A STUDY ON THE MORPHOLOGICAL TRANSFORMATION OF URBAN FABRIC OF SEGUNBAGICHA AREA WITH SPECIAL FOCUS ON OPEN SPACES AND ITS IMPACT ON LIVABILITY

Submitted
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DHAKA, BANGLADESH

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree
of
Master of Architecture
at

DEPARTMENT OF ARCHITECTURE
BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY
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The Thesis entitled '**A STUDY ON THE MORPHOLOGICAL TRANSFORMATION OF URBAN FABRIC OF SEGUNBAGICHA AREA WITH SPECIAL FOCUS ON OPEN SPACES AND ITS IMPACT ON LIVABILITY**' submitted by Shaira Parveen, Roll No. 0409012009 (P), Session: April,2009, is acceptable in partial fulfillment of the required for the degree of Master of Architecture on this day, 29 July, 2015.

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It is hereby declared that this thesis entitled or any part of it has not been submitted elsewhere for the award of any degree or diploma.

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Acknowledgements

I would like to express my thankfulness of Almighty Allah for His blessings throughout the period of the thesis.

I would also like to express my gratitude to my supervisor Professor Dr. Farida Nilufar for her constructive criticism, advice and methodological support throughout the different stages in the process of work.

I acknowledge the priceless support of all the persons who assisted this research in data collection during field survey and questionnaire survey; and obtain information from different Government organizations.

Above all, I am grateful to my husband and my three children for their support and great patience.

Shaira Parveen
July, 2015.

To

my three children

Samantina, Sanjana, Sami

&

their amazing Father

Abstract

Dhaka has a long historical background of urbanization. During the past decades, due to complex interrelated forces of urbanization the city has experienced a rapid and dramatic transformation in its urban fabric. These transformations brought significant change in the urban environments which are affecting the livable condition of Dhaka city. With the introduction of high-rise apartments in the low density residential areas, it suddenly transformed into high density areas. The serene environment of these residential areas is gradually disrupted by the invasion of commercial functions, more intensely observed specially near CBD. The resultant effect of these transformations further continued to affect the physical elements of urban fabric and brought changes in plot configuration, built form with an increased density and decrease in open space. Segunbagicha, one of the old residential areas of Dhaka city faces such transformation. This study focus on the functional and physical analysis of the process of morphological transformation that is reflected by the changing land use pattern, increasing accessibility, densification of built form and specially decrease in open space. The findings will show that the fundamental physical elements of urban fabric are continuously affected by the process of transformation and as a resultant effect the open spaces of the area are decreasing in an alarming rate. This phenomenon is affecting the natural environment and hampered the interaction of the residents with open spaces. Thus the physical and mental well-being of the residents is affected by the transformation and creates negative impact on livability of the area.

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List of Abbreviations

BBS	Bangladesh Bureau of Statistics
C.S	Cadastral Survey
DAP	Detailed Area Plan
DCC	Dhaka City Corporation
DLR & S	Directorate of Land Record and Survey
DMDP	Dhaka Metropolitan Development planning
M.J	Mahanagar Jarip
R.S	Revenue Survey
S.A	State Acquisition

Chapter 01

Chapter 01

Introduction

1.1 Introduction

Population growth and urbanization is a global phenomenon. The fast growing urbanization in most cities over the world has impact on the urban environment. Due to rapid and unplanned urbanization, commercial development, along with population pressure, urban environment suffers a huge encroachment upon open spaces and the overall city environment is being worsened seriously day by day. This is particularly evident in the cities of developing countries like Dhaka.

1.2 A Brief Background of Dhaka City

Dhaka city has gone through a long history of urbanization for over four hundred years. The city has grown rapidly since 1950s which accelerated during the last three decades (Zakaria & Nahid, 2006). Dhaka city has a complex morphological pattern that is rapidly changing due to a range of complex, inter-related forces of urbanization (Zereen, 2009). These changes in morphological elements brought significant change in the land use pattern, plot configuration, built form and open spaces and transformed the urban fabric.

During the British period, Dhaka experienced a northward expansion while the peripheral green areas were incorporated within the city boundary. In 1825, a green belt was developed at the center of the city and large parks like Ramna Udyan (Ramna Park), Suhrawardy Udyan (Suhrawardy Udyan Park) and Osmani Udyan, were the most important green spaces in this area. Residential areas like Segunbagicha were incorporated along the Ramna green belt. As a part of the Ramna green belt Segunbagicha was also filled with large trees and green. During the 70‘s the greenery of the historic Dhaka were mostly cut-off (Nilufar, 2000) and the erosion of open spaces has continued.

Open spaces are essential to get rid of monotony of urban life. Recreation and sports play a vital role in town planning and are considered highly desirable from the point of view of the citizens' physical well being. It is well known that parks, play areas and green open spaces are essential for local community strategies and key to the livability of towns and cities (DLTR, 2001). In order to create a balanced and livable urban environment, 'experts suggested that up to 75% of urban area should retain for open spaces. Ideally this should be about 40%-50%, of the total area, but in a compact or dense situation like Dhaka about 25% of urban space is recommended for lower margin' (Nilufar, 2000). Dhaka structure plan suggests that, all type including, the open space should be at least 20%. But in Dhaka urban greenery, park greenery or tree covered spaces constitutes less than 15% of the city landscape. According to DMDP 1995**,** old Dhaka has only 5% and new Dhaka has about 12% open space. For the healthy living of the increasing population of Dhaka city large amount of open space is required but at present there is a shortage of open space, particularly parks and playground in Dhaka city. As the city is losing its precious open spaces, the crucial question to confront Dhaka is whether it can exist as a decent and livable city.

Today 'livability' has become an explicit focus in planning for cities. Due to the process of transformation, the increased problems of congestion, monotonous new development, threats to natural systems, and a general decline in the quantity and quality of public space, many cities are now concerned with improving livability of neighborhoods and the city as a whole. The livability issue is more concerned in the developing countries like Dhaka which consistently listed as one of the least livable cities in the world according to the EIU ranking (The Daily Star, February 24, 2011 & August 15, 2012). To improve the livable condition it is necessary to understand livability issues of the city. High-density city like Singapore has resolved their livability issues by following different strategies. By adopting a strategy of pervasive greenery and by transforming its parks and water bodies into lifestyle spaces for community activities, Singapore integrated nature with its dense developments and brought significant change in its livable condition. As Dhaka city faces significant change in its open spaces it is necessary to understand the

transformation of the components of urban fabric that contribute the decrease of open spaces and how these transformation of open spaces affecting livability. So, to understand the livability situation focus should be given specially to the areas where rapid transformations in open spaces has taken place; through which future measure can be taken to enhance the livability of Dhaka city.

1.3 Problem Statement

Dhaka City was once known for its serenity, beautiful parks, clean roads and lush greenery, but at present those green open spaces are almost transformed to urban habitats to accommodate excessive population due to high rate of rural–urban migration (Ansari, 2008). These unplanned developments at urban areas especially at city centers have become a major planning concern (Zereen, 2009). This phenomenon is more intensely observed in the residential areas near CBD, Central Business Districts, as high rises are usually located in and around the city centers, because people attracted to reside within short distance from working place, market, educational institution etc.

Segunbagicha is one of the old residential area near CBD, Motijheel Commercial Area, is witnessing an unprecedented growth of urban development in recent years at a much higher rate compared to other part of the city. The introduction of high-rise apartment buildings by the developers at the beginning of 1980s and the increasing commercial activities in the surrounding area brought significant change in the morphology of Segunbagicha. Multistoried residential and commercial buildings are continually replacing the historic urban fabric of Segunbagicha area (Rahman, 2009). Land use restructuring is taking place through densification, large residential plots are sub-divided and high-rise apartment buildings are making their way at an accelerated rate which has transformed the skyline of Segunbagicha. The once low-density residential area with serene green environment transformed into high-density area and brought significant change in the natural setting and open spaces of the area. With these rapid redevelopments the population densities increases many times higher than intended in the original plan which changed the demand of open spaces. These changing situations

affecting the interaction of the residents with nature and open space, the overall performance of open space which are creating an effect on overall livability of Segunbagicha. Therefore to enhance the livable condition in Segunbagicha area, it has become very important to study the morphological transformation that is undergoing in this area, to have a clear knowledge on the changing patterns on land use, streets, plots, built form and open spaces; how these transformations affecting the intensity of use and overall contribution of open space as a physical factor of livability and what impact does it create on livability.

1.4 Objectives and Research Questions

Livability is an important factor for any city. Unplanned urbanization in Dhaka city accelerated rapid transformation of urban fabric and also the cause of decreasing livability. These transformations are squeezing the open spaces and affecting the livable condition of the study area. To understand the nature of morphological transformation and its impact on the livability of the study area this research aims to explore the changing phenomena with special reference to open spaces.

The objectives of the study are as follows:

1. To study the morphological transformation of urban fabric of Segunbagicha area with an emphasis to availability of open spaces.
2. To determine the impact on livability due to the changes in open spaces of the study area.

In response of the above objectives the research questions are-

- What is the process of transformation of the urban fabric of Segunbagicha?
- In what extent the open spaces of the study area changes in the process of transformation?
- What impact do the changes in open spaces create on livability of Segunbagicha?

1.5 Rational of the Study

For the last few decades Dhaka faces remarkable transformations in its urban fabric and the livability situation is also getting worse. The residential developments especially near CBD faces significant change in its morphological components- built form, land use, plot configuration and open spaces. As the physical aspects of livability is affected by the morphological components especially the decrease in open spaces, the morphological transformation of the component of urban fabric of Segunbagicha needs to be understood to identify the resultant impact of the changing open spaces on livability. This study will be a useful documentation for the academicians in this field. Moreover the study may help the respective authorities, architects, urban planners and other professionals to formulate effective policies and design guidelines regarding the future developments of residential or mixed use areas to revive and maintain livability by restoring open spaces in that area.

1.6 Scope and Limitations

The scope of the study covers an investigation on the physical and functional aspects of transformation of urban fabric of Segunbagicha, the resultant affect on open spaces of the area and its impact on livability of the study area. The study covers the scope into two broad category, 1) Morphological transformation of urban fabric and 2) Impact on livability due to the transformation. The first phase of the study focuses on the morphological evolution of the area. The scope of this part is to investigate the historical development and inter-dependence of different components of urban fabric and its resultant effect on the changing open spaces. The second part of the study focuses on livability of the residential area of Segunbagicha. The scope of the analysis is to identify how the transformation of open spaces, both public and private open spaces, affects the livability of the area considering the physical aspects of open spaces.

The scope of the study has been impeded to some extent due to several limitations. It is often difficult to collect data and research material, from different government and non-

government organization. Due to lack of land use data, the analysis of land-use transformation is conducted for a short time period. The recent map of the study area was not possible to acquire and have to update through physical survey. On the other hand the livability study usually a comparative study and there is no absolute measure of livability therefore an approximate assessment is done based on physical aspects and response of the residents of Segunbagicha area.

1.7 Methodology

The methodologies that have been used in this thesis are briefly discussed in the following part:

1.7.1. Literature Survey: To develop an in-depth understanding of the process of transformation and livability of urban areas, a thorough literature survey is conducted based on published articles, books, dissertations, websites and other relevant recorded documents available from government and semi-government organizations, to understand the physical and functional components of Urban fabric and their transformation process. The literature survey also been conducted to find the assessment criteria of open space, the livability indicators related to open spaces and the measures of livability.

1.7. 2 Data and information collection: Relevant information on open space; land-use is collected from different research works, government and semi-government sources. The data and maps required for the research are collected through various sources:

i. Reconnaissance Survey: To obtain detail information of physical and functional aspects of built-forms, changing land-use pattern carried out by reconnaissance survey in July, 2010 and September, 2014. The 2009 map of the study area prepared by the students of BUET (batch' 2005), is updated by the researcher in July'2010 and September' 2014 (Appendix: C & D).

ii. Collection of Maps: To study the transformation of the components of urban fabric the C.S, S.A, R.S and Mahanagar Jarip maps were collected from Department of Land Record & Survey (DLR&S). These maps provide the information of the physical boundary of individual plots and the building footprints. 2003 base map from Dhaka City Corporation provides the information about physical boundary of individual plots, building footprints, land use and height of the building.

iii. Physical Survey: A Physical survey is conducted to identify the location, physical and qualitative aspects of the existing open spaces of the study area in September' 2014.

iv. Questionnaire Survey: A Questionnaire survey has been conducted in September, 2014 to understand the response of the residents, about different aspects of open space and livability of the study area. Two types Questionnaire survey has been conducted-

1. Structured questionnaire survey: A Structured questionnaire survey among 100 respondents was conducted. The respondents were the residents of Segunbagicha, who were living in the study area at that time. The respondents were of different age group and selected randomly from different part of the study area (Appendix: E & Appendix: F).
2. Unstructured questionnaire survey: This survey was conducted among the people who had been living in the study area for a long time. The respondents were interviewed informally to get the open spaces scenario, use of open space in earlier period (Appendix: F).

1.7.3 Analysis

The objectives of the thesis are achieved through the answers of the research questions, based on the information and data collected from the sources mentioned in 1.7.1.

Step-01

Research Question -01: What is the process of transformation of the urban fabric of Segunbagicha?

To understand the process of morphological transformation, the study aims to explore the changing phenomena of the morphological elements of urban fabric of Segunbagicha area with special reference to the changes in plots, street pattern, use pattern of individual plot and built form, their transformation through different time period. The evolving pattern of morphology is studied through a quantitative comparison of data and information collected from primary and secondary sources.

Step-02

Research Question -2: In what extent the open spaces of the study area changes in the process of transformation?

To understand the change in open spaces, first the change in open space as a whole is calculated through the 'Figure Ground Map' technique. For better understanding of the plot level change in pattern of open space, randomly selected plots are analyzed through the ratio of open space and built form in each successive year. Then open space in both administrative part and residential part, are calculated separately and compared; for understanding the change in different periods. Block level analysis of built form and open space is done for understanding how the division of plots in successive years accelerate the reduction of open space and in what process the scenario of open space can be improved.

Step – 03

Research Question – 03: What impact do the changes in open spaces create on livability of Segunbagicha?

The study of impact on livability is conducted in reference to open spaces of the study area. The existing open spaces of the study area have been assessed on the basis of quality, quantity and accessibility. To understand the perception of the residents of

Segunbagicha, about the open spaces, a questionnaire survey has been conducted. Large scale open spaces outside study area were considered also, while taking users response. All the data and information collected from the physical survey and questionnaire survey are analyzed regarding the open space related indicators of livability. From this analysis a comparative scenario of livability has been found, which explores the impact of changing open spaces created on livability.

1.8 Structure of the Dissertation

This dissertation has been designed and compiled in five chapters to achieve the answer to the research questions and objectives with an exploration of the dynamic process of urban transformation and livability of Segunbagicha.

Chapter One gives a brief background of Dhaka city and tries to conceptualize the research problem, objectives and rationale of the study, together with the methodology for analysis of morphological transformation and its impact on livability.

Chapter Two explores the theoretical foundation relevant to the research work. The context and components of morphological analysis in the residential area is established through different theories with an objective to understand the morphology of the area. This chapter also helps to understand the notion of livability and its physical attributes and this chapter explains the importance of open space for livability of an area and how open space plays a vital role to maintain livability of an area. Finally this chapter explains the research framework in detail.

Chapter Three gives a brief description of the study area, explores the morphological evolution of Segunbagicha in terms of functional and physical aspects that have identified as indicators of morphological transformation. It also focuses on the resultant change in open spaces due to the change in morphological elements.

Chapter Four gives a brief description of livability and open space scenario of Segunbagicha and explores the impact of the changing open spaces on the livability of the study area through the assessment of existing open spaces in terms of indicators. Livability is also assessed from user's point of view by exploring their perception and responses regarding open space and livability of the area.

Chapter Five, presents a general discussion on the findings of the research work, give some recommendations and draws the concluding remark by summarizing the findings.

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Chapter 02

Chapter 02

Literature Review

2.1. Introduction

Every city needs to adapt the changes that evolve from the need of accommodation of human activities. These accommodations often result in changes in urban form and layout. The transformation of urban form is inevitable but how this change affects the overall well being and livability of urban life is the real question. The objective of this chapter is to set the theoretical foundation of relevance to the process of morphological transformation of urban fabric, open space and livability, to help to understand how the open spaces of the study area is affected by the transformation of different component of urban fabric and what impact does it create on the overall livability of the area.

2.2. Urban fabric and its Component

Urban morphology is also considered as the study of urban fabric. It is an approach to studying and designing urban form which considers both the physical and spatial components of the urban structure and focuses on three basic elements: streets, plots/lots and building and their related open spaces (Moudon, 1997), all of which are considered as part of the history/ evolutionary process of development of the particular part of the city under consideration' (Bentley and Butina 1990). Along with the physical aspects, functional aspects like land use are also part of the process of the morphological transformation, as the change of the functional aspect can influence the change of the physical components of urban form. For Conzen, understanding the layering of these aspects and elements through history is the key to comprehending urban form. Therefore, a morphological analysis of the urban fabric will give us insights into the distinctive components of urban fabric and its specific process of formation. Urban morphology is also considered as the study of urban fabric.

2.3. Urban Morphology and its Transformation

Urban morphology can change over time as new fabric is added and as the existing fabric is internally modified, e.g. new buildings replace old ones, plots are amalgamated or subdivided, street layout is modified (Knox,1995). By understanding the physical complexities of various scales, from individual buildings, plots, street blocks, and the street patterns that make up the structure of towns, urban morphological transformation helps us to understand the ways in which towns have grown and developed (Larkham, 2009). Therefore, study of the process of morphological transformation requires a thorough understanding of the process with the help of the indicators and the indicators are-

I. **Land use:** Land use is one of the key elements of urban design. Changes in land use are an important indicator of morphological transformation. Changes in land use pattern is demonstrated by the restructuring of land use e.g. conversion from residential use to commercial use. Development of mixed of uses is also indicates a process of change. However the changes in land use pattern greatly influenced and guided by the changes in accessibility (Deyllas, 1997).

II. **Street pattern:** According to urban morphology, the most enduring artifacts of any urban settlement are the pattern of street (Conzen, 1969). The accessibility of an area depends on the street pattern of that area. Interconnectivity increases the accessibility of streets. According to the theory of 'Movement Economy', land use changes can occur when the changed land use get benefit from movement, such as commercial use can brought by better accessibility (Hiller,1996).

III. **Plot configuration:** Plot defines the limit of territory for initial buildings, or developments and the subsequent transformation of built space. The morphological transformation of plot configuration in an urban area are indications of the process of adaptation to changing needs by conversion of large plots into smaller sub-division or amalgamation of plots. The changing need primarily brings changes in land use and intensity of use, affecting the density of built-form and its spatial requirements. This

influences the changes in plot configuration. The plot configuration also can brought change in street pattern. Therefore, changing plot configuration is an indicator of the process of adaptability to the changing demand.

IV. **Built-forms and related open spaces:** Shape, sizes and nature of built forms and its changing character in an urban area, is an indicator of morphological transformation. Extension of built-form is related to the transformation of land use and changing demand on individual plots. The process of transformation is evidenced through increased rate of re-building or re-development of existing built-forms.

Built form and open space are interrelated. The decreasing rate of open spaces usually represents an intensive urban growth with massive development of built form through morphological transformation. Changes in the availability of open space bring changes in the natural character of an urban area and impose severe impact on livable condition.

Over time, these elements are transformed physically, eliminated or replaced by new forms. Building and transformation cycles are important process for city planning and real estate development process (Moudon, 1997). These changes in urban fabric create certain impact on environment and in the living condition. Therefore a morphological analysis of urban fabric will give us insights into the distinctive components of the urban fabric and its specific process of formation and how these transformations can affect the livable condition of a region or city.

2.4. Livability

The concept of "livability" has become an explicit focus for urban planning now a day. Even though livability is primarily a subjected experience, there is a growing consensus to understand the attributes of a livable city. As early as the 1960s Jacobs (1961) has called for the sociability and livability of dense, mixed-use urban areas. These qualities included a clear demarcation between public and private space, streets and sidewalks in constant use and streets with attractions on them that encourage people to linger. Lynch's

(1998) good city form theory with its emphasis on qualities such as legibility, vitality, congruence, sense, access, efficiency has further influenced urban livability planning among urban designers in the 1980s and 1990s. Livability of the built environment is discussed increasingly on a global scale.

2.4.1 Understanding Livability

The term livability means the ability to live. There is no concrete or standard definition of livability. It is a notion or concept which is related to the desirable quality of life for the people of a region or city. Livability refers to an urban system that contributes to the physical, social and mental well being and personal development of all its inhabitants (Cities PLUS, 2003). Livability means different things to different people as their day-to-day experiences will differ according to their circumstances. It is sums total of qualities of urban environment which tend to induce in a citizen a state of well-being and satisfaction. The definition of livability includes a wide range of different issues that are underlined by a common set of guiding principles such as accessibility, equity, and participation, all of which can define livability at different level. The livability of a city can also be determined by the access that its residents have to participate in decision-making to meet their needs. Convenient access systems are essential including walkability and bicycle access; connectivity of the street grid and block size; convenient access to parks and recreation, local shops and services; and transportation systems that allow us to move about easily by a variety of means.

The concept of livability is complex and encompasses many aspects of urban life, including social and economic factors and several dimensions of the built environment, The built environment influences how people relate to each other, the opportunity for community to form, and the depth of our social networks. So, it can be said that economic and social conditions are not the only qualities that enhance livability but the physical form of a neighborhood contributes significantly to its livability and long-term success as a place to live. The built environment encompasses all buildings, spaces and products that are created or modified by people include buildings, parks,

recreation areas, and roads. It impacts indoor and outdoor physical environments (e.g., climatic conditions and indoor/outdoor air quality) as well as social environments, e.g., civic participation, community capacity and investment and subsequently our health and quality of life." (O'Fallon, & Dearry, 2003) The most comprehensive definition is provided by Vukan Vuchic (1999) who expresses that the concept should encompass those elements of home, neighborhood, and metropolitan area that all contribute to safety, economic opportunities and welfare, health, convenience, mobility, and recreation.

2.4.2. Indicators of Livability

It can be said that the term livability is an umbrella to a variety of meanings. Most researchers have reported livability as a concept that is difficult to define and measure (Wheeler, 2001; Balsas, 2004; Heylen, 2006). To find some common indicators various elements of livability from different literature are analyzed in Table: 2.1.

Table 2.1: Summary of various indicators of livability

Ji (2006) , McCann(2008)	Belinda. Y & Glok .L. Ooi,	Balsas (2004)	Wheeler (2001)
Ability to access infrastructure	**Attractive public spaces**	Safe	**An attractive, pedestrian-oriented public realm**
Clean air	Mixed use and higher density neighbourhood,	Clean	Low traffic speed, volume & congestion
Affordable housing	**A range of green Infrastructure**	Beautiful	Decent, affordable, well-located housing
Meaningful employment	Affordable housing	Affordable to diverse population	**Accessible parks & open space**
Social activities	Vibrant , exiting, human-scaled pedestrian experiences	**Ample parks**	**A clean natural environment**
Sense of community		Effective public Transportation	Places that feel safe & accepting to all users
Attractive public places		Interesting cultural Activities	Places that emphasize local culture, history & ecology
Green space and parks		Sense of community	Environments that nurture human community & interaction

Note: The livability indicators which are related to open spaces are made bold in the above table.

