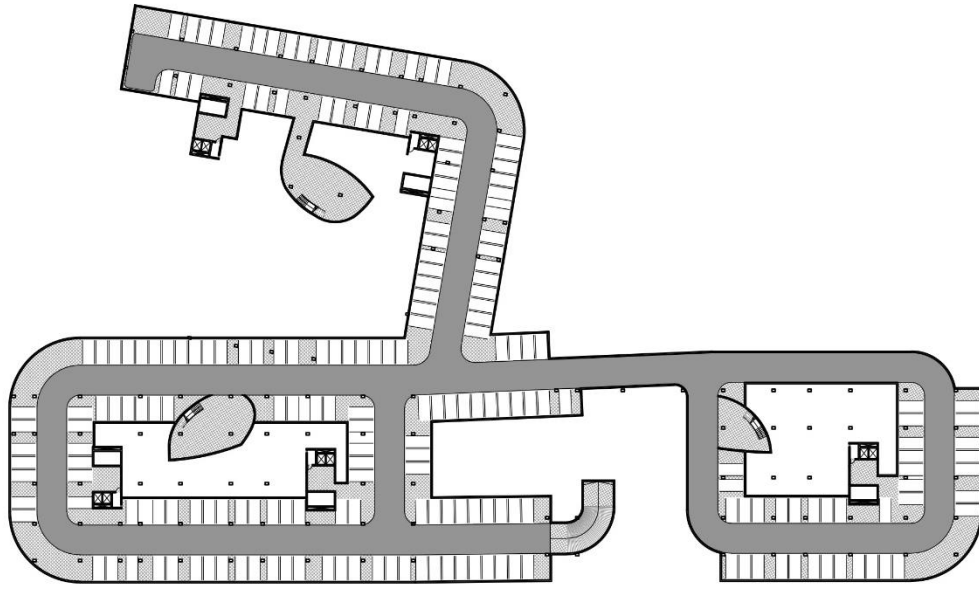


● SIXTH FLOOR PLAN
SCALE: 1/32"=1'-0"



● FOURTEENTH FLOOR PLAN
SCALE: 1/32"=1'-0"

Source: Author



PARKING
SCALE: 1/64" = 1'-0"

Source: Author

UNIT TYPES



Source: Author

6.5 Site Elevation



South Elevation

Source: Author



South Elevation of a Cluster

Source: Author



Cluster of North Elevation

Source: Author

6.6 Section of Cluster



Section AA'

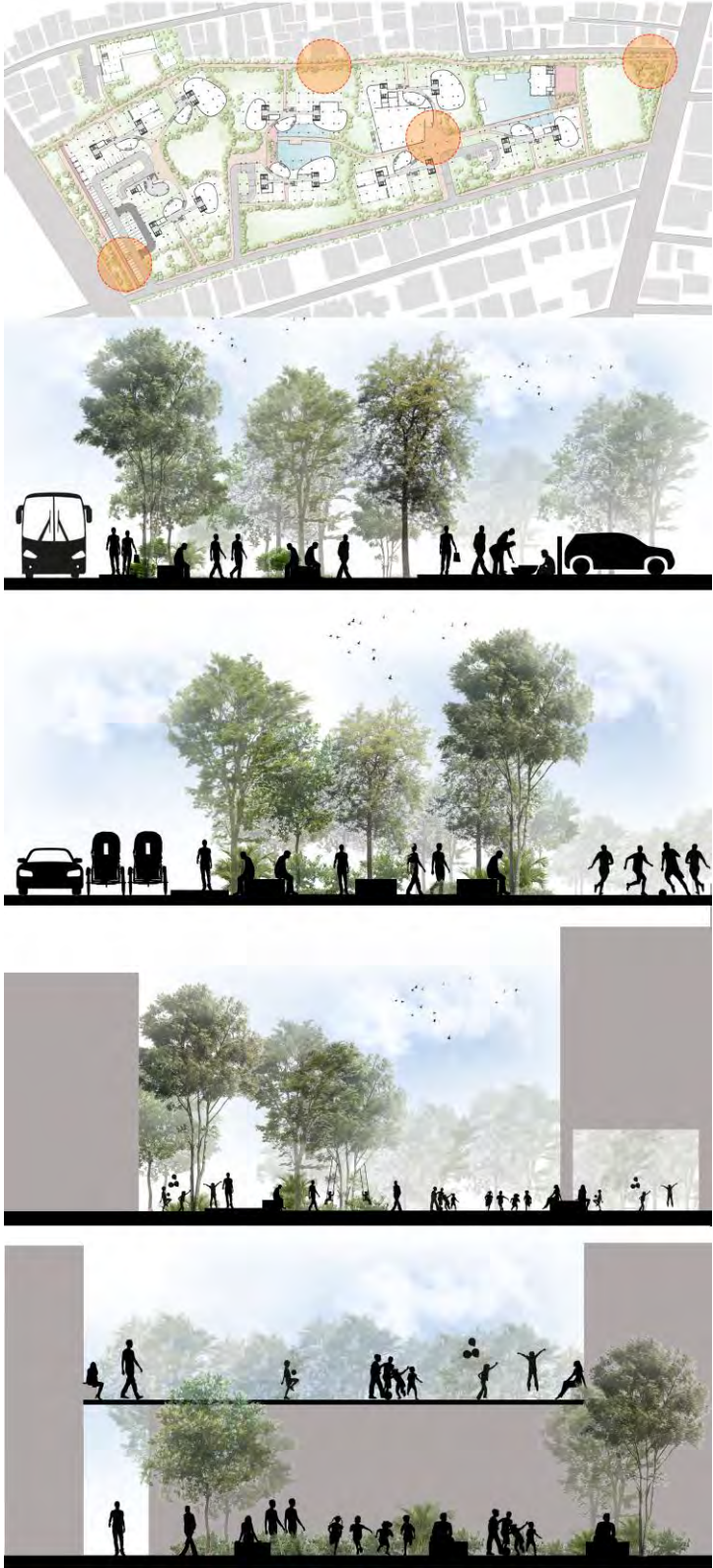
Source: Author



Section BB'

Source: Author

6.7 Spot Section



Source: Author

6.8 Rendered Images



Source: Author



Source: Author



Source: Author



Source: Author

6.8 Model Images:



Source: Author



Source: Author

Chapter 07: Conclusion

Chapter 07: Conclusion

Housing is one of the three primary needs and is as equally important as food and clothing. It provides shelter, safety and security to its owner. It also provides privacy, promotes health and makes a comfortable zone for living. International human rights law recognizes everyone's right to an adequate standard of living, including adequate housing. A 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. Sufficient and secured shelter is a basic human right, so the quality and the environment of the living space make a positive impact on human behavior. The aim of the project is to make an environmentally friendly space where people can easily interact with each other and make a healthy relationship among themselves. The objective of the project is to make a good quality residential housing with proper management and maintenance as well as appropriate ventilation, natural lighting and proper communal spaces for government employees to create a strong community.

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