From different literature and theories mentioned earlier it is found that the physical characteristics which contribute to the livability of cities include land use, built form, quality and conservation of public spaces and natural environments, efficiency of transport networks, accessibility to work, education, health and community services and social and recreational opportunities. Most studies emphasize the natural environment of communities which means that the contribution of open spaces is inevitable for livability of any region or city. From the Table 2.1 it is evident that the contribution of open space on livability of is an area very much related to the availability, accessibility and quality of parks and green spaces in that area.

2.4.3. Measures of Livability

Livability measures are typically used as a tool to make comparisons between countries and cities. There is no established theoretical framework or uniform definition of livability, and the livability literature consists mainly of empirical studies, which generally involve a direct comparison of a composite measure over different geographic areas. The concept of livability answers the question which places in the world provide the best or the worst living conditions. Livable city indices have been formulated by various institutions e.g. Mercer, the International Making Cities Livable, the Economist Intelligence Unit (EIU) etc. to measure the livability of cities.

Mercer evaluates local living conditions in more than 460 cities it surveys worldwide. Living conditions are analyzed according to 39 factors, grouped in 10 categories (Table: 2.2).

Table 2.2: Livability ranking criteria according to Mercer

Mercer Index		
No.	Category	Indicators
1.	Political and social environment	political stability, crime, law enforcement, etc.
2.	Economic environment	currency exchange regulations, banking services
3.	Socio-cultural environment	media availability and censorship, limitations on personal freedom
4.	Medical and health considerations	medical supplies and services, infectious diseases, sewage, waste disposal, air pollution, etc
5.	Schools and education	standards and availability of international schools
6.	Public services and transportation	electricity, water, public transportation, traffic congestion, etc
7.	Recreation	restaurants, theatres, cinemas, sports and leisure, etc
8.	Consumer goods	availability of food/daily consumption items, cars, etc
9.	Housing	rental housing, household appliances, furniture, maintenance services
10.	Natural environment	climate, record of natural disasters

Source: Mercer's Quality of Living Survey, 2009

Among the recognized livability surveys focus is given on open space directly in the EIU Spatially adjusted livability index and Dhaka city is also included among the cities which are assessed through the EIU Livability ranking and for that focus has been given on the process of EIU ranking.

Economist Intelligence Unit livable cities ranking:

From different literature the contribution of open space for livability is well established but in most of the livability measures overlooked the significance of open space. In the Previous EIU rating public green spaces wasn't included. The rating was done between 140 cities using 30 indicators in five broad categories. But considering the importance of open space on livability the EIU rating recently added a new category to evaluate the public green spaces available in the city (parks, squares, gardens). The EIU currently ranks 70 cities on their livability as part of the Worldwide Cost of Living Survey. Living conditions are assessed using almost 40 indicators which are grouped into six categories (Table: 2.3).

Table 2.3: Indicators of EIU Spatially adjusted livability Index

No.	Category	Weight	Indicator
01.	Stability	18.75%	Prevalence of petty crime Prevalence of violent crime Threat of terror Threat of military conflict Threat of civil unrest/conflict
02.	Healthcare	15%	Availability of private healthcare Quality of private healthcare Availability of public healthcare Quality of public healthcare Availability of over-the-counter drugs General healthcare indicators
03.	Culture & Environment	18.75%	Humidity/temperature rating Adapted from average weather conditions Discomfort of climate to travelers Level of corruption Social or religious restrictions Level of censorship Sporting availability Cultural availability EIU field rating Food and drink Consumer goods and services
04.	Education	7.5%	Availability of private education Quality of private education Public education indicators
05.	Infrastructure	15%	Quality of road network Quality of public transport Quality of international links Availability of good quality housing Quality of energy provision Quality of water provision Quality of telecommunications
06.	Spatial characteristics	25%	**Green space** Sprawl Natural assets Cultural assets Connectivity Isolation Pollution
		100%	

Source: The Economist Intelligence Unit, 2012

From the above t it is clear that open space plays an important part in livability measures directly or indirectly. So, any significant change in open space of an area can affect the livability of that area.

2.5. Open space

Open space means many things to many people. An open space can be defined as an unbuilt land within the city which provides environmental, social and economic benefits to communities. It can be an open space like parks, and gardens, play areas, sport facilities and green corridors. Open space is defined as publicly or privately owned land that is publicly accessible and has been designed for leisure, play, or sport, or land set aside for protection and/or enhancement of the natural environment.

In this study the term 'Open space' will cover all sorts of green open spaces in cities those are accessible to public like parks, play areas, green corridors etc. for this study. Type of publicly usable open space are-

- Public Parks and Gardens
- Amenity Greenspace - Residential
- Playing Fields
- Green Corridors
- Natural/Semi Natural Greenspace

2.5.1 Benefits of open space in dense environment

The urban environment is characterized by an intense use of the available space, where the preservation of open spaces is of special ecological importance (Roessner, 2001). Open space is an indispensable element of urban quality of life and livability. The importance of open space has been clearly recognized in urban architecture (MacHarg, 1971). For a healthy city a proportional balance between open and built up areas is needed. Open spaces acts like lungs besides being used as active recreational and leisure areas for its citizens. Open spaces have a direct impact on the urban environment

and general physical, mental and social health of the urban dwellers. It contributes to physical health by providing opportunities for exercise, jogging walking. Open space also contribute to mental health by providing restorative effects of nature (Forsyth, 2007). Open spaces are especially important in the dense cities like Dhaka for softening densely developed neighborhoods, creating an aesthetic within the city and providing small areas of refuge from the urban landscape. Available and attractive open space is supposed to be a useful measure to keep the quality of city life. There are several studies conducted to analyze the relationship between public open space and quality of life. Chiesura (2004) in Amsterdam found that public open space could affect quality of life through environmental, economic and social factors. Lynch (2007) in her study in Canada, stated that public open space influences quality of life through physical, social and psychological health, and also through economic and environmental quality.

Visual and physical accessibility to open space is important to human welfare at the neighborhood scale as well as the individual parcel (Jackson, 2003). Insufficient greenery in residential area reduces the aspirations and opportunities for natural experiences of residents outside the domestic setting, which may result in lower physical activity, behavioral problems, and social isolation (Lindheim and Syme, 1983). Many researches show that the natural element of open space generates relaxation, which has a relation with mental health (Abraham, Sommerhalder and Abel, 2010). The open space becomes a place to do sports and many other physical activities to support physical health (Sugiyama, Thompson & Alves, 2009). Open spaces are important indicators for livability, health and wellbeing, as better access can promote physical activity and have a positive effect on mental health. It is unquestionable that open spaces play a key role to livability of our towns and cities (Levent & Nijkamp, 2004). So, any significant change in open spaces can create impact on livability.

2.5.2 Measures of Open space

In the EIU ranking Google Earth satellite imagery and the information available on Open Street Map is used to evaluate the public open spaces available in the city (parks, squares, gardens but excluding golf courses) based on three criteria:

- The distribution of open spaces within the metropolitan region,
- The number of local open spaces and
- The number of metropolitan scale open spaces.

Cities were given a score from 1 (best) to 5 (worst) on these three criteria. These were then averaged to obtain the Open space score (EIU, 2012).

From different literature it is well established that the measure of the contribution of open space as a physical element focuses on three criteria: quantity, quality and accessibility (Levent & Nijkamp, 2004). The parameters are measured through some indicators that will help to assess the open spaces of an area shown in Table 2.3 –

Table 2.3: Assessment criteria of open space

Parameters	Indicators	Standard
Accessibility	Access to open space Distance to open space	It is recommended that all residents should have access to public park provision of some form within 400m of home. (According to Green Flag Award Scheme[1])
Quality	Facilities Cleanliness Maintenance Safety	All publicly usable open spaces will score 'good' or better on the locally used quality assessment (According to Green Flag Award Scheme)
Quantity	Per capita open space	An open space should be at least 0.2 acres in size And minimum open space quantity 0.16 acres per 1000 person is needed for local level recreational purpose like, parks, playground, sports facilities etc. (DAP report,2010)

[1] For the lack of standards regarding accessibility and quality assessment of open space the standards from Green Flag Award Scheme has been followed for this study. The Green Flag Award Scheme is the benchmark national standard for parks and green spaces in England and Wales.

Open spaces should be accessible, safe, welcoming, appealing, distinctive and well connected. Within residential developments there should be spaces that can be used by everyone regardless of age, gender or disability. There are two main constraints on accessibility - physical constraints such as distance, degree of personal mobility and severance by roads, railways or other barriers, and social and cultural constraints such as fear of crime and other concerns over personal safety.

2.5.3 Rules and Policy for Open Space

Every city must have a policy outline for the control, preservation, reservation and use of its public open spaces. Over and above the planning principles, such policy matters need to be formulated in response to general public demand and the particular geographical and spatial situation of the city itself. In the long run, the effectiveness of public open space is related to how well such spaces are integrated into the overall design of the city. Sometimes, from city design perspective, it is claimed that the public and private open spaces also need to integrate for better efficiency of open spaces system (Barnett, 1982: 185) However; the institutional control is mostly limited to the available land which is under the state control. The planning decisions may also guide to generate open spaces in local level for the community itself and for that open space related rules and policy are discussed here-

2.5.3.1 Bangladesh National Building Code, BNBC

Community Open Space Zones in Area Layout: According to BNBC (2006), in diving any land measuring a total of 0.4 hectares or more into residential or business plots, community open spaces shall be reserved for recreational purposes of the population for which the layout is planned. The minimum requirement of open spaces in layout shall be as follows:

i. 15% of the area of the planned layout, or
ii. 2000 sqm for every 1000 persons. For approve low income housing this limit may be reduced to 1000 sqm for every 1000 persons.

The community open space in residential or business layouts shall as far as practicable be provided in one place or planned out to serve the community in clusters or groups. No such community open space plot shall be less than 400 sqm in area. The shape of the plot shall be such that length is not more than 2.5 times its width.

2.5.3.2 Building Construction Rules-2008

On 03.06.2009 Government promulgated a new rule for building construction that will create some open space in the city. The new rules amended Building Construction Rules-2007.

i. Maximum Ground Coverage: Under the new rule owners of up to 2 *kathas* of land will be allowed to use highest 67.5 percent of their plot of land to construct a building. They would have to construct building leaving 0.8 meter space at the edges instead of the previous one meter.

According to the new rules, owners, who have 2-3 *kathas* of land will be able to use 65 percent of the land, owners of 5-9 *kathas* 60 percent, owners of 9-12 *kathas* 57.5 percent, owners of 12-14 *kathas* 55 percent, owner of 14-18 *kathas* 52.5 percent, and owners of 18 *kathas* and above will be able to use 50 percent of the land for constructing their structures.

The new rules allow owners, who constructed their building according to the old rules, to internally modify their building leaving alone the length, width, height and total floor space of buildings. The new rule also says that an owner constructing a building under the Key Point Installation or Civil Aviation Authority of Bangladesh height restricted area would be able to use all the land after leaving minimum space around the building. The ground coverage rule of constructing building will not be applicable for them.

ii. Required Setback of the buildings are shown in Table: 2.5

Table 2.5: Setback rules

Height of the building: Maximum 33 meter or upto 10 storied			
Size of the plot	**Minimum setback**		
Katha	Front (m)	Rear (m)	Side (m)
up to 2 *kathas*	1.50	1.00	0.8
2-3 *kathas*	1.50	1.00	1.00
3-4 *kathas*	1.50	1.5	1.00
4-20 *kathas*	1.50	2.00	1.25
Above 20 *Katha*	1.50	2.00	1.50
Height of the building: More than 33 meter or above 10 storied			
Any amount	1.50	3.0	3.0

iii. Indications for Community space

If the size of the land for residential development is larger than 1300 sqm then 10% of the total land has to left for the play area for the residents. Half of the area can be covered but can't be surrounded by walls and it will not be included in the calculation of FAR.

2.5.3.3. Dhaka Structure Plan

Dhaka City Structure Plan [1995-2015] has clear vision regarding city's open spaces; and has formulated a number of policies. [Dhaka Structure Plan, Volume-I, 1995: 84-86]. One of the proposed policies is in brief:

• POLICY SE/ 10- AUGMENTING CITY OPEN SPACE

The Municipal Planning Authority [MPA] will seek to augment the City's existing stock of major recreational facilities by means of exploiting the resource of vacant and/ or under-utilized Government land within the established urban areas.

2.6 Methodological framework

As the study aims to understand the nature of morphological transformation of Segunbagicha, at first the morphological transformation of the urban fabric of the study area with the help of following variables are examined and compare them in each morphological phase of developments. The variables are land use, plot configuration and the pattern of plot sub-division and amalgamation, built-forms and changing pattern of their related open spaces which also explain the three fundamental elements of urban fabric. Analysis of change of these variables provides significant information on the physical and functional attributes of an urban area. Therefore these variables are studied and analyzed thoroughly in Chapter 03. Open space plays an important part in this study and for that a detail investigation of transformation in open spaces of the study area is also done in chapter 03.

The second part of the study aims to understand the impact on livability of the study area with special reference to the changes in open spaces. The impact on livability is studied through different aspects related to open space like, the qualitative, quantitative aspects, accessibility of open space, local needs, and satisfaction to open spaces, perception about livability of the residents in both present time and earlier period. The assessment of open space and the comparison of the residents' perception about open space and livability will guide the investigation in chapter 04.

Understanding the various aspects of urban fabric and livability through extensive literature study a theoretical framework is developed and shown in figure: 2.1.

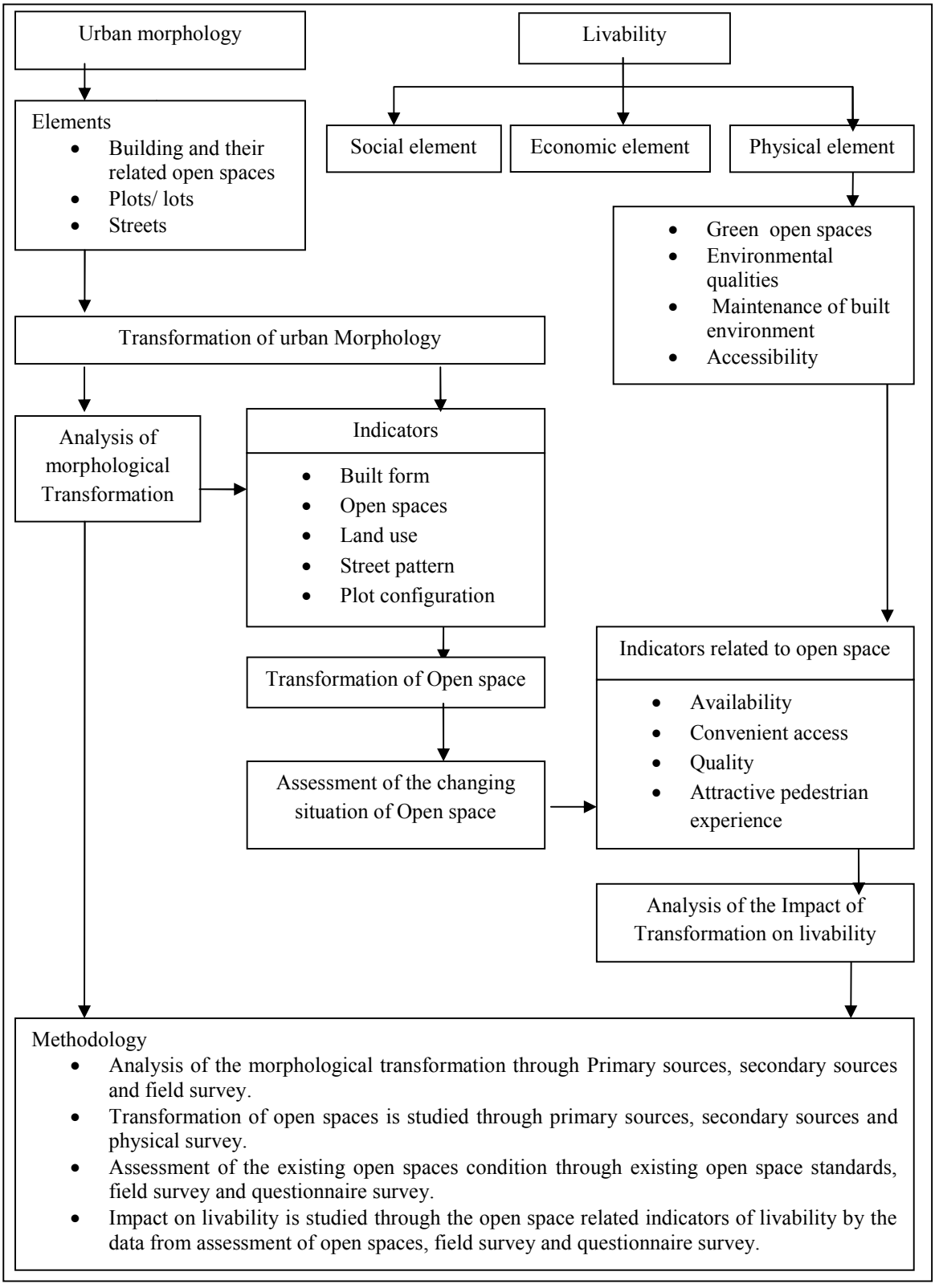

Figure-2.1: Methodological framework

2.7 Summary

The theoretical background discussed in this chapter develops an understanding that morphological transformation of an area is a complex phenomena arising from the inter-relation between various forces of physical and functional components of the urban environment. An understanding about livability is also developed through the literature and it is evident that the changes of elements of urban morphology especially open space have impact on livability of an area. With the help of theoretical framework designed for this research, the analysis through definite methodological approach will help us to find the answer to the research.

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Chapter 03

Chapter 03

Morphological Transformation of Segunbagicha

3.1 History and Background of Segunbagicha

The development of New Dhaka had started from the late nineteenth century. Segunbagicha is one of the old residential areas of Dhaka city near CBD. Segunbagicha has its historic existence tracing back as early as 1847 (Mamun, 2004). Segunbagicha was developed as a part of Ramna along with Motijheel and Paltan area. The northward expansion of the city extended from Ramna to Purana Paltan, Shantinagar and Segunbagicha area after Dhaka was made the capital of the newly formed province of Eastern Bengal and Assam in 1905. At that time, Modern European style office and residential buildings were built in Segunbagicha along with the whole Ramna area to cater the office and residential need of the newly created province (Chowdhury& Faruqui, 1989).

After the independence from British rule in 1947, Dhaka became the capital of East Pakistan. At that period the Motijhieel and Dilkhusha commercial areas were developed and Segunbagicha along with the adjoining areas of the city started developing (Chowdhury& Faruqui, 1989) (Fig: 3.1). In 1959 Master plan, Segunbagicha fall in two different zones. The north-west part lied in the administrative part and the south-east part lied in the upper-middle class residential zone (Fig: 3.2). Two major roads along Segunbagicha were proposed in the Master plan, the North-South road (Syed Nazrul Islam Sharani) and the Kakrail road (Anjuman Mufidul Islam road). The execution of this two roads segregate Segunbagicha from Paltan area and made it an individual urban block demarcated by four major roads, Topkhana road on the south, Kakrail road in the north, North-south road in the east and Captain Monsur Ali Sarani in the west.

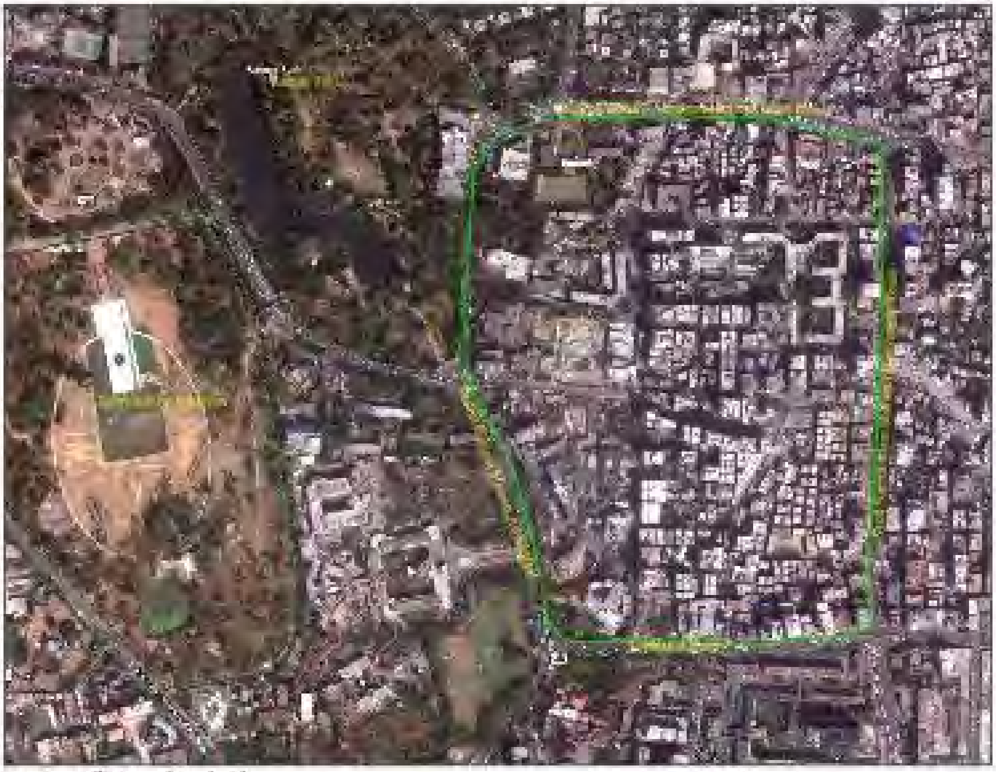


Fig 3.1.a : Satellite image of Segunbagicha
Source: Google Earth

Fig 3.1.b : City parks in the surrounding areas of Segunbagicha
Source: Map of Ramna Thana www.wikipedia.org

Fig 3.1.c : Dhaka city map with the location of Segunbagicha
Source: www.dhakacityphoto.blogspot.com

Fig 3.1 Map of Segunbagicha

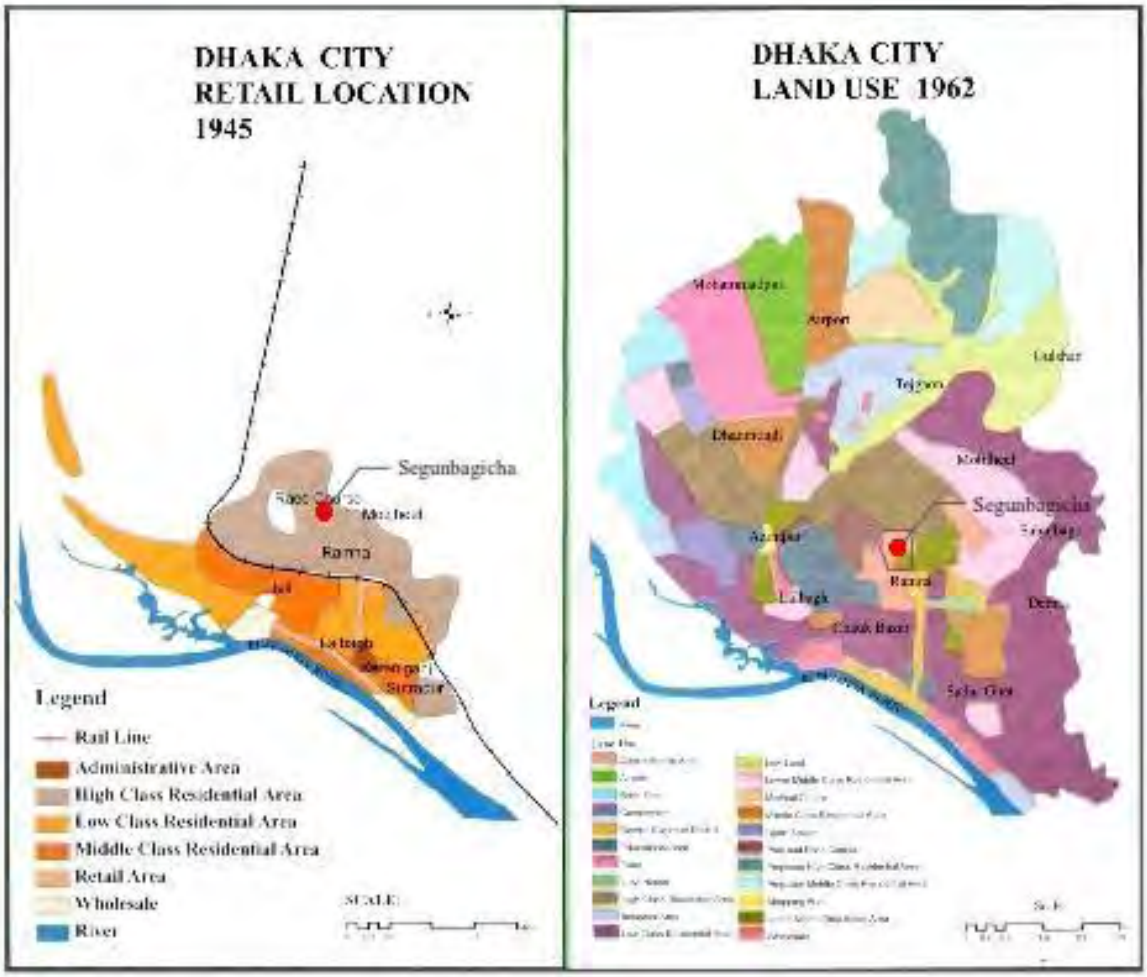


Fig 3.2: Land use map of Dhaka city with the location of Segunbagicha
Source: Ahsan,1989: 438.439

After independence the high-lands of Dhaka city along with Segunbagicha occupied by the sudden flow of people came to Dhaka, which accelerated the residential developments in this area. The close proximity of CBD (Commercial Business District), Secretariat, Press-club, High-court, Ramna Park and the peripheral office buildings played an important role in the transformation of the area. The significant location, ongoing housing needs and the increasing land value brought the developers in this area at the beginning of 1980s (Zakaria & Nahid, 2006). The introduction of high-rise apartment buildings made Segunbagicha a high-density[2] residential area. The area has been witnessing an unprecedented growth of urban development in recent years at a much higher rate compared to other part of the city. The declaration as mixed-use in the RAJUK structure plan (1995-2015) the area faces commercial intervention. Most of the low rise residential buildings redeveloped into-high-rise apartments and sometimes the original land use also changed in the process of redevelopment. Multistoried residential and commercial buildings are continually replacing the historic urban fabric (Rahman, 2009) and made Segunbagicha a highly dense area (Fig: 3.3).

3.2 Demography

Demographic structure of urban area is an important indicator of transformation of its original urban character and also has strong relation with livability. Whether an urban area is facing urban growth or decay of its natural environment is immediately reflected on the changes in total population, density, and household size. The total area of Segunbagicha is 0.47 sq. km and the total population is 21,727 approximately. The population density of the area is 46,227 person per sq. km (Appendix-A) which is higher than renowned residential areas like, Dhanmondi, 45,995 person sq. km and Gulshan , 29,187 person per sq. km (BBS, 2015): and also higher than the average population density of Dhaka city which is 45,000 person per sq. km (Cox, 2012). From the

[2] In 1995 Structure plan, Segunbagicha falls in SPZ-1(CBD south). According to the structure plan the population density of the area 183(ppa^2) in 1991 and increased into 293(ppa) in 2006. Here ppa stands for population per acre.

discussion it is evident that Segunbagicha has become a high-density area and the issue is needed to be focused for future developments.

3.3 Morphological transformation of Segunbagicha area

3.3.1 Land use:

Land use is one of the key element of urban design. With the growth of Dhaka city, changes in the economic environment brought significant change in the urban land uses in different part of the city. Segunbagicha area was developed at British period as high-class residential area. Later almost 50% of Segunbagicha were aquire for government or semi government organizations and institutions and reserved as adminitrative block, which remains almost same at present. On the other hand the residential part underwent a gradual transformation of land use its later phases. The residential development of Segunbagicha was intervented by commercial developments as the area listed as mixed-use zone. The commercial development brought significant change in the land use pattern of Segunbagicha. As the land use data of previous period was unavailable, the land use analysis of the study area is conducted with the help of 2003, 2010 and 2014 year maps only.

In **2003** map (Fig: 3.4) the dominance of residential buildings are evident in inner plots. 266 (51%) buildings are residential, 68 (13%) buildings are commercial, 91 (18%) are mixed use, 80 (16%) government or semi-government organizations and the rest are 'other'[3] use like institutional, industrial etc. From the analysis of 2003 map it is evident that most of the Commercial and mixed use developments were limited on the peripheral plots. It is found out that 54% of the commercial building and 81% of the mixed use buildings were on the peripheral plots.

[3] 'Other use' denotes the uses like industrial, institutional, health facilities etc.

A significant change in land use in the study area is visible in **2010** map (Fig: 3.4). The number of residential buildings decreased from 266 (51%) to 205 (34%). The number of mixed use developments is also increased a little from 91 (18%) to 96 (16%), but as a percentage of total number of buildings, it decreased. The number of commercial buildings increased almost three times (Table: 3.1) within these years and become 68 (13%) to 189 (31%). Most of the peripheral buildings along Bijoynagar Road and Topkhana Road, have transformed into high-rise commercial buildings. After 2003 the introduction of a link up road (Fig: 3.4) accelerated the gradual penetration of commercial use into the inner block. As a result, 46% of the commercial buildings are on the peripheral plot and rest of the building are at the inner side of the block.

From the study of **2014** map (Fig: 3.4) remarkable change in residential buildings is evident. The number of residential buildings decreased from 205 (34%) to 163 (27%) whereas the commercial building increased from 189 (31%) to 214 (35%) (Table: 3.1). The number of commercial buildings is much higher than the residential buildings at this stage.

The steep downward line of residential use in Fig-3.5 & Fig-3.6 shows the decreasing rate of the type and in opposite, the upward line of commercial use shows the increasing rate of the use. From the study it is evident that both commercial use and mixed use increased which is the proof of the dominating character of commercial use in the study area. In 2003, 48% of the commercial buildings were located inside the block which increased in 76% in 2014. The penetration of commercial use is noticeable. Commercial use also incorporated into residential buildings. From the study the dominating character of commercial use is evident. It is known that mixed use development create positive impact on livability but transformation of land-use from the actual plan has substancial impact on the given urban setting. So, there is a possibility that too much commercialization will hamper the livable condition of the residential area.

3.3.2 Street pattern:

Street is one of the most important elements of a city system. It is termed as the channel for frequent movement of all types of flow entities (Zereen, 2009). Generally street serves two basic functions that include facilitating movement (mobility) and providing access. To understand the transformation of the street pattern of Segunbagicha different period maps has been studied (Fig: 3.7).

Phase – 01 (C.S Map: 1912-1914) The development of primary street layout wasn't started at this stage. Two to three narrow streets were developed within the study area. Two major streets on the west side and south side demarcated the area boundary of Segunbagicha .

Phase -02 (S.A Map: 1958-1963): The primary street layout was developed at this phase. Along with the residential developments grid pattern streets were erected in the study area.

Phase-03 (R.S Map: 1973-1985): With the construction of North-south Road Segunbagicha became an individual urban block at this stage demarcated by four major streets: Topkhana Road on the south, Kakrail Road in the north, Captain Monsoor Ali Sarani to the west side and Bijoynagar Road on the east. To access the subdivided plots few internal streets were evolved. Later some link up streets were erected which increase the accessibility of Segunbagicha to a great extent.

Phase -04 (1997-2003): At this phase new street was developed beside 'Matshow Bhaban' which open up the block and increase the accessibility of the study area in great extent. It acts as a thoroughfare which create a direct link from ' Matshow Bhaban' to Bijoynagar Road.

Phase -05 (2014): At present most of the streets of Segunbagicha are straight and wide in shape. The main access streets of the area are 40-50 ft wide. In the southern part of the

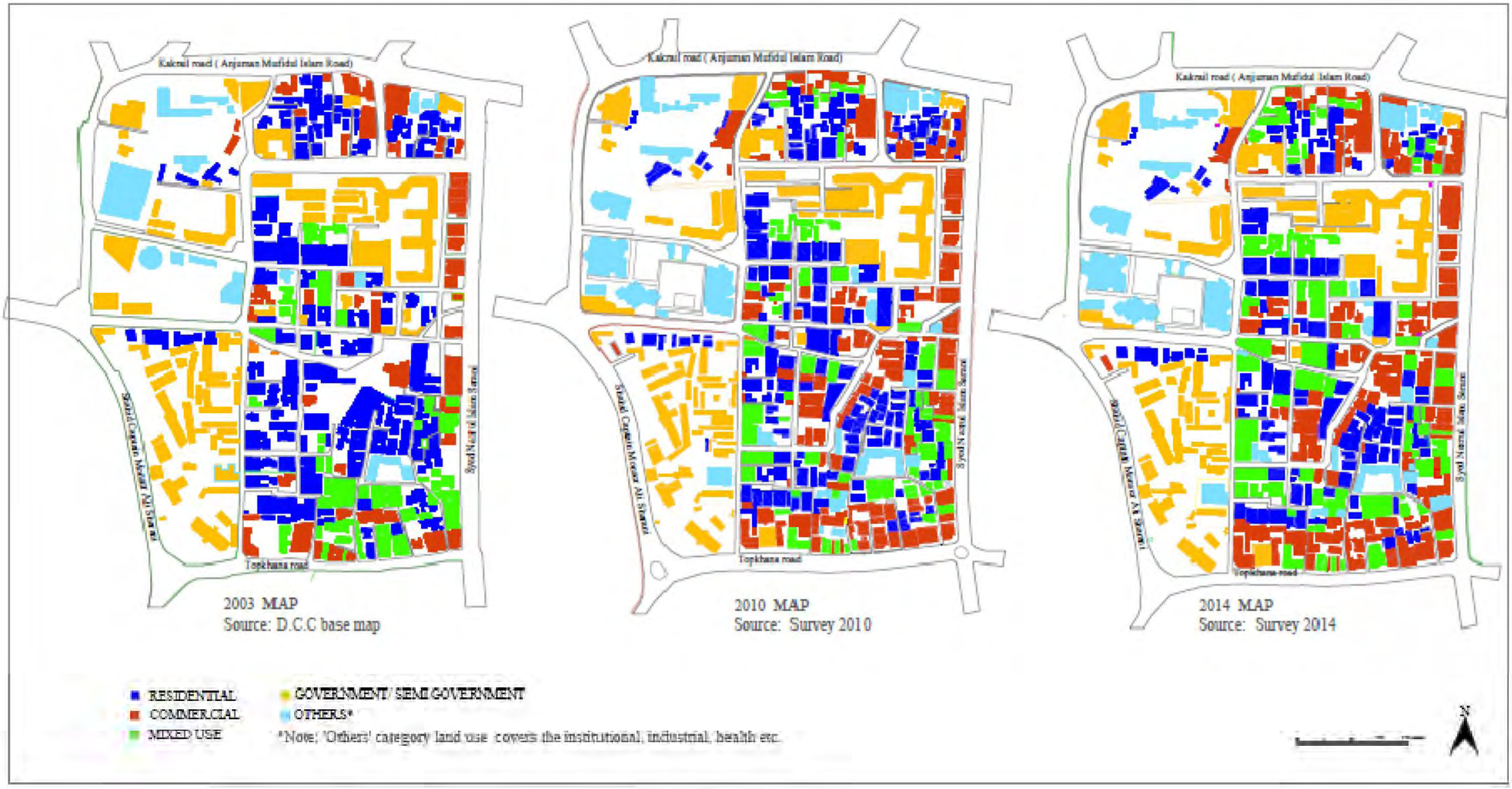
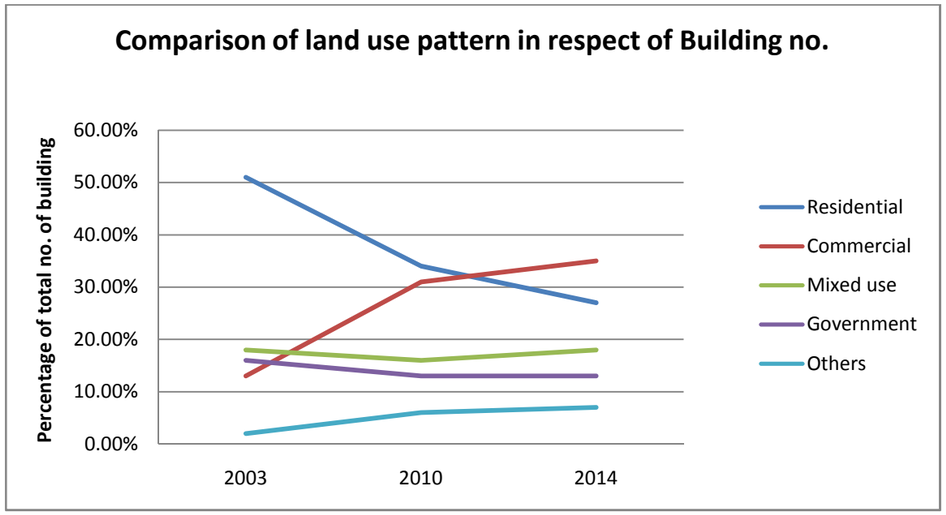


Fig 3.4: Transformation of Land use

	2003				2010				2014			
Land use	no. of Building	% of total no. of building	Built Area (sqm)	% of Total Build area	no. of Building	% of total no. of building	Built Area (sqm)	% of Total Build area	No. of Building	% of total no. of building	Built Area (sqm)	% of Total Build area
Residential	266	51%	49501	34%	205	34%	50176	28%	163	27%	40561	22%
Commercial	68	13%	20778	14%	189	31%	42735	24%	214	35%	51316	27%
Mixed use	91	18%	53981	12%	96	16%	23895	13%	110	18%	30474	16%
Government	80	16%	42849	29%	77	13%	42478	23%	77	13%	42478	23%
Others	13	2%	15463	11%	40	6%	22173	12%	45	7%	22428	12%
Total	518		145944		607		181457		609		187257	



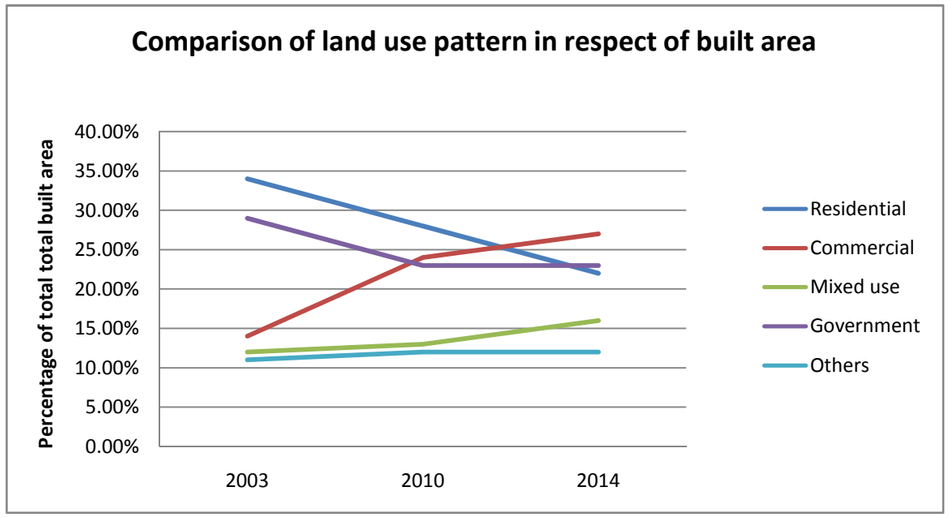


Fig- 3.7 : Transformation of Street Pattern

area at the initial stage the Roads were designed as interconnected grid pattern. The pattern of the street remains almost same only the addition of few link up Roads that increased the connectivity. The internal streets are 20-30ft wide in general. The streets on the northern part of the study are narrow and irregular in shape. In some part the streets are so narrow that any vehicle not even rickshaw can get through. Some of the streets of the study area are used as thoroughfare.

3.3.3 Plots

From the primary development stage, Segunbagicha area was divided in two part, administrative part and residential part. The plots of the administrative part are large land mostly irregular in shape and size, allocated to different government or semi government organizations/institutions. There was no significant change in the administrative part of the study area as the ownership and land use remain almost same unlike the residential part and for that focus of the analysis is given on the residential part.

Phase-01 (C.S map: 1912-1914): In this phase there was no significant developments were evidenced. The plots were not in any definite shape or size.

Phase-02 (S.A map: 1958-1963): The first phase of development of residential area, as evident from the map illustrates that most of the blocks were arranged in grid pattern (Fig: 3.8). Each block contains 4 to 8 plots. The size of the plots varied from 10-20 katha mostly and were regular (rectangular or square) in shape. The block on the south-east corner was densely subdivided with relatively small plots. Organic development of plots was evident on the northern side of the study area. Most of the plots were irregular in shape and size.

Phase-03 (R.S map: 1973-1985): In this phase (Fig: 3.8) the incident of subdivision in plots were evident as the demand of residence increases after independence. Large size plots were subdivided into two or three smaller plots. Where needed provision by lane

Fig- 3.8 : Transformation of plots

was made for access to the plots at the rear. The incident of amalgamation is rare. A significant change was brought with the development of North-south (Bijoynagar Road) which transformed the inner plots into peripheral plots. But this incident did not change the plot configuration much.

Phase -04 (1997-2003): A radical change of plot configuration is evident at the Mahanagar jarip map and 2003 D.C.C map of the area compared to the early stage maps. In this phase, the successive division of plots was observed. Some plots which were sub-divided in the previous phase were seen to be amalgamated. So plots were sub-divided in one phase and amalgamated again in the next phase to accommodate the changing land use according to the user's preferences.

Phase-05 (2014): A morphological transformation of plots is documented in the field survey at 2014. The incident of sub division and amalgamation is also observed at this phase.

From the analysis of different period maps it is evident that the plots of Segunbagicha were developed as both planned and organic ways. The plots of the study area subdivided in three to four times and become small in size. Some cases introduction of new streets reshaped the plots on the other hand amalgamation of plots sometimes dissolved street. The incident of amalgamation of plots is less than subdivision in the study area. From studying different period maps it can be said the subdivision rate is much higher in the inner plots than the peripheral plots. There is no significant change in the plots of the administrative part of the area.

3.3.4 Built form and related open spaces

Buildings are the basic element of urban block. Taking city block as a spatial unit a morphological analysis based on buildings can be related to the analysis of different aspects of urban areas. Building and their related open spaces are important element of

urban fabric. To understand the morphological transformation of built form and their related open spaces the analysis has been conducted under the following two points:

i. Vertical extension
ii. Building footprint and open space

i. Vertical extension: From the study of heights of the building (Table: 3.2) it is found that 85% (392) building in 2003 were under six storey. Whereas the percentage decreased and became 75% (394) in 2010 and 73% (390) in 2014. A significant change is noticed in six to nine storey buildings. In 2003 six to nine storey buildings were 13% (60), it increased and became 17% (84) in 2010 and 16% (88) in 2014. A massive change is noticed in ten to fifteen storey buildings. In 2003 it was

Table 3.2: The study of building height [excluding temporary (kacha) structure]

No. of storey	Year					
	2003		2010		2014	
01(One)[1]	166	36%	150	29%	154	29%
02(Two)	66	14%	64	12%	72	14%
03(Three)	49	11%	71	14%	61	11%
04(Four)	56	12%	60	11%	55	10%
05(Five)	55	12%	49	9%	48	9%
6(Six)	21	5%	36	7%	35	7%
7(Seven)	4	1%	29	6%	29	5%
8(Eight)	25	5%	10	2%	11	2%
9(Nine)	10	2%	9	2%	13	2%
10(Ten) - Fifteen	7	2%	28	5%	40	8%
Sixteen - Twenty			13	3%	13	3%
Above twenty			1		2	
Total	459		520		533	

[1] Calculation of one storey buildings includes semi-pacca structures.

2% (7), which increased to 5% (28) in 2010 and 8% (40) in 2014. From the Table 3.2 it is found that ten to fifteen storey building is not noticed in 2003. But later in 2010, 3% (13) and in 2014, 3% (13) ten to fifteen storey buildings are noticed. At 2010 and 2014, buildings above twenty storeys are also noticed. From the data it is clear that there is a significant increase in the numbers of high-rise buildings in the study area. The fact implies that there is a trend of high rise building construction is developing, which brought a significant change in the urban fabric of Segunbagicha area.

i. Building footprint and open space: Along with the increase in building height, the change in building footprint and open space is also evident in the study area. The transformation of building footprints from different phases of developments is shown in the Figure Ground Map[2] (Fig: 3.9). From the map (Fig: 3.9) it is evident that there is a massive change in built form of Segunbagicha. To understand the change some quantitative measures are conducted. The area of built form and open space of the study area calculated from different period maps and made a comparative analysis.

Table-3.3: Percentage of built area and open space

	% of Built area	% of Hard surface (Roads, pavement etc.)	% of Open space
R.S(1972-1984)	12%	6%	82%
2003	32%	10%	58%
2010	39%	30%	31%
2014	41%	30%	29%

From the Table:3.3 it is seen that even after independence of Bangladesh(1971) the built area was only 12% and open space was almost 82% of the total area. A massive change is

[2] A *Figure-ground diagram* is a two-dimensional *map* of an urban space that shows the relationship between built and unbuilt space. Figure-ground drawings are effective means of visual communication as they filter information in a binary categorization that assigns values of figure and ground.
It is used in analysis of urban design and planning (Wikipedia)

noticed in 2003 map where built area increased 12% to 32% of the area. On the other hand open space decreased almost 24%. This trend continues onwards. In 2010 a massive change in hard surface is noticed which cause a drastic change in open space. The area of the built form (39%) increased than the area of open space (31%). This incidence tends to continues and in 2014 the built area becomes 41% whereas the area of open space 29%. From the Table: 3.3 it is evident that there is a massive change in hard surface in recent years.

From the diagram (Fig: 3.9) it is evident that the open spaces of Segunbagicha are progressively filled by larger building area and forming a dense urban fabric. To understand the change in detail, the private plots which face significant transformation in its built form and open spaces, are selected randomly from different blocks of the study area. Then the built area and open space are calculated for each successive phase of developments to have a quantitative comparison. From the analysis of the Table: 3.4, it is found that many plots were vacant at phase -01 and the plots were developed had mostly 10% -20% of built area which leaves 80% - 90% of open space. In the phase-02 most of the plots were developed. The built area covered 12% to 40% of the plots that left 60% - 90% of open space. In the 3rd phase built area covered 7% to 65% of the plots in general. New development of built form was noticed which covered up to 90% space of the plot. Demolition / redevelopment of built form were noticed at this stage. In phase -04 new buildings were developed with larger footprint which means an increase of built area and decrease in open space. This incident continues and in phase -04 all the plots are developed and the new buildings hardly left any open space. The built area covers 70% to 90% of the plot in phase -05. From the analysis it is evident that at initial stage a small portion of land was used for building and rest of the land was kept open whereas at the last phase the opposite incidence occurred, which implies that the basic pattern of built form and open space of the study area has transformed.

Fig- 3.9 : Figure Ground maps of Segunbagicha

Table 3.4 Transformation of Built form in randomly selected plots

PLOT NO.	HOLDING NO.	Phase - 01 S.A MAP			Phase - 02 R.S MAP			Phase - 03 M.J MAP			Phase - 04 2003 MAP			Phase - 05 2014 MAP		
1	46 Eakrail		Built form	0%		Built form	0%		Built form	90%		Built form	90%		Built form	90%
			Open space	100%		Open space	100%		Open space	10%		Open space	10%		Open space	10%
2	69 Pioneer Road		Built form	0%		Built form	27%		Built form	35%		Built form	0%		Built form	76%
			Open space	100%		Open space	73%		Open space	65%		Open space	100%		Open space	24%
3	3 Segunbagicha		Built form	17%		Built form	21%		Built form	7%		Built form	78%		Built form	78%
			Open space	83%		Open space	79%		Open space	93%		Open space	22%		Open space	22%
4	25 Segunbagicha		Built form	11%		Built form	20%		Built form	23%		Built form	24%		Built form	70%
			Open space	89%		Open space	80%		Open space	77%		Open space	76%		Open space	30%
5	19 Segunbagicha		Built form	11%		Built form	29%		Built form	0%		Built form	33%		Built form	85%
			Open space	89%		Open space	71%		Open space	100%		Open space	67%		Open space	15%
6	6/8A Topichana		Built form	0%		Built form	40%		Built form	0%		Built form	0%		Built form	79%
			Open space	100%		Open space	60%		Open space	100%		Open space	100%		Open space	21%
7	3 Segunbagicha		Built form	11%		Built form	12%		Built form	15%		Built form	14%		Built form	74%
			Open space	89%		Open space	88%		Open space	81%		Open space	86%		Open space	26%
8	10/A Segunbagicha		Built form	38%		Built form	40%		Built form	65%		Built form	66%		Built form	80%
			Open space	62%		Open space	60%		Open space	35%		Open space	34%		Open space	20%
9	8/1 Segunbagicha		Built form	0%		Built form	18%		Built form	41%		Built form	82%		Built form	82%
			Open space	100%		Open space	82%		Open space	57%		Open space	18%		Open space	18%

3.4 Transformation of open spaces in Segunbagicha

From the previous discussion it is evident that the morphological transformation of built form brought a massive change in the open spaces of Segunbagicha which can affect the livability of the area. To enhance livability of an area special care should be taken in both private and public open spaces because both contribute for livability. The public open spaces contribute directly by creating opportunities for physical activity but the contribution of privately owned open spaces is passive as it enhances the natural environment, helps to get rid of monotony and create positive impact on mental health. As focus of this study has been given on livability of residents of the study area, it is very much important to understand the changes in open spaces in both; part of administrative developments (government & semi government organizations) and part of private developments (residential & other). To understand the change in open spaces comparative analysis of different period is conducted.

From the map (Fig:3:10) total amount of open space both in respect of administrative part and in respect of private developments is calculated. From the table: 3.5 it is seen that in R.S map 96% of the administrative part was open space whereas 76% of the part of private developments were open. In 2003 the total open space of the administrative part was 89%. A massive change is noticed in the open spaces of administrative part in 2010 and it became 46%. It decreased by 6% and became 40% in 2014. But the change of calculated open space in respect of residential part is much higher (Table: 3.5). It is also found that in 2014, the amount of open space in respect of total areas was 6.26 sqm per person, whereas the open spaces in residential part was 2 sqm per person; which implies the dense developments and lack of open space in the residential part.

Table-3.5: Changes in open space

	R.S	2003	2010	2014
Open space in the administrative part	96%	89%	46%	40%
Open space in the residential part	76%	40%	24%	21%

Fig 3.10: Transformation of Open spaces

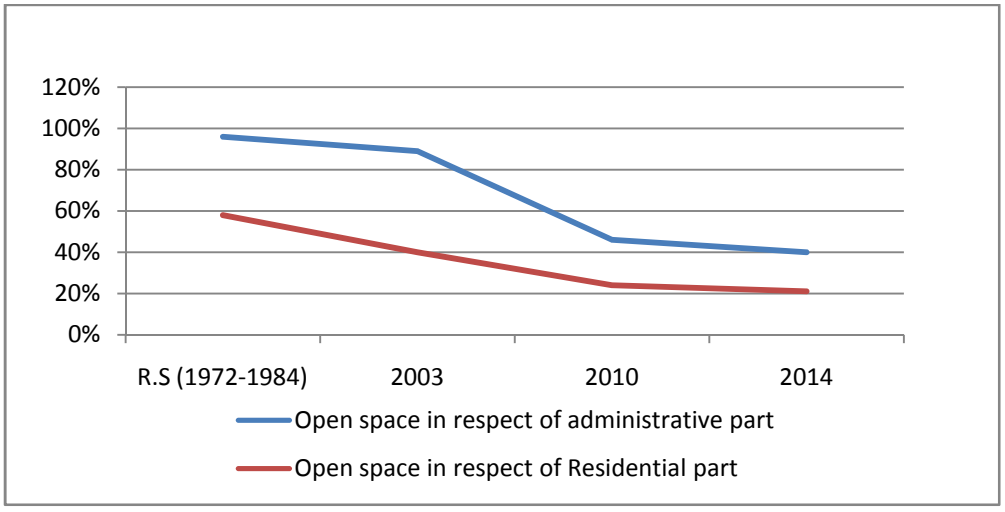

120%
100%
80%
60%
40%
20%
0%
R.S (1972-1984)
2003
2010
2014
Open space in respect of administrative part
Open space in respect of Residential part

Fig 3.12: Analysis of blocks

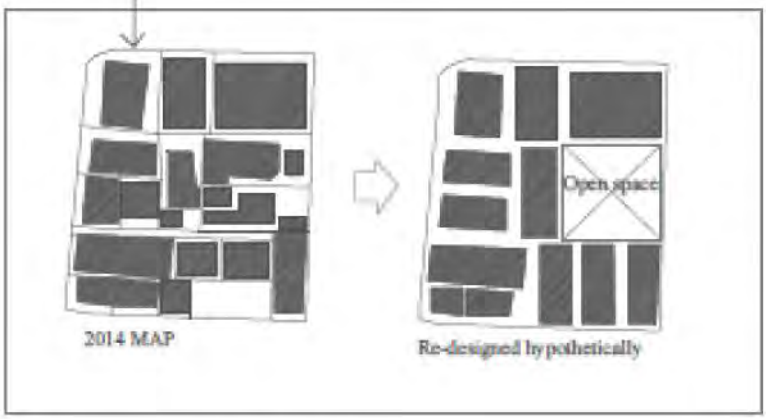


Fig 3.13: Study of plots

of the land is larger than 0.4 hectare, 15% of the land has to kept open for recreation purpose; that is 1139 sqm. The size of the open space is large enough to serve for children play area which implies that large plots have more possibilities of usable open space. So, if individual blocks can design as a single plot without dividing it, small scale open space can be created with compact built form developments which can bring significant contribution to the open space scenario of the study area.

3.5 Summary

The transformation of urban fabric is a common phenomenon. Every city or urban area need to evolve to accommodate the growing need of human activities. The study area also faces unpredictable transformation in its urban fabric. Segunbagicha was developed at British period but the area experienced significant change in last 15 years. The area was developed as residential, along with administrative part. Later it was developed as mixed use and remains as same. But in recent time, a trend of commercialization is developing in the area. The introduction of new streets made the area more accessible which leads the transformation of land use pattern. The original street pattern remains the same. Inner plots of the study area face subdivision two to three times. Amalgamation of plots is rare. Peripheral plots almost remain unchanged. The built form of the study area faces remarkable change in last decades. The basic structure of residence has been changed. The large open space adjacent to residences of the study area almost diminished with new development of high-rise apartments and commercial buildings. As a result, the study area changed from serene green to dense developments.

From the discussion in this chapter it is evident that the changes of components of urban fabric are inter-related in many ways which is also established in literature review. The close proximity of CBD and the increasing accessibility influence the change in land use. The changing land use and intensity of use affecting the density of built form and this influence the change in plot configuration. This dense development of built form and subdivisions of plots ultimately affected the open spaces of the study area. It is well

known that open space is a key indicator of livability. So the impact of diminishing open space on livability of the study area is a big concern.

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Chapter 04

Chapter 04

Open space and Livability of Segunbagicha

4.1 Introduction

The morphological transformation of urban fabric in Segunbagicha brought significant change in residential density and open spaces along with land use, accessibility and other factors associated with urban growth. From the analysis of transformation of open spaces in Chapter Three it is found that the rate of diminishing open spaces in Segunbagicha area is much higher in last decade. Open space is an important physical element of livability and any significant change in open spaces can create an effect on livability. So, how much the transformation of open space affecting the livability of the study area is questionable.

4.2 Open space scenario of Segunbagicha

"Dhaka was once full of trees. As there were plenty of Shegun (teak) trees in the study area, it was called Segun bagicha(garden)."(Muntassir Mamoon, 1991). From this statement it is clear that in spite of being in the centre of the city Segunbagicha was full of different types of trees along with large evergreen trees. These large trees kept the area green for whole time of the year. As sizes of the plots were large the residences were left with a large open ground with lots of trees and sometimes beautiful gardens. Low fences were used as boundary in most of the cases where the buildings visually look like small islands on a green sea. There were abundant open spaces adjacent to residence and different organizations but no central playground or parks were allocated for the recreation of the residents of the area from the beginning. The open spaces adjacent to Segunbagicha School, Shilpakala Academy, Anti Corruption Commission, Church, International Mother Language Institute, National Board of Revenue, were all easily accessible and used by the residents of the study area.

From the analysis of transformation of open spaces in earlier chapter it is found that the open spaces of Segunbagicha faces tremendous change. Due to the transformation, the open spaces of Segunbagicha used by the residents are not in its original state. From the physical survey it is found out that there are several provision of open spaces in Segunbagicha which can be possible recreational open space, few of them which either unused or not in the perfect condition for use. From physical survey the following open spaces (Fig: 4.1) are found –

i. Open space adjacent to Segunbagicha School: The ground is a School playground in front of Segunbagicha school building. Size is 0.39 acres. The site is in usable size and condition.
ii. Open space adjacent to Shilpakala Academy: The ground is a part of the Shilpakala Academy complex. Size is 1.39 acres. The site is in usable size and condition.
iii. Open space adjacent to Shilpakala Academy Gallery: The ground is a part of the Shilpakala Academy complex. Size is 0.74 acres. The site is not in usable size and condition.
iv. Open space adjacent to Anti Corruption Commission: The ground is a part of a public office and the size is 1.3 acres. The site is in usable size and condition.
v. Open space beside International Mother Language Institute: The ground is a government land and the size is 1.83 acres. The site is in usable size but at an abandoned state.
vi. Open space adjacent to Church: The ground is a part of Kakrail Church Complex and size is 1.48 acres. The site is in usable size and condition.

From the above open spaces at present only four are found in usable size[1] and condition for outdoor recreation, measuring a total area 4.56 acres aprox. Apart from these open

[1] An open space should be at least 0.2 acres in size for public use (DAP Report, 2010)

Fig 4.1 : Existing Open spaces of Segunhapcha

spaces, Segunbagicha is surrounded by three major parks: Ramna Park (58 acres), Sohrawardy Uddayan (55 acres), and Osmani Uddayan (10 acres) (Nilufar, 2000).

As the focus of this chapter is to understand the effect of changing open spaces on livability of the area; how much the open spaces of the study area contributing in the life of the residents, are needed to be assessed. The assessment of open space is done based on two aspects:

a. Open Space as a physical element of livability
b. Perception of the Residents

4.3 Open Space as a physical element of livability

The contribution of open space as a physical element of livability focuses on three criteria: quantity, quality and accessibility. Therefore, open spaces can be assessed by analyzing these criteria. The assessment is conducted with the help of both physical observation and questionnaire survey. The overall assessment is only conducted on the sites those are accessible to the residents of the study area.

4.3.1 Accessibility

Public open spaces are important indicators for livability, health and wellbeing. Well accessed open space can promote physical activity on the other hand visual access can create positive effect on mental health. The use of an open space largely depends on the accessibility of that space. The assessment of accessibility has been undertaken on the basis of

- Physical and visual access to open spaces and
- Open space provision across the area within the recommended thresholds[2].

[2] It is recommended that all residents should have access to public park provision of some form within 400m of home. (Green Flag Standard)

4.3.1.1. **Access to open space:** It is observed during survey that none of the existing open spaces in Segunbagicha is designed considering the use of the residents of the area as they are part of some organizations/ institutions. The accessibility of most of the open spaces is either restricted or accessible for limited period.

i. The accessibility of Anti Corruption Commission ground is restricted for general people. According to the officials of Anti Corruption Commission a few years back the ground was open for all but now the accessibility is restricted for security reason. Moreover the building itself and its high solid boundary walls blocked the visual access of the ground (Fig: 4.2).

ii. The open space adjacent to the Church is also restricted. This Church is the head office of Catholic Church of Bangladesh. According to Fr. Gabriel Priest of the church, for security of the head Catholic priest the access is kept restricted for general people. The open space is used for the physical training of the trainee priests who live in the hostel adjacent to the open space. For the safety and privacy of the hostel and the complex, the visual access is also blocked by high solid walls and the buildings itself (Fig: 4.2).

iii. The ground of Segunbagicha School is accessible for limited period. The ground is open for general people after the school is closed. The access roads have no footpaths. The road is blocked by garbage, mobile shops and hawkers (Fig: 4.3). The visual access is blocked by solid high walls. From the physical survey it is observed that the location of Segunbagicha School is ambiguous and not easily spotted from other part of the study area.

iv. The ground of Shilpakala Academy is the focal point of Segunbagicha and easily accessible from all places of the study area. The open space is accessible for all but for limited period. Among four gates only one kept open for all day for the official work and others are open from afternoon generally when the theater is open. The footpaths around

Shilpakala Academy are blocked by tea stalls, different goods (old carpets, old furniture etc.) from nearby shops kept on the footpath etc. (Fig: 4.3).

4.3.1.2 Distance to open space: According to the recommended standards mentioned in the literature review, all residents should have access to public park/open space provision of some form within 400m[3] of home which is also the catchment area of the site. As a part of administrative or institutional buildings most of the open spaces in Segunbagicha area is located in one side of the study area. Only Segunbagicha School ground is on the residential part. From the analysis of catchment area map (Fig: 4.4) it is found that the catchment area of the four open spaces individually covers only a small part of the study area. As, Shilpakala Academy ground and Segunbagicha school ground only have the provision of access for the residents; the catchment area of these two open spaces are significant. From the analysis of catchment area map it is evident that most of the residential area is covered within the cumulative catchment area boundary of four open spaces. But if only the accessible open spaces are considered then an entire block on the north-east corner of the residential part are outside the boundary of catchment area.

4.3.2 Quantitative measure

The assessment of **quantity** has been undertaken on the basis of a review of the amount of publicly usable open space, in relation to local population and made a comparison against the recommended standard[4].

As a result of transformation, the quantity of open spaces also reduced. From the analysis of Chapter 03 it is found the quantitative measures of open space includes all kinds of

[3] **Converting time into distance:** Research undertaken on behalf of LPAC in 1992 identifies that a 5 minute pedestrian travel time represents a distance of 400m on the ground for less mobile sections of the community including parents with young children, the elderly and disabled. However, a straight line distance cannot be directly used to represent a pedestrian catchment on a map as the actual walking distance is influenced by severance factors (e.g. railway lines, busy roads), topography, the location of park entrances and the morphology and grain of the surrounding pedestrian route network (Turner, 1992).

[4] According to DMDP, 0.16 acre of local level recreational use like parks, playgrounds etc are needed per 1000 people.

a- Front Facade of Kaleyali Church

b- Ground of Kaleyali Church

c- Ground of Anti Corruption Commission

d- Front Facade of Anti Corruption Commission

Visual access of open space of b & c is blocked by the building in a & d

Fig 4.2: Visual access of open space

1 & 2: Pedestrian access of Shilpakala Academy are blocked by goods from nearby store and D.C.C garbage container

3 & 4 : Blocked Entrance of Shilpakala Academy

5 & 6: Poor quality Pedestrian access of Segunbagicha School Crossing

Fig 4.2 : Physical access of the existing Open spaces of Segunbagicha

Fig - 4.4 : Catchment area map

Source: Field Survey, 2014

green areas (public/semi public/private) and all of them are not in usable shape and size. All the open spaces cannot be used for recreational purpose for lack of size and accessibility. Among the existing open spaces mentioned in earlier section, only Shilpakala Academy ground and Segunbagicha school ground have the provision of access to the residents of the area and for that the area of these two sites are considered as usable open space which is 1.78 acres in total . The total population of the study area is 21,727 (Appendix- A). According to DMDP, 0.16 acre of local level recreational use like parks, playgrounds etc are needed per 1000 people. So, the usable recreational open space needed for the residents is-

$$\text{Total population of the area} \times \text{Per capita open space} = \frac{21727 \times 0.16}{1000} = 3.47 \text{ acres}$$

From the analysis it is found that the existing usable open spaces (1.78 acre) in the study area are much lower than the required level of open space which is 3.47 acres. But, if the quantity of all the usable but inaccessible open space is calculated then the total amount will be 4.56 acres (aprox.) which is higher than the required level.

4.3.3 Qualitative measure:

The assessment of **quality** has been undertaken on the basis of site visits to accessible open spaces to rate a number of key criteria affecting quality. The site quality audits undertaken are based upon the field assessment criteria of the quality standard for parks and open space 'The Green Flag Standard' (Appendix G). The assessment is conducted through a visitor's perspective and is based upon a 'snapshot' view of the site, at the time of the visit by the researcher.

The assessment of quality has been undertaken on the basis of site visits to the existing open spaces which are accessible to the residents. From earlier discussion it is found that only two sites of the study area, Shilpakala academy ground and Segunbagicha school ground are accessible to all and being used by the residents. After visiting these two open spaces (Fig: 4.5) during the physical survey, the quality is assessed using the Open Space

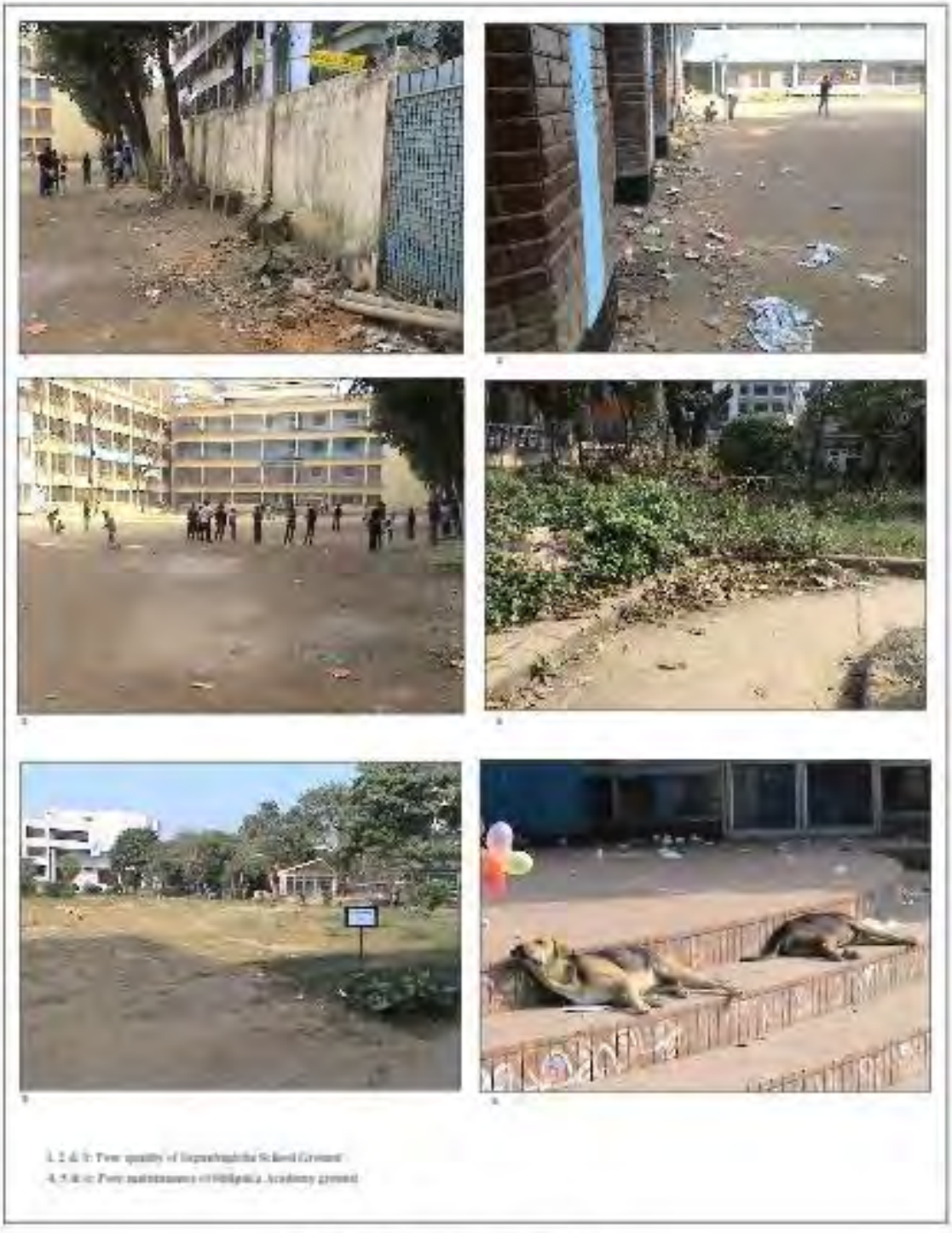


Fig 4.1 : Quality of the existing Open spaces of Gopalapuram

Assessment Manuel by Green Flag Association (Appendix: G). Based on Green Flag Assessment Manuel, the scores are given based on the description on the Manuel where very good=4, good=3, average=2, poor=1 and very poor=0 points.

Table: 4.1 Qualitative data (Based on appendix: G)

	Shilpakala Academy ground		**Segunbagicha School ground**	
Key critetia	**Score**			
Layout, Balance and Setting *(parks only)*	N/A (this criterion is only applicable for parks.)			
Experience of Nature *(nat/semi natural urban g.space only)*	N/A (this criteria is only applicable for natural /semi natural urban space)			
Safety	Good	3	Good	
Linkages via - Public Transport	N/A			
Linkages via - Cycle ways	Average	2	Very poor	0
Linkages via - Footpaths/Pedestrian	Poor	1	Very poor	0
Entrances or Access points/areas	Good	3	Average	2
Boundaries	Good	3	Average	2
Disabled access	Poor	1	Very poor	0
Roads, paths, cycle ways	Good	3	Poor	1
Planted Area (Formal planting, flora areas etc.)	Good	3	Very poor	0
Vegetation (informal shrubs, trees, hedges etc)	Very poor	0	Very poor	0
Grass Areas	Poor	1	Very poor	0
Water (still and moving)	N/A			
Ambient Noise	Average	2	Average	2
Evidence of Vandalism	Very good	4	Very good	4
Litter	Average	2	Average	2
Litter Bins	Very poor	0	Very poor	0
Dog fouling	Poor	1	Very good	4
Dog Bins	N/A			
Seats	Very poor	0	Poor	1
Toilets	Average	2	Very poor	0
Parking	Good	3	Very poor	0
Cycle stands	Very poor	0	Very poor	0
Lighting	Poor	1	Very poor	0
Information & signage	Average	2	Very poor	0
Information available before visiting	N/A			
Equipment/play areas	Very poor	0	Poor	1
Events	Average	2	Very poor	0
Average score	**Below average**	**1.68**	**Below poor**	**0.95**

From Table 4.1 it is found that the safety, boundary, entrance, roads and planted area of Shilpakala Academy ground are good. Toilet, cleanliness, information & signage are average. The lighting conditions, grass area, litter bins are poor and seats, equipment, vegetation are very poor. Paths on sites are generally level and in good condition. The cleanliness of the study area is poor.

The safety of Segunbagicha school ground is good. Entrance and boundary condition are average. Roads, seating condition, sports equipment and cleanliness are poor. The other features are very poor. In average the quality of the open spaces are below average.

According to the 'The Green Flag Association Standard' all publicly usable open spaces will score 'good' or 'better', but from the assessment (Table: 4.1) it is found that the overall quality of open spaces of the area is below average which is not up to the mark.

4.1 Users perception

Livability of an area is very much related to the perception and satisfaction of the people who lived there. To understand the need, pattern of usage, expectations and satisfaction related to open spaces and most of all the response about livability of the area, two type of questionnaire survey is conducted among the residents of Segunbagicha.

To understand the open space scenario of earlier period an unstructured questionnaire survey is conducted among the residents who have been living in the study area for a long time or a person who had been lived in the study area in earlier period. To understand the response of the residents at present period a structured questionnaire survey is conducted among the residents who are living in the study area at present (Ref: Appendix E: Questionnaire, Appendix F: User's profile).

4.4.1 Use of open space: From the discussion with the residents who are living in the area for a long time, it is found that in earlier period all the available open spaces adjacent

to different organizations and institutes were well accessible to all and for that the residents could use the open spaces spontaneously. People visited the open spaces frequently for playing, walking, physical exercise, leisure activity etc. Children also play on the vacant plots and open spaces close to their residence. The residents hardly used the open spaces in surrounding areas like Ramna Park , Sohrawardy Uddayan and Osmani Uddayan.

From the questionnaire survey among the residents of present period, it is found that, 49% of the total respondents have visited open spaces frequently (weekly/ daily), 47% have visited occasionally and 4% never visited any of the open spaces considering the open spaces of the study area and in the surrounding areas. Among the frequent user 9% use open spaces of the study area only, 19% use open spaces only in the surrounding areas and 21% use both the open spaces of the study area and in the surrounding areas.

According to the respondents the most popular reason for visiting open spaces is walking followed by leisure activity. A number of people also visited open spaces for playing/sports, physical exercise etc. From the Fig: 4.6 it is evident that the outside open

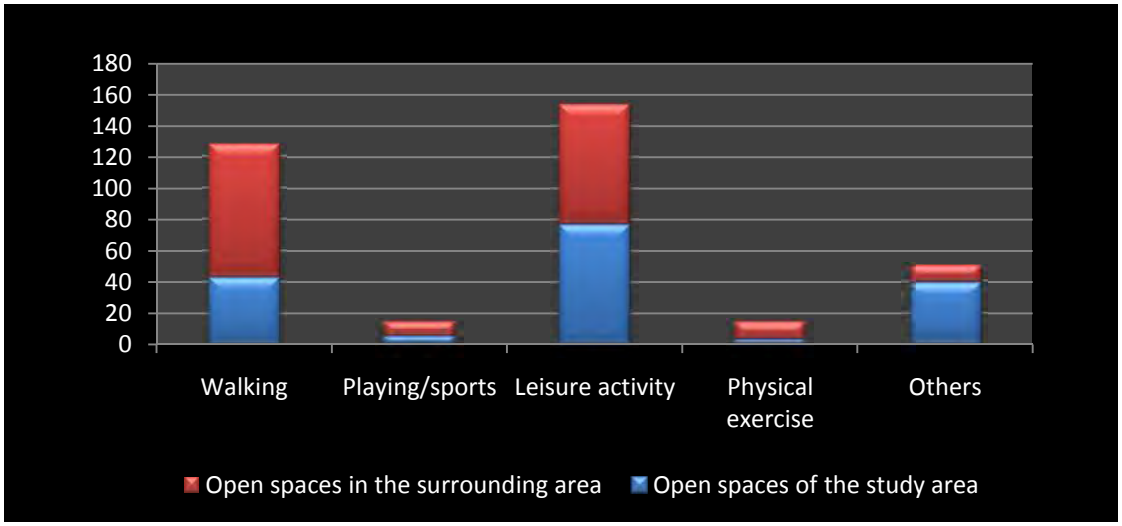


Fig- 4.6: Type of use of open space

spaces are used more than the open space of the study area for walking, playing and physical exercise. Few of the respondents mentioned lack of facilities, maintenance and safety as a reason for not using open spaces of the study area.

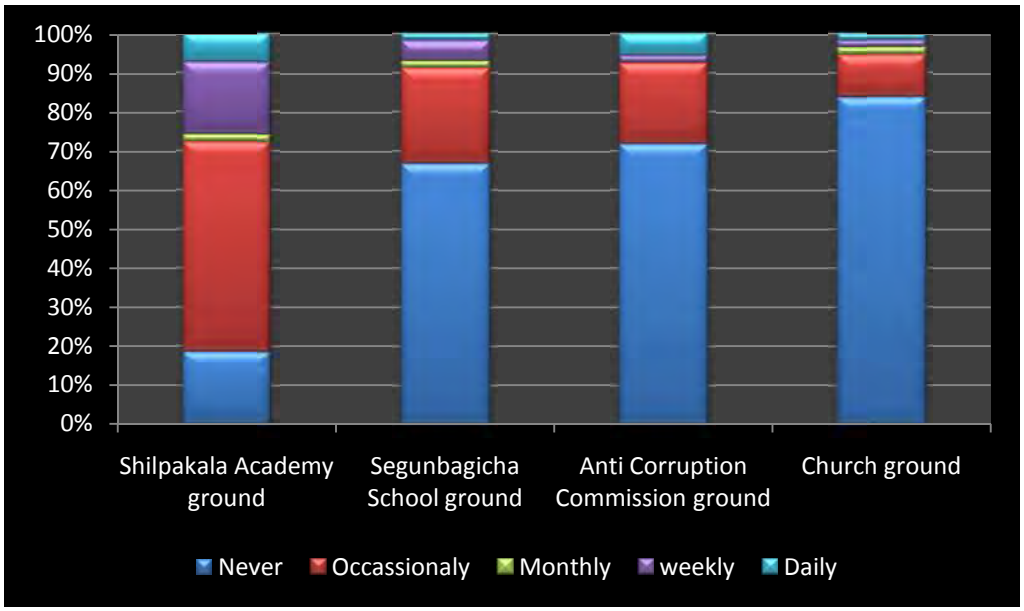


Fig-4.7: Frequency of use of open spaces of the study area

From the Fig: 4.7 it is evident that among the four open spaces of the study area a large percentage of respondents visited none of the sites except Shilpakala Academy as they were not aware of those sites, which strengthen the fact that most of the open spaces of the study area are not well accessible considering physical and visual access (from physical survey in earlier section). According to the Questionnaire survey Shilpakala Academy ground is well accessible open space and also frequent users mostly visited the site. From the above discussion it is evident that the sites which have better accessibility (from physical survey in earlier section) are being visited mostly

From the survey it is also found that 36% of the frequent users who uses open spaces both of the study area and the surrounding area, are middle aged men and only 4% are

women and children. According to the women and children, the reasons of not going to open spaces are: too far, not easy to go around and too many roads to cross. From the physical survey it is found that, the residents of the study area have to cross primary roads to visit Ramna Park, Sahawardi Uddayan and Osmani Uddayan. As almost 87% of the respondents travel to open spaces by walking, it is difficult for the women and children to cross the huge traffic. It is also found that many children play on empty streets near their home at holidays and hartals in spite of having large open spaces in the surrounding areas.

4.4.2 Response about open spaces

To understand the level of satisfaction, respondents were questioned about the provision of open spaces in the study area. The residents, who are living for a long period, said that they were satisfied with the open spaces within the study area as the large quantity of open spaces adjacent to different organizations satisfied their demands. The dependence on outside open space was almost nil as the safety and quality both were better in the open spaces of the study area.

From the questionnaire survey it is evident that at present period majority of respondents are not satisfied with the existing open space provision of the area. From the Fig: 4.8 it is found that, according to 45% of the users, at present the safety of the existing open spaces are good, 35% expressed that cleanliness are average and almost 40% answered that facilities and maintenance are average. According to the majority the overall qualities of open spaces are average (Fig: 4.9). From the survey it is also evident that the respondents who are not satisfied with existing open space provision usually do not use the open spaces within the study area.

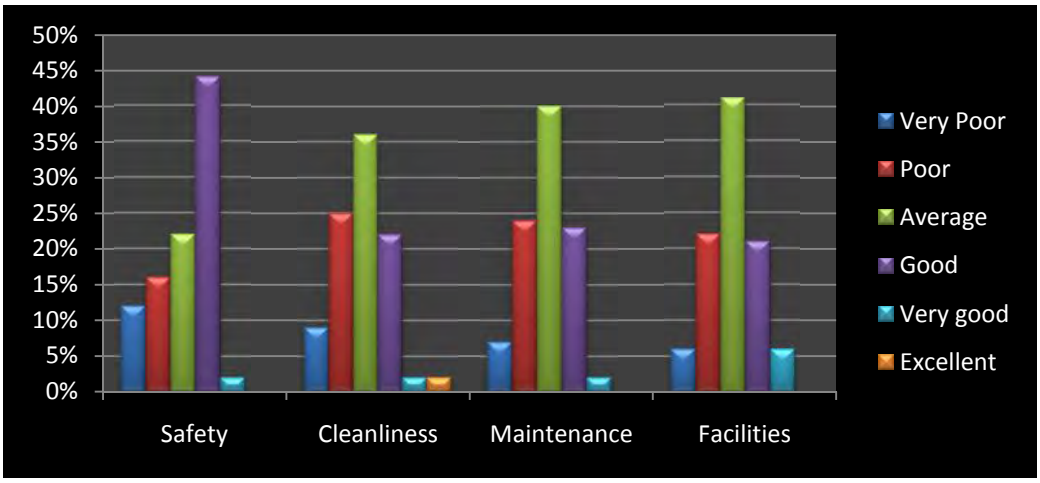


Figure 4.8: Quality of Open space (based on questionnaire survey'2014)

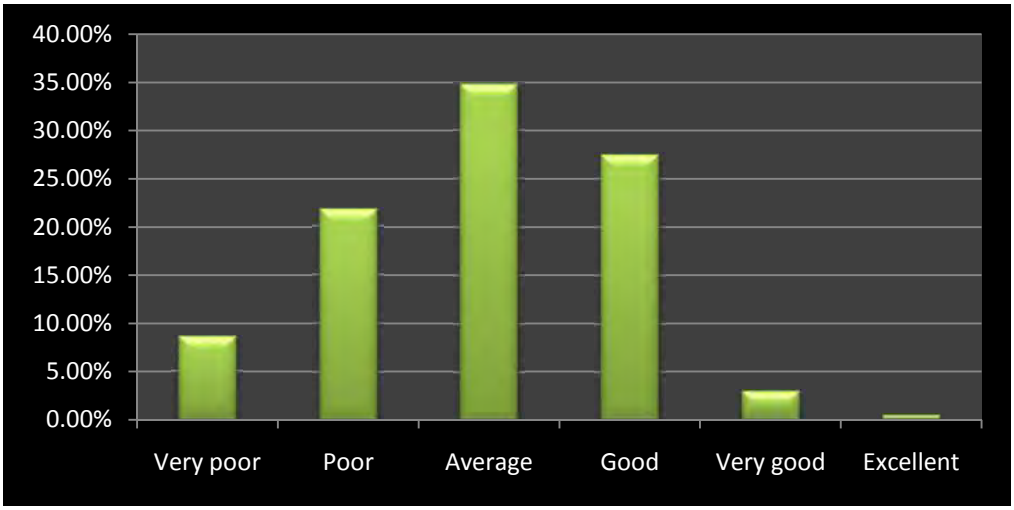


Figure 4.9: Overall quality rating (based on questionnaire survey'2014)

The respondents were also asked whether the open spaces adjacent to the study area satisfy the demand of local need. Overall, 45% of respondents expressed that the open spaces in the surrounding areas (Ramna park, Sohrawardy Uddayan etc.) supplement the open spaces of the study area and satisfy the local demand. But 55% of the respondents expressed that open spaces in the surrounding areas do not satisfy the local demand.

4.4.3 Response about livability

The majority of respondents (90%) perceived that livability of the area would be better if there were more open spaces in the area. They were also asked what changes should be done to open spaces in their opinion for the developments of livability of the area. Various thoughts and comments came through it. As there is no formal playground or outdoor recreational facilities for the residents, most of the respondents felt that more open spaces with recreational and sport facilities should be created in the study area. But the residential part is already densely developed and there is little possibilities for creating new open spaces in the area. So, the respondents expressed that if accessibility, safety, facilities and maintenance of the existing open spaces adjacent to different organization can be increased, livability of the area will be better. Due to lack of green, the respondents recommended for planting more trees in the residential part. According to them new construction should be restricted. As the precious open spaces are obstructed by the government offices, some of the respondents also suggested that the offices should be shifted from the study area to create open spaces for the residents.

4.5 Findings from the Physical and Questionnaire survey:

- In spite of having a fair amount of usable open space in the study area, due to inaccessibility of few sites the residents are deprived from using them.

- Lack of accessibility and quality of the existing open spaces in the study area are acting as barriers for the residents from using the open spaces. These facts implies that, better physical and visual accessibility can influence the frequency of use and better quality of open spaces can increase the intensity of use by attracting people to come to open spaces.

- Ramna Park, Saharawardy Uddayan and Osmani Uddayan have a huge contribution for recreation of the residents because these open spaces are used more than

the open spaces of the study area for recreational purposes. But only 40% of the respondents use these spaces along with the open spaces in the study area frequently. As most of the users travel by foot, the primary roads surrounding the study area act as a barrier for the pedestrian users, especially for women and children; which is the major drawbacks of these open spaces.

- Women and children prefer to use open spaces which is not far, especially the children feel comfortable to play near home.

- In spite of having various provisions of open spaces in the surrounding area less than half of the respondents use open spaces frequently. Most of the respondents are not satisfied with the existing open space provision and there is an urge of developing usable open spaces in the study area. The fact implies that residents prefer to visit open spaces which is close to their residence.

4.6 Impact of the Changing context on livability of Segunbagicha

The impact of the changing open spaces on livability have been assessed through the following indicators -

4.6.1 Availability of open space

To be livable one place has to have ample open spaces. As the residential density of Segunbagicha area was low earlier, in spite of not having any common open spaces (playground/park/other), the need of the residents were satisfied through the open spaces adjacent to different organizations and institutes. Due to transformation in urban fabric, along with building density, the population density of the area also increased as well as the demand of open space. From the quantity assessment it is found that the usable open spaces of the study area are not sufficient for the residents in spite of having a fair amount of usable but inaccessible open space and large amount of unused open spaces located in the study area (Fig: 4.10). Due to lack of open spaces many children play on

empty streets at holidays and hartals. From the survey it is also established that women and children prefer to use open spaces near home which increased the demand of usable open spaces in the study area. It is found that open spaces in the surrounding areas are used more than the open spaces of the study area and satisfying the demand of a fair amount of residents. But due to different drawbacks, more than half of the respondents are not incorporated with the open spaces frequently.

So, it is evident that provision of usable open space in the study area is not up to the desired level and residents are not satisfied with the overall condition of open spaces. To satisfy the need and motivate the residents of all ages and gender, development of enough provision of usable open spaces in the study area are required.

4.6.2 Accessible open space

According to the definition of livability open spaces has to be accessible to all. In earlier period all the open spaces were well accessible which contributed a lot to fulfill the local demand of open space. But the existing open spaces of the study area are not well accessible. Now in one hand population density of the area increases on the other hand the accessibility of the precious open spaces are blocked. Most of the respondents visit the open spaces by walking; so the catchment area is an important issue here. But from the analysis of accessibility, approximately15% of the residential part is outside of the catchment area which definitely affecting the use. Again primary roads surrounding the study area are affecting the pedestrian users to visit the Parks.

Like physical access visual access of open space contributes to the mental health of the residence, which is also important for livability. In earlier period light fences were used as boundary which gave an uninterrupted visual access to the beautiful limitless green environment of Segunbagicha area, these features gave a soothing effect and helps to enhance the mental health of the residents. But now as an effect of transformation of urban fabric the open spaces and precious green environment almost diminished specially in the residential part. The open spaces which are left are surrounded by high solid walls

and act as a visual barrier. The set back areas of buildings which is supposed to be green open spaces are most of the cases are blocked and treated as negative space. The visual access of these setback areas are also blocked by solid high walls. This lack of visual accessibility of open space creates fatigue and put pressure on the mental health of the residents.

From the survey it is established that physical and visual access both influence the frequency of use. So, lack of physical and visual access to the existing open spaces of the study area is affecting the frequency of use negatively.

4.6.3 Attractive pedestrian experience

The use of open space is very much related to the pedestrian experience of the residents. It is evident from the physical survey that most of the open spaces are pedestrian unfriendly due to poor condition and connectivity of pedestrian paths. Some of the open space does not have continuous pedestrian paths which will guide people to the facility. Most of the cases the existing pedestrian paths are blocked by vendors and some cases garbage is disposed beside the pedestrian paths which create unhealthy situation and nuisance. So it is evident that the existing pedestrian paths are one of the common barriers for using the existing open spaces since the paths condition made the walking environment uncomfortable.

4.6.4 Quality of open space

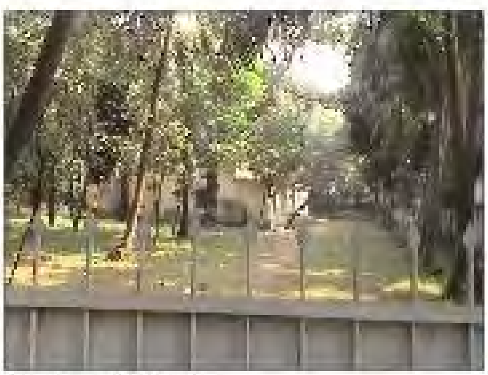
Attractive, well maintained and safe open spaces contribute a lot to enhance livability of an area. From the questionnaire survey it is evident that the quality of the open spaces in earlier period was good and played an important role in everyday life of the residents. It is also known that the open spaces were surrounded by large trees; most of them are cut off at present for the new developments. Some of the open spaces are used as car parking area (Fig: 4.10) in different occasion which degrading the overall quality of the open

1. International Modern Language Institute

2. International Modern Language Institute

3. Shilpakala Academy

4. Shilpakala Academy



5. [illegible] International Modern Language Institute

6. Shilpakala Academy

1, 2 & 3: Open spaces are mostly [illegible] for raw material [illegible]

4: Ground of Shilpakala Academy is used [illegible] parking in different [illegible]

5 & 6: Fenced and inaccessible open spaces

Fig 5.11: [illegible] of Open spaces

space and hampering the use of local residents. Many researches show that the natural element of open space generates relaxation, which has a relation with mental health (Abraham, 2010), so, the diminishing green definitely has a negative effect on the mental health of the residents. According to the quality assessment the overall quality of the open space is below average. The poor quality and lack of facilities for outdoor recreational activities of the existing usable open spaces do not encourage the residents to use these spaces.

From the above analysis of indicators it is evident that the existing condition of open spaces is not persuading, motivating, and satisfactory; and unable to attract majority of the residents using the open spaces intensively. Lack of exposure to physical activities is preventing the residents from active living. Livability of an area is related to the wellbeing and satisfaction of the people lived there. The present conditions of open spaces are not contributing to the wellbeing of the residents. So, the changing open spaces are decreasing the level of livability of the study area and definitely have a negative impact on livability.

But there are possibilities of changing the situation by creating better options of usable open space as there are a fair amount of unused and inaccessible open spaces located in the area.

4.7 Summary

The transformations of urban fabric brought massive changes in open spaces of the study area. Due to the transformation, in one hand the demand of open space increases with the increasing population density; on the other hand the provision of usable open space decreases in the study area. Though the large city parks in the surrounding areas are used by a fair amount of residents, but of all ages and genders do not visit these open spaces frequently. From the study it is found that the physical factors of the existing open spaces are failed to connect the residents with the open spaces physically and mentally;

which affects the well-being of the residents and ultimately create a negative impact on livability.

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Chapter 05

Chapter 05

Discussion and Conclusion

5.1 Introduction

The study takes an analytical approach to reveal the morphological transformation of urban fabric with special focus on open spaces. The study also explores the impact of the change in open space on livability of the area.

5.2 Morphological Transformation

In order to understand the morphological transformation of Segunbagicha the developments of morphological elements have been studied through the maps of different period.

5.2.1 Land use: Though Segunbagicha was predominantly residential area but the concentration of commercial activities and administrative offices in surrounding areas, increasing accessibility and land value, and mostly the declaration as mixed use area brought significant change in the land use pattern of the area.

From the study of different period maps remarkable changes in land use are observed. In 2003 map the dominance of residential buildings are evident. Commercial and mixed use developments were limited on the peripheral plots with few exceptions. But in 2010 map penetration of commercial use have been noticed not only in area wise but also in individual building level which increased the number of mixed use buildings. From the study of 2014 map, the decrease of the number of residential building and dominance of commercial use is evident. From the study a trend of commercialization is evident.

5.2.2 Street and plots: Most of the roads of Segunbagicha are straight and wide in shape. At the initial stage the roads of the residential part were interconnected grid pattern. The pattern of the streets remains almost same except the introduction of few link roads which increased the accessibility of the whole area. There are also few narrow and irregular shape streets in some part of the study area.

From the analysis it is evident that there is a relationship between the street pattern and shape of the plots. The plots of Segunbagicha were developed as both planned and organic ways. In the planned part the plots were a part of small blocks along with grid pattern roads. At present the blocks remain same except the plots are subdivided. In some part of the study area, the plots are developed in organic pattern. The irregular shape plots are accompanied by narrow and irregular shape streets. The incident of subdivision and amalgamation of plots are visible in different phase.

5.2.3 Built form and their related open space: The increasing accessibility, subdivision and the changing land use pattern of plots brought massive change in built form of Segunbagicha. The increasing number of high-rise buildings indicates that a trend of high-rise structures is evolving in the area which brought a significant change in the urban fabric of Segunbagicha area.

With the increase in building height a massive change in building footprint is also visible. The tendency of maximum use of land resulted high density urban form. This process of densification brought significant change in open spaces of the study area.

5.3 Transformation of Open space

Due to the morphological transformation there is a tremendous change in open space of Segunbagicha. The transformation of open space in the study area brought not only the quantitative change but the quality and accessibility is also changed.

5.3.1 Quantitative change: The transformations of built form have caused the decrease in open space especially in the residential part. With the new developments and increasing densities the open spaces adjacent to residential buildings almost diminished. Most of the open spaces left are part of the administrative / institutional organization which also faces significant change as an effect of commercial intervention in the area. A scarcity of open space is created due to the transformation, as the demand of open space is getting high with the increase in residential density. Though there are large open spaces in the surrounding area, the demand is not fully satisfied due to various circumstances.

5.3.2 Qualitative change: With the change in quantity the quality of the open spaces also changed. Along with the open spaces, beautiful trees and green are diminished which affects the natural environment of the area. The below average quality and lack of recreational facilities act as a barrier for using the open spaces of the study area and that is why the adjacent open spaces of Segunbagicha are used more for walking, sports and physical activities. From the study it is found that the quality of the open spaces was better in earlier period, which led a spontaneous use of open spaces in the study area.

5.3.3 Change in Accessibility: In earlier period the open spaces of Segunbagicha were well accessible. As there were no physical barriers the residents can interact with the open spaces both physically and visually. But at present in most of the cases the physical and visual access is restricted which affects the use of open space.

From the study it is found that the quantity, quality and accessibility were better in earlier period and for that, the residents were also satisfied.

5.4 Status of livability

Livability of an area or city depends on many factors. Sufficient open space is vital for livability of a city or area. The overall performance of open space creates impact on livability. So any change in open space can affect the livability of an area.

From the discussion of open spaces in section 5.3 it is evident that the quality and accessibility of the open spaces was good, which contributed to the physical and mental well-being of the residents. The study area was child friendly as there were lots of places for the children to play specially, empty plots beside their home. Light fences allowed visual access to the green and open spaces, which create a sense of place and belongingness to the study area, which made the residents fill a part of the area. All these factors enhanced the livable condition of the area.

In the process of transformation of urban fabric, the serene green environment diminished and the provisions for open spaces are being restricted by the compact developments of high-rise buildings. The transformation of physical factors of open spaces, influence the perception of the residents and resulted lack of participation and satisfaction regarding the open space. The fact signifies that the existing open space conditions are not promoting active living. The urge of the residents for trees and green confirm the fact that lack of green in the residential part creates a mental pressure on the residents. So, the overall contribution of open spaces is not satisfactory and decreases the level of livability of the study area. From the discussion it is evident that the livability was better in earlier period and the transformation in open space definitely decreases the livability of the study area.

5.5 Summary of the findings

The unique process of morphological transformation of Segunbagicha area studied through the detail investigation of different physical and functional element of urban fabric is carefully documented in this research. The study of elements of urban fabric of Segunbagicha and its evolution through different historical phases showed a process of transformation of land use pattern. From the study of land use pattern it is found that the residential part of Segunbagicha is gradually developing into a commercial dominated area.

Along with the transformation of land-use, the increasing accessibility of street network acted as vital force in transforming the plot configuration and built form. A process of adaptation to changing needs is revealed through plot subdivision and amalgamation. The study revealed that there is an inter-relationship among the physical and functional elements of urban fabric and their cumulative impact is the emerging built –environment. The resultant effect of these changing phenomena is massive transformation of open space of Segunbagicha area.

The study also shows that the status of open spaces has been changed. The findings from this part are that the physical factors of open space have a comprehensive impact on the perception of the residents, which affects the intensity and frequency of use of open spaces. The present condition resulted limited choice and use of open space; hampered the enhancement of physical and mental health of the residents, which ultimately create negative impact on livability of the study area.

5.6 Recommendations

To enhance the livability of Segunbagicha area some measures can be taken-

- Implementation of existing laws of using abandoned or under-utilized public open spaces of the study area for the recreation of residents can bring a big change in the situation.
- Small scale open spaces can be created as a part of the residential blocks, which can serve the children of that block and contribute to their physical and mental developments (Chapter: 3, pg- 53).
- Incorporating green in the study area especially in the residential part can enhance the natural environment which will help to increase the livability level of the study area.
- Accessibility of the open spaces has to be ensured. Construction of solid high walls should be restricted for better visual access to the green.

- Change in attitudes of the residents is also necessary to explore the unlimited resources beyond the boundary.
- Policy level reformations are necessary, which can be adopted from high density livable cities like, Singapore, Hongkong; to make a better livable condition.

5.7 Conclusion

The study of morphological transformation of Segunbagicha shows that the change in elements of urban fabric is inter-related and the resultant effect of this phenomenon can influence the livability of an area. From the study it is also found that the physical factors of open space have a strong relationship with the use of open space and enhancement of the factors can increase the interaction with open space; which can make a positive effect on livability. This study can help the areas where dense development already took place and have little possibilities of creating open spaces. The open space adjacent to different organizations and institutions of that area or in the surrounding areas can make a great help. By making the open spaces accessible to the people living in that specific area will help to enhance the well-being of people and thus increase the livability level of the area.

Moreover this thesis can help to understand how the transformation of urban fabric can affect the livability and can assist for planning or redevelopments of an area to enhance livability. Further study can focus on a detail investigation on how open space can be preserved along the ongoing transformation process and how complimentary/ substitute open spaces can be created in a dense city like Dhaka to build better livable place.

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Appendix - A

Appendix A: Demographic data

Demography

Demographic structure of urban area is an important indicator of transformation of its original urban character and also has strong connection to livability. Whether an urban area is facing urban growth or decay of its natural environment is immediately reflected on the changes in total population, density, household size, composition of male and female, number of working and non-working population. Table: 3.1 shows the demographic structure of Segunbagicha area and Table 3.2 shows detail house hold and population data.

Table 3.1: Demographic Structure of Segunbagicha area

Year		**2011**	
Area		0.47 sq. km	
Population		21727	
Household size	Paltan Thana	4.92	4.81*
	Ramna Thana	4.61	
	Shahbagh Thana	4.90	
Density per sq.km.		46227	
Administrative Unit	Thana	3 (part)	
	Ward	3 (Part)	
	Residence Community	4	

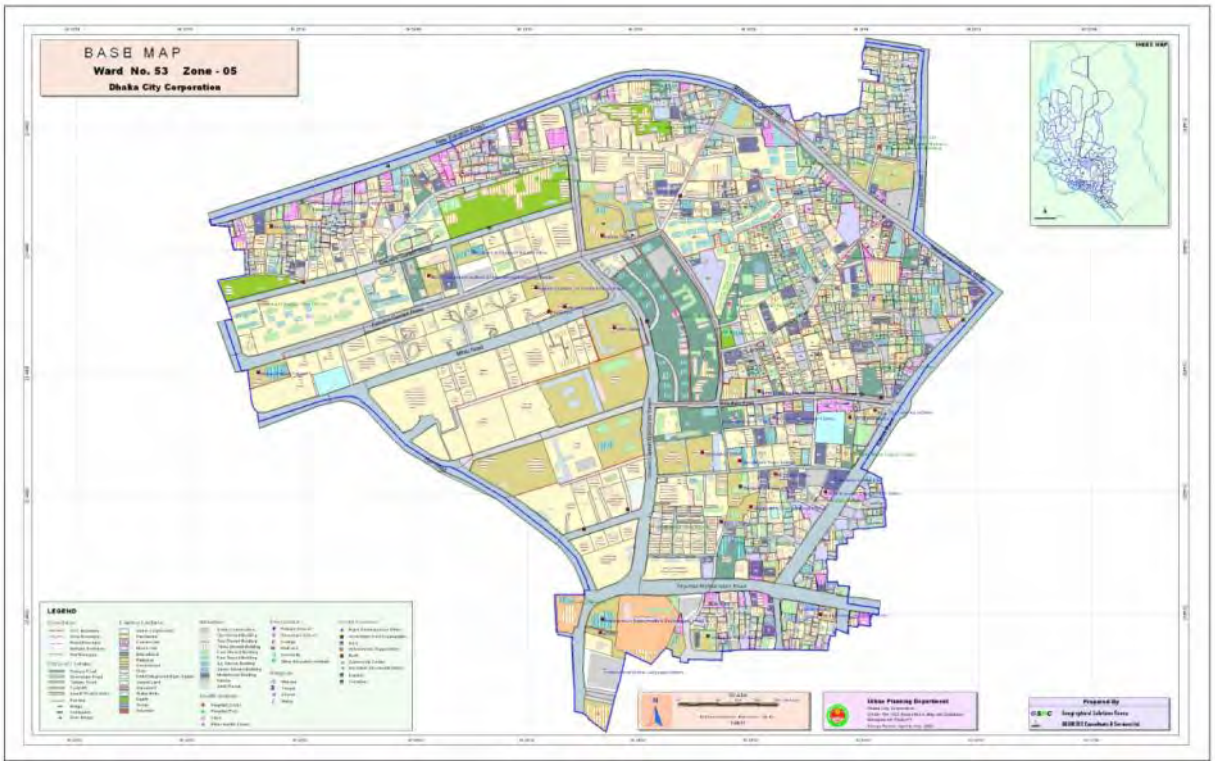
*Average of three Thana
Source: BBS, 2015

Table 3.2: Detail Household and Population data of 2011

Thana	Ward	Administrative Unit Residence Community	Total Households	Total Population in Households
Paltan	36	Bijoynagar	381	2074
Ramna	53	Baje Kakrail	343	1990
Shahbagh	56	Segunbagicha(Bijoynagar)	3046	17206
		Topkhana	85	457
Total			**3855**	**21727**

Source: BBS, 2015

Appendix - B


BASE MAP
Ward No. 53 Zone - 05
Dhaka City Corporation
LEGEND


BASE MAP
Ward No. 56 Zone - 05
Dhaka City Corporation
INDEX MAP
LEGEND
Urban Planning Department
Prepared By

Appendix - C

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
1	49, kakrail	Residential	3	Commercial	3	Commercial	3
2	50,48, Kakrail	Residential	3	Mixed	3	Mixed	3
3	53, kakrail	Residential	3	Residential	3	Residential	3
4	56/1, Kakrail	Residential	2	Residential	2	Residential	2
5	56/1A, Kakrail	Residential	2	Residential	2	Residential	2
6	56/1B, Kakrail	Residential	2	Residential	2	Residential	2
7	56/1C, Kakrail	Residential	2	Residential	2	Residential	2
8	56, Kakrail	Residential	3	Residential	UC	Residential	6
9	60, Kakrail	Residential	1	Residential	UC	Residential	6
10	60/1, Kakrail	Residential	4	Commercial	4	Commercial	4
11	61, Pioneer road	Residential	4	Mixed	4	Mixed	4
12	62, Pioneer road	Residential	5	Commercial	5	Commercial	5
13	63, Pioneer road	Residential	4	Commercial	UC	Commercial	10
14	64, Pioneer road	Residential	Semi pacca	Mixed	1	Mixed	1
15	64/1, Kakrail	Government	1	Mixed	1	Mixed	1
16	65, Kakrail	Residential	1	Commercial	1	Commercial	1
17	65, Kakrail			Residential	5	Residential	5
18	67/1, Pioneer road	Residential	3	Residential	3	Residential	3
19	67/2, Pioneer road	Residential	3	Residential	3	Residential	3
20	67/4, Pioneer road	Residential	3	Residential	3	Residential	3
21	67/5, Pioneer road	Residential	3	Residential	3	Residential	3
22	67/5, Pioneer road			Residential	5	Residential	5
23	67/6, Pioneer road	Residential	7	Residential	7	Residential	7
24	67/7, Pioneer road	Residential	6	Residential	6	Residential	6
25	67/8, Pioneer road	Residential	7	Residential	7	Residential	7
26	67/9, Pioneer road	Residential	5	Residential	5	Residential	5
27	68/A	Residential	6	Residential	6	Residential	6
28	68,68/1, 68/2	Residential	3	Residential	3	Residential	3
29	68,68/1, 68/2			Residential	3	Residential	3
30	68,68/1, 68/2			Residential	3	Residential	3
31	79/1, Karail	Residential	3	Residential	3	Residential	3
32	78/2, Karail	Residential	4	Residential	4	Residential	4
33	78/B, Karail	Residential	5	Residential	5	Residential	5
34	78/C, Karail	Residential	5	Residential	5	Residential	5
35	78/3, Karail	Residential	5	Residential	5	Residential	5
36	72, Karail	Residential	4	Residential	4	Residential	4
37	81/A, Karail	Residential	3	Mixed use	3	Mixed use	3
38	81/B, Karail	Residential	4	Mixed use	4	Mixed use	4
39	81/C, Karail	Residential	4	Mixed use	4	Mixed use	4
40	81/D, 81/E, Karail		UC	Mixed use	2	Mixed use	2
41	81/F, Karail	Residential	4	Mixed use	4	Mixed use	4
42	81/G, Karail	Residential	4	Mixed use	4	Mixed use	4
43	81/H,Karail		Vacant	Mixed use	4	Mixed use	4

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
44	80/1, Karail	Mixed use	4	Mixed use	4	Mixed use	4
45	80/2, Karail	Residential	4	Residential	4	Residential	4
46	80/3, Karail	Mixed use	4	Mixed use	4	Mixed use	4
47	80/4, Karail	Mixed use	5	Mixed use	5	Mixed use	5
48	80, Karail	Residential	1	Residential	1	Residential	1
49	80, Karail	Residential	1	Residential	1	Residential	1
50	81, Karail	Commercial	2	Commercial	2	Commercial	2
51	81, Karail	Commercial	Semi pacca	Commercial	1	Commercial	1
52	78/4, Karail	Residential	2	Residential	2	Residential	2
53	78/5, Karail	Commercial	Semi pacca	Commercial	1	Commercial	1
54	78, Karail		Vacant	Commercial	11	Commercial	11
55	77/1, Karail	Commercial	7 & above	Commercial	8	Commercial	8
56	77, Karail	Commercial	1	Commercial	1	Commercial	1
57	77, Karail	Commercial	2	Commercial	2	Commercial	2
58	75,76, Karail	Commercial	7 & above	Commercial	12	Commercial	12
59	74/A, Karail		Vacant	Commercial	9	Commercial	9
60	74, Karail	Commercial	7 & above	Commercial	8	Commercial	8
61	, Karail	Commercial	7 & above	Commercial	15	Commercial	15
62	71/2, Karail	Government	3	Commercial	5	Commercial	5
63	71/2, Karail	Government	3	Other	5	Other	5
64	70, Pioneer road	Commercial	1	Commercial	2	Commercial	2
65	70, Pioneer road	Commercial	1	Commercial	2	Commercial	2
66	69, Pioneer road		Vacant	Residential	15	Residential	15
67	67/3, Karail	Commercial	2	Commercial	15	Commercial	15
68	153, Pioneer road	Government	7 & above	Government	8	Government	8
69	153A, Pioneer road	Government	4	Government	4	Government	4
70	153B, Pioneer road	Government	1	Government	1	Government	1
71	153C, Pioneer road	Government	Semi pacca	Government	1	Government	1
72	153D, Pioneer road	Government	Semi pacca	Government	1	Government	1
73	46/A, Karail	Commercial	4	Commercial	4	Commercial	4
74	46, Karail	Commercial	6	Commercial	6	Commercial	6
75	46, Karail	Commercial	3	Commercial	3	Commercial	3
76	47, Karail	Commercial	4	Commercial	4	Commercial	4
77	42, Karail	Other	3	Other	3	Other	3
78	42A, Karail	Other	2	Other	2	Other	2
79	42B, Karail	Other	1	Other	1	Other	1
80	42C, Karail	Other	Semi pacca	Other	1	Other	1
81	42D, Karail	Other	Semi pacca	Other	1	Other	1
82	43, Karail	Government	3	Government	3	Government	3
83	43, Karail	Government	3	Government	3	Government	3
84	43, Karail	Government	Semi pacca	Government	1	Government	1
85	51, Pioneer road	Commercial	4	Commercial	4	Commercial	4
86	52, Pioneer road	Commercial	3	Commercial	3	Commercial	3

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
87	63/1-3, Pioneer road	Commercial	Semi pacca	Commercial	1	Commercial	1
88	63/1-3, Pioneer road	Commercial	Semi pacca	Commercial	1	Commercial	1
89	71/3, Pioneer road	Residential	Semi pacca	Commercial	1	Commercial	1
90	71/3, Pioneer road	Residential	Kacha	Commercial	1	Commercial	1
91	71/3, Pioneer road	Residential	Kacha	Commercial	1	Commercial	1
92	71/4, Pioneer road	Residential	Kacha	Commercial	1	Commercial	1
93	71/4, Pioneer road	Residential	Kacha	Commercial	1	Commercial	1
94	71/4, Pioneer road	Residential	Kacha	Commercial	1	Commercial	1
95	71/5, Pioneer road	Residential	Semi pacca	Commercial	1	Commercial	1
96	71/5, Pioneer road	Residential	Kacha	Commercial	1	Commercial	1
97	71/5, Pioneer road	Residential	Kacha	Commercial	1	Commercial	1
98	67/9, Pioneer road	Residential	5	Commercial	5	Commercial	5
99	67/9, Pioneer road	Residential	5	Commercial	5	Commercial	5
100	67/9, Pioneer road		UC	Residential	15	Residential	15
101	67/7, Pioneer road	Residential	7	Residential	7	Residential	7
102	67/8, Pioneer road	Residential	6	Residential	6	Residential	6
103	49, Karail	Residential	3	Residential	3	Residential	3
104	48, Karail	Residential	3	Residential	3	Residential	3
105	48, Karail	Residential	3	Residential	3	Residential	3
106	53, 54, Pioneer road	Residential	Semi pacca	Residential	1	Residential	1
107	55, 55/1, Karail	Residential	3	Residential	3	Residential	3
108	55/2, Karail	Residential	Semi pacca	Residential	1	Residential	1
109	55/3, Karail	Residential	Semi pacca	Residential	1	Residential	1
110	55/4, Karail	Residential	Semi pacca	Residential	1	Residential	1
111	56, Karail	Residential	3	Residential	3	Residential	3
112	57/1, Karail	Residential	2	Residential	2	Residential	2
113	57/2, Karail	Residential	2	Residential	2	Residential	2
114	57, Karail	Residential	2	Residential	2	Residential	2
115	57, Karail	Residential	Semi pacca	Residential	1	Residential	1
116	60, Karail	Residential	3	Residential	3	Residential	3
117	60/1, Karail	Residential	2	Residential	2	Residential	2
118	62, Pioneer road	Residential	1	Mixed use	1	Mixed use	1
119	63/1-3, Karail	Commercial	Semi pacca	Commercial	10	Commercial	10
120	63/1-3, Karail			Commercial	1	Commercial	1
121	65, Karail	Residential	1	Residential	1	Residential	1
122	66, Karail	Residential	5	Residential	5	Residential	5
123	79, Karail	Residential	3	Residential	3	Residential	3
124	78/A, 78/B, Karail	Residential	5	Residential	5	Residential	5
125	64/1,Kakrail	Commercial	1	Commercial	1	Commercial	1
126	81/5, Kakrail		UC	Government	5	Government	5
127	160, Kakrail	Government	4	Government	4	Government	4
128	1(A), Kakrail	Religious	1	Religious	1	Religious	1
129	1(B), Kakrail	Religious	2	Religious	2	Religious	2

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
131	1(D), Kakrail	Religious	4	Religious	4	Religious	4
132	1(E), Kakrail	Religious	Semi pacca	Religious	1	Religious	1
133	1(F), Kakrail	Religious	Semi pacca	Religious	1	Religious	1
134	1(G), Kakrail	Religious	Semi pacca	Religious	1	Religious	1
135	1(H), Kakrail	Religious	Kacha	Religious	1	Religious	1
136	14, Kakrail	Government	6	Government	6	Government	6
137	81/2/A, Kakrail	Government	Kacha	Government	1	Government	1
138	53249, Pioneer road	Government	6	Government	6	Government	6
139	95, Kakrail	Government	1	Government	1	Government	1
140	83/D, Kakrail	Government	1	Government	1	Government	1
141	1/KA, Kakrail		UC	Institutional	3	Institutional	UC
142	14/3, Segunbagicha	Government	3	Government	3	Government	3
143	14/4, Segunbagicha	Government	4	Government	4	Government	4
144	14/5, Segunbagicha	Government	2	Government	2	Government	2
145	14/6, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
146	14/7, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
147	1/1, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
148	1/1, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
149	1/1, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
150	1/1, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
151	1/1, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
152	1/1, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
153	1, Segunbagicha	Government	4	Government	4	Government	4
154	1, Segunbagicha	Government	4	Government	4	Government	4
155	1, Segunbagicha	Government	2	Government	2	Government	2
156	1, Segunbagicha	Government	1	Government	1	Government	1
157	1, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
158	14/4, Segunbagicha	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
159	14/4, Segunbagicha	Government	7 & above	Government	7 & above	Government	7 & above
160	5614, Shahid Captain Mansur Ali Sharani	Government	3	Government	3	Government	3
161	5614, Shahid Captain Mansur Ali Sharani	Government	2	Government	2	Government	2
162	5614, Shahid Captain Mansur Ali Sharani	Government	1	Government	1	Government	1
163	5614, Shahid Captain Mansur Ali Sharani	Government	1	Government	1	Government	1
164	5614, Shahid Captain Mansur Ali Sharani			Government	Semi pacca	Government	Semi pacca
165	5614, Shahid Captain Mansur Ali Sharani			Government	Semi pacca	Government	Semi pacca
166	5614, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
167	5614, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
168	5614, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
169	5614, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
170	5614, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
171	5615, Shahid Captain Mansur Ali Sharani	Government	1	Government	1	Government	1
172	5615, Shahid Captain Mansur Ali Sharani	Government	1	Government	1	Government	1
173	5615, Shahid Captain Mansur Ali Sharani	Government	1	Government	1	Government	1

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
175	5615, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
176	5615, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
177	5615, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
178	5615, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
179	5615, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
180	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
181	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
182	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
183	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
184	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
185	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
186	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
187	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
188	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
189	5616, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
190	5617, Shahid Captain Mansur Ali Sharani	Government	above 7	Government	above 7	Government	above 7
191	5617, Shahid Captain Mansur Ali Sharani	Government	7	Government	7	Government	7
192	5617, Shahid Captain Mansur Ali Sharani	Government	4	Government	4	Government	4
193	5617, Shahid Captain Mansur Ali Sharani	Government	4	Government	4	Government	4
194	5617, Shahid Captain Mansur Ali Sharani	Government	4	Government	4	Government	4
195	5617, Shahid Captain Mansur Ali Sharani	Government	2	Government	2	Government	2
196	5617, Shahid Captain Mansur Ali Sharani	Government	1	Government	1	Government	1
197	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
198	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
199	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
200	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
201	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
202	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
203	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
204	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
205	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
206	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
207	5617, Shahid Captain Mansur Ali Sharani	Government	Semi pacca	Government	Semi pacca	Government	Semi pacca
208	1 , Dr. Ibrahim Sharani	Government	5	Government	5	Government	5
209	1 , Dr. Ibrahim Sharani	Government	4	Government	4	Government	4
210	1 , Dr. Ibrahim Sharani	Government	1	Government	1	Government	1
211	1 , Dr. Ibrahim Sharani	Government	1	Government	1	Government	1
212	1/1 , Dr. Ibrahim Sharani	Institute	3	Institute	3	Institute	3
213	2, Segunbagicha		UC	Residential	18	Residential	18
214	3, Segunbagicha	Residential	2	Residential	UC	Residential	12
215	3/1, Segunbagicha	Residential	14	Residential	14	Residential	14
216	4,Segunbagicha	Residential	5	Residential	5	ixed use-resident	5
217	5, Segunbagicha		UC	Residential	20	Residential	20

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	**No of floor**	**ype of land us**	**No of floor**	**Type of land use**	**No of floor**
219	6/1,6/2,Segunbagicha	Residential	3	xed use-residen	3	ixed use-resident	3
220	7,Segunbagicha	Residential	2	Residential	4	Residential	4
221	7/1,Segunbagicha	Residential	4	Residential	5	Residential	5
222	7/2,Segunbagicha	Residential	4	Residential	4	Residential	4
223	7/3,Segunbagicha	Residential	2	Mixed use	2	Mixed use	2
224	8,Segunbagicha	Mixed use	3	Mixed use	3	Mixed use	3
225	8/1,Segunbagicha	Mixed use	4	Mixed use	4	Mixed use	4
226	8/2-8/4,Segunbagicha	Mixed use	5	Mixed use	5	Mixed use	5
227	8/2(a),Segunbagicha	Mixed use	6	Mixed use	6	Mixed use	6
228	8/3,Segunbagicha	Mixed use	EMI PACC	Mixed use	1	Mixed use	1
229	8/3,Segunbagicha	Mixed use	EMI PACC	Mixed use	1	Mixed use	1
230	9,Segunbagicha	Residential	7+	Residential	8	Residential	8
231	9,Segunbagicha	Residential	7+	Residential	8	Residential	8
232	9/1,Segunbagicha	Residential	7+	Residential	9	Residential	9
233	10,Segunbagicha	Residential	7+	Residential	9	Residential	9
234	11,Segunbagicha	Residential	7+	Residential	9	Residential	9
235	15,Segunbagicha	Mixed use	1	Mixed use	1	Mixed use	1
236	15/1,Segunbagicha	Mixed use	EMI PACC	Mixed use	1	Mixed use	1
237	15/3,Segunbagicha	Mixed use	EMI PACC	Mixed use	1	Mixed use	1
238	15/4,Segunbagicha	Mixed use	UC	Mixed use	4	Mixed use	4
239	25,Segunbagicha	Institutional	1	Instituional	5	Commercial	5
240	25,Segunbagicha	Institutional	1	Instituional		Residential	
241	27/1,Segunbagicha	Residential	7+	Residential	7	Residential	7
242	26,Segunbagicha	Residential	UC	Residential	15	Residential	15
243	28/A, Segunbagicha	Residential	7	Mixed use	7	Mixed use	7
244	28/B,Segunbagicha	Commercial	6	Mixed use	6	Mixed use	6
245	28/C,Segunbagicha	Residential	6	Mixed use	6	Mixed use	6
246	28/D,Segunbagicha	Commercial	7	Commercial	7	Commercial	7
247	28/E,Segunbagicha	Commercial	KACHA	Commercial	1	Commercial	1
248	28/F,Segunbagicha	Government	KACHA	Residential	UC	Residential	7
249	28/F,Segunbagicha	Commercial	7	Commercial	7	Commercial	7
250	28/G,Segunbagicha	Commercial	1	Commercial	1	Commercial	1
251	28/H,Segunbagicha	Commercial	2	Commercial	2	Commercial	2
252	29,Segunbagicha	Mixed use	3	Residential	6	Residential	6
253	29A,Segunbagicha	Mixed use	KACHA	Residential	UC	Residential	7
254	30,Segunbagicha	Mixed use	2	xed use-residen	2	ixed use-resident	2
255	31,Segunbagicha	Mixed use	2	Commercial	UC	Commercial	7
256	23,Segunbagicha	Mixed use	9	Mixed use	9	Mixed use	9
257	24, Segunbagicha	Mixed use	3	Mixed use	3	Mixed use	3
258	24, Segunbagicha	Mixed use	2	Mixed use	3	Mixed use	3
259	24, Segunbagicha	Mixed use	3	Mixed use	3	Mixed use	3
260	24, Segunbagicha	Mixed use	4	Mixed use	3	Mixed use	3
261	24/1,Segunbagicha	Mixed use	6	Mixed use	6	Mixed use	6

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
262	24/2, Segunbagicha	Mixed use		Mixed use	6	Mixed use	6
263	24/3,Segunbagicha	Mixed use		Mixed use	6	Mixed use	6
264	24/4,Segunbagicha	Residential	4	Residential	4	Residential	4
265	24/4,Segunbagicha	Mixed use	6	Mixed use	6	Mixed use	6
266	32,Segunbagicha	Commercial	2	Commercial	3	Commercial	3
267	33,Segunbagicha	Residential	4	Residential	4	Residential	4
268	33/A, Segunbagicha	Commercial	2	Commercial	2	Commercial	2
269	33/A, Segunbagicha	Commercial	2	Commercial	2	Commercial	2
270	33/A, Segunbagicha	Commercial	2	Commercial	2	Commercial	2
271	34,Segunbagicha	Mixed use	3	Residential	UC	Residential	13
272	34,Segunbagicha	Residential	1	Residential	1	Residential	1
273	34,Segunbagicha	Residential	1	Residential	1	Residential	1
274	35,Segunbagicha	Residential	7+	MR	9	MR	9
275	20,Segunbagicha	Residential	2	Residential	UC	Residential	UC
276	20,Segunbagicha	Residential	KACHA	Mixed use	1	Mixed use	1
277	20,Segunbagicha	Residential	KACHA	Mixed use	1	Mixed use	1
278	21, Segunbagicha	Religious	Semi pacca	Religious	1	Religious	1
279	21, Segunbagicha	Commercial	Semi pacca	Commercial	1	Commercial	1
280	22, 22/A,Segunbagicha	Mixed	5	Commercial	5	Commercial	5
281	6/1, Segunbagicha	Residential	3	Mixed use	UC	Mixed use	16
282	6/1/A , Segunbagicha		UC	Residential	16	Residential	16
283	6/5, Segunbagicha		UC	mixed	16	mixed	16
284	6/5, Segunbagicha		UC	mixed	1	Commercial	1
285	6/5, Segunbagicha		UC	mixed	5	Commercial	5
286	6/6, Segunbagicha		UC	mixed	16	mixed	16
287	6/7/A, Segunbagicha	Residential	2	Commercial	UC	Commercial	16
288	6/7, Segunbagicha	Residential		Commercial	UC	Commercial	16
289	25/A, Segunbagicha	Residential		Commercial	semi pacca	Commercial	semi pacca
290	6/4, Segunbagicha			Residential	8	Residential	8
291	8/4, Segunbagicha	Mixed use		Commercial	2	Commercial	2
292	8/4, Segunbagicha	Mixed use		Commercial	2	Commercial	4
293	8/4, Segunbagicha	Mixed use		Commercial	2	Commercial	5
294	8/5, Segunbagicha	Residential		Commercial	4	Commercial	4
295	8/6, Segunbagicha	Mixed use		Commercial	5	Commercial	5
296	8/6, Segunbagicha	Mixed use		Mixed use	4	Mixed use	4
297	8/4/A, Segunbagicha			Commercial	7	Commercial	7
298	24/B, Segunbagicha	Commercial	2	mixed	15	mixed	15
299	24/C/1, Segunbagicha	Residential		Residential	10	Residential	10
300	24/C/1, Segunbagicha	Residential		Residential	10	Residential	10
301	24, Segunbagicha	Residential		mixed	8	mixed	8
302	24/A, Segunbagicha	Residential		Residential	7	Residential	7
303	25, Segunbagicha	Residential	4	Residential	7	Residential	7
304	25, Segunbagicha	Residential	4	Mixed use	2	Mixed use	2

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
306	25/1, Segunbagicha	Residential	5	Residential	7	Residential	7
307	32, Segunbagicha	Residential	2	Commercial	12	Commercial	12
308	34/1, Segunbagicha	Residential	4	Commercial	4	Commercial	4
309	30, Segunbagicha	Residential	4	Commercial	4	Commercial	4
310	31/D, Segunbagicha	Residential	1	Commercial	7	Commercial	7
311	31/D, Segunbagicha	Residential	1	Commercial	1	Commercial	1
312	31/D, Segunbagicha	Residential	1	Commercial	2	Commercial	2
313	31/D, Segunbagicha	Residential	1	Commercial	1	Commercial	1
314	31/B, Segunbagicha	Residential	2	Commercial	2	Commercial	2
315	31/F, Segunbagicha	Residential	2	Commercial	6	Commercial	6
316	37/A, Segunbagicha	Residential	4	Institutional	4	Institutional	4
317	37/A, Segunbagicha	Residential	4	Institutional	1	Institutional	1
318	18/1/A, Segunbagicha	Residential	3	Residential	9	Residential	9
319	17, Segunbagicha	Commercial	4	Commercial	4	Commercial	4
320	39/1, Segunbagicha	Residential	1	Residential	1	Residential	1
321	39/1, Segunbagicha	Residential	1	Government		Government	
322	39/1, Segunbagicha	Residential	1	Commercial	1	Commercial	1
323	39, Segunbagicha	Commercial	2	Commercial	2	Commercial	2
324	39, Segunbagicha	Commercial	2	Residential	15	Residential	15
325	40, Segunbagicha	Residential	2	Residential	14	Residential	14
326	41, Segunbagicha	Government	3	Government	1	Government	1
327	35, Segunbagicha	Residential	1	Residential	7	Residential	7
328	35, Segunbagicha	Residential	1	Mixed use	4	Mixed use	4
329	35, Segunbagicha	Residential	1	Mixed use	4	Mixed use	4
330	23, Segunbagicha	mixed	4	mixed	8	mixed	8
331	24/A, Segunbagicha	mixed	3	mixed	3	mixed	3
332	32, Segunbagicha	mixed	2	mixed	2	mixed	2
333	33/A, Segunbagicha	mixed	4	mixed	4	mixed	4
334	33/A, Segunbagicha	mixed	4	mixed	4	Commercial	4
335	33/A, Segunbagicha	mixed	4	mixed	4	Commercial	7
336	33, Segunbagicha	Residential	2	Residential	4	Residential	4
337	34, Segunbagicha	Residential	3	Residential	9	Residential	9
338	34, Segunbagicha	Residential	3	Residential	9	Commercial	1
339	38/1, Segunbagicha	Residential	3	Residential	12	Residential	12
340	38, Segunbagicha	Residential	2	Residential	6	Residential	6
341	38, Segunbagicha	Residential	2	Residential	6	Residential	2
342	42/1/KHA, Segunbagicha	Commercial	2	Commercial	5	Commercial	5
343	42/1/KHA, Segunbagicha	Mixed use	6	Mixed use	6	Mixed use	6
344	42/A1, Segunbagicha	Mixed use	4	Mixed use	4	Mixed use	4
345	42/A1, Segunbagicha	Residential	4	Residential	4	Residential	4
346	42/A1, Segunbagicha			Commercial	2	Commercial	2
347	42/A1, Segunbagicha			Commercial	3	Commercial	3
348	29, Segunbagicha	Mixed use	3	Mixed use	3	Mixed use	3

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
350	28/B, Segunbagicha	mixed	8	mixed	8	mixed	8
351	28/C , Segunbagicha	Government	4	Government	4	Government	4
352	2, Segunbagicha		uc	Residential	18	Residential	18
353	3, Segunbagicha	Residential	14	Residential	14	Residential	14
354	4, Segunbagicha	Residential	5	Residential	5	Residential	5
355	5, Segunbagicha		UC	Residential	19	Residential	19
356	8/2, Segunbagicha	Commercial	3	Commercial	3	Commercial	3
357	8/2, Segunbagicha	Commercial	3	Commercial	3	Commercial	3
358	8/2/A, Segunbagicha	Mixed use	5	Mixed use	5	Mixed use	5
359	8/3, Segunbagicha	Mixed use	6	Mixed use	6	Mixed use	6
360	25, Segunbagicha	Mixed use	6	Mixed use	6	Mixed use	
361	28/D, Segunbagicha	Mixed use	6	Mixed use	6	Mixed use	6
362	26, Segunbagicha	Residential	2	Residential	16	Residential	16
363	27/1, Segunbagicha	Residential	6	Residential	6	Residential	6
364	27/1, Segunbagicha	Residential	6	Residential	4	Residential	4
365	27/1, Segunbagicha	Residential	6	Residential	2	Residential	2
366	27/1, Segunbagicha	Residential	6	Residential	4	Commercial	4
367	26/1, Segunbagicha	Institutional	3	Institutional	3	Institutional	3
368	27/4, Segunbagicha	Institutional	4	Institutional	4	Institutional	4
369	27/4, Segunbagicha	Institutional	2	Institutional	2	Institutional	2
370	27/4, Segunbagicha	Institutional	4	Institutional	4	Institutional	4
371	27/4, Segunbagicha	Institutional	4	Commercial	4	Commercial	4
372	27/4, Segunbagicha	Institutional	4	Commercial	4	Commercial	4
373	27/4, Segunbagicha	Institutional	4	Commercial	7	Commercial	7
374	10/A, Segunbagicha	Residential	6	Commercial	1	Commercial	1
375	9, 9/1, Segunbagicha	Residential	2	Residential	2	Residential	2
376	9, 9/1, Segunbagicha	Residential	2	Residential	2	Residential	2
377	9, 9/1, Segunbagicha	Residential	2	Residential	2	Residential	2
378	9, 9/1, Segunbagicha	Residential	3	Residential	3	Residential	3
379	4, Segunbagicha		UC	Residential	12	Residential	12
380	3, Segunbagicha	Residential	2	Residential	9	Residential	9
381	.3/1, Segunbagicha	Mixed use	2	Mixed use	2	Mixed use	2
382	.3/2, Segunbagicha	Residential	14	Residential	14	Residential	14
383	.3/5, Segunbagicha	Residential	2	Residential	2	Residential	2
384	3/5/1, Segunbagicha			Residential	17	Residential	17
385	6/D, Segunbagicha	Residential	3	Residential	13	Residential	13
386	6/C/2, Segunbagicha	Residential	6	Residential	6	Residential	6
387	6/C/2, Segunbagicha			Residential	1	Residential	1
388	6/C/2, Segunbagicha			Residential	1	Residential	1
389	6/C/1, Segunbagicha	Residential	2	Residential	2	Residential	2
390	3/6, Segunbagicha	Residential	2	Residential	3	Residential	3
391	3/3, Segunbagicha	Residential	2	Residential	2	Residential	2
392	3/4, Segunbagicha	Residential	1	Residential	1	Residential	1

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
394	6/A/1, Segunbagicha	Residential	2	Mixed use	3	Mixed use	3
395	6/A/2, Segunbagicha	Residential	3	Residential	3	Residential	3
396	5, Segunbagicha	Institute	2	Institute	2	Institute	2
397	6, Segunbagicha	Residential	2	Residential	2	Residential	2
398	7, Segunbagicha	Residential	7	Residential	8	Residential	8
399	8, Segunbagicha	Residential	2	Residential	2	Residential	
400	9, 9/1, Segunbagicha	Residential	2	Residential	2	Residential	2
401	9, 9/1, Segunbagicha	Residential	2	Residential	2	Residential	2
402	9, 9/1, Segunbagicha	Residential	Semi pacca	Residential	1	Residential	1
403	9, 9/1, Segunbagicha	Residential	Semi pacca	Residential	1	Residential	1
404	10/A, Segunbagicha		UC	Residential	6	Residential	6
405	10/B, Segunbagicha	Residential	5	Residential	5	Residential	5
406	10/B/1, Segunbagicha		UC	Residential	6	Residential	6
407	10/C, Segunbagicha	Residential	5	Residential	3	Residential	3
408	10/C, Segunbagicha					Residential	3
409	12, Segunbagicha	Residential	2	Residential	2	Residential	2
410	17, 17/1, Segunbagicha	Residential	9	Residential	16	Residential	16
411	16/1/2, Segunbagicha	Residential	9	Residential	12	Residential	12
412	16, Segunbagicha		UC	Mixed use	3	Mixed use	3
413	16, Segunbagicha	Residential	8	Mixed use	8	Mixed use	8
414	16, Segunbagicha	Residential	8	Mixed use	8	Mixed use	8
415	12/1, Segunbagicha	Residential	3	Mixed use	3	Mixed use	3
416	8/1, Segunbagicha	Residential	10	Residential	15	Residential	15
417	8/1, Segunbagicha	Residential	10	Residential	10	Residential	10
418	8/2, Segunbagicha	Residential	1	Residential	1	Residential	1
419	8/2, Segunbagicha	Residential	Semi pacca	Residential	1	Residential	1
420	8/3, Segunbagicha	Mixed use	4	Commercial	3	Commercial	3
421	26, Segunbagicha		UC	Residential	4	Residential	4
422	26, Segunbagicha	Residential	Kacha	Residential	1	Residential	1
423	26, Segunbagicha	Residential	Kacha	Residential	1	Residential	1
424	26/A/1, Segunbagicha	Residential	5	Residential	5	Residential	5
425	26/A/1, Segunbagicha	Residential	2	Residential	2	Residential	2
426	26/A/1, Segunbagicha	Residential	1	Residential	1	Residential	1
427	23/1, Segunbagicha	Mixed use	8	Mixed use	10	Mixed use	10
428	6/2/A, Segunbagicha	Residential	6	Commercial	11	Commercial	11
429	6/2/A, Segunbagicha			Residential	4	Residential	4
430	6/2,Segunbagicha	Commercial	3	Residential	9	Residential	9
431	6/1, Segunbagicha	Residential	UC	Residential	16	Residential	16
432	6/1/A,Segunbagicha	Residential	UC	Residential	16	Residential	16
433	6/1/A,Segunbagicha			Residential	4	Residential	4
434	6/5, Segunbagicha	Residential	UC	Mixed use	16	Mixed use	16
435	6/6,Segunbagicha	Residential	UC	Mixed use	16	Mixed use	16
436	6/7, Segunbagicha			Residential	17	Residential	17

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
438	26/B, Segunbagicha	Residential	5	Commercial	5	Commercial	5
439	26/C, Segunbagicha	Residential	Kacha	Commercial	2	Commercial	2
440	26/D, Segunbagicha	Residential	Kacha	Commercial	2	Commercial	2
441	26//E, Segunbagicha	Residential	Kacha	Commercial	2	Commercial	2
442	26/F, Segunbagicha	Residential	Kacha	Commercial	2	Commercial	2
443	26/G, Segunbagicha	Residential	Kacha	Commercial	2	Commercial	2
444	26/H, Segunbagicha	Residential	Kacha	Commercial	2	Commercial	2
445	26/I, Segunbagicha	Residential	Kacha	Commercial	2	Commercial	2
446	6/4, Segunbagicha			Commercial	4	Commercial	4
447	8/4,Segunbagicha	Mixed use	4	Commercial	5	Commercial	5
448	8/4,Segunbagicha			Commercial	1	Commercial	1
449	8/6, Segunbagicha	Mixed use	5	Mixed use	7	Mixed use	7
450	8/6, Segunbagicha			Mixed use	5	Mixed use	5
451	8/3, Segunbagicha	Mixed use	4	Mixed use	15	Mixed use	15
452	8/4/A, Segunbagicha	Institutional	4	Residential	10	Residential	10
453	14, Topkhana	Commercial	2	Commercial	2	Commercial	2
454	14, Topkhana	Commercial	Semi pacca	Commercial	4	Commercial	4
455	14/1, Topkhana	Residential	Semi pacca	Commercial	1	Commercial	1
456	14/1, Topkhana			Commercial	2	Commercial	2
457	14/1, Topkhana			Commercial	4	Commercial	4
458	14/2, Topkhana	Mixed use	5	Mixed use	5	Mixed use	5
459	15/2,15/3, Topkhana	Commercial	4	Mixed use	4	Mixed use	4
460	17/2, Topkhana	Commercial	Semi pacca	Mixed use	6	Mixed use	6
461	17/3, Topkhana	Mixed	5	Mixed use	7	Mixed use	7
462	17/3, Topkhana	Mixed	4	Residential	4	Residential	4
463	18/1, Topkhana	Mixed	1	Comercial	1	Comercial	1
464	18/2, 18/3, Topkhana	Commercial	2	Mixed use	3	Mixed use	3
465		Commercial	2	Mixed use	2	Mixed use	2
466	19, Topkhana	Mixed	5	Mixed use	5	Mixed use	5
467	21, 21/1, Topkhana	Mixed	1	Mixed use	3	Mixed use	3
468	21, 21/1, Topkhana			Institutional	5	Institutional	5
469	21, 21/1, Topkhana			Commercial	2	Commercial	2
470	21, 21/1, Topkhana			Residential	15	Residential	15
471	21/A, Topkhana	Mixed use	2	Residential	14	Residential	14
472	27/18,27/19, Topkhana	Mixed use	4	Comercial	1	Comercial	1
473	27/18,27/19, Topkhana			Comercial	1	Comercial	1
474	28, 28/1, Topkhana	Residential	3	Comercial	18	Comercial	18
475	28, 28/1, Topkhana	Residential	2	Residential	2	Residential	2
476	33, Topkhana	Mixed use	15	Commercial	18	Commercial	18
477	34, Topkhana	Mixed use	2	Commercial	16	Commercial	16
478	35, Topkhana	Commercial	2	Commercial	20	Commercial	20
479	35A, Topkhana			Commercial	5	Commercial	5
480	36, Topkhana	Commercial	5	Commercial	5	Commercial	5

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
482	44, Topkhana	Commercial	Above 7	Commercial	10	Commercial	10
483	43, Topkhana	Mixed use	4	Mixed use	5	Mixed use	5
484	43, Topkhana					Mixed use	4
485	43, Topkhana			Residential	6	Residential	6
486	42, Topkhana	Mixed use	Above 7	Mixed use	10	Mixed use	10
487	42, Topkhana			Commercial	2	Commercial	2
488	42, Topkhana			Commercial	3	Commercial	3
489	24/B, Topkhana	Commercial	2	Commercial	10	Commercial	10
490	31/G, Topkhana	Mixed use	6	Mixed use	6	Mixed use	6
491	31/C, Topkhana	Residential	2	Mixed use	2	Mixed use	2
492	41, Topkhana	Residential	2	Mixed use	2	Mixed use	2
493	41, Topkhana			Residential	6	Residential	6
494	40, Topkhana	Residential	1	Residential	2	Residential	2
495	40, Topkhana	Residential	1	Comercial	6	Comercial	6
496	40, Topkhana	Residential	1	Residential	1	Residential	1
497	40/A, Topkhana	Mixed use	5	Mixed use	5	Mixed use	5
498	40/A, Topkhana			Mixed use	2	Mixed use	2
499	38-39, Topkhana	Mixed use	2	Residential	12	Residential	12
500	37, Topkhana	Residential	2	Institutional	1	Institutional	1
501	37, Topkhana	Residential	1	Residential	1	Residential	1
502	37, Topkhana	Residential	1	Residential	1	Residential	1
503	27/11/2, Topkhana			Mixed use	7	Mixed use	7
504	27/11/2, Topkhana			Commercial	4	Commercial	4
505	27/11/2, Topkhana			Commercial	4	Commercial	4
506	13, 13/1, Topkhana			Commercial	4	Commercial	4
507	15/1, Topkhana	Residential	9	Residential	9	Residential	9
508	15/1, Topkhana			Residential	6	Residential	6
509	22/C, Topkhana	Mixed use	Semi pacca	Comercial	6	Comercial	6
510	24/1, Topkhana	Mixed use	2	Institutional	2	Institutional	2
511	24/2, Topkhana	Mixed use	Semi pacca	Institutional	2	Institutional	2
512	24/D, Topkhana	Mixed use	10	Mixed use	9	Mixed use	9
513	24/D, Topkhana			Commercial	6	Commercial	6
514	24/D, Topkhana			Commercial	6	Commercial	6
515	24/D, Topkhana			Institutional	4	Institutional	4
516	31/A, Topkhana	Mixed use	3	Commercial	3	Commercial	3
517	23, Topkhana	Mixed use	6	Commercial	5	Commercial	5
518	23/2, Topkhana	Mixed use	4	Commercial	4	Commercial	4
519	23/2, Topkhana			Commercial	4	Commercial	4
520	23/3, Topkhana	Commercial	4	Commercial	6	Commercial	6
521	22/A, Topkhana	Mixed use	6	Commercial	6	Commercial	6
522	22/A, Topkhana			Commercial	2	Commercial	2
523	22/A, Topkhana			Commercial	3	Commercial	3
524	29, Topkhana	Commercial	2	Residential	2	Residential	2

Appendix F: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
526	22/A, Topkhana			Commercial	2	Commercial	2
527	22//1, Topkhana	Mixed use	6	Commercial	7	Commercial	7
528	28,28/1, Topkhana	Residential	3	Commercial	10	Commercial	10
529	28,28/1, Topkhana			Mixed use	4	Mixed use	4
530	24/C/1, Topkhana	Mixed use	5	Mixed use	8	Mixed use	8
531	24/C/1, Topkhana			Residential	2	Residential	2
532	24/C, Topkhana	Mixed use	4	Residential	7	Residential	7
533	24, Topkhana	Mixed use	6	Residential	7	Residential	7
534	24/A, Topkhana	Mixed use	5	Mixed use	5	Mixed use	5
535	25, Topkhana			Residential	2	Commercial	3
536	25, Topkhana			Commercial	6	Commercial	6
537	25, Topkhana			Commercial	2	Commercial	2
538	27/5/A/1, Topkhana	Residential	Semi pacca	Mixed use	2	Commercial	3
539	27/5/A/1, Topkhana	Residential	Semi pacca	Mixed use	4	Mixed use	4
540	27/5 Topkhana	Residential	Semi pacca	Residential	8	Mixed use	8
541	27/5 Topkhana			Residential	2	Residential	2
542	27/5 Topkhana			Residential	4	Residential	4
543	27/6 , Topkhana	Residential	Semi pacca	Residential	6	Residential	6
544	27/6/1, Topkhana	Residential	Semi pacca	Residential	6	Residential	6
545	27/6/1, Topkhana			Mixed use	4	Mixed use	4
546	27/5/A-3, Topkhana	Residential	Semi pacca	Commercial	11	Residential	11
547	27/5/D, Topkhana	Residential	Semi pacca	Residential	5	Commercial	5
548	27/6/B, Topkhana	Mixed use	4	Residential	6	Residential	6
549	27/6/B, Topkhana			Mixed use	4	Mixed use	4
550	27/6/B, Topkhana			Commercial	1	Mixed use	1
551	27/5/A-5, Topkhana	Mixed use	4	Commercial	8	Residential	8
552	27/6/C, Topkhana	Mixed use	5	Mixed use	4	Commercial	4
553	27/6/E, Topkhana	Mixed use	2	Mixed use	1	Mixed use	1
554	27/6/E, Topkhana			Commercial	5	Commercial	5
555	27/6/E, Topkhana			Commercial	1	Commercial	1
556	27/5/E, Topkhana	Mixed use	2	Residential	8	Commercial	8
557	27/5/C/1, Topkhana	Mixed use	Semi pacca	Commercial	5	Residential	5
558	27/5/C/1, Topkhana			Residential	3	Residential	3
559	27/6/D, Topkhana	Residential	3	Residential	10	Comercial	10
560	27/6/E, Topkhana	Residential	4	Residential	4	Residential	4
561	27/7, Topkhana	Commercial	4	Commercial	16	Commercial	7
562	27/7/1, Topkhana	Commercial	5	Religious	4	Commercial	4
563	27/7/1, Topkhana			Residential	4	Residential	4
564	27/7/2 Topkhana	Commercial	4	Commercial	6	Religious	6
565	27/7/3, Topkhana	Commercial	3	Commercial	6	Commercial	6
566	27/8/B, Topkhana	Commercial	4	Commercial	2	Commercial	2
567	27/7/1, Topkhana			Commercial	3	Commercial	3
568	27/8/D, Topkhana	Institute	5	Commercial	3	Commercial	3

Appendix C: Land use data

Sl. no.	Holding no.	2003		2010		2014	
		Type of land use	No of floor	ype of land us	No of floor	Type of land use	No of floor
570	27/9/C, Topkhana	Commercial	s.p	Commercial	3	Commercial	3
571	27/9/A, Topkhana	Mixed use	4	Commercial	4	Commercial	4
572	27/9/A-1, Topkhana	Commercial	5	Commercial	3	Commercial	3
573	27/9/A-1, Topkhana			Commercial	3	Commercial	3
574	27/11/A-1, Topkhana	Mixed use	2	Commercial	6	Commercial	6
575	27/11/1-A, Topkhana	Mixed use	5	Commercial	6	Commercial	6
576	27/11/1/KA, Topkhana	Mixed use	2	Commercial	6	Commercial	6
577	27/11/3-A, Topkhana	Mixed use	2	Religious	3	Religious	3
578	27/11/3-A, Topkhana	Mixed use	2	Commercial	6	Commercial	6
579	27/11/3-A, Topkhana	Mixed use	2	Commercial	5	Commercial	5
580	27/11/3-A, Topkhana	Mixed use	2	Commercial	5	Commercial	5
581	27/11/3-B, Topkhana	Mixed use	1	Commercial	3	Commercial	3
582	27/11/1/Ka, Topkhana	Mixed use	2	Residential	3	Commercial	3
583	27/11/2-A Topkhana	Mixed use	2	Residential	4	Residential	4
584	27/11/2-A Topkhana	Residential	1	Residential	1	Residential	1
585	27/11/1-a Topkhana			Mixed use	15	Commercial	15
586	27/5/kha, Topkhana	Mixed use	5	Mixed use	6	Mixed use	6
587	27/5/kha, Topkhana	Commercial	1	Commercial	4	Commercial	4
588	27/5/kha, Topkhana	Commercial	1	Commercial	7	Commercial	7
589	27/5/kha, Topkhana			Commercial	1	Commercial	1
590	27/5/kha, Topkhana			Commercial	1	Commercial	1
591	27/11-1, Topkhana	Mixed use	4	Commercial	10	Commercial	10
592	27/11-1, Topkhana			Commercial	2	Commercial	2
593	2 11, Syed Nazrul Islam Sarani	Mixed use	4	Commercial	3	Commercial	3
594	2 10, Syed Nazrul Islam Sarani	Mixed use	5	Mixed use	5	Commercial	5
595	2 10, Syed Nazrul Islam Sarani			Mixed use	5	Mixed use	5
596	2 08, Syed Nazrul Islam Sarani	Commercial	4	Commercial	15	Commercial	15
597	2 07, Syed Nazrul Islam Sarani	Commercial	3	Commercial	15	Commercial	15
598	2 06, Syed Nazrul Islam Sarani	Commercial	1	Commercial	14	Commercial	14
599	2 06, Syed Nazrul Islam Sarani			Commercial	4	Commercial	4
600	2 05, Syed Nazrul Islam Sarani	Commercial	4	Commercial	4	Commercial	4
601	2 04, Syed Nazrul Islam Sarani	Commercial	7	Commercial	7	Commercial	7
602	2 04, Syed Nazrul Islam Sarani			Commercial	3	Commercial	3
603	2 04, Syed Nazrul Islam Sarani			Mixed use	2	Mixed use	2
604	2 03, Syed Nazrul Islam Sarani	Commercial	3	Commercial	3	Commercial	3
605	2 02, Syed Nazrul Islam Sarani	Commercial	1	Commercial	1`	Commercial	1`
606	2 02, Syed Nazrul Islam Sarani			Commercial	1`	Commercial	1`
607	2 01, Syed Nazrul Islam Sarani	Mixed use	6	Mixed use	6	Commercial	6
608	2 00/1, Syed Nazrul Islam Sarani	Commercial	1	Commercial	1	Mixed use	1
609	2 00, Syed Nazrul Islam Sarani	Commercial	1	Commercial	1	Commercial	1

Appendix - D

Appendix D

Field Survey Observation sheet for land use data of the buildings

Ward no. :
Holding no. :
Road :
Date ;

A. Type of the building

1. Building type at present

Residential ☐
Mixed use (Residential & other type of use) ☐
Mixed use (Other than residential) ☐
Commercial ☐
Government/Semi Government ☐
Other (Institutional, Industrial, Religious etc.) ☐

2. Building Type (Earlier) _____

B. Built form

1. Number of storey
2. Built-up area

Full covered ☐
Partly covered ☐

3. Approximate percentage of building footprint

C. Open space

1. Approximate percentage of open space
2. Set-back area in the plot

Paved ☐ Partly paved ☐ Green ☐

D. Plot configuration

Square ☐ Rectangular ☐ Elongated ☐ Other ☐

E. Street pattern

1. Width of the street ____ in front of the building
2. Type of road in front of building

   Internal road ☐ Peripheral road ☐
3. Name of street in front of building

Appendix - E

No.
Address:

Survey Questionnaire for the Study of Livability Assessment of Segunbagicha

Livability refers to an urban system that contributes to the physical, social and mental wellbeing and personal development of all its inhabitants (Cities PLUS 2003).

An **open space** can be defined as an unbuilt land within the city which provides environmental, social and economic benefits to communities. It can be a green space like parks, and gardens, play areas, sport facilities and green corridors.

Insufficient greenery in residential area reduces the aspirations and opportunities for natural experiences of residents outside the domestic setting, which may result in lower physical activity, behavioral problems, and social isolation (Lindheim and Syme, 1983). Public open spaces are important indicators for livability, health and wellbeing, as better access can promote physical activity and have a positive effect on mental health.

(Questionnaire for the residents of study area)

Age group of the respondent:

Years	Under 12	13-18	19-24	25-40	41-50	51-60	60+
Male							
Female							

1. **How often do you go to open spaces?**

	Never	Occasionally	monthly	weekly	Daily
Within the study area					
Ground of Shilpakala Academy					
Playground of Segunbagicha school					
Ground of Anti Corruption commission					
Ground rear the church					
Outside the study area					
Ramna Park					
Suhrawardi Uddayan					
Osmani Uddayan					

2. **Why?** (If the answer of question no. 1 is 'never')

Too far away	Not aware about the site	Not feel safe	Not well maintained	Lack of facilities	Too many roads to cross	Not easy to get around site

3. **The reason you visited open space regularly for-**

	Walking	Playing/sports	Leisure activity	Physical exercise	Others
Within the study area					
Ground of Shilpakala Academy					
Playground of Segunbagicha school					
Ground of Anti Corruption commission					
Ground rear the church					
Outside the study area					
Ramna Park					
Suhrawardi Uddayan					
Osmani Uddayan					

4. **How do you go to the open space?**

walking	Cycling	Other mode of transport

5. **How long it took you to travel to the open space?**

Minute _____

6. **How accessible the open spaces in your area are?**

	Not accessible to all	Accessible for limited period
Ground of Shilpakala Academy		
Playground of Segunbagicha school		
Ground of Anti Corruption commission		
Ground rear the church		

7. **How satisfied are you with the quality of the open space you visited regularly within the study area?**

Name of the open space						
	Very poor	Poor	Average	Good	Very good	Excellent
Cleanliness						
Safety						
Maintenance						
Facilities						

*Facilities mean overall sports facilities, toilet facilities, seating arrangements etc.

8. **How satisfied are you with the quality of the open space you visited regularly outside the study area?**

Name of the open space						
	Very poor	Poor	Average	Good	Very good	Excellent
Cleanliness						
Safety						
Maintenance						
Facilities						

*Facilities mean overall sports facilities, toilet facilities, seating arrangements etc.

9. **Are you satisfied with the amount of open spaces in your area?**

Not satisfied	Satisfied	Very much satisfied

10. **Do you think that the adjacent open spaces satisfy the demand of the area?**

Yes	
No	

11. **Do you think that the quality of life/livability would be better if there were more open spaces in your area?**

Yes	
No	

12. **In your opinion what changes should be done to open spaces for the development of livability of the area?**(open ended)

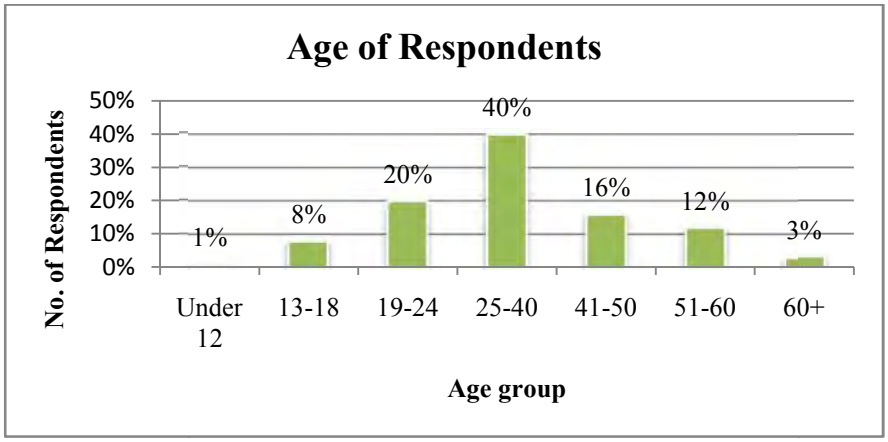
Appendix - F

Appendix F

To understand the response of the residents who are living at present a structured questionnaire survey has been conducted among the residents of Segunbagicha. To get the response and scenario of earlier period, few persons who had lived or have been living in the study area are interviewed.

1. Profile of the respondents of present time

In September 2014, a structured questionnaire survey among 100 respondents was conducted. The respondents interviewed were present residents of all ages from different parts of Segunbagicha. Among the respondents 75 % are male and 25% are female.



2. List of the persons interviewed

Name of the respondent	Age	Holding no.	Period of Living
Mr. Delower	60 year	1,Segunbagicha	1973-1997
Md. Matiur Rahman	67 year	27/6/B, Topkhana	Pakistan period to present day
Mr. Malek	60 year	27/7/1, Topkhana	Pakistan period to present day
Mr. Aftab Ahmed	59 year	26, Topkhana	Pakistan period to present day

Appendix - G

Appendix: G (Open space Assessment Manuel)

Site ID:		Date:						Ownership/Maintenance:
Name:		Day:	Mon Tue Wed Thu Fri Sat Sun					
Time:		Weather/clima	Sunny	Cloudy	Raining	Warm	Cold	
Type (Tick one)								
Park | Amenity Greenspace | Playing Field | Green Corridor | Natural & Semi-Natural Areas (see additional sheet)								
		Score						
		Very good	Good	Average	Poor	Very poor		
		4	**3**	**2**	**1**	**0**		Notes
	Layout, Balance and Setting *(parks only)*							
	Experience of Nature *(nat/semi natural urban g.space only)*							
	Safety							
	Linkages via - Public Transport							
	Linkages via - Cycleways							
	Linkages via - Footpaths/Pedestrian							
	Entrances or Access points/areas							
	Boundaries							
	Disabled access							
	Roads, paths, cycleways							
N/A for Semi-Natural space	**Planted Area (formal planting, flora areas etc.)**							
	Vegetation (informal shrubs, trees, hedges etc)							
	Grass Areas							
	Water (still and moving)							
	Ambient Noise							
	Evidence of Vandalism							
	Litter							
	Litter Bins							
	Dog fouling							
	Dog Bins							
	Seats							
	Toilets							
	Parking							
	Cycle stands							
	Lighting							
	Information & signage							
	Information available before visiting							
	Equipment/play areas							
`	**Events**							

Appendix: G

PARKS	Very good (4)	Good (3)	Average (2)	Poor (1)	Very Poor (0)
Layout, Balance and Setting	Very good balance, all elements present	Good balance between those natural, amenity and recreational elements present	Adequate relationship	An imbalance between the uses.	An imbalance between the uses, need to introduce additional elements
Safety	No areas of poor visibility or entrapment points	Some areas of poor visibility, but no entrapment points	Some areas of poor visibility and entrapment points	Lots of areas of poor visibility and entrapment points	Lots of remote areas of poor visibility and remote entrapment points with no escape options
Linkages via - *Public Transport Bus route/Train*	Good Public Transport, bus stops or train station located at the site entrance.	Bus of train station located nearby.	Reasonable public transport access, bus stop within walking distance.	The nearest bus stop is some distance away from the site (more than 5 mins walk).	No bus stops within a reasonable walking distance.
Linkages via - *Cycleways*	Separated cycle routes to and within the site.	Some cycle routes/quiet local roads safe for cyclists.	Easy access for cyclist although no designated routes-local roads quiet.	Limited cyclist access	No access for cyclists, roads are very busy, lack of a safe place to leave/lock bikes.
Linkages via - *Footpath/pedestrian route*	Clearly defined paths to and through the site, crossing points across roads to reach site.	Paths provided to and within the site, some crossing of roads required but no safety issues.	Some paths to and/or within the site, improvements to road crossings required.	Paths provided to and/or within the site, some safety issues regarding access for pedestrians.	No clear paths provided to and/or within the site, significant safety issues regarding access for pedestrians.
Entrances	Appropriate size welcoming, inviting, clean, and well maintained.	Obvious, clean and well maintained	Apparent as an entrance in average condition	Apparent as an entrance but poorly maintained	Inappropriate location and poorly maintained.
Boundaries	All clearly defined and well maintained to a high standard	Clearly defined, maintained to reasonable standard	All clearly defined - maintenance 'patchy'	Not clearly defined, some maintenance issues	Not clearly defined - maintenance needed
Disabled access	Disabled parking bays in close proximity to entrance. Entrance points accessible to all. Surface conditions are good. Good wheelchair access throughout, well distributed resting points (seats), information boards accessible to all. Site accessibility clear (onsite and before visiting).	Complete wheelchair access, but only some resting points. Most of the entrance points accessible to all.	Some access points accessible to all. Limited disabled parking bays. Some wheelchair access, some resting points. Some information regarding site accessibility (onsite and before visiting). Some surface issues.	Limited wheelchair access/ inadequate resting points. Some issues of poor surfaces.	No disabled parking bays. No wheelchair access, no resting points. Required to use poor surfaces - wet/muddy/uneven ground. No accessibility information onsite or before visiting.
Roads, paths, cycleways (on site)	Suitable materials, level for safe use, edges well defined, surfaces clean and debris and weed free - no desire lines	Path/s generally very good but some minor maintenance needed	Suitable materials but with some faults - cracking/overgrown/vegetation overhanging	Path/s in correct place, but in need of obvious repair - uneven/cracking/overgrown/vegetation overhanging	Paths inappropriate / only desire lines (evidence of people creating their own route, regardless of where the footpath goes)
Planted Areas (formal planting, flora areas etc.)	Numerous, appropriate planting, high standard and very well maintained. No Weeds	Numerous, appropriate plantings, maintained to a good standard. Very few weeds.	Some planting, well maintained.	Some planting, poorly maintained- overgrown. Numerous weeds.	Inappropriate maintenance/no planting and required
Vegetation (informal shrubs, trees, hedges etc.)	Vegetation actively managed for formal and informal amenity and biodiversity. Areas of wildlife habitat actively managed in partnership with the local community.	Less complex site where vegetation of managed for informal amenity and biodiversity. Some areas of wildlife habitat actively managed.	Vegetation managed mainly for informal amenity, with some wildlife habitat management	Vegetation managed mainly for informal amenity, no wildlife habitat management.	Limited vegetation maintenance.
Grass Areas	Full grass cover throughout, dense sward, good colour and cleanly cut	Full grass cover throughout, dense sward, good colour and cleanly cut, few weeds, grass cut frequently to keep short.	Full grass cover throughout main area but some thin patches evident; some bald areas discreet; grass cut frequently but length excessive between cuts, cut quality good (no tearing). Some weeds.	General grass cover average and patchy with some bald patches, cut infrequently or at low frequency, clippings obvious or cut quality poor. Numerous weeds.	General grass cover poor, wear has led to patchy and poor cover with little or no serious attempts to correct the problem, clippings obvious or cut quality poor. Many weeds.
Water (still and moving)	The water appears to be good condition, the banks are in good condition and are safe, safety equipment is available and in good condition.	The water quality appears to ok, there is some isolated rubbish/damage to platforms etc.	The water, banks and safety equipment is in an average condition there are some issues	The water is in poor condition, signs of rubbish, the banks appear in some places to be unsafe, unsure about the condition of safety equipment	The water and/or banks are very poor quality or the site has no water and would significantly benefit from it being present.
Ambient Noise	No noise - very peaceful	Limited noise, but site is located away from roads/railways	Some intrusion by noise (eg busy road/railway) but wouldn't deter users	Regular noise intrusion that might deter users	Noisy site from a range of source, persistent and impacts on the usability of the site.
Evidence of Vandalism	No vandalism/graffiti	Very limited evidence	Some vandalism/graffiti	Clearly evidence and may deter some from visiting	Much vandalism/graffiti seriously deterring the usage of the site.

Litter	No litter	Some limited evidence of litter	Some limited evidence of litter, but doesn't detract from the overall appearance of the site	Litter is clearly evident and may deter some from visiting	Lots of litter seriously deterring the usage of the site.
Litter Bins	Numerous for the site of site and in good condition	Numerous for the size of site, and in average condition	Adequate number, in average condition	insufficient number, in average/good condition, or appropriate number but in poor condition	None and required
Dog Fouling	No fouling	Some limited evidence of fouling	Some limited evidence of fouling, but doesn't detract from the overall usage of the site	Fouling is clearly evident and may deter some from visiting	Lots of fouling seriously deterring the usage of the site.
Dog Bins	Numerous for the site of site and in good condition	Numerous for the size of site, and in average condition	Adequate number, in average condition	insufficient number, in average/good condition, or appropriate number but in poor condition	None and required
Seats	Numerous for the size of site and in good condition and locations	Numerous and in average condition	Adequate number in average condition	Insufficient number, or in poor condition. Poor location.	None and required
Toilets	On-site (or well signed off-site), easy to access (incl disabled), signed and well maintained	As Very good, but difficult to find/not well signed	On or near off-site toilets in average condition	As Average but in poor condition/badly maintained, no disabled access	None and required
Parking	Adequate provision, commensurate to the site - clean, tidy, good access/location and in good condition.	Parking is adequate in average condition	Parking provided, commensurate to the site - but issues with location, condition and cleanliness	Parking is inadequate for the site/signs of inappropriate parking	None provided and some is required
Cycle stands	More than adequate provision, in good condition	Adequate provision, in good condition	Adequate provision, in poor or average condition	Inadequate provision, in poor condition	None and required
Lighting	Good lighting scheme, well maintained	Good lighting scheme in need of maintenance	Reasonable lighting scheme	Poor lighting scheme	None & is required
Information & signage	Information available for locals and visitors in some detail (info. Boards, signage, leaflets, way marked routes, contact details etc.)	Some information available	Limited available information	Limited available information, information board damaged	No information found & required
Information available before visiting	Information available from (Council - SGC, TC or PC) website(s) or leaflet - where the site is, what facilities are on the site, accessibility, opening hours, events and staff contacts	There is some information available	There was limited information available	Only the site name was found	No information found & required
Equipment/play areas (play areas, skateboard areas, sports equipment)	Equipment/surface in excellent condition and accessible to all users. Entrances points are safe - slow self closing gates.	Equipment/surface in good condition	Equipment/surface in reasonable condition, potential improvements needed in the future	Some equipment/surface in need of repair, improvements can be made. Entrance gates need repair.	Most equipment/surface in need of repair/hazardous - or there is no equipment and the site would benefit from it.
Events	Regular full events programme	Events programmed for this year	Some events	An event	None and required/expected
Other features:					
Historic structures (eg bandstands, fountains, statues)	Please describe if present, listing type and condition - on the scale: 4. Very Good 3. Good 2. Average 1. Poor 0. Very Poor / not present and required If not present and considered to be required in an ideal situation - please detail recommendations				
Other structures (eg changing pavilions, refreshment facilities, drinking fountains)					
Important views and vistas					
Railings					
Public art					
Open air theatres or other performance spaces					
Other sport and recreation facilities (eg tennis court/Bowling green/Boules) - Please list					
Anything else (please list)					